INTERNATIONAL BOUNDARY AND WATER COMMISSION
UNITED STATES AND MEXICO

UNITED STATES SECTION

JOSEPH F. FRIEDKIN, *Commissioner*
4110 Rio Bravo
El Paso, Texas 79902

F. J. SALDANA
Chief of Hydrography
P.O. Box 1564
Laredo, Texas 78040

MEXICAN SECTION

DAVID HERRERA JORDAN, *Commissioner*
Apartado Postal 1612D
Cd. Juarez, Chihuahua

OSCAR G. GUILBOT BOUILLET
Resident Engineer
3456 Pino Suarez Street
Nuevo Laredo, Tamaulipas

WATER BULLETIN NUMBER 48

Flow of the Rio Grande and Related Data

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

1978

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

CONTENTS

Quantity of Water

	Page
Foreword and Acknowledgements	4
General Hydrologic Conditions for 1978	6
Isohyetal Maps for August 1-7 and September 19-30, 1978	94
Isohyetal Map for Year 1978	143
Map - Rio Grande Drainage Basin	Following Page 163

Stream-Flow Records

Rio Grande below Elephant Butte Dam	7
below Caballo Dam	8
at El Paso	9
Diversions from the Rio Grande - American Canal at El Paso	10
Rio Grande below American Dam at El Paso and Cd. Juarez	11
Diversions from the Rio Grande - Acequia Madre at Cd. Juarez	12
Rio Grande near Clint and San Agustin (formerly Island Station near Clint)	13
near Acala and Praxedes Guerrero (formerly County Line Station near Acala)	14
at Fort Quitman near Colonia Luis Leon	15
near Candelaria and San Antonio del Bravo	16
above Rio Conchos near Presidio and Ojinaga	17
Tributary - Rio Conchos near Ojinaga	18
Alamito Creek near Presidio	19
Rio Grande below Rio Conchos near Presidio and Ojinaga	20
Tributary - Terlingua Creek near Terlingua	21
Rio Grande at Johnson Ranch near Castolon and Santa Elena	22
at Foster Ranch near Langtry and Rancho Santa Rosa	23
Tributary - Pecos River near Langtry	24
Dead Mans Canyon near Comstock	25
Dolan Springs near Loma Alta	26
Devils River at Pafford Crossing near Comstock	27
Big Satan Creek near Comstock and Rough Canyon near Del Rio	28
North Fork San Pedro Creek and Middle Fork San Pedro Creek near Del Rio	29
Evans Creek near Comstock	30
Carmina Springs near Cd. Acuna	31
Lourdes, Hilda, and Ernestina Springs near Cd. Acuna	32
Rio Grande below Amistad Dam near Cd. Acuna and Del Rio	33
Tributary - Springs M-15 and M-5 near Cd. Acuna	34
Arroyo de los Jaboncillos near Cd. Acuna	35
Arroyo del Buey and Arroyo de la Treinta y Una near Cd. Acuna	36
Maris Spring near Cd. Acuna	37
Eight Mile Creek near Del Rio	38
McKee Spring near Del Rio	39
Cantu Spring near Del Rio (formerly Cantu Spring on Cienegas Creek near Del Rio)	40
Cienegas Creek near Del Rio	41
Rio Grande at Del Rio and Cd. Acuna	42
Tributary - Arroyo de Las Vacas at Cd. Acuna	43
San Felipe Springs at Del Rio	44
San Felipe Creek near Del Rio	45
Diversions from the Rio Grande - Maverick Canal at Mile 13 near Quemado	46
Tributary - Pinto Creek near Del Rio	47
Rio San Diego near Jimenez (formerly Rio San Diego at Jimenez)	48
Rio Grande near Jimenez and Quemado (formerly Rio Grande below Maverick Dam near Quemado)	49
Tributary - Rio San Rodrigo at El Moral (formerly Rio San Rodrigo near mouth at El Moral)	50
Return Flow at Maverick Power Plant near Eagle Pass	51
Maverick Canal Extension below the Power Plant near Eagle Pass	52
Tributary - Return Flow from the Maverick Irrigation District above Eagle Pass (formerly Return Flow - Maverick Dam to Eagle Pass)	53
Rio Grande at Piedras Negras and Eagle Pass (formerly Rio Grande at Eagle Pass)	54
Tributary - Rio Escondido at Villa de Fuente	55
Return Flow from the Maverick Irrigation District below Eagle Pass (formerly Return Flow - Eagle Pass to San Antonio Crossing)	56
Rio Grande near El Indio and Villa Guerrero (formerly Rio Grande at San Antonio Crossing near El Indio)	57
at Villa Hidalgo near Laredo (formerly at Palafox near Laredo)	58
at Nuevo Laredo and Laredo (formerly at Laredo)	59
Tributary - Rio Salado near Las Tortillas (formerly Rio Salado at Las Tortillas)	60
Rio Grande below Falcon Dam near Falcon and Nueva Cd. Guerrero	61
Tributary - Rio Alamo at Cd. Mier	62
Contributions from the Lower Rio San Juan Irrigation District - Falcon Dam to Rio Grande City (formerly Contributions from Rio San Juan - Falcon Dam to Fort Ringgold)	63
Rio San Juan at Camargo	64
Diversions from the Rio Grande - Falcon Dam to Rio Grande City (formerly Falcon Dam to Fort Ringgold)	65
Rio Grande at Rio Grande City near Camargo (formerly Rio Grande at Fort Ringgold, Rio Grande City)	66
at Los Ebanos near Cd. Diaz Ordaz	67
Tributary - Contributions from the Lower Rio San Juan Irrigation District - Rio Grande City to Anzalduas Dam (formerly Contributions from Rio San Juan - Fort Ringgold to Anzalduas Dam)	68
Diversions from the Rio Grande - Rio Grande City to Anzalduas Dam (formerly Fort Ringgold to Anzalduas Dam)	69

CONTENTS

Quantity of Water

Diversions from the Rio Grande - Anzalduas Canal near Reynosa 70
Rio Grande below Anzalduas Dam near Reynosa and Mission 71
Floodways - United States and Mexico 72
Diversions from the Rio Grande - Anzalduas Dam to Progreso 76
Rio Grande at Progreso, Tamaulipas near Progreso, Texas 77
Diversions from the Rio Grande - Progreso to San Benito 78
Rio Grande near San Benito and Ramirez 79
Diversions from the Rio Grande - San Benito to Brownsville 80
Rio Grande near Brownsville and Matamoros 81
Diversions from the Rio Grande - Brownsville to the Gulf of Mexico 82
U. S. Side, Falcon Dam to the Gulf of Mexico 83
Tributary - Outfalls from Sewers 84
Diversions from the Rio Grande - Municipal and Industrial Water Uses - United States and Mexico . . 85
Stored Water in Large Reservoirs of the Rio Grande Basin - United States and Mexico 88
Floods of 1978 93

Quality of Water

Quality of Water 97

Climatological Data and Drainage Basin and Irrigated Areas

Rainfall on the Rio Grande Watershed - United States and Mexico 123
Average Rainfall on Subdivisions of the Rio Grande Watershed 145
Location of Rainfall Stations on the Rio Grande Watershed - United States and Mexico 146
Evaporation in the Rio Grande Basin - United States and Mexico 154
Temperature, Humidity, and Wind - United States and Mexico 156
Drainage Basin Area above Each Gaging Station and Corresponding Irrigated Areas 159

Supplementary Data

Deduced Inflows - International Amistad Reservoir 161
International Falcon Reservoir 162

Corrections to Previous Water Bulletins

Corrections to Previous Water Bulletins 163

FOREWORD

This bulletin presents the forty-eighth 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 1978.

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 1978 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, Below Anzalduas Dam, and Progreso. 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 11,475,000 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 2,207,000 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 1954-1978, this flow has averaged 897,147 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 wth 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 averge 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

Units of Measure

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

METRIC UNITS		ENGLISH UNITS
	LENGTHS	
1 Centimeter		0.393701 Inch
1 Meter		3.28084 Feet
1 Kilometer		0.621371 Mile
	AREAS	
1 Square Meter		10.76391 Square Feet
1 Hectare		2.471054 Acres
1 Square Kilometer		0.386102 Square Mile
	VOLUMES	
1 Cubic Meter		61023.74 Cubic Inches
1 Cubic Meter		35.31467 Cubic Feet
1 Cubic Meter		1.30795 Cubic Yards
1000 Cubic Meters		0.81071 Acre-Foot
1 Liter		0.264172 U. S. Gallon
	WEIGHTS	
1 Kilogram		2.204623 Pounds
1 Metric Ton		2204.623 Pounds
1 Metric Ton		1.102311 Short Tons (2,000 lbs.)

Beginning in 1976, as a step toward eventual publication of this bulletin in metric units only, both English and metric units are used to report the figures in the descriptive headings and for the yearly figures of the annual and period summaries of all gaging station pages. The yearly figures for the summaries are obtained by direct conversion, except for those stations operated by the Mexican Section, where the metric system of units is used.

GENERAL HYDROLOGIC CONDITIONS FOR 1978

Along and Adjacent to the International Portion of the Rio Grande

During the year 1978, temperatures were about average on the watershed of the Rio Grande below El Paso, Texas. Evaporation was 97% of average. Precipitation was 125% of average from El Paso to Amistad Dam, 96% of average from Amistad Dam to Falcon Dam, 80% of average from Falcon Dam to Rio Grande City, and 96% 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 the confluence of the Rio Conchos with the Rio Grande and above average from the Rio Conchos confluence to the Gulf of Mexico. In the reach between El Paso and the confluence of the Rio Conchos, the flow was 39% of average, ranging from 87% of average above Rio Conchos to 16% 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 194% 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 127% of average. Flows passing Rio Grande stations below Falcon Dam were partly regulated by releases from Falcon Reservoir. Such releases in 1978 amounted to 2,506,022 acre-feet, or 107% of the average for the twenty-five years of operation, 1954 to 1978. The volume of flow wasted to the Gulf of Mexico, including approximately 422,000 acre-feet of flood flows discharged through the United States and Mexican floodway systems, was approximately 1,845,000 acre-feet, or 153% of the average for this twenty five-year period. This volume included 1,423,356 acre-feet discharged via the Rio Grande channel, which is 159% of the average for this twenty-five year period.

The total annual flow of all measured tributaries below Fort Quitman was 173% of average. The total flow of these tributaries in the United States was 593,798 acre-feet, or 85% of average. For Mexico the measured tributary flow, excluding Rio Alamo and Rio San Juan, was 2,469,953 acre-feet, or 192% of average. The flows of the Rio Alamo and Rio San Juan were 86% and 272% of their respective averages.

Return flow to the Rio Grande at Maverick Power Plant near Eagle Pass was 753,689 acre-feet, or 143% of the eleven-year average. Return flow to the Rio Grande through various drains in the Maverick County irrigation district, excluding storm inflow, amounted to 119,256 acre-feet, or 75% of the eleven-year average.

There were two noteworthy floods during 1978. Both floods occurred in the Presidio-Ojinaga area, one in late August as a result of heavy rains on the Rio Conchos watershed below Luis L. Leon Dam and the other, in late September and early October, first from heavy rains below the dam and later from large releases required by heavy runoff into Luis L. Leon Reservoir. For a detailed description of these floods, see page 93 in this bulletin. In addition to these floods, there were two others worthy of mention. The first one occurred below Falcon Dam as a result of heavy runoff into Marte Gomez Reservoir. The resulting spills required the use of the two countries' floodway systems in order to reduce the flows sufficiently to safely convey them in the Rio Grande channel. The highest peak flow recorded in the Rio Grande during this flood was 40,000 second-feet at Rio Grande City. There was no flood damage of consequence. Another flood of significance, not only because of its magnitude but because it occurred so late in the year, originated below Big Bend National Park as a result of heavy rains falling in early November on the watershed between the park and Langtry. The flood reached a peak of 148,000 second-feet at the Foster Ranch gaging station, nearly equaling the third largest flood known to have passed Langtry since the turn of the century.

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 1978 was 4,447,200 acre-feet, or 102% of the average 4,359,100 acre-feet. In the United States, stored water in these reservoirs was 50% of average, while in Mexico the average was 124%.

In International Amistad Reservoir there was a net increase in storage during the year of 586,900 acre-feet. Storage ranged from a low of 2,830,600 acre-feet on July 30 to a high of 3,927,000 acre-feet on November 27 and averaged 3,303,500 acre-feet during the year, or 113% of the average for the period of operation June 1968 through 1978. In International Falcon Reservoir there was a net increase in storage during the year of 416,100 acre-feet. The storage varied from a low of 1,639,100 acre-feet on June 2 to a high of 2,786,700 acre-feet on November 13 and averaged 2,156,700 acre-feet during the year, or 108% of the average for the twenty-five years of operation, 1954 through 1978.

Diversions from the Rio Grande in the United States were 115% of average. Diversions into the American Canal were 50% of average; into the Maverick Canal, 125% of average; and in the United States below Falcon Dam, 126% of the average for the twenty-two years, 1957-1978. In Mexico diversions were 108% of average. Diversions into the Acequia Madre were 82% of average, while diversions through the Anzalduas Canal for irrigation in Mexico were 112% of the twenty-five year average.

In 1978, the total reported irrigated acreage from the Rio Grande and its tributaries below El Paso, Texas showed a decrease of 2% from the previous year. On the United States side, there was a decrease of about 7% above Falcon Dam and practically no change below, for an overall average decrease of 1%. On the Mexican side, there was a decrease of 13% above Falcon Dam and an increase of 4% below, for an overall average decrease of 3%.

The 1978 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 26% of the 1938-1978 average; above Amistad Reservoir at Foster Ranch, 164% of the 1968-1978 average; above Falcon Reservoir at Laredo, 127% of the 1968-1978 average; and at the station below Anzalduas Dam, 118% of the 1959-1978 average. The volume of suspended silt transported by the Rio Grande in 1978 was 267% of the 1969-1978 average at Foster Ranch above Amistad Reservoir, 55% of the 1968-1978 average at Laredo above Falcon Reservoir, and 272% of the 1955-1978 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 1978.

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-Feet (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-Feet 1978 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	7.9	* 8.5	15.0	1,240	* 13.0	1,260 *	1,780	1,280	591 *	4.3	14.0	* 10.0
2	7.9	8.5	14.0	1,240	11.0	1,280	1,790	1,280	564	* 4.5	9.7	12.0
3	* 7.9	8.5	14.0	1,250 *	11.0	1,290	1,790	1,280	565	4.2	* 8.5	9.5
4	7.9	7.9	* 14.0	1,260	11.0	1,300	1,800	1,310	260	4.7	6.2	9.6
5	7.9	7.9	16.0	1,270	1,070 *	1,310	1,810	1,320	24.0	4.9	5.6	11.0
6	7.9	7.9	14.0	1,280	1,110	1,310	1,830	1,320	22.0	5.1	5.6	12.0
7	7.9	7.9	14.0	1,280	1,100	1,320	1,830	1,330	22.0	4.9	5.6	9.7
8	7.5	8.3	15.0	1,280	52.0	1,330	1,850	1,350	22.0	4.2	5.6	9.6
9	7.9	7.9	618	1,290	17.0	1,300	1,860	1,350	22.0	4.2	6.2	9.3
10	8.7	8.6	643	1,300	17.0	1,320	1,870	1,360	22.0	4.0	6.2	8.8
11	* 8.6	9.2	644	1,300	17.0	1,320	1,880	1,370	15.0	3.6	11.0	9.1
12	7.9	8.2	642	1,310	17.0	1,340	1,880	1,380	.4	3.4	10.0	9.1
13	7.3	7.9	641	1,310	17.0	1,340	* 1,890	1,400	.2	2.9	7.7	9.1
14	7.3	8.7	641	1,290	18.0	1,310 *	1,230	1,400	.1	3.6	* 6.9	* 8.9
15	8.8	31.0	637	614	* 18.0	1,810	1,220	* 1,380	* .1	3.6	11.0	9.1
16	8.2	8.9	639	614	18.0	1,810	1,220	1,360	.1	* 3.3	16.0	9.1
17	8.6	* 8.4	641	614 *	17.0	1,830	1,220	1,360	.1	2.7	15.0	9.1
18	7.8	8.2	643	30.0	17.0	1,840	1,230	1,280	0	2.4	14.0	10.0
19	7.6	7.7	643	14.0	17.0	1,840	1,240	1,280	0	2.4	14.0	11.0
20	7.9	8.1	702 *	14.0	17.0	1,660	1,250	1,290	1.3	2.6	14.0	18.0
21	7.9	7.9	643	13.0	17.0	1,650	1,250	1,290	8.2	3.4	14.0	12.0
22	7.9	7.9	1,180	13.0	17.0	1,660	1,250	1,290	8.0	2.5	14.0	16.0
23	8.6	923 *	1,220 *	13.0	18.0	1,680	1,250	1,950	7.3	2.4	15.0	13.0
24	8.2	17.0	1,240	12.0	18.0	1,680	1,260	1,960	6.3	5.8	15.0	13.0
25	7.9	14.0	1,230	13.0	18.0	1,670	1,270	1,370	5.9	6.8	15.0	13.0
26	8.2	14.0	1,260	13.0	18.0	1,690	* 1,270	1,980	5.2	6.7	14.0	12.0
27	8.5	14.0	1,270	14.0	18.0	1,690	1,280	2,020	4.4	92.0	12.0	12.0
28	7.9	14.0	1,280	13.0	18.0	1,690	1,310	1,900	4.2	6.2	12.0	12.0
29	8.0		1,280	13.0	19.0	1,720	1,320	1,790	4.4	5.6	11.0	12.0
30	8.5		1,290	13.0	19.0	1,710 *	1,330	1,800	4.0	4.6	10.0	12.0
31	8.7		1,290		1,210		* 1,350	1,820		2.9		12.0
Sum	249.7	1,200.0	21,033.0	19,930.0	4,975.0	45,960	46,610	46,450	2,189.2	214.4	324.8	343.0

Month	Current Year 1978 Extreme Gage Feet High	Extreme Gage Feet Low	Ø Extreme Second-Feet High Day	High	Low Day	Low	Average Second-Feet	Total Acre-Feet	Period 1938-1978 Acre-Feet Average	Maximum	Minimum
Jan.			15	8.8	!13	7.3	8.1	495	24,107	86,500	200
Feb.			23	923	19	7.7	42.9	2,380	37,000	88,861	188
Mar.			!30	1,290	! 2	14.0	678	41,718	70,771	128,925	1,520
Apr.			!12	1,310	24	12.0	664	39,531	76,383	162,000	11,207
May			31	1,210	! 2	11.0	160	9,868	78,244	467,000	512
June			!18	1,840	1	1,260	1,530	91,160	90,539	363,000	16,913
July			13	1,890	!15	1,220	1,500	92,450	92,610	211,000	41,352
Aug.			27	2,020	! 1	1,280	1,500	92,132	75,269	134,000	9,530
Sept.			1	591	!18	0	73.0	4,342	32,350	129,000	163
Oct.			27	92.0	!18	2.4	6.9	425	16,641	72,100	166
Nov.			16	16.0	! 5	5.6	10.8	644	16,707	158,000	74.2
Dec.			20	18.0	10	8.8	11.1	680	18,431	87,300	179
				2,020		0	519	375,825	629,052	1,818,800	183,415
Yearly	Meters		Cubic Meters per Second					Thousands of Cubic Meters			
				57.2		0	14.7	463,580	775,935	2,243,490	226,242

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

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 61 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 1978.

REMARKS: Reservoirs, diversions, and drainage returns modify the river flow at this station. In addition to the outflow from Caballo Dam listed below, 424 acre-feet (523,000 m^3) of water were diverted in 1978 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-Feet (Cubic Meters per Second)				
Daily:	Max. 7,650 (217)	May 20, 1942	Min. 0.1 (0.003)	Several days 1954, 1955 and 1972	
Monthly:	Max. 6,710 (190)	May 1942	Min. 0.1 (0.003)	Nov. & Dec. 1955	
Yearly:	Max. 2,480 (70.2)	1942	Min. 284 (8.04)	1964	

Mean Daily Discharge in Second-Feet 1978 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	0.8	1.0	1.2	917	12.0	1,000 *	965	1,260	1,030	1.4	1.4	1.0
2	.8	.9	1.1	963	2.0	1,050	885	1,380	1,020 *	1.4	1.1	1.0
3	.8	.9	1.1	976 *	2.0	1,120	672 *	1,370 *	714	1.2	1.1	1.0
4	.8	.9	1.0	791 *	2.0	1,170	676	1,520	713	1.2	1.1	1.0
5	.8	.8	1.0	688	1.9	1,180	640	1,630	1,080	1.2	1.2	1.0
6	.8	.9	1.0	696 *	2.0	1,060 *	677 *	1,700	1,200	1.2	* 1.2	1.0
7	.8	1.0	1.2	786	2.0	922	1,100	1,720 *	1,350 *	1.5	1.1	1.2
8	.8	1.0	* 1.3	877	1.9	953 *	1,090	1,760	1,430	1.7	1.1	1.2
9	.8	1.0	1.3	856	2.0	1,420	1,130	1,810	1,440	1.8	1.1	1.2
10	.8	1.0	239	937 *	1.9	1,060	1,120 *	1,710 *	1,420	* 1.9	1.2	1.2
11	.8	.9	552	595	1.9	1,090	1,300	1,880	1,200	1.6	1.5	* 1.1
12	.8	1.0	569	608	1.9	1,070 *	1,410	1,970	1,070	1.3	1.5	1.1
13	.8	1.0	579 *	627 *	1.8	1,170	1,440 *	1,790	1,050	1.2	* 1.5	1.1
14	.8	* .9	566 *	549	1.8	1,290	1,470	1,730 *	781	1.2	1.4	1.1
15	.8	1.2	617 *	476	1.8	1,290 *	1,560	1,940	9.4	1.4	1.2	1.1
16	.8	1.2	658 *	449	1.8	1,350	1,530	1,880	3.3	* 1.4	1.1	1.1
17	.9	1.2	735	322 *	* 1.7	1,490	1,530 *	1,920 *	2.9	1.4	1.0	1.1
18	.9	1.2	774	336	1.6	1,470	1,780	1,950	* 2.7	1.1	1.0	1.1
19	* .9	1.1	773	369	1.5	1,480 *	1,930	1,880	2.3	1.1	.9	1.2
20	.9	1.1	881 *	439 *	1.8	1,570	1,990	1,170	2.2	1.0	* .9	1.2
21	.9	.9	1,110	441	1.9	1,550	1,970	1,230 *	2.0	1.0	.9	1.1
22	.9	1.0	1,400	427	2.0	1,550 *	1,880	1,230	2.1	.9	.9	1.1
23	.8	1.0	1,400 *	423	1.5	1,520	1,560	1,160	2.0 *	.9	.9	1.1
24	.8	1.1	1,090	368 *	1.6	1,510	1,180 *	892 *	1.8	.9	1.0	1.1
25	.8	1.1	907	415	228	1,540	1,240	832	* 1.7	.9	1.2	1.1
26	.8	1.2	893	479	655 *	1,540 *	1,360	889 *	1.8	.9	1.1	1.1
27	.8	1.1	871	523 *	623	1,530	1,360	739	1.6	.8	* 1.0	1.1
28	.8	1.2	867 *	539	613	1,410	1,360	721 *	1.6	.9	1.0	1.1
29	.8		899	542	592	1,130 *	1,370	822	1.5	1.0	1.0	1.1
30	.8		912 *	438	707 *	1,050	1,380	814	1.5	* 1.0	1.0	1.2
31	1.1		901		946		1,240 *	769		1.0		1.2
Sum	25.7	28.8	18,203.2	17,852	4,418.3	38,535	40,795	44,068	15,538.4	37.4	33.6	34.3

Month	Current Year 1978							Period 1938-1978		
	Extreme Gage Feet		Ø Extreme Second-Feet				Average Second-Feet	Total Acre-Feet	Acre-Feet		
	High	Low	High Day	High	Low Day	Low			Average	Maximum	Minimum
Jan.			31	1.1	! 1	0.8	0.8	51.0	1,094	21,032	19.2
Feb.			!15	1.2	5	.8	1.0	57.2	7,331	64,300	11.7
Mar.			!22	1,400	! 4	1.0	587	36,106	83,283	135,000	24,900
Apr.			3	976	17	322	595	35,409	78,935	212,000	25,470
May			31	946	!19	1.5	143	8,764	73,299	412,000	75.2
June			20	1,570	7	922	1,280	76,433	102,686	354,000	25,289
July			20	1,990	5	640	1,320	80,916	108,337	234,000	28,200
Aug.			12	1,970	28	721	1,420	87,408	105,849	179,000	20,500
Sept.			9	1,440	!29	1.5	518	30,820	47,619	181,000	6,757
Oct.			10	1.9	27	.8	1.2	74.2	4,109	35,400	15.5
Nov.			!11	1.5	!19	.9	1.1	66.6	2,204	14,400	7.0
Dec.			! 7	1.2	! 1	1.0	1.1	68.0	2,284	19,100	6.0
Yearly				1,990		0.8	492	356,173.0	617,030	1,795,670	206,085
	Meters			Cubic Meters per Second				Thousands of Cubic Meters			
				56.4		0.02	13.9	439,339	761,106	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 1978 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 1978.

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^3/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 /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 1978 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	36.8	29.6	22.0	267	155	287	542	651	296	159	45.7	32.9
2	35.9	30.5	21.6	277	174	348	457	584	267	161	38.1	26.8
3	35.3	30.9	21.5	275	192	301	578	446	387	46.3	208	23.9
4	34.3	31.5	21.8	249	77.9	315	485	463	579	42.4	167	21.0
5	38.8	33.2	21.5	312	50.4	400	302	474	302	42.8	94.1	19.9
6	39.9	40.8	23.6	199	34.2	432	195	552	195	39.1	81.5	20.1
7	39.9	57.2	21.9	188	16.1	481	167	555	172	32.8	69.8	23.0
8	39.9	43.1	20.1	193	15.9	500	147	587	305	27.0	64.5	26.6
9	34.6	34.6	19.3	201	15.7	419	203	550	329	41.8	65.3	19.0
10	37.9	17.9	21.0	250	15.5	396	390	537	353	36.8	64.4	17.4
11	41.1	19.6	26.3	300	15.5	412	270	599	318	32.0	63.5	23.1
12	40.1	30.8	26.4	306	15.5	460	339	519	292	30.3	60.5	26.6
13	36.9	30.7	18.3	241	15.7	494	381	578	248	33.2	57.7	24.8
14	35.4	25.3	18.4	196	15.7	521	451	796	186	32.2	68.3	23.1
15	35.4	18.6	138	210	15.3	527	432	705	114	31.2	95.7	22.9
16	35.1	18.5	280	228	15.4	516	432	711	112	28.6	66.9	22.7
17	33.6	17.6	330	199	15.4	543	534	735	107	25.5	54.0	22.5
18	36.2	16.0	387	136	15.6	551	576	746	107	22.3	45.2	24.4
19	32.6	15.9	418	134	15.8	589	569	692	97.0	19.9	39.9	25.0
20	32.3	15.9	494	99.8	42.2	626	621	1,490	98.9	17.5	35.4	26.2
21	29.7	15.8	510	88.7	26.2	607	743	1,360	78.0	50.6	34.2	24.5
22	29.7	13.5	518	85.4	20.0	613	757	906	185	68.4	32.7	24.3
23	28.4	14.8	531	88.7	21.4	615	909	881	329	133	30.5	27.4
24	28.1	20.3	544	94.6	16.8	613	1,080	827	327	76.2	28.8	46.0
25	28.3	20.5	551	108	13.9	616	1,010	801	323	44.6	28.4	46.5
26	30.3	17.8	432	103	13.9	612	712	833	103	38.6	27.8	42.2
27	30.5	17.8	336	89.2	13.9	665	464	582	104	40.0	26.1	28.2
28	30.2	17.7	321	72.9	13.9	661	591	509	65.7	33.5	24.1	26.0
29	30.6		329	91.5	13.9	734	596	407	119	30.4	27.4	29.2
30	30.7		307	139	23.7	669	627	348	111	28.1	37.3	24.1
31	29.7		301		202		616	347		30.8		18.6
Sum	1,058.2	696.4	7,030.7	5,421.8	1,308.4	15,523	16,176	20,771	6,609.6	1,475.9	1,782.8	808.9

Month	Current Year 1978 Extreme Gage Feet High	Extreme Gage Feet Low	Extreme Second-Feet High Day	High	Extreme Second-Feet Low Day	Low	Average Second-Feet	Total Acre-Feet	Period 1938-1978 Acre-Feet Average	Maximum	Minimum
Jan.			11	Ø 41.1	24	Ø 28.1	34.1	2,099	6,313	15,594	220
Feb.			7	Ø 57.2	22	Ø 13.5	24.9	1,381	7,175	52,200	136
Mar.	3.73	1.72	25	Ø 551	13	Ø 18.3	227	13,945	33,907	62,500	1,790
Apr.	3.18	2.18	5	Ø 312	28	Ø 72.9	181	10,754	41,021	139,000	6,820
May			31	Ø 202	125	Ø 13.9	42.2	2,595	43,648	357,000	522
June	4.38	2.78	28	828	1	Ø 287	517	30,789	51,785	304,000	6,020
July	4.86	2.27	24	1,140	8	93.2	522	32,085	57,510	198,000	9,652
Aug.	5.67	3.23	20	2,060	30	274	670	41,199	56,300	158,000	4,870
Sept.	4.12		4	695	28	Ø 65.7	220	13,110	38,069	171,000	2,430
Oct.			21	297	20	15.9	47.6	2,927	13,651	57,900	151
Nov.			3	281	24	18.7	59.4	3,536	8,193	21,300	229
Dec.			125	49.0	6	13.8	26.1	1,604	7,774	25,600	206
Yearly	5.67			2,060		Ø 13.5	216	156,024	365,346	1,559,200	57,481
	Meters			Cubic Meters per Second				Thousands of Cubic Meters			
	1.73			58.3		0.38	6.12	192,456	450,654	1,923,273	70,903

Ø Mean daily 1 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 7 discharge measurements during the year, a stable rating curve at medium and high flows, and a continuous record of gage heights. Records available: June 2, 1938 through 1978.

REMARKS: This canal diverts water from the Rio Grande at the American Dam at El Paso, Texas 2.1 river miles 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^3/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 1978 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	26.8	26.6	20.6	262	149	282	536	643	180	154	36.0	* 32.4
2	25.9	27.6	20.2	272	168	343	451	576	146	156	30.0	26.3
3	24.6	28.0	20.2	270	186	296	572	438	226	41.3	199	23.4
4	23.5	28.7	20.2	223	72.1	310	479	370	453	37.6	158	20.5
5	27.9	30.4	20.2	168	44.9	395	296	328	166	38.2	86.5	19.3
6	28.8	38.1	22.2	66.7	29.0	427	189	404	26.6	34.6	74.3	19.5
7	28.7	54.5	20.2	61.7	12.0	476	161	407	4.8	28.5	62.4	22.4
8	28.6	40.5	18.3	54.6	12.0	496	141	441	131	22.9	57.6	26.0
9	23.2	32.0	17.4	60.4	12.0	413	197	402	240	37.9	58.9	* 18.4
10	26.3	* 16.4	19.3	116	12.0	391	384	384	345	33.0	58.9	16.8
11	29.4	17.2	24.5	158	12.0	407	264	441	311	* 28.4	58.9	22.5
12	28.3	28.4	24.5	150	12.0	455	333	357 *	285	26.9	56.8	26.0
13	25.0	28.4	16.5	134	12.0	490	375	565	241	30.0	54.9	24.2
14	23.3	23.0	16.5	191	12.0	514	445	786	179	29.2	66.4	22.4
15	23.2	16.4	136	205	12.0	521	427	623	107	29.0	93.9	22.2
16	* 22.8	16.3	275	223	12.0	512	426	540	106	25.9	65.2	22.0
17	21.9	15.5	322	194	12.0	538	528	552	101	23.0	52.3	21.8
18	25.1	13.9	379	131	12.0	546	569	548	101	19.9	43.6	23.7
19	22.0	13.9	412	129	12.0	585	562	486	90.9	17.7	38.4	24.3
20	22.3	13.9	488	94.6	38.0	622	614	809	92.8	15.5	34.0	25.5
21	20.3	13.9	503	83.5	22.0	603	631	993	72.0	40.2	32.9	23.7
22	20.9	11.7	512	80.5	16.0	609	600	709	179	13.9	31.4	23.5
23	* 20.2	13.0	526	83.5	16.0	610	743	684	323	16.2	29.3	26.6
24	20.4	18.6	539	89.7	13.0	608	911	635	321	30.7	27.7	45.2
25	21.2	18.8	545	103	10.0	611	842	631	317	28.0	27.4	45.7
26	23.8	16.2	426	98.0	10.0	608	549	700	97.7	25.8	26.9	41.4
27	24.6	16.2	331	84.3	10.0	660	306	459	98.4	29.2	25.2	27.4
28	24.9	16.2	316	68.0	10.0	655	437	368	60.3	23.8	23.3	25.2
29	25.9		324	86.6	10.0	728	453	276	114	20.4	26.7	28.4
30	26.5		302	134	19.8	663	483	232	106	16.7	36.7	23.2
31	26.1		296		197		561	229		21.6		17.7
Sum	762.4	633.3	6,912.8	4,075.1	1,176.8	15,374	14,469	16,016	5,221.5	1,098.0	1,673.5	787.6

Month	Current Year 1978 Extreme Gage Feet High	Extreme Gage Feet Low	Extreme Second-Feet High Day	High	Extreme Second-Feet Low Day	Low	Average Second-Feet	Total Acre-Feet	Period 1939-1978 Acre-Feet Average	Maximum	Minimum
Jan.	3.19	2.83	11	35.0	23	19.3	24.6	1,512	2,256	15,594	0
Feb.	3.33	2.51	8	55.9	!22	8.8	22.6	1,256	4,732	19,500	0
Mar.			25	Ø 545	!13	Ø 16.5	223	13,711	30,441	50,100	1,700
Apr.			2	Ø 272	8	Ø 54.6	136	8,083	30,273	70,900	4,560
May			31	Ø 197	!25	Ø 10.0	38.0	2,334	26,919	69,000	392
June			29	Ø 728	1	Ø 282	512	30,494	35,875	65,700	5,990
July	8.74	3.70	24	971	8	87.5	467	28,691	42,511	70,700	8,673
Aug.	9.30	4.74	20	1,090	30	158	517	31,767	42,389	74,600	4,840
Sept.	7.24		4	562	! 6	0	174	10,357	27,567	63,100	2,230
Oct.	5.70	3.10	21	295	23	11.4	35.4	2,178	11,417	39,000	0
Nov.	5.54	3.34	3	272	24	17.6	55.8	3,319	6,784	21,000	0
Dec.	3.78	3.28	!25	48.2	6	13.2	25.4	1,562	6,716	25,500	0
Yearly	9.30			1,090		0	187	135,264	267,880	541,610	47,397.4
	Meters		Cubic Meters per Second					Thousands of Cubic Meters			
	2.83			30.9		0	5.30	166,848	330,430	668,076	54,465

* Discharge measurement made on this day Ø 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 42 discharge measurements during the year and a continuous record of gage heights. Computations by shifting control methods. Records available: June 1938 through 1978.

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 m³/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		Occasionally
Monthly:	Max. 4,880 (138)	May 1942	Min. 0		Occasionally
Yearly:	Max. 1,510 (42.8)	1942	Min. 13.8 (0.39)		1956

Mean Daily Discharge in Second-Feet 1978 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	10.0	* 3.0	1.4	4.6	* 5.8	4.9	6.0	* 8.1	116	5.2	9.7	* 0.5
2	10.0	2.9	* 1.4	5.0	6.1	4.9	5.7	8.1	121	5.1	8.1	.5
3	* 10.7	2.9	1.3	4.7	6.1	5.3	5.7	7.8	161	* 5.0	8.6	.5
4	10.8	2.8	1.6	* 26.2	5.8	5.0	6.0	* 92.9	126	4.8	8.9	.5
5	10.9	2.8	1.3	144 *	5.5	4.7	6.0	146 *	136 *	4.6	7.6	.6
6	11.1	2.7	1.4	132 *	5.2	* 4.7	6.0	148	168	4.5	7.2	.6
7	11.2	2.7	1.7	126 *	4.1	4.8	5.7	148	172 *	4.3	7.4	.6
8	11.3	2.6	1.8	138	3.9	4.3	5.7	146 *	174	4.1	6.9	.6
9	11.4	2.6	1.9	141	3.7	6.0	5.7	148	89.3	3.9	6.4	.6
10	11.6	2.5	1.7	134 *	3.5	4.8	5.7	153 *	7.7	3.8	5.5	.6
11	11.7	2.4	1.8	142	3.5	4.5	6.0	158	7.2	3.6	4.6	.6
12	11.8	2.4	1.9	156 *	3.5	4.8	6.0	162 *	* 6.7	3.4	3.7	.6
13	11.9	2.3	1.8	107 *	3.7	4.5	6.0	12.5	6.6	3.2	2.8	.6
14	12.1	2.3	1.9	5.2	3.7	6.6	5.7	9.5	6.5	3.1	* 1.9	.7
15	12.2	2.2	2.2	4.9	3.3	6.0	5.4	* 82.2	6.5	2.9	1.8	.7
16	* 12.3	2.2	4.5	4.6	3.4	3.5	6.0	171 *	6.4	2.7	1.7	.7
17	11.7	2.1	* 8.2	4.6	3.4	5.1	6.3	183 *	6.3	2.5	1.7	.7
18	11.1	2.1	7.8	5.2	3.6	5.1	6.9	198 *	6.2	2.4	1.6	.7
19	10.6	2.0	6.5	5.2	3.8	4.3	6.9	206	6.1	2.2	1.5	.7
20	10.0	2.0	6.5	5.2	4.2	4.1	6.9	679	6.1	2.0	1.4	.7
21	9.4	1.9	6.6	5.2	4.2	4.1	112 *	367	6.0	10.4	1.3	.8
22	8.8	1.8	6.0	4.9	4.0	4.1	157 *	197 *	5.9	54.5	1.3	.8
23	8.2	1.8	5.4	5.2	5.4	5.1	166	197 *	5.8	117	1.2	.8
24	7.7	1.7	5.5	4.9	3.8	5.1	172 *	192 *	5.7	45.5	1.1	.8
25	7.1	1.7	5.5	4.9	3.9	4.8	171	170	5.6	16.6	1.0	.8
26	6.5	1.6	5.6	5.2	3.9	4.5	163 *	133	5.6	12.8	.9	.8
27	5.9	1.6	5.3	4.9	3.9	5.1	158	123	5.5	10.8	.9	.6
28	5.3	1.5	5.1	4.9	3.9	6.3	154 *	141 *	5.4	9.7	.8	.8
29	4.7		5.1	4.9	3.9	6.3	143 *	131 *	5.3	10.0	.7	.8
30	4.2		5.1	5.2	3.9	6.0	144 *	116	5.2	9.4	.6	.9
31	3.6		5.2		4.9		55.1	118		9.2		.9
Sum	295.8	63.1	119.0	1,345.6	131.5	149.3	1,715.4	4,752.1	1,391.6	379.2	108.8	21.3

Month	Current Year 1978 Extreme Gage Feet High	Extreme Gage Feet Low	Extreme Second-Feet High Day	Extreme Second-Feet High	Extreme Second-Feet Low Day	Extreme Second-Feet Low	Average Second-Feet	Total Acre-Feet	Period 1939-1978 Acre-Feet Average	Maximum	Minimum
Jan.			16	Ø 12.3	31	Ø 3.6	9.5	587	3,947	12,000	0
Feb.			1	Ø 3.0	28	Ø 1.5	2.3	125	2,176	32,800	0
Mar.	3.86	3.60	16	9.4	3	.7	3.8	236	3,218	22,801	81.9
Apr.	4.82	3.68	12	160	16	4.0	44.9	2,669	10,121	74,500	2,230
May	4.17	3.65	23	30.9	14	3.1	4.2	261	16,039	300,000	25.2
June	4.13	3.65	28	27.5	!15	3.5	5.0	296	15,236	250,000	0
July	5.33	3.73	21	180	!15	5.4	55.3	3,402	14,473	155,000	967
Aug.	9.01	3.74	20	2,620	3	7.5	153	9,426	13,587	114,000	37.5
Sept.	6.58	3.82	2	426	30	Ø 5.2	46.4	2,760	9,946	124,000	53.8
Oct.	5.92	3.69	23	219	21	2.0	12.2	752	1,892	19,000	18.0
Nov.	4.14	3.83	1	9.7	30	Ø .6	3.6	216	1,194	8,700	0
Dec.	3.92	3.79	!30	Ø .9	! 1	Ø .5	.7	42.2	565	7,760	0
Yearly	9.01	3.60		2,620		Ø 0.5	28.7	20,772	92,694	1,093,553	10,001.1
	Meters		Cubic Meters per Second					Thousands of Cubic Meters			
	2.75	1.10		74.2		Ø 0.01	0.81	25,623	114,338	1,348,898	12,336

* Discharge measurement made on this day Ø 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 61 discharge measurements during the year, 21 by the Mexican Section and 40 by the United States Section of the Commission, and a continuous record of gage heights. Computations by shifting control methods. Records available: 1938 through 1978. 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 1978 all of the 14,903 acre-feet (18,382,000 m^3) 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^3/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-Feet (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 1978 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	0	0	0	0	0	0	0	0	111	0	0	0
2	0	0	0	0	0	0	0	0	110	0	0	0
3	0	0	0	0	0	0	0	0	111	0	0	0
4	0	0	0	17.3	0	0	0	* 72.7	101	0	0	0
5	0	0	0	130 *	0	0	0	141 *	121 *	0	0	0
6	0	0	0	127 *	0	0	0	141	145	0	0	0
7	0	0	0	118 *	0	0	0	142 *	158 *	0	0	0
8	0	0	0	121	0	0	0	144 *	164 *	0	0	0
9	0	0	0	125	0	0	0	143 *	100	0	0	0
10	0	0	0	127 *	0	0	0	144 *	5.7	0	0	0
11	0	0	0	128 *	0	0	0	147 *	0	0	0	0
12	0	0	0	141	0	0	0	139	0	0	0	0
13	0	0	0	119 *	0	0	0	10.2	0	0	0	0
14	0	0	0	0	0	0	0	0	0	0	0	0
15	0	0	0	0	0	0	0	* 50.5	0	0	0	0
16	0	0	0	0	0	0	0	161 *	0	0	0	0
17	0	0	0	0	0	0	0	167	0	0	0	0
18	0	0	0	0	0	0	0	177 *	0	0	0	0
19	0	0	0	0	0	0	0	177	0	0	0	0
20	0	0	0	0	0	0	0	177	0	0	0	0
21	0	0	0	0	0	0	* 79.1	176 *	0	0	0	0
22	0	0	0	0	0	0	151 *	170 *	0	0	0	0
23	0	0	0	0	0	0	157	181 *	0	0	0	0
24	0	0	0	0	0	0	154 *	180 *	0	0	0	0
25	0	0	0	0	0	0	153	170 *	0	0	0	0
26	0	0	0	0	0	0	150 *	136	0	0	0	0
27	0	0	0	0	0	0	149 *	130	0	0	0	0
28	0	0	0	0	0	0	143 *	138 *	0	0	0	0
29	0		0	0	0	0	134 *	133	0	0	0	0
30	0		0	0	0	0	132	110 *	0	0	0	0
31	0		0		0		* 63.9	111		0		0
Sum	0	0	0	1,153.3	0	0	1,466.0	3,768.4	1,126.7	0	0	0

Month	Average Rainfall Inches** 1938-1978	Average Rainfall Inches** 1978	Extreme Second-Feet High Day	Extreme Second-Feet High	Extreme Second-Feet Low Day	Extreme Second-Feet Low	Average Second-Feet	Total Acre-Feet	Period 1938-1978 Acre-Feet Average	Maximum	Minimum
Jan.	0.39	0.28		0		0	0	0	0	0	0
Feb.	.35	.45		0		0	0	0	0	0	0
Mar.	.25	.04		0		0	0	0	1,177	6,482	0
Apr.	.17	.02	! 4	141	! 1	0	38.5	2,287	7,767	12,383	2,020
May	.33	.66		0		0	0	0	8,786	17,380	0
June	.69	1.38		0		0	0	0	8,130	15,700	0
July	1.59	.44	24	160	! 1	0	47.3	2,910	8,302	15,170	0
Aug.	1.30	1.58	21	191	! 1	0	121	7,472	8,089	12,620	0
Sept.	1.24	3.28	8	168	110	0	37.4	2,234	4,405	12,380	0
Oct.	.79	1.83		0		0	0	0	37.3	328	0
Nov.	.32	.56		0		0	0	0	0	0	0
Dec.	.45	.12		0		0	0	0	0	0	0
Yearly	7.87	10.64		191		0	20.5	14,903	46,693.3	83,930	6,653
	Millimeters		Cubic Meters per Second					Thousands of Cubic Meters			
	200	270		5.41		0	0.58	18,382	57,597	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 19 discharge measurements during the year and a continuous record of gage heights. Computations by shifting control methods. Records available: August 17, 1938 through 1978. 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^3/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 1978 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	0	0	0	0	4.5	0	3.5	7.4	0	0	3.5	0
2	0	0	0	0	4.9	0	1.8	* 7.4	0	0	3.5	0
3	0	0	0	0	* 4.5	0	1.1	4.2	434	0	29.0	0
4	0	0	0	0	4.2	0	2.5	2.8	196	0	250	* 0
5	* 0	* 0	0	0	1.9	0	1.4	.7	346	0	89.3	0
6	0	0	0	0	0	0	1.4	0	93.2	0	66.4	0
7	0	0	0	0	0	.7	* .7	2.8	17.7	0	21.2	0
8	0	0	* 0	0	0	0	0	.4	6.7	0	18.4	0
9	0	0	0	0	0	.4	1.4	0	5.7	0	15.5	0
10	0	0	0	0	1.3	0	0	0	4.6	0	12.7	0
11	0	0	0	0	0	0	0	0	3.2	0	9.9	0
12	0	0	0	0	1.0	* 1.4	0	0	2.1	0	7.1	0
13	0	0	0	0	1.9	3.2	0	0	* 1.1	0	* 3.9	0
14	0	0	0	* 0	1.6	0	0	0	0	0	3.2	0
15	0	0	0	0	.9	0	1.4	0	0	0	2.5	0
16	0	0	0	0	0	0	.7	0	0	0	1.8	0
17	0	0	0	0	0	0	.4	.7	0	* 1.4	1.4	0
18	0	0	0	1.5	0	0	0	2.1	0	0	.7	0
19	0	0	0	3.2	0	0	0	2.1	0	0	0	0
20	0	0	0	0	0	1.8	0	713	0	0	0	0
21	0	0	0	0	0	0	0	413 *	0	0	0	0
22	0	* 0	0	0	1.6	0	0	* 78.0	0	0	0	0
23	0	0	* 0	0	1.6	0	.4	* 4.6	0	177	0	0
24	0	0	0	0	2.4	0	5.3	4.6	148	195	0	0
25	* 0	0	0	0	5.0	0	4.2	4.6	238	69.2	0	0
26	0	0	32.4	0	4.7	0	.4	8.5	253	68.5	0	0
27	0	0	0	4.2	5.0	0	0	35.7	101	66.0	0	0
28	0	0	0	5.5	4.7	.7	0	3.5	57.2	58.3	0	0
29	0		0	5.2	2.4	45.9	1.4	2.1	1.1	40.6	0	0
30	0		0	5.2	.1	8.5	6.4	0	0	29.7	0	0
31	0		0		* 0		7.4	0		5.7		0
Sum	0	0	32.4	24.8	54.2	62.6	41.8	1,298.2	1,908.6	711.4	540.0	0

Current Year 1978 — **Period** 1939-1978

Month	Extreme Gage Feet High	Extreme Gage Feet Low	Extreme Second-Feet High Day	Extreme Second-Feet High	Extreme Second-Feet Low Day	Extreme Second-Feet Low	Average Second-Feet	Total Acre-Feet	Acre-Feet Average	Acre-Feet Maximum	Acre-Feet Minimum
Jan.				0		0	0	0	3,942	11,900	0
Feb.				0		0	0	0	2,556	37,000	0
Mar.	9.76		26	37.8	! 1	0	1.0	64.3	2,044	21,000	0
Apr.	9.72		27	6.1	! 1	0	.8	49.2	3,049	70,500	0
May	9.70		! 1	5.5	! 6	0	1.7	108	8,759	299,800	0
June	11.55		!29	197	! 1	0	2.2	124	7,515	241,000	0
July	9.74		! 1	12.0	! 8	0	1.4	82.7	7,702	118,500	0
Aug.	15.58		20	1,540	! 6	0	42.0	2,576	6,974	99,400	0
Sept.	15.55		3	1,520	! 1	0	63.6	3,788	7,737	119,200	0
Oct.	13.16		23	456	! 1	0	23.0	1,410	3,696	42,800	0
Nov.	11.27		4	315	!19	0	18.0	1,072	1,072	7,270	0
Dec.				0		0	0	0	1,825	12,900	0
Yearly	15.58			1,540		0	12.8	9,274.2	56,871	1,079,340	238.1
	Meters		Cubic Meters per Second					Thousands of Cubic Meters			
	4.75			43.6		0	0.36	11,440	70,150	1,331,366	294

* Discharge measurement made on this day ! And other days

RIO GRANDE NEAR ACALA, TEXAS AND PRAXEDES 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 19 discharge measurements during the year and a continuous record of gage heights. Computations by shifting control methods. Records available: 1938 through 1978. 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^3/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 1978 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	0	0	0	0	0	* 0	0	0	0	96.1	119	69.6
2	0	0	0	0	0	0	0	* 0	0	85.1	165	69.6
3	0	0	0	0	* 0	0	0	0	201	66.0	145	69.6
4	0	0	0	0	0	0	0	0	174	25.8	237	* 62.5
5	* 0	0	0	0	0	0	0	0	145	12.7	516	44.1
6	0	* 0	0	0	0	0	0	0	120	* 0	149	41.7
7	0	0	0	0	0	0	* 0	0	36.3	0	119	27.5
8	0	0	* 0	0	0	0	0	0	17.7	0	103	23.7
9	0	0	0	0	0	0	0	0	0	0	98.5	13.4
10	0	0	0	0	0	0	0	0	0	0	96.1	13.1
11	0	0	0	0	0	0	0	0	0	0	93.6	12.7
12	0	0	0	0	0	* 0	0	0	0	0	93.6	12.4
13	0	0	0	0	0	0	0	0	* 0	0	* 89.3	12.0
14	0	0	0	* 0	0	0	0	0	0	0	66.0	11.3
15	0	0	0	0	0	0	0	0	0	0	87.9	10.9
16	0	0	0	0	0	0	0	0	0	0	72.0	10.6
17	0	0	0	0	0	0	0	0	0	0	98.5	10.2
18	0	0	0	0	0	0	0	0	0	0	89.0	9.9
19	0	0	0	0	0	0	0	0	0	0	15.9	9.5
20	0	0	0	0	0	0	0	0	0	0	2.5	9.2
21	0	0	0	0	0	0	0	364 *	0	0	0	8.8
22	0	* 0	0	0	0	0	0	169 *	0	0	0	8.5
23	0	0	* 0	0	0	0	0	* 14.5	0	0	0	7.8
24	0	0	0	0	0	0	0	7.1	0	452	0	7.4
25	* 0	0	0	0	0	0	0	0	309	310	0	7.1
26	0	0	0	0	0	0	0	0	480	263	0	6.7
27	0	0	0	0	0	0	0	0	396	226	0	6.4
28	0	0	0	0	0	0	0	0	153	173	.7	6.0
29	0		0	0	0	0	0	0	129	141	29.7	5.7
30	0		0	0	0	0	0	0	106	127	66.0	5.3
31	0		0		0		0	0		119		4.9
Sum	0	0	0	0	0	0	0	554.6	2,267.0	2,096.7	2,552.3	618.1

Month	Current Year 1978 Extreme Gage Feet High	Extreme Gage Feet Low	Extreme Second-Feet High Day	Extreme Second-Feet High	Extreme Second-Feet Low Day	Extreme Second-Feet Low	Average Second-Feet	Total Acre-Feet	Period 1938-1978 Acre-Feet Average	Maximum	Minimum
Jan.				0		0	0	0	5,128	20,000	0
Feb.				0		0	0	0	4,251	47,900	0
Mar.				0		0	0	0	3,780	38,900	0
Apr.				0		0	0	0	5,630	84,200	0
May				0		0	0	0	10,860	303,000	0
June				0		0	0	0	9,601	239,000	0
July				0		0	0	0	10,185	140,000	0
Aug.	1.46		21	629	! 1	0	18.0	1,099	9,375	123,000	0
Sept.	1.52		3	699	! 1	0	79.6	4,494	12,188	140,000	0
Oct.	1.54		24	724	! 5	0	67.8	4,161	7,455	61,400	0
Nov.	1.89		5	1,240	!21	0	85.1	5,065	4,735	20,400	0
Dec.			! 1	Ø 69.6	31	Ø 4.9	19.8	1,226	5,276	29,700	0
Yearly	1.89			1,240		0	22.2	16,045	88,464	1,247,500	0
	Meters			Cubic Meters per Second				Thousands of Cubic Meters			
	0.58			35.1		0	0.63	19.792	109,120	1,538,791	0

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

RIO GRANDE AT FORT QUITMAN, TEXAS
NEAR COLONIA LUIS LEON, CHUIHUAHUA

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 1978.

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^3/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	Frequently
Monthly:	Max.	5,030 (142)	May 1942	Min.	0	Several months since 1951
Yearly:	Max.	1,750 (49.6)	1942	Min.	2.3 (0.07)	1965

Mean Daily Discharge in Second-Feet 1978 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	7.7	8.2	8.0	3.1	3.6	* 0	0	0	0	117	47.3	47.3
2	7.7	8.2	7.2	3.0	3.7	0	0	* 1.1	244	96.3	15.9	44.5
3	8.5	8.0	6.9	2.9	* 3.8	0	36.0	0	2,610	73.8	79.1	42.0
4	8.7	4.9	7.2	2.9	3.5	0	.4	0	1,110	51.9	142	* 39.6
5	* 8.6	5.3	8.4	2.8	3.2	0	0	0	1.1	30.3	205	36.4
6	8.6	* 5.6	8.7	2.7	2.9	0	0	0	0	* 8.5	191	33.2
7	8.1	7.9	9.3	2.5	2.6	0	* 0	0	0	0	177	29.7
8	7.8	7.8	* 9.6	2.5	2.3	0	0	1.8	0	0	163	26.5
9	7.9	7.2	9.2	2.4	2.0	0	0	27.5	0	0	149	23.3
10	6.1	5.5	8.8	2.3	1.8	0	0	53.3	0	0	135	20.1
11	6.1	6.5	8.5	2.3	1.5	0	0	6.4	0	0	121	16.6
12	4.0	5.1	8.1	2.2	1.2	* 0	0	0	0	0	107	13.4
13	3.1	5.3	7.7	2.1	.9	0	0	0	* 0	0	* 93.2	13.1
14	3.8	6.1	7.3	* 2.0	.6	0	0	0	0	0	90.8	13.1
15	4.7	5.1	6.9	2.1	.3	0	0	0	1.4	0	88.3	12.7
16	6.3	3.9	6.6	2.2	0	0	0	0	1.1	0	85.5	12.4
17	7.1	3.5	6.2	2.3	0	0	0	0	.7	0	83.0	12.0
18	7.7	4.4	5.8	2.4	0	0	0	0	.4	0	80.5	12.0
19	8.0	5.0	5.4	2.5	0	0	0	0	.4	0	78.0	11.7
20	7.8	5.7	5.0	2.6	0	0	0	0	.4	0	75.2	11.3
21	8.6	5.6	4.7	2.7	0	0	4.9	* 0	.4	0	72.7	* 11.3
22	8.4	* 5.3	4.3	2.8	0	0	59.7	0	1.4	0	70.3	11.3
23	8.1	4.7	* 3.9	2.8	0	0	12.7	56.9	1.4	0	67.8	11.3
24	8.2	4.6	3.8	2.9	0	0	0	172	36.7	176	65.0	11.3
25	* 6.9	4.5	3.7	3.0	0	0	0	14.8	1,640	121	62.5	11.3
26	7.7	5.4	3.6	3.1	0	0	0	0	491	167	60.0	11.3
27	8.0	8.4	3.6	3.2	0	0	1.8	0	143	155	57.6	11.3
28	8.0	8.0	3.5	3.3	0	0	0	0	134	131	54.7	11.3
29	8.0		3.4	3.4	0	11.7	0	0	134	112	52.3	11.3
30	8.2		3.3	3.5	0	0	0	0	129	101	49.8	11.3
31	8.0		3.2		0		0	0		94.6		11.3
Sum	165.7		80.6		11.7		327.8		1,434.4			595.2
	226.4		191.8		33.9		115.5		6,680.4		2,819.5	

Month	Current Year 1978 Extreme Gage Feet High	Extreme Gage Feet Low	Extreme Second-Feet High Day	High	Extreme Second-Feet Low Day	Low	Average Second-Feet	Total Acre-Feet	Period 1938-1978 Acre-Feet Average	Maximum	Minimum
Jan.	4.42	4.11	4	10.1	12	2.9	7.3	449	5,950	20,900	0
Feb.	4.39	4.16	7	9.8	17	3.5	5.9	329	5,015	50,100	0
Mar.			8	Ø 9.6	31	Ø 3.2	6.2	380	3,912	38,900	0
Apr.			30	Ø 3.5	14	Ø 2.0	2.7	160	4,890	77,000	0
May			3	Ø 3.8	!16	0	1.1	67.2	11,532	309,000	0
June	5.25		29	61.4	! 1	0	.4	23.1	10,258	240,000	0
July	6.53		3	614	! 1	0	3.9	229	11,813	140,000	3.8
Aug.	6.53		23	618	! 1	0	10.6	649	11,142	127,000	16.7
Sep.	10.24		25	2,990	! 1	0	222	13,243	15,815	147,000	0
Oct.			24	Ø 176	! 7	0	46.3	2,843	11,483	66,500	0
Nov.			5	Ø 205	2	Ø 15.9	93.9	5,593	7,367	24,300	0
Dec.			1	Ø 47.3	120	Ø 11.3	19.1	1,180	7,483	31,000	0
	10.24			2,990		0	34.7	25,145.3	106,660	1,270,400	1,662.3
Yearly	Meters		Cubic Meters per Second					Thousands of Cubic Meters			
	3.12			84.7		0	1.0	31,017	131,565	1,567,038	2,050

** Period 1924-1978 * Discharge measurement made on this day Ø 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 2,857.84 feet (871.07 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: November 19, 1975 through 1978.

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.

EXTREME FLOWS FROM RECORDS: Momentary: Max. 19,800 second-feet (561 m^3/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 1978 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	0	0	0	* 0	* 0	33.2	4.5	33.5	7.1	13,300	94.9	81.0
2	0	* 0	0	0	0	191 *	1.9	* 3.5	2.5	7,570	96.8	72.6
3	0	0	* 0	0	0	64.5	2.4	107	2.7	3,410	95.2	64.3
4	* 0	0	0	0	0	25.6	.7	477	444	1,540	100	* 59.6
5	0	0	0	0	0	6.7	* 6.4	550	447	796	343	58.3
6	0	0	0	0	0	1.9	.3	480	268 *	363	296	55.7
7	0	0	0	0	0	0	0	306	77.6	180	172	54.0
8	0	0	0	0	0	0	0	* 29.5	62.0	144	164	55.4
9	0	0	0	0	0	0	0	11.5	57.5	119	176	54.5
10	0	0	0	0	0	0	0	16.5	32.5	107	221	55.0
11	0	0	0	0	0	0	0	47.5	17.7	98.4	225	51.1
12	0	0	0	0	0	0	* 0	32.5	8.4	* 89.8	180	46.1
13	0	0	0	0	0	0	1.0	13.8	3.3	80.9	152	43.9
14	0	0	0	0	0	0	16.6	4.6	1.1	73.5	136	42.0
15	0	0	0	0	0	* 0	.5	1.1	* .5	69.4	127	44.2
16	0	0	0	0	0	0	.1	1.0	.2	65.5	119	46.0
17	0	0	0	0	0	0	0	* .7	0	63.3	113	44.9
18	0	0	0	0	0	1.3	0	5.0	0	59.9	108	46.7
19	0	0	0	0	0	39.4	0	1.3	0	56.4	107	* 47.2
20	0	0	0	0	237	8.5	* 0	18.8	9.3	* 55.7	104	43.1
21	0	0	0	0	389	.2	6.4	13.8	479	55.8	106	40.1
22	0	0	* 0	0	402	0	147	3.5	620	52.3	103 *	45.5
23	* 0	0	0	0	289 *	0	146	1.1	584	50.1	101	46.4
24	0	0	0	0	61.4	0	1.5	.7	655	122	96.4	42.9
25	0	0	0	.1	42.9	0	1.2	.3	1,010	117	94.0	39.6
26	0	0	0	8.6	16.1	0	14.7	2.1	4,590	108	93.2	38.6
27	0	0	0	* 26.3	.4	0	19.5	60.5	11,700	84.0	89.1	39.7
28	0	0	0	81.4	.8	242	.9	18.3	11,000	68.8	90.0	42.9
29	0		0	9.0	.7	197	1.5	12.8	17,200	76.6	87.6	43.8
30	0		0	0	.6	38.5	27.1	162 *	18,900	84.4	85.2	47.0
31	0		0		.3		162	23.0		91.4		47.4
Sum	0	0	0	125.4 1,440.2	849.8	562.2		2,438.9	68,179.4	29,152.2 4,075.4		1,539.5

Month	Current Year 1978 Extreme Gage Feet High	Extreme Gage Feet Low	Extreme Second-Feet High Day	Extreme Second-Feet High	Extreme Second-Feet Low Day	Extreme Second-Feet Low	Average Second-Feet	Total Acre-Feet	Period Dec. 1975-1978 Acre-Feet Average	Maximum	Minimum
Jan.				0		0	0	0	4,148	7,415	0
Feb.				0		0	0	0	2,148	3,396	0
Mar.				0		0	0	0	1,009	1,518	0
Apr.	4.13		28	130	! 1	0	4.2	249	1,024	2,505	249
May	5.96		23	542	! 1	0	46.5	2,857	2,630	5,031	0
June	5.81		1	449	! 7	0	28.3	1,686	2,310	5,075	169
July	5.46		23	377	! 7	0	18.1	1,115	3,912	9,420	1,115
Aug.	6.76	3.07	5	761	26	.1	78.7	4,837	3,914	6,224	682
Sept.	10.86		30	19,800	! 17	0	2,270	135,232	48,935	135,232	362
Oct.	10.45	3.56	1	16,600	23	49.0	940	57,823	22,156	57,823	435
Nov.	5.16	3.77	5	371	4	78.9	136	8,083	6,108	10,241	0
Dec.	3.82	3.46	1	82.7	26	38.1	49.7	3,054	5,036	11,506	0
Yearly	10.86			19,800		0	297	214,936	103,330	214,936	15,148
	Meters		Cubic Meters per Second					Thousands of Cubic Meters			
	3.31			561		0	8.41	265,124	127,458	265,124	18,685

* Discharge measurement made on this day ! And other days

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 57 discharge measurements during the year and a continuous record of gage heights. Computations by shifting control methods. Records available: 1889 through 1978.

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^3/sec) on June 14, 1905. Highest flow recorded since 1924 was 5,160 second-feet (146 m^3/sec), with a gage height of 10.57 feet (3.22 m), on May 26, 1942. Min. frequently no flow.

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

Daily:	Max. 13,700 (388)	June 13 & 14, 1905	Min. 0		Frequently
Monthly:	Max. 10,150 (287)	June 1905	Min. 0		Frequently
Yearly:	Max. 1,970 (55.8)	1907	Min. 1.3 (0.04)		1964

Mean Daily Discharge in Second-Feet 1978 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	0	* 2.1	0.1	4.7	1.9	* 8.0	81.8	* 20.0	15.5	2,100 *	80.5	74.8
2	0	2.0	.3	2.4	* .5	42.2	40.3	19.0	11.8	3,540 *	84.5	73.0
3	0	2.3	2.3	* 1.2	.2	41.6	* 25.8	27.0	58.8	3,470 *	82.1	71.3
4	0	2.3	2.7	.8	.2	12.1	8.6	34.6	177	2,630 *	74.9	* 68.3
5	0	2.2	1.0	4.2	0	* 6.4	2.4	116	43.1	2,280 *	83.1	66.8
6	1.1	* 5.8	* 0	8.8	0	5.3	4.2	125	* 53.0	2,040 *	110	66.7
7	3.9	6.6	0	7.0	0	3.2	2.4	287 *	25.0	1,810	119 *	65.0
8	5.8	8.0	1.1	7.3	0	2.0	.6	383	21.3	1,610	118	59.1
9	* 9.9	5.7	.7	9.8	0	2.4	3.0	429 *	26.7	1,380	124	56.2
10	5.0	6.6	.1	* 12.3	0	3.5	* 6.2	386	45.7	1,090 *	140	53.7
11	2.8	4.4	.1	11.1	0	1.7	4.8	378	* 69.8	812	238	* 51.4
12	1.7	8.1	1.7	6.1	0	* 3.7	4.0	342	74.9	567	282	48.8
13	3.1	* 7.1	* 1.6	5.5	1.5	3.4	4.9	213	69.0	382	247 *	47.1
14	3.5	5.3	2.0	4.0	3.3	3.2	9.1	147 *	58.7	276	216	45.8
15	4.0	5.3	2.2	1.9	* 7.4	2.3	12.4	80.0	47.4	229	204	49.1
16	* 4.2	8.0	1.9	2.4	4.0	5.5	14.3	46.4	23.8	203 *	218	50.9
17	2.7	6.4	0	* 8.4	3.8	1.3	* 17.9	25.8	19.8	188	226	50.9
18	2.4	3.9	0	9.0	.3	3.6	11.2	7.3	* 14.2	153	214	48.6
19	7.4	2.7	0	6.0	0	* 8.3	8.3	3.3	14.2	122	189	47.1
20	8.3	5.2	0	2.3	0	4.9	9.2	52.4	4.1	104	168 *	45.5
21	5.0	* 5.1	4.0	.5	11.5	1.1	9.0	179 *	4.1	89.9	151	42.0
22	6.1	3.2	5.9	.5	* 25.4	* .1	14.7	52.4	62.4	90.2	136	38.4
23	* 2.7	.9	1.8	.5	8.0	.6	12.6	11.5	82.9	175 *	125	38.0
24	1.5	.6	1.1	* .1	23.0	2.0	* 17.6	6.2	105	280 *	115	37.8
25	2.0	2.1	2.8	.9	.3	3.9	12.4	11.4	124 *	261	106	37.7
26	2.8	4.0	.8	2.1	0	* 6.7	30.5	13.5	558 *	161	98.5	36.9
27	1.1	2.5	* 1.6	2.1	0	4.3	20.5	18.0	459	151	* 90.3	35.7
28	2.6	.4	1.0	2.7	0	11.0	24.6	15.6	456	127	85.7	35.3
29	4.4		1.7	1.1	.2	6.7	19.0	* 34.5	885	97.3	81.8	35.8
30	3.6		1.8	1.1	* 4.5	57.8	19.9	193	1,420 *	* 78.0	77.9	34.4
31	2.0		1.3		40.3		21.2	60.0		76.3		34.6
Sum	99.6	118.8	41.6	126.8	136.3	258.8	473.4	3,716.9	5,030.2	26,572.7	4,285.3	1,546.7

Month	Current Year 1978 Extreme Gage Feet High	Extreme Gage Feet Low	Extreme Second-Feet High Day	Extreme Second-Feet High	Extreme Second-Feet Low Day	Extreme Second-Feet Low	Average Second-Feet	Total Acre-Feet	Period 1958-1978 Acre-Feet Average	Maximum	Minimum
Jan.	1.73		9	14.5	! 1	0	3.2	198	5,404	24,400	0
Feb.	1.66		12	11.2	25	0	4.2	236	4,391	40,800	0
Mar.	1.61		21	8.1	! 1	0	1.3	82.5	3,139	39,100	0
Apr.	1.73	1.11	11	14.6	24	.1	4.2	252	2,297	41,600	0
May	2.19		31	57.0	13	0	4.4	270	8,053	240,000	0
June	2.42	1.19	30	89.2	122	.1	8.6	513	8,600	216,000	0
July	3.25	1.28	26	305	8	.1	15.3	939	11,423	156,000	0
Aug.		1.46	9	446	19	2.8	120	7,372	11,340	133,000	0
Sept.	# 10.80	1.36	30	1,500	120	3.0	168	9,977	15,890	151,000	0
Oct.	10.85	2.44	2	3,930	30	72.2	857	52,706	14,703	105,000	0
Nov.	3.74	2.44	12	287	5	66.1	143	8,500	5,787	34,500	0
Dec.	2.52	2.05	1	76.6	31	33.6	49.9	3,068	5,688	30,900	0
Yearly	10.85			3,930		0	116	84,113.5	96,715	1,176,700	951.8

Yearly	Meters	Cubic Meters per Second			Thousands of Cubic Meters		
	3.31	111	0	3.29	103,754	119,298	1,451,459	1,174

** Period June 1900-March 1914; September 1919-March 1920; and 1924-1978 ! And other days
* Discharge measurement made on this day # Affected by backwater from the Rio Conchos

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 127 discharge measurements during the year, 124 by the Mexican Section and 3 by the United States Section of the Commission, and a continuous record of gage heights. Computations by shifting control methods. Records available: 1896 through 1978. 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 175 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 m³/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 1978 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	275	262	255	112	* 1,430	622	805	* 4,480	727	52,600#	2,210	890 *
2	* 274	* 265	* 261	174	1,640	985	675	1,840	597	43,400#	2,210 *	646
3	277	265	249	* 257	1,630	1,700	* 583	1,300	865	35,300#	2,200	554
4	273	262	239	280	* 1,660	819	537	* 2,060	* 2,370	28,600#	2,300	554 *
5	* 266	261	244	275	1,650	* 632	551	*10,800	1,760	24,100#	5,650	554
6	250	* 261	* 284	* 823	1,630	586	* 526	*26,700	* 2,560	21,300#	2,560	554 *
7	244	258	263	1,180	1,620	551	491	* 6,750	* 879	16,800#	2,300 *	427
8	243	261	247	1,190	* 1,640	* 540	456	* 2,450	833	13,300#	2,270 *	337 *
9	* 238	* 261	* 246	1,220	1,760	530	441	* 2,590	710	*11,200#	2,260 *	357
10	239	254	229	*1,250	1,630	523	* 473	2,170	583	10,600#	2,250 *	344
11	192	248	219	1,270	* 1,590	530	470	* 1,610	* 569	*10,600#	2,290	307 *
12	* 149	244	246	*1,270	1,560	* 547	420	1,330	554	* 8,580#	2,240	353
13	173	* 238	* 243	1,270	1,540	512	* 403	915	505	5,120#	2,280 *	625
14	178	240	222	*1,270	1,550	512	364	* 1,000	* 565	3,440#	2,210	291 *
15	185	246	234	1,260	* 1,620	* 516	352	745	576	2,650	2,230 *	252
16	* 219	* 244	* 198	1,270	971	501	367	* 650	505	* 2,500	2,210	252
17	218	234	178	1,290	791	484	* 385	558	1,080	2,410	2,210 *	266
18	240	231	176	*1,260	* 720	487	378	* 526	* 1,430	* 2,370	2,200	260 *
19	246	231	170	1,270	685	* 586	367	491	1,460	* 2,310	2,190	717
20	* 261	* 228	* 163	*1,270	685	505	* 381	643	* 1,530	* 2,250	2,180 *	918
21	261	233	162	1,240	2,310	448	367	* 441	* 3,060	2,220	2,160	886 *
22	261	245	144	1,240	* 943	* 434	403	452	* 5,260	2,370	2,150 *	918
23	* 261	* 241	* 126	1,240	992	427	505	448	5,400	5,640	2,220	971
24	261	234	151	*1,260	978	434	* 519	* 537	3,210	* 5,470	2,130 *	999
25	261	237	151	1,260	* 717	438	463	706	* 4,240	* 2,820	2,120	1,010 *
26	* 260	248	111	1,260	664	* 434	558	1,010	*35,100#	2,500	2,190	999
27	259	* 260	* 72.7	*1,450	516	424	* 1,540	537	38,800#	* 2,390	2,090 *	971
28	259	254	120	1,450	590	611	* 2,200	* 452	*23,300#	2,270	2,090	971 *
29	259		161	1,400	* 614	* 2,020	1,240	851	32,700#	2,230	2,060 *	971
30	* 259		* 153	1,410	1,450	1,740	809	* 2,720	50,100#	* 2,210	1,710	971
31	260		118		773		* 1,550	1,170		* 2,160		971
Sum	7,501	6,946	6,035.7	32,671	38,549	20,078	19,580	79,932	224,828	330,610	69,280	20,089

Month	Current Year 1978 Extreme Gage Feet High	Extreme Gage Feet Low	Extreme Second-Feet High Day	Extreme Second-Feet High	Extreme Second-Feet Low Day	Extreme Second-Feet Low	Average Second-Feet	Total Acre-Feet	Period 1968-1978 Acre-Feet Average	Maximum	Minimum
Jan.	5.84	5.45	16	282	12	134	242	14,877	38,330	131,293	14,390
Feb.	2.53	2.40	! 2	265	20	226	248	13,775	32,890	124,386	3,336
Mar.	2.76	1.97	6	374	27	67.1	195	11,976	49,802	201,219	4,771
Apr.	5.18	2.03	28	1,660	1	106	1,090	64,794	41,047	87,472	5,565
May	7.74	2.33	21	4,240	27	219	1,240	76,490	43,208	123,749	10,932
June	9.68	2.85	29	6,360	27	374	671	39,828	42,827	91,767	6,008
July	6.79	2.82	27	3,000	!15	353	632	38,840	65,716	154,562	23,833
Aug.	21.75	2.95	5	42,400	29	417	2,580	158,555	100,374	243,960	31,725
Sept.	24.70	2.89	30	71,300	13	445	7,490	446,028	184,277	468,680	77,842
Oct.	23.62	4.69	1	56,200	31	2,070	10,700	655,967	135,092	655,967	16,883
Nov.	9.55	3.64	5	6,920	!29	1,610	2,310	137,415	50,348	137,415	7,484
Dec.	3.54	2.95	13	1,480	!15	247	650	39,850	30,860	51,114	17,367
Yearly	24.70	1.97		71,300		67.1	2,340	1,698,395	815,771	1,698,395	463,767
	Meters			Cubic Meters per Second				Thousands of Cubic Meters			
	7.53	0.60		2,020		1.90	66.4	2,094,945	1,006,245	2,094,945	572,051

** Period 1968-1978 # Discharge measurement made on this day ! And other days

n Estimated

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 59 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 1978.

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^3/sec).

EXTREME FLOWS FROM RECORDS: Momentary: Max. 56,400 second-feet (1,600 m^3/sec), determined by slope-area calculations, on September 2, 1962, with a gage height of 13.54 feet (4.13 m). Min. Ø0.1 second-foot (0.003 m^3/sec) on July 25, 1953 and several days in August 1958.

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

Daily:	Max. 12,400	(351)	Sept. 21, 1974	Min. 0.1 (0.003)	July 25, 1953 and several days in August 1958
Monthly:	Max. 998	(28.3)	Sept. 1974	Min. 0.4 (0.01)	June 1974
Yearly:	Max. 97.1	(2.75)	1974	Min. 4.3 (0.12)	1951

Mean Daily Discharge in Second-Feet 1978 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	1.0	* 1.0	* 1.0	0.9	0.5	* 8.0	31.1	* 25.9	* 1.1	2.5	3.5	* 1.7
2	1.0	1.0	1.0	1.0	* .5	10.0	93.9	5.8	1.1	* 2.5	3.5	1.7
3	* 1.0	1.0	1.0	* 1.0	.5	15.3	* .6	33.4	17.8	2.0	3.5	1.8
4	1.0	1.0	1.0	1.0	.5	.7	.6	85.1	50.4	1.6	3.5	* 1.8
5	1.0	1.0	1.0	.9	.6	* .4	.5	216	50.1	* 1.1	17.7	1.7
6	1.0	* 1.0	* 1.0	.9	.6	.4	.5	35.6	* 21.4	1.2	* 4.7	1.6
7	1.0	1.0	1.0	.8	.6	.4	.5	* 11.1	2.5	1.4	3.4	1.6
8	1.0	1.0	1.0	.8	* .6	.4	.5	5.2	1.9	1.5	3.2	1.5
9	* 1.0	1.0	1.0	.7	.6	.3	.4	5.2	3.4	1.7	3.0	1.5
10	1.0	1.0	1.0	* .7	.6	.3	* .4	6.8	1.1	* 1.8	2.8	1.5
11	1.0	1.0	1.0	.7	.6	.3	.4	117	* 1.1	1.8	2.6	* 1.5
12	1.0	1.0	1.0	.7	.5	* .3	.3	7.2	1.1	1.7	2.4	1.5
13	1.1	* 1.0	* 1.0	.7	.5	.3	.3	9.7	1.1	1.7	* 2.2	1.5
14	1.1	1.0	1.0	.7	.5	.3	.2	* 1.6	1.1	1.7	2.2	1.5
15	1.1	1.0	1.0	.7	* .5	* .3	.2	1.5	1.0	1.6	2.2	* 1.5
16	1.1	1.0	1.0	.7	.5	.3	.1	1.3	1.0	* 1.6	2.2	1.5
17	1.1	1.0	.9	* .7	.5	.4	* .1	1.2	1.0	1.6	2.1	1.5
18	1.1	1.0	.9	.7	.5	.3	.1	1.1	* 1.0	1.6	2.1	* 1.5
19	1.1	1.0	.9	.7	.5	* .3	.1	1.0	23.5	1.6	2.1	1.5
20	1.1	1.0	* .9	.7	98.8	.3	.1	.8	2.5	1.6	* 2.1	1.5
21	1.1	* 1.0	.9	.7	66.0	.2	.1	* .7	2.5	1.6	2.0	1.5
22	1.1	1.0	.9	.7	* 1.2	.2	.1	.8	2.5	130	2.0	1.5
23	* 1.1	1.0	.9	.7	1.1	.2	.1	.9	2.5	563 *	1.9	1.5
24	1.1	1.0	.8	* .7	1.0	.2	* .1	2.1	2.5	276 *	1.8	1.5
25	1.1	1.0	.8	.7	1.0	.1	.1	20.5	* 2.5	95.2	1.7	1.5
26	1.1	1.0	.8	4.6	.9	* .1	.1	42.6	310 *	150	1.7	1.6
27	1.1	1.0	* .8	.7	.8	.1	2.2	.9	12.5	98.6 *	1.6	1.6
28	1.0	1.0	.8	.6	.8	14.7	5.0	.8	2.5	61.3	1.6	1.6
29	1.0		.9	.5	.7	9.7	.6	* .8	2.5	16.6	1.6	1.6
30	1.0		.9	.5	* .6	20.7	363	.9	2.5	* 3.4	1.7	1.6
31	1.0		.9		.6		115	1.0		3.4		1.6
Sum	32.5	28.0	29.0	26.1	183.7	85.5	677.3	644.5	527.7	1,432.8	88.5	48.5

Month	Current Year 1978							Period 1932-1978		
	Extreme Gage Feet		Extreme Second-Feet				Average Second-Feet	Total Acre-Feet	Acre-Feet		
	High	Low	High Day	High	Low Day	Low			Average	Maximum	Minimum
Jan.	6.86	6.64	13	Ø 1.1	! 1	Ø 1.0	1.0	64.5	139	273	46.4
Feb.	6.84		! 1	Ø 1.0	! 1	Ø 1.0	1.0	55.5	192	3,120	41.5
Mar.	6.81	6.60	! 1	Ø 1.0	124	Ø .8	.9	57.5	161	1,018	46.4
Apr.	7.00	6.59	26	15.6	129	Ø .5	.9	51.8	212	1,140	40.3
May	8.69	6.36	20	2,610	! 1	Ø .5	5.9	364	982	8,520	34.7
June	7.72	6.34	1	341	125	Ø .1	2.9	170	1,351	12,655	24.2
July	9.19	6.30	30	2,090	16	Ø .1	19.9	1,224	3,267	18,500	46.8
Aug.	Ø 9.70	6.56	5	1,060	25	.5	20.8	1,278	3,270	16,330	56.9
Sept.	Ø 12.02	6.72	26	Ø 310	115	1.0	17.6	1,047	4,781	59,380	28
Oct.	9.32	6.61	22	2,240	5	Ø 1.1	46.2	2,842	1,846	19,200	36.9
Nov.	6.83	6.58	5	37.4	127	Ø 1.6	3.0	176	207	2,554	35.7
Dec.	6.60	6.59	! 3	Ø 1.8	! 8	Ø 1.6	1.6	96.2	148	408	39.3
Yearly	Ø 12.02	6.30		2,610		Ø 0.1	10.3	7,426.5	17,056	70,273.8	3,109.2
	Meters		Cubic Meters per Second					Thousands of Cubic Meters			
	3.66	1.92		73.9		0.003	0.29	9,161	21,039	86,683	3,835

* Discharge measurement made on this day Ø Mean daily ! And other days
Ø Affected by backwater from the Rio Grande

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 2,536.00 feet (772.97 m) above mean sea level, U. S. C. & G. S. datum.

RECORDS: Based on 57 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 1978. 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.

EXTREME FLOWS FROM RECORDS: Momentary: Max. 61,200 second-feet (1,730 m^3/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^3/sec) at a station 11.8 miles (19.0 km) upstream. Min. 0.2 second-foot (0.01 m^3/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 1978 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	272	249 *	251 *	74.1	1,430	587 *	904	4,440 *	792	53,300 *	2,000	820
2	270	236	251	109	1,600 *	623	736	2,670	781	45,200 *	2,000	693
3	260 *	231	249	226 *	1,630	1,660	609 *	1,750	749	41,600 *	1,990	625
4	261	225	233	251	1,660	915	556	2,680	2,850	31,200 *	1,990	568 *
5	259	188	242	250	1,630	623 *	577	5,050	2,070	24,700 *	7,140	539
6	257	186 *	261 *	519	1,610	562	518	30,200 *	2,850 *	24,500	2,930 *	495
7	259	206	239	1,050	1,590	512	482	10,300	1,100	18,700	2,140	457
8	265	208	233	1,090	1,630 *	482	442	2,550	864	13,800	2,050	434
9	267 *	208	229	1,130	1,630	473	436	2,550 *	696	12,500	2,030	407
10	261	204	221	1,210 *	1,610	509	443 *	3,460	605	11,700 *	1,990	395
11	249	203	209	1,220	1,590	485	441	2,070	578 *	11,100	2,060	375 *
12	187	201	217	1,220	1,570	502 *	416	1,630	571	9,890	2,090	215
13	224	196 *	226 *	1,220	1,520	482	400	1,100	513	4,260	2,120 *	385
14	240	196	200	1,220	1,510	473	370	1,130	539	3,140	2,020	427
15	247	208	201	1,230	1,630 *	471	353	831 *	585	2,670	2,000	352
16	256 *	201	187	1,240	1,080	464	363	725	501	2,640 *	2,010	343
17	260	212	172	1,260 *	773	466	387 *	664	867	2,470	2,020	325
18	262	205	165	1,260	711	464	381	609	1,330 *	2,370	2,030	325
19	285	212	168	1,240	637	548 *	354	599	1,410	2,280	2,000	470
20	285	222	147 *	1,240	663	500	358	724	1,410	2,210	1,970	631
21	277	225 *	123	1,210	2,490	435	359	598 *	2,410	2,170	1,960	633
22	278	234	104	1,210	1,160	409	477	539	7,520 *	2,510	1,930	644
23	280 *	227	79.1	1,230	910	386	476	449	6,110	7,200 *	1,960	681
24	281	224	107	1,260	960	390	465	529	2,880	7,880	1,920	689
25	279	232	145	1,260	705	407	431	602	4,550 *	2,930	1,900	699
26	269	230	127	1,240	623	410 *	435	1,180	28,800 *	2,510	1,890	709
27	267	222	100 *	1,420	493	361	1,160	622	40,100	2,370	1,850 *	711
28	265	250	78.8	1,460	483	433	2,130	524	23,000 *	2,240	1,820	713
29	263		98.4	1,430	518	1,590	1,440	467 *	34,100 *	2,150	1,790	720
30	261		84.6	1,420	1,200	1,920	1,310	2,750	51,700 *	2,070	1,210	733
31	255		78.0		825		1,530	1,290		2,030 *		740
Sum	8,101	6,041	5,425.9	31,399.1	38,071	18,542	19,739	85,272	222,831	356,290	64,810	16,953

Month	Current Year 1978 Extreme Gage Feet High	Extreme Gage Feet Low	Extreme Second-Feet High Day	Extreme Second-Feet High	Extreme Second-Feet Low Day	Extreme Second-Feet Low	Average Second-Feet	Total Acre-Feet	Period 1968-1978 Acre-Feet Average	Maximum	Minimum
Jan.	2.00	1.73	25	295	12	185	261	16,068	39,367	116,947	16,068
Feb.	1.94	1.74	1	254	27	183	216	11,982	33,044	110,937	4,745
Mar.	1.99		3	291	31	Ø 78.0	175	10,762	49,602	223,755	4,583
Apr.	3.39	1.41	28	1,510	1	71.0	1,050	62,279	40,328	89,704	6,497
May	4.42	1.98	21	3,770	27	270	1,230	75,513	43,651	124,046	12,147
June	4.71	2.11	29	4,640	127	337	618	36,778	41,600	89,211	5,927
July	4.17	2.10	30	3,110	21	347	637	39,152	70,743	172,324	24,764
Aug.	11.65	2.19	6	36,500	22	404	2,750	169,135	106,222	270,367	30,365
Sept.	15.41	2.33	30	61,200	13	476	7,430	441,979	198,366	469,832	22,489
Oct.	15.39	3.76	1	61,000	31	2,000	11,500	706,691	155,716	706,691	16,772
Nov.	5.81	2.98	5	8,890	30	922	2,160	128,549	52,973	128,549	8,741
Dec.	2.98	1.83	1	923	12	173	547	33,626	32,805	52,176	17,060
Yearly	15.41			61,200		71.0	2,390	1,732,514	864,417	1,732,514	483,092
	Meters			Cubic Meters per Second				Thousands of Cubic Meters			
	4.70			1,730		2.01	67.7	2,137,056	1,066,258	2,137,056	595,894

** Period 1968-1978 * Discharge measurement made on this day Ø Mean daily

! 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 61 discharge measurements during the year and a continuous record of gage heights. Computations by shifting control methods. Records available: 1932 through 1978.

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^3/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^3/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 1978 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	2.2	* 2.2	2.1	1.8	* 1.5	711 *	610	51.8	47.2	40.0	* 3.4	* 2.0
2	2.2	2.2	* 2.1	1.7	1.5	2,120	58.9	353 *	44.5	* 3.0	3.4	2.0
3	* 2.2	2.2	2.1	* 1.7	1.5	178	* 68.3	642	44.4	2.8	3.4	2.0
4	2.2	2.2	2.1	1.7	1.5	13.9	26.5	3,000	44.3	2.7	214	2.0
5	2.1	2.2	2.0	1.7	1.6	2.3	3.6	2,020 *	* 25.6	2.5	854	* 2.0
6	2.1	* 2.2	2.0	1.7	1.6	* 1.3	1.6	387	18.2	2.4	195 *	2.2
7	2.1	2.2	* 2.0	1.7	1.6	1.3	1.7	* 93.9	* 28.9	2.2	94.3	2.3
8	2.0	2.2	2.0	1.7	1.6	1.4	1.8	69.3	6.5	2.1	58.2	2.4
9	* 2.0	2.2	2.0	1.7	* 1.6	* 1.4	1.9	63.1	5.1	1.9	34.6	2.6
10	2.0	2.1	2.0	1.7	1.8	1.5	1.8	56.2	3.8	1.8	19.7	2.8
11	2.0	2.1	1.9	* 1.7	1.6	1.5	* 1.9	464	2.4	* 1.6	10.4	* 2.9
12	2.1	2.1	1.9	1.7	1.6	1.6	1.8	67.4	* 1.1	1.7	5.6	2.9
13	2.1	* 2.1	1.9	1.7	1.6	1.6	1.8	160	1.1	1.9	* 3.0	2.9
14	2.1	2.1	* 1.9	1.7	1.6	1.8	1.7	* 20.6	1.1	2.0	3.0	2.9
15	2.2	* 2.1	1.9	1.7	* 1.6	* 2.1	1.6	5.3	1.4	2.2	2.9	* 2.9
16	2.2	2.1	1.9	1.7	1.6	2.1	1.6	* 59.3	30.6	* 2.3	2.8	2.9
17	* 2.2	2.1	1.9	* 1.7	1.6	2.0	* 1.5	38.4	56.0	2.3	2.8	2.9
18	2.2	2.1	2.0	1.7	1.6	2.0	1.5	8.7	* 18.5	2.3	2.8	2.9
19	2.2	2.1	2.0	1.7	15.9	1.9	1.5	5.2	84.4	2.3	2.7	2.9
20	2.2	2.1	2.0	1.7	1.6	* 1.9	1.5	3.7	320	2.3	2.6	2.9
21	2.1	2.1	* 2.0	1.7	1,190	1.9	1.5	3.0	64.4	2.3	* 2.6	* 2.9
22	2.1	* 2.1	2.0	1.7	* 26.5	1.9	15.6	* 2.1	50.1	2.3	2.5	2.9
23	2.1	2.1	2.0	1.7	26.8	1.9	15.5	6.0	53.0	22.4	2.5	2.9
24	* 2.1	2.1	2.0	* 1.7	935	1.9	18.4	9.0	463	100	2.4	2.9
25	2.1	2.1	1.9	1.7	104	1.9	* 25.1	3.1	230	164	2.4	2.9
26	2.1	2.1	1.9	1.6	59.8	1.9	15.1	3.1	3,220	61.1	2.3	2.9
27	2.1	2.1	1.9	1.6	40.2	104 *	44.4	2.4	2,680	238	2.2	2.9
28	2.2	2.1	* 1.9	1.6	146	441	470	838 *	339	47.6	2.2	2.8
29	2.2		1.9	1.6	734	1,150	38.2	433	164	9.8	2.1	2.8
30	2.2		1.8	1.5	* 23.0	636 *	102	258	131	* 8.2	2.1	2.8
31	2.2		1.8		162		* 62.9	68.3		5.8		2.8
Sum	66.1	59.7	60.8	50.5	3,493.4	5,393.0	1,601.2	9,194.9	8,179.6	743.8	1,541.9	82.8

Month	Current Year 1978 Extreme Gage Feet High	Extreme Gage Feet Low	Extreme Second-Feet High Day	Extreme Second-Feet High	Extreme Second-Feet Low Day	Extreme Second-Feet Low	Average Second-Feet	Total Acre-Feet	Period 1932-1978 Acre-Feet Average	Maximum	Minimum
Jan.	2.16	2.15	! 1	Ø 2.2	! 8	Ø 2.0	2.1	131	191	875	82.7
Feb.	2.16	2.15	! 1	Ø 2.2	!10	Ø 2.1	2.1	118	238	4,400	73.4
Mar.	2.16	2.15	! 1	Ø 2.1	!30	Ø 1.8	2.0	121	267	2,410	72.4
Apr.	2.16	2.15	1	Ø 1.8	30	Ø 1.5	1.7	100	937	15,500	55.1
May	6.19	2.13	21	8,500	20	1.4	113	6,929	3,630	26,000	81.3
June	6.43	2.18	1	9,200	! 6	Ø 1.3	180	10,697	6,348	54,800	59.5
July	5.53	1.32	28	6,650	!17	1.5	51.7	3,176	8,532	28,700	518
Aug.	6.80	1.23	4	10,300	22	Ø 2.1	297	18,238	6,446	33,617	123
Sept.	6.83	1.38	26	10,400	!12	Ø 1.1	273	16,224	8,674	68,375	123
Oct.	3.87		27	928	11	Ø 1.6	24.0	1,475	3,172	27,900	50.8
Nov.	4.48		5	2,920	29	Ø 2.1	51.4	3,058	413	3,058	64.9
Dec.			!11	Ø 2.9	! 1	Ø 2.0	2.7	164	321	3,080	90.0
	6.83			10,400		Ø 1.3	83.5	60,431	39,169	105,807	3,958
Yearly	Meters		Cubic Meters per Second					Thousands of Cubic Meters			
	2.08			295		0.04	2.36	74,542	48,315	130,513	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 52 discharge measurements during the year and a continuous record of gage heights. Computations by shifting control methods. Records available: April 1936 through 1978.

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^3/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^3/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 1978 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	276	258 *	216	57.0	1,220 *	1,510 *	2,790	1,720	1,330	65,300	2,380 *	1,470 *
2	283	257	230 *	53.9	1,210	3,950	1,330	3,870 *	874	47,500	2,290	1,050
3	288 *	256	234	* 49.6	1,390	2,620	1,580 *	2,670	618	39,800	2,280	915
4	283	250	231	53.8	1,450	1,910	1,620	3,630	701	34,300	2,810	806
5	281	254	225	61.8	1,480	1,190	855	5,580	2,910 *	26,900	7,550	753 *
6	277	253 *	219	158	1,440	875	606	7,740	3,860	21,800	5,840 *	749
7	275	236	232 *	200	1,480	702	524	17,900 *	2,410	18,600	2,680	722
8	269	227	235	641	1,480	516	469	19,000	1,180	15,900	2,450	683
9	266 *	238	210	863	1,510 *	434 *	436	12,300	870	13,200	2,350	649
10	270	230	195	931	1,620	450	412	6,620	791	11,600	2,290	612
11	271	220	191	1,020 *	1,760	457	392 *	3,720	715	10,500 *	2,240	575 *
12	265	213	176	1,080	1,500	453	372	4,080	824 *	9,680	2,270	554
13	255	214 *	179	1,110	1,460	474	355	3,030	692	7,270	2,270 *	524
14	210	226	192 *	1,120	1,450	439	325	1,900 *	643	4,110	2,270	454
15	222	220	204	1,120	1,500 *	401 *	310	1,640	776	3,440	2,180	605 *
16	232	215	174	1,140	1,570	397	278	1,240 *	795	3,040 *	2,140	542
17	234 *	219	162	1,170 *	1,160	394	271 *	1,040	776	2,680	2,130	502
18	241	210	156	1,150	765	395	291	887	761 *	2,650	2,120	481
19	245	210	152	1,140	689	403	302	788	1,250	2,510	2,100	488
20	248	209	146	1,120	711	409 *	286	734	1,620	2,420	2,060	681
21	260	219	153 *	1,120	2,730	475	275	829	1,430	2,390	2,050 *	698
22	263	225 *	141	1,090	2,560 *	416	298	706 *	2,080	2,360	2,020	727
23	274	231	122	1,110	1,650	387	378	672	4,540	3,230	1,990	745
24	274 *	236	99.7	1,140 *	2,080	384	519	630	3,160	6,670	1,980	766
25	261	223	88.1	1,140	1,140	388	431 *	548	2,500	5,280	1,950	784
26	253	218	70.3	1,110	808	414	419	998	5,800	2,950	1,940	788
27	262	227	59.0	1,120	715	728 *	914	1,210	36,600	2,960	1,930	786
28	253	230	* 69.3	1,220	700	965	1,300	824 *	30,500	2,600	1,920	778
29	249		85.6	1,260	870	1,110	2,130	1,750	22,200	2,520	1,920	772
30	246		72.8	1,210	784 *	2,780 *	1,710	2,150	49,500	2,470 *	1,910	786
31	259		59.0		975		1,430	2,670		2,380		793
Sum	8,045	6,424	4,978.8	25,759.1	41,907	26,426	23,608	113,076	182,706	379,010	74,310	22,238

Month	Current Year 1978								Period 1968-1978		
	Extreme Gage Feet		Extreme Second-Feet				Average Second-Feet	Total Acre-Feet	Acre-Feet		
			High		Low				Average	Maximum	Minimum
	High	Low	Day		Day						
Jan.	2.12	1.87	! 2	290	14	204	260	15,957	40,183	118,276	15,957
Feb.	2.04	1.86	2	268	20	202	229	12,742	33,341	111,869	7,743
Mar.	2.02	1.33	8	250	31	56.2	161	9,875	47,940	211,676	6,067
Apr.	3.74	1.22	29	1,300	3	47.1	859	51,092	38,771	98,106	5,765
May	7.32	2.57	21	5,810	30	550	1,350	83,121	45,363	116,801	14,454
June	10.30	2.19	2	9,540	9	366	881	52,415	46,174	96,474	5,839
July	9.55	2.10	3	8,450	17	265	762	46,826	81,185	194,499	29,430
Aug.	17.61	2.85	7	21,500	25	529	3,650	224,283	119,132	242,539	30,689
Sept.	28.40	2.88	30	71,900	3	512	6,090	362,392	202,767	472,093	27,759
Oct.		6.04	1	65,300 Ø	!23	2,350	12,200	751,755	173,164	751,755	17,776
Nov.	15.23		5	17,500	30	1,910 Ø	2,480	147,392	57,373	147,392	13,267
Dec.	5.44	2.81	1	1,660	14	436	717	44,108	35,421	54,064	18,115
Yearly	28.40	1.22		71,900		47.1	2,490	1,801,958	920,814	1,801,958	501,243
	Meters		Cubic Meters per Second					Thousands of Cubic Meters			
	8.66	0.37		2,040		1.33	70.5	2,222,715	1,135,824	2,222,715	618,283

** Period 1968-1978 * Discharge measurement made on this day Ø Mean daily

! And other days

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 40 discharge measurements during the year, 36 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 1978.

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^3/sec) on November 5, 1978 with a gage height of 38.14 feet (11.63 m). Min. 188 second-feet (5.32 m^3/sec) on August 19, 1965.

Average Flow in Second-Feet (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-Feet 1978 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	502	523	482	312	* 1,360	1,320	2,310	2,180	2,670	27,900*	3,940	2,310
2	503	523	473	308	1,370	1,850	5,530	1,930	2,730	24,000*	3,730	2,300
3	509	512	473	* 319	1,330	5,120	* 3,030	* 2,020	1,930	29,100	3,590	2,090
4	520	512	473	312	1,350	9,960	1,830	4,310	1,510	58,100*	4,650	1,730 *
5	523	512	464	296	1,370	* 3,120	3,210	3,740	* 1,210	53,800*	65,200 *	1,520
6	526	512	* 469	288	1,530	6,450	2,270	7,000	1,130	38,500*	20,200 *	1,390
7	528	512	482	281	1,540	1,950	1,500	7,190	4,330	26,600	9,310	1,290
8	523	512	482	275	1,550	1,530	1,050	* 7,640	4,720	23,300	7,310	1,200
9	523	512	482	281	1,530	1,100	876	10,700	2,790	20,500	4,580	1,160
10	523	512	478	345	1,510	958	798	7,940	1,830	15,000*	3,640	1,130
11	523	494	477	406	1,540	862	740	4,260	1,390	13,100	3,310	1,090 *
12	523	492	480	904	2,930	791	675	5,270	1,250	12,100	3,130	1,060
13	512	492	467	999	1,920	756	636	4,870	1,090	11,500	3,020	1,030
14	512	492	448	1,080	1,480	744	618	3,060	1,100	10,800	3,000	1,010
15	512	491	438	1,120	1,540	745	616	2,640	1,170	8,580	3,000	1,020
16	* 507	473	433	1,170	1,470	740	603	2,340	1,420	7,100*	2,940	984
17	497	473	425	* 1,190	1,470	729	* 580	2,120	2,800	6,030	2,840	910
18	466	478	426	1,170	* 1,540	699	559	1,710	* 1,380	5,230	2,760	977 *
19	463	482	434	1,170	1,490	* 686	535	1,540	1,010	4,640	2,750	940
20	486	472	* 428	1,210	1,240	675	508	1,390	1,250	4,230	2,710 *	903
21	492	* 463	416	1,210	3,830	656	502	* 1,300	2,720	3,950	2,680	884
22	482	463	399	1,210	* 5,640	644	510	1,090	2,650	3,740	2,620	860
23	497	463	380	1,210	4,490	641	527	1,030	1,900	3,560	2,580	849
24	504	463	380	1,210	2,980	681	499	1,070	5,100	3,400	2,520	979
25	512	463	377	1,210	3,830	658	502	1,000	* 9,050	5,590	2,490	1,040
26	523	463	371	1,190	2,710	615	555	1,110	4,800	9,370	2,460	1,080
27	* 523	472	361	1,220	1,720	580	651	1,770	8,300	7,010	2,430	1,100
28	523	482	337	1,240	1,770	563	674	1,740	10,300	5,020	2,370 *	1,110
29	523		326	1,220	3,900	551	1,660	1,400	13,500	5,100	2,360	1,120
30	511		328	1,280	1,750	1,160	1,590	1,560	* 18,000	4,130	2,310 *	1,120
31	521		322		1,570		3,390	2,250		3,690		1,140
Sum	15,802	13,713	13,217	25,635	65,250	47,534	39,534	99,170	114,930	454,670	180,430	37,326

Month	Current Year 1978 Extreme Gage Feet High	Extreme Gage Feet Low	Extreme Second-Feet High Day	Extreme Second-Feet High	Extreme Second-Feet Low Day	Extreme Second-Feet Low	Average Second-Feet	Total Acre-Feet	Period 1968-1978 Acre-Feet Average	Maximum	Minimum
Jan.	1.97	1.88	6	543	18	453	510	31,343	54,793	122,084	31,343
Feb.	1.95	1.89	1 1	523	20	463	490	27,199	46,632	115,301	22,435
Mar.	1.92	1.72	1 5	492	31	312	426	26,204	63,705	224,767	19,789
Apr.	2.50	1.67	30	1,300	8	273	855	50,848	57,223	129,796	20,200
May	2.47	2.36	29	8,060	21	1,050	2,100	129,421	65,334	129,421	28,616
June	8.49	1.97	4	13,600	28	543	1,580	94,282	67,475	101,462	22,463
July	4.52	1.92	2	6,340	24	492	1,280	78,415	101,250	218,916	51,780
Aug.	7.85	2.28	10	12,400	25	918	3,200	196,701	135,894	212,846	45,474
Sept.	12.38	2.30	30	22,500	19	950	3,830	227,960	220,465	590,037	48,928
Oct.	23.99	3.47	4	64,000	24	3,330	14,700	904,825	210,263	901,875	32,134
Nov.	38.14	3.06	5	148,000	30	2,280	6,010	357,878	91,357	357,878	30,399
Dec.	3.08	2.28	1	2,330	22	849	1,200	74,035	52,304	74,035	32,025
Yearly	38.14	1.67		148,000		273	3,030	2,196,111	1,166,745	2,196,111	656,287
	Meters			Cubic Meters per Second				Thousands of Cubic Meters			
	11.63	0.51		4,190		7.73	85.8	2,708,903	1,439,180	2,708,903	809,530

** Period 1968-1978 * 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 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 26 discharge measurements during the year, 22 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 1978. 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^3/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 948,000 second-feet (26,800 m^3/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^3/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 1978 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	198	191	188	172	143 *	151	170	167	186	270	248	309
2	191	189	188	173	150	158	170	161	181	256	245	305
3	191 *	186	185	170 *	146	270	168 *	157	170	248	245	300
4	190	187	179	169	137	290	162	155	167	241	300	293 *
5	194	187	177	167	136	732 *	160	238	273	240	1,860	293
6	197	186 *	181 *	175	135	1,940	156	279	183 *	245	582 *	293
7	199	192	186	168	135	5,080	153	165 *	205	264	1,450	288
8	196	193	182	162	140	765 *	152	156	598 *	256	663	285
9	189	191	179	164	136	583	151	153	331	246	482	280
10	187	190	182	220	131	500	148	151	257	251	425	281
11	193	185	182	188	137	445	149	164	235	327	406	282
12	198	201	178	170	144	408	147	182	221	436	402	281
13	199	199	177	167	137	377	143	179	216	451	404	280
14	195	195	178	164	132	344	141	169	209	392	409	284
15	191	190	178	162	133 *	312	142	161	201	336	405	292
16	197 *	187	175	159	138	296	142	155	192	296 *	401	283
17	196	186	172	160 *	134	285	141 *	148	185	275	411	276
18	195	187	170	160	128	276	138	144	177 *	259	407	274 *
19	197	185	168	157	129	267 *	137	142	176	251	392	276
20	194	188	172 *	155	136	252	137	139	183	243	377	279
21	192	186 *	176	152	157	240	136	136 *	383	235	360	273 *
22	194	187	173	154	214	228	137	133	299	228	350	271
23	195	186	170	161	165	217	137	130	263	242	352	274
24	197	189	172	161	151	209	140	129	265	247	352	272
25	195	188	171	154	149	201	140	128	254	261	349	271
26	192	188	169	147	165	193	138	213	243	263	494	272
27	190	186 *	169	138	164	188	154	524	262	267	343	272
28	190	191	165 *	139	163	187	181	196	279	258	325	272
29	188		161	143	172	181	145	176	296	254	316	275
30	189		165	148	167	170	170	176	281	251	311	277
31	191		172		153		180	178		249		300
Sum	6,000	5,296	5,448	4,879	4,557	15,745	4,665	5,484	7,371	8,538	14,066	8,763

Month	Current Year 1978							Period July 1967-1978		
	Extreme Gage Feet		Extreme Second-Feet				Average Second-Feet	Total Acre-Feet	Acre-Feet		
	High	Low	Day	High	Day	Low			Average	Maximum	Minimum
Jan.	2.01	1.95	!13	204	!10	185	194	11,901	12,987	29,240	7,559
Feb.	2.03	1.95	12	211	! 2	185	189	10,504	11,555	25,414	7,012
Mar.	1.97	1.86	! 1	191	29	157	175	10,790	11,658	22,124	6,929
Apr.	2.22	1.79	10	278	!27	136	163	9,677	14,752	28,705	8,156
May	2.15	1.74	22	253	19	123	147	9,039	13,774	28,767	7,207
June	11.29	1.83	7	15,100	! 1	148	525	31,230	11,543	31,230	5,458
July	2.17	1.77	27	260	21	131	150	9,253	18,542	76,891	4,289
Aug.	3.00	1.75	27	1,030	!25	125	177	10,877	24,729	162,055	4,178
Sept.	3.16	1.88	21	1,270	4	163	246	14,620	82,542	804,466	7,674
Oct.	2.51	2.07	12	469	22	224	275	16,935	22,272	113,911	7,123
Nov.	4.35	2.12	5	4,330	12	242	469	27,900	17,926	59,734	6,589
Dec.	2.51	2.18	! 1	316	21	264	283	17,381	14,384	37,859	7,662
Yearly	11.29	1.74		15,100		123	249	180,107	256,664	1,087,822	94,683
	Meters		Cubic Meters per Second					Thousands of Cubic Meters			
	3.44	0.53		428		3.48	7.05	222,162	316,595	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 1978.

REMARKS: This stream is normally dry, its flow being confined to periods of storm runoff from its 83 square miles (228 km^2) of watershed area. Only the days of flow are shown below.

EXTREME FLOWS FROM RECORDS: Momentary: Max. 37,800 second-feet (1,070 m^3/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^3) in September 1974; yearly 30,527 acre-feet (37,655,000 m^3) in 1974.

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

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

Mean Daily Discharge in Second-Feet 1978

Month and Day												
Aug. 5	7.5	Sept. 21	252									

Annual Summary

Month	Maximum Gage and Discharge			Total Acre-Feet
	Day	Feet	Second-Feet	
Aug.	5	1.96	494	14.9
Sept.	21	4.16	3,880	500
		4.16	3,880	514.9
Yearly		Meters	Cub. Meters per Second	Thous. of Cub. Meters
		1.27	110	635

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 elevation of the zero of the gage has not been determined.

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 1978.

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-Feet (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-Feet 1978 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	13.2	10.5	10.7	10.5	* 9.8	11.9	11.2	10.1	11.0	13.2	13.7	11.4
2	13.3	10.5	10.7	10.5	10.0	11.9	10.5	10.1	11.0	13.3	13.7	11.7
3	* 13.3	10.4	10.5	* 10.5	10.0	14.0	9.6	* 10.1	11.1	13.3	13.7	12.0
4	13.1	10.4	10.5	10.5	10.0	13.5	9.6	10.2	11.0	* 13.4	13.7	* 12.0
5	12.8	10.5	10.6	10.5	10.2	* 12.1	9.6	10.2	11.4	13.4	13.7	12.1
6	12.6	* 10.7	* 10.6	10.4	10.4	11.6	9.4	10.3	11.2	13.4	* 13.7	12.2
7	12.5	10.7	10.6	10.4	10.4	11.6	9.4	10.3	* 11.6	13.4	13.0	12.3
8	12.5	10.7	10.7	10.8	10.4	11.6	9.4	10.4	11.6	13.4	12.5	12.4
9	12.4	10.8	10.7	10.7	10.4	11.7	9.1	10.2	11.6	13.4	12.4	12.5
10	12.4	10.6	10.7	10.9	10.4	11.7	9.3	10.3	11.7	13.5	12.1	12.6
11	12.3	10.6	10.7	10.9	10.4	11.4	9.5	10.3	11.8	13.5	11.9	12.7
12	12.3	10.7	10.7	10.9	10.4	11.2	9.7	10.3	11.9	13.5	11.9	12.7
13	12.3	10.7	10.8	10.7	10.4	11.1	9.7	10.1	11.9	13.5	11.9	12.8
14	12.2	10.7	10.8	10.6	10.4	11.0	9.7	10.2	12.0	13.5	12.0	12.9
15	12.2	10.7	10.6	10.4	10.4	11.0	9.6	10.3	12.1	13.5	12.0	13.0
16	12.1	10.7	10.7	10.4	10.4	11.1	9.7	10.5	12.1	13.6	11.8	13.1
17	12.1	10.6	10.7	10.3	10.4	11.2	9.7	10.7	12.2	13.5	11.9	13.2
18	12.0	10.5	10.7	10.1	10.4	11.2	9.9	10.6	12.3	13.5	11.7	13.3
19	12.0	10.6	10.7	10.1	10.4	11.3	10.1	10.7	12.3	13.5	11.7	13.4
20	11.6	10.7	10.7	10.1	10.4	11.4	10.1	10.5	12.4	13.5	11.4	13.5
21	11.6	10.7	10.8	10.1	11.0	11.4	10.1	10.6	12.5	13.6	11.4	13.6
22	11.6	10.7	10.8	10.0	11.4	11.5	10.1	10.4	12.6	13.6	11.4	13.7
23	11.5	10.7	10.6	10.0	11.4	12.0	10.3	10.5	12.6	13.6	11.5	13.8
24	11.5	10.5	10.7	10.6	11.4	12.1	10.3	10.4	12.7	13.6	11.5	13.9
25	11.4	10.6	10.5	10.3	11.4	12.1	10.3	10.5	12.8	13.6	11.5	14.0
26	11.2	10.6	10.5	10.3	11.4	11.5	10.0	10.5	12.8	13.6	11.5	14.0
27	10.7	10.6	10.5	10.3	11.4	11.4	10.2	10.6	12.9	13.5	11.5	14.3
28	10.7	10.7	10.5	10.1	11.4	11.3	10.0	10.8	13.0	13.6	11.5	14.4
29	10.7		10.6	9.9	11.4	11.3	10.0	10.8	13.0	13.5	11.6	14.5
30	10.6		10.6	9.9	11.4	* 11.4	10.2	10.9	13.1	13.6	11.4	14.6
31	10.6		10.4		11.4		10.2	10.9		13.6		14.7
Sum	371.3	297.5	329.9	311.6	331.0	389.3	306.5	323.3	362.1	418.3	365.0	401.3

Current Year 1978								Period 1966-1978		
Month	Extreme Gage ** Feet		Extreme Second-Feet				Average Second-Feet	Total Acre-Feet	Acre-Feet		
			High		Low				Average	Maximum	Minimum
	High	Low	Day		Day						
Jan.	1.95	1.88	! 2	13.3	!30	10.6	12.0	736	408	1,093	77.2
Feb.			9	Ø 10.8	! 3	Ø 10.4	10.6	590	405	1,068	66.8
Mar.	1.87	1.82	!13	10.8	31	10.4	10.6	654	414	1,255	70.4
Apr.	2.14	1.82	9	18.0	30	9.8	10.4	618	354	1,061	65.5
May	1.90	1.82	!21	11.4	1	9.8	10.7	657	399	1,096	66.2
June	3.83	1.82	3	14.0	!14	11.0	11.5	693	398	1,129	67.9
July	1.82	1.70	! 1	11.4	! 9	9.1	9.9	608	422	1,177	80.9
Aug.	1.78	1.73	28	11.0	1	10.1	10.4	641	516	1,105	93.8
Sept.			30	Ø 13.1	! 1	Ø 11.0	12.1	718	543	1,167	85.5
Oct.			!21	Ø 13.6	1	Ø 13.2	13.5	830	630	1,188	87.9
Nov.			! 1	Ø 13.7	!20	11.4	12.2	724	639	1,203	84.5
Dec.	1.93	1.80	31	14.7	1	11.4	13.1	808	616	1,177	88.9
Yearly		1.70		14.7		9.1	11.4	8,277	5,819	12,442	1,257.2
	Meters		Cubic Meters per Second					Thousands of Cubic Meters			
		0.52		0.42		0.26	0.32	10,210	7,178	15,348	1,551

* Discharge measurement made on this day ** Includes storm flow Ø 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 (25.6 m^3/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 25.6 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) above mean sea level, U. S. C. & G. S. datum.

RECORDS: Based on 15 discharge measurements during the year, 12 by the United States Section and 3 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 1978. 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^3/sec) on September 18, 1974 with a gage height of 19.82 feet (6.04 m). Min. 48.6 second-feet (1.38 m^3/sec) on August 20, 1969.

Average Flow in Second-Feet (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. 64.5 (1.82)	August 1964
Yearly:	Max. 377 (27.7)	1974	Min. 99.9 (2.83)	1968

Mean Daily Discharge in Second-Feet 1978 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	346	330	323	299	316	336	323	365	375	335	324	356
2	340	330	319	314	308	343	324	329	337	330	324	351
3	343	330	317	315	312	1,040	318	322	322	330	321	361
4	345	330	317	312	314	1,510	320	319	315	329	333	351
5	345 *	329	318	308	313	1,010	316	316	459	327	527	351
6	345	324	325	311	316	563	313 *	312	359	362	437	351
7	343	330	329	306	313	654	311	313	372	365	412	351
8	335	333	319	305	313	852	315	313	413	347	398	345
9	330	330	319	347	315	488	311	307	384	354	386	340
10	333	320	318	1,150	312	430	308	312	365	331	384	345
11	342	320	318	500	328	413	309	306	353	335	379	345
12	345	349	317	390	323	401	309	303	345	325	381	345
13	343	334	315	373	317	385	305	300	335	319	370	345
14	337	320	314	351 *	303	371	297	298	333	311	364	351
15	335	321	310	346	294 *	360	310	296	327	309	360	356
16	340	320	309	340	296	356	308	293	324	316 *	355	351
17	331	320	308	335 *	292	348	303 *	287	323	318	351	345
18	336	314	305	324	289	350	298	288	320 *	318	351	342 *
19	341	319	306	321	291	346 *	300	287	319	319	351	348
20	337	313	304 *	316	348	344	300	287	314	319	351 *	348
21	335	314 *	314	318	827	340	300	289 *	330	320	351	340
22	335	314	311	321	502	337	300	289	356	324	351	335
23	335	314	308	324	389	337	303	286	345	327	351	335
24	336	315	307	321	368	335	309	286	345	330	351	335
25	337	319	310	316	358	335	305	287	340	332	362	335
26	330	314	309	308	351	328	303	289	330	332 *	362	340
27	335	320	307	306	342	325	305	295	351	330	359	335
28	333	324	299	313	339	323	307	305	356	330	356	335
29	330		301	317	345	323	322	324	345	330	356	340
30	333		302	320	329	326	337	315	340	326	356	340
31	330		299		315		371	327		324		351
Sum	10,465	9,060	9,677	10,721	10,688	14,209	9,691	9,861	10,427	10,185	11,012	10,689

Current Year 1978									Period 1960-1978		
Month	Extreme Gage Feet		Extreme Second-Feet				Average Second-Feet	Total Acre-Feet	Acre-Feet		
			High		Low						
	High	Low	Day		Day				Average	Maximum	Minimum
Jan.	1.88	1.84	1	351	1 9	330	337	20,735	13,991	28,842	4,647
Feb.	1.90	1.80	12	362	119	309	323	17,959	11,955	25,287	3,999
Mar.	1.85	1.76	1 6	335	28	289	312	19,192	17,868	26,404	4,186
Apr.	3.61	1.72	10	2,900	9	270	357	21,269	13,358	38,777	4,520
May	3.30	1.73	21	2,210	17	275	345	21,199	13,955	32,716	4,517
June	3.66	1.80	4	3,430	1	309	474	28,183	17,447	54,428	4,354
July	1.92	1.79	130	373	26	284	313	19,227	22,187	186,502	4,034
Aug.	2.14	1.75	1	481	117	284	305	18,726	50,136	408,908	3,955
Sept.	2.21	1.79	5	514	4	304	348	20,731	96,284	663,509	5,800
Oct.	2.03	1.79	5	432	13	304	329	20,202	20,648	68,898	5,004
Nov.	2.73	1.81	8	979	4	314	367	21,846	15,621	35,013	4,532
Dec.	1.89	1.84	1 1	356	122	335	345	21,201	15,083	31,065	4,497
	3.66	1.72		3,430		270	346	260,671	361,536	797,352	72,444
Yearly	Meters		Cubic Meters per Second					Thousands of Cubic Meters			
	1.11	0.52		97.1		7.65	9.80	308,841	322,399	673,198	89,373

* 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 1978.
REMARKS: This creek is normally dry, its flow being confined to periods of storm runoff from its 42 square miles (109 km^2) of watershed area. Only the days of flow are shown below.
EXTREME FLOWS FROM RECORDS: Momentary: Max. 56,100 second-feet (1,590 m^3/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^3) in August 1971; yearly 12,525 acre-feet (15,450,000 m^3) in 1971.

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

Daily:	Max.	4,480	(127)	Aug. 15, 1971	Min.	see REMARKS
Monthly:	Max.	198	(5.61)	Aug. 1971	Min.	
Yearly:	Max.	17.3	(0.49)	1971	Min.	

Mean Daily Discharge in Second-Feet 1978

Month and Day		
	No flow during 1978	

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 1978.
REMARKS: This stream is normally dry, its flow being confined to periods of storm runoff from its 24 square miles (62.2 km^2) of watershed area. Only the days of flow are shown below.
EXTREME FLOWS FROM RECORDS: Momentary: Max. 7,040 second-feet (199 m^3/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^3) in August 1971; yearly 8,232.2 acre-feet (10,154,000 m^3) in 1971.

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

Daily:	Max.	2,140	(60.6)	Aug. 16, 1971	Min.	see REMARKS
Monthly:	Max.	134	(3.79)	Aug. 1971	Min.	
Yearly:	Max.	11.4	(0.32)	1971	Min.	

Mean Daily Discharge in Second-Feet 1978

Month and Day						
May 21	66.2	June 6	1.0	Aug. 1	38.4	
		7	3.0	2	10.5	

Annual Summary

Month	Maximum Gage and Discharge			Total Acre-Feet
	Day	Feet	Second-Feet	
May	21	1.99	463	131
June	7	1.10	13.6	7.9
Aug.	1	1.83	353	97.0
		1.99	463	235.9
Yearly		Meters	Cubic Meters per Second	Thous. of Cub. Meters
		0.61	13.1	291

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 1978.
REMARKS: This stream is normally dry, its flow being confined to periods of storm runoff from its 17 square miles (44 km^2) of watershed area. Only the days of flow are shown below.
EXTREME FLOWS FROM RECORDS: Momentary: Max. 5,070 second-feet (144 m^3/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^3) in October 1969; yearly 4,061.7 acre-feet (5,010,000 m^3) in 1969.

Average Flow in Second-Feet (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 1978

Month and Day							
May	21	77.6	June 3	2.1	Sept. 5	12.5	
	22	.3					

Annual Summary

Month	Maximum Gage and Discharge: Day	Feet	Second-Feet	Total Acre-Feet
May	21	2.41	529	155
June	3	1.19	18.4	4.2
Sept.	5	1.40	67.3	24.8
		2.41	529	184
Yearly		Meters	Cubic Meters per Second	Thous. of Cub. Meters
		0.73	15.0	227

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: January 1968 through 1978.
REMARKS: This creek is normally dry, its flow being confined to periods of storm runoff from its 12 square miles (31 km^2) of watershed area. Only the days of flow are shown below.
EXTREME FLOWS FROM RECORDS: Momentary: Max. 10,200 second-feet (289 m^3/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^3) in July 1975; yearly 3,726 acre-feet (4,596,000 m^3) in 1975.

Average Flow in Second-Feet (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-Feet 1978

Month and Day												
May	21	137	May	30	0.4	June	7	3.1	Sept.	7	0.5
	22	1.5		31	.1		8	3.6		8	.5
	23	1.5	June	1	.1		9	3.3		9	.5
	24	1.0		2	.5		10	1.1		10	.5
	25	.9		3	6.9		11	.7		11	.5
	26	.7		4	3.6		12	.2		12	.5
	27	.6		5	2.8	Sept.	5	5.3		13	.4
	28	.5		6	2.6		6	.3		14	.1
	29	.4									

Annual Summary

Month	Maximum Gage and Discharge: Day	Feet	Second-Feet	Total Acre-Feet
May	21	2.88	1,320	287
June	3	1.28	32.6	56.5
Sept.	5	1.12	30.7	18.0
		2.88	1,320	361.5
Yearly		Meters	Cubic Meters per Second	Thous. of Cub. Meters
		0.88	37.4	446

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", 11.9 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 1978.

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

EXTREME FLOWS FROM RECORDS: Momentary: Max. 17,400 second-feet (493 m^3/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^3) in August 1971; yearly 14,404 acre-feet (17,767,000 m^3) in 1971.

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

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

Mean Daily Discharge in Second-Feet 1978

Month and Day			
Sept. 21 25.3			

Annual Summary

Month	Maximum Gage and Discharge			Total Acre-Feet
	Day	Feet	Second-Feet	
Sept.	21	1.33	142	50.2
Yearly		1.33	142	50.2
		Meters	Cubic Meters per Second	Thous. of Cub. Meters
		0.41	4.02	61.9

CARMINA SPRINGS NEAR CD. ACUNA, COAHUILA

DESCRIPTION: Cipolletti weir of 70.6 second-foot (2.0 m^3/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 1978.

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, 1974, a flood destroyed part of the weir.

Mean Daily Discharge in Second-Feet 1978 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	47.3	47.3	47.7	47.7	47.7	47.7	48.0	47.7	50.5	48.7	58.3	59.3
2	47.3	47.3	47.7	47.7	47.7	47.7	48.0	47.7	50.5	50.1	58.3	59.7
3	47.3	47.3	47.7	47.7	47.7	49.4	48.0	47.7	50.5	50.1	58.3	59.7
4	47.3	47.3	47.7	47.7	47.7	49.4	48.0	47.7	49.4	51.9	58.3	59.7
5	47.3	47.3	47.7	47.7	47.7	49.4	48.0	47.7	47.7	53.0	58.3	59.7
6	47.3	47.3	47.7	47.7	47.7	50.1	48.0	48.0	47.7	54.7	58.3	59.7
7	47.3	47.3	47.7	47.7	47.7	50.1	48.0	48.0	47.7	55.8	58.3	59.7
8	47.3	47.3	47.7	47.7	47.7	50.1	48.0	48.0	47.7	55.8	58.3	59.7
9	47.3	47.3	47.7	47.7	47.7	50.1	48.0	48.0	47.7	55.8	58.3	59.7
10	47.3	47.3	47.7	47.7	47.7	50.1	48.0	48.7	47.7	55.8	58.3	59.7
11	47.3	47.3	47.7	47.7	47.7	50.1	48.0	48.7	47.7	55.8	58.3	58.3
12	47.3	47.3	47.7	47.7	47.7	50.1	48.0	48.7	47.7	55.8	58.3	58.3
13	47.3	47.3	47.7	47.7	47.7	48.7	48.0	48.7	47.7	55.8	58.3	58.3
14	47.3	47.3	47.7	47.7	47.7	48.7	48.0	48.7	47.7	55.8	58.3	60.0
15	47.3	47.3	47.7	47.7	47.7	48.7	48.0	48.7	47.7	55.8	58.3	60.0
16	47.3	47.3	47.7	47.7	47.7	48.7	48.0	48.7	47.7	55.8	58.3	60.0
17	47.3	47.3	47.7	47.7	47.7	48.7	48.0	48.7	47.7	55.8	58.3	60.0
18	47.3	47.3	47.7	47.7	47.7	48.7	48.0	48.7	47.7	55.8	58.3	60.0
19	47.3	47.3	47.7	47.7	47.7	48.7	48.0	48.7	48.7	55.8	58.3	60.0
20	47.3	47.3	47.7	47.7	47.7	49.4	48.0	48.7	48.7	55.8	58.3	60.0
21	47.3	47.3	47.7	47.7	47.7	49.4	48.0	48.7	48.7	55.8	58.3	60.0
22	47.3	47.3	47.7	47.7	47.7	49.4	48.0	50.5	48.7	55.8	58.3	60.0
23	47.3	47.3	47.7	47.7	47.7	49.4	48.0	50.5	48.7	55.8	58.3	60.0
24	47.3	47.3	47.7	47.7	47.7	49.4	48.0	50.5	48.7	54.7	58.3	60.0
25	47.3	47.3	47.7	47.7	47.7	48.7	48.0	50.5	48.7	54.7	58.3	60.0
26	47.3	47.7	47.7	47.7	47.7	48.0	48.0	50.5	48.7	54.7	58.3	58.3
27	47.3	47.7	47.7	47.7	47.7	48.0	48.0	50.5	48.7	54.7	58.3	58.3
28	47.3	47.7	47.7	47.7	47.7	48.0	48.0	50.5	48.7	54.7	58.3	58.3
29	47.3		47.7	47.7	47.7	48.0	48.0	50.5	48.7	54.7	58.6	58.3
30	47.3		47.7	47.7	47.7	48.0	48.0	50.5	48.7	54.7	59.0	58.3
31	47.3		47.7		47.7		48.0	50.5		54.7		58.3
Sum	1,466.3	1,326.4	1,478.7	1,431.0	1,478.7	1,470.9	1,488.0	1,519.9	1,453.1	1,694.7	1,750.0	1,841.3

Month	Extreme Gage Feet		Extreme Second-Feet				Average Second-Feet	Total Acre-Feet	Acre-Feet		
			Ø High		Ø Low						
	High	Low	Day		Day				Average	Maximum	Minimum
Oct.			1	47.3	1	47.3	47.3	2,910	2,460	3,707	364
Nov.			1-24	47.7	1	47.3	47.3	2,832	2,264	3,405	325
Dec.			1-7	47.7	1	47.7	47.7	2,932	2,419	3,621	525
Jan.			1-5	47.7	1	47.7	47.7	2,837	2,343	3,497	529
Feb.			1-11	47.7	1-11	47.7	47.7	2,938	2,327	3,492	706
Mar.			1-5	48.1	1-11	47.7	48.1	2,919	2,271	3,383	648
Apr.			1-7	48.9	1-3	48.0	48.8	2,961	2,322	3,412	633
May			1-20	50.5	1-4	47.7	48.1	2,976	2,443	3,351	540
June			1-3	50.5	1-5	47.7	48.4	2,882	2,361	3,377	593
July			1-9	55.8	1	48.7	54.7	3,302	2,684	3,836	956
Aug.			1-11	59.0	1-11	48.3	52.8	3,249	2,643	3,685	964
Sept.			1-4	60.0	1-11	58.3	59.3	3,652	2,753	3,786	1,077
Yearly				60.0		47.3	50.1	36,496	29,474	41,290	9,080
	Meters		Cubic Meters per Second					Thousands of Cubic Meters			
				1.70		1.34	1.42	45,015	36,281	50,932	11,201

Current Year 1978 | Period 1969-1978

Ø Mean daily ! 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 1978.

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 1.8 (0.05) to 2.5 second-feet (0.07 m^3/sec) and averaged 2.1 second-feet (0.06 m^3/sec). The volume for the year amounted to 1,462 acre-feet (1,803,000 m^3).

HILDA SPRING

DESCRIPTION: Rectangular sharp-crested weir of 53.0 second-foot (1.50 m^3/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 1978.

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 3.5 second-feet 0.10 m^3/sec) and averaged 2.8 second-feet (0.08 m^3/sec). The volume for the year amounted to 2,139 acre-feet (2,638,000 m^3).

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 1968.

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^3/sec), or 48 gallons per minute. The volume for the year amounted to 77.0 acre-feet (95,000 m^3). 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 21 discharge measurements during the year, 11 by the Mexican Section and 10 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 1978. 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 1978 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^3/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^3/sec) on Sept. 21, 1974. Min. 22.2 second-feet (0.63 m^3/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 1978 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	971	971	946	890	1,200	6,110	4,940	3,640	1,920	890	4,700	3,210
2	971	971	946	890	953	6,110	4,940	2,370	1,450	890	2,740	3,210
3	964	918	1,070	893	886	6,180	4,940	2,370	1,430	918	2,810	3,210
4	971	943	1,410	893	823	6,180	4,940	2,370	2,300	2,920	3,020	3,210
5	971	943	1,410	893	840	6,000	4,940	2,370	2,390	6,360	3,020	3,210
6	964	946	1,400	1,040	840	6,000	4,940	2,370	1,250	6,600	3,110	3,210
7	971	946	1,400	1,140	840	6,250	4,940	2,400	2,450	6,710	3,110	3,190 *
8	971	946	1,400	1,140	840	6,250	4,770	2,400	2,450	6,780	3,110	3,200
9	978	946	1,670*	1,120	865	6,250	4,630	2,410	2,450	6,850	3,110	3,200
10	978	946	2,640	1,370	1,430	6,250	4,520	2,440	2,450	6,850	3,110	3,200
11	971	946	3,070	2,020	3,880	6,000	4,520	2,450	2,470	6,850	3,110	1,770
12	971	946	3,070	2,020 *	4,870	5,650	4,520	2,450	2,460	6,710	3,110	883
13	* 971	946	3,070	2,020	4,100	5,010	4,520	2,450	2,460	6,710 *	3,110	883
14	971	946	3,070	1,670	4,910	5,010	4,520	2,460	2,450	6,290	2,740	918
15	971	* 946	2,920	1,220	* 5,010	* 5,160	4,520	2,480	2,450	6,290	2,020	918
16	971	946	2,880	1,220	5,650	5,160	4,450	2,480	2,450	6,360	2,060	918
17	964	946	3,020	1,220	6,570	5,160	4,450	* 2,480	2,460	6,360	2,060 *	918
18	971	946	3,020	1,200	6,360	5,160	4,450	2,470	2,460	6,360	2,060	918
19	964	946	3,020	1,320	6,290	5,160	4,450	2,470	2,460	6,360	2,060	918
20	* 971	946	3,250	1,610*	6,290	5,160	* 4,450	2,480	2,450	6,000	2,060	1,450
21	971	946	3,570	1,610	6,250	5,160	* 4,450	2,480	2,450	5,930	2,210	1,830 *
22	971	946	3,570	1,610	6,250	5,160	4,450	2,480	2,490	5,830	2,480	1,830
23	971	946	3,570*	1,610	6,250	5,160	4,450	2,460	2,490	5,830	2,480	1,830
24	978	946	3,530	1,610	6,250	5,160	4,380	2,470	2,480	5,830	2,480	1,830
25	971	946	3,530	1,610	6,250	5,160	4,380	2,470	2,480	5,830	2,480	1,830
26	978	946	3,530	1,610	6,220	* 5,160	4,380	2,470	2,480	5,830	2,480	1,830
27	978	946	3,530	1,610	6,250	5,010	4,380	2,460	1,650	5,900	2,480	1,830
28	978	946	4,030	1,610	6,220	5,010	4,380	2,460	* 865	5,930	2,480	1,830
29	971		4,700	1,610	6,220	5,010	4,380	2,470	* 869	5,830	3,160	1,830
30	971		4,700	1,610	6,140	4,980	4,380	2,460	890	5,830	3,210	1,830
31	971		2,660		6,140		4,380	* 2,460		5,830		1,830
Sum	30,115	26,504	85,602	41,889	131,887	165,180	141,740	76,950	64,254	174,468	82,170	62,674

Month	Extreme Gage Feet		Extreme Second-Feet				Average Second-Feet	Total Acre-Feet	Period 1968-1978 Acre-Feet		
			High		Low						
	High	Low	Day		Day				Average	Maximum	Minimum
Jan.	1.08	1.08	! 9	978	! 3	964	971	59,742	63,771	112,570	5,318
Feb.	1.08	.82	! 1	971	3	583	946	52,590	118,147	467,202	12,467
Mar.	2.46	1.05	!29	4,700	! 1	946	2,760	169,713	97,638	239,030	7,271
Apr.	1.57	1.02	!11	2,020	! 1	890	1,390	83,095	96,991	342,129	27,570
May	2.92	.98	17	6,570	4	812	4,240	261,591	185,370	506,848	24,137
June	2.82	2.53	! 7	6,250	30	4,980	5,510	327,602	125,157	327,602	16,418
July	2.53	2.40	! 1	4,940	!24	4,380	4,560	281,162	103,125	281,162	23,182
Aug.	2.36	1.71	1	4,310	! 2	2,370	2,480	152,552	148,213	662,215	15,589
Sept.	1.94	.26	5	2,920	! 2	82.6	2,140	127,461	240,324	1,280,079	17,606
Oct.	3.02	1.02	! 9	6,850	! 1	890	5,620	345,954	175,017	812,596	3,734
Nov.	2.76	1.61	1	5,830	15	2,020	2,740	162,919	102,179	502,295	4,539
Dec.	2.03	1.05	! 1	3,210	!12	883	2,020	124,365	60,863	216,286	4,859
Yearly	3.02	0.26		6,850		82.6	2,970	2,148,746	1,516,795	3,566,066	416,788
	Meters		Cubic Meters per Second						Thousands of Cubic Meters		
	0.92	0.08		194		2.34	84.0	2,650,451	1,870,946	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 1978.
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	Current Year 1978								Period 1969-1978		
	Extreme Gage Feet		Ø Extreme Second-Feet				Average Second-Feet	Total Acre-Feet	Acre-Feet		
			High		Low						
	High	Low	Day		Day				Average	Maximum	Minimum
Jan.			! 1	1.1	! 1	1.1	1.1	64.9	79.4	131	21.1
Feb.			! 1	1.1	! 1	1.1	1.1	59.2	70.5	123	19.5
Mar.			! 1	1.1	! 1	1.1	1.1	64.9	72.2	122	21.9
Apr.			! 1	1.1	! 1	1.1	1.1	63.2	72.2	105	21.1
May			!16	1.4	! 1	1.1	1.1	76.2	77.8	109	21.9
June			! 1	1.4	! 1	1.4	1.4	84.3	65.7	121	21.1
July			!16	1.8	! 1	1.4	1.4	98.1	69.7	106	21.1
Aug.			! 1	1.1	! 1	1.1	1.1	64.9	68.1	122	0
Sept.			! 1	1.4	! 1	1.4	1.4	84.3	69.7	105	0
Oct.			! 1	1.4	! 1	1.4	1.4	86.7	73.8	117	0
Nov.			! 1	1.4	! 1	1.4	1.4	84.3	76.2	124	21.1
Dec.			! 1	1.4	!16	1.1	1.1	75.4	80.3	131	21.9
				1.8		1.1	1.4	906.4	875.6	1,362.2	257.2
Yearly	Meters		Cubic Meters per Second					Thousands of Cubic Meters			
				0.05		0.03	0.04	1,118	1,080	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 1978.
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	Current Year 1978								Period 1969-1978		
	Extreme Gage Feet		Ø Extreme Second-Feet				Average Second-Feet	Total Acre-Feet	Acre-Feet		
			High		Low						
	High	Low	Day		Day				Average	Maximum	Minimum
Jan.			! 1	2.8	! 1	2.8	2.8	173	150	173	86.7
Feb.			! 1	2.8	! 1	2.8	2.8	157	135	162	78.6
Mar.			! 1	2.8	! 1	2.8	2.8	173	144	173	64.9
Apr.			! 1	2.8	! 1	2.8	2.8	168	139	168	63.2
May			! 1	2.8	! 1	2.8	2.8	173	145	173	64.9
June			! 1	2.8	! 1	2.8	2.8	168	135	168	63.2
July			! 1	2.8	! 1	2.8	2.8	173	136	173	43.8
Aug.			! 1	3.2	! 1	3.2	3.2	195	144	195	43.8
Sept.			! 1	3.2	! 1	3.2	3.2	189	143	189	42.2
Oct.			! 1	3.2	! 1	3.2	3.2	195	148	195	43.8
Nov.			! 1	3.2	! 1	3.2	3.2	189	145	189	63.2
Dec.			! 1	3.2	! 1	3.2	3.2	195	150	195	64.9
				3.2		2.8	2.8	2,148	1,714	2,148	723.2
Yearly	Meters		Cubic Meters per Second					Thousands of Cubic Meters			
				0.09		0.08	0.08	2,653	2,116	2,653	892

Ø Mean daily ! And other days

ARROYO DE LOS JABONCILLOS NEAR CD. ACUNA, COAHUILA

DESCRIPTION: Cipolletti weir of 70.6 second-foot (2 m^3/sec) capacity and staff gage located at latitude 29°24'25", longitude 101°02'20", 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 1978.

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 1978 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	64.3	65.7	66.4	66.4	63.2	62.2	56.5	57.9	58.6	60.0	64.3	71.3
2	65.0	66.4	66.4	66.4	63.2	63.6	56.5	57.9	58.6	60.0	64.3	71.3
3	65.0	66.4	66.4	66.4	63.2	66.4	56.5	57.9	58.6	61.1	64.3	71.3
4	65.0	66.4	66.4	64.3	62.9	66.4	56.5	58.6	58.6	61.1	64.3	71.3
5	65.0	67.1	66.4	64.3	62.9	65.7	56.5	58.6	59.3	61.1	66.7	69.6
6	65.0	67.1	66.4	64.3	62.5	66.4	56.5	58.6	59.3	62.5	67.8	68.9
7	65.0	67.1	66.4	64.3	62.5	66.4	56.5	58.6	59.3	64.3	69.2	68.9
8	65.0	67.1	66.4	64.3	62.5	66.4	56.5	58.6	60.0	64.3	68.9	68.2
9	65.0	67.1	66.4	64.3	61.8	63.6	56.5	58.6	60.0	64.3	68.9	68.2
10	65.7	67.1	66.4	64.3	61.8	62.5	56.5	57.2	61.1	65.0	68.5	68.2
11	65.7	67.1	66.4	64.3	61.8	62.2	57.2	57.2	61.1	65.0	68.5	66.4
12	65.7	67.1	66.4	64.3	61.8	61.4	57.2	57.2	61.1	64.3	68.5	65.7
13	65.7	67.1	66.4	64.3	61.8	61.8	57.2	57.2	60.7	63.2	70.3	65.7
14	65.0	67.1	66.4	65.0	61.8	61.1	57.2	57.2	60.0	62.9	70.3	65.7
15	65.0	67.1	66.4	65.7	61.8	60.4	57.2	56.5	60.0	62.9	69.6	65.7
16	65.0	66.7	66.4	65.7	61.8	60.4	57.2	55.8	59.3	62.9	68.9	65.0
17	66.4	66.0	66.4	65.7	61.8	60.4	57.2	55.8	59.3	63.2	68.9	64.3
18	66.4	65.7	66.4	65.0	61.8	60.4	57.2	55.8	59.3	63.2	68.9	64.3
19	66.4	65.7	66.4	65.0	61.8	60.4	56.5	55.1	59.3	63.2	68.9	65.0
20	66.4	65.7	66.4	65.0	61.8	59.3	55.8	55.1	59.3	63.2	69.9	64.6
21	66.4	65.7	66.4	65.0	61.8	58.6	55.1	55.1	59.3	62.5	70.6	64.3
22	66.4	65.7	66.4	65.0	61.8	58.6	55.1	55.1	59.3	62.5	71.3	64.3
23	66.4	65.7	66.4	65.0	65.0	58.6	54.4	55.1	59.3	65.0	69.9	64.3
24	66.4	66.0	66.4	65.0	65.0	57.9	54.4	55.1	59.3	65.0	69.6	63.2
25	66.4	66.0	66.4	65.0	65.0	57.9	54.4	55.1	59.3	65.0	69.6	63.2
26	66.4	66.4	66.4	64.6	65.0	57.9	54.4	55.1	59.3	65.0	69.6	63.2
27	66.4	66.4	66.4	64.3	65.0	56.5	54.4	55.1	59.3	65.0	71.3	63.2
28	66.4	66.4	66.4	63.9	65.0	56.5	54.4	55.1	59.3	65.0	71.3	63.2
29	66.4		66.4	63.6	65.0	56.5	55.8	56.9	59.3	65.0	71.3	63.2
30	66.4		66.4	63.2	65.0	56.5	56.5	58.6	59.3	65.0	71.3	63.2
31	65.7		66.4		65.0		56.5	58.6		65.0		63.2
Sum	2,037.4	1,861.1	2,058.4	1,943.9	1,953.1	1,832.9	1,740.3	1,760.3	1,785.8	1,967.7	2,065.7	2,048.1

Month	Current Year 1978 Extreme Gage Feet High	Extreme Gage Feet Low	Ø Extreme Second-Feet High Day	High	Low Day	Low	Average Second-Feet	Total Acre-Feet	Period 1969-1978 Acre-Feet Average	Maximum	Minimum
Jan.			!17	66.4	1	64.3	65.7	4,041	3,220	4,720	349
Feb.			! 5	67.1	! 1	65.7	66.4	3,691	2,921	4,207	381
Mar.			! 1	66.4	! 1	66.4	66.4	4,082	3,170	4,574	526
Apr.			! 1	66.4	30	63.2	64.6	3,855	3,052	4,345	636
May			!23	65.0	! 9	61.8	62.9	3,874	3,094	4,540	721
June			! 3	66.4	!27	56.5	61.1	3,635	2,860	4,073	678
July			!11	57.2	!23	54.4	56.2	3,452	2,969	4,367	769
Aug.			! 4	58.6	!19	55.1	56.9	3,492	3,079	4,321	782
Sept.			!10	61.1	! 1	58.6	59.7	3,544	3,175	Θ 4,417	782
Oct.			!10	65.0	! 1	60.0	63.6	3,902	3,510	μ 5,211	1,097
Nov.			!22	71.3	! 1	64.3	68.9	4,097	3,476	4,847	1,282
Dec.			! 1	71.3	!24	63.2	66.0	4,062	3,566	4,709	1,398
Yearly	Meters			71.3		54.4	63.2	45,727	38,092	51,839	9,850
			Cubic Meters per Second	2.02		1.54	1.79	56,402	Thousands of Cubic Meters 46,986	63,943	12,152

Ø Mean daily ! And other days Θ Partly estimated μ 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^3/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 1978.

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-feet (566 m^3/sec).

Current Year 1978									Period # Nov. 1961-1978		
Month	Extreme Gage Feet		Ø Extreme Second-Feet				Average Second-Feet	Total Acre-Feet	Acre-Feet		
			High		Low				Average	Maximum	Minimum
	High	Low	Day		Day						
Jan.			! 1	6.7	! 1	6.7	6.7	413	267	528	6.8
Feb.			! 1	6.7	! 1	6.7	6.7	373	242	477	5.4
Mar.			! 1	6.7	! 1	6.7	6.7	413	261	520	9.3
Apr.			! 1	6.7	! 1	6.7	6.7	399	293	540	6.3
May			! 1	6.7	! 1	6.7	6.7	413	307	544	10.9
June			! 1	6.7	! 1	6.7	6.7	399	274	492	6.3
July			! 1	6.7	! 1	6.7	6.7	413	262	503	6.5
Aug.			! 1	6.4	! 1	6.4	6.4	391	286	517	6.7
Sept.			! 1	6.7	! 1	6.7	6.7	399	295	493	6.6
Oct.			! 1	6.7	! 1	6.7	6.7	413	319	544	6.5
Nov.			! 1	6.7	!21	6.4	6.7	392	276	515	6.3
Dec.			!11	6.7	! 1	6.4	6.7	405	278	538	6.5
				6.7		6.4	6.7	4,823	3,360	6,031	216.8
Yearly	Meters		Cubic Meters per Second					Thousands of Cubic Meters			
				0.19		0.18	0.19	5,947	4,144	7,438	267

ARROYO DE LA TREINTA Y UNA

DESCRIPTION: Cipolletti weir of 35.3 second-foot (1 m^3/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 1978.

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 1978									Period # May 1961-1978		
Month	Extreme Gage Feet		Ø Extreme Second-Feet				Average Second-Feet	Total Acre-Feet	Acre-Feet		
			High		Low				Average	Maximum	Minimum
	High	Low	Day		Day						
Jan.			! 1	3.9	! 1	3.9	3.9	239	152	282	15.2
Feb.			! 1	3.9	! 1	3.9	3.9	216	139	257	13.9
Mar.			! 1	3.9	! 1	3.9	3.9	239	153	327	14.2
Apr.			! 1	3.9	! 1	3.9	3.9	231	174	302	10.5
May			!16	4.2	! 1	3.9	3.9	250	160	261	5.9
June			! 1	4.2	! 1	4.2	4.2	252	147	254	4.2
July			! 1	4.2	!21	3.9	4.2	253	142	253	0
Aug.			! 1	3.9	! 1	3.9	3.9	239	153	323	0
Sept.			! 1	3.9	! 1	3.9	3.9	231	169	273	13.1
Oct.			! 1	3.9	! 1	3.9	3.9	239	178	282	12.1
Nov.			!26	4.6	! 1	3.9	3.9	241	160	273	14.2
Dec.			! 1	4.6	!14	3.9	4.2	251	162	282	15.2
				4.6		3.9	3.9	2,881	1,889	3,264	250.4
Yearly	Meters		Cubic Meters per Second					Thousands of Cubic Meters			
				0.13		0.11	0.11	3,553	2,329	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^3/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 1978.

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 1978 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	11.3	11.3	11.3	11.3	11.3	11.3	12.0	11.7	13.1	11.7	18.7	12.4
2	11.3	11.3	11.3	11.3	11.3	11.3	12.0	16.2	12.7	11.7	18.7	12.4
3	11.3	11.3	11.3	11.3	11.3	11.3	12.0	13.8	12.0	11.7	18.7	12.4
4	11.3	11.3	11.3	11.3	11.3	11.3	12.0	12.4	12.0	11.7	18.7	12.4
5	11.3	11.3	11.3	11.3	11.3	11.3	12.0	11.3	12.0	11.7	18.7	12.7
6	11.3	11.3	11.3	11.3	11.3	11.3	12.0	11.3	12.0	11.7	18.7	12.7
7	11.3	11.3	11.3	11.3	11.3	11.3	12.0	11.3	12.0	11.7	18.7	12.7
8	11.3	11.3	11.3	11.3	11.3	11.3	12.0	11.3	12.0	11.7	18.7	12.7
9	11.3	11.3	11.3	11.3	11.3	11.3	12.0	11.3	12.0	11.7	18.7	12.7
10	11.3	11.3	11.3	11.3	11.3	11.3	12.0	11.3	12.0	12.0	18.4	12.4
11	11.3	11.3	11.3	11.3	11.3	11.3	12.0	11.3	12.0	12.0	18.0	12.4
12	11.3	11.3	11.3	11.3	11.3	11.3	12.0	11.3	12.0	12.0	17.7	12.7
13	11.3	11.3	11.3	11.3	11.3	11.3	12.0	10.9	12.0	11.7	17.7	12.7
14	11.3	11.3	11.3	11.3	11.3	11.3	12.0	10.9	12.4	11.7	17.7	12.7
15	11.3	11.3	11.3	11.3	11.3	11.3	12.0	10.9	12.4	11.7	16.6	12.4
16	11.3	11.3	11.3	11.3	11.3	11.3	12.0	10.9	12.4	11.7	15.5	12.0
17	11.3	11.3	11.3	11.3	11.3	11.3	12.0	10.9	12.4	11.7	14.8	12.0
18	11.3	11.3	11.3	11.3	11.3	11.3	12.0	10.9	12.4	11.7	14.1	12.0
19	11.3	11.3	11.3	11.3	11.3	11.3	12.0	10.9	12.4	11.7	14.1	12.7
20	11.3	11.3	11.3	11.3	11.3	11.3	12.0	10.9	12.4	11.7	13.8	12.4
21	11.3	11.3	11.3	11.3	11.3	11.3	12.0	10.9	12.4	11.7	13.8	12.0
22	11.3	11.3	11.3	11.3	11.3	11.3	12.0	10.9	12.4	11.7	13.8	12.0
23	11.3	11.3	11.3	11.3	11.3	11.3	12.0	10.9	12.4	11.7	13.4	12.0
24	11.3	11.3	11.3	11.3	11.3	11.3	12.0	10.9	12.4	11.7	13.4	11.6
25	11.3	11.3	11.3	11.3	11.3	11.3	12.0	10.9	12.4	11.7	13.4	11.6
26	11.3	11.3	11.3	11.3	11.3	11.3	12.0	10.9	12.4	11.7	13.1	12.0
27	11.3	11.3	11.3	11.3	11.3	11.3	12.0	10.9	12.4	11.7	12.7	12.0
28	11.3	11.3	11.3	11.3	11.3	11.3	12.0	10.9	12.4	11.7	12.7	11.6
29	11.3		11.3	11.3	11.3	11.3	12.0	13.4	12.4	11.7	12.4	10.9
30	11.3		11.3	11.3	11.3	11.3	12.0	16.6	12.4	11.7	12.4	10.9
31	11.3		11.3		11.3		12.0	14.1		11.7		10.9
Sum	350.3	316.4	350.3	339.0	350.3	339.0	372.0	363.0	368.6	363.6	477.8	377.0

Month	Extreme Gage Feet		Ø Extreme Second-Feet				Average Second-Feet	Total Acre-Feet	Period #Dec. 1961-1978 Acre-Feet		
			High		Low						
	High	Low	Day		Day				Average	Maximum	Minimum
Jan.			! 1	11.3	! 1	11.3	11.3	695	463	934	4.4
Feb.			! 1	11.3	! 1	11.3	11.3	627	411	843	4.1
Mar.			! 1	11.3	! 1	11.3	11.3	695	436	923	4.9
Apr.			! 1	11.3	! 1	11.3	11.3	672	450	878	4.2
May			! 1	11.3	! 1	11.3	11.3	695	529	976	8.7
June			! 1	11.3	! 1	11.3	11.3	672	473	917	6.0
July			! 1	12.0	! 1	12.0	12.0	739	491	977	7.9
Aug.			30	16.6	!13	10.9	11.7	722	525	1,216	6.2
Sept.			1	13.1	! 3	12.0	12.4	730	610	1,111	5.4
Oct.			!10	12.0	! 1	11.7	11.7	718	682	1,420	4.6
Nov.			! 1	18.7	!29	12.4	15.9	948	606	1,338	4.2
Dec.			! 5	12.7	!29	10.9	12.0	748	515	1,187	4.4
Yearly				18.7		10.9	12.0	8,661	6,191	11,421	146.2
	Meters		Cubic Meters per Second					Thousands of Cubic Meters			
				0.53		0.31	0.34	10,682	7,636	14,089	180.1

Current Year 1978

Some months missing Ø Mean daily ! 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^3/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. Acuna, 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 1978.

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 1978 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	3.2	3.2	3.1	3.0	2.6	2.7	2.5	3.0	3.0	2.8	2.7	3.6
2	3.2	3.2	3.1	3.0	2.6	2.8	2.4	3.9	2.8	2.8	2.7	3.7
3	3.3	3.3	3.1	3.0	3.3	4.8	2.4	3.3	2.8	2.8	2.8	3.6
4	3.2	3.3	3.1	3.0	3.0	4.6	2.3	3.0	2.7	2.8	3.0	3.6
5	3.1	3.2	3.1	3.0	2.9	3.8	2.3	2.8	3.6	2.8	4.1	3.6
6	3.2	3.2	3.1	2.9	2.8	4.1	2.2	2.7	3.4	2.8	4.4	3.6
7	3.2	3.2	3.1	2.8	2.8	5.5	2.2	2.7	3.3	3.3	3.7	3.6
8	3.3	3.2	3.1	3.0	2.8	4.6	2.2	2.6	3.2	3.2	3.6	3.5
9	3.3	3.2	3.0	2.8	2.7	3.9	2.2	2.6	3.0	3.3	3.6	3.4
10	3.3	3.2	3.0	3.3	2.8	3.5	2.1	2.6	3.0	3.2	3.6	3.5
11	3.2	3.1	3.0	3.0	3.0	3.4	2.2	2.7	3.0	3.2	3.5	3.5
12	3.3	2.9	3.0	2.9	3.0	3.3	2.1	2.8	3.0	3.1	3.6	3.5
13	3.2	3.1	3.0	2.8	2.7	3.2	2.2	2.7	3.0	3.1	3.6	3.5
14	3.2	3.2	3.0	2.7	2.6	3.1	2.2	2.6	3.0	3.0	3.6	3.6
15	3.1	3.0	3.0	2.7	2.6	3.0	2.2	2.6	2.9	3.2	3.6	3.7
16	3.1	3.0	3.0	2.7	2.6	3.0	2.2	2.6	2.9	3.2	3.6	3.6
17	3.2	3.0	3.0	2.7	2.6	2.9	2.1	2.6	2.8	3.2	3.6	3.6
18	3.1	3.1	3.0	2.6	2.6	3.0	2.1	2.6	2.8	3.1	3.6	3.7
19	3.2	3.0	3.0	2.6	2.5	2.9	2.1	2.7	2.8	3.0	3.6	3.7
20	3.1	3.0	3.0	2.6	2.5	2.8	2.1	2.8	2.8	2.9	3.6	3.7
21	3.3	3.1	3.0	2.6	3.3	2.8	2.1	2.8	3.0	2.9	3.7	3.7
22	3.2	3.1	3.0	2.7	3.9	2.8	2.1	2.9	3.3	2.9	3.8	3.7
23	3.2	3.1	3.0	2.7	3.3	2.8	2.2	3.0	3.3	3.0	3.6	3.8
24	3.2	3.1	3.0	2.6	3.0	2.6	2.2	3.0	3.2	3.0	3.6	3.7
25	3.3	3.0	3.0	2.6	3.0	2.6	2.2	3.1	3.0	2.9	3.6	3.7
26	3.3	3.1	3.0	2.6	3.0	2.6	2.2	3.2	3.0	2.9	3.7	3.7
27	3.3	3.0	3.0	2.6	2.8	2.5	2.3	3.3	3.1	2.8	3.6	3.6
28	3.2	3.0	3.0	2.6	2.9	2.5	2.4	3.3	3.0	2.8	3.6	3.7
29	3.2		3.0	2.6	3.2	2.5	2.7	3.4	3.0	2.8	3.6	3.7
30	3.3		3.0	2.6	2.9	2.5	2.8	3.5	2.9	2.8	3.6	3.7
31	3.2		3.0		2.8		3.0	3.6		2.8		3.8
Sum	99.7	87.1	93.8	83.3	89.1	97.1	70.5	91.0	90.6	92.4	106.5	112.6

Month	Current Year 1978								Period #March 1961-1978		
	Extreme Gage ** Feet		Ø Extreme Second-Feet				Average Second-Feet	Total Acre-Feet	Acre-Feet		
			High		Low				Average	Maximum	Minimum
	High	Low	Day		Day						
Jan.	1.13	1.08	1 3	3.3	1 5	3.1	3.2	198	88.2	294	0
Feb.	1.11	1.02	1 3	3.3	12	2.9	3.1	173	80.1	273	0
Mar.	1.10	1.07	1 1	3.1	1 9	3.0	3.0	186	82.2	271	0
Apr.	1.72	.98	10	3.3	118	2.6	2.8	165	86.8	244	0
May	2.87	.97	22	3.9	119	2.5	2.9	177	84.8	224	0
June	2.93	.96	7	5.5	127	2.5	3.2	193	74.7	214	0
July	1.57	.89	31	3.0	110	2.1	2.3	140	89.0	390	0
Aug.	1.75	.98	2	3.9	1 8	2.6	2.9	180	93.1	299	0
Sept.	2.47	.73	5	3.6	4	2.7	3.0	180	82.6	240	0
Oct.	1.12	1.02	1 7	3.3	1 1	2.8	3.0	183	101	334	0
Nov.	2.50	1.03	6	4.4	1 1	2.7	3.6	211	90.4	321	0
Dec.	1.28	1.13	31	3.8	9	3.4	3.6	223	93.8	283	0
Yearly	2.93	0.73		5.5		2.1	3.1	2,209	1,046.7	2,892	3.4
	Meters		Cubic Meters per Second					Thousands of Cubic Meters			
	0.89	0.22		0.16		0.05	0.09	2,725	1,291	3,567	4.2

\# Some months missing ** Includes storm runoff Ø Mean daily 1 And other days

MCKEE SPRING NEAR DEL RIO, TEXAS

DESCRIPTION: Cipolletti weir of 21.5 second-foot (0.6 m^3/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 25 discharge measurements during the year. Mean daily discharges determined by prorating between measurements. Records available: November 1961 through 1978.

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^3/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. On 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. 9.1 (0.26)	Aug. 15, 1972	Min. 0	Occasionally
Monthly:	Max. 8.4 (0.24)	Oct. 1978	Min. 0	Occasionally
Yearly:	Max. 7.5 (0.21)	1974	Min. 0	1963

Mean Daily Discharge in Second-Feet 1978 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	6.4	* 6.9	* 6.2	5.4	6.5	* 6.7	7.0	8.5	7.0	7.1	* 9.0	7.7
2	6.4	6.9	6.2	5.4	6.5	6.8	6.9	* 8.7	7.0	7.1	8.9	7.7
3	6.3	6.8	6.1	5.4	* 6.6	6.8	6.9	8.6	6.9	7.0	8.8	7.7
4	6.2	6.8	6.1	5.3	6.6	6.9	6.9	8.5	6.9	7.0	8.7	7.7
5	* 6.2	6.8	6.1	* 5.3	6.7	7.0	6.8	8.4	6.9	* 7.0	8.6	7.7
6	6.2	6.8	6.1	5.3	6.7	7.0	* 6.8	8.3	* 6.9	7.2	8.5	* 7.7
7	6.2	6.7	6.0	5.3	6.7	7.1	6.8	8.2	6.9	7.5	8.4	7.7
8	6.3	6.7	6.0	5.4	6.7	7.2	6.8	8.1	7.0	7.7	8.3	7.8
9	6.3	6.7	6.0	5.4	6.8	7.3	6.8	8.0	7.0	8.0	8.2	7.8
10	6.3	6.6	6.0	5.4	6.8	7.3	6.9	7.9	7.0	8.2	8.1	7.8
11	6.3	6.6	5.9	5.4	6.8	7.4	6.9	7.8	7.0	8.4	8.0	7.8
12	6.4	6.6	5.9	5.4	6.9	7.5	6.9	7.7	7.1	8.7	7.9	7.9
13	6.4	6.6	5.9	5.5	6.9	7.5	6.9	7.6	7.1	* 8.9	7.8	7.9
14	6.4	6.5	5.9	5.5	6.9	* 7.6	6.9	7.5	7.1	8.9	7.7	7.9
15	6.4	* 6.5	5.8	5.5	6.9	7.6	6.9	7.4	7.2	8.9	* 7.6	8.0
16	6.5	6.5	5.8	5.5	7.0	7.5	7.0	7.3	7.2	9.0	7.6	8.0
17	6.5	6.5	5.8	5.6	* 7.0	7.5	7.0	* 7.2	7.2	9.0	7.6	8.0
18	* 6.5	6.4	5.8	5.6	7.0	7.5	7.0	7.2	7.2	* 9.0	7.6	8.0
19	6.5	6.4	5.7	* 5.6	7.0	7.4	* 7.0	7.2	7.3	9.0	7.6	8.1
20	6.6	6.4	5.7	5.7	6.9	7.4	7.0	7.2	* 7.3	9.0	7.6	* 8.1
21	6.6	6.4	5.7	5.7	6.9	7.3	7.0	7.1	7.3	9.0	7.6	8.0
22	6.6	6.4	5.7	5.8	6.9	7.3	7.0	7.1	7.3	9.0	7.6	8.0
23	6.6	6.3	5.6	5.9	6.9	7.3	7.0	7.1	7.2	9.0	7.7	7.9
24	6.7	6.3	5.6	6.0	6.9	7.2	7.0	7.1	7.2	9.0	7.7	7.9
25	6.7	6.3	5.6	6.0	6.8	7.2	7.0	7.1	7.2	9.0	7.7	7.8
26	6.7	6.3	5.6	6.1	6.8	7.2	7.0	7.1	7.2	9.0	7.7	7.8
27	6.8	6.2	5.5	6.2	6.8	7.1	7.2	7.0	7.2	9.0	7.7	7.7
28	6.8	6.2	5.5	6.2	6.8	7.1	7.5	7.0	7.1	9.0	7.7	7.7
29	6.8		5.5	6.3	6.8	7.1	7.7	7.0	7.1	9.0	* 7.7	7.6
30	6.8		5.5	6.4	6.7	7.0	8.0	7.0	7.1	9.0	7.7	7.6
31	6.9		5.4		6.7		8.2	7.0		9.0		7.5
Sum	201.3	183.1	180.2	169.5	210.9	216.8	218.7	234.9	213.1	261.6	239.3	242.5

Month	Extreme Gage Feet		Ø Extreme Second-Feet				Average Second-Feet	Total Acre-Feet	Period Nov. 1961-1978 Acre-Feet		
			High		Low						
	High	Low	Day		Day				Average	Maximum	Minimum
Jan.			31	6.9	! 4	6.2	6.5	399	250	466	0
Feb.			! 1	6.9	!27	6.2	6.5	363	228	430	0
Mar.			! 1	6.2	31	5.4	5.8	357	249	457	0
Apr.			30	6.4	! 4	5.3	5.6	336	253	442	0
May			!16	7.0	! 1	6.5	6.8	418	281	480	.7
June			!14	7.6	1	6.7	7.2	430	248	436	0
July			31	8.2	! 5	6.8	7.1	434	254	474	0
Aug.			2	8.7	!27	7.0	7.6	466	260	473	0
Sept.			!19	7.3	! 3	6.9	7.1	423	262	479	0
Oct.			!16	9.0	! 3	7.0	8.4	519	279	519	0
Nov.			1	9.0	!15	7.6	8.0	475	262	475	0
Dec.			!19	8.1	31	7.5	7.8	481	266	481	0
Yearly				9.0		5.3	7.0	5,101	3,092	5,395	0.7
	Meters		Cubic Meters per Second					Thousands of Cubic Meters			
				0.25		0.16	0.20	6,292	3,814	6,655	0.9

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

CANTU SPRING NEAR DEL RIO, TEXAS

DESCRIPTION: Gravity well and water-stage recorder 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. The spring is isolated from surface runoff by the concrete enclosure, but creek backwater may influence the recorded gage heights. 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 52 discharge measurements during the year. Mean daily discharges determined by prorating between measurements. Records available: March 1961 through 1978.

REMARKS: The flow of this springs 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 1978 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	8.0	* 7.5	* 8.4	7.8	8.0	* 7.7	6.5	7.7	6.4	7.5	* 7.3	7.8
2	8.2	7.6	8.3	7.9	7.9	7.7	6.5	* 7.9	6.6	7.6	7.4	7.8
3	8.4	7.7	8.3	8.0	* 7.9	7.8	6.5	7.6	6.8	7.6	7.6	7.7
4	8.5	7.8	8.2	8.0	7.7	7.8	6.4	7.3	7.0	7.7	7.7	7.7
5	* 8.7	8.0	8.2	* 8.1	7.5	7.8	6.4	7.0	7.1	* 7.8	7.9	7.7
6	8.6	8.1	8.1	8.0	7.3	7.9	* 6.4	6.8	* 7.3	7.7	8.0	* 7.7
7	8.4	8.2	8.1	8.0	7.1	* 7.9	6.4	6.5	7.3	7.6	8.2	7.6
8	8.2	* 8.3	* 8.0	7.9	6.9	7.7	6.4	6.2	7.4	7.5	* 8.3	7.5
9	8.1	8.4	8.1	7.8	6.7	7.6	6.4	* 5.9	7.4	7.4	8.2	7.4
10	8.0	8.4	8.1	7.7	* 6.5	7.4	6.4	5.9	7.5	7.3	8.1	7.4
11	* 7.8	8.5	8.2	7.7	6.6	7.2	6.4	6.0	7.5	* 7.2	8.0	7.3
12	7.8	8.5	8.3	* 7.6	6.8	7.0	* 6.4	6.0	7.6	7.2	7.8	7.2
13	7.9	8.6	8.4	7.5	6.9	6.9	6.4	6.1	* 7.6	7.2	7.7	* 7.1
14	7.9	8.6	8.4	7.5	7.0	* 6.7	6.4	6.1	7.4	7.2	7.6	7.0
15	8.0	* 8.7	* 8.5	7.4	7.1	6.8	6.4	6.2	7.2	7.3	* 7.5	7.0
16	8.0	8.6	8.4	7.3	7.3	7.0	6.4	* 6.2	7.0	7.3	7.6	6.9
17	8.1	8.6	8.4	7.2	* 7.4	7.1	6.4	6.2	6.7	7.3	7.6	6.9
18	* 8.1	8.5	8.3	7.2	7.5	7.3	6.4	6.2	6.5	* 7.3	7.7	6.8
19	8.1	8.4	8.3	* 7.1	7.5	7.4	* 6.4	6.2	6.3	7.3	7.7	6.8
20	8.0	8.3	8.2	7.2	7.6	7.6	6.4	6.3	* 6.1	7.3	7.8	* 6.7
21	8.0	8.3	8.2	7.4	7.6	* 7.7	6.4	6.3	6.3	7.3	7.8	6.8
22	8.0	* 8.2	* 8.1	7.5	7.7	7.6	6.4	6.3	6.4	7.3	* 7.9	6.8
23	8.0	8.2	8.0	7.7	7.7	7.4	6.3	* 6.3	6.6	7.3	7.9	6.9
24	7.9	8.3	8.0	7.8	* 7.8	7.2	6.3	6.3	6.7	7.3	7.9	7.0
25	* 7.9	8.3	7.9	8.0	7.8	7.1	6.3	6.2	6.9	* 7.3	7.9	7.1
26	7.8	8.3	7.8	* 8.1	7.8	6.9	* 6.3	6.2	7.0	7.3	7.8	7.1
27	7.8	8.3	7.7	8.1	7.8	6.8	6.5	6.2	* 7.2	7.3	7.8	* 7.2
28	7.7	8.4	7.7	8.0	7.8	* 6.6	6.8	6.2	7.3	7.3	7.8	7.2
29	7.7		* 7.6	8.0	7.7	6.6	7.0	6.1	7.4	7.3	* 7.8	7.2
30	7.6		7.7	8.0	7.7	6.6	7.2	* 6.1	7.4	7.3	7.8	7.2
31	7.6		7.7		7.7		7.4	6.3		7.3		7.2
Sum	248.8	231.6	251.6	231.5	230.3	218.7	201.2	198.8	209.9	228.6	234.1	223.7

Month	Current Year 1978							Period March 1961-1978		
	Extreme Gage Feet		Ø Extreme Second-Feet				Average Second-Feet	Total Acre-Feet	Acre-Feet		
			High		Low						
	High	Low	Day		Day				Average	Maximum	Minimum
Jan.	2.70	2.59	5	8.7	!30	7.6	8.0	493	267	525	0
Feb.	2.83	2.70	!5	8.7	1	7.5	8.3	459	239	474	0
Mar.	3.97	2.83	!5	8.5	29	7.6	8.1	499	253	518	0
Apr.	3.33	3.08	5	8.1	19	7.1	7.7	459	244	480	0
May			1	8.0	10	6.5	7.4	457	238	508	0
June			! 6	7.9	!28	6.6	7.3	434	221	531	0
July			31	7.4	!23	6.3	6.5	399	229	505	0
Aug.			3	7.9	! 9	5.9	6.4	394	239	526	0
Sept.			!12	7.6	20	6.1	7.0	416	249	520	0
Oct.			5	7.8	!11	7.2	7.4	453	273	538	0
Nov.			8	8.3	1	7.3	7.8	464	269	521	0
Dec.			! 1	7.8	20	6.7	7.2	444	279	544	0
Yearly				8.7		5.9	7.4	5,371	3,000	5,918	0
	Meters		Cubic Meters per Second					Thousands of Cubic Meters			
				0.25		0.17	0.21	6,625	3,700	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. Acuna, Coahuila. The elevation of the zero of the gages has not been determined.

RECORDS: Based on 52 and 52 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 1978. 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 1978 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:

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

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-Feet 1978 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	17.3	17.9	19.7	16.1	15.9	16.8	12.3	19.5	13.7	16.0	14.3	18.3
2	17.8	17.9	19.6	16.7	16.8	16.4	12.0	20.6	13.3	16.0	14.7	18.6
3	17.7	18.0	19.0	16.7	18.7	21.3	11.4	18.3	13.5	16.1	15.1	18.6
4	17.7	17.8	18.6	16.8	17.0	19.8	11.1	17.5	13.8	16.3	15.8	18.6
5	18.0	18.0	18.0	16.7	16.1	18.4	10.9	15.8	15.9	16.4	19.8	18.4
6	17.7	18.1	18.2	16.8	15.9	19.0	11.2	14.7	15.7	16.0	21.2	17.9
7	17.2	18.1	17.8	17.0	15.9	19.3	11.0	13.9	15.5	16.3	20.2	17.8
8	17.1	18.2	17.1	17.9	14.8	19.0	10.7	13.5	15.3	15.9	19.5	17.6
9	17.4	17.9	17.4	18.0	14.1	18.0	10.6	12.0	15.0	15.1	19.6	17.5
10	17.5	18.1	17.0	19.8	13.6	17.2	10.6	13.0	15.2	14.5	20.0	18.1
11	17.3	18.1	16.9	19.1	13.9	17.1	10.9	13.1	15.4	14.0	20.5	18.0
12	17.8	18.6	17.0	19.0	14.5	16.5	10.7	13.1	15.2	14.1	20.6	18.0
13	18.0	18.6	17.3	18.3	13.8	16.2	10.5	13.3	15.3	14.2	20.5	17.8
14	17.5	18.5	17.8	17.9	13.8	15.8	10.8	13.2	14.6	14.4	20.4	17.7
15	17.9	19.0	18.3	17.7	13.8	15.5	10.7	12.3	14.4	14.1	20.2	17.7
16	18.2	19.0	18.2	17.7	13.9	15.6	10.2	12.7	14.1	14.1	20.0	17.8
17	18.1	18.8	18.2	17.4	14.0	15.2	10.2	12.7	13.6	13.9	19.7	17.5
18	18.5	19.2	18.1	16.9	13.9	15.6	10.1	12.4	12.9	14.4	19.4	17.6
19	17.9	19.6	17.7	16.6	14.4	15.5	9.8	11.8	12.7	14.1	19.1	17.8
20	17.9	19.5	17.4	16.6	15.0	15.6	10.0	11.4	12.3	14.1	18.9	17.6
21	17.7	19.7	17.4	16.5	18.1	15.3	10.4	11.4	12.8	13.7	18.7	16.9
22	17.9	19.8	17.3	16.2	18.4	14.5	9.8	11.4	13.7	14.0	18.8	16.5
23	17.7	20.0	17.2	16.0	17.2	14.2	9.2	11.3	14.0	13.9	18.6	16.2
24	17.8	20.0	16.5	15.2	17.2	14.0	9.3	12.2	14.6	13.7	18.4	15.7
25	17.6	19.8	16.3	13.7	16.8	13.4	9.8	12.1	15.0	14.1	18.4	15.4
26	17.2	19.8	16.1	13.7	16.8	13.1	10.0	11.5	15.2	14.0	18.4	15.3
27	17.0	19.7	15.8	14.2	16.4	12.7	10.8	11.5	15.9	13.8	18.1	15.3
28	17.5	19.8	15.6	14.4	16.5	12.4	12.6	11.9	16.1	13.8	18.0	15.4
29	17.6		15.3	15.3	17.1	12.4	14.3	12.3	16.2	13.8	18.0	15.7
30	17.6		15.4	15.9	17.0	12.3	15.5	12.2	16.2	13.9	18.5	15.6
31	17.8		15.3		17.1		18.9	13.0		14.2		16.0
Sum	547.9	527.5	537.5	500.8	488.4	478.1	346.3	415.6	437.1	452.9	563.4	532.9

Month	Current Year 1978 Extreme Gage Feet High	Extreme Gage Feet Low	ø Extreme Second-Feet High Day	High	Low Day	Low	Average Second-Feet	Total Acre-Feet	Period March 1965-1978 Acre-Feet Average	Maximum	Minimum
Jan.			18	18.5	27	17.0	17.7	1,087	737	1,242	134
Feb.			!23	20.0	4	17.8	18.8	1,046	699	1,157	98.0
Mar.			1	19.7	!29	15.3	17.3	1,066	703	1,185	102
Apr.			10	19.8	!25	13.7	16.7	993	653	1,125	100
May			3	18.7	10	13.6	15.8	969	656	1,159	109
June			3	21.3	30	12.3	15.9	948	567	1,070	86.3
July			31	18.9	23	9.2	11.2	687	632	1,527	85.5
Aug.			2	20.6	23	11.3	13.4	824	654	1,241	48.4
Sept.			!29	16.2	20	12.3	14.6	867	633	1,043	84.1
Oct.			5	16.4	!21	13.7	14.6	898	739	1,135	150
Nov.			6	21.2	1	14.3	18.8	1,117	734	1,117	152
Dec.			! 2	18.6	26	15.3	17.2	1,057	757	1,168	133
Yearly				21.3		9.2	16.0	11,559	8,164	12,965	1,530.9
	Meters		Cubic Meters per Second					Thousands of Cubic Meters			
				0.60		0.26	0.45	14,258	10,070	15,992	1,888

ø Mean daily ! 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. G. & G. S. datum.

RECORDS: Based on 22 discharge measurements during the year, 12 by the United States Section and 10 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 1978. 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 1978 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^3/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^3/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 1978 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	1,090	1,100	1,070	1,050	1,540	6,070 *	4,950	3,830	2,130	1,060	5,120	3,410
2	1,090	1,090 *	1,090	1,040	1,220	6,100	4,940	2,620	1,650	1,070	3,050 *	3,420
3	1,090	1,060	1,130	1,040	1,130	7,220	4,930	2,570 *	1,590	1,090 *	3,080	3,410
4	1,090	1,070	1,550	1,030	1,000 *	6,100	4,930	2,570	2,460	2,460	3,270	3,440
5	1,090	1,070	1,550	1,030	1,020	6,100	4,920	2,570	3,270	6,180	3,740	3,430
6	1,090 *	1,070	1,560	1,120	1,040	6,240	4,930 *	2,570	1,460	6,410	3,430	3,430 *
7	1,090	1,070	1,550	1,280	1,040	6,180	4,810	2,570	2,640	6,540	3,410	3,410
8	1,090	1,070	1,550	1,280	1,040	6,130	4,620	2,600	2,650 *	6,590	3,410	3,410
9	1,090	1,070	1,820 *	1,290	1,020	6,110	4,610	2,610	2,640	6,640	3,410	3,410
10	1,090	1,070	2,660	1,440 *	1,440	6,100	4,610	2,650 *	2,640	6,680	3,410	3,410
11	1,100	1,070	3,140	2,120	3,610	6,090	4,590	2,660	2,640	6,690	3,410	2,500
12	1,090	1,070	3,140	2,120	4,930 *	5,800	4,580	2,670	2,640	6,710	3,410	1,010
13	1,090	1,070	3,140	2,120 *	4,370	5,270	4,600	2,670	2,640	6,580	3,410	1,010
14	1,090	1,070	3,150	1,890	4,880	5,220	4,590 *	2,670	2,640	6,170	3,170	1,010
15	1,090	1,070	3,040	1,340	4,930	5,220	4,600	2,670	2,640 *	6,190	2,280	1,010
16	1,090	1,070	2,930 *	1,340	5,470	5,210	4,560	2,670	2,640	6,200	2,280	1,010
17	1,090	1,070	3,090	1,340	6,340	5,180	4,550	2,670	2,630	6,220	2,280	988
18	1,090	1,070	3,090	1,340	6,140	5,160	4,540	2,670	2,630	6,190	2,270	988
19	1,090	1,070	3,090	1,380	5,940	5,160	4,520	2,660	2,630	6,190	2,280	988
20	1,090	1,070	3,250	1,710	5,990	5,130	4,510	2,650	2,620	6,040	2,280	1,350
21	1,090	1,070	3,570	1,720	6,340	5,090	4,490	2,660	2,640	5,850	2,410	1,940
22	1,090	1,070	3,570	1,710	6,090	5,070	4,490	2,660	2,650	5,850	2,740	1,940
23	1,090	1,070	3,570	1,720	6,040	5,050	4,470	2,660	2,650	5,850	2,740	1,940
24	1,090	1,070	3,570	1,720	6,090	5,040	4,460	2,650	2,640	5,860	2,740 *	1,940
25	1,080	1,070	3,570	1,710	6,190	5,000	4,460	2,630	2,640	5,850	2,730	1,940
26	1,090 *	1,070	3,570	1,710	6,140	5,000	4,430	2,650	2,670	5,850 *	2,740	1,940
27	1,090	1,070	3,570	1,710	6,140	4,980	4,410	2,640	2,090	5,850	2,740	1,940
28	1,090	1,070	3,910	1,720	6,140	4,960	4,410	2,620	1,050	5,870	2,930	1,940 *
29	1,090		4,620	1,710	6,140	4,970	4,420	2,700	1,040	5,870	3,410	1,940
30	1,100		4,620	1,710	6,140	4,950	4,480	2,660	1,050	5,860	3,410	1,940
31	1,090		3,210		6,090		4,450	2,670		5,860		1,950
Sum	33,800	30,000	87,940	45,440	131,630	165,900	142,860	83,020	70,600	172,320	90,990	67,394

Current Year 1978 — Period #1968-1978

Month	Extreme Gage Feet High	Extreme Gage Feet Low	Extreme Second-Feet High Day	High	Extreme Second-Feet Low Day	Low	Average Second-Feet	Total Acre-Feet	Acre-Feet Average	Acre-Feet Maximum	Acre-Feet Minimum
Jan.	1.99	1.94	11	1,180	! 7	1,070	1,090	67,041	70,549	130,195	14,497
Feb.	1.96	1.85	! 1	1,110	3	883	1,070	59,504	121,489	448,205	18,633
Mar.	3.05	1.94	29	4,660	1	1,070	2,840	174,426	105,311	253,329	17,298
Apr.	2.36	1.91	!13	2,150	! 1	1,000	1,510	90,129	104,154	354,407	33,846
May	3.55	1.87	21	7,310	! 4	1,000	4,250	261,084	191,895	516,357	30,928
June	4.11	3.02	3	10,600	25	4,750	5,530	329,058	130,560	329,058	23,143
July	3.07	2.89	! 1	4,970	21	4,200	4,610	283,319	111,617	283,319	31,474
Aug.	2.94	2.42	1	4,410	! 5	2,470	2,680	164,668	156,951	670,572	28,826
Sept.	3.14	1.45	5	5,280	3	295	2,350	140,033	255,278	1,327,497	38,860
Oct.	3.45	1.89	13	6,790	! 1	1,040	5,560	341,792	184,115	815,207	11,578
Nov.	3.27	2.35	1	5,890	!16	2,250	3,030	180,476	111,709	527,524	13,644
Dec.	2.70	1.92	! 2	3,450	!13	988	2,170	133,674	68,129	228,774	13,918
Yearly	4.11	1.45		10,600		295	3,070	2,225,204	1,611,757	3,743,795	508,583
	Meters		Cubic Meters per Second					Thousands of Cubic Meters			
	1.25	0.44		300		8.35	86.9	2,744,789	1,988,102	4,617,971	627,337

** Period 1968-1978 * Discharge measurement made on this day ! And other days

Values for January 1968 are Rio Grande near Del Rio discharge less Arroyo de 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^3/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 m) 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-feet (10 m^3/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 1978, 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 1978.

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-feet (10 m^3/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-feet (1,800 m^3/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-Feet (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-Feet 1978 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	4.2	6.0	4.9	4.6	4.2	3.5	2.8	3.2	1.8	3.5	4.2	7.1
2	4.2	6.0	4.9	6.0	3.9	41.0	2.8	2.8	1.8	4.2	4.2	7.1
3	4.2	6.0	4.9	4.9	4.2	420	2.1	2.8	1.8	4.2	4.2	6.0
4	4.2	6.0	4.9	4.9	4.2	21.5	2.1	2.5	1.8	3.9	4.9	6.0
5	4.2	6.0	4.9	4.9	3.9	9.5	2.1	2.1	204	3.9	1,150 *	6.0
6	4.2	6.0	4.9	4.9	3.5	36.4	2.1	2.1	4.6	8.8	25.8	6.0
7	4.2	6.0	4.9	25.1	3.5	8.5	2.1	2.1	2.8	8.5	13.1	6.4
8	4.6	6.0	4.9	67.8	3.5	6.0	2.1	2.1	2.8	6.7	11.3	7.1
9	4.6	6.0	4.9	17.7	3.2	5.3	2.1	2.1	2.8	5.7	9.5	7.1
10	4.6	6.0	4.9	75.2	3.2	4.9	2.1	2.1	2.8	4.9	9.2	7.1
11	4.6	6.0	4.9	8.5	4.2	4.9	2.1	2.1	2.8	6.0	8.5	6.7
12	4.9	6.0	4.9	8.5	4.2	4.6	2.1	2.1	2.8	5.7	11.3	6.4
13 *	4.9	5.3	4.9	8.5	3.9	4.2	2.1	2.1	2.8	5.3	12.7	6.4
14	4.9	5.3	4.2	8.5	3.9	4.2 *	2.1	2.1	2.8	4.6	12.7	6.7
15	4.6	6.0	4.2	7.1	2.8	4.2	2.1	2.1	2.8	4.6	12.7	7.1
16	4.6	6.0	4.2	7.1	2.8	4.2	2.1	1.8	2.8	3.9	12.0	7.1
17	4.6	6.0	4.2	6.0	2.8	4.2	2.1	1.8	2.8	3.5 *	11.3	6.4
18	4.6	6.0	4.2	6.0	2.8	3.9	2.1	1.8	2.8	3.2	11.3	7.1
19	4.6	5.3	4.2	6.0	2.8	3.5	2.1	1.8	2.8	2.8	11.3	6.0
20	4.6	5.3	4.2	4.9	2.8	3.5	2.1	1.8	2.8	2.8	10.6	5.7
21	4.6	5.3	4.2	4.9	220	3.5	2.1	1.8	2.8	2.8	10.6	4.9
22	4.6	5.3	4.2	4.9	14.5	3.5	2.1	1.8	2.8	2.8	9.5	4.9
23	4.6	5.3	4.2	4.9	5.7	3.5	2.1	1.8	3.5	3.5	9.5	4.9
24	4.6	5.3	4.2	4.9	4.9	3.5	2.1	1.8	4.2	4.2	9.5	4.9
25	4.6	5.3	4.2	4.9	4.2	3.5	2.1	1.8	3.5	4.2	9.5	4.9
26	4.6	5.3	4.2	4.9	4.2 *	2.8	2.1	1.8	3.5	4.2	8.8	4.9 *
27 *	4.6 *	5.3	4.2	4.2	4.2	2.8	2.1	1.8	4.2	4.6	8.5	4.9
28	4.6	5.3	4.2	4.2	16.2	2.8	2.1	1.8	4.2	4.9	7.8	5.3
29	4.6		4.9	4.2	10.2	2.8	2.1	1.8 *	3.5	4.9	6.0	5.3
30	4.6		4.6	4.2	4.2	2.8	154	1.8	3.5	4.6	6.0	5.3
31	4.6		4.6 *		4.2		12.7	1.8 *		4.2		6.0
Sum	140.7	159.6	140.8	334.3	362.8	629.5	229.0	63.2	290.7	141.6	1,437.5	187.7

Month	Current Year 1978 Extreme Gage Feet High	Extreme Gage Feet Low	Extreme Second-Feet High Day	Extreme Second-Feet High	Extreme Second-Feet Low Day	Extreme Second-Feet Low	Average Second-Feet	Total Acre-Feet	Period 1938-1978 Acre-Feet Average	Maximum	Minimum
Jan.	0.43	0.39	!12	4.9	! 1	4.2	4.6	280	377	910	31.5
Feb.	.46	.43	! 1	6.0	!13	5.3	5.7	317	507	5,950	33.3
Mar.	.43	.39	! 1	4.9	!14	4.2	4.6	281	551	2,600	59.2
Apr.	3.02	.39	8	819	!27	4.2	11.3	664	1,390	16,610	75.4
May	3.61	.33	21	1,480	!15	2.8	11.7	720	1,308	9,080	90.0
June	4.20	.33	3	1,980	!26	2.8	21.2	1,250	2,482	62,520	43.8
July	3.41	.30	30	1,180	! 3	2.1	7.4	455	1,547	16,409	26.8
Aug.	.33	.26	1	3.2	!16	1.8	2.1	125	1,081	13,661	42.2
Sept.	3.38	.26	5	1,180	! 1	1.8	9.9	578	2,857	49,566	37.3
Oct.	.85	.33	5	29.7	!19	2.8	4.6	281	1,626	20,444	22.6
Nov.	5.58	.39	5	3,780	! 1	4.2	48.0	2,855	443	2,855	21.0
Dec.	.49	.43	! 1	7.1	!21	4.9	6.0	372	353	1,066	22.0
Yearly	5.58	0.26		3,780		1.8	11.3	8,178	14,527	70,026.3	2,066.7
	Meters		Cubic Meters per Second					Thousands of Cubic Meters			
	1.70	0.08		107		0.05	0.32	10,087	17,915	86,384	2,555

* Discharge measurement made on this day ! And other days ** Period 1938-1978

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 52 and 52 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, Feb. 1961 through 1978.

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 1978 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	148	146	147	142	138	136	147	140	142	134	140	146
2	149	146	144	147	140	136	147	141	138	137	142	144
3	147	145	142	150	138	147	144	140	136	139	144	141
4	148	144	139	147	135	142	143	142	136	139	147	142
5	144	144	138	150	138	140	146	141	141	140	152	142
6	145	144	140	148	138	150	145	142	139	138	145	143
7	144	146	136	143	136	142	144	142	140	140	143	143
8	145	145	136	142	138	137	143	142	138	138	146	142
9	148	146	137	142	137	136	142	144	137	140	143	142
10	148	145	136	139	138	138	140	144	138	140	144	143
11	148	147	137	141	138	137	138	142	138	140	143	142
12	150	150	138	141	139	141	138	138	138	139	146	143
13	149	146	138	138	138	142	142	142	138	138	145	143
14	149	145	139	139	138	141	138	141	139	138	144	141
15	149	146	136	141	149	144	139	146	139	139	144	142
16	150	150	135	143	145	145	141	150	138	139	142	142
17	149	149	135	143	152	146	140	149	137	138	142	145
18	149	149	136	143	151	146	142	146	140	138	142	142
19	146	151	137	144	153	148	148	147	138	139	142	144
20	147	153	136	141	158	148	151	144	137	142	142	144
21	148	153	136	140	155	144	146	143	138	140	141	140
22	143	152	136	139	147	141	142	143	143	141	142	138
23	146	152	136	138	145	142	142	143	142	140	143	141
24	149	152	138	138	141	139	143	148	141	138	143	140
25	144	150	136	135	142	142	143	148	139	137	140	140
26	146	149	137	136	138	143	140	148	139	138	141	140
27	143	147	138	136	136	142	139	152	139	138	141	138
28	141	148	142	139	143	144	138	149	138	140	144	141
29	141		139	138	140	143	136	142	136	140	144	141
30	142		144	140	133	144	141	140	134	138	142	142
31	146		144		130		143	142		138		142
Sum	4,541	4,140	4,288	4,243	4,387	4,266	4,411	4,461	4,156	4,303	4,297	4,399

Current Year 1978								Period Feb. 1961-1978		
	Extreme Gage Feet		Ø Extreme Second-Feet					Acre-Feet		
Month	High	Low	High Day	High	Low Day	Low	Average Second-Feet	Total Acre-Feet	Average	Maximum	Minimum
Jan.			!12	150	!28	141	146	9,007	6,487	9,370	2,274
Feb.			!20	153	! 4	144	148	8,212	5,734	8,212	2,119
Mar.			1	147	!16	135	138	8,505	6,200	9,029	2,365
Apr.			! 3	150	25	135	141	8,416	5,944	8,602	2,291
May			20	158	31	130	142	8,701	6,276	9,300	2,842
June			6	150	! 1	136	142	8,461	6,076	9,089	2,481
July			20	151	29	136	142	8,749	6,290	9,342	2,214
Aug.			27	152	12	138	144	8,848	6,283	9,039	2,114
Sept.			22	143	30	134	139	8,243	6,181	8,884	2,555
Oct.			20	142	1	134	139	8,535	6,618	9,249	2,508
Nov.			5	152	! 1	140	143	8,523	6,423	8,965	2,384
Dec.			1	146	!22	138	142	8,725	6,710	9,431	2,390
				158		130	142	102,925	75,222	107,892	36,580
Yearly	Meters		Cubic Meters per Second					Thousands of Cubic Meters			
				4.47		3.68	4.02	126,958	92,768	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 52 discharge measurements during the year and a continuous record of gage heights. Computations by shifting control methods. Records available: September 1931 through 1978.

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-feet (1,700 m^3/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-feet (1,270 m^3/sec) on June 14, 1935 with a gage height of 23.20 feet (7.07 m). Min. 0.4 second-foot (0.01 m^3/sec) on July 20, 1953.

Average Flow in Second-Feet (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-Feet 1978 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	138	131	131	114	103	121 *	110	131 *	126	134	121	131
2	136	131	131	125	137 *	125	111	125	125	127	118	130
3	135	131	134	120	119	322	108	124	123	122 *	115	130
4	141 *	130	136	119 *	114	144	109	122	123	122	125	130
5	138	130	136	120	114	141	111 *	121	140	120	348	130 *
6	136	132	133	120	115	156 *	110	121	127 *	128	141	131
7	137	134 *	131 *	119	115	148	109	120	129	128	139 *	130
8	137	132	128	124	114	138	108	120 *	129	127	133	129
9	139	130	124	124	112 *	135	103	115	130	127	131	126
10	136 *	124	125	142	112	134	97.4	113	128	124 *	132	126
11	117	127	124	124 *	119	131	* 97.4	116	129	120	133	124
12	124	128	121	123	117	130	97.8	115	127 *	121	136	119 *
13	136	122	121	121	116	126 *	98.8	117	127	118	135	115
14	138	122 *	117 *	119	114	125	99.4	115	126	120	137 *	114
15	141	124	115	117	107	120	99.7	110 *	124	122	137	117
16	141	124	111	114	102 *	116	97.7	108	123	122	137	116
17	140 *	125	111	113	100	115	95.2	109	121	122 *	133	119
18	141	125	114	114 *	99.8	117	* 93.2	105	121	123	136	122
19	131	126	117	115	102	113	98.8	101	121 *	122	136	123 *
20	126	128	117 *	116	107	113 *	103	99.8	123	122	136	126
21	128	126 *	117	117	304	114	102	98.0	129	125	136 *	125
22	125	124	117	116	122	111	105	102 *	136	124	137	128
23	132 *	123	115	116	119 *	111	106	104	135	126	136	130
24	132	124	115	115	123	112	107	106	135	118 *	136	132
25	132	129	116	114 *	123	118	105 *	105	135	126	135	134
26	129	131	116	114	123	115	104	107	135 *	126	137	135
27	132	133	114	115	123	113 *	108	114	139	124	134	134 *
28	134	133 *	115 *	113	129	114	112	110	136	126	137 *	135
29	135		115	112	128	115	121	174 *	131	126	134	134
30	133		113	109	126	112	196	129	135	124	134	135
31	135 *		113		126		151	134		124 *		137
Sum	3,579		3,544		3,905		3,590.8		3,840			3,947
	4,155		3,743		3,784.8		3,374.4		3,868		4,215	

Month	Current Year 1978								Period 1932-1978		
	Extreme Gage Feet		Extreme Second-Feet				Average Second-Feet	Total Acre-Feet	Acre-Feet		
			High		Low						
	High	Low	Day		Day				Average	Maximum	Minimum
Jan.	1.75	0.90	4	173	30	75.1	134	8,241	4,803	8,906	934
Feb.	1.49	1.31	29	139	13	113	128	7,099	3,899	8,630	487
Mar.	1.48	1.19	! 4	142	16	102	121	7,424	3,684	7,978	689
Apr.	1.97	1.16	10	204	30	99.5	118	7,029	4,152	10,407	566
May	6.33	1.14	21	1,160	1	95.2	122	7,507	4,922	17,600	739
June	5.49	.89	3	911	21	63.0	130	7,745	5,199	47,900	301
July	5.79	1.08	30	989	2	85.8	109	6,693	4,260	22,077	285
Aug.	4.23	1.13	29	586	18	90.7	116	7,122	3,785	7,584	350
Sept.	2.30	1.19	5	237	12	101	129	7,672	5,228	28,678	872
Oct.	1.66	1.00	6	156	14	79.4	124	7,617	5,061	14,229	1,000
Nov.	6.66	1.09	5	1,270	3	86.4	141	8,360	4,307	8,567	526
Dec.	1.83	1.39	1	166	12	109	127	7,829	4,399	8,642	496
	6.66	0.89		1,270		63.0	125	90,338	53,699	98,137	18,201
Yearly	Meters		Cubic Meters per Second					Thousands of Cubic Meters			
	2.03	0.27		36.0		1.78	3.54	111,432	66,238	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. Acuna, Coahuila. The elevation of the zero of the gage has not been determined.

RECORDS: Based on 27 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 1978.

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 1978, 10,148 acres (4,107 ha) of land were irrigated between canal mile 31.8 (51.2 km) and the power plant, and 26,630 acres (10,777 ha) were irrigated from the extension, making a total of 36,778 acres (14,884 ha). A total of 872,945 acre-feet (1,076,778,000 m^3) 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 /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. 1,580 (44.7)	August 1973	Min. 295 (8.35)	February 1977
Yearly:	Max. 1,400 (39.6)	1978	Min. 632 (17.9)	1972

Mean Daily Discharge in Second-Feet 1978 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	1,310	1,310	1,240	1,340	1,470	1,440	1,440	1,410 *	1,480 *	277	1,470	1,550
2	1,290	1,310	1,220 *	1,190	1,270	1,430	1,450	1,430	1,410	* 0	1,530	1,550
3	1,290	1,300 *	1,220	1,150	1,310	1,400	1,440	1,440	1,270	0	1,580	1,550
4	1,290	1,260	1,320	1,120	1,140	1,430	1,440	1,450	1,260	25.4	1,570	1,550 *
5	1,270 *	1,270	1,430	1,120	1,040	1,440	1,450	1,440	1,460	1,290	1,390	1,540
6	1,270	1,260	1,440	1,110	1,040	1,470 *	1,440	1,420	1,360	1,460	1,390	1,540
7	1,270	1,280	1,530	1,230	1,070	1,390	1,430 *	1,410	1,280	1,480	1,520	1,540
8	1,270	1,280	1,540	1,360	1,120	1,440	1,440	1,390	1,470	1,480	1,560 *	1,560
9	1,270	1,290	1,530	1,400	1,110 *	1,470	1,440	1,390	1,470	1,490	1,560	1,580
10	1,280	1,280	1,530	1,410	1,090	1,460	1,440	1,400	1,460	1,520 *	1,560	1,570
11	1,300	1,270	1,550	1,450 *	1,380	1,460	1,440	1,410	1,480	1,550	1,550	1,580
12	1,280	1,310	1,540	1,440	1,430	1,440	1,450	1,420	1,490 *	1,570	1,530	1,390
13	1,280	1,290	1,520	1,460	1,460	1,420	1,450	1,430	1,430	1,560	1,510	1,250
14	1,250	1,260 *	1,500 *	1,480	1,470	1,460	1,450	1,450 *	1,470	1,540	1,510	1,210
15	1,240	1,270	1,510	1,440	1,480	1,450	1,470	1,440	1,530	1,530	1,490	1,210
16	1,250	1,270	1,530	1,460	1,470	1,430	1,510	1,430	1,530	1,530	1,540	1,210
17	1,240 *	1,280	1,540	1,440	1,450	1,430	1,500	1,420	1,520	1,520	1,530	1,200
18	1,290	1,280	1,540	1,440	1,460	1,440	1,490 *	1,440	1,520	1,510	1,530	1,210
19	1,280	1,230	1,540	1,430	1,440	1,430	1,480	1,450	1,520	1,530	1,540	1,220 *
20	1,260	1,230	1,530	1,480	1,460	1,440	1,500	1,460	1,510	1,540	1,530	1,220
21	1,260	1,220	1,540	1,480	1,470	1,420	1,490	1,450	1,490	1,540	1,540 *	1,480
22	1,260	1,220	1,540	1,220	1,480	1,430 *	1,490	1,440	1,510	1,560	1,540	1,520
23	1,260	1,260	1,530	1,460	1,500 *	1,420	1,500	1,440	1,510	1,560	1,550	1,510
24	1,300	1,240	1,530	1,030	1,510	1,430	1,510	1,410	1,520	1,560 *	1,580	1,510
25	1,300	1,240	1,520	1,410	1,500	1,450	1,490	1,430	1,520	1,560	1,560	1,530
26	1,280	1,270	1,550	1,410	1,490	1,450	1,480	1,420	1,510 *	1,550	1,550	1,520
27	1,290	1,270	1,540	1,460 *	1,500	1,450	1,480	1,420	1,510	1,560	1,530	1,500
28	1,300	1,270	1,530 *	1,480	1,490	1,450	1,460	1,430	1,350	1,560	1,560	1,520
29	1,300		1,520	1,490	1,450	1,450	1,430	1,450	1,150	1,550	1,580	1,520
30	1,310		1,510	1,480	1,470	1,440	1,460	1,480	1,110	1,250	1,580	1,500
31	1,310		1,500		1,440		1,430	1,470		520		1,510
Sum	39,650	35,520	46,110	40,870	42,460	43,160	45,370	44,370	43,100	40,172.4	45,960	44,850

Month	Current Year 1978 Extreme Gage Feet High	Extreme Gage Feet Low	Extreme Second-Feet High Day	Extreme Second-Feet High	Extreme Second-Feet Low Day	Extreme Second-Feet Low	Average Second-Feet	Total Acre-Feet	Period 1968-1978 Acre-Feet Average	Maximum	Minimum
Jan.	8.32	7.91	24	1,330	5	1,210	1,280	78,645	58,357	93,220	20,860
Feb.	8.29	7.85	12	1,330	22	1,210	1,270	70,453	54,512	86,817	16,403
Mar.	9.38	7.84	11	1,580	! 1	1,210	1,490	91,457	61,948	91,457	27,679
Apr.	9.00	3.25	!14	1,500	24	231	1,360	81,064	68,549	88,483	40,721
May	9.13	7.30	!23	1,510	5	1,030	1,370	84,218	78,256	91,458	40,463
June	9.12	8.60	! 3	1,490	! 3	1,360	1,440	85,607	75,068	90,547	31,210
July	9.28	8.93	24	1,530	29	1,390	1,460	89,990	76,033	89,990	35,776
Aug.	9.33	8.77	31	1,490	10	1,360	1,430	88,007	75,261	97,111	36,708
Sept.	9.37	7.58	!15	1,530	7	962	1,440	85,488	74,192	89,851	32,963
Oct.	9.29		12	1,580	! 1	0	1,300	79,681	71,611	94,076	22,235
Nov.	9.31	8.18	! 2	1,590	1	1,260	1,530	91,160	61,533	92,509	22,487
Dec.	9.28	7.86	11	1,590	17	1,190	1,450	88,959	55,376	93,402	23,516
Yearly	9.38			1,590		0	1,400	1,014,729	810,696	1,014,729	458,631
	Meters			Cubic Meters per Second				Thousands of Cubic Meters			
	2.86			45.0		0	39.6	1,251,668	999,994	1,251,668	565,721

** Period 1968-1978 * 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 1978 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^3/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^3/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. 1.8 (0.05)		1945

Mean Daily Discharge in Second-Feet 1978 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	13.4	12.8	11.1	4.7	3.0	* 5.9	1.6	5.4	2.7	2.2	1.6	* 5.9
2	12.8	12.8	10.9	4.9	2.0	21.7	1.5	3.8	2.7	2.0	1.3	5.9
3	12.8	* 12.5	* 10.0	4.9	2.3	179	1.4	* 2.8	2.8	1.9	* 1.2	5.9
4	12.8	12.3	8.7	5.1	* 6.1	73.1	1.3	2.5	2.7	1.9	1.6	6.0
5	13.0	12.2	8.5	5.3	3.8	20.9	1.1	2.5	3.5	* 1.8	171	6.0
6	* 13.0	12.4	8.8	5.2	3.4	13.6	1.0	2.4	3.4	1.8	53.0	6.0
7	13.0	12.6	9.8	* 4.8	3.5	10.3	* 1.0	2.3	3.5	1.9	32.5	6.1
8	12.6	12.8	8.5	4.5	4.8	15.4	1.1	2.1	* 3.5	1.9	17.8	5.9
9	12.6	12.9	8.4	4.3	3.8	9.5	1.0	1.9	3.5	2.0	12.4	5.9
10	12.3	12.7	8.1	7.1	3.1	6.9	1.0	2.4	3.4	2.0	10.7	6.0
11	12.4	12.5	7.6	10.2	3.2	6.6	1.0	2.5	3.4	1.9	9.3	6.2
12	12.9	13.5	10.4	6.3	3.2	6.1	1.0	2.4	3.2	1.9	13.4	6.4
13	13.2	13.2	8.1	5.3	3.3	5.6	.9	2.1	3.2	1.9	10.0	6.6
14	13.2	12.8	8.5	4.6	3.2	5.1	.9	2.0	3.0	1.9	7.5	6.8
15	13.0	12.6	8.6	4.4	3.1	4.2	.9	1.9	2.9	1.8	7.0	6.9
16	13.0	12.2	8.4	4.4	3.1	4.0	.9	1.8	2.7	1.7	6.2	6.9
17	12.5	12.3	7.6	4.2	3.1	4.1	.9	1.7	2.7	1.7	6.1	7.0
18	12.5	11.8	5.6	4.1	3.1	3.8	1.0	1.5	2.5	1.6	6.1	7.1
19	12.4	11.8	5.6	3.9	3.0	3.6	1.0	1.4	2.2	1.6	6.1	7.1
20	12.4	11.7	5.5	3.8	3.8	3.4	1.0	1.4	2.2	1.6	6.1	7.2
21	12.7	11.4	5.8	3.1	4.0	2.9	1.0	1.3	2.2	1.6	6.0	7.2
22	13.0	11.3	5.7	2.9	4.0	2.7	1.0	1.3	2.1	1.5	5.9	7.3
23	13.2	11.3	5.5	3.0	4.1	2.4	1.0	1.3	2.1	1.4	5.9	7.4
24	13.4	11.3	5.3	3.0	4.0	2.5	1.0	1.2	2.2	1.4	6.0	7.4
25	13.1	11.2	5.2	2.8	3.9	2.2	1.1	1.2	2.2	1.5	6.0	7.5
26	12.7	11.1	5.3	2.7	3.8	2.1	1.1	1.2	2.0	1.5	5.9	7.6
27	12.8	10.9	5.5	5.7	3.9	2.0	1.0	1.2	2.1	1.5	5.8	7.6
28	12.8	11.4	5.7	3.2	4.0	1.9	1.1	1.2	2.3	1.7	5.8	7.7
29	12.6		5.5	2.2	4.2	1.9	1.3	22.4	2.3	1.8	5.8	7.8
30	12.5		5.8	3.7	4.3	1.9	3.1	6.8	2.3	1.8	5.9	7.8
31	12.7		5.0		4.5		9.9	3.7		1.8		7.9
Sum	397.3	340.3	229.0	134.3	112.6	425.3	44.1	89.6	81.5	54.5	439.9	211.0

Month	Current Year 1978 Extreme Gage Feet High	Extreme Gage Feet Low	Extreme Second-Feet High Day	Extreme Second-Feet High	Extreme Second-Feet Low Day	Extreme Second-Feet Low	Average Second-Feet	Total Acre-Feet	Period 1929-1978 Acre-Feet Average	Maximum	Minimum
Jan.	1.15	1.07	!24	14.0	30	12.1	12.8	788	560	2,270	0
Feb.	1.17	1.05	12	14.1	!26	10.9	12.2	675	607	5,760	0
Mar.	1.22	.82	12	14.8	31	3.9	7.4	454	529	2,500	0
Apr.	1.13	.71	11	12.3	!29	2.0	4.5	266	1,343	27,100	0
May	.97	.70	4	7.5	! 2	1.9	3.6	223	2,105	29,400	0
June	2.99	.68	3	366	30	1.7	14.2	844	3,707	56,700	0
July	1.24	.65	31	14.6	13	.7	1.4	87.5	1,599	30,000	0
Aug.	1.94	.65	29	71.3	!21	1.1	2.9	178	1,755	48,700	0
Sept.	.85	.73	5	4.2	!26	1.8	2.7	162	2,362	48,965	0
Oct.	.76	.70	1	2.3	! 2	1.4	1.8	108	1,052	8,940	0
Nov.	4.82	.68	5	1,390	! 3	1.1	14.7	873	514	2,590	0
Dec.	.95	.90	31	7.9	8	5.8	6.8	419	581	2,470	0
Yearly	4.82	0.65		1,390		0.7	7.0	5,077.5	16,714	76,259.3	1,325.3
	Meters			Cubic Meters per Second				Thousands of Cubic Meters			
	1.47	0.20		39.4		0.02	0.20	6,263	20,617	94,066	1,635

* Discharge measurement made on this day ! And other days

RIO SAN DIEGO NEAR JIMENEZ, COAHUILA

DESCRIPTION: Cableway, masonry and concrete Cipolletti weir of 777 second-foot (22 m^3/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 Acequia 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 1978 the capacity of the weir was exceeded on November 5 through November 26. Records available: 1922 through 1978. 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^3/sec) to 777 second-feet (22 m^3/sec).

EXTREME FLOWS FROM RECORDS**: Momentary: Max. 81,930 second-feet (2,320 m^3/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-Feet (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-Feet 1978 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	94.6	140	52.6	43.8	42.7	46.3	42.4	85.5	160	519	448	667
2	95.0	148	53.7	43.8	37.8	57.2	42.4	112	133	509	448	667
3	95.3	148	53.7	43.8	* 45.2	297	42.7	137	132	519	448	653
4	* 95.3	148	53.3	43.8	46.6	150	42.4	137	133	551	477	650
5	92.9	132	53.0	* 53.7	38.5	98.9	* 42.4	132	251	551	530	636
6	89.7	118	53.7	54.0	34.6	93.6	42.4	141	225	565	1,260	604 *
7	89.7	96.4	53.7	54.0	35.3	99.6	42.4	141	226	565	1,100	604
8	89.7	92.5	* 53.7	53.3	35.7	113	42.4	133	249	551	1,090 *	604
9	88.3	77.3	53.7	53.7	44.1	120	42.7	133	242	551	1,050	604
10	88.3	71.3	53.7	54.0	43.4	106	42.7	133	242	551	1,020	604
11	88.3	65.6	53.7	54.0	43.1	105	42.7	133	238	551	978	622
12	88.3	71.7	53.7	54.0	54.0	98.5	42.4	126	231	551	943	622
13	88.3	66.0	53.7	49.1	43.8	85.5	43.1	119	231	551	908	618
14	88.3	60.0	53.7	48.7	43.1	79.1	42.7	119	222	551	908	604
15	88.3	65.7	53.7	43.8	42.7	79.1	42.7	109	221	551	908	604
16	88.3	72.4	53.7	43.8	42.4	75.9	42.4	105 *	218	551	908	604
17	88.3	72.0	53.7	43.8	34.6	75.6	42.4	97.8	220	540	908	604
18	88.3	66.0	53.7	43.8	33.5	75.6	42.4	91.1	221	530 *	844	604
19	88.3	66.4	53.7	43.8	41.0	69.2	42.4	85.1	221	501	844	604
20	88.3	72.7	53.7	43.4	41.7	63.2	42.4	85.1	240	491	812	611
21	88.3	67.1	53.7	43.4	53.3	* 63.6	42.4	85.1	250	491	812	533
22	88.3	67.3	53.3	43.4	51.9	57.2	42.4	79.1	269 *	491	812	533
23	88.3	61.4	43.1	49.4	47.3	50.9	42.4	79.1	302	491	812	562
24	88.3	62.9	43.1	48.7	47.3	50.9	42.4	78.4	357	477	780	562
25	98.5	56.5	43.1	48.4	47.0	50.9	42.4	78.0	392	477	780	562
26	116	56.2	43.1	43.1	47.0	50.9	42.4	78.4	477	463	780	547
27	124	56.5	43.4	43.1	56.9	50.1	42.0	78.4	516	448	745	547
28	131	56.5	43.4	43.1	56.9	44.8	52.6	78.8	509	463	745	547
29	131		43.8	43.1	67.8	39.9	53.0	188	498	463	745	547
30	131		43.8	43.1	67.8	40.6	65.3	133	523	448	745	547
31	131		43.8		46.3		90.4	145		438		547
Sum	2,334.2		1,414.9		2,488.1		3,455.9		15,950		18,424	
	3,017.5	1,569.4		1,413.3		1,408.2		8,349		24,588		

Month	Current Year 1978 Extreme Gage Feet High	Extreme Gage Feet Low	Extreme Second-Feet High Day	High	Extreme Second-Feet Low Day	Low	Average Second-Feet	Total Acre-Feet	Period 1933-1978 Acre-Feet Average	Maximum	Minimum
Jan.	0.43	0.33	28	131	! 9	88.3	97.1	5,982	7,707	36,430	1,860
Feb.	.46	.23	! 2	148	26	56.2	83.3	4,629	6,149	25,760	1,060
Mar.	.23	.20	! 2	53.7	23	43.1	50.5	3,112	5,284	27,040	1,340
Apr.	.23	.16	! 6	54.0	26	43.1	47.3	2,807	6,366	40,270	1,110
May	.30	.16	29	67.8	18	33.5	45.6	2,803	11,388	120,200	861
June	.89	.16	3	413	29	39.9	83.0	4,935	10,391	108,300	543
July	.39	.16	30	117	27	42.0	45.2	2,793	13,683	136,149	490
Aug.	.75	.26	29	188	25	78.0	112	6,859	11,007	91,248	738
Sept.	1.02	.43	27	533	3	132	278	16,560	17,153	94,667	1,183
Oct.	1.08	.92	! 5	565	31	438	516	31,632	18,394	71,830	1,698
Nov.	6.69	.92	5	11,800	1	438	819	48,765	12,902	64,060	803
Dec.	1.18	1.02	! 1	667	21	533	593	36,543	8,992	45,320	1,130
	6.69	0.16		11,800		33.5	231	167,420	129,416	451,952	17,430
Yearly	Meters		Cubic Meters per Second					Thousands of Cubic Meters			
	2.04	0.05		333		0.95	6.55	206,511	159,634	557,477	21,508

** Period October 1932-1978 * 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^3/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. Acuna, 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 1978. 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. A bubbler gage replaced the gravity well on May 1, 1966. The weir was placed in operation June 1, 1967 at which time a bubbler gage and gravity well were installed 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^3/sec) on July 18, 1975 with a gage height of 25.20 feet (7.68 m). Min. 3.5 second-feet (0.10 m^3/sec) on March 9, 1969 with a gage height of 0.16 foot (0.05 m).

Average Flow in Second-Feet (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-Feet 1978 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	143	194	89.0	392	431	4,380	3,520	3,080	1,420	1,410	4,700	2,570
2	143	194	80.9	58.6	212	4,380	3,520	1,740	840	1,750	2,320	2,570
3	143	194	80.9	58.6	66.4	6,070	3,520	1,430	600	1,750	2,350	2,570
4	143	194	80.9	58.6	58.6	4,980	3,440	1,410	551	1,750	2,220	2,570
5	143	194	251	58.6	45.2	4,630	3,440	1,350	2,730	4,060	18,700	2,570
6	143	174	381	58.6	39.2	4,730	3,440	1,350	1,310	5,090	4,800	2,570 *
7	143	143	289	58.6	39.2	4,630	3,440	1,350	1,420	5,230	3,190	2,570
8	143	171	252	78.0	39.2	4,630	3,150	1,350	1,580	5,230	2,470	2,570
9	143	124	226	112	39.2	4,630	3,150	1,250 *	1,590	5,260	2,920	2,570
10	143	106	872	246	33.2	4,630	3,150	1,350	1,580	5,300	2,880 *	2,673
11	153	106	1,810	512	996	4,630	3,110	1,350	1,560	5,300	2,810	2,480
12	153	115	1,910	862	3,520	4,520	3,110	1,350	1,550	5,300	2,810	971
13	143	115	1,980	844	3,480	3,960	3,110	1,350	1,590 *	5,300	2,810	600
14	143	97.5	1,950	795	3,140	3,810 *	3,110	1,350	1,490	4,840	2,810	583
15	143	97.5	1,860 *	399	3,570	3,810	3,040	1,300	1,430	4,770	1,700	583
16	143	95.3	1,600	141	3,570	3,740	3,040	1,300	1,430	4,770	1,640	583
17	143	89.0	1,760	94.3	4,560 *	3,740	3,040	1,240	1,430	4,770	1,640	569
18	133 *	89.0	1,800	88.6	4,630	3,740	3,040	1,240	1,430	4,770	1,610	569
19	124	82.3	1,800	73.1	4,410	3,740	3,040 *	1,240	1,430	4,800 *	1,580	569
20	124	89.0	1,800	127	4,480	3,740	3,040	1,240	1,450	4,730	1,610	558
21	133	89.0	2,250	392 *	5,190	3,740	3,040	1,260	1,480	4,450	1,580	858
22	143	* 89.0	2,340	646	4,870	3,670	3,040	1,240	1,580	4,450	1,870	1,090
23	143	97.5	2,340	424	4,520	3,670	2,970	1,240	1,580	4,410	1,980	1,110
24	148	97.5	2,340	897	4,450	3,670	2,970	1,240	1,560	4,410	1,980	1,120
25	184	97.5	2,340	424	4,450	3,670	2,970	1,240	1,670	4,410	1,980	1,110
26	184	97.5	2,340	431	4,450	3,670	2,970	1,240	1,750	4,410	1,980	1,100
27	184	97.5	2,310	417	4,450	3,640	2,970	1,240	1,830	4,410	2,010	1,100
28	184	97.5	2,310	427	4,450	3,600	2,970	1,240	826	4,380	1,980	1,100
29	184		3,200	431	4,520	3,640	3,000	1,560	544	4,380	2,400	1,270
30	194		3,280	417	4,410	3,570	3,110	1,430	544	4,380	2,560	1,130
31	194		3,130		4,380		3,240	1,430		5,440		1,260
Sum	4,707	3,426.6	49,052.7	10,021.6	87,499.2	123,660	97,700	43,080	41,375	139,710	85,480	48,993

Month	Current Year 1978 Extreme Gage Feet High	Extreme Gage Feet Low	Extreme Second-Feet High Day	High	Low Day	Low	Average Second-Feet	Total Acre-Feet	Period 1968-1978 Acre-Feet Average	Maximum	Minimum
Jan.	0.52	0.39	!30	194	!19	124	152	9,346	32,317	144,286	5,236
Feb.	.52	.30	! 1	194	19	82.3	123	6,796	86,833	401,339	5,788
Mar.	2.62	.30	31	3,400	! 2	80.9	1,580	97,211	58,913	181,473	5,874
Apr.	2.13	.26	24	2,190	! 2	58.6	334	19,873	51,796	293,537	5,630
May	3.87	.20	21	6,500	!10	33.2	2,820	173,551	128,563	422,934	6,574
June	4.82	2.69	3	9,110	30	3,570	4,130	245,299	68,101	245,299	1,931
July	2.69	2.46	! 1	3,520	!23	2,970	3,150	193,760	87,705	311,781	2,322
Aug.	2.56	1.64	1	3,240	!17	1,240	1,390	85,420	131,632	710,869	11,355
Sept.	2.92	.56	5	3,740	4	215	1,380	82,100	215,684	1,264,108	13,678
Oct.	3.74	.98	31	5,440	1	544	4,380	269,157	168,085	831,298	13,349
Nov.	14.07	1.84	5	37,800	21	1,580	2,950	175,512	87,895	499,143	13,343
Dec.	2.30	.98	! 1	2,570	20	544	1,480	91,241	39,850	181,109	7,485
Yearly	14.07	0.20		37,800		33.2	2,000	1,449,266	1,157,375	3,169,805	807,998
	Meters 4.29	0.06		Cubic Meters per Second 1,070		0.94	56.7	1,787,650	Thousands of Cubic Meters 1,427,607	3,909,913	256,561

* Discharge measurement made on this day ! 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. The 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 23 discharge measurements during the year and a continuous record of gage heights. Computations by shifting control methods. Records available: 1962 through 1978.

REMARKS: Prior to 1976 this station was published under the heading "Rio San Rodrigo near Mouth at El Moral, Coahuila." The rating curve for this station is affected by backwater from the Rio Grande when its flow is approximately 10,000 second-feet (283 m^3/sec). 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^3/sec) on July 18, 1975 with a gage height of 18.44 feet (5.62 m). Min. frequently no flow.

Average Flow in Second-Feet (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 1978 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	10.6	8.1	8.5	5.7	3.5	2.1	11.7	* 25.4	77.7	812	169	441
2	10.6	8.1	8.1	5.7	3.5	2.1	11.7	22.6	70.6	653	169	424
3	10.6	8.1	8.1	5.7	3.5	2.1	11.7	22.6	66.7	579	169	424
4	10.6	8.1	8.1	5.7	3.5	2.1	10.6	19.8	66.7	494 *	212	406
5	10.6	8.1	8.1	5.7	3.2	8.1	10.6	19.8	385	424	9,780	388
6	10.6	8.1	8.1	5.7	3.2	39.6	10.6	19.8	445 *	385	7,100	385
7	10.6	8.1	8.1	5.7	3.2 *	79.1	9.9	31.4	217	378	3,350	385
8	10.6	8.1	8.1	5.7	2.8	71.3	9.9	25.1	167	374	2,310 *	374
9	9.9	8.5	8.1	5.7	2.5	53.0	9.9	22.6	143	367	1,940	367
10	9.9	8.5	7.4 *	5.7 *	1.8	43.1	9.2	22.6	134	350	1,620	350
11	9.9	8.1	8.1	5.7	2.5	33.2	9.2	22.6	125	313	1,410	350
12	9.9	8.5	8.1	5.3	1.8	28.3	* 9.2	24.0	119	276	982	350
13	9.2	8.5	8.1	5.3	1.8	28.3	9.2	24.0	126	252	1,180	350
14	9.2	8.5	8.1	5.3	1.8	28.3	8.1	22.6	124	237	1,060	350
15	9.2	* 8.5	8.1	5.3	1.8	28.3	8.1	22.6	117	207	971 *	331
16	9.2	8.5	7.1	5.3	1.8	28.3	8.1	22.6	113	200	883	331
17	8.1	8.8	7.1	4.9	1.8	25.4	8.1	22.6	109	188	883	313 *
18	8.1	8.8	7.1	4.9	1.8	25.4	8.1	22.6	106	182	791	295
19	8.1	8.5	7.1	4.9	1.8	24.0	8.1	21.2	102	176	770	295
20	8.1	8.5	7.1	4.9	1.8	22.6	7.4	22.6	* 98.9	176	904	295
21	8.1	8.5	7.1	4.9	3.5	22.6	8.1	22.6	102	165	699	283
22	8.1	8.5	7.1	4.9	2.8	22.6	7.4	22.6	168	165	671 *	276
23	8.1	8.5	7.1	4.9	2.5	21.2	7.4	22.6	153	165	643	276
24	8.1	8.5	7.1	4.6	2.5	19.8	7.1	21.2	232	159	600	267
25	* 8.1	8.5	7.1	4.6	2.5	17.0	7.1	22.6	802	159 *	565	258
26	8.1	8.5	6.7	4.6	2.5	17.0	6.7	24.0	3,390	159	554	258
27	8.1	8.5	6.7	4.2	2.1	14.1	* 7.1	24.0	2,290 *	153	523	247
28	8.1	8.5	6.4	3.9	2.1	* 14.1	7.1	25.4	1,620 *	159	505	247
29	8.1	*	6.0	3.9	2.1	13.1	7.1	26.8	1,260	165	473 *	247
30	8.1		6.0	3.5	2.1	13.1	7.4	* 33.9	1,050	159	459	247
31	8.1		6.0		2.1		19.1	49.1		153		258
Sum	282.7	235.0	230.0	152.8	76.2	749.3	281.0	753.9	13,979.6	8,784	42,345	10,068

Month	Current Year 1978 Extreme Gage Feet High	Extreme Gage Feet Low	Extreme Second-Feet High Day	Extreme Second-Feet High	Extreme Second-Feet Low Day	Extreme Second-Feet Low	Average Second-Feet	Total Acre-Feet	Period 1962-1978 Acre-Feet Average	Maximum	Minimum
Jan.	1.87	1.80	! 1	10.6	!17	8.1	9.2	561	3,253	11,799	0
Feb.	1.80	1.80	!17	8.8	! 1	8.1	8.5	466	2,224	8,825	0
Mar.	1.80	1.74	1	8.5	!29	6.0	7.4	456	1,831	7,818	0
Apr.	1.71	1.64	! 1	5.7	30	3.5	4.9	302	3,228	21,692	122
May	1.67	1.54	21	4.6	!10	1.8	2.5	151	3,196	14,027	17.0
June	2.53	1.57	7	125	! 1	2.1	25.1	1,486	1,617	4,705	0
July	2.10	1.77	31	26.8	26	6.7	9.2	557	42,643	454,643	0
Aug.	2.36	2.03	31	69.9	! 4	19.8	24.4	1,496	12,330	89,017	0
Sept.	4.89	2.26	26	3,710	! 3	66.7	466	27,736	16,142	48,065	0
Oct.	3.77	2.66	1	812	!27	153	283	17,421	13,712	53,088	0
Nov.	9.68	2.66	5	14,100	! 1	169	1,410	84,015	10,632	84,015	0
Dec.	3.28	2.92	1	441	!27	247	325	19,970	5,592	19,970	0
Yearly	9.68	1.54		14,100		1.8	214	154,617	116,300	606,526	3,850.7
	Meters		Cubic Meters per Second					Thousands of Cubic Meters			
	2.95	0.47		400		0.05	6.05	190,719	143,453	748,140	4,750

** Period 1961-1978 * 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 47 discharge measurements made during the year. Records available: 1949 through 1978.

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, 1966.

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

Daily:	Max. 1,480 (41.9)	Oct. 12, 1978	Min. 0	Occasionally
Monthly:	Max. 1,340 (37.9)	Nov. 1974	Min. 42.4 (1.20)	December 1971
Yearly:	Max. 1,040 (29.5)	1978	Min. 232 (6.57)	1972

Mean Daily Discharge in Second-Feet 1978 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	1,010	971	848	853	875 *	980	837	1,020	1,240	698	1,170	1,340
2	999	969	770	738	738	976	875	1,050	1,210	56.0	1,310	1,340
3	* 988	964	751	* 640	633	1,100	* 852	1,050	1,130	0	1,360	1,340
4	982	991	819	587	666	1,180	831	1,060	1,070	0	1,320	1,330
5	950	1,020	992	593	578	1,190 *	759	1,080	1,240	595	1,300	1,330 *
6	938	* 983	* 959	591	552	1,210	731	1,100	1,330	1,340	1,210	1,320
7	922	988	1,110	649	592	1,270	713	1,050 *	1,210	1,290	1,320 *	1,330
8	952	985	1,140	813	604 *	1,340	748	1,030	1,360 *	1,370	1,390	1,320
9	* 963	993	1,100	933	516	1,330	801	1,030	1,380	1,410	1,410	1,300
10	956	1,000	1,080	* 954	463	1,250	723	1,000	1,380	1,430	1,400	1,310
11	987	998	1,120	944	397	1,280	688	1,020	1,330 *	1,460	1,360	1,300 *
12	986	1,040	1,120	920	1,120	1,260 *	708	1,080	1,310	1,480 *	1,350	1,200
13	969	*1,000	*1,090	897	1,060	1,220	699	1,130	1,320	1,430	1,340 *	1,060
14	958	946	1,020	933	1,050	1,210	688	1,070	1,380	1,390	1,330	991
15	954	918	1,020	898	1,030 *	1,130	702	1,000 *	1,420	1,390	1,320	993
16	* 954	918	1,010	958	970	1,080	770	970	1,430	1,400 *	1,340	988
17	940	945	1,020	* 892	886	937	* 741	941	1,420	1,380	1,340	1,020
18	959	986	1,020	858	881	909	694	931	1,420 *	1,390	1,330	990 *
19	997	977	1,040	836	876	847	677	970	1,420	1,350	1,340	979
20	972	944	*1,010	878	993	856 *	681	997	1,370	1,300	1,350 *	965
21	964	922	980	896	1,240	814	696	960 *	1,320	1,300	1,350	1,100
22	976	739	931	773	1,390 *	808	707	923	1,370	1,320	1,340	1,230
23	* 956	* 867	961	957	1,390	801	765	886	1,420	1,290 *	1,340	1,290
24	969	834	965	578	1,390	792	* 766	902	1,420	1,330	1,370	1,540
25	980	820	963	* 838	1,360	875	729	931	1,430 *	1,330	1,350	1,340
26	936	883	1,010	862	1,360	853	738	902	1,420	1,320	1,350	1,330
27	927	* 876	* 967	875	1,370	800	713	924	1,430	1,330	1,340 *	1,310
28	940	865	919	892	1,190	811	740	918 *	1,370	1,330	1,350	1,290
29	960		907	932	1,030	813	771	1,050	1,160	1,350	1,370	1,292
30	* 976		931	954	1,030	813	880	1,130	1,100	1,300 *	1,150	1,220
31	977		927		988		* 949	1,180		510		1,250
Sum	29,897	26,342	30,500	24,922	29,617	30,735	23,372	31,285	39,810	35,869.0	39,900	37,735

Month	Extreme Gage Feet		Ø Extreme Second-Feet				Average Second-Feet	Total Acre-Feet	Period 1968-1978 Acre-Feet		
			High		Low				Average	Maximum	Minimum
	High	Low	Day		Day						
Jan.			1	1,010	7	922	964	59,300	39,029	79,220	4,992
Feb.			12	1,040	22	739	941	52,249	36,376	60,238	4,871
Mar.			8	1,140	3	751	984	60,496	35,012	60,496	5,713
Apr.			16	958	24	578	831	49,432	39,033	63,907	4,301
May			122	1,390	10	463	955	58,744	52,535	75,094	13,888
June			8	1,340	24	792	1,020	60,952	42,824	60,462	6,618
July			31	949	19	677	754	46,358	44,529	76,637	5,537
Aug.			31	1,180	23	886	1,010	62,053	46,604	65,683	18,457
Sept.			116	1,430	4	1,070	1,330	78,962	55,307	78,962	13,741
Oct.			12	1,480	13	0	1,160	71,145	54,917	79,574	11,147
Nov.			9	1,410	30	1,150	1,330	79,140	43,935	79,478	3,203
Dec.			11	1,340	20	965	1,220	74,848	37,497	75,490	2,608
Yearly	Meters			1,480		0	1,040	753,689	527,605	753,689	168,354
			Cubic Meters per Second					Thousands of Cubic Meters			
				41.9		0	29.5	929,675	650,801	929,675	207,665

** Period 1968-1978 * 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", longitude 100°32'40", 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 47 discharge measurements during the year and a continuous record of gage heights. Computations by shifting control methods. Records available: 1939 through 1978.

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 1978, 26,630 acres (10,777 ha) of land north and south of Eagle Pass were irrigated. A total of 84,709 acre-feet (104,489,000 m^3) 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^3) on July 25, 1964. Min. occasionally no flow.

Average Flow in Second-Feet (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. 68.8 (1.95)	December 1969
Yearly:	Max. 294 (8.33)	1972	Min. 228 (6.46)	1973

Mean Daily Discharge in Second-Feet 1978 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	186	190	234	400	349 *	292	377	249	201	39.6	35.8	129
2	190	187	270	393	351	293	379	247	186	40.3	107	128
3	193 *	184	297	384 *	350	237	377 *	246	200	41.0	108	128
4	193	164	300	382	343	199	409	246	68.1	41.7	111	128
5	193	148	305	380	334	199 *	441	245	54.1	42.4	115	129 *
6	194	146 *	286 *	382	345	197	452	244	49.6	43.2	111	128
7	192	146	262	388	358	138	451	244 *	46.1	43.9	112 *	127
8	194	147	262	395	350 *	23.0	450	234	* 44.0	44.7	82.7	126
9	195 *	148	282	376	357	76.9	450	218	44.5	45.4	52.0	126
10	196	149	294	334 *	400	156	445	213	45.1	46.3	65.9	127
11	195	150	293	337	362	157	442	214	* 93.1	46.8	130	127 *
12	196	150	296	376	198	159 *	441	216	152	* 77.9	127	126
13	196	150 *	292 *	373	266	161	441	217	102	142	124 *	124
14	197	160	291	371	303	189	439	244	45.4	145	125	123
15	198	185	289	367	323 *	240	437	280 *	44.1	141	123	123
16	197 *	184	293	369	371	274	437	280	43.5	103 *	123	123
17	198	184	320	363 *	409	344	437 *	291	42.6	81.5	124	123
18	198	173	348	360	372	373	452	328	* 42.1	81.8	123	123 *
19	196	174	350	360	348	374	460	328	41.9	125	125	120
20	197	178	348 *	361	297	377 *	456	327	74.9	163	124 *	114
21	195	182	353	358	168	377	458	326 *	77.4	163	124	109
22	194	187	378	353	* 24.2	377	472	326	41.3	164	126	107
23	194 *	215 *	376	357	23.3	376	493	325	40.9	164 *	127	91.3
24	194	243	373	332	23.0	377	488 *	325	39.4	163	127	60.9
25	193	239	387	349 *	22.7	381	490	325	* 38.1	163	128	63.4
26	208	237	400	351	21.5	377	491	346	38.1	162	128	60.4
27	222	233 *	396 *	363	21.7	379	496	361	104	162	127 *	57.6
28	224	232	395	354	221	379	482	359 *	38.4	161	129	55.7
29	226		417	352	294	378	450	303	38.7	161	129	54.1
30	226 *		414	359	294	378	428	268	39.0	163 *	129	104
31	204		408		293		328 *	244		81.5		160
Sum	6,174	5,065	10,209	10,979	8,192.4	8,237.9	13,749	8,619	2,115.4	3,243.0	3,422.4	3,425.4

Month	Average Rainfall Inches*** 1939-1978	Average Rainfall Inches*** 1978	Extreme Second-Feet High Day	High	Low Day	Low	Average Second-Feet	Total Acre-Feet	Period 1968-1978 Acre-Feet Average	Maximum	Minimum
Jan.	0.76	0.06	!29	226	1	184	199	12,246	12,903	18,236	6,395
Feb.	.90	.20	!23	246	6	145	181	10,046	11,397	18,006	7,532
Mar.	.66	.02	29	420	1	233	329	20,249	17,860	23,397	11,493
Apr.	1.70	.30	1	404	24	272	366	21,777	19,852	25,900	11,713
May	3.04	3.96	11	467	21	17.1	264	16,249	17,129	28,191	9,027
June	2.04	2.30	25	388	8	18.1	275	16,340	21,211	30,173	15,505
July	1.55	1.70	28	499	31	249	444	27,271	20,407	28,854	8,826
Aug.	2.15	2.35	29	376	!10	212	278	17,096	18,222	24,335	10,986
Sept.	3.07	5.97	2	264	25	37.8	70.5	4,196	11,611	17,691	4,196
Oct.	2.26	1.27	30	229	31	20.2	105	6,432	10,875	16,504	4,702
Nov.	.70	1.71	11	134	1	20.5	114	6,788	11,431	18,794	6,239
Dec.	.65	.73	!30	162	30	50.9	110	6,794	11,777	16,824	4,233
Yearly	19.48	20.57		499		17.1	229	165,484	184,675	213,138	165,075
	Millimeters		Cubic Meters per Second					Thousands of Cubic Meters			
	495	522		14.1		0.48	6.49	204,125	227,797	262,906	203,620

** Period 1968-1978 * 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 1978. 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-Feet (Cubic Meters per Second)**

Daily:	Max.	929 (26.3)	Sept. 29, 1975	Min.	18.3 (0.52)	March 9, 1969
Monthly:	Max.	154 (4.36)	June 1968	Min.	32.8 (0.93)	January 1973
Yearly:	Max.	126 (3.57)	1968	Min.	51.4 (1.46)	1973

Mean Daily Discharge in Second-Feet 1978 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	50.6	51.0	52.5	97.2	81.4	68.9	61.0	82.3	41.1	27.2	45.5	35.9
2	52.4	49.5	55.1	77.8	78.6	91.4	67.4	58.0	38.0	25.2	46.8	35.8
3	56.8	45.9	60.3	80.2	78.2	90.8	63.2	57.9	37.1	23.1	43.0	33.4
4	60.9	39.0	62.6	83.4	85.2	42.2	80.1	65.6	36.4	23.6	54.4	31.8
5	62.1	20.0	49.7	87.0	96.5	35.4	59.8	67.5	52.0	23.9	49.4	32.1
6	59.8	37.1	35.8	92.0	104	39.5	76.4	56.9	60.5	24.8	54.5	31.4
7	61.3	38.4	25.9	106	76.6	54.9	84.2	63.0	48.3	26.1	50.1	30.4
8	67.9	30.4	28.4	96.9	70.5	45.6	91.8	70.3	48.2	27.5	42.5	33.0
9	53.3	23.1	40.3	77.6	74.0	35.2	85.3	78.1	50.0	27.8	42.0	38.6
10	55.8	23.7	53.2	68.0	81.7	32.4	87.7	87.5	50.4	28.7	44.4	41.6
11	48.3	33.7	52.0	63.6	101	28.8	84.3	95.6	49.5	30.0	40.2	49.5
12	56.6	31.9	40.4	63.1	75.7	30.5	74.6	79.2	46.4	30.4	44.0	51.4
13	66.0	48.9	39.0	85.4	69.0	44.0	68.2	57.4	42.6	30.3	40.5	47.6
14	59.1	37.4	52.6	85.4	51.2	40.0	73.0	57.8	41.7	28.6	39.3	49.3
15	58.2	59.2	52.8	81.6	52.6	49.8	85.2	63.9	39.7	28.2	37.8	41.5
16	57.6	56.1	65.0	79.4	59.8	57.2	98.5	66.7	41.0	33.9	34.9	43.6
17	37.8	60.3	83.8	96.5	65.0	59.0	84.8	73.4	40.5	37.8	35.6	36.3
18	45.9	34.4	84.1	90.0	75.4	67.5	85.1	61.7	37.9	40.1	40.5	39.4
19	33.6	25.4	88.4	80.1	76.7	80.5	98.4	56.8	33.6	42.1	37.7	41.5
20	29.6	27.7	77.1	75.7	89.4	65.1	112	54.2	33.2	52.8	35.7	47.9
21	31.2	45.3	81.7	84.0	84.8	59.3	90.5	54.2	34.2	53.5	35.4	60.7
22	27.1	54.7	82.6	81.2	48.4	68.9	85.6	64.9	32.3	48.8	37.2	61.6
23	31.0	53.2	90.5	75.9	56.5	59.1	93.1	77.8	37.3	48.6	36.7	51.6
24	46.4	40.7	74.9	196	49.8	70.8	65.0	80.5	50.2	50.4	36.7	38.7
25	34.4	47.3	75.4	74.0	56.5	56.2	70.9	63.4	36.2	54.2	37.0	35.3
26	41.2	26.6	56.9	71.7	58.1	43.9	65.3	73.1	34.6	46.8	36.8	36.6
27	45.2	38.2	67.6	77.8	52.8	58.8	74.7	81.5	35.1	47.1	34.8	38.4
28	49.5	52.4	77.8	73.0	54.0	51.7	82.7	63.2	34.6	49.3	34.5	41.9
29	38.1		78.4	83.2	70.0	59.4	96.9	57.5	31.2	48.4	35.4	43.7
30	28.9		87.2	83.3	60.6	55.9	95.4	45.2	29.8	50.4	34.9	47.7
31	42.5		79.0		52.5		93.7	41.0		43.6		54.4
Sum	1,131.5		2,567.0		1,642.7			2,056.1		1,153.2		1,302.5
	1,489.1		1,951.0		2,186.5		2,534.8		1,223.6		1,218.2	

Month	Current Year 1978							Period 1968-1978		
	Extreme Gage Feet		Ø Extreme Second-Feet			Average Second-Feet	Total Acre-Feet	Acre-Feet		
	High	Low	High Day	High	Low Day	Low		Average	Maximum	Minimum
Jan.			8	67.9	22	27.1	48.0	2,954	4,080	7,640	2,014
Feb.			17	60.3	5	20.0	40.4	2,244	3,685	6,126	2,206
Mar.			23	90.5	7	25.9	62.9	3,870	4,777	6,437	3,061
Apr.			24	196	12	63.1	85.6	5,092	4,930	7,795	3,515
May			6	104	22	48.4	70.5	4,337	4,504	8,178	2,755
June			2	91.4	11	28.8	54.8	3,258	5,033	9,190	2,912
July			20	112	5	59.8	81.8	5,028	5,233	8,157	2,811
Aug.			11	95.6	31	41.0	66.3	4,078	5,127	9,261	2,931
Sept.			6	60.5	30	29.8	40.8	2,427	4,247	7,680	2,427
Oct.			25	54.2	3	23.1	37.2	2,287	3,997	6,564	2,287
Nov.			6	54.5	28	34.5	40.6	2,416	3,752	8,696	2,416
Dec.			22	61.6	7	30.4	42.0	2,583	3,471	5,774	2,438
Yearly				196		20.0	56.0	40,574	52,836	91,498	37,237
	Meters			Cubic Meters per Second				Thousands of Cubic Meters			
				5.55		0.57	1.59	50,048	65,173	112,863	45,932

** Period 1968-1978 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 63 discharge measurements during the year, 46 by the Mexican Section and 17 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 1978. 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^3/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^3/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^3/sec). Min 24.4 second-feet (0.69 m^3/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 1978 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	1,140	1,290	1,000	2,900	1,410	5,650	5,540	4,410	3,070	2,620	6,180	4,270
2	1,140	1,290	922	1,150	1,240 *	5,690	5,580	3,570	2,650	2,910	5,190	4,270
3	1,140 *	1,260	866	886	932	8,620	5,580	2,970	2,110	2,410 *	3,810	4,240
4	1,140	1,260	872	805	851	7,240	5,540 *	2,860 *	2,100	2,330	3,640	4,200
5	1,110	1,280	1,010	791	664	6,360	5,440	2,750	4,100 *	4,240	18,900	4,340 *
6	1,090	1,280	1,070	770	625	6,460	5,330 *	2,770	4,660	7,100	18,400 *	4,170
7	1,100	1,260 *	1,440 *	802	656	7,200	5,330	2,770	2,490	7,420	8,970	4,130 *
8	1,120	1,200	1,440	982	688	6,570	5,010	2,710 *	3,130	7,520	7,240 *	4,100
9	1,120	1,180	1,410	1,090	622 *	6,360	4,980	2,690	3,370	7,590	6,360	4,100
10	1,120	1,180	1,350	1,190	600	6,220	4,800 *	2,700	3,190	7,630 *	5,860	4,100
11	1,160	1,170	2,290	1,240 *	1,550 *	6,140	4,730 *	2,810	3,130	7,660	5,580	4,100
12	1,210	1,210	2,960	1,730	3,670	6,070	4,630	2,900	3,090 *	7,630	5,470	3,250 *
13	1,210	1,240	3,090	1,860 *	4,520	5,580 *	4,560	2,900	3,340	7,560	5,230	2,190
14	1,210	1,150 *	3,060 *	1,880	4,130	4,980	4,450	2,780	3,190 *	7,170	5,120 *	2,040
15	1,160	1,080	3,050	1,780	4,560	4,800	4,380	2,660 *	3,160	6,890	4,630	1,990
16	1,160	1,080	3,000	1,370	4,480 *	4,800	4,410	2,600	3,140	6,890	3,880	1,980
17	1,150 *	1,080	2,950 *	1,200	5,370	4,840	4,450	2,600	3,130	6,850 *	3,780	1,980
18	1,140	1,120	3,070	1,070	5,790	4,840	4,170 *	2,600	3,130	6,850	3,710	1,960
19	1,160 *	1,120	3,060	1,050	5,510	4,870 *	4,060	2,420	3,130 *	6,820 *	3,670	1,960 *
20	1,160	1,080	3,060	1,030	5,830	4,840 *	4,060	2,510	3,120	6,750	3,640	1,940
21	1,120	1,060 *	3,050	1,100	6,140	4,730	4,030	2,510	3,110	6,460	3,570	2,060
22	1,140	1,040	3,230	1,330	7,030	4,700	3,990	2,450 *	3,260	6,360	3,710	2,710
23	1,140	1,030	3,270	1,590	6,290 *	4,770	4,030	2,250	3,320	6,320	3,920 *	2,850
24	1,140 *	989	3,280	1,400	6,110	5,160	3,990	2,380 *	3,440	6,280 *	3,880	2,910
25	1,140	953	3,270	1,510	6,110	4,940	3,960 *	2,420	3,380	6,360	3,810	2,910
26	1,190	1,000	3,270	1,380 *	6,110	5,300	3,920	2,410	4,800 *	6,290	3,810	2,910
27	1,140	1,020	3,280 *	1,490	6,070	5,330 *	3,880	2,510	4,870	6,290	3,780	2,850
28	1,160	1,010	3,230	1,370	5,970	5,370	3,920	2,330	4,060	6,360	3,710 *	2,820
29	1,210		3,530	1,420	5,830	5,440	3,960	2,960 *	3,090 *	6,360	3,990	2,820
30	1,210		4,240 *	1,440	5,760 *	5,510	4,170	3,030	2,980	6,320	4,270	2,760
31	1,210 *		3,080		5,720		4,630 *	3,030		6,640 *		2,840
Sum	35,740	31,912	77,700	39,606	120,838	169,380	141,510	85,260	98,740	192,880	167,710	95,750

Month	Current Year 1978								Period 1968-1978		
	Extreme Gage Feet		Extreme Second-Feet				Average Second-Feet	Total Acre-Feet	Acre-Feet		
			High		Low						
	High	Low	Day		Day				Average	Maximum	Minimum
Jan.	2.76	2.66	12 !	1,210	6	1,070	1,150	70,837	82,059	162,673	26,191
Feb.	2.76	2.49	1 !	1,290	25	915	1,140	63,300	126,996	448,150	35,604
Mar.	4.56	2.33	30	4,270	4	833	2,510	154,114	101,045	236,403	20,899
Apr.	4.10	2.33	1	3,440	6	731	1,320	78,570	99,973	351,859	24,030
May	6.27	2.00	22	7,800	10	477	3,880	239,660	196,300	588,871	36,193
June	7.81	4.79	3	11,500	22	4,700	5,650	335,937	127,390	335,937	19,254
July	5.22	4.30	2 !	5,580	27	3,780	4,560	280,672	203,251	779,878	26,100
Aug.	4.69	3.35	1	4,520	28	2,240	2,750	169,075	194,605	743,286	56,856
Sept.	5.84	2.95	5	6,850	4	1,540	3,290	195,868	288,849	1,306,836	80,699
Oct.	6.20	3.25	11	7,660	1	2,010	6,220	382,517	246,278	891,747	80,699
Nov.	15.16	4.13	5	34,700	3	3,470	5,580	332,505	151,159	570,870	46,790
Dec.	4.63	3.22	5	4,340	20	1,940	3,090	189,949	91,622	268,589	26,197
	15.16	2.00		34,700		477	3,440	2,493,004	1,909,527	3,753,089	705,670
Yearly	Meters		Cubic Meters per Second						Thousands of Cubic Meters		
	4.62	0.61		984		13.5	97.5	3,075,088	2,355,379	4,629,385	870,435

** Period 1968-1978 * 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^3/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 11 discharge measurements during the year and a continuous record of gage heights. Records available: 1922 through 1978. 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-feet (680 m^3/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 1978 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	33.5	39.6	30.4	29.0	11.3	24.0	6.0	28.6	14.5	170	191	343
2	34.3	39.6	29.0	23.0	8.5	24.0	6.0	18.0	12.7	174	191	337
3	35.0	39.6	29.0	20.5	8.5	138	4.2	24.0	9.9	174	191	337
4	36.4	39.6	27.9	16.6	11.3	99.9	4.2	* 97.8	8.5	174	191	331
5	36.4	39.6	27.9	16.6	9.9	45.6	4.2	28.6	166 *	182	371	331
6	36.4	39.6	27.9	18.4	9.2	* 31.8	4.2	18.7	99.2	192	1,090 *	337
7	36.4	* 39.6	27.9	18.4	7.1	41.0	3.5	26.8	54.0	283	685	319
8	36.4	39.6	27.9	18.4	10.2	34.6	4.2	20.8	37.1	238	590	313
9	36.4	39.6	29.0	18.4	7.4	23.0	4.2	14.5	30.4	227	562	313
10	36.4	39.6	29.0	* 18.4	6.0	23.0	4.2	12.0	30.4	227	530	301
11	36.4	39.6	29.0	18.4	351	20.5	* 3.9	23.0	30.4	208	516	301
12	36.4	39.6	27.9	18.4	50.9	18.4	3.9	18.4	60.7	191	509	295
13	36.4	39.6	27.9	18.4	32.8	18.4	3.9	13.4	381	191	505	290 *
14	36.4	39.6	* 27.9	18.4	* 24.0	18.4	3.9	12.0	47.3	191	477	276
15	36.4	39.6	31.8	14.5	19.1	16.6	4.2	11.3	38.1	191	459	276
16	36.4	39.6	33.5	14.5	18.4	14.5	7.1	9.2	35.0	191	441	276
17	* 36.4	39.6	33.5	14.5	16.6	8.5	4.6	8.5	33.5	191	431	276
18	36.4	39.6	33.5	14.5	12.7	8.5	3.5	8.5	30.7	200	417	276
19	36.4	39.6	30.4	14.5	12.7	7.1	3.5	11.3	30.4	200	417	276
20	36.4	39.6	50.1	14.5	129	6.0	3.5	11.3	35.0	191	417	272
21	36.4	38.1	41.0	14.5	107	6.0	3.5	12.0	43.4	191	403	268
22	36.4	38.1	39.6	12.7	47.7	6.0	3.5	12.7	70.3	191	403	268
23	36.4	38.1	39.6	12.7	34.6	6.0	3.5	8.5	140	191	396	268
24	36.4	38.1	39.6	12.7	27.9	6.0	3.5	5.7	119	186	388	268
25	36.4	39.6	39.6	12.7	21.9	4.9	2.8	4.9	105	182	388	264
26	36.4	39.6	39.6	11.3	20.5	4.9	2.8	4.9	121	182	374	264
27	36.4	36.4	39.6	11.3	18.4	4.9	2.5	4.2	140	182	374	261
28	36.4	32.1	42.7	11.3	22.6	4.2	3.5	3.5	159	195	360	261
29	36.4		35.3	11.3	26.5	4.2	2.8	13.4	159	191	343	254
30	39.6		22.2	11.3	26.8	4.2	77.3	4.9	166	191	343	247
31	39.6		24.4		27.9		59.7	10.9		191		254
Sum	1,128.4	1,092.1	1,014.6	480.1	1,138.4	673.1	252.3	502.3	2,397.5	6,059	12,953	8,947

Month	Current Year 1978							Period 1933-1978		
	Extreme Gage Feet		Extreme Second-Feet				Average Second-Feet	Total Acre-Feet	Acre-Feet		
	High	Low	High Day	High	Low Day	Low			Average	Maximum	Minimum
Jan.	1.05	0.98	!30	39.6	1	33.5	36.4	2,237	2,651	18,030	43.8
Feb.	1.05	.95	! 1	39.6	28	32.1	38.8	2,165	1,977	14,433	38.9
Mar.	3.15	.66	20	103	29	11.3	32.8	2,011	1,662	11,407	92.4
Apr.	.92	.66	1	30.4	!26	11.3	15.9	951	2,001	21,950	81.1
May	3.41	.52	11	904	10	6.0	36.7	2,259	3,618	25,470	154
June	2.46	.46	3	374	!28	4.2	22.9	1,334	2,234	19,730	60.3
July	2.10	.36	30	247	27	2.5	8.1	502	1,877	15,568	57.6
Aug.	2.13	.43	4	237	28	3.2	16.2	996	3,386	30,105	34.9
Sept.	4.66	.59	!3	2,250	4	8.5	79.8	4,756	4,803	49,182	17.8
Oct.	2.30	1.80	7	313	1	166	195	12,013	4,062	24,327	43.5
Nov.	4.40	1.90	6	1,890	!	191	431	25,695	3,230	25,730	43.8
Dec.	2.36	2.10	1	343	30	247	289	17,738	2,768	22,003	67.3
Yearly	4.66	0.36		2,250		2.5	100	72,657	34,269	159,211	1,755.3
	Meters		Cubic Meters per Second					Thousands of Cubic Meters			
	1.42	0.11		63.8		0.07	2.84	89,621	42,271	196,389	2,164

** Period 1932-1978 * 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 decucted from the records and is not shown below. Records available: April 1959 through 1978. 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-Feet (Cubic Meters per Second)**			
Daily:	Max. 350 (9.91)	July 5, 1968	Min. 15.7 (0.44)	March 10, 1969
Monthly:	Max. 247 (7.00)	July 1968	Min. 54.6 (1.55)	December 1969
Yearly:	Max. 180 (5.10)	1971	Min. 109 (3.09)	1978

Mean Daily Discharge in Second-Feet 1978 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	96.7	141	120	204	159	144	121	228	162	37.7	82.6	88.5
2	97.8	131	124	194	131	142	131	189	141	39.4	61.0	86.3
3	114	124	121	158	119	173	141	120	131	35.1	54.1	83.1
4	85.8	120	124	164	114	212	126	128	127	26.1	46.9	78.2
5	98.2	125	139	167	112	153	119	137	153	20.2	55.2	76.1
6	96.2	115	164	177	112	125	119	156	178	21.7	59.3	71.0
7	95.7	95.7	158	178	106	155	123	184	150	31.2	57.9	70.6
8	101	72.7	151	183	143	167	142	138	84.3	22.6	54.4	66.2
9	98.4	61.1	131	210	132	124	152	117	43.9	55.9	56.4	62.1
10	95.1	56.6	126	210	104	60.2	154	105	40.7	55.6	52.7	76.9
11	93.7	65.3	128	185	144	58.4	143	107	38.3	57.4	49.9	69.6
12	93.2	88.3	143	177	150	68.8	133	96.6	43.1	42.8	46.3	68.4
13	90.5	95.8	132	174	124	89.1	127	91.7	57.2	36.0	58.3	63.1
14	86.0	89.3	113	165	101	96.1	130	89.5	70.3	33.6	63.0	62.3
15	91.9	96.0	115	172	102	95.0	133	81.3	59.8	37.8	64.5	62.2
16	110	101	127	192	132	91.1	142	84.6	46.4	59.4	53.2	61.2
17	101	96.7	137	171	142	114	143	93.2	37.2	67.9	63.2	71.5
18	90.5	108	137	151	159	132	135	99.1	37.7	65.9	65.1	71.1
19	94.0	110	154	142	155	143	139	110	36.9	55.6	64.3	64.7
20	97.0	115	181	142	153	170	130	128	34.5	45.6	59.8	67.9
21	110	102	201	141	184	171	115	114	33.9	49.4	64.2	61.1
22	120	83.9	157	155	174	138	142	106	48.6	71.8	67.1	60.6
23	111	82.0	151	160	118	143	147	90.9	67.5	89.3	82.6	69.4
24	127	89.5	152	146	70.3	154	153	92.1	97.0	86.8	71.8	77.4
25	114	99.4	152	138	47.0	152	148	99.9	73.6	84.1	80.0	71.9
26	117	119	180	124	35.1	163	154	103	41.2	82.1	89.9	69.6
27	140	114	189	136	28.2	150	183	93.5	37.0	82.9	84.6	53.6
28	123	121	188	130	22.2	119	283	100	48.5	80.9	87.0	55.3
29	124		160	153	51.5	122	234	129	41.4	83.2	86.4	56.3
30	140		162	170	86.2	128	258	129	36.1	79.4	82.1	55.8
31	137		185		148		251	145		105		87.0
Sum	3,289.7	2,818.3	4,602	4,969	3,558.5	3,952.7	4,751	3,685.4	2,197.1	1,742.4	1,963.8	2,139.0

Month	Current Year 1978 Extreme Gage Feet High	Extreme Gage Feet Low	Ø Extreme Second-Feet High Day	High	Low Day	Low	Average Second-Feet	Total Acre-Feet	Period 1968-1978 Acre-Feet Average	Maximum	Minimum
Jan.			27	140	4	85.8	106	6,525	8,818	12,728	4,924
Feb.			1	141	10	56.6	101	5,590	7,379	10,704	4,397
Mar.			21	201	14	113	148	9,128	9,720	11,675	6,118
Apr.			1 9	210	26	124	166	9,866	10,726	14,646	8,187
May			21	184	28	22.2	115	7,058	9,859	14,327	7,058
June			4	212	11	58.4	132	7,840	10,679	14,384	7,798
July			28	283	21	115	153	9,423	9,882	15,180	5,223
Aug.			1	228	15	81.3	119	7,310	9,207	11,586	7,310
Sept.			6	178	21	33.9	73.2	4,358	7,337	9,162	4,358
Oct.			31	105	5	20.2	56.2	3,456	7,060	8,220	3,456
Nov.			26	89.9	12	46.3	65.5	3,895	7,242	10,790	3,895
Dec.			1	88.5	27	53.6	69.0	4,243	7,844	12,797	3,354
Yearly				283		20.2	109	78,682	105,747	130,563	78,682
	Meters			Cubic Meters per Second				Thousands of Cubic Meters			
				8.01		0.57	3.09	97,054	130,439	161,049	97,054

** Period 1968-1978 Ø Mean daily ! And other days

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) northeast 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 29 discharge measurements during the year, 28 by the United States Section and 1 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: 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 1978 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^3/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^3/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)	February 1969
Yearly:	Max.	5,300 (150)	1974	Min.	1,230 (34.8)	1972

Mean Daily Discharge in Second-Feet 1978 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	1,350	1,520 *	1,200 *	4,190	1,580	5,920	4,540	4,870	3,250	2,830	6,590	5,040
2	1,350	1,500 *	1,130	2,050	1,480	5,990	4,530	4,300 *	3,000	2,720	6,310	5,010
3	1,390	1,480	1,020	1,370	1,240	8,350	4,510	3,100	2,400	2,740	4,190	5,020
4	1,430 *	1,470	986	1,140	1,060	9,160	4,470	2,840	2,020	2,610	4,040	4,930
5	1,440	1,500	1,070	1,060	946	7,160	4,400 *	2,780	2,940	2,620	10,400	4,940
6	1,330	1,490	1,230	1,040	813	6,820	4,340	2,680	5,740	7,040	*28,300	4,940 *
7	1,280	1,460	1,350	1,010	811	7,970 *	4,420	2,750	3,480	7,380	12,200	4,860
8	1,250	1,400	1,400	1,070	944	7,230	4,410	2,690	2,860	7,360	8,830	4,820
9	1,340	1,360	1,380	1,250	846	6,850	4,270	2,640	3,470	7,360	7,790	4,810
10	1,350	1,340	1,440	1,380	741 *	6,560	4,300	2,600	3,440	7,640	7,200	4,800
11	1,370	1,320	1,970	1,350	1,610	6,490	4,200	2,590	3,280	7,930 *	6,710	4,800
12	1,390	1,350	3,040	1,500 *	2,380	6,470	4,180	2,690	3,120	7,970	6,550	4,590
13	1,400	1,400	3,260	1,930	4,670	6,230	4,160	2,670	3,870 *	7,870	6,320	3,080
14	1,400	1,370	3,240	1,970	4,430	5,590	4,180	2,660	3,460	7,590	6,150	2,570
15	1,390	1,330 *	3,220 *	1,940	4,500	5,370	4,350	2,520	3,300	7,250	5,950	2,470
16	1,410	1,320	3,190	1,930	4,730	5,260	4,370	2,480 *	3,190	7,250	4,850	2,430
17	1,410	1,320	3,000	1,430	5,070	5,190	4,440	2,430	3,110	7,230	4,760	2,430
18	1,390 *	1,340	3,130	1,260	5,900	5,150	4,430	2,410	3,110	7,260	4,640	2,430
19	1,420	1,370	3,170	1,210	5,860	5,130	4,260 *	2,400	3,080	7,180	4,580	2,360
20	1,430	1,330	3,190	1,150	7,010	5,070	4,170	2,420	3,070	6,990	4,550	2,340 *
21	1,410	1,300	3,180	1,150	7,310	5,010 *	4,200	2,450	3,020	6,760	4,520	2,320
22	1,420	1,260	3,400	1,350	7,790	4,930	4,160	2,400	3,250	6,700	* 4,490	2,760
23	1,440	1,240	3,440	1,570	6,760	4,860	4,260	2,340	3,680	6,750	4,680	3,130
24	1,430	1,220	3,460	1,600	6,420 *	4,830	4,270	2,330	3,950	6,780	4,700	3,220
25	1,470	1,180	3,450	1,600	6,320	4,820	4,140	2,370	3,550	6,860 *	4,650	3,260

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 18 discharge measurements during the year and a continuous reecord 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 1978. 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^3/sec) on September 25, 1964 with a gage height of 42.06 feet (12.82 m). Min. 314 second-feet (8.90 m^3/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 1978 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	1,460	1,540	1,270 *	4,700	1,710	5,830	4,590	5,090	3,400	3,110	6,820	4,940
2	1,460	1,590	1,250	3,420	1,680	5,860 *	4,590	4,770	3,350	2,800	6,460	4,940
3	1,450	1,550	1,220	1,840	1,540	9,220	4,630	3,960	2,910	2,840	5,120	4,940
4	1,490	1,530	1,080	1,320 *	1,250 *	9,750	4,590 *	3,030	2,340	2,820	4,030	4,940
5	1,460	1,540	1,080	1,110	1,060	7,200	4,560	2,950	2,150	2,680	4,170	4,870
6	1,490	1,560	1,250	1,040	932	6,360	4,520	2,880	6,750	4,380	25,300 *	4,870
7	1,440	1,560 *	1,540	1,050	844	9,250	4,450	2,860	5,010	7,420	17,100	4,840 *
8	1,430	1,500	1,760	1,010	823 *	7,910	4,480	2,860 *	2,950	7,630	9,250 *	4,840
9	1,400	1,440	1,770	1,110	925	6,710	4,450	2,740	3,440	7,730	7,770	4,800
10	1,450	1,390	1,730	1,330	865	6,360	4,380	2,740	3,640	7,880	7,030	4,770
11	1,440	1,380	1,650	1,420	798	6,180	4,310	2,690	3,400	7,910	6,530	4,800
12	1,450	1,380	2,340	1,400	1,920	6,140	4,270	2,720	3,250	7,910	6,140	4,800
13	1,460	1,430	3,100	1,670	3,430	6,110	4,270	2,790	3,990	7,840	6,040	4,030
14	1,460	1,450	3,080	2,020	4,520	5,580	4,270	2,790	4,060	7,740	5,830	2,850
15	1,460	1,410	3,040	2,040	4,170	5,230	4,270	2,720	3,740	7,240	5,690	2,850
16	1,440	1,330	2,960	2,020	4,660	5,120	4,270	2,570	3,350	7,100	5,160	2,560
17	1,440 *	1,350	2,930	1,760	4,770	5,050	4,340	2,520	3,270	7,130 *	4,560	2,530
18	1,430	1,320	2,830	1,480	5,470	4,940	4,340	2,500	3,250 *	7,170	4,450	2,560
19	1,400	1,360	2,970	1,300 *	5,930 *	4,940	4,240	2,460	3,220	7,130	4,380	2,530
20	1,440	1,410	3,040	1,230	9,360	4,870	4,200	2,500	3,220	7,060	4,310	2,490 *
21	1,480	1,360	3,080	1,180	8,900	4,770	4,170	2,550	3,200	6,920	4,270	2,440
22	1,450	1,300	3,140	1,210	8,510	4,800 *	4,170	2,520	3,390	6,640	4,270	2,460
23	1,460	1,260	3,390	1,480	7,270	4,700	4,170	2,410	4,200	6,670	4,380	3,200
24	1,460	1,250	3,420	1,690	6,360	4,660	4,240	2,370	5,620	6,670	4,520	3,430
25	1,460	1,240	3,390	1,670	6,180	4,630	4,240	2,410	5,900	6,670	4,520	3,490
26	1,460	1,190	3,350	1,650	6,140	4,700	4,130	2,430	4,030	7,030	4,520	3,490
27	1,440	1,240	3,450	1,520	6,140	4,700	4,100	2,390	5,120	6,640	4,450	3,460
28	1,440	1,270	3,420	1,520	6,110	4,590	8,020	2,450	5,400	6,710	4,380	3,430
29	1,460		3,330	1,560	5,930	4,520	5,330	2,500	4,520	6,750	4,310	3,400
30	1,500		4,060	1,620	5,930	4,560	5,400	4,630	3,420	6,670	4,590	3,400
31	1,540		4,700		5,860		5,230	3,880		6,710		3,490
Sum	45,100	39,130	80,620	49,370	129,987	175,240	141,220	90,680	115,490	197,600	190,350	116,440

Month	Current Year 1978 Extreme Gage Feet High	Extreme Gage Feet Low	Extreme Second-Feet High Day	Extreme Second-Feet High	Extreme Second-Feet Low Day	Extreme Second-Feet Low	Average Second-Feet	Total Acre-Feet	Period 1968-1978 Acre-Feet Average	Maximum	Minimum
Jan.	1.67	1.41	31	1,570	9	1,380	1,450	89,469	97,656	193,508	50,489
Feb.	1.74	1.08	2	1,640	26	1,150	1,400	77,617	137,257	455,925	48,684
Mar.	4.07	.89	31	4,730	4	1,050	2,600	159,844	119,727	245,194	38,574
Apr.	4.04	.75	1	4,700	8	982	1,650	97,888	112,429	356,909	36,522
May	8.89	.20	20	15,400	11	720	4,200	257,858	218,768	611,076	60,344
June	7.22	3.94	7	11,600	29	4,480	5,830	347,565	185,442	750,690	25,768
July	8.17	3.61	28	13,700	27	4,060	4,560	280,112	225,955	921,377	30,729
Aug.	5.84	2.46	30	8,440	24	2,300	2,920	179,834	217,188	730,503	70,515
Sept.	6.36	2.00	6	9,680	5	1,840	3,850	229,090	306,491	1,250,870	93,812
Oct.	5.64	2.59	11	7,980	2	2,530	6,390	391,939	289,992	922,217	100,018
Nov.	14.30	3.54	6	34,800	4	3,960	6,360	377,544	176,222	601,059	56,954
Dec.	4.10	2.49	! 1	4,940	21	2,390	3,740	231,030	116,723	317,123	51,077
Yearly	14.30	0.20		34,800		720	3,740	2,719,790	2,204,850	3,963,062	920,935
	Meters			Cubic Meters per Second				Thousands of Cubic Meters			
	4.36	0.06		986		20.4	106	3,354,826	2,719,651	4,888,381	1,135,961

** Period 1968-1978 * Discharge measurement made on this day ! 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 interntional 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 56 discharge measurements during the year, 51 by the Mexican Section and 5 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 1978. 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^3/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^3/sec), and also that these were the only floods since 1745 with flows greater than 600,000 second-feet (17,000 m^3/sec). Min. no flow several days in June and July 1953 and on July 24, 1955.

Average Flow in Second-Feet (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 1978 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	1,290	1,390 *	1,120	4,520	1,410	6,040	4,630	5,540	4,170	3,060	6,990	4,770
2	1,310	1,400 *	1,130	4,240	1,460 *	6,000	4,590	5,190	3,390	2,830	6,670	4,840
3	1,310	1,390	1,130	2,390 *	1,430	7,980	4,590	4,480	3,070	2,590	6,290	4,840
4	1,320	1,370	1,090	1,390	1,260	10,200	4,590	3,180	2,520 *	2,740	4,240	4,800 *
5	1,310	1,360 *	992	1,080 *	1,310	8,330 *	4,590	2,730	2,430	2,560 *	3,880	4,770
6	1,260	1,390 *	964 *	950	908	6,820	4,560	2,680	3,530	2,560	10,600	4,730
7	1,240	1,370	1,120	908	851	8,300	4,410	2,760	6,890 *	6,670	22,500 *	4,730
8	1,230	1,390	1,380	908	780	8,830	4,410	2,750	3,990	7,450	10,900	4,730
9	1,210	1,340	1,550	908	752 *	7,200	4,450	2,710 *	2,840	7,660 *	8,370 *	4,730
10	1,190	1,270 *	1,550	978 *	795	6,780	4,270 *	2,620	3,430	7,840	7,420	4,730
11	1,230	1,260	1,460	1,120	795	6,500	4,240	2,590	3,570 *	7,880	6,890	4,700
12	1,230	1,240	1,540	1,200	699	6,390 *	4,170 *	2,590	3,280	7,880	6,570	4,700
13	1,240	1,230	2,670 *	1,180	1,860	6,360	4,100	2,620	3,240	7,840	6,320	4,520
14	1,240	1,240	3,050	1,530	4,310	5,830	4,030	2,520 *	4,270	7,840	6,140	3,200
15	1,240	1,290	3,020	1,730	4,380 *	5,580	4,030	2,490	3,850	7,630	5,970	2,590
16	1,260	1,290 *	2,950	1,750	4,310 *	5,400	4,060	2,370	3,400	7,270 *	5,830	2,430
17	1,240	1,210	2,930	1,700	4,700	5,330	4,100	2,300	3,180	7,270	4,840 *	2,390
18	1,270	1,190	2,930	1,360 *	5,010	5,230	4,130 *	2,260	3,100	7,270 *	4,590	2,380 *
19	1,270	1,210	2,980	1,160	5,790	5,160	4,060	2,220	3,050 *	7,240	4,480	2,360
20	1,270	1,210	3,070 *	1,060	6,070	5,120 *	4,030	2,230	3,010	7,240	4,340	2,320
21	1,310	1,230 *	3,100	1,030	10,400	5,050	3,920	2,360 *	3,010	7,130	4,270	2,280
22	1,340	1,210	3,150	992	8,370 *	5,010	3,920	2,320	3,120	6,990	4,130	2,250
23	1,320	1,160	3,490	1,030	7,840	4,940	3,920 *	2,250	4,130	6,850	4,100 *	2,500
24	1,320	1,130	3,570	1,290 *	6,750	4,870	3,990	2,190	6,290	6,890	4,450	3,070
25	1,320	1,100	3,640	1,460	6,460	4,840	4,060	2,170	6,850 *	6,890	4,480	3,170
26	1,310	1,100	3,640	1,340	6,360	4,800 *	4,030	2,170	4,560	7,130	4,450	3,230
27	1,310	1,060	3,670 *	1,390	6,290	4,870	3,990	2,170	4,480	7,030	4,410	3,280
28	1,270	1,070 *	3,670	1,280	6,290	4,840	6,960	2,190	5,540	6,960	4,340	3,210
29	1,310		3,600	1,290	6,250 *	4,770	5,900	2,400	5,230	6,960	4,310	3,170
30	1,320		3,640	1,330	6,040	4,730	4,590	3,180 *	3,780	6,960 *	4,270	3,170
31	1,360		4,450		6,040		4,770 *	5,440		6,920		3,230
Sum	39,650	35,100	78,246	44,494	125,670	182,100	136,090	87,670	117,200	198,030	187,040	111,820

Month	Current Year 1978 Extreme Gage Feet High	Extreme Gage Feet Low	Extreme Second-Feet High Day	Extreme Second-Feet High	Extreme Second-Feet Low Day	Extreme Second-Feet Low	Average Second-Feet	Total Acre-Feet	Period 1968-1978 Acre-Feet Average	Maximum	Minimum
Jan.	2.56	2.40	31	1,360	10	1,190	1,280	78,675	100,543	211,754	49,774
Feb.	2.62	2.23	3	1,420	27	1,040	1,250	69,590	139,998	450,602	39,225
Mar.	5.05	2.10	31	4,560	6	950	2,520	155,199	121,339	257,213	37,096
Apr.	5.05	2.00	1	4,560	17	908	1,480	88,285	112,689	360,566	35,107
May	9.84	1.71	21	12,400	12	639	4,060	249,277	230,308	662,839	89,917
June	9.02	5.09	7	10,900	30	4,700	6,070	361,294	187,816	695,494	29,685
July	9.38	4.63	28	11,500	21	3,880	4,380	269,885	224,009	838,520	32,270
Aug.	7.91	3.28	31	9,040	135	2,170	2,830	173,909	227,712	794,314	65,681
Sept.	7.45	3.28	25	8,300	5	2,170	3,920	232,466	315,570	1,216,757	94,988
Oct.	7.22	3.51	12	7,950	3	2,430	6,390	392,808	316,157	956,960	105,334
Nov.	15.85	4.69	6	27,100	5	3,850	6,220	370,890	176,621	586,280	58,095
Dec.	5.35	3.35	12	4,840	22	2,210	3,600	221,826	116,893	307,569	51,316
Yearly	15.85	1.71		27,100		639	3,670	2,664,104	2,269,655	3,891,074	980,740
	Meters			Cubic Meters per Second				Thousands of Cubic Meters			
	4.83	0.52		766		18.1	104	3,286,136	2,799,591	4,799,588	1,209,729

** Period 1968-1978 * 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^3/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 13 discharge measurements during the year, a stable rating curve up to 2,500 second-feet (72 m^3/sec), and a continuous record of gage heights. Computations by shifting control methods for flows greater than 2,500 second-feet (72 m^3/sec). Records available: September 9, 1953 through 1978. 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-feet (1,840 m^3/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-Feet (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-Feet 1978 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	84.8	76.6	84.8	43.8	13.4	* 48.0	52.3	2,920	4,840	6,460	646 *	2,330
2	92.9	76.6	72.7	48.0	43.8	54.4	52.3	5,470	2,530	7,100 *	562	2,080
3	97.1	* 80.9	* 56.5	60.7	43.8	3,070	50.1	8,300	1,090	6,460	526	2,020
4	97.1	80.9	60.7	56.5	50.1	2,120	48.0	671	551	5,050	501	2,020
5	92.9	80.9	68.5	60.4	54.4	2,040	* 52.3	319	301 *	4,870	477	2,020 *
6	84.8	80.9	64.6	* 50.1	45.9	823	52.3	203	417	5,190	477	2,080
7	80.9	84.8	56.5	45.9	37.4	724	52.3	182 *	2,100	5,230	466	2,080
8	77.0	89.0	60.7	48.0	31.1	2,770	52.3	138	2,330	4,660	452	1,360
9	80.9	77.0	72.7	50.1	50.1	1,680	52.3	113	625	4,030	427	622
10	* 76.6	72.7	76.6	54.4	* 48.0	855	56.5	105	283	3,370	410	501
11	76.6	64.6	64.6	54.4	43.8	526	56.5	97.1	283	3,100	399	452
12	72.7	64.6	60.7	60.4	39.6	292	52.3	89.0	283	1,960	392	452
13	60.4	68.5	68.5	52.3	48.0	198	52.3	89.0	265	1,500	392	466
14	60.4	60.7	72.7	48.0	56.5	171	39.6	97.1	225	1,310	374	477
15	60.4	60.7	64.6	43.8	56.5	154	31.1	113	195	1,180	374	501
16	56.5	56.5	48.0	41.7	52.3	121	29.0	72.7	1,230	1,090	364	646
17	54.4	50.1	41.7	48.0	50.1	105	33.2	91.8	770	1,010	357	1,050
18	54.4	41.7	50.1	45.9	54.4	89.0	33.2	56.5	374	904	597	1,090
19	56.5	43.8	48.0	41.7	48.0	89.0	35.3	48.0	242	840	2,320	1,090
20	56.5	52.3	54.4	35.3	122	80.9	35.3	52.3	171	805	2,420	1,050
21	60.4	54.4	54.4	35.3	477	72.7	35.3	52.3	148	770	2,420	1,050 *
22	56.5	54.4	52.3	29.0	512	64.6	26.8	52.3	653	706	2,420	1,050
23	60.4	52.3	54.4	31.1	611	52.3	26.8	43.8	3,440	671	2,420	1,090
24	68.5	60.7	54.4	31.1	392	52.3	39.6	39.6	6,430	646	2,420	1,050
25	60.4	64.6	50.1	26.8	225	52.3	35.3	39.6	9,320	622	2,450	1,090
26	68.5	54.4	68.5	22.6	149	54.4	24.7	31.1	11,700	830	2,450	1,140
27	64.6	60.7	76.6	18.4	97.1	56.5	18.4	22.6	11,500	1,490	2,450	1,050
28	60.4	72.7	72.7	13.4	97.1	56.5	24.0	31.1	11,200	1,270	2,450	1,010
29	64.6		52.3	11.3	97.1	56.5	95.3	39.6	4,590	1,640	2,450	1,010
30	68.5		48.0	7.1	80.9	52.3	791	249	4,770	1,140	2,450	1,050
31	76.6		41.7		56.5		2,460	1,440		840		1,050
Sum	2,183.2	1,838.0	1,873.0	1,215.5	3,783.9	16,580.7	4,495.7	21,268.5	82,856	76,744	37,313	36,027

Month	Extreme Gage Feet High	Extreme Gage Feet Low	Extreme Second-Feet High Day	High	Extreme Second-Feet Low Day	Low	Average Second-Feet	Total Acre-Feet	Period 1954-1978 Acre-Feet Average	Maximum	Minimum
Jan.	0.82	0.66	! 3	97.1	117	54.4	70.3	4,330	9,960	59,812	0
Feb.	.79	.52	8	89.0	18	39.6	65.7	3,646	8,376	66,880	0
Mar.	.79	.49	1	89.0	31	35.3	60.4	3,716	5,056	29,690	0
Apr.	.72	.10	3	72.7	30	4.2	40.6	2,411	6,171	21,994	0
May	2.10	.07	21	805	1	2.8	122	7,506	18,174	100,919	0
June	4.46	.56	3	4,840	1	43.8	551	32,883	22,950	172,970	0
July	3.94	.16	31	4,200	28	7.1	145	8,919	34,539	441,541	0
Aug.	8.17	.39	3	9,850	27	22.6	685	42,125	23,532	210,031	0
Sept.	9.51	.95	26	11,800	21	130	2,770	164,483	105,514	807,616	2,860
Oct.	6.36	1.90	3	7,350	!24	622	2,480	152,251	69,176	550,739	110
Nov.	3.25	1.48	!25	2,450	16	337	1,240	73,940	35,703	338,000	0
Dec.	3.25	1.57	1	2,450	!11	452	1,170	71,552	23,005	176,100	0
Yearly	9.51	0.07		11,800		2.8	784	567,762	362,156	2,400,553.5	41,238.2
	Meters		Cubic Meters per Second					Thousands of Cubic Meters			
	2.90	0.02		334		0.08	22.2	700,327	446,715	2,961,050	50,859

Current Year 1978

** Period September 1953-1978 * 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 1978 there were 6 discharge measurements, 2 by the United States Section and 4 by the Mexican Section of the Commission. Records available: 1958 through 1978. 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^3/sec) on September 18, 1971. Min. 1.5 second-feet (0.04 m^3/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 1978 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	3,600	2,000	655	3,900	8,320	9,080	4,080	4,330	545	18.0	18.0	8,760
2	3,380	1,430	327	3,690	8,750	8,890	4,040	3,820	1,060	18.0	18.0	8,740
3	2,800	783	772	3,820	9,520	4,290	3,120	3,980	1,060	434	18.0	8,730
4	2,980	716	1,500	3,970	10,200	5,360	3,360	5,310	856	18.0	18.0	8,790
5	3,270	709	1,510	4,160	10,800	4,440	3,930	5,760	859	18.0	18.0	8,750
6	2,820	700	1,520	4,360	11,400	4,620	3,780	5,720	542	18.0	18.0	7,380
7	3,100	369	1,380	4,590	11,700	3,070	3,870	5,980	18.0	18.0	18.0	7,340
8	3,450	18.0	1,290	5,440	12,100	1,280	4,550	6,290	18.0	18.0	18.0	6,350
9	3,690	18.0	857	5,670	13,400 *	946	4,710	6,200	18.0	18.0	18.0	4,210
10	4,700	124	1,060	4,920	13,200	1,460	4,350	5,990	18.0	18.0	492	4,190
11	5,660	515	1,860	3,050	12,000 *	1,850	3,920	5,340	18.0	18.0	1,270	4,180
12	5,930	702	2,300	1,110	11,900 *	1,850	3,750	5,600	18.0	18.0	1,280	4,160
13	5,880	704	2,300	448	12,100	1,470	3,770	5,260	18.0	18.0	3,230	4,190
14	6,690	693	2,010	537	10,700	1,250	3,500	4,730	18.0	18.0	6,240	4,200
15	6,770	635	1,940	1,140	11,100	1,060	3,460	4,820	534	18.0	6,360	2,140
16	6,580	539	2,020	1,150	12,000	1,760	3,700	5,090	524	18.0	6,330	2,140
17	6,710	541	2,230	1,560	11,700	1,880	4,330	5,570	553	18.0	6,380	2,120
18	2,360	548	2,680	2,240	11,200	2,100	4,390	5,160	528	18.0	6,350	2,140
19	1,820	546	2,880	2,380	11,200 *	2,140	4,660	4,990	684	18.0	6,350	2,120
20	1,840	544	3,620	2,580	11,300	2,110	4,970	5,100	781	18.0	5,900	2,130
21	1,870	536	3,260	3,080	11,500	2,640	5,070	3,840	755	18.0	6,770	2,120
22	1,860	547	3,260	3,900	10,000	2,060	5,240	3,390	1,060	18.0	6,360	2,110
23	776	554	3,040	4,160	8,330	2,640	5,210	2,520	381	18.0	6,350	3,180
24	977	550	3,040	4,220	8,330	2,930	4,000	2,220	18.0	18.0	6,360	3,140
25	890	547	3,360	4,690	8,350	2,990	4,760	2,230	18.0	18.0	6,370	3,160
26	1,280	876	3,090	5,490	7,910	3,000	4,760	2,370	18.0	18.0	6,360	3,160
27	2,060	865	3,460	6,250	7,930	3,220	4,730	2,600	18.0	18.0	6,340	3,150
28	3,060	661	3,720	7,150	8,240	3,320	4,830	2,760	18.0	18.0	6,670	5,320
29	3,300		3,730	7,590	8,260	3,580	5,230	2,010	18.0	18.0	8,720	5,290
30	2,960		3,720	8,390	8,280	4,020	5,350	1,850	18.0	18.0	8,720	5,280
31	2,580		3,720		8,660		4,940	18.0		18.0		5,200
Sum	105,643	17,970.0	72,111	115,635	320,380	91,306	134,360	130,848.0	10,992.0	974.0	119,364.0	143,870

Month	Extreme Gage Feet		Ø Extreme Second-Feet				Average Second-Feet	Total Acre-Feet	Period #1954-1978 Acre-Feet		
			High		Low						
	High	Low	Day		Day				Average	Maximum	Minimum
	Current Year 1978										
Jan.			15	6,770	23	776	3,410	209,540	209,429	414,129	16,245
Feb.			1	2,000	! 8	18.0	642	35,643	166,526	367,384	16,600
Mar.			29	3,730	2	327	2,330	143,030	132,663	347,000	2,390
Apr.			30	8,390	13	448	3,850	229,359	247,318	503,683	19,530
May			9	13,400	26	7,910	10,300	635,464	321,618	635,464	21,574
June			1	9,080	9	946	3,040	181,103	241,051	551,000	22,887
July			30	5,350	3	3,120	4,330	266,499	123,835	302,471	12,839
Aug.			8	6,290	31	18.0	4,220	259,533	223,669	1,478,678	25,900
Sept.			! 2	1,060	! 7	18.0	366	21,802	185,820	1,080,871	1,428
Oct.			3	434	! 1	18.0	31.4	1,932	249,401	1,997,000	1,932
Nov.			129	8,720	! 1	18.0	3,980	236,755	123,593	1,128,000	1,400
Dec.			4	8,790	22	2,110	4,640	285,362	121,266	465,000	8,761
Yearly				13,400		18.0	3,460	2,506,022	2,346,189	5,016,800	1,143,806
	Meters		Cubic Meters per Second					Thousands of Cubic Meters			
				379		0.51	98.0	3,091,178	2,894,024	6,188,223	1,410,885

** Period 1954-1978 * Discharge measurement made on this day Ø Mean daily

Values prior to 1958 are Chapeno discharge less arroyo inflow ! And other days

RIO ALAMO AT CD. MIER, TAMAULIPAS

DESCRIPTION: Cableway, reinforced concrete weir of 177 second-foot (5 m^3/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 3 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 1978.

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^3/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, and 1977.

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 1978 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	24.7	18.7	10.6	6.0	0	4.9	0	434	604	434	59.0	54.7
2	24.7	18.7	10.6	6.0	0	119	0	120	327	293	59.0	54.7
3	23.3	18.7	10.6	6.0	0	2,600	0	38.5	74.2	191	56.9	54.7
4	23.3	18.7	9.2	6.0	0	773	0	13.4	32.5	145	54.7	54.7
5	27.9	18.7	8.1	4.2	0	155	0	6.0	18.7	291	54.7	54.7
6	27.9	18.7	9.2	3.5	0	49.8	0	3.9	2,290	1,060	50.9	54.7
7	23.3	17.3	9.2	2.5	0	30.4	0	2.5	1,240 *	2,250	47.3	54.7
8	21.5	15.9	9.2	2.5	0	15.9	0	113	512	1,350	47.3	54.7
9	21.5	15.9	9.2	2.5	0	10.6	0	36.7	540	989	45.6	50.9
10	21.5	15.9	9.2	1.1	0	8.1	0	13.4	122	763	45.6	50.9
11	18.7	17.3	8.1	1.8	0	8.1	0	6.0	434	537	47.3	50.9
12	18.7	15.9	8.1	2.5	0	6.0	0	2.5	260	381	47.3	54.7
13	20.1	14.5	9.2	2.5	625	4.2	0	2.5	80.5	296	45.6	59.0
14	20.1	14.5	9.2	2.5	1,490	4.2	0	3.2	46.3	235	47.3	59.0
15	20.1	13.1	8.1	1.8	448	4.2	0	9.5	37.1	171	45.6	59.0
16	18.7	15.9	8.1	1.1	32.1	4.2	0	4.2	27.9	148	47.3	61.1
17	20.1	15.9	7.1	2.5	13.8	4.2	0	2.5	24.7	140	47.3	61.1
18	24.7	15.9	7.1	2.5	8.1	4.2	0	2.5	18.7	124	50.9	59.0
19	24.7	14.5	6.0	1.8	6.0	3.5	0	0	14.5	108	54.7	59.0
20	24.7	13.1	6.0	1.1	72.0	1.8	0	10.6	13.1	97.8	54.7	61.1
21	24.7	13.1	6.0	1.1	85.1	0	0	3.9	16.2	91.8	56.9	63.2
22	24.7	13.1	6.0	0	45.6	0	0	0	664	86.2	59.0	61.1
23	24.7	13.1	6.0	0	54.7	0	0	0	1,220	80.5	59.0	59.0
24	24.7	13.1	6.0	0	17.0	0	0	0	2,570	73.5	59.0	59.0
25	26.1	13.1	6.0	0	572	0	0	0	5,050 *	71.3	59.0	59.0
26	26.1	13.1	6.0	0	338	0	0	0	6,390 *	68.2	61.1	59.0
27	21.5	13.1	6.0	0	96.8	0	0	0	4,590	67.1	59.0	63.2
28	18.7	10.6	6.0	0	25.4	0	0	0	1,890	68.9	59.0	63.2
29	17.3		6.0	0	18.0	0	0	0	1,050	67.1	59.0	65.3
30	18.7		6.0	0	10.6	0	0	1,150	629	63.6	54.7	63.2
31	18.7		6.0		8.1		9.9	865		63.2		63.2
Sum	696.1	430.1	238.1	61.5	3,966.3	3,811.3	9.9	2,843.8	30,786.4	10,805.2	1,594.7	1,801.7

Month	Current Year 1978								Period 1924-1978		
	Extreme Gage Feet		Extreme Second-Feet				Average Second-Feet	Total Acre-Feet	Acre-Feet		
			High		Low				Average	Maximum	Minimum
	High	Low	Day		Day						
Jan.			! 5	27.9	29	17.3	22.6	1,382	3,461	34,920	0
Feb.	188.65	188.55	! 1	18.7	28	10.6	15.2	852	2,563	25,550	0
Mar.	188.55	188.48	! 1	10.6	!19	6.0	7.8	472	2,573	19,830	0
Apr.	188.48		! 1	6.0	!22	0	2.1	121	5,915	36,210	0
May	192.03		13	2,620	! 1	0	128	7,870	12,240	137,000	0
June	193.37		3	4,730	!20	0	127	7,568	12,868	83,240	0
July	190.16		31	473	! 1	0	.4	19.5	8,016	62,246	0
Aug.	196.33		30	9,710	!19	0	91.8	5,637	15,891	205,700	0
Sept.	195.87	188.62	26	8,900	21	10.6	1,030	61,067	41,154	434,387	135
Oct.	191.96	189.01	6	3,090	!31	63.2	349	21,429	19,213	193,700	0
Nov.	189.01	188.91	26	61.1	! 9	45.6	53.0	3,163	4,469	25,165	0
Dec.	189.04	188.91	29	65.3	! 9	50.9	58.3	3,574	3,668	15,982	0
	196.33			9,710		0	156	113,154.5	132,031	605,678.4	11,898.7
Yearly	Meters		Cubic Meters per Second					Thousands of Cubic Meters			
	59.84			275		0	4.43	139,573	162,858	747,096	14,686

** Period 1924-1978 * 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 Puertecitos, Los Indios, Hulzache, 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 68 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 45 current meter measurements made during the year. There were no drainage flows through Los Fresnos Drain in 1978. All storm water measured at these two drains was deducted and is not included in the tabulation below. Records available: 1953 through 1978. Records prior to 1976 include Rio San Juan flow.

REMARKS: In 1978 there were 162,084 irrigable acres (65,593 ha) in the Lower Rio San Juan Irrigation District.

Mean Daily Discharge in Second-Feet 1978 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	3.9	12.0	* 13.8	6.4	11.3	18.0	6.0	9.9	2.5	2.5	* 1.4	1.1
2	3.9	* 10.6	13.1	6.4	12.7	18.7	5.7	* 10.9	2.8	2.8	1.4	1.1
3	3.9	11.3	12.4	6.0	* 13.8	19.1	5.7	10.2	2.8	2.8	1.4	.7
4	* 3.9	12.4	11.7	6.0	14.8	19.8	5.3	9.5	3.2	3.2	1.4	.7
5	3.9	13.1	10.9	* 5.7	16.2	20.1	* 5.3	8.8	3.5	3.2	1.4	.7
6	4.2	13.8	10.2	6.0	17.3	20.8	5.3	8.5	3.9	3.5	1.4	* .7
7	4.2	14.8	9.5	6.0	18.4	* 21.2	5.3	7.8	3.9	3.5	1.4	.7
8	4.2	* 15.5	* 8.8	6.4	19.4	19.4	5.3	7.1	4.2	3.9	* 1.4	.7
9	4.2	14.8	8.5	6.4	20.8	18.0	5.3	6.4	4.6	3.9	1.4	.7
10	4.6	14.1	8.1	6.7	* 21.9	16.2	5.3	* 5.7	4.9	3.9	1.4	.7
11	* 4.6	13.4	7.8	6.7	20.8	14.8	5.3	4.9	4.9	4.2	1.4	.7
12	4.6	12.7	7.4	7.1	19.8	13.1	* 5.3	4.6	5.3	4.2	1.4	.7
13	4.9	12.4	7.1	7.4	18.7	11.7	4.9	4.2	* 5.7	4.6	1.4	.7
14	4.9	11.7	6.7	7.4	17.3	* 9.9	4.9	3.5	5.3	4.6	1.4	.7
15	4.9	10.9	* 6.4	7.8	16.2	9.9	4.6	2.8	4.6	4.9	* 1.4	.7
16	4.9	* 10.2	6.4	7.8	15.2	9.5	4.6	* 2.5	4.2	4.9	1.4	.7
17	5.3	10.2	6.4	8.1	* 14.1	9.5	4.2	2.8	3.9	5.3	1.4	.7
18	* 5.3	10.6	6.4	8.1	13.4	9.5	4.2	2.8	3.5	* 5.3	1.4	.7
19	7.4	10.6	6.7	* 8.5	12.7	9.5	* 3.9	3.2	2.8	5.3	1.8	* .7
20	9.9	10.6	6.7	8.1	12.0	9.2	3.9	3.2	* 2.5	4.9	1.8	.7
21	12.0	10.9	6.7	7.8	10.9	* 9.2	3.5	3.5	2.5	4.9	1.8	.7
22	14.5	* 10.9	6.7	7.4	10.2	8.8	3.5	3.5	2.5	4.6	* 1.8	.7
23	16.6	11.3	6.7	6.7	9.5	8.5	3.2	* 3.9	2.5	4.6	1.8	.7
24	19.1	11.7	6.7	6.4	* 8.8	8.1	3.2	3.5	2.5	4.2	1.4	1.1
25	* 21.2	12.0	6.7	6.0	10.2	7.4	2.8	3.5	2.5	* 4.2	1.4	1.1
26	19.8	12.7	7.1	* 5.7	11.3	7.1	* 2.8	3.2	2.5	3.9	1.4	1.1
27	18.4	13.1	7.1	6.7	12.7	6.7	3.9	2.8	2.5	3.6	1.4	1.1
28	17.3	13.4	7.1	8.1	13.8	* 6.4	5.3	2.5	2.5	3.2	1.1	* 1.1
29	16.9		* 7.1	9.2	15.2	6.4	6.4	2.5	2.5	2.5	* 1.1	1.1
30	14.5		6.7	10.2	16.2	6.0	7.4	* 2.1	2.5	2.1	1.1	1.1
31	13.4		6.7		* 17.7		8.5	2.1		1.8		1.1
Sum	280.3	341.7	250.3	213.2	463.3	372.5	150.8	152.4	104.0	120.9	43.1	25.7

Month	Extreme Gage Feet		Ø Extreme Second-Feet				Average Second-Feet	Total Acre-Feet	Period 1954-1978 Acre-Feet		
			High		Low						
	High	Low	Day		Day				Average	Maximum	Minimum
			Current Year 1978								
Jan.			25	21.2	! 1	3.9	9.2	556	172	556	0
Feb.			8	15.5	!16	10.2	12.4	678	273	938	0
Mar.			1	13.8	!15	6.4	8.1	496	220	771	25.9
Apr.			30	10.2	! 5	5.7	7.1	422	269	700	19.5
May			10	21.9	24	8.8	14.8	919	549	1,454	61.6
June			7	21.2	30	6.0	12.4	739	490	1,257	55.9
July			31	8.5	!25	2.8	4.9	299	243	525	32.4
Aug.			2	10.9	!30	2.1	4.9	302	193	443	25.9
Sept.			13	5.7	! 1	2.5	3.5	206	210	697	15.4
Oct.			!17	5.3	31	1.8	3.9	240	189	797	19.5
Nov.			!19	1.8	!28	1.1	1.4	85.1	183	641	6.5
Dec.			! 1	1.1	! 3	.7	.7	50.3	167	495	29.2
Yearly				21.9		0.7	7.1	4,992.4	3,168	6,786	490
	Meters		Cubic Meters per Second					Thousands of Cubic Meters			
				0.62		0.02	0.20	6,160	3,895	8,370	605

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

RIO SAN JUAN AT CAMARGO, TAMAULIPAS

DESCRIPTION: Cableway, gravity well, and water-stage recorder located on the left bank opposite Camargo, Tamaulipas at latitude 26°18'40", longitude 98°50'15", 3.1 river miles (5 km) from the confluence with the Rio Grande, and 9.3 river miles (15 km) downstream from Marte R. Gomez Dam. This stream enters the Rio Grande at river mile 238.7 (384.1 km); 3.7 river miles (6.0 km) upstream from the Rio Grande gaging station at Rio Grande City, 36.1 river miles (58.1 km) downstream from Falcon Dam. The zero of the gage is at mean sea level, U. S. C. & G. S. datum.

RECORDS: Based on 64 discharge measurements during the year and a continuous record of gage heights. Computations by shifting control methods. Discharge prorated between measurements during times of extremely low flow. Records available: January 1954 through 1978.

REMARKS: Except for storm inflow, diversions, and drainage returns below Marte R. Gomez Dam, the flow at this station is controlled by spills from Marte R. Gomez Reservoir and leakage through the dam. Backwater from the Rio Grande frequently reaches this station. Prior to July 1, 1968 the zero of the gage was 130.45 feet (39.76 m) above mean sea level, U. S. C. & G. S. datum.

EXTREME FLOWS FROM RECORDS: Momentary: Max. 115,000 second-feet (3,270 m^3/sec) on September 25, 1967 with a gage height of 42.03 feet (12.81 m). Min. 0.7 second-foot (0.02 m^3/sec) several days in April 1960.

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

Daily:	Max.	115,000 (3,250)	Sept. 25, 1967	Min.	0.7 (0.02)	April 23, 24 & 25, 1960
Monthly:	Max.	31,600 (894)	Sept. 1967	Min.	2.1 (0.06)	November 1964
Yearly:	Max.	3,990 (113)	1967	Min.	14.6 (0.41)	1963

Mean Daily Discharge in Second-Feet 1978 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	34.3	19.1	* 20.1	8.1	2.5	1.4	4.2	55.4	5.7	28,100	3,500	1,120
2	34.6	* 19.4	19.4	7.8	1.8	1.8	4.6	* 63.6	5.7	20,900 *	3,410	1,120
3	35.3	18.7	19.1	7.4	* 1.4	2.1	4.9	56.5	5.7	16,700 *	3,290 *	1,110
4	* 35.7	18.0	18.4	6.7	1.8	2.5	5.7	49.8	5.7	13,800 *	3,170	1,090
5	34.6	17.3	17.7	* 6.4	1.8	2.8	* 6.0	43.1	5.7	12,700 *	3,090	1,090
6	33.9	16.6	17.0	6.4	2.1	3.2	6.4	36.0	622	14,100 *	3,090	1,090
7	32.8	15.9	16.6	6.4	2.5	3.5	6.4	29.0	445	16,400 *	2,970	1,060
8	32.1	* 15.2	* 15.9	6.4	2.8	3.9	6.7	22.2	5.3	21,700	2,830 *	1,010
9	31.1	14.8	14.1	6.4	2.8	4.2	6.7	15.5	597	29,100 *	2,340	1,010
10	30.4	14.1	12.0	6.4	* 3.2	4.6	7.1	* 8.5	53.0	29,500 *	629	1,010
11	* 29.3	13.8	10.2	6.4	3.9	4.9	7.1	8.1	999 *	25,400	179	989
12	28.3	13.4	8.1	6.0	4.6	5.3	* 7.4	7.8	210 *	21,000 *	212	918
13	27.2	13.1	6.4	6.0	5.3	5.7	7.4	7.8	70.6	16,800 *	212 *	883
14	26.5	12.7	4.2	6.0	6.4	* 6.0	7.4	7.4	* 22.2	13,800	212 *	883
15	25.4	12.0	* 2.5	6.0	7.1	6.0	7.4	7.1	20.5	12,400	212	883
16	24.4	* 11.7	2.8	6.0	7.8	5.7	7.4	* 6.7	18.7	11,200 *	283	883
17	23.3	12.7	3.5	6.0	* 8.5	5.7	7.4	7.1	17.0	9,680	388	883
18	22.2	13.8	3.9	6.0	8.5	5.3	7.4	7.1	15.5	8,370 *	494	883
19	21.5	14.8	4.6	* 6.0	8.5	5.3	* 7.4	7.4	13.8	7,420	530	883
20	20.5	15.9	4.9	6.0	8.5	4.9	7.4	7.4	* 12.0	6,920 *	600	883
21	19.4	17.0	5.7	5.7	8.1	* 4.9	7.1	7.8	12.0	6,390	600	883
22	18.4	* 18.0	6.0	5.7	8.1	4.6	7.1	7.8	12.0	5,900	742	883
23	17.7	18.4	6.4	5.3	8.1	4.2	7.1	* 8.1	12.0	5,120 *	918 *	883
24	16.6	18.7	7.1	5.3	* 8.1	3.9	7.1	7.8	618	4,240	1,060	883
25	* 15.5	19.1	7.4	4.9	7.1	3.9	6.7	7.4	12,500 *	4,130 *	1,200	883
26	15.9	19.1	8.1	* 4.9	6.0	3.5	* 6.7	7.1	29,600 *	4,060	1,270	865
27	16.6	19.4	8.5	4.6	4.9	3.2	14.8	6.7	36,000 *	3,880 *	1,340	759
28	17.0	19.8	9.2	3.9	4.2	* 2.8	23.0	6.4	38,500 *	3,880	1,310	706
29	17.7		* 9.5	3.5	3.2	3.2	31.1	6.0	39,200 *	3,710	1,170	671
30	18.0		9.2	2.8	2.1	3.9	39.2	* 5.7	36,000 *	3,600 *	1,130 *	636
31	18.4		8.5		* 1.1		47.3	5.3		3,530		600
Sum	774.6	452.5	307.0	175.4	152.8	122.9	329.6	529.6	195,604.0	384,430	42,381	28,333

Month	Current Year 1978 Extreme Gage Feet High	Extreme Gage Feet Low	Extreme Second-Feet High Day	High	Low Day	Low	Average Second-Feet	Total Acre-Feet	Period 1954-1978 Acre-Feet Average	Maximum	Minimum
Jan.			4	35.7	25	15.5	25.1	1,536	12,504	95,871	88.4
Feb.			28	19.8	16	11.7	16.2	897	6,186	64,323	203
Mar.			1	20.1	15	2.5	9.9	609	3,557	24,513	212
Apr.			1	8.1	30	2.8	6.0	348	3,146	35,876	177
May			! 17	8.5	31	1.1	4.9	302	4,342	28,709	245
June			! 14	6.0	1	1.4	4.2	244	20,838	334,608	244
July			31	47.3	1	4.2	10.6	653	36,466	341,429	182
Aug.			2	63.6	31	5.3	17.0	1,050	26,958	273,904	161
Sept.	155.58		29	39,600	! 7	5.3	6,530	387,961	144,090	1,878,406	226
Oct.	150.95	133.63	1	32,300	31	3,510	12,400	762,513	131,595	901,500	193
Nov.	133.66		1	3,530	! 11	177	1,410	83,997	34,806	230,100	126
Dec.			! 1	1,120	31	600	915	56,219	22,074	154,765	163
Yearly	155.58			39,600		1.1	1,790	1,296,329	446,562	2,891,093	10,534
	Meters			Cubic Meters per Second				Thousands of Cubic Meters			
	47.42			1,120		0.03	50.7	1,599,006	550,830	3,566,125	12,993

* Discharge measurement made on this day ! 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 1978, 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 1978 in this river reach was 11,018 acre-feet (13,591,000 m^3), or 1.0% 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 1978 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	3.4	8.6	31.7	40.0	32.7	16.2	11.5	3.9	18.3	5.8	3.5	6.5
2	13.0	8.6	29.6	19.5	26.2	14.2	5.2	3.9	11.6	9.3	3.5	4.2
3	17.7	6.6	32.4	36.8	52.6	9.1	7.6	3.5	12.6	7.1	6.0	5.3
4	20.1	7.9	31.0	34.7	44.4	10.3	6.9	2.8	6.0	7.1	7.0	4.0
5	30.2	7.9	26.9	35.3	48.9	5.5	8.2	4.4	7.1	7.1	5.5	8.5
6	37.1	5.0	39.8	33.1	35.2	7.2	9.4	4.3	4.0	7.1	10.0	10.8
7	31.4	7.6	23.9	51.2	20.4	10.9	10.7	5.7	2.9	10.6	11.3	13.5
8	26.5	7.6	27.6	30.8	42.7	8.8	12.0	9.3	2.9	9.3	13.8	16.1
9	26.7	7.6	27.0	24.0	37.6	9.3	6.6	9.4	6.0	13.1	13.4	11.6
10	15.4	10.4	35.6	55.4	32.4	9.3	9.3	9.7	3.0	14.1	14.4	6.2
11	16.2	8.9	33.0	28.3	37.7	9.3	8.8	9.1	3.0	18.6	13.4	8.8
12	18.3	4.8	25.1	9.3	57.8	11.6	9.8	9.9	3.0	13.8	12.4	.9
13	18.9	16.6	29.1	9.3	28.4	12.8	13.4	1.4	3.0	45.0	12.5	7.0
14	20.6	13.6	22.6	18.9	20.8	13.7	12.2	13.8	3.0	46.5	12.5	7.9
15	18.5	14.1	21.5	18.4	22.0	14.1	17.4	12.4	10.5	27.2	11.3	7.9
16	18.7	14.1	20.1	13.1	11.0	14.3	10.3	17.1	12.4	32.9	22.3	12.9
17	14.8	22.8	29.2	13.1	17.1	10.1	10.7	15.7	4.6	13.5	24.6	16.1
18	14.5	25.1	27.1	24.9	7.5	3.3	13.0	9.9	6.0	13.3	25.3	17.9
19	26.3	22.9	20.9	25.3	16.4	7.3	18.9	14.4	9.0	12.2	17.3	12.9
20	22.9	24.3	26.6	30.1	8.2	5.2	12.5	7.0	11.5	14.7	16.2	15.8
21	22.5	24.3	24.9	23.0	12.7	5.2	12.4	11.8	8.6	18.9	3.8	13.2
22	13.9	16.5	24.8	27.2	2.7	7.4	10.0	10.4	9.6	14.8	3.8	13.1
23	13.9	25.9	24.2	17.0	2.7	9.1	3.2	12.3	9.9	19.6	3.8	12.8
24	18.0	31.6	19.7	17.0	2.7	6.5	7.8	11.2	2.7	11.1	3.6	12.8
25	12.6	7.0	28.2	7.5	2.7	5.2	8.3	9.7	2.8	15.0	5.7	11.7
26	16.1	9.6	20.6	15.3	12.3	12.9	8.4	11.1	2.9	13.6	4.2	11.7
27	25.6	32.6	37.2	13.6	21.4	11.3	7.6	9.0	3.5	13.6	8.4	17.4
28	17.3	31.7	39.3	23.7	15.0	10.6	10.6	15.5	3.5	7.1	9.6	9.8
29	16.1		40.2	24.4	16.7	8.9	4.5	18.9	4.4	2.5	9.6	9.8
30	12.7		36.1	24.6	6.9	5.3	5.4	13.7	7.0	2.5	9.6	14.8
31	9.8		43.4		15.0		3.8	18.3		5.2		7.6
Sum	589.7	424.2	899.3	744.8	710.8	284.9	296.4	309.5	195.3	452.2	318.3	329.5

Month	Current Year 1978 Average Rainfall Inches** 1957-1978	1978	Ø Extreme Second-Feet High Day	High	Low Day	Low	Average Second-Feet	Total Acre-Feet	Period 1957-1978 Acre-Feet Average	Maximum	Minimum
Jan.	1.02	1.03	6	37.1	1	3.4	19.0	1,170	676	1,482	159
Feb.	1.07	.22	27	32.6	12	4.8	15.2	841	803	1,782	223
Mar.	.55	.01	31	43.4	24	19.7	29.0	1,784	1,042	1,845	158
Apr.	1.41	1.07	10	55.4	25	7.5	24.8	1,477	1,084	2,199	357
May	2.31	2.64	12	57.8	!22	2.7	22.9	1,410	1,050	2,624	211
June	2.60	1.96	1	16.2	18	3.3	9.5	565	1,042	2,610	209
July	1.44	.77	19	18.9	23	3.2	9.6	588	718	1,620	278
Aug.	2.30	2.33	29	18.9	13	1.4	10.0	614	691	1,252	278
Sept.	5.26	6.52	1	18.3	24	2.7	6.5	387	514	1,230	178
Oct.	2.26	2.48	14	46.5	!29	2.5	14.6	897	715	1,549	131
Nov.	1.16	.31	18	25.3	! 1	3.5	10.6	631	512	1,170	211
Dec.	.69	.73	18	17.9	12	.9	10.6	654	593	1,580	145
Yearly	22.07	20.07		57.8		0.9	15.2	11,018	9,440	14,754	4,989
	Millimeters			Cubic Meters per Second				Thousands of Cubic Meters			
	561	510		1.64		0.03	0.43	13,591	11,644	18,199	6,154

Ø Mean daily ** United States side - average of several stations in the reach ! 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 29 discharge measurements during the year, and a continuous record of gage heights. Computations by shifting control methods. Records available: January 1955 through 1978. 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 Harlingen Office of the Commission, where it is recorded automatically, and to the Anzalduas Dam control room for visual readout.

EXTREME FLOWS FROM RECORDS: Momentary: Max. 220,000 second-feet (6,230 m^3/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 1978 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	2,370	2,620	670	3,650	8,100	8,930	3,940	5,340	1,290	29,400 *	3,710	10,400
2	3,380	2,050	660 *	3,800	7,980	8,740	4,190	4,670	901	23,400 *	3,580	10,400
3	3,350	1,540	358	3,400	8,520	12,900	3,990	3,880	1,320	18,400	3,570 *	10,400
4	2,730	836	688	3,530	9,470	4,780	3,290	4,220	1,200	15,300 *	3,670	10,300
5	2,890	805	1,570	3,780	10,300	5,880	3,500	5,810	1,070	13,000 *	3,580	9,540
6	3,190	760	1,630	3,840	10,800	4,080	4,060	5,580	2,470	14,200 *	3,450	9,790
7	2,830	738	1,490	4,120	11,000	4,560	3,930	5,200	3,620	18,500	3,320	9,070
8	3,180	424	1,410	4,650	11,400	3,110	4,180	6,370	1,830	24,100	3,240	7,600
9	3,350	300	1,330	5,110	12,300 *	1,490	4,940	6,420	3,500	29,900 *	2,620	6,570
10	3,750	139	994	5,150	13,000	1,120	4,640	5,490	2,110	30,900 *	576	5,290
11	4,590	107	1,090	2,500	12,300	1,580	4,430	5,670	2,380	27,000 *	491	5,390
12	5,440	245	1,340	1,510	11,900	1,910	4,080	5,200	1,430	21,700 *	1,290	5,430
13	5,460	657	2,270	1,300	13,300	1,910	3,930	5,260	415	17,500 *	1,460	5,520
14	5,820	648	2,270	631	14,900	1,550	3,960	4,650	221 *	14,200 *	4,720	5,590
15	6,370	651	2,010	603	12,000	1,350	3,740	3,910	148	12,400	6,480	*3,970
16	6,100	625	1,920	1,200	12,000	1,160	3,680	4,810	284	11,200 *	6,980	3,480
17	6,060	497	2,020	1,310	12,200	1,810	4,000	4,860	567	10,200	6,890	3,440
18	5,270	481	2,240	1,620	11,600	1,900	4,550	5,700	539	8,620 *	7,000	3,430
19	2,530	504	2,760	2,240	11,500	2,100	4,560	4,320	564	7,700 *	7,650	3,430
20	1,960	492	2,660	2,360	11,500	2,120	4,880	4,860	647	6,990 *	7,370	3,420
21	1,910	498	3,410	2,520	11,900	2,120	5,090	3,950	746	6,440	7,310	3,420
22	2,000	517	3,150	3,040	11,900	2,570	5,260	3,740	973	5,960	7,640	3,330
23	1,990	499	3,170	3,880	9,280	2,080	5,730	3,300	1,830	5,490	7,750	3,400
24	934	530	3,000	3,780	8,750	2,630	4,540	2,560	2,700	4,700	7,910	4,450
25	925	522	2,900	4,030	8,880	2,970	3,760	2,280	11,000 *	4,530	8,020	4,250
26	949	530	3,430	4,530	9,170	2,840	4,870	2,270	29,000 *	4,380	8,110	4,080
27	1,360	878	2,830	5,690	8,190	2,970	4,690	2,360	37,300 *	4,240	7,620	4,440
28	2,050	879	3,410	6,090	8,630	3,130	4,680	2,550	37,200 *	4,120	7,850	4,760
29	2,930		3,530	7,050	8,580	3,220	5,080	2,720	38,800 *	4,050	9,890	6,210
30	3,180		3,570	7,150	8,530	3,480	5,530	2,120	36,300 *	3,910	9,490 *	6,240
31	2,910		3,560		8,300		4,660	3,850		3,770		6,360
Sum	101,758	19,972	67,840	104,064	328,180	100,990	136,360	133,920	222,355	406,200	163,237	183,400

Month	Extreme Gage Feet		Extreme Second-Feet				Average Second-Feet	Total Acre-Feet	Period #1954-1978 Acre-Feet		
			High		Low						
	High	Low	Day		Day				Average	Maximum	Minimum
Jan.	30.29	25.58	18	8,130	25	450	3,280	201,834	220,039	416,906	33,043
Feb.	28.22	24.92	1	3,980	11	104	713	39,614	180,947	376,607	25,500
Mar.	29.11	25.26	21	5,610	3	244	2,190	134,559	138,991	378,000	14,400
Apr.	30.14	25.48	12	7,790	15	376	3,470	206,408	252,024	510,426	75,100
May	34.98	29.82	13	17,200	2	7,480	10,600	650,936	338,327	650,936	36,702
June	35.03	25.72	3	16,600	10	566	3,370	200,311	280,565	623,778	98,620
July	30.09	26.53	22	7,670	25	1,590	4,400	270,466	171,097	573,798	22,300
Aug.	30.21	25.95	1	7,950	30	796	4,320	265,626	256,208	1,502,678	25,000
Sept.	47.71	24.91	29	40,000	16	101	7,410	441,035	386,971	2,712,754	42,423
Oct.	43.23	27.89	10	31,500	31	3,440	13,100	805,686	406,734	3,047,000	30,000
Nov.	31.32	25.20	30	10,400	11	213	5,440	323,776	167,270	1,442,000	29,274
Dec.	31.37	27.06	1 †	10,400	23	2,240	5,920	363,769	143,986	540,000	36,100
Yearly	47.71	24.91		40,000		101	5,390	3,904,020	2,943,159	6,619,700	1,269,259
	Meters		Cubic Meters per Second					Thousands of Cubic Meters			
	14.54	7.59		1,130		2.86	153	4,815,609	3,630,387	8,165,400	1,565,631

Current Year 1978

** Period 1955-1978 * Discharge measurement made on this day † And other days

1954 values are Rio Grande City less arroyo inflow

RIO GRANDE AT LOS EBANOS, TEXAS
NEAR CD. DIAZ ORDAZ, TAMAULIPAS

DESCRIPTION: Cableway, bubbler gage, water-stage recorder, and digital transmitter located on the left bank at latitude 26° 14'15", longitude 98° 33'50", and river mile 204.3 (328.8 km); 660 feet (201 m) downstream from Los Ebanos International Ferry, and 34.0 river miles (54.7 km) upstream from Anzalduas Dam. 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 19 discharge measurements during the flood period and a continuous record of gage heights. Computations for the flood period by shifting control methods. Records available: June 1976 through 1978, complete gage height record and flood flows.

REMARKS: This station is operated as a flood stage recording and transmitting station. Discharges are computed only during flood periods. The transmitter relays gage height data via radio to the Harlingen Office of the Commission, where it is recorded automatically, and to the Anzalduas Dam control room for visual readout.

EXTREME FLOWS FROM RECORDS: Momentary: Max. 39,800 second-feet (1,130 m^3/sec) on August 28, 1976 with a gage height of 28.22 feet (8.60 m).

Mean Daily Discharge in Second-Feet 1978 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1										34,700		
2										28,200		
3										21,800		
4										16,900		
5										13,700		
6										13,300		
7										16,800		
8										21,800		
9										26,900		
10										29,700		
11										28,500		
12										24,600		
13										19,800		
14										16,200		
15										13,800		
16										11,900		
17										10,600		
18												
19												
20												
21												
22												
23												
24												
25									6,320			
26									22,900			
27									32,400			
28									34,350			
29									36,800			
30									37,500			
31												
Sum												

Month	Current Year 1978						Period		
	Extreme Gage Feet		Extreme Second-Feet				Average Second-Feet	Total Acre-Feet	Acre-Feet		
			High		Low						
	High	Low	Day	High	Day	Low			Average	Maximum	Minimum
Jan.											
Feb.											
Mar.											
Apr.											
May											
June											
July											
Aug.											
Sept.	27.86		30	37,800							
Oct.	27.75		1	36,800							
Nov.											
Dec.											
Yearly	Meters		Cubic Meters per Second						Thousands of Cubic Meters		

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, Rancherias 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 Puertecitos, Los Indios, and Morillo Drains was determined by prorating between frequent current meter measurements. In 1978, 43, 45, and 7 meter measurements were made at Puertecitos, Los Indios, and Morillo Drains, respectively. There were no drainage flows through Huizache Drain in 1978. All storm water measured at these drains was deducted and is not included in the tabulation below. In 1978, 50% 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 1978.

REMARKS: In 1978 there were 162,084 irrigable acres (65,593 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 1978, 47,980 acre-feet (59,183,000 m^3) were diverted.

Mean Daily Discharge in Second-Feet 1978 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	11.7	87.2	31.4	25.1	137	120	27.5	20.1	25.8	127	68.2	68.9
2	12.0	88.3	31.4	24.7	128	134	27.2	21.2	26.5	126	77.3	67.8
3	12.7	99.6	31.4	24.4	148	137	26.5	20.1	27.9	125	77.3	67.1
4	13.1	71.7	31.4	24.0	117	139	25.4	19.4	28.6	124	77.3	66.0
5	12.7	59.3	31.8	23.7	118	142	24.7	18.4	29.3	123	76.6	65.3
6	12.7	45.6	31.8	24.0	133	144	24.0	17.7	30.0	122	76.6	65.0
7	12.4	54.0	37.4	24.7	130	157	23.3	19.1	31.4	121	76.6	63.9
8	12.7	64.6	150	28.6	145	142	22.6	23.0	32.1	120	76.6	62.9
9	12.4	49.8	55.1	25.8	121	110	21.9	15.2	32.8	119	77.3	62.2
10	12.4	43.8	37.1	26.1	126	103	21.2	13.4	33.5	118	78.0	61.4
11	12.0	43.8	24.7	26.8	120	102	20.5	13.4	35.0	117	78.0	60.4
12	13.8	43.8	24.7	27.5	134	103	19.8	13.4	35.7	116	78.0	61.4
13	15.9	43.1	24.7	27.9	137	103	19.4	13.4	36.4	115	78.4	62.9
14	17.7	43.1	24.4	28.6	139	104	18.7	13.4	35.7	114	78.4	63.9
15	29.3	42.7	24.4	29.0	141	96.8	18.4	13.4	35.3	113	78.4	65.0
16	60.7	42.7	24.4	29.7	142	90.8	17.7	13.4	34.6	112	77.7	66.0
17	63.6	42.0	24.7	30.0	144	80.5	17.3	16.6	34.3	111	77.7	67.5
18	69.6	41.0	24.7	31.1	143	84.8	16.6	16.2	33.5	68.9	77.3	42.7
19	59.3	40.3	24.7	38.8	143	67.8	16.2	17.7	32.2	31.8	77.0	10.6
20	54.0	39.2	25.1	56.9	180	53.0	15.9	19.1	32.5	24.0	76.3	10.9
21	102	38.1	25.1	79.5	179	44.1	15.5	20.5	32.5	20.1	76.3	10.9
22	164	37.4	25.4	89.7	187	37.1	15.2	21.9	32.5	19.4	75.9	11.3
23	166	36.4	25.4	86.2	186	35.7	14.5	23.3	32.5	18.7	75.6	11.7
24	103	35.7	25.4	95.3	185	34.6	14.1	23.7	32.5	18.0	74.9	11.7
25	60.7	34.6	25.8	113	165	33.2	13.8	23.7	32.5	17.3	74.5	12.0
26	53.7	34.3	25.8	116	151	32.1	13.4	24.0	32.5	17.0	74.2	12.4
27	75.2	33.2	25.8	114	144	31.1	14.5	24.4	80.2	17.3	73.8	12.4
28	86.2	32.5	26.1	124	144	30.0	15.9	24.7	128	72.4	72.0	12.7
29	72.7		26.1	145	136	29.3	17.7	24.7	128	51.6	71.0	12.4
30	71.7		25.8	145	113	28.3	33.9	25.1	128	18.0	69.9	12.0
31	77.0		25.4		112		18.7	25.1		26.8		10.9
Sum	1,552.9	1,367.8	997.4	1,685.1	4,428	2,549.2	612.0	598.7	1,302.3	2,444.3	2,277.1	1,292.2

Month	Current Year 1978 Extreme Gage Feet High	Extreme Gage Feet Low	Ø Extreme Second-Feet High Day	High	Low Day	Low	Average Second-Feet	Total Acre-Feet	Period 1954-1978 Acre-Feet Average	Maximum	Minimum
Jan.			23	166	1	11.7	50.1	3,079	1,942	4,745	466
Feb.			3	99.6	28	32.5	48.7	2,713	2,981	7,059	509
Mar.			8	150	!14	24.4	32.1	1,980	2,388	5,291	582
Apr.			!29	145	5	23.7	56.2	3,341	3,129	6,111	899
May			22	187	31	112	143	8,787	7,421	30,179	1,557
June			7	157	30	28.3	85.1	5,060	8,505	85,952	2,027
July			30	33.9	26	13.4	19.8	1,214	4,707	48,782	1,037
Aug.			!30	25.1	!10	13.4	19.4	1,187	2,661	13,292	661
Sept.			!28	128	1	25.8	43.4	2,584	2,535	11,273	665
Oct.			1	127	26	17.0	79.1	4,854	3,094	9,831	623
Nov.			!13	78.4	1	68.2	75.9	4,517	2,306	10,461	520
Dec.			1	68.9	19	10.6	41.7	2,563	2,990	34,043	512
				187		10.6	57.9	41,879	44,659	179,482	13,462
Yearly	Meters		Cubic Meters per Second					Thousands of Cubic Meters			
				5.24		0.30	1.64	51,656	55,089	221,389	16,608

Ø 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 1978, 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 1978 in this river reach was 295,780 acre-feet (364,845,000 m^3), or 25.4% of the total water diverted from the Rio Grande below Falcon Dam. About 85% 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 1978 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	207	124	347	395	804	772	415	529	423	54.2	290	411
2	173	39.8	342	357	798	718	263	483	180	77.5	270	183
3	499	73.9	312	873	840	242	645	448	160	154	305	172
4	532	4.5	221	800	872	260	663	526	203	108	183	511
5	539	4.5	212	784	882	538	646	303	457	122	187	528
6	535	48.3	614	709	555	597	726	269	399	61.5	329	554
7	332	42.8	623	756	492	472	476	603	287	70.2	407	588
8	253	43.3	690	496	947	421	427	665	181	72.4	477	477
9	582	43.2	636	479	936	359	335	660	219	72.2	490	204
10	644	114	511	764	935	182	718	624	78.0	75.5	494	149
11	657	12.6	325	521	949	136	852	556	102	155	304	575
12	610	7.3	275	460	944	341	850	232	138	81.5	114	598
13	498	78.2	644	333	562	416	828	306	190	114	128	531
14	270	98.1	584	309	484	443	828	625	189	80.3	138	506
15	250	162	585	192	726	404	489	623	190	69.7	186	444
16	529	165	594	200	758	350	416	668	133	254	315	218
17	517	154	501	549	908	243	857	658	127	258	274	128
18	186	43.7	202	503	933	200	744	559	232	319	125	424
19	84.2	43.7	179	555	765	409	722	288	344	388	142	489
20	15.0	168	643	548	490	505	937	316	366	366	347	508
21	10.6	202	754	529	406	585	810	636	397	170	318	483
22	7.3	208	728	378	731	559	488	679	304	168	301	339
23	39.9	318	784	295	753	682	413	675	101	478	200	81.2
24	2.5	251	673	622	790	416	830	644	69.4	448	180	32.6
25	39.4	130	407	688	737	422	817	737	237	467	189	45.6
26	62.2	79.4	358	769	670	714	875	351	142	470	199	311
27	114	317	764	750	457	731	900	236	192	370	455	187
28	11.0	330	803	682	339	751	631	595	38.6	179	466	203
29	9.4		815	393	722	764	464	540	66.6	182	501	181
30	52.5		731	343	764	668	401	539	52.7	336	463	94.9
31	49.0		665		831		662	446		295		78.0
Sum	8,310.0	3,306.3	16,522	16,032	22,780	14,300	20,128	16,019	6,198.3	6,516.0	8,777	10,234.3

Month	Current Year 1978 Average Rainfall Inches** 1957-1978	1978	Ø Extreme Second-Feet High Day	High	Low Day	Low	Average Second-Feet	Total Acre-Feet	Period 1957-1978 Acre-Feet Average	Maximum	Minimum
Jan.	1.35	3.27	11	657	24	2.5	268	16,483	11,765	28,747	2,010
Feb.	1.07	.45	28	330	! 4	4.5	118	6,558	12,394	38,599	1,640
Mar.	.62	.02	29	815	19	179	533	32,771	19,491	41,200	637
Apr.	1.39	.96	3	873	15	192	534	31,799	24,418	42,028	5,760
May	2.16	1.06	11	949	28	339	735	45,183	24,104	48,400	3,177
June	2.67	1.61	1	772	11	136	477	28,364	25,030	59,900	5,011
July	1.56	.72	20	937	2	263	649	39,923	20,852	45,400	6,753
Aug.	2.02	1.01	25	737	12	232	517	31,773	21,425	36,280	6,866
Sept.	4.17	4.18	5	457	28	38.6	207	12,294	14,139	35,000	4,136
Oct.	2.65	3.07	23	478	1	54.2	210	12,924	14,945	30,400	2,830
Nov.	.99	.14	29	501	12	114	293	17,409	13,244	21,972	2,930
Dec.	.87	1.24	12	598	24	32.6	330	20,299	11,865	21,233	2,506
Yearly	21.52	17.73		949		2.5	409	295,780	213,672	302,180	136,460
	Millimeters		Cubic Meters per Second					Thousands of Cubic Meters			
	547	450		26.9		0.07	11.6	364,845	263,564	372,739	168,323

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

DIVERSIONS FROM THE RIO GRANDE
ANZALDUAS CANAL NEAR REYNOSA, TAMAULIPAS

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 km) 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 54 discharge measurements during the year and a continuous record of gage heights. Computations by shifting control methods. Records available: 1952 through 1978.

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 1978, 468,355 acres (189,537 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 1978, there was no water returned to the Rio Grande through Poniente Drain.

EXTREME FLOWS FROM RECORDS: Momentary: Max. 10,950 second-feet (310 m^3/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		Frequently
Monthly:	Max. 6,250 (177)	May 1978	Min. 0		Several months
Yearly:	Max. 1,980 (56.1)	1959	Min. 150 (4.26)		1952

Mean Daily Discharge in Second-Feet 1978 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	0.7	2,260	0.7	1,120	4,270 *	4,410	530	3,220	706	5,260	1.4	0
2	300	2,120	.7	1,110	4,910 *	4,590	533	3,110	533	4,310	1.4	0
3	830	1,820	.7	925	4,910 *	4,940	523 *	3,050	512	2,710 *	1.4	0
4	1,150 *	1,400	.7	703	5,300	4,980	530	3,090	512 *	2,490 *	1.4	0
5	1,560	851	.7	703	5,900	4,130	530	3,330	512	1,420 *	1.4	0
6	957	459	.7	893	6,500 *	3,050	523	3,640	512	1.4	1.4	339
7	533	374	.7	1,070 *	7,130	2,000 *	523	3,710 *	1.4	607	248	650 *
8	533	374	.7	1,070	7,270 *	1,950	533	3,640	1.4	2,610	625	309
9	780	353	.7	1,310	6,960	1,410	491	3,990	1.4	4,170 *	381 *	1.4
10	830 *	360	.7	1,770	7,420	812	512 *	4,200 *	1.4	3,810	1.4	1.4
11	862	353	.7	1,940	7,910 *	600	533	4,060	1.4	2,960 *	1.4	1.4
12	2,050	360	.7	1,910 *	7,910	512 *	533	3,880	1.4	2,980	1.4	1.4
13	2,100 *	353	98.9	1,660	7,590	533	533	3,740	1.4	2,940 *	1.4	1.4
14	2,420	360 *	639 *	1,120	7,420	533	523	3,600 *	1.4	2,050	0	1.4
15	2,680	353	703	544	5,650	533	523	3,370	184	494	0	1.4
16	3,280 *	360	706	194	7,800 *	360	523	3,180	374	1.4	0	1.4
17	3,810 *	184	703	1.4	7,950	385	523	2,830 *	184	1.4	0	1.4
18	3,640	.7	706	1.4	7,730	385	523 *	2,830	1.4	1.4	0	1.4
19	2,470	.7	706	406	7,420	381 *	703	2,420	1.4	1.4	0	1.4
20	2,510	.7	703 *	798	7,420	385	1,180	2,360	1.4	1.4	0	1.4
21	1,940	.7	735	989 *	7,420	1.4	1,670 *	2,300 *	1.4	1.4	0	1.4
22	2,160	.7	742	1,120	7,350	1.4	2,100	2,250	353	1.4	0	1.4
23	2,290	.7	742	1,240	6,990 *	1.4	2,300	2,040	710	1.4	275	1.4
24	2,290	.7	742	1,430	5,440	1.4	2,290 *	1,530	1.4	1.4	533	1.4
25	1,240	.7	742	1,590	4,590 *	1.4	2,200	1,170 *	1.4	1.4	533	1.4
26	710	.7	735	1,850 *	4,410	1.4	2,100 *	1,080	1.4	1.4	240	343
27	798	.7	689	2,200	4,410	1.4	2,120	1,090	1,120	1.4	0	533
28	1,120	.7	703 *	3,090	4,410	1.4	2,120	1,080 *	5,470 *	1.4	0	622 *
29	1,660		862	3,530	4,410	1.4	2,450	1,080	5,400 *	1.4	0	706
30	2,050		883	4,170	4,410	290	2,830	968	5,370	1.4	0	357
31	2,420 *		1,120 *		4,410 *		2,970 *	883		1.4		357
Sum	51,973.7	12,701.7	13,668.3	40,457.8	193,620	37,181.6	36,475	82,721	22,473.0	38,834.8	2,849.0	4,239.8

Current Year 1978									Period 1954-1978		
Month	Average Rainfall Inches**		Ø Extreme Second-Feet				Average Second-Feet	Total Acre-Feet	Acre-Feet		
			High		Low				Average	Maximum	Minimum
	1954-1978	1978	Day		Day						
Jan.	1.34	2.80	17	3,810	1	0.7	1,680	103,101	98,871	259,799	1,520
Feb.	1.34	1.06	1	2,260	!18	.7	452	25,197	100,027	251,519	1,086
Mar.	.67	0	31	1,120	! 1	.7	441	27,096	43,214	147,900	1,128
Apr.	1.89	1.89	30	4,170	!17	1.4	1,350	80,235	120,485	303,212	23,381
May	2.28	.63	17	7,950	1	4,270	6,250	384,058	196,104	384,058	29,169
June	2.99	1.61	4	4,980	!21	1.4	1,240	73,783	112,269	270,700	14,221
July	1.89	1.10	31	2,970	9	491	1,180	72,357	43,666	162,400	5,730
Aug.	2.52	3.94	10	4,200	31	883	2,670	164,123	82,144	236,942	6,709
Sept.	5.04	8.58	28	5,470	! 7	1.4	749	44,591	67,531	165,800	8,708
Oct.	3.03	5.43	1	5,260	! 6	1.4	1,250	77,013	57,463	209,590	0
Nov.	1.34	.43	8	625	!14	0	95.0	5,654	13,286	83,690	0
Dec.	1.02	1.97	29	706	! 1	0	137	8,408	25,764	166,700	651
Yearly	25.35	29.44		7,950		0	1,470	1,065,616	960,824	1,434,920	551,946
	Millimeters		Cubic Meters per Second					Thousands of Cubic Meters			
	644	748		225		0	41.7	1,314,424	1,185,165	1,770,162	680,817

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

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 81 discharge measurements during the year, 69 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: 1952 through 1978.

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^3/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 1978 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	1,590	456	494	1,970	2,820	3,920	2,730	1,250	1,460	20,500 *	3,670	9,530 *
2	1,800	378	438	2,030	2,630 *	3,850	2,900	1,410	657	19,500 *	3,640	9,780
3	2,160	268	371	2,300	2,690 *	4,100	2,960	1,060 *	593	15,200 *	3,530 *	9,890
4	2,030 *	194	300	2,370 *	2,930 *	6,780	2,910 *	855	699	12,300 *	3,510	9,640
5	1,770	194	583	2,370	2,930	2,610	2,590	784	699	13,800 *	3,480	9,180
6	1,770	153 *	731 *	2,430	2,960	2,660	2,400	1,130	636	14,600 *	3,280	8,760
7	1,850	141	724	2,310	3,170	2,370	2,520	1,370	1,730 *	13,500	2,990	8,050
8	2,040	141	869	2,340	3,220	2,040 *	2,680	1,390 *	3,180	13,000	2,330 *	7,880
9	2,380 *	158	908	2,600	3,430 *	1,310	2,760	1,400	2,740	15,200 *	2,340	7,660
10	2,610 *	189	862	2,770 *	3,570	777	2,790	1,400	3,850	18,000 *	2,400	6,710
11	2,720	192	738	2,780	3,570	773	2,680	1,350	2,720 *	18,600 *	1,200	5,440
12	2,610	477	936	1,580	3,520	1,140	2,560	1,150	3,430	18,400 *	1,260	4,730 *
13	2,460	664 *	1,080 *	756	3,460	1,220	2,600 *	1,190	1,470	16,400 *	2,030 *	4,730
14	2,270	512	1,150	406	5,760	1,230	2,700	1,420	509	12,100	2,150	4,940
15	2,970	345	1,060	316	6,320 *	1,210	2,600	1,430 *	406 *	11,100	4,590	5,010
16	3,280	289	1,080	381	3,810	1,190	2,540	1,420	352	13,700 *	6,070	4,520
17	2,560	300	1,010	699 *	3,450 *	1,210	2,500	1,460	319	11,400	6,600 *	3,710
18	3,420	300	1,180	731	3,490	1,570	2,420	1,730	424	9,820 *	6,780	3,340
19	2,010	308	1,260	749	3,490	1,590	2,380	1,840	410	8,760	6,960	3,200 *
20	477	291	1,350 *	802	3,570	1,420 *	2,110 *	1,900	385	5,260	7,130	3,130
21	371	272	1,500	802	4,060	1,300	2,140	1,780	364 *	7,460	7,100 *	3,100
22	406	262	1,750	802	4,410 *	1,510	2,200	1,340	353	6,530	7,100	3,140
23	350	247	1,720	1,230	4,100	1,690	2,190	1,170 *	352	5,790 *	6,920	3,220
24	335 *	293	1,650	1,610 *	3,780 *	1,840	2,040	1,060	1,590	5,120	7,030	3,570
25	283	302	1,560	1,730	3,710	2,000	1,840 *	971	4,940	4,380	7,240	4,270
26	300	480	1,680	1,890	3,670	2,360	1,720	823	16,100 *	4,100 *	7,590	3,710
27	403	480 *	1,930 *	2,030	4,060	2,570 *	1,410	855	21,200 *	4,170	7,700	3,460
28	477	491	1,900	2,170	3,880	2,650	1,420	999	17,400 *	4,270	7,310	3,480 *
29	618		1,950	2,170	3,850 *	2,700	1,120	1,000	20,400 *	4,310	7,520 *	3,920
30	766		1,980	2,830	3,880	2,700	1,340	816	20,500	3,960 *	8,830	5,330
31	607 *		2,040		3,960		1,780	653 *		3,740		5,510
Sum	49,693	8,777	36,784	49,954	114,150	64,290	71,530	38,406	129,869	337,960	150,280	172,540

Month	Current Year 1978 Extreme Gage Feet High	Extreme Gage Feet Low	Extreme Second-Feet High Day	Extreme Second-Feet High	Extreme Second-Feet Low Day	Extreme Second-Feet Low	Average Second-Feet	Total Acre-Feet	Period 1954-1978 Acre-Feet Average	Maximum	Minimum
Jan.	85.43	79.92	18	4,870	121	283	1,600	98,582	103,832	325,550	1,090
Feb.	80.71	79.63	13	724	1 3	124	314	17,406	76,521	276,639	830
Mar.	82.58	79.89	31	2,070	3	265	1,190	72,924	76,244	235,500	339
Apr.	84.02	79.79	11	3,400	13	212	1,670	99,090	104,658	319,470	3,160
May	91.77	82.94	15	10,200	1	2,330	3,670	226,408	132,266	418,591	35,360
June	89.50	80.45	4	7,980	10	572	2,140	127,475	156,813	368,852	7,850
July	83.73	80.97	3	2,960	29	911	2,310	141,898	120,605	567,022	2,000
Aug.	83.50	80.25	18	2,770	31	459	1,240	76,174	149,362	1,207,862	943
Sept.	99.21	79.72	27	24,700	16	247	4,340	257,502	270,382	1,862,856	3,920
Oct.	99.48	85.04	1 1	20,500	31	3,600	10,900	670,264	328,244	2,326,000	1,730
Nov.	91.11	80.97	30	9,390	111	848	5,010	298,141	152,051	1,438,000	1,430
Dec.	91.67	84.32	3	9,960	121	2,860	5,580	342,235	113,834	540,100	1,500
	99.48	79.63		24,700		124	3,350	2,428,099	1,784,802	4,640,968	114,749
Yearly	Meters			Cubic Meters per Second				Thousands of Cubic Meters			
	30.32	24.27		700		3.50	95.0	2,995,028	2,201,532	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 northeastward 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 division, 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.

A total of 210,547 acre-feet (259,710,000 m^3) of flood flow was diverted through the floodway system in 1978.

BANKER FLOODWAY AT ANZALDUAS DAM NEAR MISSION, TEXAS

DESCRIPTION: Cableway, gravity well, concrete control weir, water-stage recorder, and selsyn-type transmitter, located on the right bank at latitude 26°08'30", longitude 98°19'20", about 0.2 river mile (0.3 km) from the point of diversion. The point of diversion is at river mile 171.1 (275.4 km), 0.8 river mile (1.3 km) upstream from Anzalduas Dam. The zero of the gage is at mean sea level, U. S. C. & G. S. datum. The crest of the weir is at elevation 106.5 feet (32.46 m) above mean sea level, U. S. G. & G. S. datum.
RECORDS: Based on 17 discharge measurements and a continuous record of gage heights during the flood period. Computations based on a stable control weir rating curve defined by meter measurements.
REMARKS: The transmitter relays gage height data to the Anzalduas control room.

Mean Daily Discharge in Second Feet 1978 - Period Summary

Sep. 27	1,970	Oct. 4 !	6,400	Oct. 11 !	7,710	Period	Maximum Gage - Feet	Date	Maximum Second-Feet	Total Acre-Feet
28 !	7,160	5	1,040	12 !	6,200					
29 !	8,670	6	56.6	13 !	3,770		109.76	Oct. 1	11,500	210,547
30 !	10,800	7 !	974	14 !	3,590	Sept. 27-				
Oct. 1 !	11,300	8	2,850	15	2,750	Oct. 15				
2	10,700	9	4,420				Meters		Cubic Meters per Second	Thous. of Cubic Meters
3 !	9,400	10 !	6,350	Total	106,150.6					
							33.45		326	259,710

MAIN FLOODWAY SOUTH OF WESLACO, TEXAS

DESCRIPTION: Gravity well and digital water-stage recorder located in the low-flow channel on the downstream side of the bridge on Farm Road No. 88 at latitude 26°06'40", longitude 97°59'30", about 3 miles (4.8 km) south of Weslaco, Texas, 25.4 channel miles (40.9 km) from the point of diversion from the Rio Grande, and 2.5 channel miles (4.0 km) upstream from the point where this floodway branches into the Arroyo Colorado and North Floodway. The zero of the gage is at mean sea level, U. S. C. & G. S. datum (I. B. & W. C. Survey, 1967).
RECORDS: Based on 14 discharge measurements and a continuous record of gage heights during the flood period. Computations by shifting control methods. Flood measurements are made from the highway bridge.
REMARKS: Besides floodwaters from the Rio Grande, the floodway carries local storm, drainage, and seepage flows.

Mean Daily Discharge in Second Feet 1978 - Period Summary

Sep. 28	620	Oct. 6 !	2,860	Oct. 14 !	4,220	Period	Maximum Gage - Feet	Date	Maximum Second-Feet	Total Acre-Feet
29 !	6,070	7	1,900	15	4,070					
30 !	8,320	8	1,200	16 !	2,800		65.73	Oct. 2	11,000	217,672
Oct. 1	10,300	9	3,070	17	1,150	Sept. 28-				
2 !	10,900	10 !	5,270	18 !	403	Oct. 18				
3 !	10,200	11 !	6,910				Meters		Cubic Meters per Second	Thous. of Cubic Meters
4 !	9,410	12 !	7,870							
5 !	6,000	13 !	6,200	Total	109,743		20.03		312	268,498

! Discharge measurement made on this day

RIO GRANDE FLOODWAY DISCHARGES
LOWER RIO GRANDE VALLEY

On the United States Side

NORTH FLOODWAY WEST OF MERCEDES, TEXAS

DESCRIPTION: Gravity well and water-stage recorder located in the pilot channel of the floodway on the upstream side of the old U. S. Highway No. 83 bridge at latitude 26°08'30", longitude 97°55'50" on the west city limit of Mercedes, Texas, and about 2 channel miles (3.2 km) from the point where the Main Floodway divides into the North Floodway and Arroyo Colorado. The zero of the gage is 0.16 foot (0.05 m) above mean sea level, U. S. C. & G. S. datum (I. B. & W. C. Survey, 1967).
RECORDS: Based on 13 discharge measurements and a continuous record of gage heights during the flood period. Computations by shifting control methods. Flood measurements are made from the highway bridge.
REMARKS: Besides a portion of Rio Grande floodwaters from the Main Floodway, the North Floodway carries local storm, drainage, and seepage flows.

Mean Daily Discharge in Second-Feet 1978 - Period Summary

Sep. 29	2,440	Oct. 6 !	1,310	Oct. 13 !	4,330	Period	Maximum Gage - Feet	Date	Maximum Second-Feet	Total Acre-Feet
30	5,470	7	501	14 !	2,340					
Oct. 1 !	7,260	8	43.1	15	1,640		63.29	Oct. 2	7,860	132,223
2 !	7,810	9	816	16 !	1,150	Sept. 29-				
3 !	7,390	10 !	2,830	17 !	92.3	Oct. 17	Meters		Cubic Meters per Second	Thous. of Cubic Meters
4 !	6,780	11 !	4,440							
5 !	4,340	12 !	5,680	Total	66,662.4		19.29		223	163,097

NORTH FLOODWAY NEAR SEBASTIAN, TEXAS

DESCRIPTION: Gravity well and water-stage recorder located in the pilot channel of the floodway on the downstream side of the northbound U. S. Highway No. 77 bridge at latitude 26°18'50", longitude 97°46'35", about 2 miles (3.2 km) south-southwest of Sebastian, Texas, and about 23 channel miles (37.0 km) from the point where the Main Floodway divides into the North Floodway and Arroyo Colorado. The zero of the gage is 0.37 foot (0.11 m) above mean sea level, U. S. C. & G. S. datum (I. B. & W. C. Survey, 1967).
RECORDS: Based on 14 discharge measurements and a continuous record of gage heights during the flood period. Computations by shifting control methods. Flood measurements are made from the highway bridge.
REMARKS: Besides a portion of Rio Grande floodwaters from the Main Floodway, the North Floodway carries local storm, drainage, and seepage flows.

Mean Daily Discharge in Second Feet 1978 - Period Summary

Sep. 30	1,420	Oct. 8	2,610	Oct. 16 !	2,240	Period	Maximum Gage - Feet	Date	Maximum Second-Feet	Total Acre-Feet
Oct. 1 !	4,450	9	1,720	17 !	1,610					
2 !	7,600	10 !	1,360	18	874		41.35	Oct. 3	8,480	151,468
3 !	8,420	11 !	2,660	19 !	581	Sept. 30-				
4 !	7,900	12 !	4,070			Oct. 19	Meters		Cubic Meters per Second	Thous. of Cubic Meters
5 !	7,320	13 !	5,350							
6 !	5,600	14 !	4,270				12.60		240	186,835
7	3,580	15	2,730	Total	76,365					

ARROYO COLORADO FLOODWAY SOUTH OF MERCEDES, TEXAS

DESCRIPTION: Cableway, bubbler gage, and digital water-stage recorder located on the left bank immediately upstream from the Hidalgo and Cameron Counties Water Control and Improvement District No. 9 El Fuste Siphon at latitude 26°07'45", longitude 97°54'45", near the south city limits of Mercedes, Texas and about 3.5 channel miles (5.6 km) from the point where the Main Flooday divides into the North Floodway and Arroyo Colorado. The zero of the gage is 51.88 feet (15.81 m) above mean sea level, U. S. C. & G. S. datum (I. B. & W. C. Survey, 1967).
RECORDS: Based on 11 discharge measurements and a continuous record of gage heights during the flood period. Computations by shifting control methods.
REMARKS: Besides a portion of Rio Grande floodwaters from the Main Floodway, the Arroyo Colorado carries local storm, drainage, and seepage flows.

Mean Daily Discharge in Second-Feet 1978 - Period Summary

Sep. 28	603	Oct. 6 !	1,720	Oct. 14 !	1,780	Period	Maximum Gage - Feet	Date	Maximum Second-Feet	Total Acre-Feet
29	1,790	7	1,660	15	1,750					
30 !	1,910	8	1,490	16 !	1,690		2.96	Oct. 2	2,060	72,664
Oct. 1	1,970	9	1,660	17	1,480	Sept. 28-				
2	2,030	10 !	1,860	18 !	1,000	Oct. 19	Meters		Cubic Meters per Second	Thous. of Cubic Meters
3	2,020	11 !	1,950	19 !	472					
4 !	2,010	12 !	2,020				0.90		58.3	89,631
5	1,860	13 !	1,910	Total	36,635					

! Discharge measurement made on this day

RIO GRANDE FLOODWAY DISCHARGES
LOWER RIO GRANDE VALLEY

On the United States Side

ARROYO COLORADO FLOODWAY SOUTH OF HARLINGEN, TEXAS

DESCRIPTION: Gravity well and water-stage recorder located in the low-flow channel on the downstream side of the south service road bridge for U. S. Highway No. 83 at latitude 26° 10'20", longitude 97° 41'55", on the south city limit of Harlingen, Texas, and about 18 channel miles (29.0 km) from the point where the Main Floodway divides into the North Floodway and Arroyo Colorado. The zero of the gage is at mean sea level, U. S. C. & G. S. datum (I. B. & W. C. Survey, 1967).

RECORDS: Based on 4 discharge measurements and a continuous record of gage heights during the flood period. Computations by shifting control methods. Flood measurements are made from the highway bridge.

REMARKS: Besides a portion of Rio Grande floodwaters from the Main Floodway, the Arroyo Colorado carries local storm, drainage, and seepage flows.

Mean Daily Discharge in Second-Feet 1978 - Period Summary

Sep. 28	489	Oct. 6	# 2,570	Oct. 14	1,910	Period	Maximum Gage - Feet	Date	Maximum Second-Feet	Total Acre-Feet
29	1,250	7	# 2,840	15 !	1,780					
30	1,800	8	# 2,400	16	1,750		14.20	Oct. 7	# 2,990	80,529
Oct. 1	1,990	9	1,850	17 !	1,630					
2	2,010	10	1,900	18	1,380	Sept. 28-				
3	2,060	11 !	2,000	19 !	891	Oct. 19	Meters		Cubic Meters per Second	Thous. of Cubic Meters
4	2,050	12	2,000							
5	2,040	13	2,010	Total	40,600		4.33		# 84.7	99,333

! Discharge measurement made on this day # Includes local storm flow

RIO GRANDE FLOODWAY DISCHARGES
LOWER RIO GRANDE VALLEY

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 approximately 38 miles (61.2 km) downstream from Anzalduas Dam and, when necessary, through Anzalduas Canal located at Anzalduas Dam. Floodwaters were diverted through Retamal Floodway and Anzalduas Canal in 1978.

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.

A total of 100,144 acre-feet (123,526,000 m^3) of flood flow was diverted through Retamal Floodway in 1978. In addition, 111,414 acre-feet (137,428,000 m^3) of flood flow was diverted through Anzalduas Canal during the period September 27 through October 15, 1978.

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

RETAMAL FLOODWAY AT RETAMAL DAM NEAR PROGRESO, TAMAULIPAS

DESCRIPTION: Concrete control weir of 106,000 second-foot (3,000 m^3/sec) capacity located at latitude 26°02'20", longitude 98°02'10", about 0.2 river mile (0.3 km) from the point of diversion. The point of diversion is at river mile 133.2 (214 km), 0.8 river mile (1,200 m) upstream from Retamal Dam, and 1,115.6 river miles (1,795.4 km) downstream from the American Dam at El Paso, Texas. The zero of the gage is at 79.89 feet (24.35 m) above mean sea level, U. S. C. & G. S. datum.
RECORDS: Based on 11 discharge measurements and hourly gage height readings during the flood period. Computations by shifting control methods due principally to an irrigation ditch located across the floodway downstream from the concrete weir which acted as a shifting control.
REMARKS: Retamal Floodway was used for the first time in 1976.

Mean Daily Discharge in Second Feet 1978 - Period Summary

Sep. 27	1,080	Oct. 3 !	5,260	Oct. 12 !	5,580	Period	Date	Maximum Second-Feet	Total Acre-Feet
28 !	1,890	4 !	724	13 !	4,240				
29 !	4,410	5	0	14 !	939	Sept. 27-Oct. 14	Oct. 1	8,300	100,144
30 !	5,330	9	0						
Oct. 1	7,350	10 !	1,850					Cubic Meters per Second	Thous. of Cubic Meters
2 !	7,840	11 !	3,990						
				Total	50,483			235	123,526

! Discharge measurement made on this day

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 1978, 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 1978 in this river reach was 242,496 acre-feet (299,119,000 m^3), or 20.8% of the total water diverted from the Rio Grande below Falcon Dam. About 94% 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.	1,120 (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-Feet 1978 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	33.3	19.3	298	427	654	698	676	455	295	0	143	68.6
2	157	16.1	295	383	656	751	466	359	227	42.8	65.2	180
3	458	4.5	273	590	637	661	607	469	40.3	42.1	112	69.6
4	558	0	132	577	647	458	584	380	199	108	31.4	300
5	557	0	71.6	615	688	497	626	326	240	0	30.7	438
6	450	0	196	621	676	360	637	223	179	125	71.2	411
7	262	0	277	641	619	233	721	309	158	0	75.3	169
8	249	12.0	295	510	626	362	710	466	248	0	213	79.7
9	487	16.9	312	316	684	371	630	512	176	115	286	80.3
10	491	37.6	294	552	702	224	694	489	31.5	0	280	75.2
11	537	0	271	523	697	37.8	652	356	141	32.9	149	127
12	523	0	87.8	354	704	375	662	249	39.1	99.3	58.9	318
13	519	159	360	410	679	442	646	129	138	129	248	454
14	424	199	443	323	696	461	676	381	183	7.3	247	439
15	218	84.0	462	152	745	506	649	424	92.5	7.3	134	351
16	482	54.9	482	19.5	744	528	437	447	73.8	238	350	276
17	561	123	522	296	760	474	591	458	.7	248	483	103
18	224	3.9	465	399	740	242	632	501	130	210	374	300
19	37.1	0	390	421	775	587	662	406	301	258	103	332
20	98.9	12.4	533	450	717	567	694	104	297	440	346	343
21	0	50.5	546	471	692	576	706	390	302	476	441	332
22	0	59.9	546	407	710	612	657	322	305	474	232	284
23	0	135	564	314	732	662	378	281	285	484	15.9	103
24	0	150	558	438	736	589	524	261	224	313	156	10.5
25	0	71.9	416	486	744	412	547	272	95.3	289	50.1	10.5
26	17.0	5.3	184	462	776	520	558	182	44.2	347	11.3	318
27	16.3	127	581	526	762	641	534	73.3	43.0	335	83.4	362
28	2.6	256	597	596	717	683	519	225	29.5	189	129	244
29	2.6		612	592	657	737	383	349	10.9	111	65.3	248
30	136		603	576	686	730	204	380	.6	109	31.0	41.7
31	125		623		697		545	296		180		41.6
Sum	7,625.8	1,598.2	12,289.4	13,447.5	21,755	14,996.8	18,207	10,474.3	4,529.4	5,409.7	5,015.7	6,909.7

	Current Year 1978								Period 1957-1978		
Month	Average Rainfall Inches**		Ø Extreme Second-Feet				Average Second-Feet	Total Acre-Feet	Acre-Feet		
	1957-1978	1978	Day	High	Day	Low			Average	Maximum	Minimum
Jan.	1.52	3.77	17	561	!21	0	246	15,126	11,681	34,959	723
Feb.	1.23	.58	28	256	! 4	0	57.1	3,170	9,822	28,535	1,140
Mar.	.71	.04	31	623	5	71.6	396	24,376	15,808	36,100	1,050
Apr.	1.53	1.00	7	641	16	19.5	448	26,673	18,609	39,277	3,630
May	2.41	.38	26	776	7	619	702	43,150	22,051	43,150	817
June	2.90	1.46	2	751	11	37.8	500	29,746	27,284	44,541	5,336
July	1.75	.37	7	721	30	204	587	36,113	21,611	41,100	6,597
Aug.	2.17	2.42	9	512	27	73.3	338	20,775	15,816	27,542	7,452
Sept.	4.57	5.74	22	305	30	.6	151	8,984	11,784	28,000	3,214
Oct.	3.00	4.13	23	484	! 1	0	175	10,730	13,519	29,215	2,059
Nov.	1.27	.36	17	483	26	11.3	167	9,948	10,295	22,818	1,015
Dec.	1.05	1.23	13	454	!24	10.5	223	13,705	10,146	18,097	1,852
Yearly	24.11	21.48		776		0	335	242,496	188,426	242,496	121,008
	Millimeters			Cubic Meters per Second				Thousands of Cubic Meters			
	612	546		22.0		0	9.49	299,119	232,423	299,119	149,263

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

RIO GRANDE AT PROGRESO, TAMAULIPAS
NEAR PROGRESO, TEXAS

DESCRIPTION: Gravity well, water-stage recorder, and digital transmitter located on the downstream side of the center pier of the Progreso International Bridge at latitude 26°03'40", longitude 97°57'00", and river mile 123.4 (198.6 km); 0.8 river mile (1.3 km) downstream from the Progreso pumping plant, 2 miles (4 km) south of Progreso, Texas, and 47.0 river miles (75.6 km) downstream from Anzalduas Dam. Meter measurements are made from the bridge. An auxiliary gage well and water-stage recorder located about 300 feet (91 m) upstream from the bridge are used when the low-flow channel shifts to the left bank. The zero of the gage at both recorders is at mean sea level, U. S. C. & G. S. datum.

RECORDS: Based on 17 discharge measurements during the year, 14 by the Mexican Section and 3 by the United States Section of the Commission, and a continuous record of gage heights. Computations by shifting control methods. Records available: December 1952 through August 24, 1953; and December 1953 through April 30, 1978.

REMARKS: Except during 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, 151.4 miles (243.7 km) upstream. Excessive upstream flood flows are partly diverted into the United States floodway system inlet at Anzalduas Dam and through Retamal Heading of the Mexican floodway system before reaching this station. The transmitter relays gage height data upon interrogation by telephone via commercial circuits. Prior to January 1, 1969, the zero of the gage was 52.56 feet (16.02 m) above mean sea level, U. S. C. & G. S. datum. This station was discontinued May 1, 1978.

EXTREME FLOWS FROM RECORDS: Momentary: Max. 60,700 second-feet (1,720 m^3/sec) on September 26, 1967 with a gage height of 24.84 feet (7.57 m). Min. no flow several days in June, July, and August 1953.

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

Daily:	Max. 48,400 (1,370)	Sept. 26, 1967	Min. 0	Frequently	1953
Monthly:	Max. 22,400 (634)	Oct. 1971	Min. 5.1 (0.15)	June	1953
Yearly:	Max. 4,560 (129)	1971	Min. 666 (18.9)		1957

Mean Daily Discharge in Second-Feet 1978 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	1,350	512	194	1,250								
2	1,380	445	141	1,380								
3	1,540	374	106	1,510								
4	1,520	290	141	1,610								
5	1,280*	265	494	1,560								
6	1,060*	261	530	1,640								
7	1,170	* 254	459	1,650								
8	1,420	247	494 *	1,570								
9	1,530	230	477	1,850								
10	1,590	222	487	2,110								
11	1,760	219	583	2,100 *								
12	1,890*	219	653	1,890								
13	1,850	* 374	699	858 *								
14	1,780	509	671	480								
15	1,850	* 438	664 *	318								
16	2,500	353	600	343								
17	2,340	328	558	388								
18	2,350	325	593	388								
19	3,200*	325	671	388								
20	2,320	321	759 *	388								
21	1,170	314	840	388								
22	770	300	1,040	392								
23	706	* 297	1,060	477								
24	675	290	1,020	759								
25	590	290	1,030	957								
26	452 *	328	1,090	1,100								
27	533	466	1,320	1,230								
28	593	* 473	1,240 *	1,320 *								
29	667		1,190	1,390								
30	650		1,180	1,800								
31	558		1,200									
Sum	43,044	9,269	22,184	33,484								

Month	Current Year 1978								Period 1954-1978		
	Extreme Gage Feet		Extreme Second-Feet				Average Second-Feet	Total Acre-Feet	Acre-Feet		
			High		Low						
	High	Low	Day		Day				Average	Maximum	Minimum
Jan.	60.24	55.25	19	3,370	!25	441	1,390	85,386	102,211	339,405	17,340
Feb.			14	516	!11	212	331	18,387	76,407	371,900	12,620
Mar.			27	1,320	3	106	717	44,044	67,435	379,400	4,990
Apr.			10	2,110	15	318	1,120	66,452	92,127	295,990	32,060
May											
June											
July											
Aug.											
Sept.											
Oct.											
Nov.											
Dec.											
Yearly	Meters		Cubic Meters per Second					Thousands of Cubic Meters			

* Discharge measurement made on this day ! 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 1978, 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 1978 in this river reach was 493,372 acre-feet (608,574,000 m^3), or 42.4% of the total water diverted from the Rio Grande below Falcon Dam. About 99% 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.	2,750 (77.9)	June 15, 1965	Min. 0		Occasionally March 1957 1968
Monthly:	Max.	2,080 (58.9)	June 1960	Min. 53.5 (1.52)		
Yearly:	Max.	726 (20.6)	1965	Min. 367 (10.4)		

Mean Daily Discharge in Second-Feet 1978 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	831	300	58.8	996	1,350	2,180	1,560	422	281	454	411	381
2	910	248	86.6	837	1,420	2,150	1,430	422	125	448	384	454
3	892	49.9	134	968	1,430	1,770	1,600	422	77.3	446	282	473
4	993	57.2	57.6	1,090	1,410	1,360	1,620	410	76.2	588	96.2	427
5	1,130	16.1	26.3	1,190	1,550	1,630	1,700	341	124	592	32.9	512
6	1,080	88.9	304	1,250	1,610	1,630	1,630	202	266	459	84.4	540
7	841	57.8	353	1,250	1,510	1,160	1,460	601	331	452	86.5	568
8	798	85.7	318	1,230	1,750	655	1,450	760	147	438	87.5	370
9	1,140	68.5	569	1,080	1,810	725	1,580	763	101	439	108	178
10	1,300	73.1	633	1,130	1,710	369	1,630	783	68.8	774	120	161
11	1,240	94.8	520	1,050	1,780	288	1,620	830	76.6	692	116	120
12	1,380	0	463	501	1,590	360	1,600	952	27.5	448	113	286
13	1,420	219	629	254	1,650	519	1,650	888	34.1	447	304	464
14	1,380	294	706	302	1,460	581	1,250	820	156	446	426	597
15	1,230	289	670	258	1,730	615	1,380	944	299	433	452	523
16	1,340	215	500	20.9	1,660	649	1,380	935	159	427	446	323
17	1,560	93.4	439	79.7	1,700	552	1,340	947	76.9	426	423	306
18	555	120	374	279	1,550	357	1,340	944	76.8	389	198	284
19	69.2	17.0	262	363	1,860	602	1,370	988	112	469	130	305
20	126	118	602	372	1,860	667	1,400	1,060	99.6	611	234	134
21	180	83.9	684	401	1,880	702	1,220	1,080	126	361	297	132
22	13.4	78.4	694	380	1,850	721	1,070	1,020	155	213	239	205
23	35.2	75.6	896	345	2,160	840	712	932	81.4	449	94.8	84.9
24	68.5	69.1	967	658	2,200	928	854	664	0	671	167	35.6
25	82.2	40.0	921	865	2,020	953	943	637	517	629	130	0
26	117	17.7	670	887	2,040	1,140	911	609	784	629	151	444
27	210	201	927	1,000	2,180	1,290	901	589	720	359	345	463
28	169	242	1,030	1,080	2,200	1,550	640	631	753	30.6	430	239
29	125		1,040	1,160	2,230	1,570	450	538	452	30.0	481	219
30	253		1,160	1,160	2,270	1,710	270	534	454	81.2	329	209
31	297		1,160		2,260		359	431		249		77.4
Sum	3,313.1		22,436.6		30,223		22,099		13,579.8		9,514.9	
	21,765.5		17,854.3		55,680		38,320		6,757.2		7,198.3	

Month	Current Year 1978 Average Rainfall Inches**		Ø Extreme Second-Feet				Average Second-Feet	Total Acre-Feet	Period 1957-1978 Acre-Feet		
			High		Low				Average	Maximum	Minimum
	1957-1978	1978	Day		Day						
Jan.	1.65	3.47	17	1,560	22	13.4	702	43,171	37,701	97,130	4,872
Feb.	1.53	.97	1	300	12	0	118	6,571	20,706	49,859	4,807
Mar.	.77	.02	30	1,160	5	26.3	576	35,413	25,373	54,200	3,280
Apr.	1.64	1.45	! 6	1,250	16	20.9	748	44,502	42,929	98,523	12,900
May	2.75	.12	30	2,270	1	1,350	1,800	110,440	52,597	110,440	9,277
June	3.34	1.74	1	2,180	11	288	1,010	59,946	69,013	123,000	14,674
July	2.01	.94	5	1,700	30	270	1,240	76,007	38,756	77,132	11,307
Aug.	2.79	4.99	21	1,080	6	202	713	43,833	28,786	64,223	12,736
Sept.	5.46	7.50	26	784	24	0	225	13,403	22,434	59,400	4,308
Oct.	3.30	3.98	10	774	29	30.0	438	26,935	22,759	58,164	5,146
Nov.	1.62	.44	29	481	5	32.9	240	14,278	18,666	44,359	4,853
Dec.	1.28	2.29	14	597	25	0	307	18,873	21,363	37,500	6,663
	28.14	27.91		2,270		0	681	493,372	401,083	525,771	266,680
Yearly	Millimeters		Cubic Meters per Second					Thousands of Cubic Meters			
	715	709		64.3		0	19.3	608,574	494,736	648,539	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 29 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 1978.

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^3/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 1978 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	412	318	202	88.1	189	710	150	646	250	12,900	3,410	8,130
2	386	284	220	317	468	791	426	492	534	12,900	3,200	8,870
3	474	353	223	410	339	966	645	356	755	12,800*	3,240 *	8,880
4	515	412	206	364	231	1,920	591	* 465	516	12,800	3,340	8,780
5	* 223	381	201	211	* 324	3,380	465	217	454	13,100	3,430	8,600 *
6	90.4	291	* 195	149	245	1,400	283	194	365	13,400	3,430	8,220
7	87.6	281	150	161	401	831	* 160	263	* 229	13,500	3,330	7,840
8	467	276	153	119	612	* 1,400	253	191	375	13,300	3,130	7,460
9	414	254	127	259	464	1,070	264	178	1,790	13,400	2,570	7,400
10	231	240	95.0	1,040	481	819	391	146	3,120	13,300*	2,310	7,220
11	340	196	84.2	778	612	545	398	115	3,300	13,500*	2,390	6,710
12	434	290	80.1	1,050	743	341	359	87.9	2,900	13,600	1,840	5,630
13	297	* 296	72.6	1,420	880	228	223	62.9	2,820	13,500*	1,200	4,500
14	204	204	70.4	678	809	117	343	62.8	1,980	13,500	1,470	4,040
15	261	198	66.5	220	2,470	107	467	67.8	647	13,300	1,720	4,010 *
16	581	179	* 62.6	149	3,170	89.0	452	70.7	294	12,800*	3,270 *	4,230
17	687	177	56.1	264	1,410	68.6	557	66.0	300	12,600	4,470	4,190
18	807	231	53.0	250	594	78.4	518	* 59.6	287	11,100*	5,250	3,710
19	2,280	305	61.0	131	480	428	369	61.9	263	9,440	5,820	3,200
20	2,410	305	133	104	462	313	* 261	184	251	8,260	6,270	2,940
21	1,130	320	91.2	* 81.4	516	256	223	594	* 262	7,820	6,270	3,010
22	621	279	84.3	62.0	923	* 111	205	536	378	6,780	6,150	2,820
23	546	258	170	51.2	1,090	82.4	633	357	555	5,930	6,460	2,980
24	488	242	147	46.7	755	71.1	849	299	734	4,870	6,540	3,250
25	405	227	109	49.6	606	72.2	610	271	895	4,110	6,550	3,620
26	* 303	263	218	49.7	* 551	148	390	204	3,680	3,560	6,800	3,900
27	149	274	431	53.7	413	348	280	176	10,900	3,300*	7,080	3,380
28	143	212	280	54.5	597	279	188	144	12,900 *	3,570	7,060	3,270
29	298		166	60.9	628	226	297	216	13,000 *	3,860	6,820	3,300
30	383		124	66.7	653	248	503	322	13,000	3,920	6,970	3,690
31	314		93.5		610		553	290		3,750		4,640
Sum	7,546		8,738.5		17,443.7			7,395.6		304,470		162,420
	16,381.0		4,425.5		22,726		12,306		77,734		131,790	

Current Year 1978 — Period 1954-1978

Month	Extreme Gage Feet		Extreme Second-Feet				Average Second-Feet	Total Acre-Feet	Acre-Feet		
			High		Low						
	High	Low	Day		Day				Average	Maximum	Minimum
Jan.	40.77	34.33	20	2,820	7	76.7	528	32,491	55,350	319,002	2,920
Feb.	35.18	34.41	4	457	11	117	270	14,967	50,337	363,000	3,380
Mar.	35.25	34.24	27	483	117	47.6	143	8,778	37,686	360,000	2,560
Apr.	37.91	34.20	13	1,700	23	40.5	291	17,333	44,934	251,919	11,500
May	42.82	34.34	16	3,610	1	77.1	733	45,076	57,557	349,091	16,873
June	42.96	34.27	5	3,650	17	55.9	581	34,599	54,664	159,560	16,100
July	35.89	34.46	24	883	1	122	397	24,409	72,536	447,886	4,690
Aug.	35.57	34.27	1	704	118	55.5	239	14,669	95,845	827,107	3,100
Sept.	55.86	34.69	30	13,100	7	191	2,590	154,183	164,021	638,757	7,710
Oct.	56.55	42.30	7	13,700	27	3,140	9,820	603,907	210,387	880,859	3,840
Nov.	49.01	36.00	30	7,340	13	1,040	4,390	261,402	94,830	662,000	5,640
Dec.	51.36	40.20	2	9,110	22	2,720	5,240	322,155	84,858	479,000	2,430
Yearly	56.55	34.20		13,700		40.5	2,120	1,533,969	1,023,005	2,743,424	145,520
	Meters			Cubic Meters per Second				Thousands of Cubic Meters			
	17.24	10.42		388		1.15	60.0	1,892,151	1,261,877	3,384,014	179,499

** Period 1954-1978 * 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 1978, 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 1978 in this river reach was 118,732 acre-feet (146,456,000 m^3), or 10.2% of the total water diverted from the Rio Grande below Falcon Dam. About 89% 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 1978 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	78.1	157	92.1	116	96.1	663	181	162	44.7	20.0	101	35.6
2	177	114	64.6	94.7	264	623	179	165	42.8	20.0	116	38.3
3	248	72.5	53.6	392	353	619	355	170	42.8	25.0	91.4	35.0
4	284	33.8	48.1	366	215	645	452	111	225	21.3	40.9	29.0
5	290	34.8	49.2	332	209	582	486	100	331	21.3	38.6	70.0
6	228	74.4	49.9	284	380	574	443	101	331	26.1	41.0	72.3
7	111	61.2	55.0	172	370	512	310	104	188	22.3	36.0	34.9
8	135	33.4	47.2	200	367	263	126	100	45.7	69.7	43.5	37.3
9	314	32.6	43.4	178	424	269	146	100	45.7	72.7	50.1	45.8
10	435	96.8	45.2	336	475	157	254	88.0	23.0	82.0	55.0	43.9
11	314	56.1	34.5	382	452	139	310	95.1	23.3	83.2	52.5	157
12	329	30.7	22.5	220	445	212	296	91.9	41.9	83.2	55.3	160
13	278	29.7	33.3	166	405	196	290	88.2	49.0	82.0	53.6	148
14	62.8	29.6	66.6	140	443	245	233	101	108	82.0	48.5	168
15	51.5	34.0	60.8	81.9	437	225	122	93.2	88.8	82.0	47.7	119
16	298	38.1	91.7	61.9	460	209	124	92.5	66.6	82.9	50.0	52.7
17	483	58.8	115	62.2	471	130	395	89.8	56.0	89.0	53.7	52.4
18	287	31.8	49.1	121	502	113	547	84.7	92.3	105	42.7	53.2
19	87.1	31.7	60.8	152	487	174	466	86.0	117	104	39.5	45.1
20	102	121	102	119	398	186	401	85.1	110	53.5	89.1	86.1
21	84.2	161	136	60.2	448	227	305	301	93.4	54.0	148	160
22	51.4	108	150	34.5	484	235	90.3	434	36.5	50.2	83.5	133
23	116	82.9	119	31.1	631	176	111	447	32.0	50.2	34.0	63.7
24	126	32.6	187	52.0	643	110	322	263	32.0	48.6	84.5	38.8
25	117	85.8	172	42.3	639	107	450	97.5	20.9	48.6	33.8	35.5
26	235	40.3	82.0	43.2	594	151	454	72.6	70.0	110	33.8	34.2
27	218	39.7	149	39.5	570	137	398	52.4	70.0	108	35.1	48.4
28	116	84.8	338	39.9	520	252	350	74.8	70.0	47.6	30.4	30.9
29	49.4		265	46.9	636	288	249	102	70.0	34.5	74.3	36.1
30	166		196	46.9	651	266	106	106	70.0	106	38.4	35.3
31	177		135		661		121	101		37.5		29.9
Sum	6,048.5	1,807.1	3,113.6	4,413.2	14,130.1	8,685	9,072.3	4,159.8	2,637.4	1,922.4	1,741.9	2,129.4

Month	Current Year 1978 Average Rainfall Inches** 1957-1978	1978	Ø Extreme Second-Feet High Day	High	Low Day	Low	Average Second-Feet	Total Acre-Feet	Period 1957-1978 Acre-Feet Average	Maximum	Minimum
Jan.	1.78	3.23	17	483	29	49.4	195	11,997	11,128	24,568	1,290
Feb.	1.76	1.02	21	161	14	29.6	64.5	3,584	7,364	20,626	1,028
Mar.	.63	0	28	338	12	22.5	100	6,176	7,023	15,200	705
Apr.	1.81	2.27	3	392	23	31.1	147	8,753	11,382	27,753	2,180
May	2.62	.05	31	661	1	96.1	456	28,027	15,082	28,027	2,561
June	3.40	2.47	1	663	25	107	290	17,226	17,988	32,279	6,690
July	1.96	2.11	18	547	22	90.3	293	17,995	10,950	23,145	3,687
Aug.	2.92	3.23	23	447	27	52.4	134	8,251	8,312	14,556	4,061
Sept.	5.71	8.82	! 5	331	25	20.9	87.9	5,231	5,736	12,600	876
Oct.	3.29	4.12	26	110	! 1	20.0	62.0	3,813	5,676	11,300	1,591
Nov.	1.55	.62	21	148	28	30.4	58.1	3,455	4,638	9,021	1,796
Dec.	1.45	2.67	14	168	4	29.0	68.7	4,224	5,972	11,200	2,014
Yearly	28.88	30.61		663		20.0	164	118,732	111,251	161,503	73,788
	Millimeters		Cubic Meters per Second					Thousands of Cubic Meters			
	734	777		18.8		0.57	4.64	146,456	137,228	199,214	91,018

Ø Mean daily ** United States side - average of several stations in the reach ! 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 29 discharge measurements during the year and a continuous record of gage heights. Computations by shifting control methods. Records available: 1934 through 1978.

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^3/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 1978 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	214	216	194	21.2	17.9	33.4	38.6	329	214	12,100 *	3,750	7,610
2	326	214	155	21.8	7.4	102	40.2	373	205	12,400 *	3,690	8,320
3	197	236	172	22.7	5.6	193	88.4	320 *	387	12,400 *	3,660	8,880
4	198	289	184	42.5	11.0	370	163	192	611	12,200 *	3,600	9,100 *
5	* 259	386	185	85.5	8.6	1,490	160	240	289	12,300	3,610	9,150
6	147	366	181	133	12.9	2,170	76.6	171	214	12,600	3,640	8,810
7	107	291	* 198	172	9.7	960	40.3	102	162 *	12,900	3,600	8,250
8	99.1	257	170	242	7.5	970	17.6	138	217	12,900	3,460	7,730
9	133	264	143	343	24.9	1,150	9.1	118	682	12,700	3,130	7,550
10	134	* 221	125	458	48.5	890	20.8	95.2	2,060	12,700 *	2,640	7,500
11	82.6	177	106	729	35.4	710	32.9	74.1	2,540	12,700 *	2,420	7,190
12	66.0	204	97.2	688	86.0	495	52.5	56.6	2,890	13,000 *	2,300	6,460
13	118	232	86.8	1,000	185	275	54.4	43.9	2,650	12,900	1,740	5,330
14	161	275	75.2	1,120	187	185	34.6	32.1	2,500	12,600 *	1,460	4,400
15	151	222	57.0	542	296	87.0	34.4	21.1	1,670	12,500	1,680	4,020
16	170	173	* 25.7	274	1,950	58.5	227	15.9	793	12,300 *	2,090	4,040
17	141	166	21.5	152	2,000	45.5	231	10.1	443	12,100	3,450 *	4,290
18	290	163	31.6	145	791	30.0	95.6	* 4.7	365	11,700 *	4,560	4,140 *
19	857	187	34.2	141	207	23.6	67.9	1.7	320	10,700	5,430	3,680
20	2,030	235	29.0	* 84.3	76.1	54.5	* 34.0	24.9	275	9,490	6,020	3,160
21	1,810	194	18.1	61.0	59.8	146	15.2	69.5	258 *	8,600	6,440	2,910
22	1,050	193	20.0	55.0	106	115	1.3	86.5	328	7,920	6,480	2,770
23	650	210	32.0	52.9	317	60.4	3.6	126	524	7,120	6,580	2,700
24	* 508	194	36.8	52.6	416	35.0	256	65.8	574	6,220	6,860	2,890
25	440	213	31.7	47.2	237 *	24.0	369	112	657	5,180	6,890	3,180
26	348	227	22.2	41.2	126	21.4	246	182	951	4,360	6,990	3,530
27	187	230	59.3	35.9	91.3	38.5	102	158	4,890	3,700 *	7,170	3,640
28	141	257	31.1	31.2	52.1	79.0	47.4	99.8	10,300	3,500	7,370	3,240
29	134		26.4	21.1	34.3	111 *	23.0	76.3	11,800 *	3,730	7,360	3,170
30	202		21.1	17.1	47.9	51.5	5.1	98.7	12,000 *	3,980	7,300	3,210
31	261		20.7		48.8		192	199		3,940		3,760
Sum	6,492		6,832.2		10,974.3		3,636.9		303,440		164,610	
	11,611.7		2,590.6		7,503.7		2,779.5		61,769		135,370	

Month	Current Year 1978 Extreme Gage Feet High	Extreme Gage Feet Low	Extreme Second-Feet High Day	Extreme Second-Feet High	Extreme Second-Feet Low Day	Extreme Second-Feet Low	Average Second-Feet	Total Acre-Feet	Period 1954-1978 Acre-Feet Average	Maximum	Minimum
Jan.	12.01	3.51	20	2,200	12	63.4	375	23,031	44,742	330,268	283
Feb.	6.00	4.55	5	393	16	148	232	12,877	44,750	362,000	1,060
Mar.	5.00	2.72	1	222	21	16.9	83.6	5,138	32,299	361,000	2,050
Apr.	13.68	2.94	14	2,800	30	14.8	228	13,551	32,355	219,590	875
May	12.87	2.97	16	2,490	3	4.7	242	14,883	41,149	340,106	4,140
June	12.77	3.38	6	2,430	26	20.0	366	21,767	35,765	143,517	2,430
July	5.94		25	392	122	0	89.7	5,513	62,431	437,546	1,120
Aug.	6.01		2	405	20	0	117	7,214	86,191	812,033	218
Sept.	27.05	4.40	30	12,100	7	142	2,060	122,517	147,748	635,722	950
Oct.	28.06	15.42	12	13,100	28	3,400	9,790	601,864	197,425	887,207	756
Nov.	21.85	9.08	28	7,410	14	1,400	4,510	268,502	89,876	528,000	1,290
Dec.	24.13	13.25	5	9,220	122	2,660	5,310	326,499	82,416	480,000	524
Yearly	28.06			13,100		0	1,970	1,423,356	897,147	2,645,434	30,696
	Meters		Cubic Meters per Second					Thousands of Cubic Meters			
	8.55			371		0	55.8	1,755,710	1,106,631	3,263,143	37,740

** Period 1954-1978 * 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 1978, 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 1978 in this river reach was 2,495.0 acre-feet (3,078,000 m^3), 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		Frequently
Monthly:	Max. 23.4 (0.66)	June 1965	Min. 0		Occasionally
Yearly:	Max. 7.0 (0.20)	1965	Min. 0.7 (0.02)		1976

Mean Daily Discharge in Second-Feet 1978 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	1.2	0	0	0	0	11.5	5.0	3.0	0	0	5.7	0
2	1.2	0	0	0	0	8.5	5.0	3.0	0	0	5.7	0
3	6.1	0	0	0	0	7.0	5.0	1.7	0	0	0	0
4	4.9	0	0	0	6.7	7.0	3.8	0	0	1.0	0	0
5	6.4	0	0	0	6.7	12.9	3.8	0	0	1.0	0	0
6	6.4	0	0	4.7	6.7	18.2	1.7	0	0	1.0	0	0
7	6.4	0	0	4.7	6.7	18.2	1.7	0	0	1.0	0	0
8	6.4	0	2.4	4.7	8.6	24.0	1.7	0	0	1.0	0	0
9	6.4	0	2.4	4.7	6.0	19.3	1.7	6.4	0	0	0	0
10	9.1	0	2.4	4.7	5.9	14.2	4.3	4.5	0	0	0	0
11	5.7	0	2.4	4.7	6.0	14.2	7.0	4.5	0	0	0	0
12	5.7	0	0	0	10.0	18.1	6.9	4.5	0	0	0	0
13	5.2	0	0	0	10.0	15.1	2.6	0	0	0	0	0
14	5.2	0	0	3.4	10.0	9.1	16.6	0	0	0	0	0
15	3.9	0	0	3.4	20.2	9.1	23.2	0	3.2	0	0	0
16	5.7	0	0	3.4	18.3	7.6	19.0	0	3.2	0	0	0
17	5.7	0	0	3.4	19.4	7.6	20.0	1.7	3.2	0	0	0
18	1.2	0	0	0	19.4	15.3	22.6	3.6	3.2	0	0	0
19	1.2	0	0	0	21.5	17.8	19.6	1.8	0	0	0	0
20	3.7	0	0	0	18.6	13.9	23.2	1.8	0	0	0	0
21	2.6	0	0	0	9.4	18.4	23.2	1.8	0	0	0	0
22	2.6	0	0	0	14.1	9.5	12.0	0	0	0	0	0
23	0	0	0	0	11.4	11.5	5.9	0	0	0	0	0
24	0	0	0	0	11.3	10.5	8.0	0	0	0	0	0
25	0	0	0	0	12.7	10.5	2.1	0	0	0	0	0
26	0	0	0	0	15.0	13.7	4.5	6.3	0	0	0	0
27	0	0	2.7	0	11.1	9.7	4.5	3.4	0	8.0	0	3.8
28	0	0	2.7	0	11.1	8.3	4.5	3.4	0	5.5	0	3.8
29	0		2.7	0	11.1	3.8	4.5	0	0	4.3	0	3.9
30	0		2.7	0	7.5	5.0	4.5	0	0	4.3	0	3.9
31	0		0		11.5		4.5	0		5.7		0
Sum	102.9	0	20.4	41.8	326.9	369.5	272.6	51.4	12.8	32.8	11.4	15.4

Month	Current Year 1978								Period 1957-1978		
	Average Rainfall Inches**		Ø Extreme Second-Feet				Average Second-Feet	Total Acre-Feet	Acre-Feet		
			High		Low						
	1957-1978	1978	Day		Day				Average	Maximum	Minimum
Jan.	1.77	2.71	10	9.1	!23	0	3.3	204	404	1,275	0
Feb.	1.85	1.36		0		0	0	0	219	668	0
Mar.	.61	0	!27	2.7	! 1	0	.7	40.5	140	634	0
Apr.	1.97	2.58	! 6	4.7	! 1	0	1.4	82.9	227	953	0
May	2.51	.03	19	21.5	! 1	0	10.5	648	372	1,356	0
June	3.16	2.98	8	24.0	29	3.8	12.3	733	444	1,393	9.7
July	1.81	2.09	!15	23.2	! 6	1.7	8.8	541	194	778	0
Aug.	2.78	3.15	9	6.4	! 4	0	1.7	102	120	317	13.7
Sept.	5.66	9.48	!15	3.2	! 1	0	.4	25.4	54.3	190	0
Oct.	3.22	4.51	27	8.0	! 1	0	1.1	65.1	58.9	218	0
Nov.	1.57	.60	! 1	5.7	! 3	0	.4	22.6	67.0	252	0
Dec.	1.51	2.67	!29	3.9	! 1	0	.5	30.5	79.4	335	0
Yearly	28.42	32.16		24.0		0	3.4	2,495.0	2,379.6	5,036.3	543.2
	Millimeters		Cubic Meters per Second					Thousands of Cubic Meters			
	722	817		0.68		0	0.10	3,078	2,935	6,212	670

Ø Mean daily ** United States side - average of several stations in the reach ! 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 1978, 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 1,163,763 acre-feet (1,435,502,000 m^3). 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 26 & 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.	1,610 (45.6)		1976	Min.	880 (24.9)	1970

Mean Daily Discharge in Second-Feet 1978 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	1,150	609	828	1,970	2,940	4,340	2,850	1,570	1,060	534	994	903
2	1,430	426	818	1,690	3,160	4,260	2,350	1,440	586	598	844	868
3	2,120	207	805	2,860	3,310	3,310	3,220	1,510	333	674	796	755
4	2,390	103	490	2,870	3,200	2,740	3,330	1,430	709	833	958	1,270
5	2,550	63.3	386	2,960	3,380	3,270	3,470	1,070	1,160	743	995	1,560
6	2,340	217	1,200	2,900	3,260	3,190	3,450	799	1,180	680	536	1,590
7	1,580	169	1,330	2,870	3,020	2,410	2,980	1,620	967	556	616	1,370
8	1,470	182	1,380	2,470	3,740	1,730	2,730	2,000	625	590	835	980
9	2,560	169	1,590	2,080	3,900	1,750	2,700	2,950	548	712	948	520
10	2,890	332	1,520	2,840	3,860	956	3,310	2,000	204	946	963	435
11	2,770	172	1,190	2,510	3,920	624	3,450	1,850	346	982	635	988
12	2,870	42.8	873	1,540	3,750	1,320	3,420	1,540	250	725	354	1,360
13	2,740	502	1,700	1,170	3,330	1,600	3,430	1,410	414	817	746	1,600
14	2,160	634	1,820	1,100	3,110	1,750	3,020	1,940	633	662	872	1,720
15	1,770	583	1,800	706	3,680	1,770	2,680	2,100	684	619	831	1,440
16	2,670	487	1,690	319	3,650	1,760	2,390	2,160	448	1,030	1,180	883
17	3,140	452	1,610	1,000	3,680	1,420	3,210	2,170	268	1,030	1,260	696
18	1,270	224	1,120	1,330	3,750	931	3,300	2,100	540	1,040	765	1,080
19	305	115	913	1,520	3,920	1,800	3,250	1,780	883	1,230	432	1,180
20	368	444	1,910	1,520	3,490	1,940	3,470	1,570	884	1,490	1,030	1,090
21	300	522	2,140	1,480	3,450	2,110	3,080	2,420	927	1,080	1,210	1,120
22	88.6	471	2,140	1,230	3,790	2,140	2,330	2,470	810	920	854	974
23	205	637	2,390	1,000	4,290	2,380	1,620	2,350	509	1,480	348	346
24	215	534	2,400	1,790	4,380	2,060	2,550	1,840	328	1,490	591	130
25	251	335	1,940	2,090	4,160	1,910	2,770	1,750	873	1,450	409	103
26	447	152	1,310	2,180	4,110	2,550	2,810	1,230	1,040	1,570	390	1,120
27	584	717	2,460	2,330	4,000	2,820	2,750	963	1,030	1,790	927	1,080
28	316	944	2,810	2,420	3,800	3,250	2,160	1,540	895	459	1,060	730
29	202		2,770	2,220	4,270	3,370	1,560	1,550	604	364	1,130	598
30	620		2,730	2,150	4,390	3,380	997	1,570	584	639	871	400
31	658		2,630		4,480		1,700	1,290		772		254
Sum	10,445.1		57,145		68,841		53,082		27,906		29,125	
	44,429.6		50,693		115,370		86,341		20,328		23,054	

Month	Average Rainfall Inches**		Ø Extreme Second-Feet				Average Second-Feet	Total Acre-Feet	Acre-Feet		
			High		Low						
	1957-1978	1978	Day		Day				Average	Maximum	Minimum
Jan.	1.46	3.02	17	3,140	22	88.6	1,430	88,125	73,351	182,403	6,717
Feb.	1.32	.61	28	944	12	42.8	373	20,718	51,305	126,230	11,735
Mar.	.65	.02	28	2,810	5	386	1,640	100,548	68,888	140,050	6,280
Apr.	1.53	1.21	5	2,960	16	319	1,900	113,286	98,641	209,970	22,100
May	2.39	.80	31	4,480	1	2,940	3,720	228,833	115,281	228,833	14,071
June	2.97	1.83	1	4,340	11	624	2,290	136,544	140,847	259,000	37,427
July	1.71	1.00	15	3,470	30	991	2,790	171,255	93,099	178,000	31,502
Aug.	2.40	2.43	22	2,470	6	799	1,710	105,287	75,145	143,286	24,208
Sept.	4.30	6.04	5	1,180	10	204	678	40,320	54,642	136,000	12,709
Oct.	2.97	3.53	26	1,570	29	364	900	55,351	57,684	124,598	12,941
Nov.	1.27	.31	17	1,260	5	295	768	45,727	47,417	97,969	12,674
Dec.	1.06	1.62	14	1,720	25	103	940	57,769	50,025	84,500	14,934
Yearly	24.57	22.42		4,480		42.8	1,610	1,163,763	926,315	1,163,763	636,622
	Millimeters		Cubic Meters per Second						Thousands of Cubic Meters		
	624	569		127		1.21	45.6	1,435,502	1,142,610	1,435,502	785,536

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

OUTFALLS FROM SEWERS INTO THE RIO GRANDE
In Acre-Feet

EL PASO SEWAGE OUTFALL

This sewage enters the Rio Grande through the outfalls of the El Paso and Ascarate Sewage Plants, located 7.1 and 8.7 river miles, respectively, downstream from the American Dam. The outfall from the El Paso Plant consists of flows measured by a Parshall meter and estimates of amounts which bypass the meter. The effluent from the Socorro Plant, located 17.6 miles below American Dam, is discharged into ponds at the approximate rate of 10 c.f.s. When the ponds overflow, the effluent may enter either the Rio Grande or Riverside Canal. No record has been kept of the amount of this effluent entering the Rio Grande, and it is not included in the table below. All of the 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. Ascarate Sewage Plant was shut down August 31, 1978.

Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Yearly
1978	1,535	1,649	1,480	2,038	2,121	2,055	2,259	2,149	2,289	1,989	2,089	2,102	23,753
* Average	1,783	1,680	1,778	1,861	1,981	1,923	2,080	2,067	1,972	1,908	1,794	1,855	22,682

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
1978	175	169	181	167	199	181	212	227	229	202	195	195	2,332
* Average	86.4	78.4	87.8	77.2	87.3	93.9	96.0	110	102	106	107	101	1,133

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
1978	698	640	724	696	777	745	839	838	874	845	764	744	9,184
* Average	553	498	579	575	634	587	614	598	566	549	592	580	6,925

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
1978	941	958	878	734	778	822	893	1,140	1,158	1,191	1,094	1,063	11,650
# Average	943	845	852	817	995	869	866	827	920	1,077	1,062	1,112	11,185

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
1978	735	679	754	724	767	763	782	809	884	928	823	784	9,432
* Average	582	569	599	580	607	610	623	615	620	646	604	607	7,262

* Period averages are for past 10 years # Period 1976-1978

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 3,642 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, 69, 76, 78, 80, 82, and 83 herein. Population data for all cities are estimates based on the 1970 official census except for Falcon Villge (estimated by the International Boundary and Water Commission), and Del Mar and San Ignacio, which are based on utilities connections.

In the United States

Month	EL PASO (Pop. 410,000)				DEL RIO Ø (Pop. 32,500)			
	1978	Period 1969-1978			1978	Period 1969-1978		
		Average	Maximum	Minimum		Average	Maximum	Minimum
Jan.	0	0	0	0	416.1	401.4	495.1	332.3
Feb.	0	0	0	0	442.8	424.9	603.2	328.5
Mar.	0	276.8	829	0	759.6	614.6	759.6	397.8
Apr.	0	1,043.5	2,164	0	725.0	593.9	725.0	493.3
May	0	2,205.5	3,360	0	661.3	607.1	838.6	466.3
June	2,099	2,828.6	4,084	1,596	802.7	783.8	932.9	561.2
July	2,200	2,595.8	3,728	1,962	1,191.7	885.9	1,191.7	472.3
Aug.	2,067	2,814.1	3,850	1,748	871.6	847.3	1,236.9	500.8
Sept.	863	1,696.4	2,709	863	484.4	617.7	972.2	484.4
Oct.	0	230.4	540	0	485.5	487.4	650.6	376.8
Nov.	0	60.4	339	0	363.9	392.1	458.2	322.8
Dec.	0	29.3	131	0	360.3	393.4	444.3	313.3
Yearly	7,229	13,780.1	18,309	7,229	7,564.9	7,049.2	7,908.6	6,429.1

Month	EAGLE PASS (Pop. 24,000)				DEL MAR (Pop. 3,670)			
	1978	Period 1969-1978			1978	Period 1969-1978		
		Average	Maximum	Minimum		Average	Maximum	Minimum
Jan.	227.9	226.3	305.1	171.5	39.9	25.1	39.9	10.9
Feb.	243.6	217.8	331.9	167.2	40.0	28.7	51.1	12.8
Mar.	394.9	268.7	394.9	192.1	73.0	39.1	73.0	16.3
Apr.	407.7	270.0	407.7	215.6	78.3	44.9	78.3	27.2
May	372.7	295.6	400.1	212.0	84.6	48.6	84.6	21.2
June	433.0	341.5	433.0	281.5	76.5	52.8	76.5	26.6
July	582.1	383.7	582.1	281.9	95.5	51.1	95.5	32.1
Aug.	453.2	372.4	550.8	260.6	74.9	52.6	76.1	33.2
Sept.	269.7	286.4	478.7	224.3	45.1	43.2	71.1	32.5
Oct.	296.3	266.3	344.0	191.4	52.9	34.9	53.4	15.6
Nov.	242.6	224.8	278.6	183.9	45.0	32.0	54.2	19.9
Dec.	202.1	223.4	279.4	172.0	47.2	28.2	48.4	12.2
Yearly	4,125.8	3,376.9	4,125.8	2,820.3	752.9	487.2	752.9	310.1

Month	LAREDO (Pop. 85,800)				LAREDO POWER STATION			
	1978	Period 1969-1978			1978	Period 1969-1978		
		Average	Maximum	Minimum		Average	Maximum	Minimum
Jan.	1,042.0	993.8	1,135.0	769.9	134.1	69.4	134.1	40.1
Feb.	1,041.2	969.1	1,238.9	792.6	122.7	65.5	122.7	35.1
Mar.	1,576.6	1,219.2	1,576.6	947.0	181.3	79.6	181.3	41.9
Apr.	1,764.2	1,318.9	1,764.2	1,015.9	120.6	80.1	143.4	53.9
May	1,860.7	1,448.9	1,860.7	1,058.8	159.0	94.4	159.0	51.5
June	1,806.9	1,554.9	1,806.9	1,289.3	144.1	96.8	144.1	69.6
July	2,276.7	1,738.3	2,276.7	1,434.1	177.8	109.6	177.8	73.7
Aug.	1,872.6	1,671.0	2,125.7	1,339.0	137.2	110.5	173.8	73.8
Sept.	1,383.4	1,344.4	1,723.8	1,105.4	147.5	91.9	147.5	50.0
Oct.	1,476.6	1,275.6	1,476.6	898.8	215.7	87.7	215.7	45.0
Nov.	1,320.5	1,098.2	1,374.5	927.6	86.0	77.9	125.6	53.7
Dec.	1,330.9	1,036.5	1,330.9	877.0	61.2	72.1	120.9	53.5
Yearly	18,752.3	15,668.8	18,752.3	13,928.0	1,686.2	1,035.5	11,686.2	771.9

Ø Includes Laughlin Air Force Base

MUNICIPAL AND INDUSTRIAL WATER USES

In Acre-Feet

In the United States

Month	SAN YGNACIO (Pop. 1,070)				NEW ZAPATA (Pop. 3,600)			
	1978	Period 1969-1978			1978	Period 1969-1978		
		Average	Maximum	Minimum		Average	Maximum	Minimum
Jan.	3.6	2.8	3.8	1.6	46.9	34.2	46.9	21.3
Feb.	3.6	3.2	4.4	1.9	50.3	36.4	53.4	22.4
Mar.	5.2	4.0	5.2	2.2	77.1	46.3	77.1	32.1
Apr.	5.7	4.7	6.2	3.0	77.7	48.6	77.7	36.4
May	6.3	4.5	6.3	2.6	79.1	50.0	79.1	32.5
June	7.5	4.8	7.5	2.9	84.4	51.4	88.4	34.1
July	8.7	4.8	8.7	3.2	102.7	57.6	102.7	39.4
Aug.	6.6	5.2	8.5	3.2	80.2	56.7	89.5	31.5
Sept.	3.7	4.0	5.8	2.5	49.6	40.5	65.2	26.2
Oct.	4.9	3.4	4.9	1.8	51.3	39.0	57.0	20.0
Nov.	3.6	3.1	4.4	2.2	49.3	35.4	56.6	18.9
Dec.	4.1	3.0	4.1	1.7	48.8	34.6	53.3	20.7
Yearly	63.5	47.5	63.5	35.3	797.4	530.7	797.4	389.9

Month	FALCON VILLAGE (Pop. 150)				ROMA * (Pop. 2,900)			
	1978	Period 1969-1978			1978	Period 1969-1978		
		Average	Maximum	Minimum		Average	Maximum	Minimum
Jan.	8.9	8.3	9.9	5.5	61.6	36.5	61.6	18.0
Feb.	8.1	8.1	9.9	6.2	107.0	40.8	107.0	17.2
Mar.	11.5	10.2	12.9	8.3	72.9	43.5	72.9	21.7
Apr.	11.0	10.8	13.0	8.9	77.6	47.9	77.6	25.1
May	9.8	10.3	11.6	8.4	79.0	51.3	79.0	26.1
June	9.3	10.8	14.3	7.9	82.6	52.6	82.6	26.0
July	13.8	12.4	15.3	9.2	93.4	53.7	93.4	31.0
Aug.	10.3	11.7	14.5	9.7	85.9	52.4	85.9	27.1
Sept.	7.0	9.2	10.8	7.0	64.7	45.6	65.0	22.2
Oct.	7.3	8.9	10.5	6.2	59.1	42.0	72.8	22.3
Nov.	6.6	8.3	10.1	6.6	86.4	44.8	86.4	20.9
Dec.	11.6	8.8	11.6	5.7	60.0	40.7	66.1	18.9
Yearly	115.2	117.8	128.5	105.1	930.2	551.9	930.2	283.1

Month	RIO GRANDE CITY (Pop. 5,750)				BROWNSVILLE (Pop. 72,200)			
	1978	Period 1969-1978			1978	Period 1969-1978		
		Average	Maximum	Minimum		Average	Maximum	Minimum
Jan.	146.6	91.4	146.6	61.4	1,355.8	966.3	1,355.8	620.4
Feb.	127.5	85.7	127.5	55.9	1,132.7	939.7	1,132.7	602.4
Mar.	164.8	99.3	164.8	66.3	1,484.7	1,133.6	1,484.7	845.1
Apr.	167.5	104.2	167.5	67.5	1,366.3	1,136.6	1,413.9	910.0
May	177.6	107.5	177.6	62.9	1,708.5	1,199.1	1,708.5	795.3
June	186.5	113.5	186.5	59.2	1,667.8	1,206.5	1,667.8	752.5
July	203.2	131.5	203.2	69.4	2,068.6	1,325.6	2,068.6	936.1
Aug.	188.3	125.5	205.7	48.4	1,715.0	1,295.2	1,776.6	926.5
Sept.	134.7	112.0	148.9	77.3	1,391.6	1,114.9	1,534.0	835.5
Oct.	140.5	113.6	160.2	83.9	1,303.9	1,123.0	1,472.6	810.3
Nov.	116.6	101.9	155.0	80.7	1,235.4	1,043.3	1,341.9	798.5
Dec.	129.3	100.3	157.9	80.0	1,223.2	1,019.6	1,411.4	775.4
Yearly	1,883.1	1,286.4	1,883.1	918.9	17,653.5	13,503.4	17,653.5	9,764.7

* Includes Los Saenz and Escobares, Texas

MUNICIPAL AND INDUSTRIAL WATER USES
In Acre-Feet

In Mexico

Month	CD. ACUNA, COAHUILA (Pop. 50,000)				PIEDRAS NEGRAS, COAHUILA (Pop. 95,696)			
	1978	Period 1971-1978			1978	Period 1969-1978		
		Average	Maximum	Minimum		Average	Maximum	Minimum
Jan.	220.0	79.8	220.0	0	401.7	302.0	401.7	198.2
Feb.	206.2	100.8	206.2	38.0	336.0	264.0	340.8	183.5
Mar.	226.3	134.9	226.3	76.8	388.3	312.0	389.5	223.6
Apr.	176.2	128.9	176.2	67.9	428.5	320.0	428.5	244.7
May	197.3	133.0	197.3	77.6	458.5	353.0	458.5	269.5
June	238.3	142.2	238.3	83.7	422.5	371.8	455.5	275.2
July	278.0	161.8	278.0	80.1	523.9	396.1	523.9	304.0
Aug.	279.0	181.9	279.0	83.7	462.8	386.8	462.8	281.2
Sept	270.0	153.0	270.0	81.9	434.7	350.2	454.2	270.5
Oct.	225.4	138.8	225.4	68.3	428.2	341.6	448.9	251.2
Nov.	175.3	111.2	181.0	55.7	418.0	302.9	418.0	213.8
Dec.	170.4	95.2	186.3	0	387.5	301.6	414.0	199.5
Yearly	2,662.4	1,561.3	2,662.4	828.8	5,090.6	4,002.0	5,090.6	3,119.0

Month	NUEVO LAREDO, TAMPS. (Pop. 210,000)				NUEVA CD. GUERRERO, TAMPS. (Pop. 4,373)			
	1978	Period 1969-1978			1978	Period 1969-1978		
		Average	Maximum	Minimum		Average	Maximum	Minimum
Jan.	1,663.7	1,509.5	1,879.9	1,126.2	37.5	29.4	48.7	24.5
Feb.	1,516.6	1,403.5	1,565.3	1,024.8	36.6	29.0	50.2	21.7
Mar.	1,883.9	1,642.0	1,960.3	1,182.0	44.4	33.1	54.3	25.9
Apr.	1,999.0	1,694.7	1,999.0	1,187.0	43.6	34.2	61.0	23.3
May	2,164.8	1,811.1	2,209.3	1,375.4	44.2	35.6	60.3	23.3
June	2,112.8	1,905.8	2,273.6	1,612.3	45.0	35.2	60.1	25.6
July	2,204.8	2,048.5	2,512.5	1,746.3	59.0	36.1	59.0	25.1
Aug.	2,466.3	2,072.2	2,466.3	1,745.5	46.9	35.2	53.2	19.3
Sept.	2,130.5	1,885.7	2,155.9	1,389.2	39.8	30.8	43.8	15.7
Oct.	2,267.2	1,890.4	2,267.2	1,453.0	52.9	33.5	52.9	20.5
Nov.	2,062.8	1,746.8	2,111.0	1,241.4	53.3	31.0	53.3	20.9
Dec.	1,991.5	1,673.7	1,991.5	1,243.4	47.2	28.3	47.2	20.5
Yearly	24,463.9	21,283.9	24,463.9	16,326.5	550.4	391.4	587.1	282.8

Month	CD. MIER, TAMPS. (Pop. 7,250)				CD. MIGUEL ALEMAN, TAMPS. (Pop. 16,624)			
	1978	Period 1969-1978			1978	Period 1969-1978		
		Average	Maximum	Minimum		Average	Maximum	Minimum
Jan.	40.8	32.8	69.1	11.8	40.9	38.3	55.7	25.3
Feb.	38.5	27.5	50.0	10.5	49.5	37.8	55.0	25.9
Mar.	46.5	33.5	54.0	9.9	48.1	44.9	58.0	32.4
Apr.	50.2	32.0	50.2	9.1	49.0	46.5	62.8	32.3
May	50.9	34.5	50.9	9.1	51.8	47.8	63.9	36.6
June	50.8	38.8	57.5	27.2	52.3	50.5	66.7	37.4
July	62.1	41.0	73.6	28.6	47.3	53.8	66.6	40.6
Aug.	57.2	38.9	59.4	13.7	55.6	55.6	68.1	38.8
Sept.	43.2	32.7	49.4	15.2	48.1	47.6	59.9	35.9
Oct.	42.4	34.0	49.9	14.5	49.3	46.9	61.4	35.8
Nov.	39.0	36.3	72.2	13.3	46.2	45.7	62.0	36.3
Dec.	38.2	35.6	60.6	12.6	46.2	42.2	56.9	27.8
Yearly	559.8	417.6	608.6	191.3	575.3	557.6	721.9	420.5

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 91 and 92 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 and Cochiti 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)	
	1978	# Average 1927-1978	1978	# Average 1928-1978	1978	# Average 1928-1978	1978	# Average 1925-1978	1978	# Average 1924-1978
Jan.	5.1	13.5	4.2	4.6	3.6	6.6	0	3.6	1.4	3.5
Feb.	6.2	14.6	4.6	5.0	3.9	7.0	1.0	3.9	1.6	3.8
Mar.	7.5	16.0	5.0	5.5	4.3	7.8	1.0	4.3	1.8	4.2
Apr.	8.1	16.4	5.1	6.0	4.4	9.0	1.0	5.3	2.0	4.7
May	10.8	21.0	8.5	7.7	6.4	12.2	1.1	6.9	3.0	6.3
June	9.3	21.7	8.7	7.9	6.1	13.5	1.0	8.1	3.9	6.4
July	9.3	12.9	8.6	5.4	5.0	9.3	1.0	5.5	2.4	4.7
Aug.	9.6	6.9	8.7	3.6	5.0	5.1	1.0	3.5	1.1	2.9
Sept.	9.6	7.0	8.7	3.5	5.0	4.9	1.0	3.0	.9	2.6
Oct.	4.6	8.0	4.5	3.4	4.3	5.1	.9	3.1	1.2	2.6
Nov.	6.4	10.5	4.7	3.8	4.9	5.6	0	3.1	1.7	2.9
Dec.	8.2	12.2	5.7	4.3	5.4	6.1	0	3.4	1.7	3.2
Avg.	7.9	13.4	6.4	5.1	4.9	7.7	0.8	4.5	1.9	4.0
Max.	10.8	52.1	8.7	26.7	6.4	42.1	1.1	17.7	3.9	16.4
Min.	4.6	0	4.2	0	3.6	0	0	0	0.9	0

Month	SANCHEZ (Capacity 103.2)		PLATORO (Capacity 60.0)		COSTILLA (Capacity 15.7)		HERON (Capacity 401.3)		EL VADO (Capacity 196.5)	
	1978	# Average 1927-1978	1978	Average 1952-1978	1978	# Average 1922-1978	1978	Average 1971-1978	1978	Average 1935-1978
Jan.	4.6	10.6	12.7	8.2	1.8	4.2	114.1	105.3	27.5	36.7
Feb.	4.9	10.8	12.7	8.2	2.2	4.6	114.5	105.8	28.6	34.5
Mar.	5.7	11.3	12.8	8.5	2.6	5.1	115.7	106.8	45.6	35.1
Apr.	6.1	12.7	12.8	9.2	3.6	6.2	131.0	108.2	83.5	72.1
May	8.5	16.0	12.8	10.7	6.1	8.1	160.1	132.3	84.0	113.0
June	12.2	15.3	13.6	16.0	5.4	7.4	186.2	153.3	84.5	103.6
July	8.7	11.2	13.6	14.5	3.8	4.8	191.4	158.6	67.2	84.7
Aug.	5.7	8.8	13.6	13.8	.8	3.2	189.2	158.2	39.8	63.4
Sept.	4.5	9.0	13.6	14.0	.4	2.8	185.1	156.4	23.3	52.0
Oct.	4.6	9.5	13.6	13.8	.8	3.1	184.2	157.4	23.2	48.2
Nov.	5.3	9.8	13.6	8.8	1.4	3.5	183.8	157.2	23.2	38.4
Dec.	5.6	10.2	13.6	8.8	1.7	3.8	148.0	125.4	52.6	36.7
Avg.	6.4	11.3	13.2	11.2	2.6	4.7	158.6	136.4	48.6	59.9
Max.	12.2	62.4	13.6	54.0	6.1	15.1	191.4	252.1	84.5	203.5
Min.	4.5	0	12.7	0	0.4	0	114.1	0.6	23.2	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 1,216.0)		COCHITI (Capacity 498.1)		BLUEWATER (Capacity 43.5)		ELEPHANT BUTTE (Capacity 2,109.4)		CABALLO (Capacity 344.0)	
	1978	Average 1965-1978	1978	# Average 1973-1978	1978	# Average 1927-1978	1978	Average 1915-1978	1978	# Average 1938-1978
Jan.	19.1	5.6	47.5	30.4	2.0	6.4	215.4	729.4	19.5	94.5
Feb.	19.1	5.5	47.6	30.1	2.0	7.1	245.0	733.2	23.2	117.7
Mar.	19.2	6.4	47.5	30.4	7.6	10.3	230.9	710.5	26.5	101.6
Apr.	19.8	9.6	47.8	32.0	9.2	13.3	196.9	703.3	31.1	96.4
May	56.6	39.5	47.8	31.8	8.2	11.8	282.6	791.2	30.2	97.7
June	32.7	31.2	47.1	36.8	5.8	9.7	262.1	816.0	41.0	82.1
July	22.5	22.3	55.3	38.8	3.5	8.4	185.7	758.5	45.1	65.4
Aug.	17.4	22.0	59.4	39.5	3.2	7.4	95.8	702.9	43.0	38.2
Sept.	17.1	22.6	59.1	39.2	3.0	7.1	92.2	678.6	16.0	28.4
Oct.	17.0	21.3	58.6	40.9	2.9	6.7	94.4	678.4	17.8	42.6
Nov.	16.9	14.9	58.6	35.0	2.8	6.6	136.3	695.5	27.4	56.8
Dec.	16.9	10.0	58.5	36.7	2.8	6.4	182.6	715.8	41.9	72.6
Avg.	22.9	17.6	52.9	35.1	4.4	8.4	185.0	726.1	30.2	74.5
Max.	56.6	194.0	59.4	59.4	9.2	47.1	Ø 288.8	Ø 2,302.8	Ø 58.3	Ø 346.6
Min.	16.9	0	47.1	3.6	2.0	0	Ø 90.8	Ø 3.3	Ø 14.5	Ø 0.1

Month	STORRIE (Capacity 23.3)		LAKE SUMNER (Capacity 101.6)		McMILLAN & AVALON (Capacity 38.0)		RED BLUFF (Capacity 310.0)		LAKE CASA BLANCA (Capacity 19.1)	
	1978	# Average 1939-1978	1978	# Average 1937-1978	1978	# Average 1908-1978	1978	# Average 1936-1978	1978	Average 1962-1978
Jan.	0	7.1	42.1	65.5	11.0	25.8	23.9	94.5	13.4	13.5
Feb.	0	7.0	46.5	69.4	12.4	25.9	24.9	96.1	13.0	13.2
Mar.	0	7.7	28.0	57.6	16.9	25.9	25.2	93.0	12.5	12.9
Apr.	0	7.9	2.5	50.5	21.4	17.2	24.7	80.4	11.9	12.9
May	0	8.3	9.3	52.7	11.4	19.2	24.6	82.9	11.4	13.4
June	0	7.0	11.4	46.2	15.5	18.6	34.5	83.9	10.9	13.9
July	0	7.1	4.3	44.7	20.5	17.7	33.6	74.8	9.6	13.4
Aug.	0	7.8	4.6	48.2	7.3	16.6	32.7	70.5	9.3	13.4
Sept.	0	7.3	5.6	50.5	9.1	17.8	96.5	74.7	9.9	15.0
Oct.	0	6.9	6.6	53.9	9.3	19.8	96.5	84.3	9.8	14.4
Nov.	0	7.0	17.0	56.3	15.0	21.3	109.0	87.1	9.8	14.2
Dec.	0	6.5	22.8	60.9	21.4	24.3	107.3	91.2	9.7	13.9
Avg.	0	7.3	16.7	54.7	14.3	20.8	52.8	84.4	10.9	13.7
Max.	0	26.3	46.5	156.3	21.4	85.5	109.0	327.5	13.4	28.2
Min.	0	0	2.5	0.4	7.3	0	23.9	10.0	9.3	3.5

Month	WILLACY (Capacity 25.0)								TOTAL IN U. S. RESERVOIRS (Capacity 5,659.4)	
	1978	# Average 1939-1978							1978	Estimated ! Average
Jan.	18.4	15.2							587.3	1,284.7
Feb.	17.3	14.6							631.2	1,318.0
Mar.	18.0	13.9							634.3	1,274.8
Apr.	16.3	13.9							639.2	1,287.2
May	14.5	14.5							797.9	1,497.2
June	14.8	14.8							806.7	1,513.4
July	17.6	14.6							708.7	1,377.3
Aug.	16.7	13.6							563.9	1,249.5
Sept.	16.8	15.0							577.4	1,211.4
Oct.	16.3	15.3							571.1	1,238.7
Nov.	16.9	15.1							654.7	1,253.4
Dec.	16.4	14.8							722.8	1,267.2
Avg.	16.7	14.6							657.9	1,314.4
Max.	18.4	22.6							806.7	
Min.	14.5	0							563.9	

Some months missing Ø 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 344.6)		CHIHUAHUA (Capacity 25.9)	
	1978	# Average 1914-1978	1978	Average 1940-1978	1978	Average 1940-1978	1978	# Average 1948-1978	1978	Average 1961-1978
Jan.	1,054.0	1,430.9	19.8	17.9	13.9	12.5	119.5	221.2	2.1	7.4
Feb.	1,008.2	1,395.6	19.8	18.3	13.9	12.4	122.3	218.9	1.6	7.2
Mar.	1,206.4	1,343.3	19.9	18.4	13.9	11.8	124.1	206.7	1.2	6.8
Apr.	1,252.8	1,270.9	19.9	18.9	13.9	11.4	100.7	173.8	1.1	6.3
May	1,162.3	1,206.8	19.9	18.5	13.9	11.6	67.5	145.5	.6	5.9
June	1,069.3	1,126.3	19.9	18.7	13.9	11.9	60.6	127.8	.4	5.4
July	1,006.3	1,166.2	19.8	18.7	13.9	11.8	50.2	143.1	.6	5.6
Aug.	1,296.9	1,333.8	20.0	18.3	13.9	12.8	165.2	172.5	2.9	6.9
Sept.	2,346.9	1,510.4	19.9	18.1	13.9	13.1	354.4	217.1	22.5	9.5
Oct.	2,458.4	1,518.1	19.9	17.9	13.9	13.0	344.8	225.3	21.7	9.4
Nov.	2,391.8	1,482.6	19.9	16.1	13.9	12.3	342.6	225.7	20.7	9.1
Dec.	2,381.9	1,466.7	15.8	18.1	13.9	12.8	342.6	226.5	20.0	8.7
Avg.	1,552.9	1,354.3	19.5	18.2	13.9	12.3	182.9	192.0	8.0	7.4
Max.	2,458.4	2,544.7	20.0	22.5	13.9	19.4	354.4	366.6	22.5	26.5
Min.	1,006.3	16.9	15.8	11.6	13.9	0	50.2	1.4	0.4	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)	
	1978	Average 1968-1978	1978	Average 1934-1978	1978	Average 1930-1978	1978	Average 1931-1978	1978	Average 1963-1978
Jan.	477.5	388.7	9.0	13.4	751.0	438.1	6.1	7.2	33.0	27.5
Feb.	480.8	388.3	9.1	13.2	703.9	417.0	9.6	9.2	32.8	27.5
Mar.	479.9	366.2	7.6	9.9	661.7	394.4	6.8	7.2	32.2	27.0
Apr.	407.8	334.5	7.5	8.6	621.2	382.7	12.3	8.7	31.4	25.9
May	348.6	314.5	7.1	9.2	583.6	365.6	9.8	8.7	30.9	25.6
June	319.4	317.8	7.7	7.7	578.3	347.3	8.4	7.8	31.9	25.5
July	305.6	338.9	4.1	7.4	556.8	361.9	8.2	7.3	29.3	25.8
Aug.	466.2	346.8	6.4	8.0	575.0	367.6	6.6	7.5	31.6	26.8
Sept.	728.0	435.2	9.2	10.0	841.6	422.0	9.8	8.4	32.8	28.6
Oct.	611.3	439.6	9.0	12.3	1,031.5	457.5	13.8	7.9	32.8	29.2
Nov.	581.3	441.9	9.2	12.5	1,122.8	464.7	12.6	7.2	32.8	28.9
Dec.	602.4	448.6	9.0	13.0	1,135.6	462.8	13.3	6.8	30.8	28.7
Avg.	484.1	380.1	7.9	10.4	763.6	406.8	9.8	7.8	31.9	27.2
Max.	Ø 753.1	Ø 753.1	9.2	20.7	Ø1,137.1	Ø1,167.8	Ø 14.4	15.8	33.0	35.7
Min.	Ø 301.6	Ø 3.8	4.1	0	Ø 543.3	* 1.0	Ø 4.3	0	29.3	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 5,815.6)	
	1978	# Average 1943-1978	1978	# Average 1939-1978	1978	Average 1942-1978			1978	Estimated ! Average
Jan.	795.5	620.0	0	32.7	0	34.4			3,281.4	3,251.9
Feb.	771.1	572.4	0	30.2	0	29.9			3,173.1	3,140.1
Mar.	742.9	541.8	0	28.2	0	29.6			3,296.6	2,991.3
Apr.	653.4	503.8	0	29.6	0	27.3			3,122.0	2,802.4
May	526.6	465.0	0	31.5	0	27.5			2,770.8	2,635.9
June	491.5	458.8	0	33.2	0	29.8			2,601.3	2,518.0
July	453.9	448.6	0	29.2	0	28.8			2,448.7	2,593.3
Aug.	379.7	498.9	0	31.2	0	26.2			2,964.4	2,859.3
Sept.	1,060.4	629.0	0	38.3	0	37.3			5,439.4	3,377.0
Oct.	889.3	669.9	0	39.8	0	41.5			5,446.4	3,481.4
Nov.	912.2	672.3	0	33.7	0	39.9			5,459.8	3,446.6
Dec.	903.6	669.1	0	37.2	0	38.4			5,468.9	3,437.4
Avg.	715.0	562.5	0	32.9	0	32.6			3,789.4	3,044.4
Max.	Ø1,092.2	Ø1,465.4	0	176.8	0	140.1			5,468.9	
Min.	Ø 379.7	** 17.8	0	0	0	0			2,448.7	

\# Some months missing Ø Daily extremes * Minimum since full reservoir in 1932
! Total of period averages in all reservoirs ** 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 1978 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	3,317.6	3,320.7	3,332.0	3,224.0	3,233.6	3,143.5	3,006.6	2,836.2	2,922.5	3,125.7	3,650.8	3,925.8
2	3,317.0	3,320.7	3,333.2	3,225.8	3,235.6	3,149.5	3,006.6	2,836.2	2,925.3	3,179.4	3,651.9	3,925.8
3	3,316.3	3,322.0	3,332.6	3,225.8	3,236.6	3,155.5	3,004.7	2,836.2	2,927.2	3,232.6	3,651.9	3,925.8
4	3,317.0	3,322.6	3,328.9	3,226.4	3,237.6	3,167.4	2,998.9	2,839.9	2,930.1	3,324.3	3,657.3	3,920.0
5	3,318.2	3,322.6	3,328.2	3,226.4	3,238.7	3,169.4	2,995.0	2,846.4	2,936.7	3,423.8	3,814.1	3,915.5
6	3,318.2	3,324.5	3,329.5	3,226.4	3,242.7	3,184.4	2,990.2	2,855.7	2,937.7	3,508.3	3,866.3	3,914.3
7	3,318.2	3,325.1	3,328.9	3,227.0	3,245.7	3,187.4	2,985.4	2,866.9	2,941.5	3,559.6	3,878.8	3,910.9
8	3,318.2	3,325.7	3,327.6	3,226.4	3,247.8	3,183.4	2,978.7	2,877.2	2,947.2	3,594.2	3,885.7	3,906.3
9	3,317.6	3,325.7	3,325.7	3,235.0	3,249.8	3,175.4	2,971.0	2,897.0	2,951.0	3,627.8	3,889.1	3,901.7
10	3,317.6	3,323.8	3,323.8	3,233.8	3,251.8	3,167.4	2,963.4	2,914.9	2,951.9	3,647.5	3,892.5	3,896.0
11	3,317.6	3,325.1	3,319.5	3,231.4	3,249.8	3,159.4	2,957.7	2,918.7	2,951.0	3,659.5	3,894.8	3,894.8
12	3,318.2	3,328.2	3,314.5	3,228.9	3,245.7	3,151.5	2,950.0	2,924.4	2,951.0	3,670.5	3,896.0	3,894.8
13	3,318.2	3,328.2	3,312.6	3,227.7	3,241.7	3,145.5	2,942.4	2,931.0	2,949.1	3,681.5	3,897.1	3,897.1
14	3,317.6	3,328.2	3,308.2	3,227.0	3,235.6	3,137.6	2,935.8	2,932.0	2,948.1	3,689.2	3,896.0	3,897.1
15	3,318.8	3,328.2	3,304.5	3,228.3	3,230.6	3,130.7	2,929.1	2,932.9	2,947.2	3,691.4	3,901.7	3,900.5
16	3,320.7	3,328.9	3,300.1	3,230.1	3,223.5	3,121.8	2,922.5	2,932.9	2,947.2	3,691.4	3,902.8	3,902.8
17	3,318.8	3,328.9	3,294.5	3,232.6	3,215.5	3,113.9	2,915.8	2,932.0	2,946.2	3,688.1	3,904.0	3,902.8
18	3,318.8	3,328.9	3,290.8	3,233.2	3,206.4	3,107.0	2,907.3	2,931.0	2,944.3	3,684.8	3,905.1	3,906.3
19	3,319.5	3,328.9	3,286.4	3,233.2	3,200.4	3,099.1	2,898.8	2,930.1	2,943.4	3,681.5	3,907.4	3,907.4
20	3,318.8	3,329.5	3,282.7	3,232.0	3,193.4	3,092.2	2,891.3	2,928.2	2,941.5	3,676.0	3,909.7	3,908.6
21	3,318.8	3,328.2	3,278.3	3,231.4	3,195.4	3,083.4	2,883.8	2,925.3	2,952.9	3,670.5	3,912.0	3,907.4
22	3,318.2	3,327.6	3,273.4	3,232.6	3,195.4	3,075.6	2,876.3	2,922.5	2,957.7	3,667.2	3,914.3	3,906.3
23	3,318.8	3,327.6	3,270.9	3,232.6	3,193.4	3,065.8	2,869.7	2,920.6	2,959.6	3,662.8	3,915.5	3,905.1
24	3,319.5	3,328.9	3,262.8	3,232.6	3,188.4	3,058.0	2,862.2	2,917.7	2,963.4	3,657.3	3,916.6	3,904.0
25	3,320.1	3,329.5	3,258.5	3,233.2	3,184.4	3,049.2	2,853.8	2,914.9	2,977.7	3,654.1	3,920.0	3,905.1
26	3,319.5	3,328.9	3,252.9	3,231.4	3,179.4	3,041.4	2,848.3	2,913.0	2,984.5	3,660.6	3,924.6	3,904.0
27	3,320.1	3,330.7	3,247.4	3,230.7	3,173.4	3,034.6	2,842.7	2,913.0	2,998.9	3,661.7	3,927.0	3,902.8
28	3,318.2	3,331.4	3,238.7	3,233.2	3,168.4	3,026.9	2,835.2	2,913.0	3,016.3	3,660.6	3,925.8	3,901.7
29	3,318.2		3,232.6	3,232.6	3,165.4	3,018.2	2,831.5	2,917.7	3,041.4	3,658.4	3,925.8	3,902.8
30	3,319.5		3,225.8	3,232.6	3,158.4	3,011.4	2,830.6	2,917.7	3,074.6	3,656.3	3,925.8	3,905.1
31	3,319.5		3,222.7		3,150.5		2,834.3	2,920.6		3,653.0		3,905.1

Month	1978							Period 1969-1978		
	MOMENTARY MAXIMUM			MOMENTARY MINIMUM			Average Storage	Mean Monthly Storage		
	Elevation	Storage	Day	Elevation	Storage	Day		Average	Maximum	Minimum
Jan.	1,114.10	3,320.7	16	1,114.03	3,316.3	3	3,318.5	2,873.1	4,030.4	722.6
Feb.	1,114.27	3,331.4	28	1,114.08	3,319.5	1	3,326.8	2,864.0	4,014.7	787.7
Mar.	1,114.30	3,333.2	2	1,112.52	3,222.7	31	3,292.5	2,836.7	4,016.4	861.7
Apr.	1,112.72	3,235.0	9	1,112.52	3,222.7	1	3,230.1	2,847.5	3,981.0	962.8
May	1,112.99	3,251.8	10	1,111.34	3,150.5	31	3,213.4	2,797.6	3,829.5	1,038.6
June	1,111.94	3,187.4	7	1,109.01	3,011.4	30	3,113.5	2,748.6	3,807.8	914.4
July	1,109.01	3,011.4	1	1,105.87	2,830.6	30	2,920.0	2,754.8	3,847.3	949.6
Aug.	1,107.66	2,932.9	!15	1,105.94	2,834.3	1	2,903.1	2,882.9	3,941.3	963.9
Sept.	1,110.07	3,074.6	30	1,107.45	2,920.6	1	2,958.9	2,959.8	4,117.2	1,034.0
Oct.	1,119.82	3,691.4	!15	1,110.07	3,074.6	1	3,590.3	3,119.1	4,471.2	1,207.2
Nov.	1,123.24	3,927.0	27	1,119.21	3,650.8	1	3,868.7	3,149.9	4,241.4	1,263.2
Dec.	1,123.23	3,925.8	! 1	1,122.79	3,894.8	!11	3,906.6	3,165.2	4,029.7	1,290.4
Yearly	1,123.24	3,927.0		1,105.87	2,830.6		3,303.5	2,916.9	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 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 1978 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	2,352.5	2,219.6	2,246.1	2,221.1	2,041.7	1,645.3	1,851.0	1,801.7	1,755.4	2,148.7	2,617.6	2,768.8
2	2,347.8	2,218.8	2,246.9	2,219.6	2,025.3	1,639.1	1,849.6	1,809.8	1,770.5	2,165.7	2,627.9	2,765.3
3	2,343.0	2,219.6	2,247.7	2,218.1	2,008.8	1,688.2	1,849.0	1,815.8	1,779.8	2,182.1	2,639.9	2,761.7
4	2,339.9	2,220.3	2,246.9	2,215.8	1,991.1	1,701.6	1,848.3	1,833.4	1,785.7	2,195.5	2,649.4	2,759.0
5	2,336.7	2,221.1	2,246.1	2,211.3	1,972.1	1,715.1	1,847.6	1,830.7	1,795.1	2,209.8	2,658.9	2,755.5
6	2,333.6	2,221.9	2,248.6	2,204.5	1,951.0	1,720.9	1,846.3	1,826.6	1,805.1	2,228.7	2,669.3	2,753.7
7	2,330.4	2,225.6	2,243.1	2,195.5	1,930.1	1,734.5	1,844.9	1,819.9	1,821.2	2,246.1	2,711.3	2,752.8
8	2,326.5	2,227.1	2,240.8	2,185.8	1,909.3	1,754.1	1,842.9	1,812.5	1,842.2	2,264.5	2,733.3	2,753.7
9	2,321.8	2,230.2	2,239.3	2,175.4	1,885.9	1,771.8	1,840.1	1,805.1	1,855.8	2,283.7	2,746.6	2,754.6
10	2,315.6	2,231.7	2,238.5	2,166.4	1,862.6	1,781.8	1,837.4	1,796.4	1,868.0	2,303.1	2,760.8	2,756.4
11	2,307.0	2,233.2	2,237.8	2,162.7	1,840.1	1,789.7	1,835.4	1,788.4	1,876.3	2,321.1	2,770.6	2,756.4
12	2,297.7	2,234.0	2,235.5	2,162.7	1,818.5	1,796.4	1,833.4	1,780.4	1,884.5	2,339.1	2,781.3	2,756.4
13	2,288.4	2,235.5	2,235.5	2,164.2	1,798.4	1,803.1	1,832.0	1,773.2	1,891.4	2,359.6	2,786.7	2,757.2
14	2,277.6	2,236.3	2,234.7	2,165.0	1,783.8	1,812.5	1,830.7	1,765.9	1,898.9	2,372.3	2,785.8	2,756.4
15	2,266.8	2,237.0	2,235.5	2,165.0	1,768.5	1,819.2	1,830.0	1,758.7	1,903.8	2,384.3	2,784.9	2,756.4
16	2,255.3	2,237.8	2,235.5	2,165.0	1,751.4	1,823.9	1,828.6	1,752.1	1,910.0	2,397.9	2,784.0	2,757.2
17	2,244.6	2,239.3	2,235.5	2,166.4	1,735.8	1,828.6	1,826.6	1,744.2	1,915.5	2,408.3	2,782.2	2,758.1
18	2,242.3	2,240.1	2,235.5	2,165.7	1,721.5	1,833.4	1,823.9	1,737.7	1,919.0	2,422.8	2,781.3	2,759.0
19	2,240.8	2,240.8	2,234.7	2,164.2	1,707.3	1,836.8	1,820.6	1,731.9	1,922.5	2,435.8	2,779.6	2,760.8
20	2,238.5	2,241.6	2,234.0	2,159.8	1,695.2	1,841.5	1,816.5	1,727.3	1,927.3	2,447.1	2,777.8	2,762.6
21	2,236.3	2,241.6	2,233.2	2,154.6	1,699.0	1,844.9	1,812.5	1,724.8	1,932.9	2,459.4	2,777.8	2,763.5
22	2,234.0	2,241.6	2,232.5	2,147.2	1,697.1	1,848.3	1,807.8	1,721.5	1,940.5	2,471.7	2,778.7	2,765.3
23	2,234.0	2,241.6	2,231.7	2,139.1	1,695.2	1,849.0	1,803.1	1,719.6	1,955.9	2,485.6	2,778.7	2,766.2
24	2,234.0	2,242.3	2,230.9	2,130.3	1,691.3	1,848.3	1,801.1	1,718.3	1,979.1	2,496.4	2,779.6	2,767.9
25	2,234.0	2,243.9	2,230.2	2,120.8	1,688.2	1,847.6	1,797.7	1,717.0	2,002.5	2,508.8	2,779.6	2,768.8
26	2,234.0	2,244.6	2,230.2	2,110.5	1,683.7	1,846.9	1,794.4	1,715.7	2,030.3	2,524.6	2,779.6	2,770.6
27	2,232.5	2,245.4	2,228.7	2,099.6	1,679.3	1,848.3	1,791.1	1,714.4	2,063.3	2,542.2	2,781.3	2,773.3
28	2,229.4	2,246.1	2,227.1	2,086.5	1,674.8	1,851.0	1,789.7	1,711.8	2,093.7	2,563.2	2,780.5	2,776.0
29	2,225.6		2,225.6	2,072.7	1,671.0	1,853.0	1,790.4	1,710.6	2,115.6	2,577.5	2,776.9	2,775.1
30	2,223.4		2,224.1	2,057.5	1,664.1	1,852.4	1,789.7	1,716.4	2,132.5	2,592.0	2,772.4	2,774.2
31	2,221.1		2,222.6		1,653.4		1,792.4	1,737.1		2,605.6		2,773.3

Month	1978						Period 1954-1978		
	MOMENTARY MAXIMUM			MOMENTARY MINIMUM			Average Storage	Mean Monthly Storage		
	Elevation	Storage	Day	Elevation	Storage	Day		Average	Maximum	Minimum
Jan.	297.46	2,357.2	1	295.70	2,221.1	31	2,275.6	2,172.3	3,070.8	218.7
Feb.	296.03	2,246.1	28	295.67	2,218.8	2	2,234.2	2,059.6	3,009.6	156.2
Mar.	296.05	2,247.7	3	295.72	2,222.6	31	2,235.8	2,028.1	2,990.8	226.7
Apr.	295.72	2,222.6	1	293.48	2,057.5	30	2,159.1	1,923.7	2,954.6	325.6
May	293.48	2,057.5	1	287.51	1,653.4	31	1,796.6	1,802.9	2,869.9	490.1
June	290.56	1,853.0	29	287.28	1,639.1	2	1,794.2	1,714.7	2,673.3	273.7
July	290.55	1,852.4	1	289.62	1,789.7	128	1,822.7	1,825.2	2,685.9	209.9
Aug.	290.27	1,833.4	4	288.41	1,710.6	29	1,761.9	1,810.6	2,771.4	208.0
Sept.	294.51	2,132.5	30	288.82	1,737.1	1	1,912.5	1,915.6	2,871.1	256.2
Oct.	300.48	2,605.6	31	294.51	2,132.5	1	2,385.3	2,185.2	3,250.2	308.3
Nov.	302.55	2,786.7	13	300.48	2,605.6	1	2,747.1	2,265.7	3,124.5	390.9
Dec.	302.43	2,776.0	28	302.17	2,752.8	7	2,762.5	2,292.1	3,129.7	343.4
Yearly	302.55	2,786.7		287.28	1,639.1		2,156.7	1,999.6	2,764.2	544.3

* When necessary, the Commission may set temporary conservation levels ! And other days

FLOODS OF 1978

During the early part of August, a moisture-laden air mass situated over the State of Chihuahua was triggered by a low pressure area moving northwestward along the Rio Conchos in the direction of the Presidio-Ojinaga area, producing heavy rainfall on the Rio Conchos watershed below Luis L. Leon (El Granero) Dam.

Rainfall data during the period August 1-7 indicate numerous stations had rainfall in excess of 3 inches (76.2 mm), with a recorded high of 5.55 inches (141 mm) at Coyame, about 30 miles (48.3 km) west-southwest of Presidio, Texas. As shown on the isohyetal map based on rainfall estimates from satellite photos, the heaviest precipitation of about 10 inches (254 m) was centered about 60 miles (96.5 km) southwest of Presidio, Texas.

Runoff resulting from these rains produced a peak flow of 36,500 second-feet (1,030 m^3/sec) on the Rio Grande station below the Rio Conchos confluence on August 6. Flows of the Rio Grande above the Rio Conchos confluence during this period were not significant. There was no flood damage caused by this flood, as all the flows were contained within the river levee system.

During the latter part of September, weather conditions over most of the North American continent were such as to cause heavy rains to fall over most of Northern Mexico and Southwest Texas as moisture associated with tropical cyclones in the Gulf of Mexico and the Pacific Ocean moved into the area. Heavy precipitation occurred over the entire Rio Conchos watershed, particularly in the area between Madero and Luis L. Leon Reservoirs and in the area below Luis L. Leon Dam.

Rainfall during the period September 19-28 averaged over 4 inches (100 mm) in the entire watershed, with several stations reporting amounts in excess of 6 inches (150 mm). The largest amounts of rain recorded were 7.84 inches (199 mm) at Villa Aldama and 7.56 inches (192 mm) at a station in Chihuahua City.

Runoff caused by these rains resulted in two separate floods from the Rio Conchos reaching the Presidio-Ojinaga Valley. The first one reached the Rio Grande station below the Rio Conchos confluence on September 26 and crested at 52,300 second-feet (1,480 m^3/sec). The river levees were topped and breached at several places, but damage from this flood was not material. Contributions from the Rio Grande above Rio Conchos were minimal.

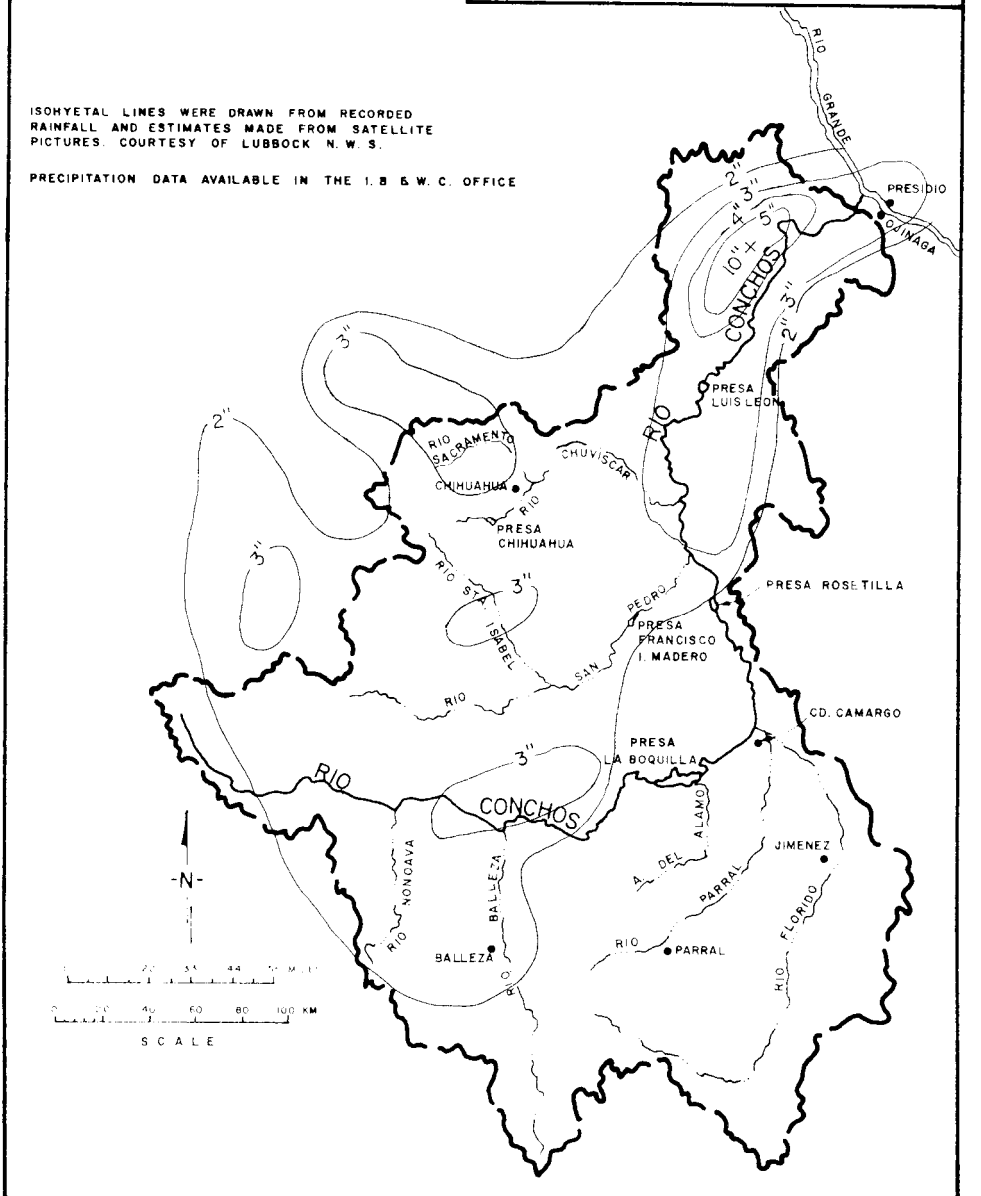
The second flood to reach the Presidio-Ojinaga area arrived early on the morning of September 30 when the flow of the Rio Grande below Rio Conchos reached about 61,000 second-feet (1,730 m^3/sec). The effect of major levee breaks which had occurred earlier caused the stage and flow at the station to fall rapidly for 1-1/2 hours. After the added channel storage capacity due to the breaks was satisfied, the river again began to rise until it reached a crest of 61,200 second-feet (1,730 m^3/sec) near midnight of the same day. Had the river levees held, the peak would have been considerably higher. The Rio Grande above Rio Conchos did not contribute significant amounts of flow to the peak below. This flood caused extensive damage to croplands in both countries and the two bridges across the Rio Grande between Presidio, Texas and Ojinaga, Chihuahua.

INTERNATIONAL BOUNDARY & WATER COMMISSION
UNITED STATES & MEXICO
UNITED STATES SECTION

ISOHYETAL MAP FOR PERIOD AUGUST 1-7, 1978

ISOHYETAL LINES WERE DRAWN FROM RECORDED RAINFALL AND ESTIMATES MADE FROM SATELLITE PICTURES. COURTESY OF LUBBOCK N. W. S.

PRECIPITATION DATA AVAILABLE IN THE I. B & W. C. OFFICE

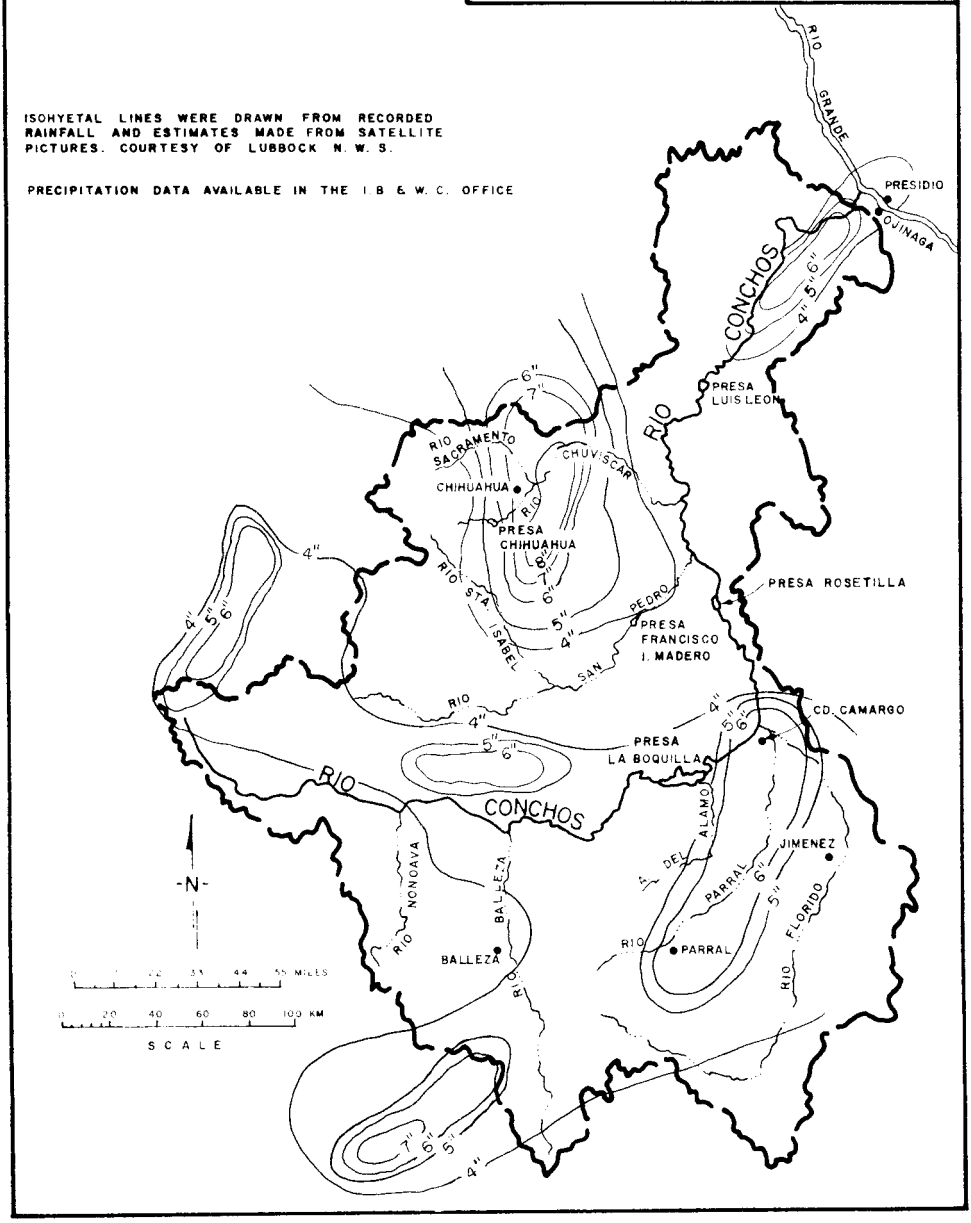


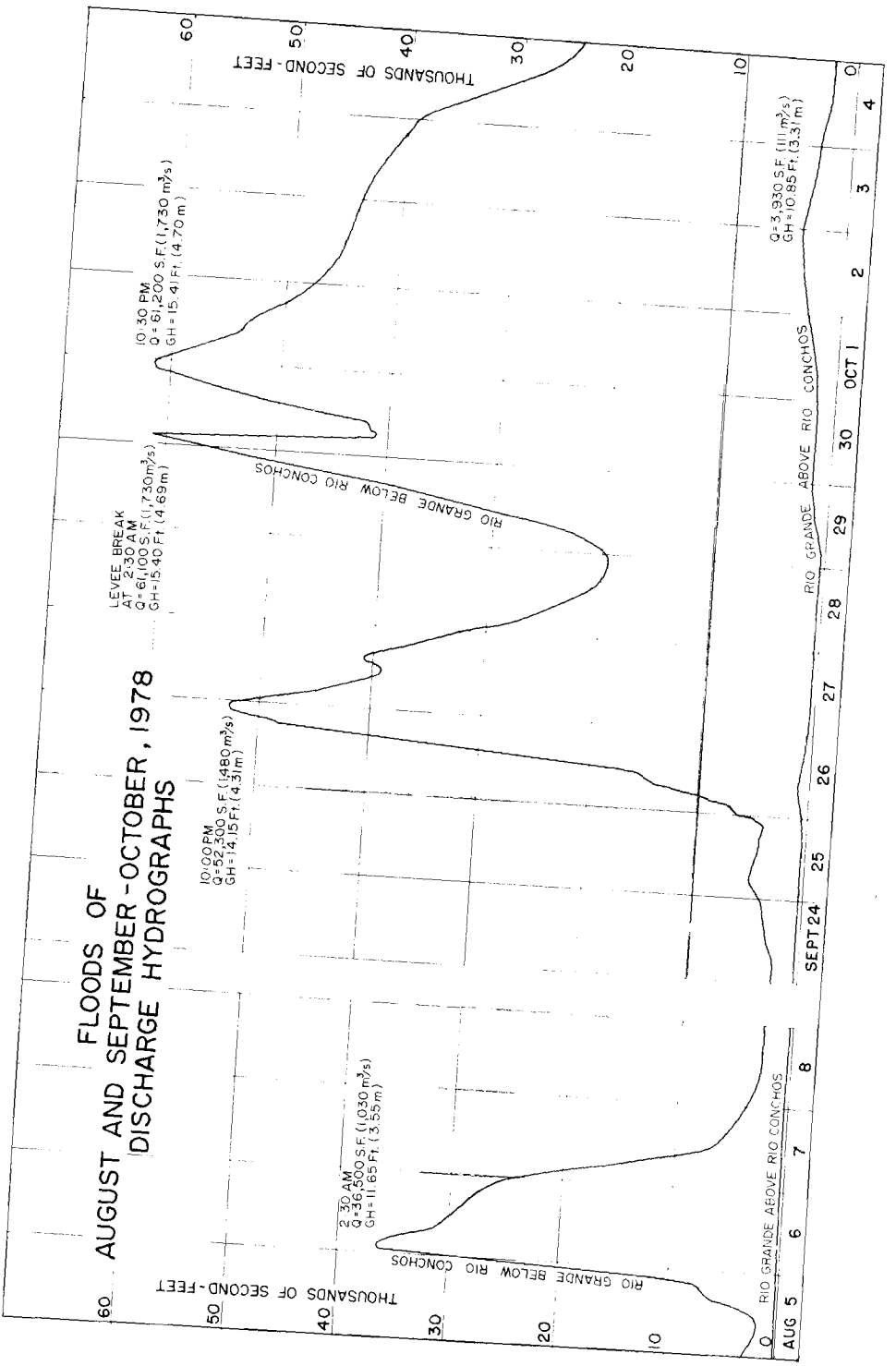
INTERNATIONAL BOUNDARY & WATER COMMISSION
UNITED STATES & MEXICO
UNITED STATES SECTION

ISOHYETAL MAP FOR PERIOD SEPTEMBER 19-30, 1978

ISOHYETAL LINES WERE DRAWN FROM RECORDED RAINFALL AND ESTIMATES MADE FROM SATELLITE PICTURES. COURTESY OF LUBBOCK N. W. S.

PRECIPITATION DATA AVAILABLE IN THE I. B. & W. C. OFFICE




FLOODS OF
AUGUST AND SEPTEMBER - OCTOBER, 1978
DISCHARGE HYDROGRAPHS
THOUSANDS OF SECOND-FEET
RIO GRANDE BELOW RIO CONCHOS
RIO GRANDE ABOVE RIO CONCHOS
2:30 AM
Q=36,500 S.F. (1,030 m³/s)
GH=11.65 Ft. (3.55 m)
10:00 PM
Q=52,300 S.F. (1,480 m³/s)
GH=14.15 Ft. (4.31 m)
LEVEE BREAK
AT 2:30 A.M.
Q=61,100 S.F. (1,730 m³/s)
GH=15.40 Ft. (4.69 m)
10:30 PM
Q=61,200 S.F. (1,730 m³/s)
GH=15.41 Ft. (4.70 m)
Q=3,930 S.F. (111 m³/s)
GH=10.85 Ft. (3.31 m)
AUG 5
SEPT 24
OCT 1

QUALITY OF WATER - 1978

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 1978; biochemical analyses, September 1943 through 1972 and February 1976 through 1978; specific conductance 1930 through 1932 and 1937 through 1978; 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.

1978 Date	Time Standard	Streamflow, Momentary Second-Feet	Specific Conductance Micromhos	pH Units	Temperature Deg C	Hardness, Total (as CaCO3) mg/L	Hardness, Noncarbonate (as CaCO3) mg/L	Calcium ion (Ca), Dissolved mg/L	Magnesium ion (Mg), Dissolved mg/L
Jan. 16	0810	35.5	2,780	8.0	6.5	470	170	130	36
Feb. 21	0800	15.8	3,220	8.1	5.5	510	170	140	39
Mar. 20	0800	476	1,540	7.5	9.0	340	160	100	23
Apr. 17	0800	205	1,380	7.9	14.5	280	86	82	19
May 15	0900	15.3	4,040	8.0	18.0	510	200	140	39
June 19	0900	586	1,150	7.6	21.0	250	75	71	17
July 17	0900	541	1,010	8.0	28.0	240	66	69	16
Aug. 14	0825	813	867	7.6	25.5	210	58	64	13
Sep. 18	0925	106	1,630	8.0	21.0	300	88	86	21
Oct. 16	0915	29.9	2,890	8.0	16.5	460	190	130	33
Nov. 16	0900	67.4	1,840	8.0		340	130	100	22
Dec. 18	0910	23.3	3,030	8.2	9.0	490	210	140	34

Samples taken at American Dam

1978 Date	Sodium ion (Na), Dissolved mg/L	Sodium Adsorption Ratio(SAR)	Potassium ion (K), Dissolved mg/L	Bicarbonate ion (HCO3) mg/L	Carbonate ion (CO3) mg/L	Sulfate ion (SO4), Dissolved mg/L	Chloride ion (Cl), Dissolved mg/L	Silica (SiO2), Dissolved mg/L	Solids Dissolved (Calculated) mg/L
Jan. 16	470	9.4	11	370	0	650	380	35	1,890
Feb. 21	560	11	8.9	410	0	730	440	36	2,160
Mar. 20	200	4.7	10	220	0	260	250	14	965
Apr. 17	180	4.7	10	240	0	310	140	14	873
May 15	720	14	12	380	0	860	560	41	2,560
June 19	130	3.6	8.9	210	0	240	100	10	680
July 17	120	3.4	8.0	210	0	210	82	12	621
Aug. 14	93	2.8	6.8	190	0	170	68	13	521
Sep. 18	250	6.3	11	260	0	370	190	23	1,080
Oct. 16	480	9.7	14	330	0	700	400	34	1,950
Nov. 16	280	6.6	12	260	0	410	230	20	1,200
Dec. 18	500	9.8	4.8	340	0	680	420	30	1,980

Samples taken at American Dam

1978 Date	Temperature Deg C	Oxygen, Dissolved (DO) mg/L	pH Units	Coliform, Fecal Colonies /100 mL	Oxygen Demand, Biochemical (BOD) mg/L
Jan. 3	2.2	9.6	8.1	50	3
10	5.6	9.0	8.0	400	4
17	6.1	9.0	8.1	20	5
24	3.9	9.0	8.2	4,600	6
31	7.8	9.0	8.2	300	14
Feb. 7	5.6	9.0	8.2	170	13
14	11.1	9.0	8.0	0	3
21	4.4	9.0	8.3	20	7
28	10.0	7.7	8.0	100	4
Mar. 7	10.0	8.0	8.0	100	16
14	8.9	9.0	8.0	0	11
21	13.3	7.8	8.1	60	8
28	14.4	8.8	8.1	120	21
Apr. 4	14.4	8.4	8.2	1,360	6
11	15.0	8.8	7.9	280	8
18	14.4	9.0	8.2	680	11
25	16.7	8.3	8.2	540	4
May 2	14.4	8.2	8.5	80	4
16	17.8	6.4	7.9	1,050	3
23	21.1	6.0	7.9	1,040	18
30	22.2	6.2	8.3	520	47
June 6	21.1	6.2	8.4	1,680	7
13	22.2	7.2	8.0	500	9
20	24.4	6.6	7.7	350	5
27	24.4	7.0	7.9	80	4

1978 Date	Temperature Deg C	Oxygen Dissolved (DO) mg/L	pH Units	Coliform, Fecal Colonies /100 mL	Oxygen Demand, Biochemical (BOD) mg/L
July 11	25.6	6.8	8.2	300	5
18	25.6	5.8	8.0	700	5
25	25.6	6.4	7.8	1,600	6
Aug. 5	26.7	6.6	8.2	100	6
8	25.6	6.4	8.0	1,900	4
22	25.6	5.6	8.0	10,800	13
Sep. 5	23.3	6.4	7.2	7,750	10
12	21.1	6.8	7.1	2,400	9
19	18.9	7.2	7.1	530	6
26	16.7	6.8	6.8	1,430	8
Oct. 3	17.8	7.2	7.0	910	5
10	16.7	7.2	7.2	1,670	6
17	17.8	7.6	7.2	1,650	9
31	16.7	8.8	7.4	1,100	6
Nov. 7	13.3	9.0	7.5	470	6
14	13.3	9.0	7.5	1,000	2
21	13.3	9.0	7.4	0	8
28	8.9	8.4	7.5	1,190	5
Dec. 5	8.9	9.0	7.3	680	7
12	5.6	9.0	7.5	740	9
19	13.3	7.6	7.5	2,180	5

QUALITY OF WATER - 1978

Rio Grande at El Paso, Texas

SPECIFIC CONDUCTANCE OF WATER SAMPLES IN MICROMHOS/CM @ 25 DEG C - 1978

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1		2,940			1,800	1,290		937			1,750	2,720
2		3,010	3,310		4,030	1,290		1,010		2,360	1,710	
3	2,840	3,010	3,330	1,400	3,910		1,070	1,040		2,490	1,250	
4	2,820			1,410	4,040			960		2,620		3,030
5	2,810			1,300	4,070	1,270	1,190		953	2,620		3,070
6	2,820	2,970	3,310	1,360		1,280	1,340		1,140	2,670	1,960	
7		2,990	3,330			1,250	1,140	958	1,160		1,960	3,130
8		3,130	3,380			1,280		914	1,170		2,360	3,110
9	2,790	3,160	3,410	1,300	3,920	1,280		921			2,400	
10	2,770	3,160	3,520	1,360	4,100		1,140	956		2,840		
11	2,840			1,360	4,100		1,230	940	1,010	2,860		3,100
12	2,850			1,300	4,080	1,150	1,140		1,110	2,930		2,940
13	2,830	3,140	3,470	1,330		1,150	1,140		1,140	3,050	2,570	3,100
14		3,220	3,460			1,150	1,080		1,710		2,320	3,260
15		3,240	3,370		4,090	1,150		880	1,720		1,870	3,090
16		3,300	1,800		4,090	1,180		883				
17	2,910	3,300	1,600					891		3,030	2,290	
18	2,440			1,630	4,090		1,000			2,990		
19	2,920			1,630	3,990		1,000		2,000	3,250		3,190
20	2,870			1,680		1,110	1,000		2,240	3,240	2,880	3,200
21			1,490	1,610		1,090	902	788	2,140		2,750	2,980
22		3,380	1,480		3,980	1,090		786	1,580		2,940	2,740
23	2,870	3,390	1,480		3,990	1,090		838		3,240		
24	3,020	3,390			3,440		898	859		3,230		
25	3,000			1,610	4,160		1,060	859	1,570			
26	3,010			1,790	4,150	1,100	1,030					
27	3,000			1,790		1,070	1,030		2,320		2,990	3,160
28		3,390	1,480	1,790		1,060	1,000	1,020	2,320		3,030	2,760
29			1,430			1,030		1,030	2,330		2,650	2,770
30	3,000		1,400		4,170	1,040				3,240	2,670	
31	3,030		1,370		1,380		955			3,260		

* 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 1978. Samples also collected quarterly by the Texas Department of Water Resources one mile upstream at Ysleta-Zaragoza Bridge, 1937 through 1972 and May 1975 through 1978.
REMARKS: Sampling by International Boundary and Water Commission. Analyses by the Waste Water Treatment Plant Laboratory in El Paso.

1978 Date	Temperature Deg C	Oxygen, Dissolved (DO) mg/L	pH Units	Coliform, Fecal Colonies /100 mL	Oxygen Demand, Biochemical (BOD) mg/L
Jan. 3	5.6	5.4	7.4	0	24
5	10.0	5.1	7.6	600	26
10	7.2	3.4	7.5	107,500	43
24	5.6	4.0	7.6	268,000	47
31	8.9	3.0	7.5	2,000,000	54
Feb. 7	10.0	4.0	7.1	90,000	28
14	10.6	3.0	7.6	0	39
21	5.6	4.4	7.6	0	25
28	10.6	1.6	7.4	7,000,000	35
Mar. 7	9.4	8.0	8.0	100	16
14	10.0	9.0	8.0	0	11
21	14.4	7.8	8.1	60	8
28	15.6	8.8	8.1	120	21
Apr. 4	15.0	5.5	7.7	0	13
11	15.6	6.5	7.7	40,000	30
18	15.6	6.6	7.6	1,800	15
25	17.8	5.4	7.7	515,000	18
May 2	15.0	5.9	7.7	10,000	18
16	18.9	4.6	7.6	100,000	22
23	22.2	1.6	7.5	12,000,000	40
30	21.1	3.1	7.6	1,688,000	23
June 6	20.0	2.8	7.0	2,600,000	10
13	23.3	3.9	7.8	500,000	14
20	23.3	2.6	8.3	212,000	20
27	24.4	3.6	7.9	620,000	35

1978 Date	Temperature Deg C	Oxygen Dissolved (DO) mg/L	pH Units	Coliform, Fecal Colonies /100 mL	Oxygen Demand, Biochemical (BOD) mg/L
July 11	25.6	2.4	7.5	4,700,000	16
18	25.6	2.4	7.3	950,000	18
25	26.7	4.4	7.7	170,000	6
Aug. 5	26.7	4.0	7.6	2,400,000	19
8	26.7	2.8	7.2	1,900,000	7
15	26.7	5.8	7.7	350,000	23
22	26.7	3.8	7.8	145,000	5
29	24.4	2.0	7.6	2,500,000	17
Sep. 5	24.4	3.0	7.3	305,000	9
12	22.2	1.6	7.5	2,700,000	20
19	16.7	2.0	7.1	220,000	35
26	17.8	4.4	6.9	230,000	15
Oct. 3	18.9	3.2	7.2	285,000	36
10	21.1	3.4	7.5	0	17
17	17.8	2.4	7.3	60,000	27
31	17.8	4.6	7.6	70,000	18
Nov. 7	16.1	6.4	7.6	0	13
14	14.4	6.2	7.6	1,500	27
21	15.6	5.6	7.6	6,350	24
28	8.9	6.4	7.6	1,800	28
Dec. 5	7.8	6.4	7.7	700	36
12	7.8	6.2	7.9	900	36
19	12.2	3.4	7.7	4,000	24

QUALITY OF WATER - 1978

Rio Grande at Fort Quitman, Texas near Colonia Luis Leon, Chihuahua

LOCATION: Gaging station at river mile 1,173.2 (1,888.1 km); 1.5 river miles (2.4 km) downstream from old Fort Quitman.
RECORDS: Chemical analyses, February 1938 through 1978; biochemical analyses, October 1974 through 1978; specific conductance (daily), October 1974 through 1977.
REMARKS: Sampling and analyses by 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 prior to 1977 by the International Boundary and Water Commission.

1978 Date	Time Std.	Streamflow, Momentary Sec.-Ft.	Specific Conductance Micromhos	pH Units	Temperature Deg C	Hardness, Total (as CaCO3) mg/L	Hardness, Noncarbonate (as CaCO3) mg/L	Calcium ion (Ca), Dissolved mg/L	Magnesium ion (Mg) mg/L	Sodium ion (Na), Dissolved mg/L	Sodium Adsorption Ratio (SAR)	Potassium ion (K), Dissolved mg/L
Jan. 18	1700	7.7	10,800	8.2	13.5	1,800	1,500	430	170	1,700	18	18
Feb. 15	1121	5.1	9,560	7.9	10.0	1,800	1,600	460	160	1,600	16	17
Mar. 21	1123	4.7	10,300	7.9	17.0	2,100	1,900	540	180	1,900	18	20
Apr. 18	1224	2.4	11,200	7.8	23.5	2,000	1,800	500	180	1,800	18	41
May												
June												
July												
Aug.												
Sept.												
Oct. 11	1615	7.0	9,800	7.8	22.5	1,600	1,400	380	160	1,500	16	19
Nov. 2	1611	16.0	6,230	8.3	20.5	1,100	850	300	86	1,000	13	17
Dec. 5	1515	39.0	3,500	8.2	11.0	600	380	170	43	490	8.7	17

1978 Date	Bicarbonate ion (HCO3) mg/L	Carbonate ion (CO3) mg/L	Sulfate ion (SO4), Dissolved mg/L	Chloride ion (Cl), Dissolved mg/L	Silica (SiO2), Dissolved mg/L	Oxygen, Dissolved (DO) mg/L	Coliform, Fecal Cols./ 100 mL	Oxygen Demand, Biochemical (BOD) 5 day mg/L	Turbidity JTU	Solids, Dissolved (Calculated) mg/L	Solids, Dissolved (Residue @ 180 Deg C) mg/L	Suspended Sediment mg/L
Jan. 18	280	0	1,500	2,600	21	17.2			10	6,580	6,650	
Feb. 15	290	0	1,500	2,500	21	14.5			30	6,400	6,420	
Mar. 21	250	0	1,700	3,000	15	12.0			30	7,480	7,480	
Apr. 18	270	0	1,700	2,900	16	11.4			25	7,270	7,140	
May												
June												
July												
Aug.												
Sept.												
Oct. 11			1,200	2,500	2.7	7.3	200		1.4	5,910	6,610	16
Nov. 2			1,000	1,400	23	9.1	390		25	3,980	4,000	78
Dec. 5			590	610	25	10.8	30		32	2,080	2,210	369

QUALITY OF WATER - 1978

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 1978; specific conductance, 1931; 1935 through 1978.
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 1978, available on request.

1978 Date	Time Standard	Streamflow, Momentary Second-Feet	Specific Conductance Micromhos	pH Units	Temperature Deg C	Hardness, Total (as CaCO3) mg/L	Hardness, Noncarbonate (as CaCO3) mg/L	Calcium ion (Ca), Dissolved mg/L	Magnesium ion (Mg), Dissolved mg/L
Jan. 16	1325	4.2	1,360	7.9	13.0	320	150	98	18
Feb. 21	0943	5.5	1,360	7.9	8.0	300	140	90	18
Mar. 20	1000	0							
Apr. 20	1100	2.5	1,220	7.9	18.5	290	120	88	16
May 17	0940	6.0	1,290	7.6	21.0	280	130	85	16
June 26	0955	6.4	1,360	7.5	28.0	290	140	90	15
July 20	0855	8.4	1,330	7.9	25.0	270	120	83	16
Aug. 14	0940	151	731	7.9	20.0	200	59	70	5.8
Sep. 21	1400	4.1	1,230	7.8		300	160	100	13
Oct. 16	1000	187	1,550	7.9	16.5	370	190	120	17
Nov. 20	1145	167	1,970	8.0		360	200	110	20
Dec. 18	1215	49.1	4,400	7.5	9.5	870	670	250	60

1978 Date	Sodium ion (Na), Dissolved mg/L	Sodium Adsorption Ratio(SAR)	Potassium ion (K), Dissolved mg/L	Bicarbonate ion (HCO3) mg/L	Carbonate ion (CO3) mg/L	Sulfate ion (SO4), Dissolved mg/L	Chloride ion (Cl), Dissolved mg/L	Silica (SiO2), Dissolved mg/L	Solids Dissolved (Calculated) mg/L
Jan. 16	180	4.4	7.3	200	0	400	96	28	926
Feb. 21	180	4.5	7.1	190	0	380	88	23	880
Mar.									
Apr. 20	160	4.1	8.4	200	0	380	53	28	832
May 17	190	5.0	8.3	180	0	400	100	28	916
June 26	180	4.6	8.3	180	0	410	74	28	894
July 20	180	4.7	7.9	190	0	400	72	29	882
Aug. 14	74	2.3	6.1	170	0	180	30	15	465
Sep. 21	150	3.7	7.5	180	0	390	74	25	848
Oct. 16	200	4.5	9.4	220	0	300	220	13	988
Nov. 20	280	6.4	10	190	0	340	340	5.7	1,200
Dec. 18	640	9.4	16	250	0	810	830	1.6	2,730

SPECIFIC CONDUCTANCE OF WATER SAMPLES IN MICROMHOS/CM @ 25 DEG C - 1978

January		March		May		July		August		October		November	
9	1,410	6	1,440	22	1,150	3	988	21	868	1	633	13	2,460
16	1,380	13	1,490	30	1,260	10	1,330	29	1,200	2	646	20	2,010
19	1,330	27	1,470	June		13	1,350	September		4	540	27	2,730
23	1,370	April		1	846	17	1,340	1	1,110	5	564	December	
February		3	1,620	5	1,370	24	1,330	6	719	6	590	1	3,340
1	1,380	10	1,300	15	1,340	August		11	647	6	775	4	3,690
6	1,400	17	1,300	17	1,320	1	1,210	18	1,100	16	1,380	11	4,130
13	1,380	May		19	1,360	7	829	25	859	23	1,800	15	4,290
15	1,370	2	1,290	23	1,350	9	548	26	713	30	3,180	18	4,470
21	1,390	15	1,340			14	756	27	709	November		26	3,350
								30	572	7	3,310		

QUALITY OF WATER - 1978

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 1978; suspended silt, 1956 through 1978, specific conductance 1935 through 1978.
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.

1978 Date	Time Standard	Streamflow, Momentary Second-Feet	Specific Conductance Micromhos	pH Units	Temperature Deg C	Hardness, Total (as CaCO3) mg/L	Hardness, Noncarbonate (as CaCO3) mg/L	Calcium ion (Ca), Dissolved mg/L	Magnesium ion (Mg), Dissolved mg/L
Jan. 16	1240	250	1,380	7.9	14.5	320	150	100	18
Feb. 21	1130	230	1,440	8.3	11.0	330	150	100	19
Mar. 20	1400	163	1,470	7.9		350	180	110	19
Apr. 20	1025	1,300	1,210	8.0	19.0	270	110	80	17
May 17	0900	760	1,290	7.7	23.5	310	150	99	16
June 22	0950	418	1,280	7.9	26.0	310	140	100	14
July 20	0930	307	1,370	8.1	27.0	290	130	88	17
Aug. 14	1415	1,100	1,350	7.8	21.0	460	320	160	14
Sep. 21	1015		1,120	7.6	19.0	270	130	85	14
Oct. 18	1500	2,420	958	8.0		260	110	86	11
Nov. 27	1130	2,090	879	8.2	19.0	230	87	78	9.6
Dec. 18	1130	350	1,880	8.0	12.0	440	280	140	23

1978 Date	Sodium ion (Na), Dissolved mg/L	Sodium Adsorption Ratio(SAR)	Potassium ion (K), Dissolved mg/L	Bicarbonate ion (HCO3) mg/L	Carbonate ion (CO3) mg/L	Sulfate ion (SO4), Dissolved mg/L	Chloride ion (Cl), Dissolved mg/L	Silica (SiO2), Dissolved mg/L	Solids Dissolved (Calculated) mg/L
Jan. 16	180	4.4	7.2	210	0	400	96	30	935
Feb. 21	180	4.3	7.1	220	0	390	90	27	922
Mar. 20	200	4.6	7.7	210	0	430	100	27	997
Apr. 20	160	4.2	8.1	200	0	360	50	32	806
May 17	180	4.4	7.9	200	0	480	57	31	970
June 22	150	3.7	7.5	200	0	390	68	28	856
July 20	180	4.6	7.7	200	0	410	76	31	908
Aug. 14	110	2.2	7.2	170	0	470	71	19	935
Sep. 21	140	3.7	7.2	170	0	360	54	32	776
Oct. 18	110	3.0	5.6	180	0	270	54	27	652
Nov. 27	94	2.7	6.1	180	0	220	50	25	571
Dec. 18	230	4.7	9.3	200	0	480	200	24	1,200

SUSPENDED SILT - 1978

Month	Tons Water	Tons Silt	Number of Samples	Gravimetric Percentages Average	Gravimetric Percentages Maximum Sample	Gravimetric Percentages Minimum Sample	Acre-Feet at 1,452 Tons/Ac.Ft.	Period of Record Average	Period of Record Maximum	Period of Record Minimum
Jan.	20,219,000	0	9	0	0	0	0	0	0	0
Feb.	18,721,000	0	8	0	0	0	0	.20	4.5	0
Mar.	16,276,000	0	9	0	0	0	0	.29	6.6	0
Apr.	88,060,000	0	9	0	0	0	0	.70	10.2	0
May	103,955,000	0	9	0	0	0	0	31.1	145	0
June	54,129,000	0	10	0	0	0	0	141	688	0
July	52,786,000	0	10	0	0	0	0	238	1,450	0
Aug.	215,487,000	1,985,000	14	.9210	1.9037	0	1,370	478	2,650	0
Sept.	606,183,000	1,138,000	11	.1878	1.1057	0	784	1,050	9,330	0
Oct.	891,505,000	152,000	12	.0170	.2224	0	105	622	12,400	0
Nov.	186,757,000	0	14	0	0	0	0	4.9	70.2	0
Dec.	54,159,000	0	10	0	0	0	0	1.2	14.0	0
Year	2,308,237,000	3,275,000	125	0.1419	1.9037	0	2,259	2,567.39	21,903.3	32.9

QUALITY OF WATER - 1978

Rio Conchos near Ojinaga, Chihuahua

SPECIFIC CONDUCTANCE OF WATER SAMPLES IN MICROMHOS/CM @ 25 DEG C - 1978

January		February		March		April		May		June		July	
3	1,390	2	1,350	6	1,430	10	1,240	8	1,220	5	1,040	3	1,160
5	1,380	6	1,440	10	1,440	12	1,240	11	1,190	8	1,320	6	1,330
9	1,400	9	1,430	13	1,360	14	1,230	15	1,240	12	1,340	10	1,350
12	1,350	13	1,430	16	1,490	18	1,190	18	1,330	15	1,330	13	1,360
16	1,400	16	1,430	23	1,570	20	1,210	22	1,100	19	1,330	17	1,390
20	1,390	20	1,440	27	1,610	24	1,180	25	1,220	22	1,290	20	1,400
23	1,350	23	1,480	30	1,590	27	1,210	29	1,350	26	1,310	24	1,320
26	1,410	27	1,450	April		May		June		29	1,250	27	1,250
30	1,330	March		3	1,510	1	1,220	1	1,060	30	1,050	28	907
		4	1,440	6	1,360	4	1,250						

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 1978.
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 1978, available on request.

SPECIFIC CONDUCTANCE OF WATER SAMPLES IN MICROMHOS/CM @ 25 DEG C - 1978

January		March		May		June		August		October		November	
3	1,380	1	1,660	2	1,250	26	1,410	9	937	1	836	6	842
5	1,450	6	1,550	8	1,240	July		14	1,100	2	814	13	1,120
16	1,540	13	1,500	15	1,250	3	1,190	15	1,470	3	759	20	1,020
19	1,499	20	1,130	22	1,120	10	1,400	21	1,490	4	712	27	1,070
23	1,500	27	1,080	30	1,390	13	1,420	29	1,230	5	714	December	
February		31	1,960	June		17	1,420	September		6	658	1	1,400
1	1,440	April		1	1,060	21	1,420	1	813	10	711	4	1,930
6	1,440	3	1,540	5	1,100	24	1,390	5	1,010	16	1,180	11	2,290
13	1,510	10	1,260	12	1,400	August		11	1,290	23	730	15	2,400
16	1,510	17	1,190	15	1,340	1	902	18	1,280	30	1,080	18	2,430
21	1,560	24	1,230	19	1,400	6	407	22	793	31	1,080	26	1,500
						7	778	25	785				

QUALITY OF WATER - 1978

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 1978; biochemical, October 1974 through 1978; suspended silt, 1969 through 1978; specific conductance, 1969 through 1978.
REMARKS: Sampling and chemical analyses by U. S. Geological Survey; suspended silt sampling and determinations by the International Boundary and Water Commission; sampling and determinations for specific conductance by 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.

1978 Date	Time Std.	Stream-flow, Momen-tary Sec.-Ft.	Specific Conduct-ance Micromhos	pH Units	Temper-ature Deg C	Hard-ness, Total (as CaCO3) mg/L	Hard-ness, Noncar-bonate (as CaCO3) mg/L	Calcium ion (Ca), Dis-solved mg/L	Magne-sium ion (Mg) mg/L	Sodium ion (Na), Dis-solved mg/L	Sodium Adsor-ption Ratio (SAR)	Potassium ion (K), Dissolved mg/L
Jan. 18	1200	465	1,080	7.8	10.0	300	140	84	22	130	3.3	5.3
Feb. 15	1115	490	1,090	7.9	13.0	260	110	81	15	120	3.2	5.3
Mar. 22	1105	400	1,100	7.9	21.0	300	150	82	23	120	3.0	5.9
Apr. 12	1200	900	946	7.9	21.5	280	130	75	23	94	2.4	5.4
May 3	1130	1,350	1,180	8.2	22.5	320	170	98	19	150	3.6	7.9
June 7	1330	1,880	780	7.4	26.5	270	120	96	8.4	60	1.6	5.9
July 12	1105	675	900	8.1	27.5	270	120	88	12	86	2.3	5.9
Aug. 9	1330	3,660	760	7.6	26.0	280		99	8.5	41	1.1	4.9
Sep. 14	1230	1,100	889	7.8	29.0	280	160	98	9.6	74	1.9	4.9
Oct. 25	1115	5,500	1,280	8.0	20.0	370	200	120	16	130	3.0	7.0
Nov. 29	1335	2,350	1,060	7.9	14.5	300	130	95	15	110	2.8	6.3
Dec. 27	1310	1,100	1,780	7.8	12.0	490	300	150	27	210	4.1	8.6

1978 Date	Bicar-bonate ion (HCO3) mg/L	Car-bonate ion (CO3) mg/L	Sulfate ion (SO4), Dis-solved mg/L	Chlo-ride ion (Cl), Dis-solved mg/L	Silica (SiO2), Dis-solved mg/L	Oxygen, Dis-solved (DO) mg/L	Coli-form, Fecal Cols./ 100 mL	Oxygen Demand, Bio-Chemical (BOD) 5 day mg/L	Tur-bid-ity JTU	Solids, Dis-solved (Calcu-lated) mg/L	Solids, Dis-solved (Residue @ 180 Deg C) mg/L	Sus-pended Sedi-ment mg/L
Jan. 18	200	0	300	75	24	10.4	24	0.5	65	740	714	119
Feb. 15	190	0	270	74	24	10.0	23	.7	80	685	704	181
Mar. 22	180	0	280	77	19	8.7	52	.6	68	697	686	145
Apr. 12	190	0	230	62	20	8.4	700	1.2	240	604	600	595
May 3	190	0	340	62	29	9.0	180	.3	320	802	781	690
June 7	184	0	230	18	14	8.5	3,000	.8	3,800	524	532	
July 12	180	0	230	45	24	7.6	920	1.1	420	587	595	
Aug. 9			220	17	16	8.4	6,000	3.4	4,200		461	
Sep. 14	156	0	260	40	17	7.8	8,000	.4	800	581	599	
Oct. 25	202	0	340	97	22	8.2	300	.6	170	833	840	433
Nov. 29	210	0	280	90	24	8.3	1,500	.7	80	725	730	214
Dec. 27	230	0	490	200	22	9.7	300	1.1	25	1,220	1,210	107

SUSPENDED SILT - 1978

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.	42,597,000	5,980	30	0.01404			4.1	6.4	34.9	0.61
Feb.	36,965,000	6,270	27	.01696			4.3	4.3	17.8	.57
Mar.	35,613,000	4,700	30	.01320			3.2	10.5	49.2	.72
Apr.	69,106,000	39,100	30	.05652			26.9	9.9	26.9	.22
May	175,892,000	1,150,000	30	.6536	1.337	0.04970	792	154	792	.60
June	128,136,000	829,000	30	.6473	1.342	.01210	571	230	657	24.6
July	106,571,000	774,000	31	.7262	1.687	.01670	533	498	875	51.0
Aug.	267,330,000	1,704,000	31	.6375	1.393	.04110	1,170	605	1,320	21.8
Sept.	309,814,000	1,883,000	29	.6079	1.279	.1800	1,300	801	1,660	81.3
Oct.	1,225,643,000	2,310,000	30	.1885	.5728	.05650	1,590	388	1,590	3.5
Nov.	486,381,000	2,555,000	30	.5253	1.170	.01590	1,760	195	1,760	.76
Dec.	100,619,000	13,100	31	.01304			9.0	9.6	19.6	.62
Year	2,984,667,000	11,274,150	359	0.3777	1.687		7,763.5	2,911.7	7,763.	954.9

QUALITY OF WATER - 1978

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

SPECIFIC CONDUCTANCE OF WATER SAMPLES IN MICROMHOS/CM @ 25 DEG C - 1978

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1		1,130	1,100	1,010	1,190	901	912	1,220	1,210	800	1,180	1,130
2	1,100	1,120	1,110	995	1,180	773	880	1,100	1,260	1,010	1,190	1,140
3	1,110	1,050	1,120	982	1,190	519	822	822	931	1,000	1,210	1,150
4	1,130	1,120	1,120	971	1,180	685	802	843		945	1,200	1,150
5	1,220	1,100	1,110	954	1,140	678	988	931	1,120	797	351	1,140
6	1,140		1,130	933	1,150	471	823	523	1,020		600	1,140
7	1,130	1,110	1,130	940	1,200	874	622	585	1,070	766	751	1,160
8	1,140	1,120	1,120	937	1,200	981	610	835	1,000	720	921	1,190
9	1,130	1,120	1,130	917	1,210	952	711	826	911	708	928	1,210
10	1,130	1,120	1,150	816	1,190	952	790	707	780	804	962	1,260
11	1,110	1,120	1,140	923	1,180	872	892	768	887	854	910	1,310
12	1,110	1,110	1,140	971	1,230	1,000	889	878	864	832	974	1,380
13	1,100	1,120	1,140	1,490	1,000	1,090	881	962	988	802	1,050	1,410
14	1,110	1,110	1,130	1,550	1,050	1,080	983	903	877	818	1,190	1,450
15	1,100	1,090	1,160	1,290	1,100	1,050	1,040	801	889	849	1,180	1,480
16	1,100	1,100	1,110	1,220	1,180	1,030	1,050	771	961	870	1,170	1,510
17	1,110	1,100	1,110	1,190	1,190	1,050	1,060	872	643	960	1,190	1,530
18	1,100	1,100	1,100	1,180	1,190	1,080	1,090	952	974	1,050	1,280	1,560
19	1,100	1,090	1,120	1,180	1,190	1,120	1,100	970	869	1,150	1,250	1,570
20	1,100	1,100	1,120	1,180	1,200	1,130	1,100	986	1,100	1,210	1,180	1,610
21	1,080	1,120	1,120	1,180	962	1,130	1,090	1,100	768	1,280	1,100	1,620
22	1,090	1,120	1,110	1,170	494	1,130	1,090	1,130	1,120	1,290	1,140	1,630
23	1,090	1,120	1,100	1,170	700	1,130	1,100	1,240	760	1,290	1,140	1,650
24	1,090	1,110	1,080	1,160	1,140	1,140	1,100	1,070	1,080	1,270	1,140	1,640
25	1,100	1,100	1,080	1,170	1,050	1,150	1,110	1,290	803	1,270	1,120	1,660
26	1,110	1,100	1,060	1,170	1,130	1,160	1,130	1,320	645	1,220	1,120	1,760
27	1,130	1,100	1,060	1,170		1,160	1,120	1,150	655	1,020	1,120	1,780
28	1,160	1,100	1,050	1,170	1,020	1,160	1,110	1,010	888	940	1,120	1,810
29	1,150		1,050	1,170	465	1,150	969	1,130	751	910	1,110	1,830
30	1,140		1,050	1,170	822	1,140	1,210	923	736	1,040	1,120	1,890
31	1,130				1,010		501	1,180		1,060		1,800

QUALITY OF WATER - 1978

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 1978; biochemical analyses, October 1974 through 1978; suspended silt November 1954 through 1976; specific conductance 1969 through 1978.
REMARKS: Sampling and chemical 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.

1978 Date	Time Std.	Stream-flow, Momen-tary Sec.-Ft.	Specific Conduct-ance Micromhos	pH Units	Temper-ature Deg C	Hard-ness, Total (as CaCO3) mg/L	Hard-ness, Noncar-bonate (as CaCO3) mg/L	Calcium ion (Ca), Dis-solved mg/L	Magne-sium ion (Mg) mg/L	Sodium ion (Na), Dis-solved mg/L	Sodium Adsor-ption Ratio (SAR)	Potassium ion (K), Dissolved mg/L
Jan. 18	0905	195	2,830	7.9	9.0	610	460	140	63	380	6.7	6.6
Feb. 15	0830	190	3,130	8.0	10.5	630	480	140	68	420	7.3	7.1
Mar. 22	0830	175	3,360	8.0	20.5	680	550	150	74	460	7.5	8.3
Apr. 12	0900	170	2,920	8.0	20.0	580	470	130	63	390	7.0	7.5
May 3	0830	150	3,200	8.2	23.5	560	460	120	64	410	7.5	8.8
June 7	0940	5,840	960	7.7	22.0	210	22	58	16	110	3.3	4.5
July 12	0825	150	3,200	8.3	28.0	500	380	110	54	320	6.2	7.0
Aug. 9	1000	155	1,760	7.9	29.5	340	220	79	35	220	5.2	5.4
Sep. 14	0840	210	1,800	7.6	28.5	360	220	86	36	220	5.0	5.1
Oct. 25	0835	260	2,830	7.9	17.5	630	500	160	56	350	6.1	8.5
Nov. 29	1000	320	4,100	7.9	14.0	890	710	190	100	560	8.2	11
Dec. 27	1040	270	4,350	7.9	10.0	840	690	190	89	650	9.8	11

1978 Date	Bicar-bonate ion (HCO3) mg/L	Car-bonate ion (CO3) mg/L	Sulfate ion (SO4), Dis-solved mg/L	Chlo-ride ion (Cl), Dis-solved mg/L	Silica (SiO2), Dis-solved mg/L	Oxygen, Dis-solved (DO) mg/L	Coli-form, Fecal Cols./ 100 mL	Oxygen Demand, Bio-Chemical (BOD) 5 day mg/L	Tur-bid-ity JTU	Solids, Dis-solved (Calcu-lated) mg/L	Solids, Dis-solved (Residue @ 180 Deg C) mg/L	Sus-pended Sedi-ment mg/L
Jan. 18	180	0	350	640	13	10.6	2	0.2	4.0	1,680	1,710	9
Feb. 15	180	0	290	810	12	10.1	1	.6	4.0	1,840	1,880	22
Mar. 22	160	0	430	730	7.5	8.3	5	.5	6.0	1,930	2,030	17
Apr. 12	140	0	360	660	8.2	8.6	2	.7	10	1,690	1,790	12
May 3	130	0	360	690	8.4	7.5	10	.8	10	1,730	1,800	11
June 7	230	0	100	170	8.3	8.1	130	2.9	300	581	541	
July 12	146	0	300	550	17	7.5	78	.8	7.0	1,430	1,510	
Aug. 9	150	0	200	370	13	8.6	270	1.0	15	997	1,040	
Sep. 14	170	0	210	370	15	8.2	130	.1	2.0	1,030	1,070	
Oct. 25	162	0	460	570	14	8.3	53	.3	4.0	1,700	1,780	11
Nov. 29	210	0	580	860	13	8.4	65	.4	4.0	2,420	2,580	19
Dec. 27	190	0	630	980	11	10.0	12	.4	3.0	2,660	2,810	8

SPECIFIC CONDUCTANCE OF WATER SAMPLES IN MICROMHOS/CM @ 25 DEG C - 1978

January		February		April		June		July		September		November	
3	2,870	21	3,300	10	3,290	12	2,230	24	2,390	11	1,460	13	3,340
9	2,870	27	3,320	17	3,290	19	2,540	31	2,160	18	1,970	20	4,150
16	2,910	March		24	3,260	26	2,670	August		25	1,740	27	3,210
23	2,970	6	3,380	May		July		14	2,170	October		December	
30	3,040	20	3,450	1	3,150	3	2,600	21	2,270	3	2,000	11	3,870
February		27	3,410	8	3,050	10	2,570	28	1,600	10	2,580	18	3,840
6	3,090	April		15	2,920	17	2,460	September		16	5,090	26	4,420
13	3,170	3	3,410	30	2,720			5	1,890	23	3,120		

QUALITY OF WATER - 1978

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, 1956 through 1978.
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, available from U. S. Geological Survey.

SPECIFIC CONDUCTANCE OF WATER SAMPLES IN MICROMHOS/CM @ 25 DEG C - 1978

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1		419	407	370	354	295	312	342	335		361	383
2		394	400	377	325	310	328	351	328	362	360	381
3	444	400	391	380	354	314	341	357	350	362	352	376
4		404	410	391	380	328	326	352	370	362	364	386
5		401	421	333	314	260	341	307	351	374	381	383
6		398	415	343	363	308	323	325	357	356	381	383
7		413	410	344	358	344	354	331	365		383	383
8		405	403	345	396	393	317	348	356	359	376	367
9		407	385	304	356	341	315	313	365	363	381	394
10		403	365	268	381	357	345	335	360	383	383	400
11		394	349	241	366	375	334	323	351	379	379	400
12		406	375	343	395	299	358	331	355	346	375	378
13		400	398	364	389	325	334	335	349	356	380	382
14		390	384	359	377	310	366	338	338		372	
15		400	342	357	385	307	357	340	350	367	371	
16	376	386	370	360	292	357	354	290	345	370	372	
17		408	393	392	393	350	349	338	343	381	391	
18		422	380	393	366	349	350	347	353	363	377	
19		418	381	380	373	347	360	350	341	365	383	
20		408	400	396	344	319	338	355	347		381	
21		413	396	364	308	344	336	360	335	370	381	
22		415	349	361	375	357	343	364	326	379	386	
23	439	420	396	360	393	367	357	344	349	375	383	380
24		417	384	353	375	350	355	327	362	371	387	387
25		418	390	378	389	333	359	358	357	375	377	388
26		415	390	358	378	350	355	361	353	376	373	
27		407	391	356	385	346	359	359	370	385	374	
28		412	381	388	378	358	368	356	366	386	378	383
29			402	354	385	356	365	362	353	368	380	384
30			400	370	373	340	368	359	362	376	387	393
31			393		350		369	366		371		390

QUALITY OF WATER - 1978

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 1978; suspended silt, 1969 through 1976; specific conductance, 1968 through 1978.
REMARKS: Sampling for chemical analyses by the International Boundary and Water Commission, analyses by the U. S. Geological Survey. Sampling and determination for specific conductance by the International Boundary and Water Commission.

1978 Date	Time Standard	Streamflow, Momentary Second-Feet	Specific Conductance Micromhos	pH Units	Temperature Deg C	Hardness, Total (as CaCO3) mg/L	Hardness, Noncarbonate (as CaCO3) mg/L	Calcium ion (Ca), Dissolved mg/L	Magnesium ion (Mg), Dissolved mg/L
Jan. 18	0825	971	1,060	8.0	10.5	260	150	70	21
Feb. 15	0820	946	1,050	8.1	10.0	260	140	69	21
Mar. 15	0800	3,070	1,040	7.8		270	150	75	20
Apr. 19	0815	1,220	1,060	8.1	18.0	240	120	63	20
May 17	0725	6,570	1,100	7.8	26.5	260	140	70	21
June 21	0720	5,160	1,090	8.0	22.0	250	120	66	20
July 19	0720	4,450	1,080	8.2		250	130	66	20
Aug. 16	0720	2,480	1,070	7.8	26.0	250	130	67	19
Sep. 20	0725	2,460	1,030	7.9	26.0	250	140	68	20
Oct. 18	0725	6,360	1,010	8.1	21.0	260	140	72	19
Nov. 15	0830	2,060	996	8.0	18.5	240	120	65	18
Dec. 20	0820	918	1,000	8.0	13.5	240	110	68	16

1978 Date	Sodium ion (Na), Dissolved mg/L	Sodium Adsorption Ratio(SAR)	Potassium ion (K), Dissolved mg/L	Bicarbonate ion (HCO3) mg/L	Carbonate ion (CO3) mg/L	Sulfate ion (SO4), Dissolved mg/L	Chloride ion (Cl), Dissolved mg/L	Silica (SiO2), Dissolved mg/L	Solids Dissolved (Calculated) mg/L
Jan. 18	120	3.2	5.2	140	0	220	130	18	653
Feb. 15	110	3.0	5.1	150	0	220	120	16	635
Mar. 15	120	3.2	5.1	150	0	220	130	15	659
Apr. 19	120	3.4	5.3	150	0	210	120	16	628
May 17	120	3.2	5.3	150	0	200	130	16	636
June 21	120	3.3	5.2	150	0	210	130	17	642
July 19	130	3.6	5.3	140	0	210	130	17	647
Aug. 16	110	3.1	4.9	140	0	210	130	16	626
Sep. 20	120	3.3	5.1	140	0	240	120	18	660
Oct. 18	120	3.3	5.2	140	0	250	100	17	652
Nov. 15	100	2.8	6.0	140	0	220	110	15	603
Dec. 20	110	3.1	5.6	150	0	220	93	15	602

SPECIFIC CONDUCTANCE OF WATER SAMPLES IN MICROMHOS/CM @ 25 DEG C - 1978

January		February		April		June		July		September		November	
3	1,090	24	1,070	19	1,080	7	1,070	26	1,080	11	1,050	6	1,010
6	1,090	27	1,080	21	1,100	9	1,080	28	1,070	13	1,040	8	1,020
9	1,090	March		24	1,090	12	1,080	31	1,080	15	1,050	13	1,010
11	1,090	1	1,040	26	1,100	14	1,080	August		18	1,050	15	1,010
13	1,090	3	1,030	28	1,100	16	1,090	2	1,100	22	1,030	17	1,020
16	1,090	6	1,070	May		19	1,080	4	1,080	25	1,040	20	1,020
18	1,090	8	1,150	1	1,090	21	1,090	7	1,070	27	1,040	22	1,010
20	1,080	10	1,050	3	1,080	24	1,090	9	1,080	29	1,040	24	1,010
23	1,090	13	1,060	5	1,090	26	1,090	11	1,070	October		27	1,000
25	1,090	15	1,060	8	1,080	28	1,080	14	1,070	2	1,040	29	1,010
27	1,090	20	1,070	10	1,090	30	1,090	16	1,070	4	1,040	December	
February		22	1,060	12	1,070	July		18	1,070	6	1,040	1	1,010
1	1,090	24	1,050	15	1,090	3	1,090	21	1,070	10	1,020	4	1,020
3	1,090	27	1,060	17	1,100	5	1,090	23	1,070	13	1,020	6	1,020
7	1,080	29	1,120	19	1,100	7	1,080	25	1,070	15	1,020	8	1,020
8	1,080	April		22	1,090	10	1,090	28	1,070	20	1,010	11	1,020
10	1,070	3	1,090	24	1,100	12	1,090	30	1,060	23	1,010	13	1,010
13	1,080	5	1,080	26	1,100	14	1,080	September		25	1,020	15	1,020
15	1,070	7	1,090	30	1,090	17	1,090	1	1,070	27	1,010	18	1,010
17	1,080	10	1,080	June		19	1,080	5	1,040	30	1,010	20	1,010
21	1,070	13	1,090	2	1,100	21	1,080	6	1,030	November		22	1,000
23	1,070	17	1,090	5	1,090	24	1,080	8	1,050	1	1,020	26	1,000
										3	1,020	29	1,010

QUALITY OF WATER - 1978

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 1978.
REMARKS: Sampling and determinations by the International Boundary and Water Commission.

SPECIFIC CONDUCTANCE OF WATER SAMPLES IN MICROMHOS/CM @ 25 DEG C - 1978

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	1,040	1,030	987	1,050	984	1,050	1,070	1,040	1,010	992	1,010	983
2	1,030	1,030	972	965	974	1,040	1,050	1,040	1,010	988	1,010	993
3	1,040	1,020	948	1,020	959	1,010	1,030	1,040	997	988	1,010	992
4	1,030	1,020	944	1,020	932	1,010	1,060	1,040	1,000	997	1,020	994
5	1,030	1,020	967	1,030	967	1,040	1,080	1,030	1,030	1,050	643	995
6	1,030	1,010	978	1,030	985	1,050	1,070	1,020	1,030	1,040	844	993
7	1,020	1,020	968	1,030	975	1,020	1,080	1,030	1,020	1,030	958	987
8	1,040	1,010	977	1,030	977	1,040	1,080	1,050	1,020	1,030	981	994
9	1,030	1,020		1,050	956	1,050	1,040	1,060	1,020	1,020	994	998
10	1,030	1,020	1,080	1,070	968	1,080	1,060	1,060	1,020	1,020	1,000	1,000
11	1,030	1,020	1,040	1,070	1,070	1,080	1,080	1,060	1,030	1,020	996	1,000
12	1,020	1,010	1,020	1,050	1,080	1,070	1,070	1,060	1,050	1,020	1,000	989
13	1,020	1,010	1,040	1,070	1,050	1,040	1,080	1,060	1,060	1,030	1,000	976
14	1,020	1,010	1,040	1,050	1,070	1,050	1,090	1,080	1,040	1,030	1,000	982
15	1,020	1,010	1,040	1,040	1,090	1,070	1,080	1,080	1,030	1,030	997	971
16	1,020	1,010	1,060	1,050	1,080	1,080	1,080	1,070	1,040	1,020	996	975
17	1,040	1,010	1,060	1,050	1,010	1,070	1,090	1,060	1,030	1,030	995	974
18	1,040	1,010	1,040	1,040	1,100	1,090	1,080	1,060	1,030	1,020	985	972
19	1,020	1,010	1,040	1,020	1,100	1,070	1,080	1,060	1,020	1,020	991	971
20	1,030	995	1,050	1,020	1,080	1,070	1,090	1,060	1,020	1,020	993	967
21	1,040	999	1,050	1,050	1,100	1,080	1,080	1,060	1,030	1,020	988	988
22	1,030	998	1,040	1,060	1,020	1,080	1,090	1,060	1,000	1,020	992	981
23	1,030	1,000	1,050	1,060	1,060	1,070	1,070	1,060	1,020	1,020	994	991
24	1,030	1,000	1,070	1,020	1,090	1,070	1,050	1,030	1,020	1,010	985	985
25	1,060	995	1,050	1,040	1,090	1,070	1,060	1,050	1,020	1,020	990	1,000
26	1,030	992	1,050	1,040	1,080	1,080	1,070	1,050	1,020	1,020	994	986
27	1,040	979	1,040	1,050	1,090	1,080	1,080	1,050	1,020	1,010	996	980
28	1,020	1,000	1,050	1,060	1,120	1,080	1,070	1,050	1,020	1,010	989	988
29	1,020		1,100	1,060	1,070	1,070	1,090	1,030	991	1,020	995	992
30	1,030		1,070	1,040	1,090	1,070	1,080	1,040	992	1,020	993	991
31	1,030		1,070		1,090		1,070	1,040		1,020		972

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 1978.
REMARKS: Sampling and determinations by the International Boundary and Water Commission.

SPECIFIC CONDUCTANCE OF WATER SAMPLES IN MICROMHOS/CM @ 25 DEG C - 1978

January		March		April		June		August		September		November	
4	1,040	1	1,110	26	1,130	7	1,080	2	1,020	27	796	6	420
18	995	15	1,100	May		21	1,100	16	1,060	October		22	809
February		29	1,130	10	1,140	July		30	912	11	966	December	
1	969	April		24	1,060	7	1,100	September		25	1,000	6	885
15	1,070	12	1,090			19	1,100	13	945			26	804

QUALITY OF WATER - 1978

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 1978; biochemical analyses, September 1968 through 1978; suspended silt, 1953 through 1978; specific conductance, 1948-1949 and 1955 through 1978.

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; biochemical analyses, collected and analyzed 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.

1978 Date	Time Std.	Stream-flow, Momen-tary Sec.-Ft.	Specific Conduct-ance Micromhos	pH Units	Temper-ature Deg C	Hard-ness, Total (as CaCO3) mg/L	Hard-ness, Noncar-bonate (as CaCO3) mg/L	Calcium ion (Ca), Dis-solved mg/L	Magne-sium ion (Mg) mg/L	Sodium ion (Na), Dis-solved mg/L	Sodium Adsor-ption Ratio (SAR)	Potassium ion (K), Dissolved mg/L
Jan. 23	1615	1,320	1,050	8.0	9.5	290	150	83	21	110	2.8	4.0
Feb. 13	1245	1,230	1,050	7.9	14.0	300	160	84	21	100	2.5	4.0
Mar. 13	1255	2,650	1,060	7.8	20.5	310	190	88	21	100	2.5	3.9
Apr. 17	1630	1,600	1,110	8.1	27.5	310	170	88	22	110	2.7	4.8
May 8	1430	770	1,150	8.0	28.5	280	160	76	22	140	3.6	5.3
June 5	1530	8,000	1,000	7.6	29.0	280	160	73	23	110	2.9	5.2
July 10	1530	4,250	1,200	8.0	31.0	270	150	70	22	120	3.2	4.9
Aug. 14	1210	2,500	1,070	8.0	30.0	260	130	70	20	110	3.0	4.9
Sep. 11	1410	3,550	757	8.1	28.5	220	100	64	14	74	2.2	4.0
Oct. 2	1415	2,800	787	8.3	27.5	230	86	67	14	70	2.0	3.6
Nov. 13	1520	6,300	751	8.2	22.0	230	83	71	13	60	1.7	3.3
Dec. 4	1440	4,800	846	8.3	18.5	250	110	77	15	79	2.2	4.3

1978 Date	Bicar-bonate ion (HCO3) mg/L	Car-bonate ion (CO3) mg/L	Sulfate ion (SO4), Dis-solved mg/L	Chlo-ride ion (Cl), Dis-solved mg/L	Silica (SiO2), Dis-solved ug/L	Oxygen, Dis-solved (DO) mg/L	Coli-form, Fecal Cols./ 100 mL	Oxygen Demand, Bio-Chemical (BOD) 5 day mg/L	Tur-bid-ity JTU	Solids, Dis-solved (Calcu-lated) mg/L	Solids, Dis-solved (Residue @ 180 Deg C) mg/L	Sus-pended Sedi-ment mg/L
Jan. 23	170	0	220	120	15	11.0	4,600	1.4	6.0	657	648	8
Feb. 13	170	0	200	110	15	10.3	1,400	1.4	15	619	634	21
Mar. 13	140	0	180	120	14	8.5	1,600	.2	55	597	610	125
Apr. 17	170	0	220	120	17	8.0	2,000	1.5	50	667	675	92
May 8	150	0	230	140	16	8.2	16,000	3.1	30	704	693	
June 5	140	0	220	110	12	7.4	7,600	1.0		623	613	
July 10	140	0	230	130	20	8.0	290	.4	30	667	666	
Aug. 14	150	0	210	120	18	7.3	840	1.0	40	628	643	
Sep. 11	140	0	150	79	14	7.0	19,000	.8	90	469	470	
Oct. 2	170	0	130	79	15	7.6	2,200	.7	40	463	502	89
Nov. 13	180	0	120	65	14	6.8		1.8	30	436	474	97
Dec. 4	170	0	160	82	14	8.8	240	.6	15	516	524	73

1978 Date	Time Std.	Stream-flow, Momen-tary Sec-Ft.	Specific Conduct-ance Micro-mhos	pH Units	Tem-pera-ture Deg C	Oxygen, Dis-solved (DO) mg/L	Coli-form, Fecal Cols./ 100 mL	Oxygen Demand, Bio-Chemical (BOD) 5 Day mg/L	Alkalinity Total (as CaCO3) mg/L	Sulfate ion (SO4), Dis-solved mg/L	Chloride ion (Cl), Dis-solved mg/L	Solids, Dis-solved (Residue @ 180 Deg C) mg/L	Sus-pended Sedi-ment mg/L
Jan. 23	1305	1,320	1,060	8.4	8.0	10.6	0		142	200	114	660	10
Feb. 14	1330	1,250	1,140	8.6	13.0	10.4	0		144	203	116	660	31
Mar. 29	1919	3,600	970	8.3	20.0	8.5			136	220	124	730	77
Apr. 12	1320	1,200	1,450	8.3	21.5	6.0	40		152	252	136		58
May 24	1350	6,890	1,220	8.3	29.0	6.9	438		122	215	118	670	560
June 13	1830	6,350	1,010	8.3	30.0	7.6	40		130	216	131	660	123
July 12	1430	4,200	1,090	8.2	30.5	6.0	20	3.0	114	218	125	630	45
Aug. 22	1335	2,360	1,110	8.1	28.0	4.2	40		120	239	119	640	61
Sep. 20	0907	3,000	928	8.3	27.7	7.6	60	1.5	127	200	108	640	79
Oct. 23	1440	6,890	970	8.2	23.5	7.7	40	1.0	126	207	96		59
Nov. 14	1450	6,200	740	8.3	24.0	8.1	120	2.0	165	143	63	510	69
Dec. 5	0825	4,770	800	8.5	15.6	9.5	25		142	170	76	560	24

QUALITY OF WATER - 1978

Rio Grande at Nuevo Laredo, Tamaulipas and Laredo, Texas

SUSPENDED SILT - 1978

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.	106,925,000	6,260	31	0.005857			4.3	3.8	8.3	0.93
Feb.	94,578,000	3,820	27	.004040			2.6	15.2	109	.88
Mar.	210,926,000	11,700	31	.005560			8.1	8.2	23.8	1.8
Apr.	119,985,000	7,920	30	.006600			5.5	37.7	251	1.2
May	338,785,000	50,400	31	.01488			34.7	56.0	165	22.5
June	491,024,000	176,000	30	.03588			121	84.5	688	.56
July	366,793,000	19,100	31	.005200			13.2	88.4	418	1.3
Aug.	236,355,000	15,200	31	.006440			10.5	67.7	313	2.3
Sept.	315,938,000	58,800	30	.01860			40.5	104	700	9.0
Oct.	533,854,000	46,300	31	.008680			31.9	74.9	286	7.5
Nov.	504,065,000	39,700	30	.007880			27.3	9.1	27.3	1.6
Dec.	301,477,000	11,700	31	.003880			8.1	5.1	13.8	.83
Year	3,620,705,000	446,900	364	0.01234			307.7	554.6	1,626.9	124.0

SPECIFIC CONDUCTANCE OF WATER SAMPLES IN MICROMHOS/CM @ 25 DEG C - 1978

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	1,030	1,000	1,070	1,100	1,120	1,100	1,100	1,060	698	799	966	846
2	1,030	1,030	1,070	1,100	1,090	1,100	1,090	1,030	837	810	970	809
3	1,040	1,010	1,060	1,140	1,130	1,090	1,090	1,060	960	812	975	849
4	1,020	1,000	1,080	1,160	1,140	1,030	1,080	1,080	991	741	972	872
5	1,040	987	1,090	1,170	1,150	944	1,100	1,030	987	712	967	875
6	1,040	1,110	1,110	1,170	1,120	941	1,100	1,080	1,020	663	963	842
7	1,050	1,000	1,120	1,170	1,150	885	1,100	1,100	908	684	672	871
8	1,040	1,010	1,110	1,180	1,150	863	1,100	1,050	858	755	514	883
9	1,040	978	1,070	1,190	1,170	961	1,100	1,040	792	922	562	863
10	1,040	1,050	1,080	1,210	1,150	996	1,100	1,060	819	938	662	881
11	1,050	1,000	1,080	1,230	1,170	1,030	1,100	1,060	800	956	712	879
12	1,060	1,020	1,100	1,230	1,190	1,050	1,080	1,060	852	944	714	890
13	1,040	1,030	1,030	1,220	1,180	1,050	1,090	1,050	923	944	753	893
14	1,050	1,020	1,080	1,230	1,180	1,070	1,100	1,060	939	947	781	888
15	1,040	1,060	1,070	1,180	990	1,080	1,100	1,070	905	952	788	891
16	1,040	1,000	1,070	1,160	1,060	1,080	1,090	1,070	903	959	779	913
17	1,050	1,070	1,060	1,100	1,090	1,080	1,090	1,060	911	962	790	925
18	1,040	1,040	1,090	1,100	1,110	1,080	1,100	1,070	947	951	922	904
19	1,040	1,080	1,090	1,110	1,110	1,080	1,100	1,070	985	955	802	849
20	1,030	1,070	1,090	1,140	1,120	1,090	1,100	1,070	988	949	771	819
21	1,040	1,070	1,060	1,150	1,020	1,090	1,110	1,070	994	961	769	765
22	1,040	1,050	1,080	1,150	867	1,100	1,120	1,080	994	952	810	807
23	1,030	1,090	1,090	1,140	1,000	1,090	1,120	1,080	977	951	807	761
24	1,050	1,080	1,090	1,160	1,050	1,080	1,120	1,090	881	954	783	770
25	1,030	1,080	1,090	1,160	1,020	1,090	1,110	1,080	780	957	801	727
26	1,050		1,090	1,160	1,050	1,090	1,110	1,080	648	950	815	764
27	1,050	1,060	1,090	1,150	1,080	1,100	1,110	1,080	796	944	825	818
28	1,050	1,060	1,100	1,150	1,110	1,100	1,110	1,080	883	925	804	834
29	1,050		1,120	1,130	1,110	1,100	728	1,080	867	949	833	844
30	1,060		1,100	1,120	1,100	1,100	881	1,060	769	953	842	817
31	1,020		1,100		1,100		1,020	950		962		845

QUALITY OF WATER - 1978

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 1978.
REMARKS: Sampling by the International Boundary and Water Commission and analyses by the U. S. Geological Survey.

1978 Date	Time Standard	Streamflow, Momentary Second-Feet	Specific Conductance Micromhos	pH Units	Temperature Deg C	Hardness, Total (as CaCO3) mg/L	Hardness, Noncarbonate (as CaCO3) mg/L	Calcium ion (Ca), Dissolved mg/L	Magnesium ion (Mg), Dissolved mg/L
Jan. 10	1035	80.9	4,060	7.8	14.0	1,500	1,300	330	160
Feb. 3	1025	72.7	4,440	7.9	10.0	1,700	1,500	390	170
Mar. 3	1030	56.5	4,540	7.7	18.0	1,600	1,500	380	170
Apr. 6	1100	52.3	4,430	8.0		1,500	1,400	350	160
May 10	1035	43.8	5,030	7.6	28.0	1,700	1,600	380	190
June 1	1000	48.0	3,030	7.8	29.0	770	650	190	71
July 5	1045	48.0	4,130	7.9	36.0	970	860	300	170
Aug. 7	1200	182	1,280	7.6	30.0	340	230	98	24
Sep. 5	1100	283	888	7.8	29.0	260	160	76	18
Oct. 2	1415	7,060	714	8.1	27.0	270	140	77	18
Nov. 1	1210	621	1,740	8.1	23.0	620	450	180	41
Dec. 5	1100	2,020	785	8.1	17.0	270	130	75	19

1978 Date	Sodium ion (Na), Dissolved mg/L	Sodium Adsorption Ratio(SAR)	Potassium ion (K), Dissolved mg/L	Bicarbonate ion (HCO3) mg/L	Carbonate ion (CO3) mg/L	Sulfate ion (SO4), Dissolved mg/L	Chloride ion (Cl), Dissolved mg/L	Silica (SiO2), Dissolved mg/L	Solids Dissolved (Calculated) mg/L
Jan. 10	490	5.5	4.5	200	0	1,700	420	23	3,230
Feb. 3	540	5.7	4.1	200	0	1,900	430	38	3,570
Mar. 3	550	5.9	4.4	180	0	1,900	470	14	3,580
Apr. 6	550	6.1	5.9	160	0	1,800	440	16	3,400
May 10	700	7.3	6.0	140	0	2,200	590	24	4,160
June 1	400	6.3	6.5	140	0	940	380	15	2,070
July 5	520	7.3	6.1	130	0	1,700	410	18	3,187
Aug. 7	130	3.1	5.0	140	0	320	140	13	799
Sep. 5	77	2.1	5.0	130	0	260	68	16	584
Oct. 2	49	1.3	4.1	150	0	180	48	19	469
Nov. 1	160	2.8	3.8	210	0	510	190	20	1,210
Dec. 5	50	1.3	3.4	160	0	180	53	14	473

QUALITY OF WATER - 1978

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 (4.0 km) below Falcon Dam; latitude 26°31'45", longitude 99°09'30".
RECORDS: Chemical analyses, July 1955 through 1978; biochemical analyses, July 1975 through 1978; suspended silt July 1955 through 1976; specific conductance 1955 through 1978.
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.

1978 Date	Time Standard	Streamflow, Momentary Second-Feet	Specific Conductance Micromhos	pH Units	Temperature Deg C	Hardness, Total (as CaCO3) mg/L	Hardness, Noncarbonate (as CaCO3) mg/L	Calcium ion (Ca), Dissolved mg/L	Magnesium ion (Mg), Dissolved mg/L
Jan. 16	1000	6,580	1,060	7.9	15.5	270	160	71	22
Feb. 21	1100	536	1,080	8.0	12.0	280	180	76	23
Mar. 13	1000	2,300	1,090	7.8	13.5	290	170	77	23
Apr. 17	1000	1,560	1,100	7.8	19.0	270	160	69	24
May 15	0930	11,100	1,140	7.8	24.5	280	160	74	23
June 19	0915	2,140	1,150	7.8	24.5	280	170	75	23
July 17	1015	4,330	1,140	8.0	26.5	270	160	70	23
Aug. 28	1130	2,760	1,140	7.6	28.0	260	160	70	21
Sep. 18	0900	528	1,120	7.7	28.0	250	150	63	22
Oct. 23	1435	18	1,100	7.7	24.5	280	180	72	24
Nov. 20	0900	5,900	1,060	7.8	21.0	250	150	62	22
Dec. 18	0900	2,140	1,060	8.2	16.5	260	150	68	21

1978 Date	Sodium ion (Na), Dissolved mg/L	Sodium Adsorption Ratio(SAR)	Potassium ion (K), Dissolved mg/L	Bicarbonate ion (HCO3) mg/L	Carbonate ion (CO3) mg/L	Sulfate ion (SO4), Dissolved mg/L	Chloride ion (Cl), Dissolved mg/L	Silica (SiO2), Dissolved mg/L	Solids Dissolved (Calculated) mg/L
Jan. 16	110	2.9	5.0	130	0	240	130	13	655
Feb. 21	110	2.8	4.9	130	0	230	120	10	638
Mar. 13	120	3.1	4.9	140	0	230	130	10	664
Apr. 17	120	3.2	5.1	140	0	230	130	11	658
May 15	140	3.6	5.1	140	0	390	56	11	768
June 19	120	3.1	5.1	140	0	250	140	11	693
July 17	130	3.4	5.3	130	0	240	140	11	683
Aug. 28	130	3.5	5.1	120	0	260	140	11	696
Sep. 18	140	3.9	5.4	120	0	270	140	11	711
Oct. 23	120	3.1	5.4	120	0	260	130	12	683
Nov. 20	120	3.3	6.1	120	0	230	140	10	649
Dec. 18	120	3.3	5.7	130	0	230	130	9.9	649

Date	Time Standard	Streamflow, Momentary Second-Feet	Specific Conductance Micromhos	pH Units	Temperature Deg C	Oxygen, Dissolved (DO) mg/L	Coliform, Fecal Cols./ 100 mL	
Jan. 12	1313	6,000	987	8.4	15.9	10.2	6	
Feb. 16	1152	908	1,020	8.5	12.8	11.2	2	
Mar. 15	1450	1,720	952	8.3	18.6	10.4	6	
Apr. 26	1243	9,300	920	8.4	20.0	8.1	4	
May								
June 8	1008	84.0	1,120	7.9	27.5	7.2	26	
July 31	1242	4,360	1,100	8.3	28.0	7.8	70	
Aug. 30	1535	3,100	1,070	8.2	28.8	8.2	94	
Sep. 28	0945	80.0	888	7.9	28.5	7.9	1,000	
Oct. 31	1330	52.0	1,110	8.1	26.5	10.6	0	
Nov. 28	1515	8,200	1,000	8.1	19.9	8.7	11	
Dec. 18	1415	1,380	1,000	8.3	17.7	10.2		

QUALITY OF WATER - 1978

Rio Grande below Falcon Dam near Falcón, Texas and Nueva Cd. Guerrero, Tamaulipas

SPECIFIC CONDUCTANCE OF WATER SAMPLES IN MICROMHOS/CM @ 25 DEG C - 1978

January		February		April		June		August		September		November	
3	1,080	24	1,100	17	1,120	7	1,140	2	1,150	22	1,130	10	1,110
4	1,080	27	1,100	19	1,130	9	1,140	4	1,140	25	1,130	13	1,090
6	1,080	March		21	1,140	12	1,140	7	1,150	27	1,130	15	1,070
9	1,080	1	1,100	24	1,130	14	1,130	9	1,140	29	1,130	17	1,080
11	1,080	3	1,100	26	1,140	16	1,140	11	1,140	October		20	1,080
13	1,080	6	1,110	28	1,130	19	1,140	14	1,140	2	1,130	22	1,080
16	1,080	8	1,110	May		21	1,140	16	1,150	4	1,130	24	1,080
18	1,080	10	1,100	1	1,130	23	1,140	18	1,140	6	1,130	27	1,080
20	1,090	13	1,110	3	1,130	26	1,150	21	1,140	10	1,130	29	1,090
23	1,090	15	1,110	5	1,130	28	1,140	23	1,140	11	1,130	December	
25	1,080	17	1,110	8	1,140	30	1,150	25	1,140	13	1,130	1	1,080
27	1,090	20	1,110	10	1,140	July		28	1,150	16	1,120	4	1,080
30	1,090	22	1,110	12	1,160	3	1,150	30	1,140	18	1,110	6	1,070
February		24	1,120	15	1,140	5	1,150	September		20	1,110	8	1,210
1	1,090	27	1,110	17	1,140	7	1,150	1	1,140	23	1,110	11	1,090
3	1,090	29	1,110	19	1,150	10	1,150	5	1,140	25	1,100	13	1,070
6	1,090	31	1,110	22	1,150	12	1,150	6	1,130	27	1,090	15	1,070
8	1,100	April		24	1,150	14	1,150	8	1,150	30	1,090	18	1,070
10	1,100	3	1,120	26	1,150	17	1,150	11	1,140	November		20	1,070
13	1,090	5	1,120	30	1,150	19	1,150	13	1,140	1	1,110	22	1,060
15	1,100	7	1,120	31	1,160	21	1,150	15	1,140	3	1,110	26	1,060
17	1,100	10	1,130	June		24	1,150	18	1,130	6	1,110	27	1,070
21	1,100	12	1,130	2	1,160	26	1,140	20	1,150	8	1,110	29	1,060
22	1,100	14	1,130	5	1,140	28	1,150						
						31	1,150						

Rio Alamo at Cd. Mier, Tamaulipas

LOCATION: At gaging station, 5.0 river miles (8 km) from the confluence with the Rio Grande, which is located at river mile 262.4 (422.3 km).
RECORDS: Suspended silt, 1934 through 1978.
REMARKS: Sampling and analyses by the International Boundary and Water Commission.

SUSPENDED SILT - 1978

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.	1,878,000		0					1.5	21.8	0
Feb.	1,158,000		0					2.5	48.6	0
Mar.	641,000		0					5.6	91.2	0
Apr.	164,000		0					26.0	229	0
May	10,696,000	17,500	7	0.1637	0.2246	0	12.1	41.1	281	0
June	10,285,000	25,600	7	.2486	.2927	0	17.6	61.8	471	0
July	26,500	0	0	0	0	0	0	25.4	213	0
Aug.	7,661,000	2,800	5	.0366	.1817	0	1.9	110	1,610	0
Sept.	82,994,000	317,000	19	.3819	.9480	.0011	218	204	2,920	0
Oct.	29,124,000	29,100	14	.0998	.3248	.0007	20.0	73.7	753	0
Nov.	4,299,000	0	4	0	.0004	0	0	2.1	40.7	0
Dec.	4,857,000	0	4	0	0	0	0	1.3	33.7	0
Year	153,783,500	392,000	60	0.2548	0.9480	0		555.0	3,156.57	11.12

Rancherias Drain near Camargo, Tamaulipas

LOCATION: At a point about 1,000 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 1978.
REMARKS: Sampling and determinations by the International Boundary and Water Commission.

SPECIFIC CONDUCTANCE OF WATER SAMPLES IN MICROMHOS/CM @ 25 DEG C - 1978

January		February		April		June		July		September		November	
4	6,280	22	5,880	19	6,820	7	5,470	19	6,540	13	3,600	8	6,330
11	6,240	March		26	6,830	14	6,730	26	6,660	24	6,150	15	6,360
18	6,240	1	6,770	May		21	6,830	August		October		22	6,630
25	3,090	8	6,890	3	4,270	28	6,780	2	4,150	18	6,670	29	7,000
February		15	6,990	10	4,060	July		10	5,360	25	6,330	December	
2	5,050	29	6,980	17	6,510	5	6,510	16	5,920	November		6	7,140
8	5,650	April		24	6,840	12	6,500	23	5,530	1	6,010	19	7,210
16	5,870	5	6,950	31	4,570			30	5,770			28	6,760

QUALITY OF WATER - 1978

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 1978.
REMARKS: Sampling and determinations by the International Boundary and Water Commission.

SPECIFIC CONDUCTANCE OF WATER SAMPLES IN MICROMHOS/CM @ 25 DEG C - 1978

January		February		March		May		June		July		August	
4	1,190	16	1,750	29	1,910	3	1,840	14	1,730	19	1,830	23	# 1,670
11	1,330	22	1,620	April		10	# 1,830	21	1,720	26	1,810	30	# 1,750
25	1,460	March		5	1,900	17	1,550	28	1,820	August		September	
February		8	1,640	19	# 1,940	24	1,540	July		2	# 1,030	20	# 1,200
2	1,530	10	1,650	26	2,070	31	1,780	5	1,800	10	# 1,720	October	
8	1,510	15	1,760					12	# 1,790	16	# 1,780	18	580

Below Marte R.Gomez Dam

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 1978; specific conductance, 1958 through 1978; 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.

1978 Date	Time Standard	Streamflow, Momentary Second-Feet	Specific Conductance Micromhos	pH Units	Temperature Deg C	Hardness, Total (as CaCO3) mg/L	Hardness, Noncarbonate (as CaCO3) mg/L	Calcium ion (Ca), Dissolved mg/L	Magnesium ion (Mg), Dissolved mg/L
Jan. 16	1400	4,460	1,070	7.8	15.0	270	170	72	23
Feb. 21	1330	540	1,460	8.0	14.0	340	220	92	27
Mar. 13	1300	3,190	1,140	7.6	19.0	290	180	79	23
Apr. 18	1330	2,560	1,140	7.9	26.0	270	160	70	24
May 22	1500	11,900	1,150	7.8	26.0	280	170	75	23
June 19	1430	2,680	1,220	7.7	30.0	270	160	71	23
July 17	1400	4,150	1,150	8.0	30.5	270	160	70	23
Aug. 14	1420	3,490	1,170	7.6	28.5	270	160	72	22
Sep. 18	1400	631	1,220	7.4	29.0	260	120	81	15
Oct. 23	1530	5,490	1,647	7.9		220	87	66	13
Nov. 13	1530	1,490	1,990	7.6	24.5	450	260	130	31
Dec. 18	1500	3,750	1,030	7.8	15.0	290	170	82	20

1978 Date	Sodium ion (Na), Dissolved mg/L	Sodium Adsorption Ratio(SAR)	Potassium ion (K), Dissolved mg/L	Bicarbonate ion (HCO3) mg/L	Carbonate ion (CO3) mg/L	Sulfate ion (SO4), Dissolved mg/L	Chloride ion (Cl), Dissolved mg/L	Silica (SiO2), Dissolved mg/L	Solids Dissolved (Calculated) mg/L
Jan. 16	110	2.9	5.0	130	0	240	130	13	657
Feb. 21	180	4.2	5.1	150	0	300	210	7.5	896
Mar. 13	120	3.1	4.9	140	0	230	140	11	677
Apr. 18	130	3.4	5.2	140	0	250	140	11	699
May 22	140	3.6	5.1	140	0	380	58	11	761
June 19	140	3.7	5.2	140	0	260	150	11	729
July 17	130	3.4	5.4	130	0	250	140	11	693
Aug. 14	140	3.7	5.0	130	0	260	150	11	724
Sep. 18	160	4.3	5.8	170	0	230	180	12	768
Oct. 23	54	1.6	3.2	160	0	130	48	11	404
Nov. 13	250	5.1	6.8	240	0	350	320	14	1,220
Dec. 18	110	2.8	5.4	140	0	220	130	10	646

QUALITY OF WATER - 1978

Rio Grande at Rio Grande City, Texas near Camargo, Tamaulipas

SPECIFIC CONDUCTANCE OF WATER SAMPLES IN MICROMHOS/CM @ 25 DEG C - 1978

January		March		May		June		August		September		November	
3	1,100	11	1,390	1	1,140	21	1,180	9	1,140	27	645	13	1,210
9	1,100	13	1,140	4	1,150	23	1,230	11	1,160	29	653	15	1,240
12	1,110	15	1,150	5	1,140	26	1,180	16	1,160	October		17	1,060
16	1,100	17	1,170	8	1,140	28	1,180	17	1,180	2	572	20	1,050
20	1,150	20	1,140	10	1,140	July		18	1,150	4	572	22	1,010
23	1,140	22	1,150	13	1,150	1	1,150	21	1,170	6	557	24	1,050
27	1,280	24	1,150	15	1,110	3	1,160	23	1,180	9	620	27	1,030
30	1,120	27	1,150	17	1,150	5	1,180	26	1,200	11	567	29	1,040
February		29	1,130	19	1,150	7	1,170	28	1,190	13	556	December	
3	1,160	31	1,140	22	1,150	10	1,230	30	1,200	16	603	1	1,050
6	1,490	April		25	1,160	11	1,180	September		18	596	4	1,040
10	1,730	5	1,130	26	1,140	14	1,170	1	1,050	21	625	6	1,040
13	1,680	7	1,140	29	1,160	16	1,150	4	1,070	23	640	8	1,040
16	1,480	10	1,130	31	1,160	19	1,160	6	1,550	25	659	12	1,070
21	1,520	13	1,520	June		21	1,190	8	574	27	683	13	1,030
24	1,480	15	1,360	4	991	24	1,160	11	756	30	700	15	1,090
27	1,630	17	1,360	5	1,110	25	1,180	13	795	November		18	1,090
March		19	1,180	7	1,190	30	1,160	15	1,030	1	685	20	1,110
2	1,400	21	1,150	9	1,220	31	1,160	18	1,240	3	691	22	1,030
3	1,510	24	1,140	12	1,240	August		20	1,330	6	732	26	1,080
5	1,240	25	1,140	15	1,400	2	1,140	22	1,290	8	741	27	1,060
7	1,430	29	1,140	16	1,390	6	1,150	25	781	10	958	30	1,060
9	1,370			19	1,260	7	1,190						

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 1,050 feet (650 m) from its confluence with Puertecitos Drain. These two drains join at a point about 2,100 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 1978.
REMARKS: Sampling and determinations by the International Boundary and Water Commission.

SPECIFIC CONDUCTANCE OF WATER SAMPLES IN MICROMHOS/CM @ 25 DEG C - 1978

Date	Puerte-citos Drain	Los Indios Drain	Date	Puerte-citos Drain	Los Indios Drain	Date	Puerte-citos Drain	Los Indios Drain	Date	Puerte-citos Drain	Los Indios Drain
Jan. 4	3,910	2,600	Apr. 5	3,440	2,800	July 5	3,960	2,830	Oct. 18	3,590	2,870
11	3,420	2,550	19	3,640	2,800	12	3,890	2,840	25	3,690	2,860
18		2,710	26	3,060	2,250	19	3,870	2,790	Nov. 1	3,650	2,830
25	3,260	2,590	May 3	3,240	2,940	26	3,810	2,740	8	3,660	2,830
Feb. 2	3,640	2,810	10	3,650	3,020	Aug. 2	3,340	2,640	15	3,660	2,810
8	3,700	2,750	17	3,820	2,950	10	3,610	2,670	22	3,760	2,770
16	3,380	2,750	24	3,480	2,660	16	3,560	2,440	29	3,620	2,750
22	4,180	2,750	31	3,950	2,440	23	3,520	2,770	Dec. 6	3,690	2,750
Mar. 1	4,270	2,840	June 7		2,700	30	3,440	2,750	19	3,720	2,730
8	1,200	2,780	14	3,260	2,970	Sep. 13	3,490	2,910	28	3,740	2,710
15	4,260	2,780	21	3,990	2,820	20	3,610	2,860			
29	3,550	2,830	28	3,990	2,860						

QUALITY OF WATER - 1978

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 1978. Specific conductance, 1956 through 1978.
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.

1978 Date	Time Standard	Streamflow, Momentary Second-Feet	Specific Conductance Micromhos	pH Units	Temperature Deg C	Hardness, Total (as CaCO3) mg/L	Hardness, Noncarbonate (as CaCO3) mg/L	Calcium ion (Ca), Dissolved mg/L	Magnesium ion (Mg), Dissolved mg/L
Jan. 16	1430	6,920	1,080	7.8	16.0	270	170	72	23
Feb. 21	1445	428	1,840	7.9	14.0	410	270	110	34
Mar. 13	1430	1,240	1,340	7.6	20.0	330	220	89	27
Apr. 18	1415	741	1,400	7.9	28.0	330	190	84	28
May 22	1600	11,300	1,150	7.8	26.5	280	160	74	23
June 19	1515	1,500	1,350	7.9	30.0	290	170	76	24
July 17	1520	3,450	1,200	8.0	30.5	280	170	71	24
Aug. 14	1520	5,480	1,170	7.6	29.0	270	170	73	22
Sep. 18	1520	465	1,660	7.8	29.5	370	210	110	23
Oct. 23	1630	5,680	658	7.8		220	81	67	13
Nov. 13	1620	1,450	1,990	7.5	24.0	430	230	120	32
Dec. 18	1600	3,100	1,090	7.8	16.0	270	140	74	21

1978 Date	Sodium ion (Na), Dissolved mg/L	Sodium Adsorption Ratio(SAR)	Potassium ion (K), Dissolved mg/L	Bicarbonate ion (HCO3) mg/L	Carbonate ion (CO3) mg/L	Sulfate ion (SO4), Dissolved mg/L	Chloride ion (Cl), Dissolved mg/L	Silica (SiO2), Dissolved mg/L	Solids Dissolved (Calculated) mg/L
Jan. 16	120	3.2	4.9	130	0	230	130	13	657
Feb. 21	230	4.9	5.7	180	0	340	280	11	1,100
Mar. 13	160	3.8	5.4	140	0	280	180	11	821
Apr. 18	160	3.9	5.9	160	0	300	190	11	858
May 22	140	3.6	5.2	140	0	250	140	11	712
June 19	160	4.1	5.4	150	0	280	170	12	801
July 17	130	3.4	5.3	130	0	260	150	11	715
Aug. 14	130	3.4	5.0	130	0	260	140	11	705
Sep. 18	210	4.8	7.1	190	0	300	280	16	1,040
Oct. 23	57	1.7	3.3	170	0	130	49	12	415
Nov. 13	250	5.2	7.2	240	0	350	330	14	1,220
Dec. 18	110	2.9	5.0	160	0	220	130	11	650

SPECIFIC CONDUCTANCE OF WATER SAMPLES IN MICROMHOS/CM @ 25 DEG C - 1978

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	1,310	1,160	1,840	1,170	1,160	1,180	1,210	1,160	1,130	701	740	1,030
2	1,130	1,160	1,620	1,170	1,170	1,180	1,210	1,150	1,130	708	745	1,030
3	1,120	1,360	1,620	1,170	1,180	1,170	1,200	1,160	1,150	726	751	1,030
4	1,110	1,350	1,660	1,160	1,170	1,180	1,200	1,190	1,180	745	759	1,030
5	1,160	1,350	1,520	1,160	1,170	1,170	1,210	1,180		614	787	1,030
6	1,150	1,690	1,520	1,160	1,160	1,180	1,220	1,180		613	813	1,040
7	1,150	1,710	1,300	1,160	1,160	1,220	1,210	1,170	1,450	597	780	1,030
8	1,140	1,710	1,290	1,170	1,170	1,220	1,200	1,170	740	638	784	1,020
9	1,140	1,700	1,460	1,150	1,170	1,230	1,200	1,170	542	598	820	999
10	1,140	1,970	1,460	1,150	1,170	1,220	1,210		542	622	877	1,030
11	1,120	2,010	1,450	1,150	1,160	1,380	1,190	1,160	512	593	983	1,050
12	1,120	2,390	1,450	1,150	1,170	1,510	1,190	1,170	613	563	1,320	1,050
13	1,110	2,350	1,610	1,170	1,170	1,510	1,210	1,190	676	580	1,490	1,050
14	1,110	2,310	1,610	1,360	1,250	1,380	1,210	1,190	886	578	1,790	1,050
15	1,100	2,380	1,270	1,730	1,120	1,380	1,210	1,180	1,240	563	1,160	1,060
16	1,100	2,500	1,270	1,730		1,380	1,200	1,180	1,550	582	1,130	1,060
17	1,100	2,580	1,270	1,720	1,150	1,390	1,200	1,170	1,880	603	1,040	1,120
18	1,110	1,770	1,270	1,510	1,160	1,400	1,210	1,180	1,870	615	1,040	1,120
19	1,110	1,750	1,170	1,340	1,150	1,410	1,190	1,170	1,890	609	1,030	1,120
20	1,100	1,860	1,170	1,340	1,160	1,410	1,190	1,170	1,470	629	1,020	1,120
21	1,190	1,870	1,150	1,280	1,150	1,350	1,180	1,180	1,660	642	1,010	1,110
22	1,190	1,930	1,150	1,270	1,170	1,340	1,190	1,190	1,650	649	1,010	1,110
23	1,240	1,930	1,160	1,190		1,270	1,190		1,580	657	1,010	1,120
24	1,230	1,940	1,160	1,170	1,170	1,280	1,170	1,220	1,330	669	1,000	1,120
25	1,310	1,940	1,160	1,170	1,170	1,260	1,190	1,220	1,120	700	993	1,090
26	1,520	1,900	1,160	1,190	1,170	1,260	1,190	1,350	808	704	992	1,090
27	1,530	1,900	1,160	1,170	1,180	1,230	1,190	1,350	736	713	988	1,100
28	1,500	1,850	1,160	1,170	1,150	1,230	1,170	1,300	635	751	979	1,080
29	1,360		1,160	1,190	1,160	1,210	1,180	1,290	693	733	984	1,060
30	1,170		1,150	1,170	1,180	1,220	1,190	1,220	672	758	1,040	1,040
31	1,170		1,150		1,180		1,160	1,220		745		1,030

QUALITY OF WATER - 1978

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 1978.
REMARKS: Sampling and determinations by the International Boundary and Water Commission.

SPECIFIC CONDUCTANCE OF WATER SAMPLES IN MICROMHOS/CM @ 25 DEG C - 1978

January		February		April		June		August		September		November	
2	1,180	24	2,080	17	1,540	7	1,140	2	1,200	22	1,810	10	867
4	1,120	27	2,070	19	1,660	9	1,230	4	1,200	25	1,530	13	1,110
6	1,150	March		21	1,340	12	1,330	7	1,180	27	848	15	1,690
9	1,150	1	2,080	24	1,210	14	1,460	9	1,180	29	704	17	1,200
11	1,150	3	2,020	26	1,190	16	1,360	11	1,170	October		20	1,130
13	1,130	6	1,180	28	1,200	19	1,430	14	1,190	2	684	22	1,070
16	1,130	8	1,490	May		21	1,420	16	1,250	4	687	24	1,090
18	1,130	10	1,440	1	1,160	23	1,370	18	1,200	6	678	27	1,030
20	1,120	13	1,490	3	1,160	26	1,250	21	1,260	9	750	29	1,070
23	1,110	15	1,330	5	1,180	28	1,270	23	1,220	11	706	December	
25	1,450	17	1,300	8	1,160	30	1,250	25	1,240	13	708	1	1,040
27	1,350	20	1,240	10	1,160	July		28	1,380	16	662	4	1,050
30	1,470	22	1,220	12	1,180	3	1,230	30	1,360	18	656	6	1,040
February		24	1,200	15	1,130	5	1,250	September		20	641	8	1,050
1	1,350	27	1,210	17	1,150	7	1,240	1	1,320	23	670	11	1,070
3	1,240	29	1,210	19	1,170	10	1,220	4	983	25	730	13	1,050
6	1,250	31	1,190	22	1,170	12	1,210	6	1,120	27	743	15	1,070
8	1,360	April		24	1,180	14	1,220	8	1,360	30	1,060	18	1,170
10	1,660	3	1,200	26	1,200	17	1,220	11	620	November		20	1,170
13	1,750	5	1,200	29	1,190	19	1,220	13	601	1	790	22	1,180
15	1,800	7	1,200	31	1,190	21	1,210	15	926	3	827	25	1,070
17	2,260	10	1,190	June		24	1,210	18	904	6	835	27	1,120
20	2,410	12	1,170	2	1,210	26	1,200	20	1,800	8	829	29	1,120
22	2,080	14	1,260	5	854	28	1,200						
						31	1,210						

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 miles (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 1978; specific conductance, 1956 through 1978.
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.

1978 Date	Time Standard	Streamflow, Momentary Second-Feet	Specific Conductance Micromhos	pH Units	Temperature Deg C	Hardness, Total (as CaCO3) mg/L	Hardness, Noncarbonate (as CaCO3) mg/L	Calcium ion (Ca), Dissolved mg/L	Magnesium ion (Mg), Dissolved mg/L
Jan. 16	1320	132	5,020	7.7	20.0	790	600	200	70
Feb. 21	0930	82.3	8,820	7.7	13.0	1,300	1,000	310	120
Mar. 13	1410	68.5	9,020	7.4	25.0	1,400	1,100	330	130
Apr. 17	1030	119	8,080	7.9	24.5	1,100	870	260	110
May 23	0800	273	5,300	7.7	26.0	820	620	210	72
June 19	0920	137	6,630	7.9	28.0	950	730	230	90
July 17	1030	49.1	9,280	8.0	28.0	1,300	1,000	290	130
Aug. 17	1330	76.7	5,380	7.6	28.5	800	620	190	79
Sep. 18	1115	73.5	6,890	7.5	27.0	1,000	790	250	93
Oct. 23	1100	58.6	8,730	7.8	29.5	1,800	1,600	300	260
Nov. 14	1300	60.0	9,070	7.7	28.5	1,300	1,000	280	140
Dec. 19	0800	35.0	8,160	8.0	18.5	1,100	910	240	130

1978 Date	Sodium ion (Na), Dissolved mg/L	Sodium Adsorption Ratio(SAR)	Potassium ion (K), Dissolved mg/L	Bicarbonate ion (HCO3) mg/L	Carbonate ion (CO3) mg/L	Sulfate ion (SO4), Dissolved mg/L	Chloride ion (Cl), Dissolved mg/L	Silica (SiO2), Dissolved mg/L	Solids Dissolved (Calculated) mg/L
Jan. 16	810	13	8.5	230	0	930	1,000	23	3,150
Feb. 21	1,500	18	9.2	300	0	1,600	2,000	32	5,720
Mar. 13	1,600	19	9.9	290	0	1,500	2,300	35	6,060
Apr. 17	1,200	16	11	280	0	1,300	1,600	32	4,660
May 23	850	13	9.8	240	0	980	940	26	3,210
June 19	1,200	17	9.0	260	0	1,200	1,500	30	4,390
July 17	1,700	21	11	280	0	1,600	2,200	37	6,110
Aug. 17	870	13	7.9	220	0	1,000	1,100	27	3,380
Sep. 18	1,300	18	10	260	0	1,300	1,700	32	4,810
Oct. 23	1,500	15	10	290	0	1,700	2,200	33	6,150
Nov. 14	1,800	22	12	300	0	1,600	2,300	33	6,310
Dec. 19	1,500	19	10	270	0	1,200	2,000	29	5,240

QUALITY OF WATER - 1978

Morillo Drain near Anzalduas Dam

SPECIFIC CONDUCTANCE OF WATER SAMPLES IN MICROMHOS/CM @ 25 DEG C - 1978

	Bypass Canal	Pumping Plant		Bypass Canal	Pumping Plant		Bypass Canal	Pumping Plant		Bypass Canal	Pumping Plant
Jan. 5	7,860		Apr. 10	6,460		June 15	6,610	6,520	Sep. 18	7,050	7,100
12	5,810		12		5,320	19	6,710	6,750	21	7,430	
16		5,060	13	6,560	6,600	22	8,080		25	3,880	
20	2,960		17	7,440	7,480	26	9,100		Oct. 23	9,040	9,060
24		7,000	20	6,100		29	9,290		26	9,790	
26	7,650		21		5,640	July 3	9,500		30	7,910	
Feb. 2	6,920		25	5,900		6	8,550		Nov. 3	9,190	
3		7,540	27	6,200	6,260	17	9,630	9,500	6		9,360
6	8,600		May 2	6,560	6,340	20	9,670		9		9,600
9	8,740		4	5,930	6,250	24	8,990		10		9,600
13	8,400		9	5,760		27	8,500		13		9,360
16	8,810		10		5,400	31	7,660		14		9,430
20	8,780		11	5,890		Aug. 3	6,500		16		8,590
21		8,680	12		6,170	7	5,360		20		9,160
23	8,710		15	5,260		10	6,230		23		9,230
27	9,300		18	6,050	6,030	14	6,660		27		9,310
Mar. 2	7,070		22	4,170	3,870	17	5,700	5,560	30		9,250
6	9,480		23		5,400	21	5,640		Dec. 4		9,370
9	9,250		25	5,670		24	5,700		7		9,530
13	9,060	9,150	26		5,990	28	6,920		11		9,510
16	8,830		29	5,820	5,730	31	6,750		14		4,890
20	8,020		June 1	6,430		Sep. 4	7,930		18		6,800
23	7,250		2		5,830	7	5,870		19		8,380
27	7,820		5	5,040		11	2,030		21	9,340	
30	8,450		8	5,810		13		2,440	26	9,650	
Apr. 4	7,150		9		6,740	14	4,640		28	8,980	
6	6,650		12	6,700	6,570						

Rio Grande below Anzalduas Dam 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 1978; specific conductance, 1948 and 1956 through 1978; 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.

1978 Date	Time Standard	Streamflow, Momentary Second-Feet	Specific Conductance Micromhos	pH Units	Temperature Deg C	Hardness, Total (as CaCO3) mg/L	Hardness, Noncarbonate (as CaCO3) mg/L	Calcium ion (Ca), Dissolved mg/L	Magnesium ion (Mg), Dissolved mg/L
Jan. 16	1345	3,100	1,100	7.9	19.0	270	170	72	23
Feb. 21	1015	272	2,830	7.8	15.5	710	480	190	56
Mar. 13	1340	1,100	1,430	7.9	20.5	350	230	95	28
Apr. 17	1045	700	1,330	8.0	23.5	310	200	83	26
May 23	0815	4,400	1,260	8.0	26.5	300	190	80	25
June 19		1,590	1,830	7.9	29.5	370	240	100	30
July 17	1100	2,500	1,430	8.2	29.0	300	180	77	26
Aug. 17	1150	1,460	1,190	7.6	29.0	290	170	83	23
Sep. 18	1145	400	875	7.4	28.0	170	69	53	8.4
Oct. 23	1130	6,500	1,100	8.0	29.5	300	150	88	20
Nov. 14	1330	2,150	1,890	7.9	28.0	450	270	130	32
Dec. 19	0830	3,200	1,390	8.1	18.5	310	170	84	25

1978 Date	Sodium ion (Na), Dissolved mg/L	Sodium Adsorption Ratio(SAR)	Potassium ion (K), Dissolved mg/L	Bicarbonate ion (HCO3) mg/L	Carbonate ion (CO3) mg/L	Sulfate ion (SO4), Dissolved mg/L	Chloride ion (Cl), Dissolved mg/L	Silica (SiO2), Dissolved mg/L	Solids Dissolved (Calculated) mg/L
Jan. 16	120	3.2	5.0	130	0	240	140	11	675
Feb. 21	350	5.7	7.2	270	0	520	510	16	1,780
Mar. 13	170	3.9	5.4	150	0	290	200	10	872
Apr. 17	150	3.7	5.5	140	0	270	170	12	786
May 23	140	3.5	5.3	140	0	250	170	12	751
June 19	240	5.4	6.0	160	0	360	280	15	1,110
July 17	170	4.3	5.5	140	0	280	200	12	850
Aug. 17	130	3.3	5.1	140	0	260	150	10	726
Sep. 18	120	4.0	5.0	120	0	160	130	11	547
Oct. 23	190	5.0	5.8	180	0	200	150	13	683
Nov. 14	230	6.7	6.8	230	0	300	350	15	1,180
Dec. 19	150	3.9	10.0	170	0	270	190	11	836

QUALITY OF WATER - 1978

Rio Grande below Anzalduas Dam near Reynosa, Tamaulipas and Mission, Texas

SPECIFIC CONDUCTANCE OF WATER SAMPLES IN MICROMHOS/CM @ 25 DEG C - 1978

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	1,210	1,330	2,150	1,190	1,230	1,270	1,270	1,220	1,310	672	886	1,110
2	1,190	1,300	2,150	1,200	1,220	1,260	1,270	1,210	1,310	597	926	1,100
3	1,220	1,350	2,150	1,210	1,240	1,250	1,250	1,210	1,290	612	896	1,130
4	1,160	1,340	2,080	1,200	1,230	1,250	1,220	1,180	1,300	620	1,020	1,100
5	1,130	1,440	2,130	1,200	1,210	955	1,240	1,240	1,270	626	1,030	1,090
6	1,130	1,390	2,080	1,210	1,220	1,220	1,280	1,200	1,000	672	1,030	1,090
7	1,150	1,400	2,100	1,190	1,220	924	1,280	1,190	1,020	622	1,030	1,090
8	1,180	1,430	2,010	1,200	1,210	1,340	1,290	1,180	1,270	638	1,070	1,090
9	1,160	1,470	1,850	1,190	1,220	1,420	1,270	1,190	1,490	734	1,080	1,100
10	1,160	1,450	1,900	1,190	1,210	1,370	1,250	1,170	970	621	1,100	
11	1,140	1,520	1,870	1,160	1,200	1,400	1,220	1,160	692	610	1,120	1,120
12	1,170	1,570	1,550	1,180	1,200	1,460	1,200	1,170	785	595	1,160	1,120
13	1,120	1,670	1,440	1,220	1,210	1,600	1,220	1,180	517	605	1,680	1,170
14	1,110	1,840	1,520	1,220	1,210	1,610	1,200	1,180	671	601	1,640	1,210
15	1,110	1,940	1,600	1,180	1,190	1,700	1,220	1,180	824	613	1,780	1,160
16	1,120	1,990	1,350	1,180	1,170	1,640	1,230	1,200	836	711	1,290	1,120
17	1,130	2,140	1,290	1,250	1,220	1,600	1,260	1,200	881	678	1,250	1,220
18	1,120	2,370	1,340	1,330	1,230	1,610	1,260	1,220	870	711	1,150	1,210
19	1,170	2,560	1,370	1,340	1,220	1,640	1,250	1,200	855	636	1,130	1,190
20	1,310	2,840	1,210	1,260	1,220	1,600	1,220	1,210	817	635	1,100	1,140
21	1,280	2,880	1,290	1,780	1,230	1,540	1,200	1,190	775	669	1,130	1,160
22	1,500	2,740	1,250	1,630	1,240	1,490	1,210	1,250	763	679	1,120	1,170
23	1,670	2,710	1,240	1,450	1,220	1,450	1,220	1,240	801	686	1,100	1,170
24	1,720	2,510	1,220	1,350	1,240	1,390	1,210	1,230	1,230	754	1,070	1,160
25	1,610	2,370	1,210	1,300	1,260	1,370	1,220	1,300	1,880	796	1,100	1,120
26	1,520	2,260	1,220	1,350		1,310	1,190	1,280	859	799	1,070	1,130
27	1,550	2,210	1,210	1,320	1,250	1,320	1,220	1,270	787	789	1,080	1,080
28	1,530	2,200	1,220	1,300	1,200	1,290	1,240	1,310	659	786	1,120	1,140
29	1,720		1,200	1,260	1,240	1,310	1,200	1,330	676	933	1,120	1,100
30	1,680		1,210	1,250	1,240	1,300	1,190	1,320	682	836	1,120	1,120
31	1,450		1,200		1,240		1,240	1,400		838		1,080

QUALITY OF WATER - 1978

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 1978.
REMARKS: Sampling and determinations by the International Boundary and Water Commission.

SPECIFIC CONDUCTANCE OF WATER SAMPLES IN MICROMHOS/CM @ 25 DEG C - 1978

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	1,300	1,650	2,550	1,250	1,310	1,250	1,300	1,270	1,390	714	917	1,120
2	1,270	1,790	2,500	1,250	1,270	1,260	1,290	1,300	1,380	685	867	1,120
3	1,260	1,760	2,430	1,260	1,260	1,260	1,290	1,230	1,390	648	858	1,120
4	1,240	1,760	2,290	1,230	1,240	1,260	1,290	1,270	1,400	618	1,000	1,120
5	1,270	1,610	2,290	1,220	1,260	1,270	1,270	1,240	1,380	614	1,010	1,130
6	1,200	1,560	2,290	1,210	1,250	1,250	1,260	1,250	1,400	614	1,010	1,100
7	1,210	1,540	2,230	1,210	1,230	1,040	1,250	1,280	1,420	646	1,000	1,100
8	1,220	1,600	2,230	1,210	1,240	954	1,280	1,350	1,370	685	1,020	1,110
9	1,210	1,610	2,190	1,220	1,220	1,140	1,320	1,220	1,360	657	1,000	1,120
10	1,210	1,640	2,140	1,220	1,260	1,260	1,310	1,190	1,330	642	1,010	1,120
11	1,170	1,660	2,030	1,240	1,220	1,260	1,280	1,220	1,380	605	1,020	1,120
12	1,190	1,680	1,990	1,220	1,220	1,270	1,290	1,220	1,240	614	1,010	1,150
13	1,170	1,670	1,970	1,210	1,240	1,310	1,240	1,210	1,100	605	1,030	1,110
14	1,210	1,690	1,890	1,240	1,230	1,430	1,230	1,210	991	607	1,150	1,140
15	1,160	1,660	1,570	1,280	1,240	1,480	1,220	1,230	611	627	1,220	1,150
16	1,150	1,670	1,510	1,300	1,230	1,680	1,220	1,210	635	627	1,640	1,330
17	1,130	1,710	1,500	1,340	1,190	1,650	1,240	1,210	689	650	1,500	1,320
18	1,120	1,740	1,580	1,370	1,200	1,650	1,250	1,210	727	683	1,270	1,330
19	1,130	1,810	1,630	1,400	1,210	1,650	1,240	1,230	790	695	1,240	1,240
20	1,160	1,910	1,620	1,370	1,230	1,600	1,250	1,300	906	744	1,190	1,190
21	1,200	1,900	1,370	1,430	1,230	1,640	1,270	1,200	1,020	741	1,180	1,210
22	1,200	1,950	1,400	1,500	1,240	1,720	1,240	1,200	975	752	1,150	1,170
23	1,240	2,070	1,400	1,450	1,230	1,670	1,260	1,190	840	743	1,130	1,200
24	1,390	2,060	1,320	1,760	1,260	1,530	1,250	1,210	982	697	1,140	1,210
25	1,400	2,200	1,270	1,610	1,250	1,480	1,210	1,230	992	704	1,150	1,200
26	1,310	2,210	1,270	1,440	1,280	1,420	1,210	1,260	1,860	763	1,140	1,210
27	1,460	2,260	1,280	1,370	1,280	1,410	1,210	1,260	950	798	1,140	1,150
28	1,580	2,650	1,260	1,350	1,280	1,340	1,210	1,280	823	961	1,100	1,140
29	1,460		1,240	1,350	1,250	1,330	1,230	1,330	769	963	1,120	1,150
30	1,650		1,240	1,330	1,250	1,310	1,250	1,240	668	962	1,120	1,150
31	1,660		1,240		1,260		1,270	1,290		963		1,170

QUALITY OF WATER - 1978

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 1978; biochemical, December 1976 through 1978; specific conductance, 1955 through 1978; 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.

1978 Date	Time Std.	Streamflow, Momentary Sec.-Ft.	Specific Conductance Micromhos	pH Units	Temperature Deg C	Hardness, Total (as CaCO3) mg/L	Hardness, Noncarbonate (as CaCO3) mg/L	Calcium ion (Ca), Dissolved mg/L	Magnesium ion (Mg) mg/L	Sodium ion (Na), Dissolved mg/L	Sodium Adsorption Ratio (SAR)	Potassium ion (K), Dissolved mg/L
Jan. 24	1545	500	1,380	7.8	11.0	320	220	86	26	160	3.9	4.9
Feb. 14	1530	275	1,650	7.7	17.5	440	260	120	35	180	3.7	5.2
Mar. 14	1445	75.2	2,540	7.9	22.0	630	410	170	51	300	5.2	7.0
Apr. 19	0900	140	1,270	7.8	26.0	310	200	83	26	140	3.4	5.2
May 10	0930	48.0	1,810	7.9	28.5	500	290	130	42	200	3.9	7.4
June 7	1515	1,000	1,280	7.7	29.5	330	220	86	27	150	3.6	5.5
July 12	0920	50.0	1,600	8.0	30.0	390	240	100	33	180	4.0	5.8
Aug. 15	1100	1,470	1,470	8.0	30.0	360	210	93	31	180	4.1	6.1
Sep. 13	0945	2,700	1,330	7.8	29.5	230	140	66	17	180	5.1	5.5
Oct. 4	0915	12,200	613	7.9	27.0	180	81	52	12	52	1.7	3.5
Nov. 15	1005	1,650	1,060	8.1	25.0	300	150	90	19	110	2.8	3.7
Dec. 6	1355	1,080	1,070	8.0	20.5	280	170	76	21	110	2.9	6.4

1978 Date	Bicarbonate ion (HCO3) mg/L	Carbonate ion (CO3) mg/L	Sulfate ion (SO4), Dissolved mg/L	Chloride ion (Cl), Dissolved mg/L	Silica (SiO2), Dissolved mg/L	Oxygen, Dissolved (DO) mg/L	Coliform, Fecal Cols./ 100 mL	Oxygen Demand, Biochemical (BOD) 5 day mg/L	Turbidity JTU	Solids, Dissolved (Calculated) mg/L	Solids, Dissolved (Residue @ 180 Deg C) mg/L	Suspended Sediment mg/L
Jan. 24	130	0	270	190	11	9.9	150,000	1.4	40	813	811	79
Feb. 14	220	0	290	250	13	8.6	800	3.2	20	1,000	984	34
Mar. 14	270	0	460	410	9.9	10.7	2,700	2.1	20	1,540	1,490	97
Apr. 19	140	0	260	160	12	9.1	600	3.3	40	756	775	51
May 10	250	0	340	270	21	7.8	290,000	2.9	30	1,130	1,100	
June 7	130	0	280	170	8.6	7.9	280,000	1.1	160	792	774	
July 12	180	0	330	210	18	7.6	1,700	3.0	25	966	961	
Aug. 15	180	0	300	200	15	8.6	1,200	3.4	30	915	931	
Sep. 13	110	0	250	200	11	6.2	18,000	2.0	280	784	789	
Oct. 4	120	0	110	58	8.0	5.6	5,900	2.2	320	355	378	766
Nov. 15	190	0	170	140	13	8.6	84	2.0	30	640	660	88
Dec. 6	130	0	210	140	10	6.7	140	1.5	190	638	664	569

QUALITY OF WATER - 1978

Rio Grande near Brownsville, Texas and Matamoros, Tamaulipas

SPECIFIC CONDUCTANCE OF WATER SAMPLES IN MICROMHOS/CM @ 25 DEG C - 1978

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	1,270	1,380	2,060	1,590	1,570	1,340	1,650	1,190	1,430	607	868	1,080
2	1,310	1,210	2,210	1,570	1,590	1,380	1,600	1,200	1,360	673	881	1,060
3	1,300	1,600	2,260	1,550	1,730	1,230	1,520	1,190	1,370	675	966	1,050
4	1,300	1,610	2,370	1,730	1,620	1,250	1,520	1,290	1,380	725	729	1,060
5	1,340	1,600	2,360	1,730	1,760	1,230	1,440	1,270	1,420	618	770	1,060
6	1,380	1,600	2,350	1,180	1,670	2,170	1,410	1,260	1,420	691	810	1,080
7	1,340	1,630	2,620	1,180	1,600	1,250	1,430	1,250	1,290	715	860	1,090
8	1,300	1,760	2,500	1,170	1,550	1,240	1,530	1,300	1,190	602	900	1,080
9	1,280	1,670	2,550	1,170	1,700	1,230	1,530	1,310	1,280	687	930	1,090
10	1,300	1,680	2,620	1,170	1,810	1,240	1,520	1,310	1,290	625	950	1,080
11	1,360	1,570	2,530	1,170	1,500	1,100	1,440	1,350	1,300	630	966	1,090
12	1,390	1,590	2,500	1,170	1,430	1,070	1,440	1,410	1,300	605	1,000	1,100
13	1,550	1,610	2,460	1,180	1,300	1,270	1,320	1,420	1,330	595	1,010	1,140
14	1,540	1,590	2,390	1,190	1,300	1,580	1,430	1,430	1,200	600	1,020	1,160
15	1,540	1,600	1,830	1,220	1,260	1,580	1,340	1,440	1,390	622	1,070	1,110
16	1,520	1,530	2,030	1,230	1,230	1,670	1,320	1,460	1,200	632	1,050	1,130
17	1,450	1,650	1,870	1,240	1,220	1,650	1,300	1,500	1,300	696	1,100	1,110
18	1,140	1,710	2,060	1,260	1,240	1,600	1,350	1,510	1,390	660	1,170	1,120
19	1,140	1,700	2,050	1,260	1,230	1,550	1,380	1,400	1,230	645	1,180	1,150
20	1,270	1,690	2,040	1,300	1,180	1,490	1,330	1,300	1,240	650	1,190	1,140
21	1,270	1,730	2,160	1,310	1,180	1,470	1,320	1,230	807	639	1,190	1,160
22	1,280	1,710	2,180	1,320	1,180	1,450	1,320	1,250	803	652	1,170	1,100
23	1,290	1,810	2,160	1,370	1,280	1,720	1,300	1,230	829	669	1,180	1,040
24	1,300	1,970	2,300	1,410	1,270	1,540	1,290	1,250	830	645	1,120	1,050
25	1,210	2,020	2,300	1,500	1,210	1,550	1,300	1,260	839	642	1,120	1,060
26	1,220	2,000	2,250	1,430	1,260	1,570	1,370	1,290	942	752	1,140	1,040
27	1,230	1,970	2,230	1,570	1,350	1,700	1,290	1,300	939	740	1,130	1,030
28	1,240	2,040	2,300	1,470	1,300	1,660	1,220	1,300	1,360	1,040	1,130	1,020
29	1,400		2,300	1,730	1,290	1,570	1,280	1,230	662	1,020	1,120	1,020
30	1,450		1,600	1,500	1,330	1,720	1,250	1,230	661	1,030	1,120	1,040
31	1,430		1,580		1,360		1,210	1,420		862		1,050

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 146 through 149 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.

	Las Cruces, New Mexico		American Dam		Clint Station		Acala Station		Fort Hancock Bridge	
Month	1978	Average	1978	Average	1978	Average	1978	Average	1978	Average
Jan.	0.72	0.65	0.23	0.38	0.26	0.31	0.27	0.31	0.22	0.37
Feb.	.52	.36	.48	.37	.37	.29	.46	.21	.52	.30
Mar.	.27	.28	.14	.32	0	.21	0	.25	.10	.24
Apr.	0	.19	0	.18	.10	.14	0	.18	.15	.26
May	1.96	.68	.52	.24	.73	.31	.90	.35	.30	.47
June	1.82	.76	.82	.57	1.65	.51	.91	.57	.42	.81
July	.43	1.28	.20	1.52	.72	1.04	.53	1.13	.82	1.33
Aug.	3.19	2.39	2.46	1.30	.86	1.14	.84	1.24	.40	1.59
Sept.	2.30	1.83	2.40	1.15	.45	.85	.89	.90	6.11	1.35
Oct.	2.07	1.21	2.06	.74	.67	.66	.77	.86	1.47	1.07
Nov.	2.98	1.05	1.40	.28	.16	.23	0	.26	1.32	.35
Dec.	1.02	.52	.17	.38	T	.36	0	.32	.47	.41
Yearly	17.28	11.20	10.88	7.43	5.97	6.05	5.57	6.58	12.30	8.49

	Guayuco Arroyo		Fort Quitman		Neely Ranch		96 Ranch Headquarters		La Nutria Station	
Month	1978	Average	1978	Average	1978	Average	1978	Average	1978	Average
Jan.	0.18	0.29	0.36	0.37	0.40	0.33	1.80	.63	0.40	0.11
Feb.	.31	.20	.32	.24	.42	.19	1.00	.60	.25	.23
Mar.	.04	.22	.03	.22	.25	.18	.10	.34	.05	.17
Apr.	.62	.20	.36	.22	.85	.16	.40	.09	.20	.13
May	.60	.45	.49	.38	.79	.37	3.70	1.17	0	.24
June	.31	.56	.20	.76	.81	.75	.20	2.09	.52	.78
July	.62	1.41	1.87	1.50	1.94	1.74	1.70	5.43	1.36	1.63
Aug.	.38	1.71	1.27	1.65	.63	1.77	3.80	3.10	2.11	2.06
Sept.	6.89	1.22	3.03	1.08	9.67	1.55	10.60	6.24	4.68	2.02
Oct.	1.13	1.03	.51	.84	1.51	1.05	1.20	1.30	.47	1.02
Nov.	.60	.22	.10	.29	1.19	.25	1.00	.63	.63	.37
Dec.	.08	.36	0	.36	.37	.40	.40	.60	.23	.24
Yearly	11.76	7.87	8.54	7.91	18.83	8.74	25.90	22.22	10.90	9.00

	La Macolla Farm		Bill Shannon Ranch		Presidio (IB&WC Gage)		Quebec Ranch		Bloys Camp	
Month	1978	Average	1978	Average	1978	Average	1978	Average	1978	Average
Jan.	0.42	0.42	0.70	0.44	0.40	0.25	0.70	0.43		0.68
Feb.	.27	.27	.30	.36	.10	.21	.60	.33		.63
Mar.	0	0	0	.35	0	.17	0	.29		.54
Apr.	.25	.14	.80	.16	.05	.19	.20	.25	.17	.43
May	1.67	1.34	.85	.73	0	.49	.30	.79	1.16	1.37
June	1.05	1.12	2.00	1.51	.30	1.18	0	1.64		2.45
July	1.79	1.53	.55	2.34	1.40	1.50	1.90	2.67		3.71
Aug.	6.03	3.84	6.70	2.41	.75	1.09	5.10	2.52		3.89
Sept.	5.84	3.20	8.00	2.64	3.80	1.46	6.30	2.42		2.84
Oct.	1.07	1.15	1.80	1.16	3.40	.69	3.10	.95		1.52
Nov.	.81	.48	1.15	.41	.55	.30	0	.32		.63
Dec.	.50	.25	.60	.41	.40	.25	.70	.33		.57
Yearly	19.70	13.74	23.45	12.92	11.15	7.78	18.90	12.94		19.26

T Trace

RAINFALL ON THE RIO GRANDE WATERSHED IN THE UNITED STATES

In Inches

Month	Kerr Mitchell Ranch		Loma Vista Ranch		H. T. Fletcher Ranch		Plata		La Mota Ranch	
	1978	Average	1978	Average	1978	Average	1978	Average	1978	Average
Jan.	0.49	0.45		0.61	0.75	0.72	0.38		0.50	0.78
Feb.	.40	.34		.31	.60	.33	.34		.15	.12
Mar.	0	.20		.22	0	.36	0		0	.31
Apr.	.52	.44	1.29	.54	.85	.43	.47		.28	.32
May	.65	1.08	.64	.97	.80	1.07	0		1.27	1.17
June	2.90	1.80		1.79	5.50	1.70	1.39		1.07	1.57
July	1.90	2.10		2.08	.80	3.02	.40	0.75	.93	1.32
Aug.	3.07	2.29		2.11	10.15	3.09	2.91	2.50	6.56	1.59
Sept.	6.76	2.11		1.88	7.65	2.48	4.81	2.40	2.50	1.82
Oct.	2.00	1.28		1.06	1.40	1.47	2.45	1.84	1.75	.33
Nov.	1.05	.37		.30	1.20	.45	1.22	.61	1.25	.46
Dec.	.45	.37		.43	.70	.41	0	0	.87	.32
Yearly	20.19	12.83		12.30	30.40	15.53	14.37		17.13	10.11

Month	Redford		Lajitas		Study Butte		Villa de la Mina		Terlingua Creek Station	
	1978	Average	1978	Average	1978	Average	1978	Average	1978	Average
Jan.	0.40	0.28	0.22	0.08	0.24		0	0.07	0.20	0.21
Feb.	.25	.21	T	.24	.04		0	.12	.05	.22
Mar.	0	.23	.16	.26	.09		0	.43	.10	.16
Apr.	.05	.24	.22	.47	.35		0	.26	T	.31
May	.40	.48	1.50	.75	2.31		0	.19	.70	.65
June	1.55	.91	1.76	1.33	1.16		4.68	2.09	1.70	1.01
July	.95	1.41	1.28	1.08	2.64	3.04	.63	2.79	3.60	1.19
Aug.	2.40	1.18	1.93	1.38	1.94	1.75	1.09	1.16	2.45	1.21
Sept.	3.90	1.76	5.29	2.41	4.12	2.20	4.02	1.41	2.70	1.32
Oct.	3.70	.87	1.33	.81	.87	.55	1.50	.57	.80	.69
Nov.	.60	.36	1.31	.30	.34	.19		.14	.95	.19
Dec.	.40	.24	.40	.30	.42	.21		.55	.20	.27
Yearly	14.60	8.17	15.40	9.41	14.52			9.78	13.45	7.43

Month	Castolon		Johnson Ranch		J. F. Woodward Ranch		Yarborough Ranch		Elephant Mountain Ranch	
	1978	Average	1978	Average	1978	Average	1978	Average	1978	Average
Jan.	0.14	0.20	0.15	0.30	T	0.42	0.52	0.21	0.74	0.44
Feb.	.06	.32	0.05	.23	.75	.40	.28	.39	0	.28
Mar.	.19	.28	.05	.19	.39	.22	0	.26	0	.16
Apr.	.23	.36	.10	.38	1.12	.54	.84	.33	1.07	.49
May	1.47	.90	2.00	1.03	1.59	1.04	2.05	.93	1.50	.85
June	1.98	1.33	2.30	1.04	2.09	1.94	2.51	1.72	3.18	1.44
July	3.05	2.00	4.60	1.21	6.12	2.42	2.95	2.89	2.10	1.86
Aug.	2.38	1.82	.90	.84	2.98	2.90	3.48	2.91	3.70	1.84
Sept.	4.29	2.12	3.15	1.32	7.99	2.37	4.65	3.09	4.03	1.83
Oct.	.97	.83	.70	.65	2.02	1.08	2.71	1.29	3.00	1.06
Nov.	1.49	.25	1.05	.21	0	.57	1.19	.60	.80	.33
Dec.	.47	.26	.30	.30	1.86	.33	.83	.50	1.10	.52
Yearly	16.72	10.67	15.35	7.70	26.91	14.23	22.01	15.12	21.22	11.10

Month	Buttrill Ranch		A. M. Potter Ranch		Ernest Wright Ranch		Black Gap Game Refuge - Hdqtrs.		Black Gap Game Refuge-Shirley House	
	1978	Average	1978	Average	1978	Average	1978	Average	1978	Average
Jan.	0	0.46	0.30	0.34	0.59		1.17	0.44	0	
Feb.	0	.17	.64	.45	.21		.50	.46	0	
Mar.	0	.17	0	.19	T		.50	.28	.07	.29
Apr.	.61	.56	.28	.26	.09		0	.39	0	1.28
May	.95	1.12	.90	.99	2.61		2.72	1.46	2.01	2.76
June	1.24	1.39	1.21	1.16			2.88	1.28	3.20	1.60
July	1.50	1.56	2.00	1.48			1.29	1.70	.80	1.45
Aug.	2.66	1.54	2.80	1.62			2.17	1.31	1.45	.73
Sept.	5.37	2.06	6.11	1.98			5.78	2.35	4.35	2.95
Oct.	1.10	.95	1.02	.60			.80	1.08	0	.75
Nov.	1.40	.31	.72	.39			2.17	.41	1.40	1.12
Dec.	.80	.27	0	.41			.46	.36	0	.32
Yearly	15.63	10.56	15.98	9.87			20.44	11.52	13.28	

T Trace

RAINFALL ON THE RIO GRANDE WATERSHED IN THE UNITED STATES

In Inches

Month	Persimmon Gap Ranger Station		Sheep Pasture		Heath Crossing		Jones Headquarters		Dove Mountain Ranch	
	1978	Average	1978	Average	1978	Average	1978	Average	1978	Average
Jan.	0.48	0.50	1.00	0.32		0.20			0	0.42
Feb.	.35	.51	0	.36		.43			.40	.37
Mar.	.04	.33	.50	.38		.30			0	.22
Apr.	.67	.46	0	.31		.42			.30	.47
May	1.50	.94	1.50	1.51	1.09	.99	2.01		1.43	1.08
June	.24	1.18	3.50	1.50	.74	1.15	2.28		.87	1.12
July		1.48	.70	1.87	1.06	1.43	.57		0	1.88
Aug.	1.09	.97	.75	1.36	2.35	1.57	2.89		1.80	1.25
Sept.	4.21	1.40	5.40	3.10	2.44	2.55	6.62		5.20	1.69
Oct.	1.33	1.12	1.00	1.53	0	.80	0		1.17	1.32
Nov.	2.55	.38	1.40	.50	4.10	.69	4.29		.68	.33
Dec.	.53	.31	0	.42	.64	.32	.98		.50	.38
Yearly		9.58	15.75	13.16		10.85			12.35	10.53

Month	Bullis Gap Ranch Headquarters		Slaughter Ranch		Slaughter Ranch Martin Pens		Slaughter Ranch Keith Mill		Slaughter Ranch Ten Section	
	1978	Average	1978	Average	1978	Average	1978	Average	1978	Average
Jan.			0.56	0.42	0.55	0.48	0.85	0.62	0.55	0.48
Feb.			.38	.49	.40	.30	.50	.35	.40	.30
Mar.			0	.42	0	.10	0	.10	0	.10
Apr.	1.00		.15	.72	.10	1.15	.10	.90	.10	1.00
May	3.21		2.18	1.36	2.70	2.20	2.70	2.40	3.50	2.70
June	2.54		1.86	1.34	1.60	1.40	1.50	1.75	1.50	1.65
July	.41		.83	1.09	.50	.50	.80	.40	1.00	.85
Aug.	2.28		3.53	2.49	2.90	2.05	3.20	2.30	3.40	2.55
Sept.	5.81		6.83	2.84	7.80	4.30	7.60	4.63	7.00	4.30
Oct.	1.43		1.43	1.54	.40	1.00	.90	.90	1.10	.90
Nov.	5.90		4.28	1.02	4.40	1.83	4.20	1.63	4.30	1.67
Dec.	.75		1.03	.48	1.00	.63	.90	.60	1.00	.63
Yearly			23.06	14.21	22.35	15.94	23.25	16.58	23.85	17.13

Month	Slaughter Ranch Cow Creek		Steve Stumberg Ranch		C. F. Cox Ranch Headquarters		McGonagill Ranch Headquarters		McGonagill East Mill	
	1978	Average	1978	Average	1978	Average	1978	Average	1978	Average
Jan.	0.65	0.56	0	0.47	0.45	0.58	0	0.28	0	0.30
Feb.	.30	.28	.15	.39	.49	.40	0	.49	0	.23
Mar.	0	.14	0	.42	.50	.70	0	.44	0	.51
Apr.	.10	.57	.22	.67	.08	1.64	.30	.50	.30	.65
May	3.20	1.26	1.07	1.39	1.00	1.81	3.40	1.29	2.60	1.26
June	.50	.98	2.60	1.69	3.37	2.20	3.50	1.97	3.40	1.94
July	.80	.74	1.68	2.06	2.28	1.14	2.10	2.26	.80	1.54
Aug.	3.50	1.25	4.55	1.90	2.10	1.30	4.70	1.76	2.00	1.85
Sept.	6.80	1.75	6.19	2.34	12.85	6.69	6.70	2.65	5.70	2.54
Oct.	1.10	1.15	2.67	1.54	.92	1.34	1.10	1.14	1.10	1.13
Nov.	4.30	.49	6.40	.64	3.95	1.98	4.20	.37	4.20	.36
Dec.	1.00	.24	.20	.45	.30	.15	0	.14	0	.18
Yearly	22.25	9.41	25.73	13.96	28.29	19.93	26.00	13.29	20.10	12.49

Month	E. W. Hardgrave Ranch		Lewis James Ranch		Dryden		Ross Foster Ranch		W. A. Arledge Ranch	
	1978	Average	1978	Average	1978	Average	1978	Average	1978	Average
Jan.	0.85	0.50	0.30	0.30		0.49	0.05	0.39	0	0.62
Feb.	.50	.60	.35	.54		.51	.20	.48	.42	.55
Mar.	0	.36	0	.38		.43	0	0.27	1.00	.47
Apr.	.75	1.32	.22	.85		.91	.90	.83		1.30
May	3.00	1.47	1.32	1.27	1.83	1.66	.35	1.22		1.83
June	2.10	1.57	1.62	1.09	2.20	1.12	2.20	1.09		1.60
July	2.00	1.29	1.40	1.60	1.00	1.14	.80	.74		1.30
Aug.	1.41	1.48	1.18	1.89		1.33	0	1.26		1.31
Sept.	5.67	2.95	4.27	3.56		2.13	1.45	1.89		2.10
Oct.	1.55	1.68	.90	1.49		1.35	.40	1.05		1.62
Nov.	5.50	.74	5.24	.92		.43	3.35	.41		.47
Dec.	.70	.37	.56	.36		.45	.62	.34		.50
Yearly	24.03	14.33	17.36	14.25		11.95	10.32	9.97		13.67

RAINFALL ON THE RIO GRANDE WATERSHED IN THE UNITED STATES

In Inches

	Hoffman Ranch		Owens Ranch		Calvin Hutto Ranch		Latham Ranch		Prosser Ranch No. 3	
Month	1978	Average	1978	Average	1978	Average	1978	Average	1978	Average
Jan.	0.25	0.42	0.35	0.35	0.40	0.37	0	0.32	0.40	0.36
Feb.	0	.38	.65	.66	.33	.21	.40	.92	.60	.82
Mar.	0	.34	0	.85	0	.33	0	.59	.25	.59
Apr.	.40	.29	1.60	1.81	0	1.20	1.00	1.73	.90	1.46
May	.47	1.04	1.60	1.89	2.25	1.85	2.50	2.96	1.90	2.04
June	1.50	1.91	5.00	1.81	1.53	1.21	5.00	1.96	2.40	1.18
July	2.60	2.49	.30	1.25	0	1.22	.70	3.27	1.39	1.72
Aug.	6.19	2.41	2.20	1.80	0	1.41	2.30	3.02	1.61	2.34
Sept.	5.25	2.32	3.50	2.74	5.05	3.24	4.00	3.88	4.50	4.08
Oct.	4.25	1.27	2.20	2.38	.96	2.32	2.00	2.04	1.00	1.95
Nov.	.45	.39	1.94	1.43	.50	.72	.90	.91	2.70	.68
Dec.	.41	.32	.20	.50	.50	.50	.60	.60	1.10	.36
Yearly	21.77	13.58	19.54	17.47	11.52	14.58	19.40	22.20	18.75	17.58

	Ranchita (Continental)		Rio Grande near Dryden		Pecos River near Langtry Station		Dead Mans Canyon near Comstock		Prosser Ranch No. 1	
Month	1978	Average	1978	Average	1978	Average	1978	Average	1978	Average
Jan.	0.40	0.34	0	0.10	0.50	0.27	0.35	0.33	0.10	0.30
Feb.	.50	.82	0	.05	.35	.71	.40	.69	.40	.73
Mar.	0	.67	0	.15	0	.49	.20	.60	0	.46
Apr.	1.50	1.17	.10	.30	.55	.94	1.72	1.24	2.20	1.50
May	1.65	1.81	1.44	1.18	2.35	1.22	2.00	1.96	1.60	1.99
June		1.90	1.40	.82	2.50	1.62	2.70	1.91	1.70	1.42
July	1.90	1.80	.94	1.28	.60	1.61	3.90	2.79	1.30	2.45
Aug.	2.60	2.87	2.32	.77	1.41	1.80	.67	1.97	1.40	2.19
Sept.	5.40	3.28	4.51	1.76	3.94	2.86	4.78	3.13	2.50	3.50
Oct.	1.40	2.29	.14	.47	.55	1.33	.40	2.02	.75	1.84
Nov.		.71	3.15	1.17	4.05	.79	3.25	.76	2.80	.71
Dec.	.95	.49	.61	.37	1.03	.35	.75	.44	.43	.35
Yearly		18.15	14.61	8.42	17.83	13.99	21.12	17.84	15.18	17.44

	Continental Ranch		Martin King Ranch		Brotherton Ranch		Walker Ranch		Zuberbueler Ranch	
Month	1978	Average	1978	Average	1978	Average	1978	Average	1978	Average
Jan.	0.40	0.51	0.09	0.48	0.02	0.64	0.20	0.25	0.03	0.26
Feb.	.50	.93	.25	.74	.47	.88	.50	.73	.45	.82
Mar.	0	.63	.06	.35	.12	.59	T	.59	0	.40
Apr.	1.50	1.41	1.61	.93	.68	1.01	1.90	1.22	.94	1.28
May	3.40	2.59	1.53	1.48	1.66	1.47	2.23	2.12	2.03	1.88
June		1.83	3.00	1.58	3.01	1.78	2.40	1.87	2.47	1.20
July	2.10	2.70	1.10	1.46	.88	1.58	1.47	2.21	1.16	3.74
Aug.	1.40	2.58	1.91	1.46	2.42	1.96	1.63	1.37	2.02	.62
Sept.	6.25	4.39	3.91	2.76	3.37	2.85	5.00	4.31	5.04	2.18
Oct.	1.50	2.52	.55	2.20	.61	1.94	.80	2.19	1.10	1.42
Nov.		.69	2.73	.56	2.18	.54	2.80	.78	2.32	.80
Dec.	.95	.47	.67	.45	.81	.34	.45	.40	.57	.62
Yearly		21.25	17.41	14.45	16.23	15.58	19.38	18.04	18.13	15.22

	P. W. Kelly Ranch		Comstock		Cow Creek near Comstock		Amistad Reservoir near Comstock		Feely	
Month	1978	Average	1978	Average	1978	Average	1978	Average	1978	Average
Jan.	0	0.46	0.12	0.58	0.17	0.33	T	0.25	0.05	0.41
Feb.	.55	.79	.03	.80	.30	.59	.10	.37	.25	.73
Mar.	.18	.90	.10	.61	.10	.43	0	.56	0	.50
Apr.	1.35	1.25	1.41	1.44	1.00	1.20	1.00	1.51	.90	1.47
May	1.95	2.02	1.67	1.87	.40	1.08	1.38	1.14	2.40	1.85
June	3.32	2.04	2.38	2.10	3.60	1.54	1.22	1.22	3.10	1.94
July	1.94	2.43	2.86	1.39	1.20	1.86	.70	1.62	.90	1.56
Aug.	.72	2.12	1.31	1.85	.90	2.20	.86	1.72	2.15	2.07
Sept.	5.59	3.23	3.74	2.46	3.55	2.51	1.94	2.14	2.95	2.51
Oct.	1.99	1.89	1.24	1.89	2.55	1.89	.36	2.22	2.50	2.32
Nov.	2.18	.83	1.90	.59	1.80	.59	1.29	.29	2.45	.50
Dec.	.50	.31	.57	.65	.30	.32	.20	.25	.20	.35
Yearly	20.27	18.27	17.33	16.23	15.87	14.54	9.05	13.29	17.85	16.21

T Trace

RAINFALL ON THE RIO GRANDE WATERSHED IN THE UNITED STATES

In Inches

Month	Line Store		W. E. Sawyer Ranch		Whitehead Brothers Ranch		Prosser Ranch No. 2		Devils River at Cauthorn Ranch	
	1978	Average	1978	Average	1978	Average	1978	Average	1978	Average
Jan.	0.42	0.53	0.31	0.42	0.10	0.49	0.30	0.35	0.12	0.36
Feb.	1.22	.93	1.20	.95	.90	.74	.70	.88	.50	.82
Mar.	.05	.59	.56	.88	.10	.78	.15	.67	0	.25
Apr.	1.60	1.96	.82	2.04	.80	1.82	1.90	1.50	.75	1.41
May	.63	2.28	5.68	2.44	1.56	2.47	2.95	2.04	1.99	2.10
June	4.45	1.66	2.90	1.69	2.35	1.47	2.10	1.37	1.72	.91
July	4.07	2.43	3.20	2.64	1.43	2.26	2.00	2.18	.47	.24
Aug.	1.45	2.47	1.28	3.21	4.44	2.66	2.20	2.64	1.26	.42
Sept.	3.52	4.06	2.04	3.53	5.33	3.42	3.50	4.01	2.60	1.36
Oct.	.91	1.97	.72	2.27	2.00	2.95	.90	2.00	.90	1.23
Nov.	2.50	.92	3.37	.81	3.90	.92	2.40	.72	.85	.44
Dec.	.16	.32	.10	.49	.20	.40	.70	.35	.40	.33
Yearly	20.98	20.12	22.18	21.37	23.11	20.38	19.80	18.71	11.56	9.87

Month	Bakers Crossing		Erekson Ranch		Vinegarone		Eugene Miller Ranch		Dolan Springs	
	1978	Average	1978	Average	1978	Average	1978	Average	1978	Average
Jan.	0.20	0.72	0	0.82	0.20	0.50	0.90	0.44	0.30	0.49
Feb.	.55	.95	1.44	1.25	.80	.82	.47	.26	.80	.82
Mar.	.10	.74	.45	.96	.10	.87	.21	.37	0	.87
Apr.	1.48	1.34	2.10	2.27	1.60	1.92	.81	2.07	2.15	1.90
May	3.80	2.56	1.80	2.51	1.33	2.46	4.54	3.21	3.19	2.11
June	3.09	1.98	4.70	2.86	2.82	1.61	4.33	1.83	4.41	1.90
July	2.39	1.79	2.47	2.46	1.43	2.61	1.40	5.43	1.13	2.37
Aug.	2.32	2.16	3.70	2.42	5.47	3.22	2.60	1.75	2.25	3.27
Sept.	3.35	3.73	4.40	3.13	4.40	3.17	2.67	3.13	3.27	3.50
Oct.		1.85	2.64	2.60	2.00	2.88	1.45	2.31	1.00	2.57
Nov.	.46	.56	4.33	.96	3.60	.94	3.13	1.38	2.20	.76
Dec.	.75	.63	0	.47	.30	.44	.54	.27	.40	.41
Yearly		19.01	28.03	22.71	24.05	21.44	23.05	22.45	21.10	20.97

Month	H. K. Fawcett Ranch		Ed Crane Ranch		H. T. Miers Ranch Headquarters		H. T. Miers Ranch No. 2		A. A. Baker Ranch	
	1978	Average	1978	Average	1978	Average	1978	Average	1978	Average
Jan.	0.15	0.69	0.27	0.79	0.15	0.61	0.33	0.48	0.17	0.40
Feb.	.80	.77	.52	1.16	.90	1.09	.57	.89	.29	.72
Mar.	0	.76	.20	.61	T	.78	.22	.94	.15	.58
Apr.	1.60	1.88	2.65	1.85	4.55	1.98	5.31	1.78	1.60	1.42
May	3.52	2.34	2.34	2.62	2.63	2.69	3.47	2.46	2.05	1.71
June	2.05	1.46	2.94	1.96	2.77	2.71	2.93	2.04	2.28	1.73
July	1.51	1.82	1.13	2.03	1.23	1.89	.88	1.60	1.13	1.80
Aug.	2.32	2.49	1.44	1.05	2.13	2.22	2.24	2.85	1.80	2.09
Sept.	2.28	3.43	3.83	2.90	2.39	2.86	4.22	3.29	3.05	3.34
Oct.	1.00	2.41	1.35	2.09	2.30	2.97	1.72	2.23	1.51	1.95
Nov.	2.70	.71	2.19	.80	3.00	.82	2.28	.81	2.08	.62
Dec.	.50	.44	.54	.61	.60	.56	.33	.57	.59	.39
Yearly	18.43	19.20	19.40	18.47	22.65	21.18	24.50	19.94	16.70	16.75

Month	Harlow Ranch		Goldwire Ranch		Pafford Crossing		Big Satan Creek Station		Cliff Lowry Ranch	
	1978	Average	1978	Average	1978	Average	1978	Average	1978	Average
Jan.	0.17	0.29	0.20	0.56	0.15	0.51	0.20	0.51	0.20	0.40
Feb.	.40	.53	.60	.72	.50	.78	.49	.64	.59	1.05
Mar.	0	.36	T	.80	0	.54	.01	1.05	.07	.77
Apr.	1.60	1.45	3.90	1.87	2.75	1.47	3.50	2.05	2.06	2.00
May	0	1.81	3.07	2.56	4.05	1.96	3.47	2.28	6.33	2.74
June	4.70	1.99	2.23	1.91	3.40	2.05	2.44	1.68	3.25	2.04
July	.45	1.74	1.33	3.03	1.61	2.00	1.80	2.73	2.07	2.07
Aug.	2.62	1.98	3.38	3.98	2.16	2.22	1.87	3.65	3.05	2.60
Sept.	3.18	3.18	3.09	3.03	2.04	3.33	2.33	2.87	2.91	3.41
Oct.	1.50	2.28	1.40	2.62	2.00	2.33	2.00	2.85	2.34	2.45
Nov.	2.30	.60	2.70	.86	3.40	.68	2.80	.85	2.92	.86
Dec.	.50	.33	.50	.42	.40	.47	.40	.51	.53	.48
Yearly	17.42	16.54	22.40	22.36	22.46	18.34	21.31	21.67	26.32	20.87

T Trace

RAINFALL ON THE RIO GRANDE WATERSHED IN THE UNITED STATES

In Inches

Month	Lowry Ranch No. 2		Tuffy Whitehead Ranch		Stewart Ranch		Rough Canyon near Del Rio		Devils Lake	
	1978	Average	1978	Average	1978	Average	1978	Average	1978	Average
Jan.	0.29	0.35	0.16	0.33	0.10	0.40	T	0.29	0.07	0.62
Feb.	.39	.87	.25	.74	.49	.86	.30	.85	.29	.84
Mar.	.07	.84	.22	.64	.13	.61	0	.76	.07	.61
Apr.	1.76	1.90	1.48	1.54	.98	1.85	1.40	1.68	1.13	1.68
May	3.16	2.15	2.41	1.58	5.01	1.86	1.98	1.80	2.11	1.84
June	3.15	1.90	3.24	1.78	3.35	2.22	5.15	2.14	4.65	2.31
July	1.45	2.25	1.92	1.61	1.93	2.06	1.50	2.81	1.80	1.39
Aug.	2.58	2.89	1.24	1.72	2.27	2.02	5.74	3.26	2.00	1.89
Sept.	2.20	2.62	1.88	3.05	2.76	2.79	4.22	2.71	2.53	2.42
Oct.	2.21	2.22	.93	1.98	2.19	2.30	1.94	2.90	2.19	2.01
Nov.	2.56	.83	1.79	.62	2.43	.75	2.27	.85	2.47	.69
Dec.	.47	.50	.10	.41	.55	.50	.40	.50	.46	.69
Yearly	20.29	19.32	15.62	16.00	22.19	18.22	24.90	20.55	19.77	16.99

Month	Sellers Ranch		Evans Creek near Comstock		J. G. Brite Ranch		Hutto Ranch No. 1		Hutto Ranch No. 2	
	1978	Average	1978	Average	1978	Average	1978	Average	1978	Average
Jan.	0.05	0.36	0.02	0.21	0.10	0.35	0.14	0.51	0.10	0.48
Feb.	.10	.73	.30	.69	.25	.88	.46	.89	.43	.97
Mar.	0	.56	0	.76	.11	.73	.20	.61	.16	.61
Apr.	1.10	1.45	1.14	1.35	1.06	1.68	1.72	2.15	1.91	2.27
May	2.37	1.51	1.31	1.11	2.42	2.03	5.72	2.04	2.67	1.74
June	4.69	2.25	4.92	1.86	4.91	1.97	1.91	1.94	3.53	2.08
July	1.56	1.49	1.56	2.52	1.98	1.81	3.58	2.55	3.20	2.48
Aug.	1.76	2.09	1.31	3.26	2.02	2.45	2.57	2.49	3.63	2.42
Sept.	2.59	2.65	5.34	3.47	3.29	3.43	2.92	2.96	3.20	3.66
Oct.	2.85	2.14	.65	2.39	2.54	2.32	.66	2.41	.64	2.18
Nov.	3.10	.67	3.50	.89	2.97	.79	2.76	.85	3.26	.95
Dec.	.35	.45	.32	.35	.49	.48	.36	.50	.60	.45
Yearly	20.52	16.35	20.37	18.86	22.14	18.92	23.00	19.90	23.33	20.29

Month	Middle Fork San Pedro		North Fork San Pedro		Long Ranch		Buoy No. 11		Amistad Raft	
	1978	Average	1978	Average	1978	Average	1978	Average	1978	Average
Jan.	0.15	0.42	0.15	0.38	0.06	0.41	0.15	0.35	0	0.40
Feb.	.40	.81	.40	.71	.40	.69	.30	.42	.25	.46
Mar.	.15	.68	.15	.73	.18	.73	.10	.62	.10	.59
Apr.	2.50	2.09	1.35	1.97	1.08	1.87	1.00	1.66	1.20	1.74
May	4.66	2.34	5.68	2.25	3.24	1.99	2.79	1.47		1.58
June	3.71	2.00	3.52	2.05	4.03	1.88	2.21	1.69		1.83
July	3.15	3.63	2.90	3.51	4.32	3.28	1.30	2.41		3.05
Aug.	3.71	2.98	3.87	2.97	2.27	1.95	2.16	2.26		3.53
Sept.	3.09	1.79	2.83	2.20	2.81	2.38	3.82	2.79		2.50
Oct.	.85	3.24	.94	2.94	.93	2.55	.10	2.06		3.04
Nov.	3.46	1.04	3.07	1.03	3.21	.79	2.50	.56		.62
Dec.	.70	.60	.65	.55	.56	.50	.40	.40		.45
Yearly	26.53	21.62	25.51	21.29	23.09	19.02	16.83	16.69		19.79

Month	Amistad Dam		Laughlin Air Force Base		Gillis Headquarters Ranch		Lewis Ranch		Maverick County Canal Headgate	
	1978	Average	1978	Average	1978	Average	1978	Average	1978	Average
Jan.	0.05	0.42	0.07	0.50	0.32	0.51	0.30	0.60	0	0.56
Feb.	.38	.81	.41	.92	.68	1.01	.50	1.08	T	.96
Mar.	.18	.74	.29	.42	.10	.80	0	.66	0	.55
Apr.	1.51	1.97	.66	2.12	1.48	2.42	1.20	2.38	0	1.60
May	3.42	1.98	4.61	2.05	4.28	2.50	6.32	2.61	2.80	2.12
June	4.84	1.91	2.73	2.63	2.58	2.40	3.15	2.40	2.05	2.09
July	2.40	2.17	3.98	2.87	1.60	3.22	1.18	1.88	1.70	1.88
Aug.	1.58	2.38	2.46	2.07	2.47	3.45	2.20	2.65	1.20	1.61
Sept.	5.32	4.07	1.83	2.68	4.08	2.32	3.62	3.44	2.65	2.82
Oct.	2.51	2.11	.52	2.80	2.01	3.05	.65	2.96	1.25	2.20
Nov.	3.13	.77	5.90	1.04	3.82	1.16	5.84	1.10	8.30	.99
Dec.	.55	.52	.85	.57	.76	.62	.94	.64	.95	.57
Yearly	25.87	19.85	24.31	20.67	24.18	23.46	25.90	22.40	20.90	17.95

T Trace

RAINFALL ON THE RIO GRANDE WATERSHED IN THE UNITED STATES

In Inches

	Wardlaw Standart Ranch		Pinto Creek Station		Las Moras Creek		Wipff Ranch		Lateral No. 2 Spill	
Month	1978	Average	1978	Average	1978	Average	1978	Average	1978	Average
Jan.	0.08		0.05	0.56	0.31	0.71	0.10	0.67	0.10	0.60
Feb.	.55		.20	.77	.48	1.03	.50	.81	T	.71
Mar.	1.38		0	.44	0	.55	.10	.53	0	.61
Apr.	0	1.82	.15	1.46	.11	1.47	.10	1.69	.10	1.69
May	2.81	2.13	3.10	1.99	2.15	2.20	2.15	2.25	2.00	2.58
June	2.54	2.17	2.90	2.46	2.05	2.61	2.85	2.34	2.15	2.34
July	1.45	.72	1.20	1.61	1.52	1.36	1.00	1.75	.50	1.99
Aug.	.50	.25	1.70	1.76	1.56	2.11	1.40	1.98	2.05	2.18
Sept.	1.76	1.36	2.40	3.06	4.79	3.62	6.10	3.10	4.80	3.26
Oct.	.70	2.34	.65	2.16	1.23	2.66	.20	2.35	.55	2.33
Nov.	8.26	5.13	9.60	1.25	1.08	1.00	4.75	1.13	4.40	1.02
Dec.	.55	.30	.70	.56	.90	.65	1.00	.58	1.90	.52
Yearly	20.58		22.65	18.08	16.18	19.97	20.25	19.18	17.65	19.83

	Normandy		Lateral No. 12 Headgate		Lateral 15 Spill		Maverick Power Plant		Cooper Ranch	
Month	1978	Average	1978	Average	1978	Average	1978	Average	1978	Average
Jan.	0.10	0.72	T	0.57	T	0.58	0.10	0.68	T	0.48
Feb.	.51	.74	T	.60	T	.64	.38	.77	.15	.68
Mar.	.01	.69	0	.57	0	.50	0	.76	0	.66
Apr.	.33	1.84	.10	1.65	.25	1.45	.55	1.83	.40	1.56
May	2.45	2.80	2.90	2.72	2.50	2.56	3.31	2.71	3.00	2.44
June	3.02	2.10	2.75	1.93	2.25	1.88	2.39	2.21	2.90	2.34
July	.57	2.21	.70	1.77	.90	2.10	1.34	1.78	1.00	2.10
Aug.	1.67	2.25	2.35	1.91	2.80	1.83	2.73	2.01	2.70	2.07
Sept.	5.66	3.26	4.95	3.07	5.20	2.60	7.75	2.88	7.25	3.60
Oct.	.87	2.60	.70	2.75	.50	2.71	.81	2.61	.60	2.57
Nov.	4.28	1.01	3.80	.83	3.10	.73	3.20	.77	2.30	.84
Dec.	.59	.68	.70	.53	.85	.55	.52	.59	.60	.55
Yearly	20.06	20.90	18.95	18.90	18.35	18.13	23.08	19.60	20.90	19.89

	Coal Mine		Elm Creek Station		Chittim Ranch		Eagle Pass		Canon Diablo	
Month	1978	Average	1978	Average	1978	Average	1978	Average	1978	Average
Jan.	0	0.56	T	0.50	0.05	0.53	0.04	0.64	0.05	0.52
Feb.	.16	.74	T	.64	.20	.78	.15	.86	.05	.71
Mar.	.06	.72	.10	.51	.15	.58	.09	.81	0	.65
Apr.	.23	1.69	.25	1.67	.30	1.83	.32	1.67	.35	1.94
May	3.34	2.78	4.60	3.04	4.50	3.17	4.77	3.84	7.35	4.00
June	2.78	1.65	2.35	2.06	2.10	2.02	2.28	2.70		2.48
July	1.45	2.41	1.50	2.13	1.40	2.20	1.26	2.19	2.40	1.63
Aug.	2.99	1.85	3.85	2.32	4.20	2.24	3.42	3.19	3.80	2.62
Sept.	7.54	3.51	5.30	3.06	6.15	3.14	6.14	3.70	5.70	3.86
Oct.	2.54	2.68	.90	2.65	.50	2.79	.84	2.63	.95	2.40
Nov.	2.47	.73	3.30	.70	1.70	.66	2.86	.81	2.05	.78
Dec.	.48	.45	.75	.55	.50	.57	.61	.74	.80	.58
Yearly	24.04	19.77	22.90	19.83	21.75	20.51	22.78	23.78		22.17

	Rosita Creek Siphon		Weyrick Farm		Trees Farm		Rosita Creek Station		Farias Ranch	
Month	1978	Average	1978	Average	1978	Average	1978	Average	1978	Average
Jan.	0.10	0.47	T	0.49	0.02	0.50	0.05	0.43	0	0.60
Feb.	.10	.74	T	.74	.06	.77	.05	.68	.26	1.02
Mar.	T	.60	T	.48	.03	.45	0	.49	0	.50
Apr.	.40	1.73	.20	1.69	.37	1.80	.55	1.80	.39	1.96
May	3.40	2.87	2.85	3.23	2.51	3.02	2.60	2.59	3.28	3.06
June	2.20	2.11	1.30	1.85	3.68	1.76	2.60	2.07	1.97	1.95
July	1.10	1.99	.55	1.31	1.94	1.92	2.00	1.49	1.66	2.35
Aug.	4.00	1.97	2.75	2.03	2.79	1.84	2.60	1.85	1.70	2.17
Sept.	5.20	3.08	4.85	3.07	5.89	3.05	4.85	3.15	7.08	4.09
Oct.	.60	2.40	1.00	1.91	1.00	3.16	2.05	2.87	1.72	3.13
Nov.	2.00	.76	1.25	.69	2.48	.76	2.45	.76	1.12	.82
Dec.	.90	.63	1.15	.61	.54	.61	.80	.58	.88	.76
Yearly	20.00	19.35	15.90	18.10	21.31	19.64	20.60	18.76	20.06	22.41

T Trace

RAINFALL ON THE RIO GRANDE WATERSHED IN THE UNITED STATES

In Inches

Month	Indio Ranch		El Indio		Van Dalsem Farm		Wuensche Farm		Keisling Farm	
	1978	Average	1978	Average	1978	Average	1978	Average	1978	Average
Jan.	0.16	0.60	0.03	0.71	0.10	0.50	0.19	0.63	0.13	0.54
Feb.	.28	.83	.39	.91	.25	.85	.36	.94	.42	.87
Mar.	0	.53	0	.53	T	.48	T	.58	T	.64
Apr.	.26	2.01	.07	1.72	.15	1.81	.23	1.67	.18	1.77
May	2.35	2.58	4.57	3.27	6.15	3.01	5.18	2.86	4.04	2.73
June	1.36	2.26	2.10	1.94	1.40	1.34	2.49	2.12	2.36	2.44
July	2.20	2.12	1.10	1.33	2.20	1.76	2.35	1.44	2.48	1.59
Aug.	2.21	1.72	1.91	1.99	.35	1.54	.15	1.73	.13	1.74
Sept.	5.36	3.80	4.50	3.26	5.70	3.62	5.49	3.26	6.85	3.16
Oct.	1.42	2.80	1.68	2.38	2.20	2.69	1.78	2.35	1.47	2.58
Nov.	.99	.80	.99	.72	.55	.69	.62	.71	.43	.64
Dec.	1.04	.66	.81	.64	.75	.63	.67	.59	.67	.78
Yearly	17.63	20.71	18.15	19.40	19.80	18.92	19.51	18.88	19.16	19.48

Month	Cuervo Creek Station		Apache Ranch		Laredo Water Plant		Fort McIntosh (Laredo)		Corralitos Ranch	
	1978	Average	1978	Average	1978	Average	1978	Average	1978	Average
Jan.	0.10	0.59	0	0.60	0.33	0.75	0.36	0.73	0.10	0.58
Feb.	.30	.72	0	.87	.17	.78	.33	.86	.23	.76
Mar.	T	.41	0	.39	0	.58	0	.69	0	.45
Apr.	.15	1.58	0	1.49	T	1.12	.07	1.31	T	1.05
May	3.45	2.30	4.50	2.57	1.03	2.42	1.83	2.69	1.80	1.89
June	2.85	2.11	1.50	1.80	2.44	2.17	2.73	2.26	.80	2.36
July	2.65	1.42	3.50	2.23	.74	1.25	1.17	1.47	0	1.17
Aug.	T	1.61	1.00	2.05	3.98	1.91	4.06	1.97	2.70	1.97
Sept.	5.90	3.28	6.50	3.58	5.15	3.20	5.86	3.00	5.85	3.63
Oct.	.75	2.39	0	2.32	1.97	1.81	2.01	1.79	.30	1.82
Nov.	.10	.66	0	.69	.16	.87	.26	1.14	.20	.88
Dec.	.70	.55	0	.72	.77	.86	.78	.86	3.70	.61
Yearly	16.95	17.62	17.00	19.31	16.74	17.72	19.46	18.77	15.68	17.17

Month	Huisache Ranch		Zapata Water Plant		Arroyo Tigre Chiquito		Falcon Dam		Roma International Bridge	
	1978	Average	1978	Average	1978	Average	1978	Average	1978	Average
Jan.	1.07	0.70	0.85	0.77	0.25	0.71	0.71	0.81	0.80	0.83
Feb.	.23	.92	.18	.83	.20	.85	.43	.86	.10	.99
Mar.	0	.50	0	.49	0	.31	.01	.63	0	.64
Apr.	.70	1.22	1.38	1.47	1.00	1.09	.99	1.14	1.00	1.38
May	1.80	2.16	2.07	2.58	.21	2.23	2.67	2.29		1.69
June	.80	2.46	3.50	2.25	1.87	2.23	3.01	2.76	0	2.13
July	0	1.23	0	1.29	.40	1.23	.02	1.18	.87	1.19
Aug.	2.30	1.62	2.57	1.87	2.00	2.22	2.29	2.50	.42	2.01
Sept.	7.95	4.49	6.07	4.86	4.20	4.79	8.22	4.76	6.03	4.70
Oct.	.35	2.12	.32	1.84	0	1.98	3.36	2.21	0	2.01
Nov.	.25	.91	0	.97	.20	1.09	.35	1.16	0	.79
Dec.	3.65	.74	2.90	.69	.75	.53	.98	.64	0	.44
Yearly	19.10	19.07	19.84	19.91	11.08	19.26	23.04	20.94		18.80

Month	Garciasville		Los Ebanos		La Joya		HCWCID #6 Goodwin Pump No. 4B		HCWCID #6 Goodwin Pump No. 3	
	1978	Average	1978	Average	1978	Average	1978	Average	1978	Average
Jan.	1.29	0.89	2.00	1.04		1.01	3.00	1.27	3.00	1.30
Feb.	.25	.88	.15	.80		.90	3.25	1.02	0	.99
Mar.	0	.43	0	.42	0	.43	0	.47	0	.61
Apr.	.48	1.08	.33	1.52	.50	.99	.75	1.05	.95	1.29
May	2.09	2.09	1.33	1.83	.93	2.14	.67	2.00	1.49	2.18
June	3.07	2.41	1.31	2.25	1.35	2.57	2.39	2.43	1.57	2.46
July	1.36	1.43	1.79	1.35	2.92	1.29	0	1.25	.05	1.62
Aug.	0	1.95	.06	2.04	.10	1.65	1.20	1.53	1.94	1.73
Sept.	3.37	3.74	5.68	3.52	3.02	3.41	1.00	3.51	5.11	3.50
Oct.	0	2.05	.03	2.17	0	1.90	0	2.65	3.40	2.93
Nov.		.95	0	.55	0	.87	0	.97	0	.91
Dec.	.74	.63	.84	.65	.70	.83	2.80	.83	1.47	.90
Yearly		18.53	13.52	18.14		17.99	15.06	18.98	18.98	20.42

T Trace

RAINFALL ON THE RIO GRANDE WATERSHED IN THE UNITED STATES

In Inches

Month	HCWCID #6 Goodwin Pump No. 5		HCWCID #6 Goodwin Pump No. 3A		HCWCID #6 Goodwin Pump No. 4		Penitas (Edinburg Pumping Plant)		New Mission Pumping Plant	
	1978	Average	1978	Average	1978	Average	1978	Average	1978	Average
Jan.	3.00	1.31	3.00	1.27	3.00	1.67	3.38	1.33	4.35	1.02
Feb.	0	.99	0	1.00	.45	.98	0	.92	.20	.78
Mar.	0	.61	0	.59	0	.53	0	.49	0	.70
Apr.	0	1.23	1.03	1.60	1.06	1.34	.73	1.00	.85	1.46
May	0	2.42	1.35	2.02	.93	2.20	1.00	2.14	.65	2.27
June	4.10	2.49	2.10	2.65	1.27	2.84	.90	2.88	0	2.72
July	0	1.27	.68	1.60	.38	1.73	2.00	1.58	0	1.64
Aug.	1.57	2.45	.38	1.99	.42	1.86	.77	2.12	.55	1.71
Sept.	3.10	4.38	3.00	3.50	3.51	3.90	2.73	3.78	4.61	3.25
Oct.	1.50	2.70	4.50	3.04	3.90	3.05	5.42	2.93	5.00	2.50
Nov.	0	.98	0	.94	0	.93	.06	.96	0	.63
Dec.	1.70	.86	1.70	.82	1.48	.99	1.00	.92	0	.67
Yearly	14.97	21.69	17.74	21.02	16.40	22.02	17.99	21.05	16.21	19.35

Month	O. C. Dale Farm		HCWCID #15 (Edinburg Office)		Edinburg Filtration Plant		La Feria Pumping Plant		La Feria Materials Yard	
	1978	Average	1978	Average	1978	Average	1978	Average	1978	Average
Jan.	5.14	1.74	3.17	1.40	5.35	1.57	2.20	1.65	4.85	1.47
Feb.	.65	1.18	.37	1.03	.48	1.11	.25	1.57	1.30	1.32
Mar.	.17	.80	0	.61	.07	.70	0	.78	0	.76
Apr.	1.51	1.70	1.45	1.62	1.11	1.54	1.60	2.24	1.55	1.61
May	.28	2.07	.25	2.17	.61	2.12	0	3.01	.50	2.86
June	1.52	3.07	2.23	2.52	1.82	2.75	0	3.54	0	3.84
July	.79	1.68	.22	1.53	.78	1.37	1.10	2.41	0	1.98
Aug.	.98	2.26	2.16	2.09	1.68	2.02	9.85	3.74	8.30	3.27
Sept.	5.69	4.19	6.06	4.62	5.82	3.95	7.76	7.06	7.60	5.50
Oct.	4.70	3.25	3.44	2.71	4.80	2.72	4.90	4.26	5.40	3.45
Nov.	.37	1.24	.55	1.06	.43	1.13	0	1.92	0	1.49
Dec.	2.20	1.09	1.60	.90	1.00	.96	2.10	1.49	4.00	1.64
Yearly	24.00	24.27	21.50	22.26	23.95	21.94	29.76	33.67	33.50	29.19

Month	CCWCID #19 (Adams Gardens)		San Benito Pump		Whipple Farm		* CCWID #11 (Bayview Dist. Off.)			
	1978	Average	1978	Average	1978	Average	1978	Average		
Jan.	3.23	1.31	3.58	1.39	3.99	1.92	2.60	1.46		
Feb.	1.00	1.24	1.27	.97	.42	1.81	1.40	1.72		
Mar.	.01	.74	0	.79	0	.64	0	.66		
Apr.	1.09	1.55	2.00	1.35	2.40	2.03	2.71	1.95		
May	.19	2.41	0	2.46	.20	2.95	0	2.54		
June	1.82	2.89	2.26	2.57	2.93	3.55	5.19	2.48		
July	.64	1.61	.80	1.73	5.64	2.49	5.08	1.95		
Aug.	4.89	2.84	4.95	2.23	1.80	3.16	.65	2.58		
Sept.	7.43	4.37	8.32	4.53	10.45	6.09	9.73	5.52		
Oct.	6.45	3.09	3.80	2.71	5.30	3.29	3.96	2.39		
Nov.	.92	1.55	.24	1.10	.95	1.63	0	1.50		
Dec.	2.46	1.12	2.60	1.29	3.97	1.60	2.50	1.37		
Yearly	30.13	24.72	29.82	23.12	38.05	31.16	33.82	26.12		

* 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 150 through 153 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.

	Juarez, Chihuahua		El Sauzal D. B., Chihuahua		Garita Km. 28, Chihuahua		Samalayuca, Chihuahua		San Agustin, Chihuahua	
Month	1978	Average	1978	Average	1978	Average	1978	Average	1978	Average
Jan.	0.24	0.40	0.47	0.50	0.79	0.57	0.75	0.42	0.28	0.37
Feb.	.47	.44	0	.38	.94	.42	.55	.52	.47	.35
Mar.	.04	.36	.28	.14	.28	.29	.51	.37	.04	.24
Apr.	T	.28	.12	.08	0	.10	0	.12	0	.11
May	.59	.34	.04	.23	.08	.23	.43	.18	.55	.29
June	.91	.64	.20	.44	.75	.77	.59	.78	2.17	.68
July	.28	1.58	1.10	1.29	1.38	1.90	1.50	2.10	.43	1.60
Aug.	2.52	1.45	1.30	1.15	3.15	1.71	2.17	1.78	1.46	1.17
Sept.	5.67	1.49	.28	1.70	3.54	1.80	2.99	2.05	3.90	1.50
Oct.	2.48	1.01	2.28	1.16	2.60	.98	1.57	.71	2.17	.82
Nov.	.39	.49	0	.19	.91	.56	.55	.37	.63	.31
Dec.	.20	.53	.20	.41	.51	.60	.35	.45	.04	.49
Yearly	13.79	9.01	6.27	7.67	14.93	9.93	11.96	9.85	12.14	7.93

	Guadalupe, Chihuahua		Tinajas, Chihuahua		Praxedis G. Guerrero, Chihuahua		Porvenir, Chihuahua		Vado de Cedillos, Chihuahua	
Month	1978	Average	1978	Average	1978	Average	1978	Average	1978	Average
Jan.	0.28	0.37	0	0.29	0.16	0.30	0.16	0.35	0.31	0.38
Feb.	.35	.37	.39	.30	.51	.25	.51	.37	.47	.34
Mar.	0	.34	0	.34	0	.22	0	.24	.16	.23
Apr.	.12	.15	0	.06		.07	.16	.12	.16	.18
May	.94	.30	.43	.30		.26	.24	.40	.39	.39
June	1.30	.76	0	.60		.58	1.30	.85	1.26	1.04
July	.67	1.89	.47	1.76	.67	1.90	.55	1.79	.28	1.77
Aug.	1.54	1.43	1.22	1.62	.47	1.21	.79	1.69	1.89	1.74
Sept.	5.04	1.55		1.65	4.25	1.51	6.81	1.84	7.48	1.94
Oct.	2.13	1.02		1.02	2.36	.91	1.77	.98	1.38	1.08
Nov.	.55	.37		.39	.87	.37	.87	.47	1.26	.44
Dec.	.04	.32		.36	.16	.36	.24	.48	.24	.52
Yearly	12.96	8.87		8.69		7.94	13.40	9.58	15.28	10.05

	Los Barriles, Chihuahua		Banderas, Chihuahua		Luis L. Leon, Chihuahua		El Cuervo, Chihuahua		Carichic, Chihuahua	
Month	1978	Average	1978	Average	1978	Average	1978	Average	1978	Average
Jan.	0.12	0.33		0.14	0.43	0.38	0.04	0.21	0.04	0.40
Feb.	.28	.23		.28	.35	.28	0	.29	.35	.49
Mar.	.04	.22		.19	0	.21	T	.11	.55	.18
Apr.	.04	.11		.10	.24	.16	0	.13	.71	.18
May	T	.36	0.12	.23	.63	.41	.43	.42	.08	.37
June	T	1.05	.04	.78	.20	1.14	.83	1.33	1.02	1.67
July	T	1.95	0	1.24	.87	1.94	.79	2.47	.43	6.12
Aug.	.94	2.08	.12	1.85	1.57	2.06	7.05	2.69	6.42	4.93
Sept.	1.34	1.62	7.48	1.85	11.14	1.93	6.93	2.67	5.55	3.43
Oct.	1.26	1.11	1.02	.96	1.65	1.16	3.39	1.04	1.22	1.18
Nov.	.43	.49	.12	.32	1.30	.47	.94	.29	.04	.56
Dec.		.33	.16	.24	.51	.40	.47	.17	1.85	.69
Yearly		9.88		8.18	18.89	10.54	20.87	11.82	18.26	20.20

T Trace

RAINFALL ON THE RIO GRANDE WATERSHED IN MEXICO

In Inches

Month	San Juanito, Chihuahua			Siquirichic, Chihuahua		El Vergel, Chihuahua		Balleza, Chihuahua		
	1977	1978	Average	1978	Average	1978	Average	1977	1978	Average
Jan.	1.81	0.91	1.54	0	1.03	0.08	1.27	0.59	T	0.34
Feb.	0	2.44	1.09	0	.59	.20	.75	0	.31	.35
Mar.	.39	1.26	.36	0	.42	.43	.51	T	.39	.12
Apr.	.31	.67	1.26	.47	.21	1.61	.47	T	.43	.20
May	.04	.04	.37	.04	.47	.47	.72	T	.12	.23
June	2.91	1.02	1.81	1.57	1.71	1.50	3.06	3.31	.94	1.59
July	7.48	4.21	11.16	2.56	5.55	6.06	6.89	5.35	3.31	4.72
Aug.	3.31	8.82	7.43	7.09	5.64	6.61	6.65	5.35	6.93	4.93
Sept.	2.99	9.37	3.90	5.51	3.26	13.15	4.97	3.54	7.64	3.48
Oct.	3.31	3.54	3.18	7.52	1.55	2.99	1.87	2.68	.31	.82
Nov.	.51	.55	1.24	1.57	.48	.71	.70	0	0	.48
Dec.	T	1.61	1.51	4.13	1.22	1.22	1.36	0	.24	.47
Yearly	23.06	34.44	34.85	30.46	22.13	35.03	29.22	20.82	20.62	17.73

Month	El Sitio, Chihuahua		La Boquilla, Chihuahua		San Antonio, Durango		Estacion Rosario, Durango		Ojo Caliente, Chihuahua	
	1978	Average	1978	Average	1978	Average	1978	Average	1978	Average
Jan.	0.16	0.18	0.16	0.29	0	0.30	0	0.23	0.12	0.17
Feb.	0	.34	T	.18	0	.16	0	.32	0	.22
Mar.	.16	.13	.08	.15	.08	.08	0	.12	0	.16
Apr.	0	.15	2.99	.22	1.65	.28	1.73	.28	.08	.16
May	.51	.37	.94	.56	1.81	.62	.79	.84	.47	.51
Juhe	.67	1.67	1.58	1.42	2.17	2.01	.71	2.38	1.69	1.66
July	2.56	4.50	2.68	3.00	8.15	4.74	5.28	4.64	4.25	3.46
Aug.	8.31	4.83	4.06	2.96	8.43	4.11	7.83	5.23	4.53	2.75
Sept.	9.68	3.67	7.09	2.99	8.82	4.39	7.83	5.38	8.62	2.77
Oct.	1.18	.86	1.65	.90	.98	1.16	1.06	1.12	1.46	1.13
Nov.	0	.40	0	.32	0	.27	0	.39	0	.19
Dec.	.16	.34	T	.36	0	.25	.12	.41	.12	.26
Yearly	23.39	17.44	21.23	13.35	32.09	18.37	25.35	21.34	21.34	13.44

Month	Valle Allende, Chihuahua		Escalon, Chihuahua		Jimenez, Chihuahua		Parral, Chihuahua		Camargo, Chihuahua	
	1978	Average	1978	Average	1978	Average	1978	Average	1978	Average
Jan.	T	0.18	0.08	0.31	0	0.20	0.04	0.19	0.20	0.31
Feb.	.04	.20	.08	.18	.20	.16	T	.22	T	.29
Mar.	T	.06	T	.10	0	.08	.04	.10	T	.11
Apr.	.16	.20	.39	.31	.31	.13	.24	.20	.04	.16
May	2.52	.72	2.48	.69	.79	.45	1.81	.46	.35	.59
June	1.10	1.71	3.27	1.74	1.18	1.24	.31	1.72	1.65	1.56
July	5.98	4.17	4.21	2.66	5.75	3.52	4.21	4.37	2.80	3.39
Aug.	9.45	4.80	3.98	2.89	5.16	2.43	8.54	4.37	5.98	2.83
Sept.	10.87	4.20	3.07	2.72	5.43	2.44	7.05	4.33	10.12	3.02
Oct.	.79	.96	2.44	1.21	.47	1.25	1.57	1.16	1.73	1.03
Nov.	0	.30	0	.25	0	.25	T	.49	T	.35
Dec.	T	.31	T	.33	T	.24	T	.38	.12	.35
Yearly	30.91	17.81	20.00	13.39	19.29	12.39	23.81	17.99	22.99	13.99

Month	Victoria, Chihuahua		Tacubaya, Chihuahua		Nonoava, Chihuahua		El Maguey, Chihuahua		San Lorenzo, Chihuahua	
	1978	Average	1978	Average	1978	Average	1978	Average	1978	Average
Jan.	0	0.25	0.04	0.19	0	0.13	0	0.20	0	0.14
Feb.	.08	.62	.08	.54	.43	.42	0	.33	0	.18
Mar.	T	.15	T	.11	.12	.18	.31	.13	.20	.03
Apr.	.04	.24	.04	.15	.12	.14	.43	.15	0	.06
May	1.26	.85	.79	.99	.16	.38	.87	.37	.71	.51
June	1.34	1.98	1.61	1.62	1.02	1.95	.94	1.57	.35	1.61
July	4.25	3.31	2.76	4.25	3.43	5.66	1.97	3.66	2.32	4.14
Aug.	9.06	3.29	4.25	2.33	5.51	3.26	6.69	4.10	6.10	4.39
Sept.	8.43	3.16	7.20	3.31	5.98	2.80	8.98	3.67	10.08	4.80
Oct.	.87	.65	2.05	.72	1.06	1.15	.51	.84	2.72	1.05
Nov.	.98	.27	.63	.28	0	.41	0	.25	0	.41
Dec.	.12	.32	.16	.53	.67	.38	.04	.29	.16	.41
Yearly	26.43	15.09	19.61	15.02	18.50	16.86	20.74	15.56	22.64	17.73

T Trace

RAINFALL ON THE RIO GRANDE WATERSHED IN MEXICO

In Inches

	Villalba, Chihuahua		Las Virgenes, Chihuahua		Km. 135, Chihuahua		Delicias, Chihuahua		Lazaro Cardenas, Chihuahua	
Month	1978	Average	1978	Average	1978	Average	1978	Average	1978	Average
Jan.	0	0.29	0.12	0.24	0	0.07	0	0.30	0.04	0.20
Feb.	0	.15	0	.13	0	.23	T	.16	T	.28
Mar.	.08	.06	.08	.05	0	.08	0	.11	.12	.10
Apr.	0	.16	.08	.19	.08	.24	T	.25	T	.22
May	.04	.37	.16	.32	.08	.54	.47	.34	.48	.45
June	2.09	1.26	2.01	1.15	.51	1.18	1.06	1.16	.63	1.16
July	2.91	3.63	2.24	2.67	3.11	2.62	1.57	2.54	2.54	3.12
Aug.	3.35	2.94	5.43	2.60	5.67	2.64	2.52	2.45	6.55	2.71
Sept.	7.40	2.86	6.57	2.41	7.13	3.26	6.73	2.24	7.23	2.80
Oct.	1.73	.98	1.57	.85	2.13	.99	1.97	.83	1.75	.92
Nov.	0	.27	0	.22	0	.24	0	.25	T	.28
Dec.	.20	.36	.20	.34	.31	.32	.12	.36	.24	.21
Yearly	17.80	13.33	18.46	11.17	19.02	12.41	14.44	10.99	19.58	12.45

	Meoqui, Chihuahua		Las Burras, Chihuahua		Ciudad Guerrero, Chihuahua		Bachiniva, Chihuahua		La Trasquila, Chihuahua	
Month	1978	Average	1978	Average	1978	Average	1978	Average	1978	Average
Jan.	0.04	0.14	0.20	0.21	0.12	0.58	0.16	0.41	0.35	0.28
Feb.	.04	.21	.04	.19	1.06	.42	.24	.18	.24	.32
Mar.	.08	.08	0	.11	.87	.21	.39	.31	0	.10
Apr.	T	.36	.04	.17	.31	.20	.24	.11	.04	.12
May	.20	.49	.43	.40	T	.30	.04	.21	0	.32
June	1.14	1.18	.55	1.04	1.50	1.54	2.20	1.46	.67	1.36
July	2.91	2.85	2.72	2.92	2.60	4.86	2.17	5.57	4.72	3.76
Aug.	5.28	2.62	3.86	2.55	5.59	5.22	4.41	4.50	4.02	2.73
Sept.	6.61	2.39	5.71	2.43	8.07	3.15	5.63	2.66	6.57	3.41
Oct.	2.20	1.07	2.64	.81	1.06	1.20	1.14	1.20	1.26	.83
Nov.	T	.19	.43	.20	.04	.50	.04	.33	.20	.32
Dec.	.24	.35	.35	.34	1.18	.69	.79	.41	.16	.29
Yearly	18.74	11.93	16.97	11.37	22.40	18.87	17.45	17.35	18.23	13.84

	Cuauhtemoc, Chihuahua		Colonia Anahuac, Chihuahua		Presa Chihuahua, Chihuahua		Chihuahua, Chihuahua		Majalca, Chihuahua	
Month	1978	Average	1978	Average	1978	Average	1978	Average	1978	Average
Jan.	0.04	0.28	0.04	0.25	T	0.18	0.08	0.26	0.16	0.29
Feb.	.04	.15	.04	.30	T	.23	.08	.20	.04	.35
Mar.	.43	.11	.31	.12	.20	.13	.12	.19	.31	.23
Apr.	.16	.19	.16	.20	T	.19	T	.19	.16	.31
May	.16	.35	.63	.58	.47	.93	.35	.45	.91	.78
June	1.10	1.49	1.34	1.62	2.52	2.30	1.18	1.48	1.42	2.58
July	2.87	4.69	2.32	4.86	1.46	4.49	.51	3.53	1.73	6.46
Aug.	6.06	4.16	6.38	4.66	6.18	4.22	5.91	3.36	7.28	5.85
Sept.	6.46	2.76	7.68	3.87	10.43	3.60	11.14	2.96	11.42	4.48
Oct.	1.38	1.18	2.52	1.16	2.76	1.00	2.87	.86	2.01	1.08
Nov.	.08	.30	.08	.33	.16	.32	.08	.42	.47	.39
Dec.	.55	.37	.47	.24	.51	.33	.55	.36	.71	.37
Yearly	19.33	16.03	21.97	18.19	24.69	17.92	22.87	14.26	26.62	23.17

	Posta Zootecnica, * Chihuahua		Villa Aldama, Chihuahua		Presa Luis L. Leon, Chihuahua		Maclovio Herrera (Falomir), Chihuahua		Parrita, Chihuahua	
Month	1978	Average	1978	Average	1978	Average	1978	Average	1978	Average
Jan.	0.12	0.21	0.04	0.17	0.04	0.05	0.04	0.29	0.24	0.15
Feb.	T	.23	T	.19	.08	.12	.12	.20	.12	.26
Mar.	.04	.14	T	.15	.39	.14	.04	.13	.04	.07
Apr.	T	.25	0	.17	0	.21	.04	.29	0	.38
May	1.34	.67	.51	.46	2.52	.42	.31	.58	1.73	.39
June	.08	1.43	.71	1.67	2.24	1.18	.94	1.16	.79	1.80
July	.43	3.44	1.50	3.03	1.50	2.50	1.50	2.86	.59	2.54
Aug.	6.69	3.82	7.64	2.94	7.68	2.79	5.00	2.60	6.14	3.10
Sept.	10.63	3.04	10.00	3.50	6.02	2.72	6.06	3.23	9.49	3.35
Oct.	2.01	1.09	2.05	.77	2.52	.72	1.57	.79	3.23	1.09
Nov.	.08	.35	T	.31	.39	.24	.87	.32	.63	.28
Dec.	.63	.34	.47	.35	.31	.30	.35	.58	.59	.21
Yearly	22.05	15.01	22.92	13.71	23.69	11.39	16.84	13.03	23.59	13.62

T Trace

* Formerly Planta Zootecnica, Chihuahua

RAINFALL ON THE RIO GRANDE WATERSHED IN MEXICO

In Inches

	Maijoma, Chihuahua		Coyame, Chihuahua		Gallego, Chihuahua		El Sueco, Chihuahua		Ojinaga (IB&WC), Chihuahua	
Month	1978	Average	1978	Average	1978	Average	1978	Average	1978	Average
Jan.	0.08	0.36	0.24	0.16	0.24	0.31	0.39	0.40	0.47	0.31
Feb.	.24	.34	.15	.34	.24	.39	T	.42	.16	.25
Mar.	.20	.18	T	.15	.47	.18	.16	.23	T	.18
Apr.	T	.22	.31	.23	0	.17	T	.18	.12	.22
May	1.18	.80	.51	.59	.51	.30	.31	.30	.43	.45
June	1.42	1.59	3.19	1.52	.67	.96	1.06	.83	.94	1.26
July	2.68	3.16	.79	2.57	1.69	3.26	2.87	3.16	.91	1.75
Aug.	5.75	3.24	8.50	2.13	5.51	3.09	5.35	3.38	3.62	1.56
Sept.	5.94	2.74	10.67	3.02	11.81	2.94	11.22	3.19	4.57	1.72
Oct.	3.43	1.03	2.60	.87	2.09	1.36	1.57	1.22	2.91	1.04
Nov.	.59	.35	.94	.40	.39	.31	.59	.44	.83	.40
Dec.	.39	.39	.31	.18	.43	.26	.51	.32	.63	.33
Yearly	21.90	14.40	28.22	12.16	24.05	13.53	24.03	14.07	15.59	9.47

	Ojinaga (M.S. of Mexico), Chihuahua		Manuel Benavides, Chihuahua		Ejido Eutimias, Coahuila		San Fernando, Coahuila		Hacienda San Miguel, Coahuila	
Month	1978	Average	1978	Average	1978	Average	1978	Average	1978	Average
Jan.	T	0.28	T	0.13	0	0.20	0	0.27	0	0.32
Feb.	.08	.23	.04	.24	0	.15	.12	.59	0	.60
Mar.	T	.21	.04	.28	0	.01	.24	.39	.16	.51
Apr.	.08	.25	T	.24	0	.15	1.10	1.06	.91	1.86
May	.31	.58	1.81	1.13	2.40	.99	1.73	1.29	3.27	2.47
June	2.36	1.12	1.97	1.36	0	.62	2.91	1.19	1.30	1.84
July	2.20	1.65	2.13	2.32	3.46	2.55	1.50	1.33	2.68	1.97
Aug.	2.87	1.55	2.52	2.36	2.56	.59	6.57	1.81	0	1.58
Sept.	4.17	1.64	4.41	2.87	3.94	1.53	3.46	3.08	6.69	3.40
Oct.	2.44	1.02	1.26	.89	.98	.52	1.50	1.88	.91	1.70
Nov.	.35	.38	.75	.27	.47	.25	4.72	.63	2.17	.64
Dec.	.16	.41	.39	.33	0	.60	.94	.41	.63	.34
Yearly	15.02	9.32	15.32	12.42	13.81	8.16	24.79	13.93	18.72	17.23

	Rancho La Chuparrosa, Coahuila		Presa Centenario, Coahuila		Amistad Res. near Tlaloc, Coahuila		La Amistad, Coahuila		Represa Amistad, Coahuila	
Month	1978	Average	1978	Average	1978	Average	1978	Average	1978	Average
Jan.	0.10	0.15	0.04	0.53	T	0.39	0.04	0.04	0.04	0.27
Feb.	.20	.40	.31	.81	T	.06	0	.53	.28	.54
Mar.	.08	.54	.08	.43	0	.79	.20	.83	.24	.74
Apr.	.92	1.16	.79	1.62	1.42	1.54	1.42	2.32	.87	1.33
May	2.45	1.29	3.78	1.84	2.24	1.64	2.60	1.68	3.39	1.21
June	1.83	1.29	2.01	2.05	4.41	2.17	4.72	3.42	2.36	1.07
July	.80	2.34	2.09	1.74	1.00	3.19	1.97	1.04	1.34	2.61
Aug.	1.57	2.09	.55	2.64	.70	2.72	1.81	1.08	2.91	2.13
Sept.	4.20	2.79	3.90	4.14	3.80	3.63	5.04	2.90	5.39	3.15
Oct.	.68	2.25	1.73	2.83	3.15	2.35	1.69	2.46	.91	2.72
Nov.	2.36	.49	4.76	1.08	3.05	.63	3.23	1.87	2.44	.79
Dec.	.23	.27	.59	.53	.44	.41	.47	.26	.31	.31
Yearly	15.42	15.06	20.63	20.24	20.21	19.52	23.19	18.43	20.48	16.87

	Ciudad Acuna, Coahuila		Presa Cabeceras, Coahuila		Presa San Miguel, Coahuila		Palestina, Coahuila		Chupadero, Coahuila	
Month	1978	Average	1978	Average	1978	Average	1978	Average	1978	Average
Jan.	0.04	0.53	0.08	0.54	0.16	0.48	0.08	0.87	0	0.49
Feb.	.35	.86	.28	.71	.24	.77	.28	.95	0	.85
Mar.	.16	.68	.20	.52	.20	.54	0	.63	0	.48
Apr.	3.15	1.74	.63	1.74	.39	1.32	1.02	1.83	.24	1.82
May	3.66	2.29	3.11	2.57	1.54	2.37	3.94	2.39	2.01	2.05
June	2.01	2.16	2.56	2.27	3.03	2.18	2.17	2.24	0	2.07
July	2.24	1.83	1.85	3.06	1.93	2.00	1.81	2.07	2.40	2.20
Aug.	.91	1.92	1.69	3.14	3.90	2.77	1.46	2.23	1.69	2.13
Sept.	3.03	3.21	5.83	4.99	4.96	4.10	5.79	3.26	2.36	3.44
Oct.	1.59	2.56	2.05	3.12	1.61	2.45	2.64	2.29	0	2.07
Nov.	4.13	.72	7.17	1.29	6.93	1.14	5.83	.86	8.31	1.13
Dec.	.79	.55	.63	.48	.75	.46	.75	.75	0	.49
Yearly	22.16	19.05	26.08	24.43	25.64	20.58	25.77	20.37	17.01	19.22

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	
	1978	Average	1978	Average	1978	Average	1978	Average	1978	Average
Jan.	0.24	0.83	0.08	0.67	0	0.33	0.12	0.71	0	0.54
Feb.	.35	.63	.47	.90	0	.60	.12	.96	.28	.71
Mar.	.24	.43	0	.69	0	.40	T	.65	0	.42
Apr.	.28	2.44	0	1.75	0	1.37	.67	1.97	.24	1.48
May	2.40	4.29	2.24	2.48	2.68	2.36	6.42	3.49	5.98	2.74
June	2.52	2.56	1.02	2.56	6.77	3.49	2.20	2.31	2.17	2.38
July	1.26	5.45	1.50	1.76	4.80	2.82	1.57	2.27	2.60	1.82
Aug.	1.18	.83	1.77	1.81	2.95	1.86	1.73	2.63	1.18	2.12
Sept.	4.21	2.34	3.66	3.14	14.33	4.23	6.10	3.34	6.10	3.93
Oct.	.87	2.68	1.57	2.67	1.34	3.00	.94	3.00	2.56	2.92
Nov.	6.14	2.71	7.01	1.09	0	.56	2.80	.81	0	.60
Dec.	.83	1.03	.51	.64	0	.40	.51	.65	.47	.56
Yearly	20.52	26.22	19.83	20.16	32.87	21.42	23.18	22.79	21.58	20.22

Month	Rancho San Diego, Coahuila		Villa Hidalgo, Coahuila		Colombia (IB&WC), Nuevo Leon		Rancho Vidrios, Tamaulipas		Nv. Laredo (M. S. of Mexico), Tamps.	
	1978	Average	1978	Average	1978	Average	1978	Average	1978	Average
Jan.	0	0.24	0	0.72	0.39	0.32	0.31	0.74	0.24	0.79
Feb.	0	.50	0	.92	.39	.65	.35	.88	.24	.90
Mar.	0	.35	0	.56	0	.55	0	.47	0	.61
Apr.	0	1.07	.20	1.53	.20	1.49	.79	1.41	.04	1.19
May	1.38	2.57	1.65	2.82	2.36	2.96	1.57	3.04	1.26	2.51
June	0	1.71	0	2.08	1.97	1.74	2.36	1.96	1.57	2.25
July	1.38	1.23	2.28	1.19	6.89	1.54	2.95	1.59	1.77	1.35
Aug.	.59	1.33	6.93	2.18	7.52	3.05	4.69	2.20	4.21	1.70
Sept.	2.56	3.18	7.24	3.64	7.44	4.35	5.12	3.67	5.51	3.05
Oct.	.59	1.40	1.42	2.15	1.97	2.07	1.57	2.56	1.73	1.66
Nov.	0	.68	.20	.97	.20	1.06	.20	1.16	.20	.97
Dec.	0	.50	0	.72	1.38	.70	.75	.91	.63	.86
Yearly	6.50	14.76	19.92	19.48	30.71	20.48	20.66	20.59	17.40	17.84

Month	Nv. Laredo (IB&WC), Tamaulipas		Nuevo Laredo (Sur), Tamaulipas		Nuevo Laredo Km. 26 SSW, Tamaulipas		Rancho Las Espuelas, Tamaulipas		San Ignacio, Tamaulipas	
	1978	Average	1978	Average	1978	Average	1978	Average	1978	Average
Jan.	0.31	0.65	0.31	0.46	0.75	0.71	0.39	0.72	0.20	0.57
Feb.	.31	.91	.16	.21	.20	1.03	.51	.93	.35	.92
Mar.	T	.43	T	.29	0	.43	0	1.04	0	.37
Apr.	.08	1.25	.08	2.07	0	1.62	.51	1.14	.39	1.29
May	1.65	2.83	1.57	4.18	1.57	2.68	2.01	3.62	.98	2.68
June	2.24	2.62	2.40	1.74	3.74	2.24	1.30	2.46	1.18	2.13
July	1.14	1.41	.75	3.89	2.80	1.96	.51	3.36	2.72	1.41
Aug.	4.25	2.44	3.43	1.64	3.11	2.42	4.69	1.82	4.72	2.46
Sept.	5.47	3.54	4.57	3.03	2.36	3.65	8.50	5.26	2.68	3.96
Oct.	1.42	2.06	1.61	3.24	1.22	2.22	5.91	2.92	3.94	2.78
Nov.	.16	.99	.20	.87		1.07	.39	1.09	.20	1.04
Dec.	.71	.73		.32	.79	.67	1.61	.88	1.18	.73
Yearly	17.74	19.86		21.94		20.70	26.33	25.24	18.54	20.34

Month	El Treinta Coahuila		Sabinas, Coahuila		Cuatro Cienegas, Coahuila		Ocampo, Coahuila			
	1978	Average	1978	Average	1978	Average	1976	1977	1978	Average
Jan.	0	0.27	0.04	0.56	0	0.30	0.31	0.24	0	0.33
Feb.	0	.46	.31	.69	0	.36	0	0	0	.26
Mar.	0	.48	0	.37	0	.12	0	0	0	.18
Apr.	.12	1.30	.67	1.17	0	.31	.39	2.52	0	.70
May	4.41	2.51	2.76	2.44	.67	.79	.39	.94	.98	1.15
June	2.20	2.97	5.35	2.10	.83	.72	0	1.81		1.33
July	3.07	3.04	2.91	1.44	.91	.82	2.64	1.02		1.85
Aug.	2.28	1.94	2.36	2.15	5.04	1.14	.39	1.93		1.60
Sept.	7.56	4.28	11.81	3.55	4.02	1.52	2.68	2.80		2.29
Oct.	2.13	1.93	3.50	1.84	.43	.77	3.03	1.06		1.10
Nov.	3.74	.59	.47	.61	.08	.40	3.15	0		.46
Dec.	0	.29	.28	.51	.91	.45	2.60	0		.49
Yearly	25.51	20.06	30.46	17.43	12.89	7.70	15.58	12.32		~~14.74~~ 11.74

T Trace

RAINFALL ON THE RIO GRANDE WATERSHED IN MEXICO

In Inches

Month	San Buenaventura, Coahuila		Monclova, Coahuila		Progreso, Coahuila		Presa Carranza, Coahuila		Laguna de Salinillas, Nuevo Leon	
	1978	Average	1978	Average	1978	Average	1978	Average	1978	Average
Jan.	0.55	0.58	0.24	0.46	0.12	0.46	0.24	0.69	0.28	0.61
Feb.	0	.49	.08	.48	.20	.52	.08	.64	.20	.62
Mar.	0	.37	0	.30	0	.37	0	.48	0	.54
Apr.	0	.79	.08	.63	.28	1.11	0	1.19	.08	1.03
May	.51	1.44	1.57	1.43	1.02	2.05	3.07	2.09	2.13	2.18
June	.87	1.56	.83	1.38	2.68	1.67	2.80	1.78	5.31	1.85
July	1.06	1.61	2.68	1.71	2.05	1.12	4.25	1.09	4.09	1.06
Aug.	1.34	1.80	6.10	1.64	6.77	1.98	1.69	1.99	2.13	2.40
Sept.	1.65	2.41	9.41	3.04	8.31	3.15	7.76	3.09	9.76	3.51
Oct.	.79	1.33		1.25	.94	1.84	1.18	1.72	3.46	2.01
Nov.	.08	.57		.61	.24	.59	.24	.58	.28	.73
Dec.	0	.65		.57		.50	.31	.63	.39	.59
Yearly	6.85	13.60		13.50		15.36	21.62	15.97	28.11	17.13

Month	Candela, Coahuila		Lampazos, Nuevo Leon		Anahuac, Nuevo Leon		Rio Salado, Carr. 85, N. L.		Bustamante, Nuevo Leon	
	1978	Average	1978	Average	1978	Average	1978	Average	1978	Average
Jan.	0.51	0.28	0.55	0.59	0.39	0.69	0.43	0.48	0.43	0.56
Feb.	.04	.48	.28	.83	.16	.62	T	.78	.31	.83
Mar.	0	.15	.04	.51	0	.49	0	.40	0	.45
Apr.	.71	.60	.08	1.01	0	1.15	0	1.09	0	.95
May	.39	1.10	.75	2.26	2.95	2.23	1.34	2.27	1.06	1.41
June	1.89	1.77	1.50	2.79	3.54	1.88	2.05	2.89	0	3.25
July	3.07	2.97	2.72	2.17	.71	1.42	.39	2.06	5.98	2.20
Aug.	3.70	1.61	3.90	1.73	10.43	2.38	2.28	1.55		3.26
Sept.	8.98	3.91	14.41	5.74	6.02	3.40	6.89	4.88	13.66	6.30
Oct.	3.19	1.39	1.97	1.98	1.57	1.70	3.15	1.92	5.31	2.36
Nov.	.31	.53	.24	.71	.24	.66	.51	.79	.91	.90
Dec.	.12	.54	.35	.58		.72	.71	.62	.16	.61
Yearly	22.91	15.33	26.79	20.90		17.34	17.75	19.73		23.08

Month	Sabinas Hidalgo, Nuevo Leon		Garza Ayala, Nuevo Leon		Vallecillo, Nuevo Leon		Las Tortillas, Tamaulipas		Rancho Bonanza, Tamaulipas	
	1978	Average	1978	Average	1978	Average	1978	Average	1978	Average
Jan.	0.24	0.46	0	0.23		0.56	0.39	0.55	0.39	0.73
Feb.	.39	.84		.54		.82	.39	1.03	.59	.96
Mar.	0	.73		.60	0.08	.49	0	.54	0	.99
Apr.	.12	1.13		1.36	0	1.67	.39	1.35	.59	.60
May	1.54	2.31		1.14	.28	1.75	.75	2.99	2.01	3.14
June	2.09	4.24		1.84	2.60	3.17	5.71	3.35	2.52	2.51
July	.08	2.99		6.83	1.10	1.84	2.76	1.31	.51	3.83
Aug.	1.14	2.38	2.13	2.50	2.72	1.93	4.72	2.18	2.80	1.88
Sept.	12.13	7.30	10.35	5.66	10.24	4.68	7.01	4.47	6.42	4.59
Oct.	5.51	2.88	4.84	4.36		2.30	2.36	1.89	1.81	2.44
Nov.	.12	1.09	.35	3.23		.99	.35	1.18	.20	.88
Dec.	0	.54	.35	.37	.20	.65	.98	.80	1.69	.78
Yearly	23.36	26.89		28.66		20.85	25.81	21.64	19.53	23.33

Month	Rancho San Rafael, Bustamante, Tamps.		Rio Salado Riberena, Tamaulipas		Aniego 166, Tamaulipas		La Bandera, Tamaulipas		Nueva Cd. Guerrero, Tamaulipas	
	1978	Average	1978	Average	1978	Average	1978	Average	1978	Average
Jan.	0.20	0.62	T	0.53	0.55	0.75	0.51	0.72	0.47	0.90
Feb.	.20	1.22	.20	.93	.20	.95	.24	.82	.24	.87
Mar.	0	.57	0	.52	0	.54	0	.68	.04	.54
Apr.	.71	1.08	.47	1.08	1.06	1.07	1.02	1.38	1.14	1.21
May	.39	2.68	2.17	2.58	2.64	3.04	2.87	2.95	2.72	2.11
June	4.33	3.50	4.33	2.58	5.79	3.23	6.93	3.73	4.13	2.81
July	3.35	2.14	1.97	1.70	3.11	1.45	2.24	1.97	1.42	1.30
Aug.	5.12	3.05	3.58	2.55	2.87	2.46	2.24	2.41	5.51	2.21
Sept.	7.09	5.05	5.12	5.41	5.47	6.07	7.40	5.73	5.91	4.47
Oct.	1.57	3.48	1.97	2.18	4.17	2.09	3.66	2.01	3.23	2.18
Nov.	.47	1.30	.39	1.03	.47	1.14	.35	1.07	.31	1.04
Dec.	1.93	.66	1.57	.86	.94	.59	.91	.67	.94	.58
Yearly	25.36	25.35	21.77	21.95	27.27	23.38	28.37	24.14	26.06	20.22

T Trace

RAINFALL ON THE RIO GRANDE WATERSHED IN MEXICO

In Inches

Month	Hacienda El Alamo, Nuevo Leon		General Trevino, Nuevo Leon		Paras, Nuevo Leon		San Javier, Nuevo Leon		Cd. Mier, Km. 8 SW, Tamaulipas	
	1978	Average	1978	Average	1978	Average	1978	Average	1978	Average
Jan.	0.71	0.88	0.87	1.04	0.43	0.37	0.63	0.74	0.59	0.74
Feb.	0	.88	.35	.49	.04	.44	.28	.96	.24	1.03
Mar.	.24	.35	0	.14	0	.63	0	.66	0	.67
Apr.	.39	1.02	1.22	.73	.47	.67	1.06	1.63	1.10	1.32
May	1.61	2.00	4.02		3.78	1.48	4.06	3.52	3.82	2.88
June	1.34	3.77	1.54	1.52	2.48	2.82	6.22	3.72	7.05	3.36
July	1.81	2.93	.67	.53	.98	1.67	1.26	2.23	1.10	1.84
Aug.	3.90	3.16	1.65	1.65	2.32	1.79	3.23	3.12	2.40	2.83
Sept.	12.40	6.06	9.69	7.05	8.03	4.20	6.97	6.10	7.99	5.63
Oct.	3.27	3.03	3.11	2.27	4.92	2.64	2.44	2.41	2.68	2.61
Nov.	.75	1.10	.08	1.55	.35	.81	.51	1.15	.39	1.12
Dec.	.47	.66	.39	.69	.39	.40	.94	.69	.98	.68
Yearly	26.89	25.84	23.59		24.19	17.92	27.60	26.93	28.34	24.71

Month	Cd. Mier, Tamaulipas		Miguel Aleman, Tamaulipas		Parras, Coahuila		General Cepeda, Coahuila		Reata, Coahuila	
	1978	Average	1978	Average	1978	Average	1978	Average	1978	Average
Jan.	0.71	0.95	0.79	0.86	0.35	0.47	0.39	0.47	0.31	0.27
Feb.	.24	1.12	.20	.95	.20	.35	.08	.47	.12	.23
Mar.	0	.64	.04	.37	.43	.34	.04	.28	0	.27
Apr.	.87	1.30	1.10	1.68	.04	.27	0	.39	.16	.36
May	3.58	2.57	1.97	2.00	2.48	1.10	.55	.83	.31	.78
June	3.19	2.46	3.78	2.47	2.72	1.84	2.68	2.16	.47	1.02
July	.98	1.15	1.85	1.77	4.06	2.77	2.52	3.26	.16	1.12
Aug.	1.81	2.57	.35	2.22	4.72	3.11	4.21	3.11	1.57	1.57
Sept.	8.74	5.18	5.39	6.52	7.01	3.04	5.94	2.86	3.31	1.60
Oct.	1.97	2.21	2.28	1.79	.87	1.23	.83	1.25	2.17	.76
Nov.	.47	1.17	.43	.96	.04	.58	0	.50	.20	.52
Dec.	1.10	.67	.87	.59	.28	.76	.63	.55	T	.35
Yearly	23.66	21.99	19.05	22.18	23.20	15.86	17.87	16.13		8.85

Month	San Antonio de las Alazanas, Coahuila				Saltillo, Coahuila		Ramos Arizpe, Coahuila		Carbonera, Nuevo Leon	
	1977	1978	Average		1978	Average	1978	Average	1978	Average
Jan.	1.42	1.34	0.99		0.47	0.57	0.28	0.46	0.20	0.75
Feb.	0	.63	.74		.24	.55	.20	.37	.71	.66
Mar.	0	0	.46		.04	.40	0	.29	.55	.62
Apr.	1.38	3.27	1.02		.20	.79	.35	.46	.87	.87
May	.98	3.43	1.93		1.57	1.18	.94	.86	3.54	2.04
June	1.97	1.89	2.60		2.48	2.20	1.97	1.08	1.34	2.30
July	3.31	5.83	3.51		2.80	2.61	.79	1.39	3.62	3.01
Aug.	4.80	3.90	3.09		3.54	2.53	.94	1.34	2.28	3.25
Sept.	2.76	6.50	2.95		3.31	2.72	3.39	1.79	4.29	3.00
Oct.	1.10	1.97	1.84		1.02	1.25	.31	.74	2.72	1.65
Nov.	.24	0	1.00		.12	.82	.12	.49	.16	.94
Dec.	0	0	.85		.24	.64	.12	.51	.39	.95
Yearly	17.96	28.76	20.98		16.03	16.26	9.41	9.78	20.67	20.04

Month	Icamole, Nuevo Leon		Mina, Nuevo Leon		La Popa, Nuevo Leon		La Arena, Nuevo Leon		Cienega de Flores, Nuevo Leon	
	1978	Average	1978	Average	1978	Average	1978	Average	1978	Average
Jan.	0	0.24	0.24	0.43	0.24	0.42	0.59	0.71	1.77	1.29
Feb.	0	.26	.08	.40	0	.79	.51	.94	1.26	1.01
Mar.	0	.13	0	.10	0	.25	0	.64	T	1.08
Apr.	.31	.27	.31	.58	.16	.50	.55	1.08	.91	1.51
May	.24	.77	.12	.57	.31	.98		2.05	1.26	2.59
June	2.20	1.05	.47	1.62	.20	1.75	1.26	3.72	1.50	3.37
July	.55	.62	.04	1.23	0	1.30	1.58	4.05	2.17	2.36
Aug.	1.22	1.02	2.87	1.55	.71	1.94	2.83	4.13	7.91	4.47
Sept.	2.76	2.25	3.90	3.33	5.87	3.43	6.97	5.90	8.58	6.05
Oct.	.67	.89	.87	1.10		.77	3.54	3.20	3.98	2.74
Nov.	.31	.60	.55	.79		.72	.79	1.02	2.68	1.26
Dec.		.45	.04	.46		.64	.39	.48	.83	1.14
Yearly		8.55	9.49	12.16		13.49		27.92	32.85	28.87

T Trace

RAINFALL ON THE RIO GRANDE WATERSHED IN MEXICO

In Inches

	Hacienda Mamulique, Nuevo Leonn		Cola de Caballo, Nuevo Leon		Topo Chico, Nuevo Leon		Higueras, Nuevo Leon		Los Ramones, Nuevo Leon	
Month	1978	Average	1978	Average	1978	Average	1978	Average	1978	Average
Jan.	0.24	0.54	0.55		0.47	0.40	0.94	0.66	0.63	0.66
Feb.	0	.22	.79		.39	.55	.24	.58	.71	.75
Mar.	0	.25	.67		.12	.45	.12	.65	.04	.62
Apr.	.47	.84	2.36		.67	.96	.55	1.25	.16	1.55
May	1.42	1.02	3.46		1.02	1.36	1.02	1.93	1.18	2.60
June	2.52	2.65	2.91		1.89	2.39	1.57	2.73	.87	3.26
July	2.60	4.70	.75		.63	1.54	1.54	2.29	.63	1.98
Aug.	4.41	2.68	6.10		9.21	3.15	1.42	3.29	3.37	3.52
Sept.	12.52	6.44	29.57		10.00	4.77	5.63	4.89	19.96	5.79
Oct.	2.20	1.42	6.65		4.68	2.69	4.80	1.87	3.54	2.89
Nov.	.59	1.58	1.14		.59	.75	.94	.83	.67	.76
Dec.	.31	.59	.35		.16	.43	.39	.68	.63	.48
Yearly	27.28	22.93	55.30		29.83	19.44	19.16	21.65	32.33	24.84

	Cerro Prieto, Nuevo Leon		Los Herrera, (La Tableta), N. L.		Madero (Los Aldamas) Nuevo Leon		Rinconada, Nuevo Leon		Santa Catarina, Nuevo Leon	
Month	1978	Average	1978	Average	1978	Average	1978	Average	1978	Average
Jan.	0.75	0.37	0.98	0.58	0.75	0.97	0.95	0.29	0.98	0.64
Feb.	.75	.67	.24	.65	.91	.95	0	.27	.55	.43
Mar.	.39	.50	.16	.65	0	.90	0	.19	.35	.31
Apr.	.39	1.08	1.26	1.28	1.26	.74	0	.41	0	.62
May	3.58	4.45	.91	2.73	4.72	3.24	0	.53	.47	.89
June	2.20	3.67	3.07	2.72	4.92	4.74	2.36	1.13	.91	2.01
July	2.72	2.63	1.93	1.86	.98	2.29	.79	.58	.12	1.23
Aug.	3.03	3.01	2.87	2.77	1.22	5.07	.87	1.23	3.23	2.82
Sept.	10.16	5.39	12.91	5.13	7.20	6.40	7.72	1.97	10.67	4.28
Oct.	8.19	3.04	3.39	2.42	4.06	2.29	1.10	.86	2.36	1.72
Nov.	.20	.61	.20	.68	.24	.64	0	.39	.43	.56
Dec.	.51	.41	.24	.47	.20	.55	0	.32	.28	.50
Yearly	32.87	25.83	28.16	21.94	26.46	28.78	13.79	8.17	20.35	15.99

	Monterrey, Nuevo Leon		Apodaca, Nuevo Leon		Agua Blanca Canoas, Nuevo Leon		Pajonal, Nuevo Leon		Cadereyta, Nuevo Leon	
Month	1978	Average	1978	Average	1978	Average	1978	Average	1978	Average
Jan.	0.39	0.60	0.59	0.59	0	0.68	0.79	0.54	0.43	0.72
Feb.	.47	.69	.47	.86	0	.44	.31	.59	.87	.92
Mar.	0	.71	0	.55	.91	.34	.16	.23	.55	1.14
Apr.	.75	1.11	1.38	1.08	1.06	.68	2.60	.75	1.69	1.49
May	1.73	1.56	.31	1.80	2.40	1.46	1.61	1.70	3.31	2.47
June	1.77	2.81	.98	2.91		2.46	4.41	2.53	1.85	3.57
July	.75	2.45	.47	2.41		2.68	2.80	2.43	.94	2.60
Aug.	9.33	3.25	4.02	3.62		3.31	3.62	3.98	2.36	3.54
Sept.	13.11	6.07	9.76	6.26		4.59	5.91	4.85	9.09	6.41
Oct.	5.87	3.23	5.59	2.39		2.12	4.96	2.62	5.83	3.33
Nov.	.59	1.22	1.50	.92		.92	.83	.50	1.14	1.22
Dec.	.20	.68	.16	.55		.55	.31	.53	.35	.70
Yearly	34.96	24.38	25.23	23.94		20.23	28.31	20.65	28.41	27.61

	La Cruz, Nuevo Leon		Tunel San Francisco, Nuevo Leon		Las Comitas, Nuevo Leon		Presa La Boca, Nuevo Leon		Las Enramadas, Nuevo Leon	
Month	1978	Average	1978	Average	1978	Average	1978	Average	1978	Average
Jan.	0	0.65	1.26	0.91	0.59	0.32	0.71	0.88	0.75	0.85
Feb.	0	.45	.75	1.23	.12	.38	.59	.99	.39	.70
Mar.	.35	.26	.83	1.54	0	.25	.16	1.10	0	.74
Apr.	2.48	.69	2.72	2.06	1.26	.73	1.77	1.69	.87	1.82
May	.79	1.37	4.53	3.07	.63	.97	4.61	2.63	1.22	2.84
June	2.64	2.42	4.76	6.89	1.57	2.48	5.28	5.67	.98	3.41
July	2.32	3.04	1.06	4.15	.47	1.86	1.22	3.80	2.40	2.37
Aug.	3.66	3.73	8.66	7.61	4.37	3.36	15.55	6.42	3.43	3.77
Sept.	45.66	6.60	27.68	12.06	5.87	4.83	23.35	9.65	21.26	6.66
Oct.	4.80	2.32	10.59	5.93	3.07	1.85	8.58	5.08	5.83	2.72
Nov.	0	.87	2.24	1.93	.28	.54	.75	1.41	.28	.80
Dec.	.59	.36	.43	.92	.20	.36	.35	.84	.31	.71
Yearly	63.29	22.76	65.51	48.30	18.43	17.91	62.92	40.16	37.72	27.39

RAINFALL ON THE RIO GRANDE WATERSHED IN MEXICO

In Inches

Month	Adjuntas, Nuevo Leon		Villa Allende, Nuevo Leon		San Juan, Nuevo Leon		Laguna de Sanchez, Nuevo Leon		Cerritos, Nuevo Leon	
	1978	Average	1978	Average	1978	Average	1978	Average	1978	Average
Jan.	1.18	0.47	1.30	0.96	1.02	0.50	1.14	0.64	0.98	0.56
Feb.	.63	.56	1.65	1.28		.93	1.10	.61	.47	.98
Mar.	.59	.44	.47	1.31	0	.70	0	.44	.47	.48
Apr.	1.89	1.28	1.30	2.47	2.99	1.98	2.20	1.23	.79	.97
May	3.27	3.00	2.91	3.60	2.91	2.49	.43	1.87	4.65	3.43
June	4.41	8.37	1.57	5.24	2.64	3.15	1.26	3.47	3.70	7.42
July	2.68	5.78	3.11	3.62	3.03	2.27	2.83	2.66	.75	6.89
Aug.	7.68	5.65	8.23	5.73	2.64	3.66	5.98	4.49	10.31	5.78
Sept.	29.13	13.40	31.42	9.28	13.27	5.79	30.20	6.52	19.92	12.64
Oct.	6.54	4.73	7.24	5.55	6.22	3.25	.71	2.66	7.64	4.47
Nov.	.63	.98	1.54	1.68	1.10	1.00	0	.65	1.30	.65
Dec.	.24	.41	.87	.93	.79	.55	.31	.58	.47	.31
Yearly	58.87	45.07	61.61	41.65		26.27	46.16	25.82	51.45	44.58

Month	Casillas, Nuevo Leon		Cienega del Toro, Nuevo Leon		Potrero Redondo, Nuevo Leon		Mimbres, Nuevo Leon		Rusio, Nuevo Leon	
	1978	Average	1978	Average	1978	Average	1978	Average	1978	Average
Jan.	0.35	0.51	0.47	0.88	1.26	0.88	0.51	1.28	0.12	0.67
Feb.	.24	.72	.75	.45	1.50	1.45	.55	1.25	1.14	.64
Mar.	.39	.63	.63	.83	.47	1.16	.24	1.20	.24	.52
Apr.	.71	.83	2.83	1.38	3.15	2.43	1.81	1.53	1.26	1.10
May	.75	1.92	3.82	2.42	3.70	3.81	3.03	2.24	1.22	1.83
June	1.02	3.29	1.54	2.39	3.74	7.76	2.64	2.92	1.57	2.00
July	2.09	2.49	2.83	3.21	5.67	5.71	3.07	3.04	.39	1.20
Aug.	4.61	3.00	3.86	2.91	6.97	7.84	4.33	3.54	2.17	1.39
Sept.	13.23	4.77	9.06	3.87	30.75	13.25	10.79	4.26	4.21	1.88
Oct.	2.76	2.33	2.09	2.12	7.32	5.19	2.36	1.97	.98	1.20
Nov.	0	.67	1.26	.91	.16	3.39	.55	1.23	.28	.72
Dec.	.12	.53	0	.62	.39	.83	0	1.18	.08	.77
Yearly	26.27	21.69	29.14	21.99	65.08	53.70	29.88	25.64	13.66	13.92

Month	Rayones, Nuevo Leon		Potosi, Nuevo Leon		Galeana, Nuevo Leon		Iturbide, Nuevo Leon		Cabezones, Nuevo Leon	
	1978	Average	1978	Average	1978	Average	1978	Average	1978	Average
Jan.	0.83	0.33	0.24	0.88	0.35	0.20	0.31	0.54	0.87	0.78
Feb.	.24	.41	.39	.70	.39	.49	.71	.65	.75	.90
Mar.	.67	.31	0	.38	.43	.37	.91	.60	1.10	1.24
Apr.	1.02	1.02	.55	1.27	1.18	1.10	2.60	1.17	1.34	2.42
May	.75	1.77	1.61	1.58	3.03	1.53	2.17	1.96	5.28	3.80
June	1.22	2.10	0	1.31	1.26	1.83	1.85	3.51	2.68	4.52
July	2.68	1.16	1.06	1.44	2.91	1.70	2.40	2.67	2.60	3.48
Aug.	4.80	2.80	1.50	1.64	2.95	2.51	4.69	4.16	6.54	5.51
Sept.	11.65	3.41	3.27	1.83	11.26	3.22	17.95	6.07	25.20	9.38
Oct.	2.24	1.55	.16	1.30	2.24	1.30	2.99	2.51	10.16	3.82
Nov.	.04	.42	.08	1.34	.08	.29	.20	.56	.55	1.06
Dec.	.20	.32	.39	1.75	.35	.44	.47	.48	.47	.68
Yearly	26.34	15.60	9.25	15.42	26.43	14.98	37.25	24.88	57.24	37.59

Month	Linares, Nuevo Leon		Montemorelos, Nuevo Leon		El Realito, Nuevo Leon		San Rafael, Nuevo Leon		El Cuchillo, Nuevo Leon	
	1978	Average	1978	Average	1978	Average	1978	Average	1978	Average
Jan.	0.91	0.88	0.71	0.77	0.79	0.64	0.87	0.79	1.46	0.63
Feb.	.71	.86	.79	.98	.12	.57	0	.88	.51	.55
Mar.	.24	1.07	1.89	1.17	0	.64	.47	.66	.04	.50
Apr.	.83	2.27	.94	2.16	1.85	1.19	1.46	.85	1.14	1.28
May	5.83	3.68	1.97	3.24	1.38	2.37	2.72	1.68	3.70	2.28
June	4.21	3.85	4.17	4.09	.67	2.66	0	1.96	1.50	2.56
July	.71	2.72	1.14	2.28	.71	3.00	2.36	2.60	1.50	1.96
Aug.	1.50	3.77	2.83	4.32	2.64	3.79	2.01	2.57	3.15	2.89
Sept.	17.56	6.60	26.06	6.46	13.15	7.51	4.49	2.49	15.39	4.69
Oct.	14.25	3.53	7.91	4.02	3.86	2.17	3.58	1.50	2.09	1.99
Nov.	.63	1.16	.43	1.59	.08	.57	0	.93	.16	.56
Dec.	.91	1.01	.35	.85	.20	.49	.35	.80	.35	.46
Yearly	48.29	31.40	49.19	31.93	25.45	25.60	18.31	17.71	30.99	20.35

RAINFALL ON THE RIO GRANDE WATERSHED IN MEXICO

In Inches

Month	Gral. Bravo, Nuevo Leon		Cerralvo, Nuevo Leon		Comales, Tamaulipas		Camargo, Tamaulipas		Valadeces, Tamaulipas	
	1978	Average	1978	Average	1978	Average	1978	Average	1978	Average
Jan.	1.34	0.75	0.51	0.67	1.38	0.85	1.02	0.97	1.97	1.19
Feb.	.55	.55	.51	.62	.12	.73	.28	.89	.08	.88
Mar.	.04	.56	0	.53	0	.64	0	.52	0	.53
Apr.	1.89	1.44	.83	1.80	1.22	1.47	1.02	1.62	.31	1.54
May	4.57	2.89	2.36	2.99	2.17	2.00	3.54	2.19	1.18	2.64
June	1.81	2.67	1.77	3.22	1.14	2.12	.47	2.35	1.14	3.20
July	.24	2.23	1.14	1.85	1.57	1.36	.43	1.48	.59	1.76
Aug.	.91	2.69	4.29	3.45	1.18	2.69	2.28	2.17	.71	2.50
Sept.	9.49	4.54	9.57	5.43	6.22	4.33	5.47	4.96	8.03	5.14
Oct.	2.87	2.06	4.06	2.68	2.95	2.34	3.50	2.02	3.66	2.50
Nov.	.28	.86	.43	.73	.55	.74	.31	1.07	.16	1.16
Dec.	.87	.72	.28	.46	.67	.70	.67	.68	.39	.74
Yearly	24.86	21.96	25.75	24.43	19.17	19.97	18.99	20.92	18.22	23.78

Month	Bajo Rio San Juan, Tamps., No. 2-29		Cd. Diaz Ordaz, Tamaulipas		Reynosa Km. 22 SW, Tamaulipas		Bajo Rio San Juan, Tamps., No. 2-38		Bajo Rio San Juan, Tamps., No. 2-33	
	1978	Average	1978	Average	1978	Average	1978	Average	1978	Average
Jan.	3.54	1.35	2.56	0.97	3.54	1.18	3.15	1.29	3.66	1.37
Feb.	.12	.86	.08	.87	.39	.75	.31	.82	.20	.87
Mar.	0	.44	0	.52	0	.60	0	.46	0	.47
Apr.	.31	1.54	.31	1.56	.39	1.42	.55	1.34	.75	1.57
May	.98	3.22	.31	2.29	.79	2.41	1.30	3.34	.55	3.45
June	.79	2.72	.67	2.28	.79	2.87	1.18	3.16	1.10	2.93
July	2.17	1.65	1.26	1.37	1.97	2.17	3.07	2.07	3.62	2.15
Aug.	.63	2.78	1.26	2.12	1.97	2.48	2.17	3.36	1.50	3.04
Sept.	3.98	4.79	5.98	4.07	2.76	4.52	6.22	4.36	4.84	4.78
Oct.	4.72	2.65	2.99	2.65	3.35	2.13	4.72	2.01	3.86	2.52
Nov.	.31	.94	.39	.98	.24	1.11	.55	1.17	.35	1.03
Dec.	.75	.79	.71	.79	1.18	1.11	.75	.80	.87	.97
Yearly	18.30	23.73	16.52	20.47	17.37	22.75	23.97	24.18	21.30	25.15

Month	Arguelles, Tamaulipas		Presa Anzalduas, Tamaulipas		Reynosa, Tamaulipas		Bajo Rio San Juan, Tamps., No. 3-55		Bajo Rio San Juan, Tamps., No. 3-58	
	1978	Average	1978	Average	1978	Average	1978	Average	1978	Average
Jan.	3.15	1.22	4.21	0.86	3.07	1.10	3.15	1.78	2.40	1.52
Feb.	.39	1.06	.31	.51	.47	.86	.79	1.23	.51	1.10
Mar.	0	.51	.04	.52	.04	.69	0	.65	0	.63
Apr.	.39	1.42	1.61	1.51	.63	1.28	.71	2.23	1.10	1.80
May	.79	2.49	.79	2.25	1.81	2.17	.79	2.34	.87	2.31
June	.39	2.50	.71	2.42	1.38	2.24	1.65	3.55	1.57	3.05
July	1.57	1.74	.31	1.63	.24	1.50	.12	3.29	.16	3.37
Aug.	.79	1.86	.98	2.13	1.77	1.60	3.19	2.75	1.18	2.77
Sept.	3.54	4.18	3.62	3.84	5.79	3.62	7.91	4.64	9.53	5.15
Oct.	3.54	1.80	2.95	2.33	4.65	2.28	1.46	3.26	1.57	2.95
Nov.	.20	1.07	.16	.64	0	.91	.24	.87	0	1.05
Dec.	.79	1.06	.79	.66	1.02	.76	1.34	.79	.79	.82
Yearly	15.54	20.91	16.48	19.30	20.87	19.01	21.35	27.38	19.68	26.52

Month	Bajo Rio San Juan, Tamps., No. 3-60		Bajo Rio San Juan, Tamps., No. 3-47		Bajo Rio San Juan, Tamps., No. 3-63		Rio Bravo, Tamaulipas		Retamal, Tamaulipas	
	1978	Average	1978	Average	1978	Average	1978	Average	1978	Average
Jan.	2.24	1.40	2.36	1.79	2.64	1.56	5.31	1.30		0.98
Feb.	.83	1.13	.67	1.09	.16	1.25	.91	1.15	0.87	.90
Mar.	0	.61	.04	.56	0	.64	.04	.66	0	.66
Apr.	1.30	1.70	.79	1.82	1.26	1.46	.87	1.75	.91	1.52
May	.47	2.18	.55	3.10	.59	2.22	.67	2.22	.95	2.23
June	.39	3.26	1.22	3.63	.47	3.44	1.10	2.87	1.42	2.76
July	.43	2.49	.20	2.91	0	2.61	.75	2.36	.28	1.64
Aug.	.98	2.45	3.86	2.54	2.48	2.86	2.40	2.57	3.78	2.52
Sept.	8.03	4.80	8.35	5.16	10.94	5.27	9.13	5.08	7.60	3.56
Oct.	1.69	3.05	2.91	2.73	.63	2.50	2.09	2.87	6.30	2.68
Nov.	.20	1.07	.24	1.07	0	.86	.16	1.20	.08	1.22
Dec.	.71	.76	.98	.86	1.10	.70	1.54	.83	1.26	.89
Yearly	17.27	24.90	22.17	27.26	20.27	25.37	24.97	24.86		21.56

RAINFALL ON THE RIO GRANDE WATERSHED IN MEXICO

In Inches

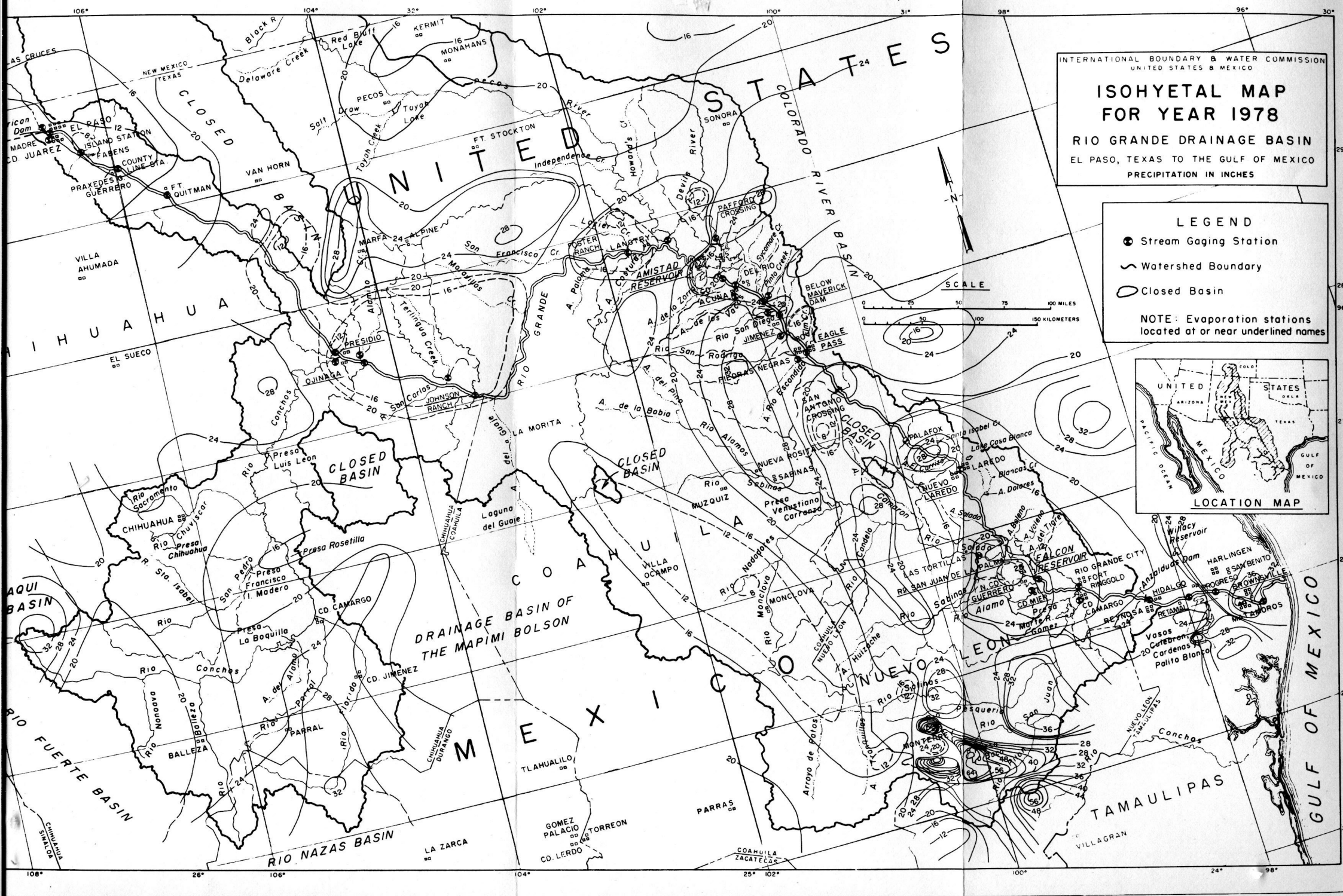
Month	Bajo Rio Bravo, Tamps., No. 3-15		Bajo Rio Bravo, Tamps., No. 4-16		Bajo Rio Bravo, Tamps., No. 3-14		Bajo Rio Bravo, Tamps., No. 3-17		Bajo Rio Bravo, Tamps., No. 4-8	
	1978	Average	1978	Average	1978	Average	1978	Average	1978	Average
Jan.	2.52	1.68	1.34	1.36	2.40	1.42	2.17	1.62	3.31	1.58
Feb.	.98	1.38	.87	1.14	.79	.94	.75	1.22	1.18	1.24
Mar.	0	.81	0	.72	0	.52	0	.68	0	.89
Apr.	1.69	2.27	.75	1.93	1.10	1.50	1.34	1.63	4.21	2.62
May	1.30	2.60	.39	2.50	.39	2.55	.43	2.53	5.87	3.07
June	2.95	4.00	0	3.70	2.52	3.03	1.26	3.07	.75	3.17
July	2.28	3.18	0	2.56	1.65	2.73	.47	2.97	.04	3.37
Aug.	5.00	3.17	1.46	3.65	2.76	2.57	3.66	3.34	1.65	4.00
Sept.	11.81	4.60	14.92	5.34	7.05	4.20	8.46	5.19	8.94	5.90
Oct.	2.28	2.98	2.80	2.62	2.99	2.64	1.89	2.69	2.01	2.96
Nov.	.79	1.35	.59	1.55	.43	.97	.16	1.31	.83	1.60
Dec.	2.17	1.19	.87	.98	1.93	.95	1.50	1.09	1.46	1.09
Yearly	33.77	29.21	23.99	28.05	24.01	24.02	22.09	27.34	30.25	31.49

Month	Bajo Rio Bravo, Tamps., No. 2-6		Bajo Rio Bravo, Tamps., No. 4-10		Valle Hermoso, Tamaulipas		Control, Tamaulipas		Bajo Rio Bravo, Tamps., No. 2-5	
	1978	Average	1978	Average	1978	Average	1978	Average	1978	Average
Jan.	3.31	2.12	2.13	1.44	1.77	1.15	2.68	1.29	2.68	1.86
Feb.	1.30	1.36	1.26	1.65	1.26	1.20	1.30	1.04	1.06	1.32
Mar.	0	.87	0	1.13	0	.70	0	.61	0	1.13
Apr.	3.31	1.81	2.60	2.14	2.83	1.98	1.73	1.64	2.87	1.96
May	.59	2.73	1.22	2.42	.16	2.53	.24	2.70	.08	2.38
June	2.01	3.03	1.57	3.28	2.20	3.19	1.54	3.07	3.66	3.47
July	.43	2.92	.43	2.98	0	2.14	4.29	1.78	.28	2.31
Aug.	1.54	3.14	3.94	3.00	2.76	2.31	5.83	3.07	.71	3.27
Sept.	6.14	4.94	15.20	5.94	12.01	5.56	7.17	5.14	8.11	5.14
Oct.	3.11	2.79	3.03	2.44	5.04	2.65	6.02	2.79	5.43	2.84
Nov.	.12	1.43	1.46	1.33	.71	1.47	.35	1.25	.51	1.42
Dec.	1.38	1.08	.94	.87	2.40	.96	1.54	.92	2.09	1.20
Yearly	23.24	28.22	33.78	28.62	31.14	25.84	32.69	25.30	27.48	28.30

Month	Bajo Rio Bravo, Tamps., No. 2-11		Bajo Rio Bravo, Tamps., No. 1-2		Bajo Rio Bravo, Tamps., No. 2-7		Bajo Rio Bravo, Tamps., No. 1-4		Bajo Rio Bravo, Tamps., No. 1-18	
	1978	Average	1978	Average	1978	Average	1978	Average	1978	Average
Jan.	2.05	1.56	2.68	1.69	1.85	1.48	3.07	1.85	2.76	1.58
Feb.	1.77	1.10	2.91	1.85	1.42	1.21	.98	1.18	1.73	1.30
Mar.	0	.66	0	.48	0	.71	0	.73	0	.44
Apr.	2.05	2.50	1.85	1.53	2.44	2.67	1.77	1.98	1.85	2.03
May	0	2.67	.28	2.94	.20	2.69	.16	2.43	.04	2.31
June	2.76	4.25	1.22	3.90	6.30	3.73	2.95	3.59	1.42	3.55
July	1.02	2.91	1.50	2.09	0	2.46	.47	1.85	.24	2.20
Aug.	3.15	3.67	5.47	3.64	1.81	3.64	2.83	3.22	3.07	3.26
Sept.	12.40	5.89	7.52	5.43	11.97	5.52	8.03	5.36	8.19	4.63
Oct.	2.84	3.02	3.35	3.06	5.71	2.71	3.35	2.79	4.65	3.57
Nov.	1.46	1.32	.20	1.36	1.30	1.54	.55	1.26	1.02	1.41
Dec.	2.56	1.27	2.13	.97	2.52	1.15	2.52	1.19	2.60	1.22
Yearly	32.06	30.82	29.11	28.94	35.52	29.51	26.68	27.43	27.57	27.50

Month	Bajo Rio Bravo, Tamps., No. 1-3		Bajo Rio Bravo, Tamps., No. 1-13		Bajo Rio Bravo, Tamps., No. 1-12		Matamoros, Tamaulipas			
	1978	Average	1978	Average	1978	Average	1978	Average		
Jan.	2.80	1.59	2.20	1.45	3.39	1.88	3.58	1.83		
Feb.	1.10	1.21	1.02	1.16	1.06	1.38	1.38	1.78		
Mar.	0	.50	0	.57	0	.53	T	.53		
Apr.	2.52	1.83	1.65	1.82	2.99	1.90	3.43	2.27		
May	0	2.34	0	1.67	0	2.74	.08	2.43		
June	1.73	3.41	1.54	3.61	2.64	3.33	1.50	3.93		
July	.47	2.04	.39	2.01	2.76	2.30	.79	2.15		
Aug.	.91	2.57	1.14	3.09	7.95	2.85	5.59	3.89		
Sept.	7.01	5.19	8.35	5.48	11.22	5.65	10.43	6.26		
Oct.	3.19	3.01	5.28	2.68	4.33	3.73	5.12	3.93		
Nov.	.43	1.53	.47	1.13	.59	1.37	.98	1.35		
Dec.	3.31	1.17	2.01	1.04	3.07	1.28	3.66	1.63		
Yearly	23.47	26.39	24.05	25.71	40.00	28.94	36.54	31.98		

T Trace


INTERNATIONAL BOUNDARY & WATER COMMISSION
UNITED STATES & MEXICO
ISOHYETAL MAP
FOR YEAR 1978
RIO GRANDE DRAINAGE BASIN
EL PASO, TEXAS TO THE GULF OF MEXICO
PRECIPITATION IN INCHES
LEGEND
Stream Gaging Station
Watershed Boundary
Closed Basin
NOTE: Evaporation stations located at or near underlined names
SCALE
0 25 50 75 100 MILES
0 50 100 150 KILOMETERS
LOCATION MAP
UNITED STATES
MEXICO
GULF OF MEXICO
PACIFIC OCEAN
CHIHUAHUA
COAHUILA
NUEVO LEON
TAMAULIPAS
DRAINAGE BASIN OF THE MAPIMI BOLSON
RIO NAZAS BASIN
RIO FUERTE BASIN
CLOSED BASIN
EL PASO
JUAREZ
FT. QUITMAN
VAN HORN
FT. STOCKTON
PECOS
MONAHANS
KERMIT
ALPINE
MARFA
PRESIDIO
OJINAGA
EAGLE PASS
PIEDRAS NEGRAS
ACUNA
DEL RIO
AMISTAD RESERVOIR
FALCON RESERVOIR
LAREDO
NUEVO LAREDO
MONCLOVA
MONTERREY
CD. CAMARGO
CD. JIMENEZ
CHIHUAHUA
RIO GRANDE CITY
HARLINGEN
BROWNSVILLE
MATAMOROS
RETAMAL
REYNOSA
HIDALGO
PROGRESO
SAN BENITO
FORT RINGGOLD
PALMITO
LAS TORTILLAS
SAN JUAN DE LA
CD. GUERRERO
CD. MIER
MORTE R. GOMEZ
VILLA OCAMPO
NUEVA ROSITA
SABINAS
MUZQUIZ
TLAHUALILO
GOMEZ PALACIO
TORREON
CD. LERDO
PARRAS
LA ZARCA
BALLEZA
PARRAL
CHIHUAHUA
SINALOA
COAHUILA
ZACATECAS
VILLAGRAN
EL SUECO
VILLA AHUMADA
PRAXEDES G. GUERRERO
CD. JUAREZ
EL PASO
ISLAND STATION
FABENS
COUNTY LINE STA.
MADRE
Black R.
Red Bluff Lake
Delaware Creek
Salt Draw
Toyah Creek
Toyah Lake
Independence Cr.
Howard's Draw
Devils River
Sonora
Pafford Crossing
Lozier Cr.
Foster Ranch
Lantry
San Francisco Cr.
Sycamore Cr.
Pinto Creek
Los Ojuelos Cr.
Alamito Cr.
Terlingua Creek
Conchos
Rio Grande
Rio Conchos
Rio Florido
Rio Parral
Rio Balleza
Rio Nonoava
Rio Chuvíscar
Rio Sacramento
Rio Sta. Isabel
Rio San Pedro
Rio Moctezuma
Rio Nadadores
Rio Sabinas
Rio Alamos
Rio San Rodrigo
Rio San Diego
Rio Escondido
Rio Salado
Rio Candela
Rio Huizache
Rio Monclova
Rio Sabinas
Rio Alamo
Rio San Juan
Rio Pesqueria
Rio Morte
Rio Gomez
Arroyo de Patos
Arroyo Colorado
Laguna del Guaje
Laguna Madre
Presa Chihuahua
Presa Rosetilla
Presa La Boquilla
Presa Francisco I. Madero
Presa Luis Leon
Presa Vertustiano Carranza
Presa Falcon
Presa Retamal
Presa Anzalduas Dam
Presa Wilacy Reservoir
Presa Vasos Cortedron
Presa Cardenas
Presa Palito Blanco
Presa Mortero
Presa Alamo
Presa Gomez
Presa Huizache
Presa Candela
Presa Salado
Presa Condon
Presa Nadadores
Presa Moctezuma
Presa Sabinas
Presa Alamos
Presa Escondido
Presa Rio Grande
Presa Rio Conchos
Presa Rio Florido
Presa Rio Parral
Presa Rio Balleza
Presa Rio Nonoava
Presa Rio Chuvíscar
Presa Rio Sacramento
Presa Rio Sta. Isabel
Presa Rio San Pedro
Presa Rio Moctezuma
Presa Rio Nadadores
Presa Rio Sabinas
Presa Rio Alamos
Presa Rio San Rodrigo
Presa Rio San Diego
Presa Rio Escondido
Presa Rio Salado
Presa Rio Candela
Presa Rio Huizache
Presa Rio Monclova
Presa Rio Sabinas
Presa Rio Alamo
Presa Rio San Juan
Presa Rio Pesqueria
Presa Rio Morte
Presa Rio Gomez
Presa Arroyo de Patos
Presa Arroyo Colorado
Presa Laguna del Guaje
Presa Laguna Madre

AVERAGE RAINFALL ON SUBDIVISIONS OF THE RIO GRANDE WATERSHED

With Averages for the 108 Years 1871-1978, 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.

	El Paso to Fort Quitman (2,677 Square Miles)		Fort Quitman to Above Rio Conchos (3,022 Square Miles)		* Above Rio Conchos to Johnson Ranch (3,816 Square Miles)		Johnson Ranch to Foster Ranch (12,982 Square Miles)	
Month	1978	Period Average	1978	Period Average	1978	Period Average	1978	Period Average
Jan.	0.32	0.44	0.82	0.39	0.23	.34	0.31	0.48
Feb.	.49	.37	.52	.27	.19	.28	.23	.37
Mar.	.10	.33	.09	.25	.09	.20	.09	.40
Apr.	.13	.26	.55	.34	.12	.39	.27	.79
May	.51	.40	1.39	.60	1.16	.77	1.61	1.50
June	.86	.80	.93	1.19	1.97	1.12	1.85	1.70
July	.71	2.29	1.41	2.96	1.96	1.89	1.94	1.89
Aug.	1.43	1.89	3.21	2.40	3.90	1.89	2.08	2.09
Sept.	5.12	1.44	8.38	1.99	5.01	1.59	4.25	2.22
Oct.	1.65	.92	1.32	1.03	2.31	.85	.86	1.21
Nov.	.77	.43	1.01	.41	.87	.34	2.78	.60
Dec.	.25	.58	.41	.53	.42	.41	.51	.54
Yearly	12.34	10.15	20.04	12.36	18.23	10.07	16.78	13.79

	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)	
Month	1978	Period Average	1978	Period Average	1978	Period Average	1978	Period Average
Jan.	0.31	0.68	0.05	0.51	0.33	0.67	0.11	0.74
Feb.	.37	.86	.17	.64	.94	.72	.36	.90
Mar.	.11	.76	.18	.76	.35	1.06	.16	.98
Apr.	.89	1.85	1.10	1.34	1.36	1.79	.81	1.71
May	2.33	1.81	2.26	1.97	2.57	2.59	3.58	2.91
June	3.28	2.43	2.40	2.18	3.41	2.63	2.84	2.47
July	1.22	1.88	1.75	1.28	2.03	1.82	1.62	1.92
Aug.	2.30	1.99	2.33	1.65	3.02	2.15	2.17	1.98
Sept.	4.56	2.52	4.60	2.39	3.61	3.00	4.36	3.10
Oct.	1.39	1.85	1.17	1.47	1.26	2.21	1.16	2.09
Nov.	2.59	.94	3.15	.76	3.07	1.51	4.66	1.04
Dec.	.30	.72	.70	.62	.25	.97	.72	.86
Yearly	19.65	18.29	19.86	15.57	22.20	21.12	22.55	20.70

	! 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)	
Month	1978	Period Average	1978	Period Average	1978	Period Average	1978	Period Average
Jan.	0.08	0.72	0.48	0.75	0.56	0.89	3.35	1.27
Feb.	.16	.80	.24	.79	.24	.83	.67	1.08
Mar.	0	.91	0	.79	.01	.93	.02	1.03
Apr.	.19	1.58	.54	1.39	1.04	1.20	1.27	1.38
May	3.62	3.13	1.65	3.18	1.50	2.41	.63	2.77
June	1.62	2.42	2.85	1.99	2.15	2.13	1.77	2.55
July	2.87	1.49	1.29	2.10	.51	1.91	1.02	1.80
Aug.	2.55	2.30	3.35	1.88	1.97	2.16	2.45	2.33
Sept.	5.76	3.07	5.16	3.13	5.29	3.62	5.90	4.42
Oct.	1.25	1.90	1.46	1.66	1.32	1.96	3.72	2.57
Nov.	.31	.95	.20	1.53	.26	.79	.31	1.37
Dec.	.44	.97	1.54	.83	.78	.66	1.75	1.23
Yearly	18.85	20.24	18.76	20.02	15.63	19.49	22.86	23.80

* 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 1978. 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	LATITUDE	LONGITUDE	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 Raft	C	29° 27'	101° 03'	¢¢	#Dec. 1968	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.
Apache Ranch	C	27° 56'	99° 56'	500	# 1953	Eagle Pass - Laredo	Ranch Foreman
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.
Black Gap Game Refuge Headquarters	S	29° 34'	102° 57'	2,325	# 1952	Johnson Ranch - Foster Ranch	Texas Parks & Wildlife
Black Gap Game Refuge - Shirley House	S	29° 48'	103° 03'	2,592	Mar. 1977	Johnson Ranch - Foster Ranch	C. A. Haynes
Bloys Camp	S	30° 33'	104° 07'	5,650	# 1941	Alamito Creek	George Knight
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
Bullis Gap Ranch Headquarters	S	29° 49'	102° 35'	2,525	Apr. 1978	Johnson Ranch - Foster Ranch	Blackie McRoberts
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
CCWCID #19 (Adams Gardens)	S	26° 10'	97° 47'	50	1952	Lower Rio Grande Valley	CCWCID #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.
Corralitos 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	Foster Ranch - Amistad Dam	I. B. & W. C.
Cox, C. F. Ranch Headquarters	V	30° 09'	102° 46'	3,500	1977	Johnson Ranch - Foster Ranch	C. F. Cox
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	Pecos River below 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° 54'	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. Senoenfeldt
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

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	LATITUDE	LONGITUDE	ELEV. (FT.)	RECORD BEGAN	WATERSHED SUBDIVISION	OBSERVER
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	H. K. Fawcett
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	Alamito 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.
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
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.
Hardgrave, E. W. Ranch	S	30° 18'	102° 09'	2,650	#Apr. 1952	Johnson Ranch - Foster Ranch	Jack Hardgrave
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
Hoffman Ranch	S	30° 38'	103° 51'	4,650	#June 1955	Pecos River above Sheffield	Dr. A.J. Hoffman
Huisache Ranch	C	26° 57'	99° 21'	383	Aug. 1953	Laredo - Falcon Dam	I. B. & W. C.
Hutto, Calvin Ranch	S	30° 04'	101° 49'	1,990	July 1975	Pecos River below Sheffield	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 Scales
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.
Jones Headquarters	S	29° 56'	102° 54'	3,520	May 1978	Johnson Ranch - Foster Ranch	Mike Woods
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 Farm	S	29° 33'	103° 59'	3,854	# 1943	Alamito Creek	John Rice
La Nutria Station	C	30° 14'	104° 43'	2,880	#Mar. 1967	Fort Quitman - Above Rio Conchos	I. B. & W. C.
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.
Lewis, Billie C., Jr. Ranch	S	29° 33'	100° 40'	1,400	# 1964	Amistad Dam - Eagle Pass	Billie C. Lewis, Jr.
Line Store	S	30° 40'	100° 57'	2,400	#Oct. 1962	Devils River	Claud Ward
Loma Vista Ranch	S	30° 13'	103° 47'	5,050	# 1941	Alamito Creek	R. W. Eply
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.

S Standard C Cumulative R Recording V Visual # Some months missing

LOCATION OF RAINFALL STATIONS ON THE RIO GRANDE WATERSHED

In the United States

NAME OF STATION	TYPE GAGE	LATITUDE	LONGITUDE	ELEV. (FT.)	RECORD BEGAN	WATERSHED SUBDIVISION	OBSERVER
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.E. McGonagill
McGonagill Ranch - East Mill	V	30° 21'	102° 55'	4,050	#May 1952	Johnson Ranch - Foster Ranch	W.E. McGonagill
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	H. T. Miers
Miller, Eugene Ranch	S	30° 25'	101° 10'	2,150	July 1975	Devils River	I. B. & W. C.
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'		#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	Fannin G. Love
North Fork San Pedro	C	29° 31'	100° 53'	1,144	June 1969	Devils River	I. B. & W. C.
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	National Park Service
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	Mrs. Ed Hamilton
Potter, A. M. Ranch	S	29° 46'	103° 25'	3,440	# 1952	Johnson Ranch - Foster Ranch	A. M. Potter
Presidio (IB&WC Gage)	C	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.
Shannon, Bill Ranch	C	29° 57'	104° 40'	2,680	#July 1956	Fort Quitman - Above Rio Conchos	Bill Shannon
Sheep Pasture	S	29° 33'	102° 55'	2,210	#May 1965	Johnson Ranch - Foster Ranch	Texas Parks and Wildlife
Slaughter Ranch	V	29° 57'	102° 41'	2,560	# 1965	Johnson Ranch - Foster Ranch	Mike Wood
Slaughter Ranch - Cow Creek	V	29° 56'	102° 39'	2,600	# 1949	Johnson Ranch - Foster Ranch	Mike Wood
Slaughter Ranch - Keith Mill	V	29° 58'	102° 38'	2,610	Sep. 1976	Johnson Ranch - Foster Ranch	Mike Wood
Slaughter Ranch - Martin Pens	V	29° 55'	102° 44'	2,820	Sep. 1976	Johnson Ranch - Foster Ranch	Mike Wood
Slaughter Ranch - Ten Section	V	29° 59'	102° 40'	2,750	Sep. 1976	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.

S Standard R Recording C Cumulative # Some months missing

LOCATION OF RAINFALL STATIONS ON THE RIO GRANDE WATERSHED

In the United States

NAME OF STATION	TYPE GAGE	LATITUDE	LONGITUDE	ELEV. (FT.)	RECORD BEGAN	WATERSHED SUBDIVISION	OBSERVER
Villa de la Mina	S	29° 19'	103° 40'	3,274	Sep. 1974	Terlingua Creek	Glenn Pepper
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.
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
Wright, Ernest Ranch	S	29° 33'	103° 32'	3,350	#July 1977	Terlingua Creek	E. Wright
Wuensche Farm	S	28° 24'	100° 19'	670	# 1952	Eagle Pass - Laredo	I. B. & W. C.
Yarborough Ranch	S	30° 06'	103° 36'	4,550	# 1966	Johnson Ranch - Foster Ranch	F. L. Hillhouse
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 # Some months missing

LOCATION OF RAINFALL STATIONS ON THE RIO GRANDE WATERSHED

In Mexico

NAME OF STATION	TYPE GAGE	LATITUDE	LONGITUDE	ELEV. (FT.)	RECORD BEGAN	WATERSHED SUBDIVISION	OBSERVER
A. Blanca Canoas, Nuevo Leon	S	25° 32'	100° 30'	!	# 1958	Rio San Juan	S. A. R. H.
Adjuntas, Nuevo Leon	S	25° 18'	100° 08'	!	# 1958	Rio San Juan	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'	!	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'	!	1964	Lower Rio Grande Valley	S. A. R. H.
No. 1-3	S	25° 50'	97° 42'	!	1964	Lower Rio Grande Valley	S. A. R. H.
No. 1-4	S	25° 51'	97° 45'	!	1964	Lower Rio Grande Valley	S. A. R. H.
No. 1-12	S	25° 56'	97° 38'	!	1964	Lower Rio Grande Valley	S. A. R. H.
No. 1-13	S	25° 44'	97° 40'	!	1964	Lower Rio Grande Valley	S. A. R. H.
No. 1-18	S	25° 49'	97° 42'	!	1964	Lower Rio Grande Valley	S. A. R. H.
No. 2-5	S	25° 48'	97° 49'	!	1964	Lower Rio Grande Valley	S. A. R. H.
No. 2-6	S	25° 44'	97° 53'	!	1964	Lower Rio Grande Valley	S. A. R. H.
No. 2-7	S	25° 39'	97° 42'	!	1964	Lower Rio Grande Valley	S. A. R. H.
No. 4-8	S	25° 40'	97° 55'	!	1964	Lower Rio Grande Valley	S. A. R. H.
No. 4-10	S	25° 36'	97° 52'	!	1964	Lower Rio Grande Valley	S. A. R. H.
No. 2-11	S	25° 35'	97° 46'	!	# 1964	Lower Rio Grande Valley	S. A. R. H.
No. 3-14	S	25° 56'	97° 59'	!	1964	Lower Rio Grande Valley	S. A. R. H.
No. 3-15	S	25° 46'	98° 01'	!	1964	Lower Rio Grande Valley	S. A. R. H.
No. 3-17	S	25° 49'	97° 58'	!	1964	Lower Rio Grande Valley	S. A. R. H.
No. 4-16	S	25° 35'	98° 00'	!	1964	Lower Rio Grande Valley	S. A. R. H.
Bajo Rio San Juan, Tamps.							
No. 2-29	S	26° 10'	98° 38'	!	1964	Lower Rio Grande Valley	S. A. R. H.
No. 2-33	S	26° 10'	98° 28'	!	1964	Lower Rio Grande Valley	S. A. R. H.
No. 2-38	S	26° 06'	98° 34'	!	1964	Lower Rio Grande Valley	S. A. R. H.
No. 3-47	S	25° 58'	98° 07'	!	1964	Lower Rio Grande Valley	S. A. R. H.
No. 3-55	S	25° 52'	98° 12'	!	1964	Lower Rio Grande Valley	S. A. R. H.
No. 3-58	S	25° 50'	98° 11'	!	1964	Lower Rio Grande Valley	S. A. R. H.
No. 3-60	S	25° 46'	98° 10'	!	1964	Lower Rio Grande Valley	S. A. R. H.
No. 3-63	S	25° 41'	98° 06'	!	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'	!	# 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'	!	# 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'	!	# 1970	Rio Salado	S. A. R. H.
Carbonera, Nuevo Leon	S	24° 49'	100° 47'	!	# 1958	Rio San Juan	S. A. R. H.
Carichic, Chihuahua	S	27° 55'	107° 04'		#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'	!	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'	!	# 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.
Chihuahua, Chihuahua	S	28° 38'	106° 04'	4,690	# 1900	Rio Conchos	Meteor. Service of Mexico
Chupadero, Coahuila	S	29° 05'	100° 51'	980	# 1961	Rio San Diego	F. Jakubesch
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'	!	1978	Rio San Juan	S. A. R. H.
Colombia, Nuevo Leon	C	27° 42'	99° 46'	!	# 1964	Eagle Pass-Laredo	I. B. & W. C.
Colonia Anahuac, Chihuahua	S	28° 29'	106° 44'	6,550	1961	Rio Conchos	Celulosa de 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.

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	LATITUDE	LONGITUDE	ELEV. (FT.)	RECORD BEGAN	WATERSHED SUBDIVISION	OBSERVER
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.
El Cuchillo, Nuevo Leon	S	25° 43'	99° 16'	590	#June 1938	Rio San Juan	S. A. R. H.
El Cuervo, Chihuahua	S	30° 15'	105° 08'	3,840	# 1961	Adjacent to Ft. Quitman Above Rio Conchos	Meteor. Service of Chihuahua
El Maguey, Chihuahua	S	27° 37'	106° 09'	4,380	#July 1955	Rio Conchos	Meteor. Service of Chihuahua
El Realito, Nuevo Leon	S	25° 18'	99° 21'	!	# 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'	!	July 1955	Rio Conchos	Meteor. Service of Chihuahua
El Sueño, Chihuahua	S	29° 54'	106° 24'	5,090	# 1958	Adjacent to Rio Conchos	Meteor. Service of Chihuahua
El Treinta	S	28° 19'	101° 24'	!	1961	Rio Salado	I. B. & W. C.
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'	!	#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.
Estacion Rosario, Durango	S	26° 30'	105° 38'	!	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'	!	# 1968	Rio Salado	S. A. R. H.
General Trevino, Nv. Leon	S	26° 13'	99° 29'	!	#Oct. 1976	Rio Alamo	S. A. R. H.
Gral. Bravo, Nuevo Leon	S	25° 48'	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.
Guadalupe, Chihuahua	S	31° 23'	106° 06'	3,650	1958	El Paso - Ft. Quitman	I. B. & W. C.
Guerrero, Coahuila	S	28° 19'	100° 23'	690	#June 1958	Eagle Pass - Laredo	I. B. & W. C.
Hacienda El Alamo, N.Leon	S	26° 29'	99° 46'	!	# 1968	Rio Alamo	I. B. & W. C.
Hacienda Mamulique, N.Leon	S	26° 07'	100° 14'	!	#Sept.1973	Rio San Juan	S. A. R. H.
Hacienda San Miguel, Coahuila	S	29° 13'	101° 30'	!	# 1961	Foster Ranch - Amistad Dam	I. B. & W. C.
Higueras, Nuevo Leon	S	25° 58'	100° 01'	1,640	#Sept.1906	Rio San Juan	Meteor. Service of Mexico
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'	!	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.
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'	!	Feb. 1977	Amistad Dam - Eagle Pass	I. B. & W. C.
La Arena, Nuevo Leon	S	25° 46'	100° 01'	!	# 1968	Rio San Juan	S. A. R. H.
La Bandera, Tamaulipas	C	26° 42'	99° 22'	!	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'	!	# 1958	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 Trasquila, Chihuahua	S	29° 08'	107° 08'	!	# 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 Burras, 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.
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.
Luis L. Leon, Chihuahua	S	31° 05'	105° 38'	3,460	Apr. 1958	El Paso - Ft. Quitman	I. B. & W. C.
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

S Standard C Cumulative R Recording ! Not available # Some months missing

LOCATION OF RAINFALL STATIONS ON THE RIO GRANDE WATERSHED

In Mexico

NAME OF STATION	TYPE GAGE	LATITUDE	LONGITUDE	ELEV. (FT.)	RECORD BEGAN	WATERSHED SUBDIVISION	OBSERVER
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
Meoqui, Chihuahua	S	28° 16'	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.
Mina, Nuevo Leon	S	26° 00'	100° 32'	!	# 1958	Rio San Juan	S. A. R. H.
Monclova, Coahuila	S	26° 54'	101° 25'	1,920	# 1897	Rio Salado	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.
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, Chihuahua	S	27° 19'	102° 24'	3,770	#May 1960	Adjacent to Rio Salado	S. A. R. H.
Ojinaga, Chihuahua	S	29° 34'	104° 24'	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.
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'	106° 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.
Potrero Redondo, Nv. Leon	S	25° 16'	100° 10'	!	# 1958	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.
Reata, Coahuila	S	26° 08'	101° 05'	3,070	#July 1944	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.
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'	!	# 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.

S Standard C Cumulative V Visual 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	LATITUDE	LONGITUDE	ELEV. (FT.)	RECORD BEGAN	WATERSHED SUBDIVISION	OBSERVER
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 de las Alazanas, Coahuila	S	25° 16'	100° 35'	!	# 1958	Rio San Juan	S. A. R. H.
San Antonio, Durango	S	26° 25'	105° 21'	5,430	# 1943	Rio Conchos	S. A. R. H.
San Buenaventura, Coahuila	S	27° 04'	101° 33'	2,300	#Dec. 1926	Rio Salado	Meteor. Service of Mexico
San Fernando, Coahuila	S	29° 25'	101° 43'	!	Aug. 1961	Foster Ranch - Amistad Dam	I. B. & W. C.
San Ignacio, Tamaulipas	C	27° 04'	99° 28'	!	# 1964	Laredo - Falcon Dam	I. B. & W. C.
San Javier, Nuevo Leon	C	26° 16'	99° 25'	!	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 Juanito, Chihuahua	S	27° 58'	107° 36'	!	# 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 Rafael, Nuevo Leon	S	25° 02'	100° 33'	!	# 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.
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
Tinajas, Chihuahua	S	31° 08'	106° 05'	4,210	# 1958	El Paso - Ft. Quitman	I. B. & W. C.
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'	!	# 1958	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.
Valadeces, Tamaulipas	S	26° 14'	98° 40'	!	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 Allende, Chihuahua	S	26° 56'	105° 23'	!	#Mar. 1962	Rio Conchos	Meteor. Service of Chihuahua
Valle Hermoso, Tamaulipas	S	25° 41'	97° 48'	52	#June 1949	Lower Rio Grande Valley	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 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 ! 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 146 through 149 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 evaporometer, 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. On October 1, 1971, the Wardlaw Ranch station was relocated to the Long Ranch, about 1.5 miles west, where an evaporometer was installed to replace the pan at the former location.

Month	Presidio		Johnson Ranch		Martin King Ranch		Long Ranch	
	1978	Average 1950-1978	1978	Average 1950-1978	1978	#Average 1956-1978	1978	Average October 1971-1978
Jan.	3.18	3.79	2.21	3.26	3.05	3.02	1.94	2.27
Feb.	3.93	5.11	3.12	4.77	3.18	3.62	2.09	2.93
Mar.	6.83	8.15	6.83	8.13	6.69	6.19	4.98	4.81
Apr.	9.47	10.00	8.29	10.32	8.63	7.35	6.42	5.42
May	11.01	11.74	10.24	11.77	8.65	8.15	6.46	5.34
June	12.44	12.73	10.76	12.08	11.02	10.05	7.50	7.52
July	12.04	11.88	9.66	11.90	11.69	11.01	9.28	7.80
Aug.	7.63	11.04	7.32	10.99	9.97	10.47	6.61	7.08
Sept.	5.81	9.25	4.38	8.78	5.73	7.40	4.20	5.75
Oct.	4.33	7.38	2.42	6.91	3.98	5.31	3.20	3.30
Nov.	5.53	4.83	2.52	4.40	2.77	3.79	1.94	2.85
Dec.	3.81	3.59	2.56	3.27	3.04	3.11	1.87	2.14
Total	86.01	99.49	70.31	96.58	78.40	79.47	56.49	57.21

Month	Amistad Dam		Eagle Pass		Falcon Dam				Brownsville	
					2-Foot Pan		4-Foot Pan			
	1978	Average March 1963-1978	1978	#Average 1964-1978	1978	#Average 1950-1978	1978	#Average 1956-1978	1978	#Average 1958-1978
Jan.	3.81	3.95	3.76	3.21	3.82	3.49	3.46	4.00	2.49	2.60
Feb.	3.84	4.94	3.16	3.61	3.54	4.41	4.03	5.40	2.13	3.38
Mar.	9.37	8.60	7.02	5.72	7.61	6.64	9.53	8.45	3.90	4.45
Apr.	10.91	10.15	8.25	6.74	8.57	7.89	11.15	10.45	5.32	5.39
May	11.36	10.72	8.02	7.11	9.44	9.24	12.09	11.90	6.83	5.28
June	13.61	13.26	9.10	9.46	10.64	10.80	13.60	13.43	6.82	5.91
July	15.76	14.90	12.14	10.78	13.14	12.55	16.25	15.40	9.20	6.52
Aug.	11.78	13.38	8.51	9.56	10.33	11.28	13.65	14.09	5.56	6.13
Sept.	7.33	9.56	6.24	7.06	5.74	7.93	7.40	9.82	4.10	4.83
Oct.	5.55	6.99	4.63	5.75	4.57	6.34	5.10	7.31	3.08	4.20
Nov.	3.01	4.69	2.55	3.73	3.64	4.77	4.01	5.28	2.98	3.35
Dec.	3.47	3.79	3.11	3.43	3.30	3.71	3.66	3.99	2.98	2.79
Total	99.80	104.93	76.49	76.16	84.34	89.05	103.93	109.52	55.39	54.83

Some months missing

EVAPORATION IN THE RIO GRANDE BASIN IN MEXICO

In Inches

Tabulated below are records of evaporation observed at nine stations in Texas operated by the Mexican Section of the Commission. Eight 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 150 through 153 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. 48 published by the Mexican Section of the Commission.

	Ojinaga, Chihuahua		Cd. Acuna, Coahuila		La Amistad, Coahuila		Jimenez, Coahuila	
Month	1978	#Avg. Apr. 1954-1978	1978	# Average 1951-1978	1978	#Avg. Feb. 1977-1978	1978	# Average 1951-1978
Jan.	3.19	3.74	2.98	3.48	3.74		3.66	3.62
Feb.	4.13	5.12	3.58	4.71	5.20	5.18	4.02	4.61
Mar.	7.60	8.70	8.35	7.90	9.88	9.33	8.54	7.19
Apr.	11.93	11.20	9.09	8.87	11.34	10.34	9.65	7.90
May	13.50	13.37	9.37	9.74	11.46	9.04	10.91	8.91
June	13.86	13.87	12.13	11.74	14.53	12.60	12.13	10.85
July	14.53	13.01	13.62	13.16	16.81	15.47	14.17	12.05
Aug.	9.21	11.34	10.67	11.93	12.68	14.37	10.75	10.92
Sept.	5.12	8.91	5.63	8.56	6.81	9.94	6.69	7.79
Oct.	4.37	7.16	4.65	6.04	5.91	6.68	5.39	5.49
Nov.	3.27	4.46	2.04	3.90	3.23	4.58	3.27	3.68
Dec.	3.15	3.42	2.87	3.16	3.70	4.52	3.39	3.16
Total	93.86	104.30	84.98	93.19	105.29		92.57	86.17

	Hidalgo, Coahuila		Nuevo Laredo, Tamaulipas		Nueva Cd. Guerrero, Tamaulipas		Cd. Mier, Tamaulipas		Retamal, Tamaulipas	
Month	1978	# Average 1951-1978	1978	Avg. Aug. 1964-1978	1978	#Avg. June 1954-1978	1978	#Avg. Oct. 1955-1978	1978	Average 1951-1978
Jan.	3.19	3.92	3.43	3.98	2.48	3.45	2.99	3.66		4.11
Feb.	3.35	5.23	4.41	5.23	3.58	4.44	4.65	4.92	3.70	4.75
Mar.	4.80	7.94	10.59	8.42	8.23	7.22	8.94	7.91	7.56	6.61
Apr.	6.81	9.90	12.09	10.16	9.13	8.96	10.94	9.67	8.70	7.92
May	11.38	11.75	13.78	11.04	10.08	10.35	10.79	10.95	9.92	8.47
June	7.52	13.41	15.16	12.85	12.05	11.53	14.06	12.31	10.43	9.07
July	13.66	15.04	17.36	13.76	14.13	13.18	15.83	14.17	12.56	9.98
Aug.	10.35	13.65	14.61	12.96	12.01	12.14	13.39	13.02	9.41	9.65
Sept.	6.46	9.78	8.35	9.75	6.38	8.75	7.13	9.54	6.26	7.34
Oct.	4.17	7.31	7.04	7.33	4.57	6.48	5.55	7.25	5.12	6.00
Nov.	3.11	4.72	4.25	5.01	3.03	4.57	3.58	4.85	3.39	4.39
Dec.	2.72	3.70	4.17	4.00	3.19	3.46	4.02	3.75	4.45	3.86
Total	77.52	106.35	115.24	104.69	88.86	94.53	101.87	102.00		82.15

\# 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 mximum 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 or 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 Weater Service evaporation station.

Temperature - Degrees Fahrenheit

In the United States

Month	Amistad Dam, Texas				Eagle Pass, Texas				Falcon Dam, Texas			
	Mean 1978	Average March 1963-1978	1978 Max.	1978 Min.	Mean 1978	#Average 1964-1978	1978 Max.	1978 Min.	Mean 1978	Average July 1950-1978	1978 Max.	1978 Min.
Jan.	45.9	50.0	77	24	47.5	51.1	79	27	47.5	55.6	81	35
Feb.	49.3	53.4	79	24	50.2	55.1	88	28		59.8	85	33
Mar.	62.5	62.7	89	29	64.8	64.2	89	31		67.0	94	35
Apr.	73.1	71.4	98	50	75.7	73.0	101	50	77.0	75.0	99	54
May	79.1	70.3	104	52	81.0	77.4	102	55	84.1	79.8	105	63
June	82.9	82.2	100	62	84.5	82.9	103	57	87.8	83.8	109	68
July	86.3	84.5	105	69	88.4	85.4	104	72	89.9	85.7	105	72
Aug.	82.9	83.5	102	56	84.7	84.5	103	67	86.1	85.5	106	70
Sept.	77.1	78.2	95	60	77.3	78.8	95	62	81.5	81.0	98	65
Oct.	68.1	69.2	93	50	69.2	69.5	88	52		73.2	97	51
Nov.	61.4	59.8	83	38	62.8	60.6	82	42	66.9	63.8	88	45
Dec.	50.5	51.8	78	25	54.5	53.9	83	27	59.7	57.5	89	24
Yearly	68.3	68.1	105	24	70.0	69.7	104	27		72.3	109	24

In Mexico

Month	Cd. Juarez, Chihuahua				Ojinaga, Chihuahua				La Amistad, Coahuila			
	Mean 1978	#Average July 1960-1978	1978 Max.	1978 Min.	Mean 1978	#Average April 1954-1978	1978 Max.	1978 Min.	Mean 1977		1977 Max.	1977 Min.
Jan.	46.4	45.4	75	25	48.2	49.3	73	25				
Feb.	50.0	50.0	75	25	53.6	54.2	82	25	57.2		91	34
Mar.	59.0	57.1	86	32	64.4	61.7	93	34	64.4		90	37
Apr.	66.2	64.4	93	39	73.4	71.1	97	39	71.6		93	46
May	73.4	73.3	100	45	82.4	79.6	104	59	77.0		95	61
June	84.2	81.5	109	61	87.8	85.3	108	61	84.2		102	66
July	86.0	83.1	106	66	87.8	85.6	108	64	87.8		108	70
Aug.	80.6	80.8	102	61	84.2	84.3	104	68	91.4		109	72
Sept.	73.4	75.1	95	55	77.0	79.6	100	59	87.8		111	77
Oct.	64.4	64.8	91	41	69.8	70.4	91	39	73.4		104	41
Nov.	55.4	52.8	77	30	59.0	58.1	86	32	66.2		88	41
Dec.	44.6	46.5	70	16	48.2	50.6	81	21	57.2		90	32
Yearly	65.3	64.6	109	16	69.7	69.2	108	21			111	

Month	La Amistad, Coahuila				Cd. Acuna, Coahuila				Chupadero, Coahuila			
	Mean 1978	#Average 1977-1978	1978 Max.	1978 Min.	Mean 1978	#Average April 1951-1978	1978 Max.	1978 Min.	Mean 1978	#Average 1961-1978	1978 Max.	1978 Min.
Jan.	44.6	44.6	77	23	44.6	49.3	79	16	42.8	47.9	75	18
Feb.	50.0	53.6	82	21	48.2	54.5	82	21	46.4	53.0	73	21
Mar.	62.6	63.5	93	23	62.6	63.2	91	25	59.0	62.4	86	25
Apr.	75.2	73.4	95	52	71.6	72.0	102	43	69.8	71.3	97	43
May	82.4	79.7	108	54	80.6	78.4	113	46	75.2	75.9	95	46
June	86.0	85.1	104	66	84.2	84.5	104	61	80.6	82.0	104	59
July	89.6	88.7	109	72	87.8	87.1	108	66	87.8	85.1	108	68
Aug.	86.0	88.7	106	68	84.2	86.6	104	63	82.4	83.8	100	66
Sept.	80.6	84.2	99	59	78.8	81.3	100	54	75.2	78.9	91	52
Oct.	69.8	71.6	91	50	68.0	71.1	97	45	64.4	69.1	86	46
Nov.	66.2	66.2	88	41	59.0	58.9	86	30	57.2	58.5	79	36
Dec.	51.8	54.5	77	23	48.2	51.2	82	16	46.4	51.3	72	19
Yearly	70.4	71.2	109	21	68.2	69.8	113	16	65.6	68.3	108	18

Some months missing

TEMPERATURE, HUMIDITY, AND WIND

Temperature - Degrees Fahrenheit
In Mexico

Month	Jimenez, Coahuila				El Remolino, Coahuila				Piedras Negras, Coahuila			
	Mean 1978	Average #March 1951-1978	1978 Max.	1978 Min.	Mean 1978	Average June 1958-1978	1978 Max.	1978 Min.	Mean 1978	#Average April 1951-1978	1978 Max.	1978 Min.
Jan.	48.2	52.6	88	25	57.2	56.9	91	27	48.2	51.0	81	23
Feb.	50.0	56.6	81	25	60.8	60.2	91	34	51.8	55.8	88	27
Mar.	62.6	63.2	91	34	66.2	66.1	95	34	66.2	63.0	95	30
Apr.	75.2	71.3	102	50	73.4	74.6	100	41	77.0	72.0	102	50
May	82.4	77.3	106	54	78.8	79.2	104	52	82.4	77.7	104	54
June	84.2	83.3	104	66	78.8	84.0	104	54	86.0	83.8	106	68
July	89.6	85.4	109	72	84.2	86.0	108	64	89.6	86.2	106	72
Aug.	86.0	85.0	104	68	84.2	85.4	108	61	86.0	85.6	106	64
Sept.	80.6	80.6	97	61	80.6	81.7	106	54	78.8	79.8	97	61
Oct.	73.4	71.3	97	52	75.2	73.8	100	50	69.8	70.3	90	50
Nov.	66.2	61.2	93	39	71.6	67.4	100	45	62.6	59.3	86	39
Dec.	57.2	54.3	95	21	62.6	60.4	95	25	51.8	52.7	82	21
Yearly	71.3	70.2	109	21	72.8	73.0	108	25	70.8	69.8	106	21

Month	Guerrero, Coahuila				Villa Hidalgo, Coahuila				Nuevo Laredo, Tamps., C.I.L.A.			
	Mean 1978	#Average 1958-1978	1978 Max.	1978 Min.	Mean 1978	#Average August 1951-1978	1978 Max.	1978 Min.	Mean 1978	Average August 1964-1978	1978 Max.	1978 Min.
Jan.	51.8	51.3	86	32	48.2	53.2	77	32	51.8	54.8	88	30
Feb.	53.6	55.9	93	28	53.6	57.5	82	32	55.4	59.4	97	34
Mar.	68.0	66.0	97	41	66.2	65.7	100	37	69.8	69.2	95	36
Apr.	84.2	74.0	104	57	80.6	75.4	113	48	80.6	77.4	106	54
May	86.0	79.5	106	50	82.4	80.0	108	52	87.8	81.9	111	61
June	89.6	84.2	104	70	82.4	85.3	102	63	89.6	85.7	109	70
July	91.4	85.8	106	77	86.0	86.7	106	64	91.4	87.7	109	75
Aug.	89.6	86.0	104	75	84.2	87.0	104	68	89.6	87.6	109	70
Sept.	80.6	81.0	97	66	77.0	82.3	95	57	84.2	83.5	102	66
Oct.	73.4	71.0	88	50	68.0	73.5	90	45	77.0	75.3	97	57
Nov.	66.2	62.0	86	43	62.6	61.4	86	37	69.8	66.0	93	46
Dec.	55.4	54.6	86	41	53.6	55.9	84	16	59.0	59.5	91	28
Yearly	74.2	70.9	106	28	70.4	72.0	113	16	75.5	74.0	111	28

Month	Nuevo Laredo, Tamps. M.S. of M.				El Treinta, Coahuila				Sabinas Hidalgo, Nuevo Leon			
	Mean 1978	#Average 1945-1978	1978 Max.	1978 Min.	Mean 1978	Average 1961-1978	1978 Max.	1978 Min.	Mean 1978	Average October 1961-1978	1978 Max.	1978 Min.
Jan.	48.2	55.8	79	28	41.0	49.2	82	18	50.0	56.6	79	32
Feb.	73.4	60.9	90	30	48.2	54.4	95	21	53.6	60.2	77	34
Mar.	66.2	67.7	90	34	62.6	64.2	95	25	66.2	67.4	93	32
Apr.	78.8	75.5	102	54	73.4	73.0	104	43	75.2	75.5	95	54
May	86.0	80.9	108	64	80.6	77.4	108	54	86.0	80.3	102	57
June	87.8	84.7	108	70	82.4	81.4	104	61	82.4	84.0	102	64
July	89.6	87.6	108	72	84.2	82.7	108	63	91.4	84.8	106	73
Aug.	87.8	87.2	104	72	80.6	82.7	104	63	87.8	84.8	104	72
Sept.	80.6	81.4	95	64	73.4	77.7	97	54	77.0	79.9	91	66
Oct.	71.6	72.9	90	52	66.2	69.0	90	46	71.6	73.6	90	57
Nov.	64.4	64.2	84	45	60.8	59.2	90	36	68.0	65.0	90	48
Dec.	50.0	50.6	82	23	48.2	51.6	79	16	55.4	59.2	81	25
Yearly	73.7	72.4	108	23	66.8	68.5	108	16	72.0	72.6	106	25

Month	Nueva Cd. Guerrero, Tamaulipas				Cd. Mier, Tamaulipas				Retamal, Tamaulipas			
	Mean 1978	Average 1958-1978	1978 Max.	1978 Min.	Mean 1978	#Average October 1955-1978	1978 Max.	1978 Min.	Mean 1978	#Average 1951-1978	1978 Max.	1978 Min.
Jan.	51.8	55.2	81	34	51.8	55.0	82	34		60.1		
Feb.	55.4	59.1	91	32	53.6	59.3	86	32	55.4	62.8	102	30
Mar.	68.0	67.0	91	36	68.0	67.3	91	39	66.2	69.3	90	32
Apr.	77.0	75.8	97	52	75.2	75.6	100	52	75.2	76.4	95	52
May	84.2	80.7	102	59	84.2	80.5	100	66	82.4	79.9	99	57
June	86.0	84.7	100	68	87.8	84.5	104	68	86.0	83.5	99	70
July	87.8	86.0	104	72	91.4	86.2	104	79	86.0	85.1	100	72
Aug.	86.0	86.1	104	70	87.8	86.3	104	72	86.0	85.9	102	68
Sept.	80.6	81.9	97	64	82.4	81.9	99	64	82.4	82.9	97	63
Oct.	73.4	74.5	91	54	73.4	74.2	95	54	75.2	76.8	91	52
Nov.	66.2	65.3	88	46	66.2	64.9	86	45	68.0	67.9	88	45
Dec.	57.2	57.7	91	27	60.8	58.2	90	25	60.8	61.9	91	27
Yearly	72.8	72.8	104	27	73.6	72.8	104	25		74.4	102	

\# 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	
	1978	Average 1957-1978	1978	#Average March 1963-1978	1978	#Average December 1963-1978	1978	#Average July 1950-1978
Jan.	4.3	3.8	3.1	3.3	4.2	2.4	3.4	3.8
Feb.	4.4	4.6	3.1	3.8	4.2	3.0	3.5	4.4
Mar.	6.0	6.1	3.9	4.6	5.1	3.4	4.7	4.9
Apr.	7.2	6.3	4.4	4.7	5.9	3.6	5.8	5.6
May	6.7	6.7	3.8	4.6	5.6	3.5	5.4	5.5
June	7.2	7.1	4.1	4.9	5.2	3.5	4.6	5.8
July	6.5	6.7	3.7	4.6	5.2	3.5	5.5	6.1
Aug.	5.6	5.9	3.1	4.0	4.2	3.1	4.1	5.1
Sept.	4.2	5.0	2.7	3.6	3.2	2.6	2.8	3.9
Oct.	4.0	4.6	2.5	3.4	2.6	2.2	1.8	3.4
Nov.	3.9	4.0	2.9	3.1	3.1	2.0	3.3	3.7
Dec.	3.5	3.5	2.9	3.1	3.1	2.1	3.0	3.5
Yearly	5.3	5.4	3.4	4.0	4.3	2.9	3.9	4.6

Mean Relative Humidity-Percent

In the United States

Month	Amistad Dam, Texas		Eagle Pass, Texas		Falcon Dam, Texas	
	1978	Average March 1963-1978	1978	#Average 1964-1978	1978	Average July 1950-1978
Jan.	62.4	60.8	63.3	63.7	63.4	66.1
Feb.	63.1	59.2	61.4	60.7		63.0
Mar.	47.8	53.6	50.3	57.3		61.3
Apr.	56.2	58.6	56.6	61.4	70.0	61.6
May	62.0	65.0	61.3	67.6	72.6	64.3
June	65.1	62.2	62.8	64.9	68.1	63.3
July	59.4	60.0	57.4	61.8	65.6	60.2
Aug.	65.7	61.0	65.1	63.8	68.7	61.1
Sept.	82.3	67.6	76.7	70.9	77.7	66.1
Oct.	75.3	67.7	72.3	69.9		66.2
Nov.	84.7	65.1	76.3	68.4	80.0	66.3
Dec.	64.4	61.9	66.3	65.2	72.7	64.8
Yearly	65.7	61.9	64.2	64.6		63.7

In Mexico

Month	Nueva Cd. Guerrero, Tamaulipas	
	1978	Average August 1961-1978
Jan.	68	78
Feb.	61	76
Mar.	47	71
Apr.	51	71
May	62	77
June	57	75
July	54	73
Aug.	58	73
Sept.	82	79
Oct.	84	78
Nov.	79	77
Dec.	80	78
Yearly	65	76

Some months missing

DRAINAGE BASIN AND IRRIGATED AREAS
Along the Rio Grande and Tributaries – 1978

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 1978 are shown, except that in the reaches below Falcon Dam, the figures shown represent acreages which were subject to irrigation in 1978 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 1978. 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	101,785	0	101,785
Above American Dam	29,271	0	29,271	101,785	0	101,785
American Dam to Clint Station	187	285	472	28,850	3,237	32,087
Above Clint Gaging Station	29,458	285	29,743	130,635	3,237	133,872
Clint Station to Acala Station	485	259	744	0	0	0
American Dam to Acala Station - Total	672	544	1,216	28,850	3,237	33,087
Above Acala Gaging Station	29,943	544	30,487	130,635	3,237	133,872
Acala Station to Fort Quitman Station	663	794	1,457	9,176	0	9,176
Above Fort Quitman Gaging Station	30,606	1,338	31,944	139,811	3,237	143,048
Fort Quitman Station to Above Presidio Station	1,646	1,410	3,056	a) 425	a) 77	502
Above Presidio Station above Rio Conchos	32,252	2,748	35,000	140,236	3,314	143,550
Rio Conchos above Boquilla Dam	0	8,131	8,131	0	b) 6,425	6,425
Rio Conchos above Luis L. Leon Dam	0	22,992	22,992	0	318,498	318,498
Rio Conchos - Total	0	26,404	26,404	0	324,923	324,923
Alamito Creek above Gaging Station	1,504	0	1,504	340	0	340
Presidio Station above Rio Conchos to Presidio Station below Rio Conchos - excluding above tributaries	340	91	431	2,020	7	2,027
Presidio Station above Rio Conchos to Presidio Station below Rio Conchos - Total	1,844	26,495	28,339	2,360	324,930	327,290
Above Presidio Station below Rio Conchos	34,096	29,243	63,339	142,596	328,244	470,840
Terlingua Creek above Gaging Station	1,070	0	1,070	c) 1,050	0	1,050
Presidio Station below Rio Conchos to Johnson Ranch Station - excluding Terlingua Creek	1,093	2,258	3,351	940	1,473	2,413
Presidio Station below Rio Conchos to Johnson Ranch Station - Total	2,163	2,258	4,421	1,990	1,473	3,463
Above Johnson Ranch Gaging Station	36,261	31,499	67,760	144,586	329,717	474,303
Johnson Ranch Station to Foster Ranch Station	6,412	6,570	12,982	d) 3,155	213	3,368
Above Foster Ranch Gaging Station	42,673	38,069	80,742	147,741	329,930	477,671
Foster Ranch Station to Langtry Station	182	505	687	0	0	0
Above Langtry Gaging Station (Discontinued)	42,855	38,574	81,429	147,741	329,930	477,671
Pecos River above Girvin	29,562	0	29,562		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	82,685	40,449	123,134	147,741	329,930	477,671
Amistad Dam to Below Amistad Dam Gaging Station	55	4	9	0	0	0
Above the Below Amistad Dam Gaging Station	82,690	40,453	123,143	147,741	329,930	477,671
Below Amistad Dam Station to Del Rio Station	60	100	160	178	0	178
Above Del Rio Gaging Station	82,750	40,553	123,303	147,919	329,930	477,849
Arroyo Las Vacas above Gaging Station	0	350	350	0	581	581
San Felipe Creek above Gaging Station	46	0	46	2,308	0	2,308
Pinto Creek above Gaging Station	249	0	249	400	0	400
Rio San Diego above Gaging Station	0	853	853	0	10,247	10,247
Rio San Diego - Total	0	859	859	0	11,176	11,176

DRAINAGE BASIN AND IRRIGATED AREAS

Along the Rio Grande and Tributaries – 1978

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) 38,501	2,293	40,794
Del Rio Station to Jimenez Station - Total	964	1,319	2,283	41,209	14,050	55,259
Above the Jimenez Gaging Station	83,714	41,872	125,586	189,128	343,980	533,108
Rio San Rodrigo above Gaging Station	0	1,049	1,049	0	5,402	5,402
Rio San Rodrigo - Total	0	1,049	1,049	0	5,402	5,402
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	5,402	6,912
Above Maverick Power Plant	84,001	43,035	127,036	190,638	349,382	540,020
Maverick Power Plant to Piedras Negras Station	244	32	276	86	744	830
Above Piedras Negras Gaging Station	84,245	43,067	127,312	190,724	350,126	540,850
Rio Escondido above Gaging Station	0	1,459	1,459	0	10,472	10,472
Rio Escondido - Total	0	1,471	1,471	0	10,472	10,472
Piedras Negras Station to El Indio Station - excluding Rio Escondido	237	206	443	250	173	423
Piedras Negras Station to El Indio Station - Total	237	1,677	1,914	250	10,645	10,895
Above El Indio Gaging Station	84,482	44,744	129,226	190,974	360,771	551,745
El Indio Station to Villa Hidalgo Station	629	1,683	2,312	1,017	1,631	2,648
Above Villa Hidalgo Gaging Station	85,111	46,427	131,538	191,991	362,402	554,393
Villa Hidalgo Station to Nuevo Laredo Station	607	433	1,040	3,727	4,383	8,110
Above Nuevo Laredo Gaging Station	85,718	46,860	132,578	195,718	366,785	562,503
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	118,101	118,101
Rio Salado above River Road Crossing	0	23,323	23,323	0	118,101	118,101
Nuevo Laredo Station to Falcon Dam - excluding Rio Salado	2,042	1,327	3,369	f) 9,411	4,060	13,471
Nuevo Laredo Station to Falcon Dam - Total	2,042	24,650	26,692	9,411	122,161	131,572
Amistad Dam to Falcon Dam - excluding above tributaries	4,780	4,009	8,789	54,680	13,284	67,964
Above Falcon Dam	87,760	71,510	159,270	205,129	488,946	694,075
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	162,084	162,084
Rio San Juan - Total	0	12,949	12,949	0	264,633	264,633
Falcon Dam to Rio Grande City Station - excluding above tributaries	222	246	468	4,993	2,548	7,541
Falcon Dam to Rio Grande City Station - Total	222	14,870	15,092	4,993	274,841	279,834
Above Rio Grande City Gaging Station	87,982	86,380	174,362	210,122	763,787	973,909
Rio Grande City Station to Anzalduas Dam	952	798	1,750	181,568	484,978	666,546
Above Anzalduas Dam	88,934	87,178	176,112	391,690	1,248,765	1,640,455
Anzalduas Dam to Progreso Station	13	163	176	127,768	5,248	133,016
Above Progreso Gaging Station	88,947	87,341	176,288	519,458	1,254,013	1,773,471
Progreso Station to San Benito Station	7	9	16	321,223	4,339	325,562
Above San Benito Gaging Station	88,954	87,350	176,304	840,681	1,258,352	2,099,033
San Benito Station to Brownsville Station	14	15	29	101,041	1,873	102,914
Falcon Dam to Brownsville Station - excluding Rio Alamo and Rio San Juan	1,208	1,231	2,439	736,593	498,986	1,235,579
Above Brownsville Gaging Station	88,968	87,365	176,333	941,722	1,260,225	2,201,947
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	498,986	1,240,379
Amistad Dam to Gulf of Mexico - excluding above tributaries				796,073	512,270	1,308,343
Above Gulf of Mexico				946,522	1,260,225	2,206,747

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 1,000 acres irrigated by spreader dams
d) Includes 3,000 acres irrigated by spreader dams
e) Includes 36,778 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 1978 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-Feet 1978 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	1,440	1,470	1,710	1,740	2,440	3,110	3,540	5,690	4,310	28,100	4,360	3,580
2	1,360	1,440	1,830	2,210	2,620	5,840	6,550	4,680	4,080	24,800	4,110	3,550
3	1,300	1,450	1,750	2,100	2,490	10,900	4,230	3,880	2,770	29,800	3,920	3,410
4	1,400	1,450	1,530	2,110	2,380	16,100	3,030	5,370	3,010	57,000	5,140	2,850
5	1,460	1,490	1,630	2,070	2,190	7,640	4,530	5,360	4,360	53,300	69,600	2,420
6	1,470	1,550	1,710	1,980	2,790	12,300	3,360	8,520	4,100	40,400	24,400	2,200
7	1,460	1,690	1,750	1,900	3,080	10,800	2,870	8,900	6,570	28,900	14,100	2,000
8	1,350	1,720	1,660	1,890	3,200	6,060	2,600	8,720	6,000	26,000	11,200	1,930
9	1,300	1,660	1,540	2,790	2,850	3,570	2,310	12,300	4,050	25,700	8,330	1,780
10	1,290	1,550	1,670	3,490	2,860	3,540	1,840	10,500	3,330	20,000	7,580	1,590
11	1,340	1,530	1,860	2,760	3,240	2,930	1,970	6,860	3,000	16,000	7,180	1,470
12	1,400	1,730	1,770	2,850	4,480	2,810	1,950	7,340	2,760	13,900	4,890	1,340
13	1,420	1,650	1,780	2,880	3,180	2,780	1,960	6,060	2,380	13,800	3,590	1,300
14	1,350	1,610	1,740	1,960	2,410	2,480	1,830	4,160	2,480	11,600	3,590	1,420
15	1,350	1,600	1,770	2,220	2,830	2,510	2,020	3,840	2,420	8,760	4,000	1,670
16	1,450	1,520	1,760	2,420	2,930	2,080	2,160	3,270	2,870	7,140	3,870	1,600
17	1,340	1,500	1,550	2,730	3,150	2,140	2,120	3,050	3,690	5,790	3,580	1,500
18	1,320	1,470	1,590	2,700	2,990	2,140	1,780	2,640	2,050	4,150	3,350	1,760
19	1,390	1,480	1,650	2,680	3,330	2,320	1,480	2,570	1,660	4,320	3,320	1,820
20	1,380	1,600	1,550	2,530	3,280	2,490	1,320	2,510	2,260	3,950	3,250	1,980
21	1,380	1,470	1,620	2,350	7,650	2,160	1,500	2,240	5,950	3,670	3,420	1,970
22	1,320	1,290	1,610	2,310	8,090	2,170	1,680	1,860	5,770	3,820	3,240	2,000
23	1,360	1,290	1,830	2,340	6,500	1,700	1,860	1,920	5,370	3,770	3,320	1,930
24	1,440	1,360	1,730	2,380	4,420	1,900	1,820	2,030	6,690	3,540	3,370	2,100
25	1,410	1,400	1,770	2,560	5,260	1,720	1,640	1,990	10,100	5,660	3,620	2,140
26	1,290	1,340	1,750	2,400	4,240	2,020	1,820	2,140	5,700	9,550	3,990	2,100
27	1,420	1,440	1,660	2,240	3,500	2,140	2,200	3,220	9,670	6,980	3,910	2,130
28	1,320	1,490	1,400	2,520	4,060	2,270	2,360	3,270	11,200	5,040	3,670	1,980
29	1,280		1,470	2,450	6,150	2,080	3,240	3,750	14,100	5,110	3,620	2,080
30	1,360		1,340	2,440	3,770	2,490	3,670	4,080	18,200	4,540	3,630	2,150
31	1,370		1,580		3,110		6,460	5,080		4,240		2,240
Sum	42,520	42,240	51,560	72,000	115,470	125,190	81,700	147,800	160,900	479,330	229,150	63,990

Month	Extreme Gage Feet		Ø Extreme Second-Feet				Average Second-Feet	Total Acre-Feet	Acre-Feet		
			High		Low						
	High	Low	Day		Day				Average	Maximum	Minimum
Jan.			6	1,470	29	1,280	1,370	84,337	99,542	136,708	72,708
Feb.			12	1,730	122	1,290	1,510	83,782	106,001	172,088	73,688
Mar.			11	1,860	30	1,340	1,660	102,268	153,250	304,417	93,840
Apr.			10	3,490	1	1,740	2,400	142,810	159,248	231,030	86,703
May			22	8,090	5	2,190	3,720	229,031	178,642	230,589	103,515
June			4	16,100	23	1,700	4,170	248,311	154,152	248,311	103,948
July			2	6,550	20	1,320	2,640	162,050	260,392	689,085	97,790
Aug.			9	12,300	22	1,860	4,770	293,157	239,028	294,793	143,446
Sept.			30	18,200	19	1,660	5,360	319,140	548,830	2,091,428	131,202
Oct.			4	57,000	24	3,540	15,500	950,737	364,489	950,737	98,505
Nov.			5	69,600	22	3,240	7,640	454,512	180,751	454,512	67,616
Dec.			1	3,580	13	1,300	2,060	126,922	113,594	163,332	98,459
				69,600		1,280	4,420	3,197,057	2,557,919	4,328,998	1,614,745
Yearly	Meters		Cubic Meters per Second					Thousands of Cubic Meters			
				1,970		36.2	125	3,943,570	3,155,193	5,339,819	1,991,788

Current Year 1978 — Period 1973-1978

Ø Mean daily ! 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 1978 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 1978 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	1,310	1,350	1,260	4,340	1,300	6,040	4,410	9,640	10,500	8,510	6,250	7,270
2	1,090	1,150	1,110	3,810	1,240	6,710	4,480	8,860	9,360	9,010	5,720	7,240
3	448	1,330	1,650	3,920	2,110	29,400	3,960	11,100	6,500	9,220	6,570	7,380
4	1,520	1,260	1,570	3,220	2,420	12,800	4,200	12,000	4,560	7,100	5,160	8,050
5	1,810	1,300	1,620	3,210	2,030	12,000	4,730	5,190	6,070	7,910	5,230	7,380
6	1,400	1,330	1,370	1,770	1,560	7,880	4,200	4,480	5,970	9,820	5,860	6,780
7	1,790	2,600	1,440	1,020	1,900	10,800	4,380	3,400	8,400	8,930	21,600	7,060
8	2,100	1,020	855	1,190	2,430	11,900	4,770	3,160	11,000	9,360	11,600	7,130
9	1,660	1,690	653	1,150	2,280	10,600	4,380	3,380	7,270	10,100	6,990	5,050
10	1,900	989	1,590	1,030	1,820	7,310	4,030	2,440	6,460	10,100	8,020	5,300
11	1,440	1,380	2,330	1,490	1,350	6,750	3,960	2,310	4,410	9,460	6,780	4,450
12	1,440	1,750	1,770	1,520	2,120	6,250	3,960	2,550	4,630	9,530	7,030	4,340
13	1,530	2,080	3,300	1,720	2,230	5,620	4,130	2,600	3,960	11,000	6,430	4,700
14	1,580	1,370	2,410	1,560	4,060	6,960	3,880	2,220	4,450	6,960	6,110	3,960
15	1,780	1,300	3,090	1,950	4,590	5,440	4,200	2,330	3,570	6,430	6,430	2,420
16	1,320	1,080	2,520	1,940	4,310	5,160	4,060	2,910	4,310	7,350	6,110	3,000
17	1,560	1,850	2,990	3,120	4,840	5,160	4,450	2,670	4,030	5,620	5,790	2,860
18	1,330	1,210	3,510	2,790	4,450	5,470	4,200	2,930	3,260	7,800	6,000	2,770
19	1,380	1,280	3,260	2,660	5,400	4,700	4,170	2,890	3,190	7,030	5,510	3,350
20	897	1,380	3,880	968	6,250	5,370	4,030	3,380	3,850	6,110	5,540	3,640
21	883	946	3,570	950	13,900	5,300	4,270	3,310	4,130	6,780	6,390	3,050
22	713	996	3,490	925	9,820	4,870	3,990	2,090	5,010	6,920	6,960	3,290
23	837	943	3,260	1,070	8,300	3,990	3,640	2,900	8,260	7,590	6,500	3,990
24	1,100	1,440	3,340	901	7,490	3,740	3,600	2,390	12,000	5,760	7,030	4,590
25	1,400	1,830	3,400	819	7,630	3,810	3,920	2,380	12,200	6,750	6,530	4,100
26	1,710	1,650	3,600	1,230	6,670	3,740	4,130	2,590	14,500	8,260	6,920	4,170
27	1,480	1,600	3,530	1,450	6,820	4,940	3,880	2,880	17,000	9,150	7,310	4,630
28	1,690	1,690	3,920	1,260	7,130	5,760	4,940	2,340	15,500	10,700	6,460	6,780
29	1,510		3,740	1,210	7,420	5,580	6,570	1,980	11,500	7,590	7,200	4,980
30	1,300		3,520	1,430	5,830	4,700	5,580	5,190	9,040	7,660	6,780	4,980
31	1,520		3,670		4,560		6,640	10,700		7,380		5,010
Sum	44,028	39,794	81,218	55,623	144,260	218,750	135,740	129,190	224,890	251,890	212,810	153,700

Month	Current Year 1978							Period 1968-1978		
	Extreme Gage Feet		∅ Extreme Second-Feet				Average Second-Feet	Total Acre-Feet	Acre-Feet		
	High	Low	High Day	High	Low Day	Low			Average	Maximum	Minimum
Jan.			8	2,100	3	448	1,420	87,353	107,400	245,376	50,635
Feb.			7	2,600	23	943	1,420	78,927	154,677	453,053	54,934
Mar.			28	3,920	9	653	2,620	161,125	134,169	243,527	53,064
Apr.			1	4,340	25	819	1,850	110,321	128,079	351,929	49,911
May			21	13,900	2	1,240	4,660	286,191	261,838	674,606	101,854
June			3	29,400	124	3,740	7,270	433,721	245,305	770,709	46,609
July			31	6,640	24	3,600	4,380	269,255	320,140	1,056,340	33,481
Aug.			4	12,000	29	1,980	4,170	256,261	283,255	1,023,293	64,413
Sept.			27	17,000	19	3,190	7,490	446,021	503,416	1,442,682	137,408
Oct.			13	11,000	17	5,620	8,120	499,493	420,720	1,365,884	122,189
Nov.			7	21,600	4	5,160	7,100	422,233	201,987	538,929	45,260
Dec.			4	8,050	15	2,420	4,940	304,865	141,164	304,865	42,870
Yearly				29,400		448	4,630	3,355,766	2,902,150	6,234,950	1,280,067
	Meters			Cubic Meters per Second				Thousands of Cubic Meters			
				853		12.7	131	4,139,294	3,579,763	7,690,727	1,578,946

∅ Mean daily

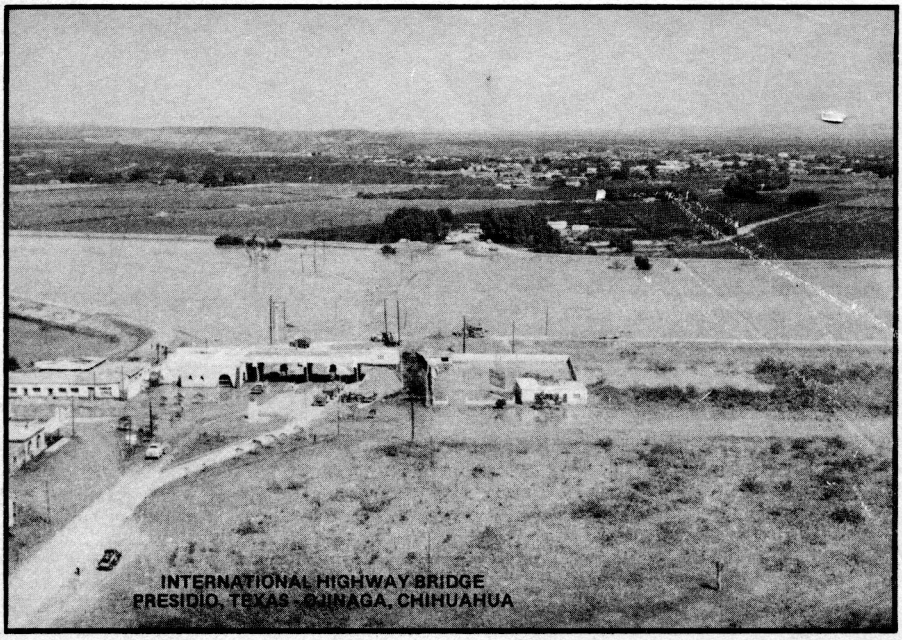
‡ And other days

CORRECTIONS TO PREVIOUS WATER BULLETINS

Water Bulletin and Page Numbers	Heading	Reference	Published As	Correction
44-29 45-28 46-29 47-29	North Fork San Pedro Creek near Del Rio, Texas	Description, first line, location	Left bank	Right bank
47-47	Pinto Creek near Del Rio, Texas	Period Summary, maximum for February	2,760	5,760
47-149	Drainage Basin and Irrigated Areas	Drainage basin area titled Amistad Dam to Below Amistad Dam Gaging Station, under column headed United States	55	5

Flow of the Rio Grande and Related Data

1978



UNITED STATES OF AMERICA
DEPARTMENT OF STATE

INTERNATIONAL BOUNDARY AND WATER COMMISSION
UNITED STATES AND MEXICO

WATER BULLETIN NUMBER 48

COVER PHOTOGRAPH

Rio Grande at Presidio-Ojinaga international highway bridge during the flood of September-October 1978. The inspection station at Ojinaga, Chihuahua is seen near the center of the photograph and in the background, the town of Presidio, Texas. The bridge is completely submerged and only the turbulence of the water indicates its presence. Flow in the river at the time this photograph was taken was approximately 35,000 c.f.s.