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WATER BULLETIN NUMBER 23

Flow of the Rio Grande and Related Data

From Elephant Butte Dam, New Mexico

to the Gulf of Mexico

1953

WITH MAXIMUMS, MINIMUMS, AND NORMALS

STORAGE CAPACITIES AND WATER IN STORAGE
SOURCES OF RIVER FLOW
DIVERSIONS
SILT, CHEMICAL AND SANITARY ASPECTS OF WATER QUALITY
RAINFALL AND EVAPORATION
DRAINAGE BASIN AND IRRIGATED AREAS

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FOREWORD

This bulletin presents the twenty-third 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 stream flow data and kindred subjects pertain to the Rio Grande and its important tributaries near their confluence with the main stream from Elephant Butte Dam, 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 the information for the year 1953.

International stream gaging on the Rio Grande was initiated in 1889, when the station at El Paso, Texas was established. A number of 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 started.

During 1953, the United States Section of the Commission operated the stream gaging stations on the Rio Grande at El Paso, American Dam, Island, County Line, Fort Quitman, Upper Presidio, Lower Presidio, Johnson Ranch, Agua Verde, Langtry, Del Rio, Zapata, Chapeño, Rio Grande City, Progreso, San Benito, and Lower Brownsville. The Mexican Section operated the stream gaging stations on the main stream at Juárez, Jiménez, Eagle Pass, San Antonio Crossing, Laredo, Roma, Anzalduas, and Matamoros. Each Section operated the gaging stations on tributary streams, floodways, and diversions within its own country.

The total drainage area within the outer rim of the Rio Grande Basin is 335,500 square miles. However, nearly half of this area yields no runoff to the river, the estimated productive area of the watershed being 171,900 square miles. Reservoirs in the basin have a total storage capacity of approximately 8,600,000 acre-feet, in addition to the International Falcón Reservoir, which has a conservation storage capacity of 2,400,000 acre-feet. A present total of 2,300,000 acres is irrigated. The residual flow from the Rio Grande that escaped to the Gulf of Mexico averaged 2,500,000 acre-feet per year for the period 1934-1953.

Acknowledgments

Other agencies, which have each contributed to some part of the data published herein, include: the Bureau of Plant Industry, the Division of Soils and Agricultural Engineering, 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 Weather Bureau of the U. S. Department of Commerce; the Texas Board of Health; the Colorado State Engineer; the New Mexico State Engineer; the Red Bluff Water Power Control District; the Willacy County Water Control and Improvement District No. 1; the El Paso Department of Water and Sewerage; the Laredo City Water Department; the Ministry of Hydraulic Resources of Mexico; the Meteorological Service of Mexico; the Cía. Agrícola de Fuerza Eléctrica del Río Conchos, S. A.; the Federal Board of Public Improvement Works of Nuevo Laredo, Tamaulipas; and the Water and Drainage Board of Matamoros, Tamaulipas.

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

GENERAL HYDROLOGIC CONDITIONS FOR 1953

Along and Adjacent to the International Portion of the Rio Grande

During the year 1953, on the watershed of the Rio Grande below Elephant Butte Dam, temperatures averaged 102% of normal. Evaporation averaged 105% of normal on the Rio Grande watershed from El Paso to Diablo Dam site, 102% of normal from Diablo Dam site to Falcón Dam and 98% of normal from Falcón Dam to the Gulf of Mexico. Precipitation averaged 46% of normal from El Paso to Diablo Dam site, 72% of normal from Diablo Dam site to Falcón Dam, 124% of normal from Falcón Dam to Rio Grande City and 78% of normal in the Lower Rio Grande Valley.

The yearly volume of flow of the Rio Grande from El Paso to the Gulf was much below normal varying from 4.4% at Upper Presidio station to 48% at El Paso station. At the Rio Grande City gaging station, where the largest annual volume was recorded, the flow was 1,828,000 acre-feet, or 41% of the annual normal of 4,421,000 acre-feet. The annual volumes of flow past all gaging stations from Upper Presidio through Eagle Pass were the lowest of record. At Lower Brownsville gaging station, the lowermost station on the Rio Grande, the annual flow was 653,500 acre-feet, or 26% of the 1934-1953 normal flow of 2,494,000 acre-feet. After August 25, 1953, except for tributary inflows and diversions below Falcón Dam, all flows passing Rio Grande gaging stations below the dam were controlled by releases from Falcón Reservoir.

The total annual flow of the measured tributaries below Fort Quitman was below normal. The total flow of these tributaries in the United States was 367,300 acre-feet, or 40% of the normal total flow of 928,300 acre-feet. A new minimum yearly flow was recorded at San Felipe Creek gaging station. In Mexico, the total measured tributary flow, excluding the Río San Juan, was 1,134,000 acre-feet, or 68% of the normal flow of 1,675,000 acre-feet. The yearly flow of the Río Conchos at Ojinaga was the lowest of record, and the yearly flow of the Río Alamo was the highest of record.

Return flow to the Rio Grande at the Maverick Power Plant near Eagle Pass was 320,700 acre-feet, or 56% of the five-year average. Due to the shortage of water, this plant did not operate all or parts of the months of April, May, June, and July.

There were no floods of consequence on the Rio Grande during 1953. On the Río Alamo and Río Salado tributaries, small floods occurred on August 27. The peak flow at the Río Salado station of 46,000 second-feet was the highest of record at that station. No damage of consequence was caused by either of these floods.

For all reservoirs in the Rio Grande Basin of capacity greater than 15,000 acre-feet, excepting Bluewater Reservoir, the average amount of water in storage in 1953 was 1,526,000 acre-feet, or 40% of the normal 3,808,000 acre-feet. In the United States, stored water in these reservoirs averaged 26% of normal, while in Mexico, the average was 48% of normal. International Falcón Dam on the Rio Grande began storing water on August 25, 1953.

Diversions from the Rio Grande in the United States were below normal at all points, the diversion into the Maverick Canal being the lowest of record. In Mexico, diversions into the Acequia Madre were below normal, and into the Retamal and Anzaldúas canals were 151% of the 1944-1953 normal of the combined diversions. Diversions for municipal uses in the United States and in Mexico were 134% and 149%, respectively, of the average for the most recent ten years.

There was a critical shortage of irrigation water during parts of the year along the Rio Grande. There was a very small average flow at Lower Presidio station, with zero flows occurring intermittently during the months of April, May, and June and parts of July and August. At Johnson Ranch station, the river was dry from April 26 through May 31, and seven days in June and July. At Laredo station, the river went dry on June 3 and, with the exception of a very few days of low flow, was dry until July 18. Other stations below Laredo having no flow for days or parts of days during June and July were Zapata, Chapeño, Roma, Rio Grande City, Progreso Bridge, and Below San Benito. There was no flow at Matamoros from June 6 through August 27 and at Lower Brownsville all day or parts of days for 140 days from January to August 28. The shortage was relieved the latter part of August when substantial rains fell on the watershed, particularly from Eagle Pass to Falcón Dam on the Rio Grande watershed, and on the Río Salado and Río Alamo watersheds.

The total reported acreage irrigated from the Rio Grande and its tributaries below El Paso, Texas, showed a decrease from the 1952 total. There was a decrease of 3% on the United States side and 12% on the Mexican side. The decrease on the Mexican side was noticeable along the entire watershed from American Dam to the Gulf with the largest decreases being from Laredo to the Gulf. A small increase was reported from San Antonio Crossing to Laredo. On the United States side, the largest decreases were from Anzaldúas Dam site to the Gulf, with small increases reported in the reaches from Johnson Ranch to Langtry and Falcón Dam to Anzaldúas Dam site.

The 1953 investigations of the quality of Rio Grande water extended from El Paso to Mercedes, Texas. The annual tonnage of salts, or total dissolved solids carried by the river, was the lowest of record. The total average quantity of suspended silt at the sampling stations on the Rio Grande for the year was 14% of normal.

RIO GRANDE BELOW ELEPHANT BUTTE DAM, NEW MEXICO

DESCRIPTION: Water-stage recorder 3,800 feet below Elephant Butte Dam, and cable with sit-down cable car and winch 100 feet below the recorder. Elephant Butte Dam is 135.1 river miles above the American Dam at El Paso, Texas. The zero of the gage is 4,242.09 feet above mean sea level, U.S.C. & G.S. datum.

RECORDS: Based on 50 current meter measurements during the year, a continuous record of gage heights, and a stable rating curve. Records, marked "subject to revision," were furnished by the United States Geological Survey. Records available: January 1915 through December 1953.

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

Daily:	Max.	8,220	May 22, 1942	Min.	0	Occasionally
Monthly:	Max.	7,600	May 1942	Min.	3.0	Jan. 1930
Yearly:	Max.	2,510	1942	Min.	592	1951

Mean Daily Discharge in Second-Feet 1953 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	259	992	523	1,460	127	872	1,180	1,620	1,720	7.1	36	5.2
2	276	1,320	800	1,430	148	926	1,240	1,580	1,710	6.6	5.2	5.6
3	728	1,640	1,020	1,430	44.0	631	1,250	1,640	1,710	6.6	5.2	5.6
4	813	1,640	1,200	1,410	254	576	1,130	1,780	1,310	6.6	5.6	6.1
5	1,080	1,650	1,180	1,330	178	588	884	1,780	676	6.6	4.3	6.1
6	1,090	1,700	1,060	1,510	252	326	1,290	1,790	690	6.1	3.9	6.1
7	540	1,690	1,040	1,480	301	142	1,640	1,800	838	6.6	3.9	6.6
8	520	1,570	945	1,440	454	920	1,640	1,770	875	4.7	3.9	16.0
9	828	1,570	1,110	1,410	52.0	1,310	1,580	1,760	654	4.3	3.9	20.0
10	971	1,680	1,230	1,430	17.0	1,380	1,600	1,720	638	4.3	4.3	6.6
11	448	1,680	1,280	1,440	486	1,280	1,570	1,700	198	4.3	4.3	5.6
12	500	1,610	1,310	1,420	488	1,320	1,520	1,780	9.4	4.3	4.7	6.1
13	505	1,660	1,290	1,520	446	1,350	1,430	1,740	7.1	4.3	4.7	6.6
14	1,260	1,630	1,160	1,480	504	1,260	1,350	1,740	6.1	4.3	4.7	6.6
15	1,300	1,590	1,020	1,180	349	1,340	778	1,690	6.1	3.9	4.7	6.6
16	1,320	1,620	1,380	872	162	1,400	807	1,690	5.6	4.3	5.2	6.1
17	1,190	1,630	1,410	772	17.0	1,390	683	1,690	5.6	4.3	5.6	5.2
18	1,170	1,540	1,480	632	456	1,310	196	1,540	6.1	4.3	6.1	5.2
19	1,390	1,180	1,560	282	462	1,290	254	696	6.1	4.3	5.6	5.6
20	1,390	1,340	1,620	862	637	1,280	465	578	6.1	4.3	7.1	23.0
21	1,400	1,400	1,540	860	650	1,280	496	532	6.6	4.3	6.1	4.7
22	1,510	1,300	1,380	780	632	1,370	467	12.0	7.1	4.3	6.6	4.3
23	1,540	1,380	1,660	622	502	1,400	284	10.0	7.1	4.3	6.6	4.7
24	1,290	1,480	1,710	550	100	1,400	460	122	6.1	4.3	6.1	4.7
25	1,080	1,500	1,800	93.0	820	1,150	148	248	6.1	4.3	6.1	4.3
26	1,380	1,540	1,840	38.0	966	1,120	548	362	6.6	4.3	6.1	4.3
27	1,380	1,360	1,840	540	952	785	1,280	411	6.1	4.3	6.1	4.3
28	1,280	1,270	1,850	480	773	693	1,690	472	5.6	4.7	5.6	4.7
29	1,340		1,670	342	610	1,160	1,670	589	6.1	5.2	5.2	4.7
30	1,410		1,650	358	383	1,180	1,590	654	6.6	5.2	5.6	4.7
31	1,170		1,730		98.0		1,720	1,080		5.2		4.3
Sum	32,358	42,162	42,288	29,453.0	12,320.0	32,429	32,840	36,576.0	11,141.2	152.5	189.0	210.2

Month	Current Year 1953: Extreme Gage Feet High	Extreme Gage Feet Low	ϕ Extreme Second-Feet High Day	High	Low Day	Low	Average Second-Feet	Total Acre-Feet	Period 1924-1953: Acre-Feet Average	Maximum	Minimum
Jan.			23	1,540	1	259	1,040	64,200	27,922	86,500	184
Feb.			6	1,700	1	992	1,510	83,600	40,226	83,600	969
Mar.			28	1,850	1	523	1,360	83,900	63,604	95,300	1,520
Apr.			13	1,520	26	38.0	982	58,400	97,543	162,000	42,300
May			26	966	10	17.0	397	24,400	102,970	467,000	24,400
June			‡16	1,400	7	142	1,080	64,300	111,830	363,000	62,800
July			31	1,720	25	148	1,060	65,100	110,763	211,000	54,800
Aug.			7	1,800	23	10.0	1,180	72,500	102,053	161,000	31,000
Sept.			1	1,720	‡16	5.6	371	22,100	62,263	129,000	14,700
Oct.			1	7.1	15	3.9	4.9	302	27,685	72,100	241
Nov.			1	36.0	‡ 6	3.9	6.3	375	26,526	158,000	375
Dec.			20	23.0	‡22	4.3	6.8	417	26,487	87,300	275
Yearly				1,850		3.9	745	539,594	799,872	1,818,800	428,695

‡ And other days ϕ Mean daily

RIO GRANDE BELOW CABALLO DAM, NEW MEXICO

DESCRIPTION: Water-stage recorder and cable with sit-down cable car equipped for winch and heavy weights, located .8 river mile below Caballo Dam, and 106.8 river miles above the American Dam at El Paso, Texas. The zero of the gage is 4,140.90 feet above mean sea level, U.S.C. & G.S. datum.

RECORDS: Based on 113 meter measurements during the year and a continuous record of gage heights. Records, subject to revision, were furnished by the El Paso office of the United States Bureau of Reclamation. Records available: February 26, 1938 through December 1953.

REMARKS: Reservoirs, diversions, and drainage returns modify the river flow at this station. In addition to the outflow from Caballo Dam listed below, 2,445 acre-feet of water were diverted in 1953 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 downstream from this station. Small accretions to the river take place between this station and Percha Dam.

EXTREME FLOWS FROM RECORDS:

Average Flow in Second-Feet

Daily:	Max.	7,650	May 20, 1942	Min.	.4	Several days Nov. 1952; Nov. & Dec. 1953
Monthly:	Max.	6,710	May 1942	Min.	.4	Nov. 1953
Yearly:	Max.	2,480	1942	Min.	648	1951

Mean Daily Discharge in Second-Feet 1953 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	.7	.9	1.9	2.140	667	930	1,560	1,550	2,250	" 1.5	.6	.5
2	.7	.9	2.0	1,880	782	1,000	1,540	1,620	2,240	" 1.4	.5	.5
3	.7	.9	2.1	1,880	943	1,100	1,630	1,620	2,140	" 1.4	.5	.4
4	.7	.9	2.3	1,840	999	1,220	1,730	1,620	2,000	" 1.3	.5	.4
5	.8	.9	2.5	1,820	1,000	1,250	1,810	1,660	1,980	" 1.3	.5	.4
6	.8	.9	2.7	1,740	1,020	1,300	1,820	1,780	2,180	" 1.2	.5	.5
7	.8	.9	2.7	1,480	920	1,310	1,840	1,830	2,130	" 1.1	.4	.5
8	.8	.9	2.6	1,280	802	1,290	1,750	2,000	1,930	" 1.1	.4	.5
9	.8	.9	2.6	1,080	732	1,280	1,560	2,240	1,870	" 1.0	.4	.5
10	.7	.9	524	909	843	1,360	1,490	2,160	1,830	" 1.0	.4	.5
11	.7	1.0	1,250	830	840	1,400	1,670	2,030	1,720	" .9	.4	.5
12	.7	1.1	1,550	930	850	1,290	1,860	1,890	827	" .8	.4	.5
13	.7	1.2	1,690	924	744	1,310	1,060	1,660	" 6.0	" .8	.4	.5
14	.7	1.3	2,030	877	705	1,430	789	1,640	" 5.4	" .7	.4	.5
15	.8	1.4	2,300	774	674	1,330	793	1,790	" 4.8	" .7	.4	.5
16	.8	1.4	2,130	770	677	1,230	797	1,970	" 4.2	.6	.4	.5
17	.9	1.5	2,000	737	689	1,310	810	1,960	" 3.6	.6	.4	.5
18	1.0	1.5	2,270	763	683	1,310	1,050	1,820	" 3.0	.6	.4	.5
19	1.1	1.5	2,420	780	640	1,180	1,320	1,520	" 2.9	.6	.4	.5
20	1.2	1.5	2,440	775	588	1,290	1,310	1,360	" 2.8	.6	.4	.5
21	1.1	1.5	2,600	770	570	1,490	1,270	1,010	" 2.6	.6	.4	.6
22	1.1	1.6	2,670	673	425	1,470	1,280	1,090	" 2.5	.7	.4	.6
23	1.0	1.7	2,670	507	521	1,390	1,360	1,220	" 2.4	.7	.4	.6
24	1.0	1.8	2,680	310	758	1,370	1,660	1,400	" 2.2	.7	.4	.6
25	1.1	1.7	2,670	300	747	1,340	1,900	1,620	" 2.1	.7	.4	.6
26	1.2	1.7	2,670	404	742	1,260	2,090	1,670	" 2.0	.7	.5	.6
27	1.3	1.6	2,680	386	843	1,390	2,140	1,600	" 1.9	.6	.5	.5
28	1.2	1.8	2,680	436	870	1,590	2,080	1,640	" 1.8	.6	.5	.5
29	1.2		2,690	578	872	1,540	1,950	1,930	" 1.6	.6	.5	.5
30	1.1		2,820	678	880	1,550	1,810	2,160	" 1.5	.6	.5	.5
31	1.1		2,590		861		1,600	2,160		.6		.6
Sum	28.5	35.8	50,045.4	29,251	23,887	39,510	47,329	53,220	23,150.3	* 26.3	13.2	15.9

Month	Current Year 1953: Extreme Gage Feet High	Low	ϕ Extreme Second-Feet High Day	High	Low Day	Low	Average Second-Feet	Total Acre-Feet	Period 1938-1953: Acre-Feet Average	Maximum	Minimum
Jan.			27	1.3	‡ 1	.7	.9	56.5	1,003	4,850	40.5
Feb.			‡24	1.8	‡ 1	.9	1.3	71.0	15,440	64,300	58.5
Mar.			30	2,820	1	1.9	1,610	99,300	80,150	120,000	34,000
Apr.			1	2,140	25	300	975	58,000	113,069	212,000	58,000
May			6	1,020	22	425	771	47,400	108,850	412,000	23,500
June			28	1,590	1	930	1,320	78,400	126,600	354,000	75,600
July			27	2,140	14	789	1,530	93,900	132,069	234,000	93,900
Aug.			9	2,240	21	1,010	1,720	106,000	129,112	179,000	103,000
Sept.			1	2,250	30	1.5	772	45,900	63,731	181,000	26,200
Oct.			1	" 1.5	‡16	.6	* .8	* 52.2	10,362	35,400	52.0
Nov.			1	.6	‡ 7	.4	.4	26.2	5,522	14,400	26.2
Dec.			‡21	.6	‡ 3	.4	.5	31.5	5,727	19,100	31.5
Yearly				2,820		.4	731	529,137.4	791,635	1,795,670	469,313.1

" Estimated * Partly estimated ‡ And other days ϕ Mean daily

RIO GRANDE AT EL PASO, TEXAS

DESCRIPTION: Water-stage recorder and cable with sit-down cable car equipped for winch and heavy weights. The recorder is located 5 miles northwest of El Paso, Texas, 6 miles northwest of Juárez, Chihuahua, and 1.9 river miles above the American Dam. The cable and staff gage are located 1 mile downstream from the recorder in the pass opposite Courchesne Quarry. The zeros of the gages at the recorder and at the cable are 3,722.30 feet and 3,720.51 feet, respectively, above mean sea level, U.S.C. & G.S. datum.

RECORDS: Discharges in 1953 were computed by taking the sum of the flows in the American Canal and the flows at the station below American Dam. Records available: 1889 through December 1953.

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

EXTREME FLOWS FROM RECORDS: Momentary: Max. 24,000 second-feet on June 12, 1905, with a gage height of 6.0 feet at the lower gage. 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 on September 3, 1925.

Average Flow in Second-Feet

Daily:	Max.	23,680	June 12, 1905	Min.	0	Occasionally
Monthly:	Max.	14,300	June 1905	Min.	0	Occasionally
Yearly:	Max.	2,780	1905	Min.	70.1	1902

Mean Daily Discharge in Second-Feet 1953 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	80.4	60.3	59.2	984	259	403	506	872	864	105	81.1	64.7
2	75.8	56.0	49.2	838	270	398	533	872	893	106	82.4	63.9
3	73.5	55.3	48.2	682	335	398	578	840	1,000	97.1	85.6	61.3
4	71.0	56.6	47.6	762	364	442	565	* 699	1,060	93.0	83.5	61.6
5	70.9	56.0	43.4	875	400	541	632	* 659	961	96.2	81.4	60.9
6	70.7	53.6	40.0	967	508	569	793	* 672	937	90.3	75.1	60.7
7	72.9	54.9	37.7	923	544	610	801	684	869	92.6	69.2	61.5
8	70.6	59.9	35.9	793	556	669	857	843	884	93.6	68.1	61.9
9	70.5	55.6	39.0	665	528	660	868	890	786	94.0	67.0	60.1
10	70.4	56.9	38.4	637	527	651	777	962	634	93.2	67.8	59.9
11	77.0	56.8	38.9	663	504	677	705	906	571	92.8	69.9	61.5
12	72.6	54.8	35.8	589	409	694	755	845	561	91.8	64.8	62.7
13	74.7	49.9	46.9	548	456	844	1,580	842	594	85.0	66.8	63.7
14	79.2	48.4	581	551	460	740	1,260	747	473	86.2	67.6	61.6
15	79.3	50.0	935	536	455	722	716	779	266	86.9	71.0	62.1
16	79.4	48.6	1,310	528	395	654	496	773	221	86.5	71.8	60.9
17	72.8	45.1	882	475	393	650	* 498	793	190	84.8	71.9	56.6
18	72.9	44.7	544	400	377	622	393	823	175	91.6	72.0	55.1
19	66.7	" 44.6	626	400	349	708	388	888	162	91.6	70.4	57.8
20	64.9	" 48.6	968	414	365	634	420	865	155	91.6	72.2	59.9
21	62.9	" 52.2	934	411	402	581	465	689	150	90.3	72.2	61.7
22	62.7	" 50.0	962	423	382	575	500	721	140	89.0	70.4	61.3
23	64.3	" 48.7	1,080	397	329	567	489	597	140	87.7	68.7	48.1
24	64.2	" 47.4	915	395	354	611	438	505	129	86.4	70.4	61.1
25	65.9	" 47.6	934	403	291	592	418	470	120	85.1	70.4	65.5
26	67.5	" 46.8	897	318	306	561	533	444	130	83.8	72.2	54.9
27	67.3	" 46.4	951	340	372	511	845	684	128	79.0	72.2	66.7
28	62.9	52.2	1,080	211	345	495	894	739	122	75.9	70.4	60.7
29	66.0		1,050	252	397	466	919	767	111	82.0	70.6	56.0
30	65.3		1,170	255	391	511	931	808	109	90.9	63.5	53.8
31	62.9		1,240		412		824	913		86.0		51.6
Sum	2,178.1	*1,447.9	17,619.2	16,635	12,435	17,756	21,377	23,591	13,535	2,785.9	2,160.6	1,859.8

Month	Current Year 1953: Extreme Gage Feet High	Low	Extreme Second-Feet High	Day	Low	Day	Average Second-Feet	Total Acre-Feet	Period 1924-1953: Acre-Feet Average	Maximum	Minimum
Jan.	2.72	2.54	83.9	16	51.6	22	70.3	4,320	10,511	17,500	4,290
Feb.	2.80	2.25	66.9	18	37.2	18	* 51.7	* 2,870	17,250	52,200	* 2,870
Mar.	6.09	2.30	2,210	29	32.7	13	568	34,900	38,445	62,500	8,970
Apr.	5.29	3.07	1,120	6	169	28	554	33,000	62,504	139,000	26,100
May	4.26	3.04	594	8	210	25	401	24,700	70,955	357,000	17,900
June	4.96	3.52	930	13	376	‡ 1	592	35,200	73,121	304,000	33,900
July	7.30	3.38	4,650	13	363	25	690	42,400	79,910	198,000	42,400
Aug.	5.45	3.64	1,190	19	406	26	761	46,800	82,578	158,000	46,800
Sept.	5.19	2.50	1,110	3	95.3	30	451	26,800	60,333	171,000	17,100
Oct.	2.66	2.23	114	2	62.0	28	89.9	5,530	24,330	57,900	5,530
Nov.	2.55	2.23	89.6	5	52.5	25	72.0	4,290	16,014	29,500	4,290
Dec.	2.65	2.24	102	26	36.8	23	60.0	3,690	15,051	27,700	3,690
Yearly	7.30	2.23	4,650		32.7		365	264,500	551,002	1,559,200	252,000

" Estimated * Partly estimated ‡ And other days

RIO GRANDE BELOW AMERICAN DAM

DESCRIPTION: Water-stage recorder and cable with sit-down cable car equipped for winch and heavy weights, located 3,200 feet below the American Dam and 1.5 miles above the International Dam, west of El Paso, Texas. The American Dam is 1,241.4 river miles above the Gulf of Mexico. The zero of the gage is 3,712.30 feet above mean sea level, U.S.C. & G.S. datum.

RECORDS: Based on 54 meter measurements during the year and a continuous record of gage heights. Computations by shifting channel methods. Records available: June 1, 1938 through December 1953.

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 was diverted into the American Canal (see records of "Diversions from the Rio Grande") and the remainder, including excess flood flows, passed this station.

EXTREME FLOWS FROM RECORDS: Momentary: Max. 6,770 second-feet on May 18, 1942, with a gage height of 9.77 feet. Min. .2 second-foot on September 12, 1951.

Average Flow in Second-Feet

Daily:	Max.	6,040	May 20, 1942	Min.	.7	Sept. 9, 1951
Monthly:	Max.	4,880	May 1942	Min.	2.0	Dec. 1942
Yearly:	Max.	1,510	1942	Min.	70.4	1951

Mean Daily Discharge in Second-Feet 1953 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	80.4	60.3	5.2	65.9	126	120	109	138	160	8.5	81.1	4.6
2	75.8	56.0	5.6	84.7	134	112	114	141	164	8.1	82.4	4.4
3	73.5	55.3	4.6	81.7	133	115	112	141	171	6.5	85.6	4.1
4	71.0	56.6	4.0	85.9	140	106	109	* 138	163	6.5	83.5	3.9
5	70.9	56.0	3.6	82.8	148	95.9	105	* 135	164	6.5	81.4	* 3.7
6	70.7	53.6	4.5	77.9	142	99.0	108	* 139	165	6.1	75.1	* 3.5
7	72.9	54.9	4.5	74.8	138	97.9	109	141	163	6.1	42.8	* 3.2
8	70.6	59.9	4.3	78.3	138	93.7	114	132	178	5.5	3.0	* 3.0
9	70.5	55.6	4.1	81.9	136	98.9	110	132	184	5.9	2.5	2.9
10	70.4	56.9	5.2	79.8	133	100	108	132	216	6.7	2.0	2.7
11	77.0	56.8	5.7	79.6	134	93.8	103	126	18.2	6.3	2.1	2.6
12	72.6	54.8	4.2	79.4	142	90.2	128	125	10.2	6.1	2.2	2.4
13	74.7	49.9	3.4	83.1	143	90.9	603	127	7.7	6.1	2.3	2.3
14	79.2	48.4	8.4	84.7	140	87.3	132	128	8.0	5.0	2.5	2.1
15	79.3	50.0	10.6	76.6	136	90.0	97.5	126	101	1.9	2.6	2.0
16	79.4	48.6	488	74.1	135	94.8	91.7	120	221	1.5	2.7	2.0
17	72.8	45.1	181	73.4	142	88.6	282	126	190	54.1	2.8	2.3
18	72.9	44.7	4.6	76.4	138	88.6	110	126	175	91.6	46.4	2.0
19	66.7	19.3	3.3	81.2	137	88.7	99.0	131	162	91.6	70.4	1.8
20	64.9	5.2	5.4	82.6	137	88.7	141	127	155	91.6	72.2	1.6
21	62.9	8.8	4.9	79.8	144	88.8	176	124	150	90.3	72.2	1.6
22	62.7	6.6	4.9	81.0	149	88.8	180	155	140	89.0	70.4	* 3.0
23	64.3	5.3	6.4	78.0	154	93.1	180	155	140	87.7	68.7	* 2.5
24	64.2	4.0	5.4	83.4	149	95.2	167	168	129	86.4	70.4	1.8
25	65.9	4.2	5.1	84.6	150	93.2	162	178	50.3	85.1	70.4	1.3
26	67.5	3.4	5.4	83.7	150	95.3	183	186	9.9	83.8	72.2	1.1
27	67.3	3.0	5.4	80.7	144	93.3	176	194	10.7	79.0	72.2	1.6
28	62.9	2.9	4.6	75.6	144	95.4	188	196	10.7	75.9	70.4	39.8
29	66.0		4.0	75.6	143	97.6	192	190	10.3	82.0	46.5	56.0
30	65.3		50.2	79.7	146	102	195	189	9.9	90.9	¤ 4.6	53.8
31	62.9		15.8		151		192	200		86.0		51.6
Sum	2,178.1	1,026.1	872.3	2,386.9	4,376	2,882.7	4,876.2	4,566	3,436.9	1,358.3	1,363.6	271.2

Month	Current Year 1953: 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 June 1938-1953: Acre-Feet Average	Acre-Feet Maximum	Acre-Feet Minimum
Jan.	5.07	4.91	16	83.9	22	51.6	70.3	4,320	8,123	12,000	4,170
Feb.	4.99	4.31	18	66.9	26	1.4	36.6	2,040	4,827	32,800	521
Mar.	6.95	4.33	16	1,520	13	2.8	28.1	1,730	3,323	17,500	* 1,390
Apr.	5.24	4.33	1	171	1	11.4	79.6	4,730	11,533	74,500	2,230
May	5.28	4.91	1	171	1	81.8	141	8,680	31,329	300,000	5,660
June	5.22	4.83	1	151	19	71.6	96.1	5,720	26,701	250,000	5,720
July	7.95	4.50	13	3,440	15	35.8	157	9,670	21,656	155,000	8,780
Aug.	5.54	5.00	31	265	16	97.7	147	9,060	19,004	114,000	6,040
Sept.	5.56	4.14	15	257	15	5.1	115	6,820	18,151	124,000	925
Oct.	5.04	3.88	29	110	‡16	¤ 1.3	43.8	2,690	3,635	19,000	197
Nov.	4.97	4.00	5	89.6	10	2.0	45.5	2,700	2,662	8,700	¤ 119
Dec.	4.88	4.27	28	64.0	‡25	1.1	8.7	538	1,676	7,760	120
Yearly	7.95	3.88		3,440		1.1	81.1	58,698	152,620	1,093,553	50,974

¤ Estimated * Partly estimated ‡ And other days

RIO GRANDE AT JUAREZ, CHIHUAHUA

DESCRIPTION: Water-stage recorder and cable with sit-down cable car equipped for winch and heavy weights, located 2.9 river miles downstream from El Paso, Texas and Juárez, Chihuahua. This station is 7.0 river miles below the American Dam at El Paso, Texas and 4.9 river miles below the International Dam. The zero of the gage is 3,683.98 feet above mean sea level, U.S.C. & G.S. datum.

RECORDS: Based on 153 meter measurements during the year, 136 by the Mexican and 17 by the United States Section of this Commission, and a continuous record of gage heights. Computations by shifting channel methods. Records available: April 1, 1938 through December 1953.

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

EXTREME FLOWS FROM RECORDS: Momentary: Max. 6,600 second-feet on May 18, 1942, with a gage height of 11.15 feet. Min. 4.9 second-feet on December 10, 1953, with a gage height of 2.56 feet.

Average Flow in Second-Feet

Daily:	Max.	6,460	May 20, 1942	Min.	17.0	Dec. 21, 1944
Monthly:	Max.	5,290	May 1942	Min.	37.9	Feb. 1953
Yearly:	Max.	1,820	1942	Min.	170	1951

Mean Daily Discharge in Second-Feet 1953 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	60.7	53.3	33.2	516	78.0	111	117	334	381	30.7	72.7	19.1
2	61.8	54.4	31.1	378	58.6	123	135	378	456	32.1	71.7	20.1
3	59.7	56.5	29.3	352	102	121	176	351	509	30.0	71.3	23.0
4	60.7	43.1	31.1	353	114	165	166	240	597	27.2	74.9	26.1
5	66.0	38.1	25.8	505	135	256	242	171	477	27.9	75.2	29.0
6	59.0	43.1	25.1	576	204	296	413	162	445	27.5	69.9	27.2
7	55.8	37.1	25.8	519	217	331	410	194	364	25.8	65.7	29.7
8	56.9	40.6	24.7	406	245	385	480	406	378	26.5	41.7	19.1
9	57.9	39.9	32.5	271	186	367	466	424	292	27.2	39.2	23.0
10	59.0	49.8	35.0	252	200	340	434	519	171	27.9	25.8	29.0
11	72.4	49.1	29.7	293	198	340	341	470	234	26.5	23.7	71.7
12	77.7	40.6	27.9	232	130	300	320	413	230	28.6	24.7	64.3
13	70.6	33.2	28.3	178	172	420	509	378	316	28.3	25.8	59.3
14	65.3	27.9	287	201	192	353	646	327	209	31.8	26.8	62.9
15	66.7	30.4	727	208	178	326	456	326	106	35.3	26.5	67.5
16	64.3	29.3	1,220	226	135	278	277	351	193	31.8	30.0	62.2
17	57.9	31.8	724	183	121	291	289	374	172	66.0	26.5	57.9
18	58.3	29.7	357	127	112	280	132	406	150	73.8	54.4	53.0
19	55.1	36.0	484	114	69.2	351	73.5	403	131	78.0	63.9	61.4
20	65.3	32.5	943	123	55.4	305	68.5	487	119	71.3	58.6	57.6
21	60.4	31.1	622	137	94.6	224	67.1	282	116	78.4	54.7	44.8
22	55.4	35.0	565	253	79.1	209	74.9	229	107	82.3	54.4	23.0
23	57.9	36.7	749	182	31.8	183	87.6	204	107	81.6	61.1	27.2
24	53.0	36.0	593	161	39.2	220	58.3	110	92.2	85.5	54.7	27.2
25	53.3	30.7	579	161	40.3	199	39.6	105	66.0	79.1	52.6	23.0
26	57.2	31.4	523	125	36.7	183	49.8	77.0	33.9	67.8	51.2	19.4
27	78.4	31.8	519	138	73.5	142	258	221	26.8	62.5	66.0	19.4
28	53.3	32.5	650	98.5	58.3	115	326	299	30.4	65.7	72.7	44.1
29	57.9		561	77.7	72.4	102	342	321	30.0	97.5	57.2	56.5
30	55.4		780	73.5	83.0	131	410	343	31.4	84.8	24.7	51.6
31	56.2		812		109		302	406		79.8		51.6
Sum	1,889.5	1,061.6	12,074.5	7,419.7	3,620.1	7,447	8,166.3	9,711.0	6,570.7	1,619.2	1,518.3	1,250.9

Month	Current Year 1953: 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 Apr. 1938-1953: Acre-Feet Average	Acre-Feet Maximum	Acre-Feet Minimum
Jan.	2.99	2.69	27	78.4	22	43.1	61.0	3,750	9,863	13,270	3,750
Feb.	2.85	2.46	3	68.9	18	25.4	37.9	2,110	9,512	42,690	2,110
Mar.	5.15	2.43	16	1,550	8	24.7	390	23,950	25,012	45,790	6,640
Apr.	4.72	2.95	6	742	30	73.5	247	14,720	38,446	111,500	12,680
May	4.00	2.66	8	280	24	24.7	117	7,180	44,008	325,100	4,620
June	4.86	3.02	13	519	1	72.4	248	14,770	47,815	272,400	14,710
July	5.41	2.72	14	759	25	33.9	263	16,200	48,758	162,500	16,200
Aug.	5.45	2.82	20	717	26	50.9	313	19,260	47,038	127,300	19,260
Sept.	5.28	2.79	4	653	27	26.8	219	13,030	34,919	143,800	6,880
Oct.	4.04	2.59	29	280	14	21.9	52.2	3,210	15,474	45,390	3,210
Nov.	3.22	2.69	2	87.6	17	18.4	50.6	3,010	8,382	13,670	3,010
Dec.	3.22	2.56	12	89.7	10	4.9	40.4	2,480	8,691	18,060	2,480
Yearly	5.45	2.43		1,550		4.9	171	123,670	337,918	1,315,890	122,740

RIO GRANDE AT ISLAND STATION

DESCRIPTION: Water-stage recorder and cable with sit-down cable car equipped for winch and heavy weights, located near Clint, Texas and San Agustín, Chihuahua. This station is on the rectified channel of the Rio Grande, 27.1 river miles below the American Dam at El Paso, Texas. The zero of the gage is 3,608.99 feet above mean sea level, U.S.C. & G.S. datum.

RECORDS: Based on 49 meter measurements during the year, 38 by the United States and 11 by the Mexican Section of this Commission, and a continuous record of gage heights. Computations by shifting channel methods. Records available: August 17, 1938 through December 1953.

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

EXTREME FLOWS FROM RECORDS: Momentary: Max. 6,490 second-feet on May 19, 1942, with a gage height of 16.06 feet. Min. frequently no flow.

Average Flow in Second-Feet

Daily:	Max.	6,140	May 19, 1942	Min.	0	Frequently
Monthly:	Max.	4,880	May 1942	Min.	0	Several months 1951 & 1953
Yearly:	Max.	1,490	1942	Min.	7.9	1952

Mean Daily Discharge in Second-Feet 1953 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	40.7	43.1	5.5	27.1	.5	.6	.1	5.9	25.4	0	0	0
2	38.1	40.5	6.5	8.2	.4	.6	.3	5.7	37.0	0	0	0
3	40.7	41.4	4.9	6.0	.2	1.5	.3	5.3	4.9	0	0	0
4	36.0	39.8	3.8	5.6	1.4	.3	.3	4.5	4.8	0	0	0
5	35.0	40.3	4.0	6.0	2.8	.3	.4	4.1	7.6	0	0	0
6	36.0	33.4	4.8	37.9	.7	.6	.6	3.8	9.4	0	0	0
7	42.5	35.1	4.9	21.8	.9	.5	1.2	4.0	11.0	0	0	0
8	43.4	32.0	4.8	8.2	1.1	.9	1.6	4.4	7.4	0	0	0
9	43.2	33.7	5.0	6.4	.9	1.1	2.1	5.3	4.9	0	0	0
10	40.5	34.2	4.9	6.1	.5	.1	1.8	5.5	2.1	0	0	0
11	39.1	29.4	3.8	5.6	.6	.4	.9	5.5	1.6	0	0	0
12	44.5	31.3	3.5	10.4	1.0	.4	.9	5.4	2.8	0	0	0
13	45.9	29.3	4.1	9.3	1.2	.3	598	5.3	2.9	0	0	0
14	39.4	27.0	3.2	4.7	1.6	2.0	460	4.6	3.8	0	0	0
15	43.1	12.6	4.0	4.0	4.9	2.3	174	3.1	1.4	0	0	0
16	44.5	10.8	898	3.5	1.7	2.6	12.8	3.9	1.5	0	0	0
17	44.7	5.9	190	3.4	.6	2.8	7.1	4.5	1.8	0	0	0
18	43.6	5.1	22.1	2.7	1.0	3.2	6.6	4.9	.7	0	0	0
19	41.5	3.3	10.8	2.4	1.6	1.9	3.3	3.5	.1	0	0	0
20	40.5	4.1	10.2	2.4	1.2	.8	2.1	3.7	.1	0	0	0
21	39.6	4.5	10.0	2.4	.6	1.3	2.5	6.7	0	0	0	0
22	37.5	4.5	8.4	3.0	.9	.8	1.4	3.5	0	0	0	0
23	35.6	4.0	7.6	2.9	.4	.5	.7	3.4	1.3	0	0	0
24	40.6	4.4	6.6	2.1	0	.7	.3	1.9	2.5	0	0	0
25	37.3	3.7	6.1	1.7	0	2.0	.1	1.4	1.8	0	0	0
26	37.6	4.7	5.6	1.4	0	1.4	0	.8	.1	0	0	0
27	41.6	4.1	4.4	1.1	0	.7	.5	3.2	0	0	0	0
28	41.9	4.8	6.0	1.1	0	.4	4.6	6.1	0	0	0	0
29	41.6		6.1	.9	1.2	.4	6.5	6.1	0	0	0	0
30	44.8		115	.5	.9	.2	6.8	6.5	0	0	0	8.2
31	45.7		10.4		.9		6.9	7.0		0		24.5
Sum	1,266.7	567.0	1,385.0	198.8	29.7	31.6	1,304.7	139.5	136.9	0	0	32.7

Month	Current Year 1953								Period Sept. 1938-1953		
	Extreme Gage Feet		Extreme Second-Feet				Average Second-Feet	Total Acre-Feet	Acre-Feet		
	High	Low	Day	High	Day	Low			Average	Maximum	Minimum
Jan.	10.16	9.97	1	55.1	23	31.7	40.9	2,510	7,913	11,900	2,020
Feb.	10.08	9.41	1	64.9	19	2.9	20.2	1,120	6,144	37,000	161
Mar.	13.55	9.30	16	2,210	14	2.8	44.7	2,750	4,187	21,000	20.2
Apr.	10.52	9.10	6	189	30	.5	6.6	394	7,647	70,500	5.0
May	9.54		4	9.5	‡ 3	0	1.0	58.9	22,652	299,800	21.0
June	9.43		3	4.7	‡ 2	0	1.1	62.7	19,147	241,000	62.7
July	13.69		13	2,380	‡26	0	42.1	2,590	14,709	* 118,500	81.1
Aug.	9.57	9.04	21	10.3	26	.2	4.5	277	13,380	99,400	277
Sept.	10.17		2	74.6	‡20	0	4.6	272	15,680	* 119,200	97.0
Oct.				0		0	0	0	7,084	42,800	0
Nov.				0		0	0	0	1,662	7,270	0
Dec.	9.80		31	27.7	‡ 1	0	1.1	64.9	3,254	12,900	0
Yearly	13.69			2,380		0	14.0	10,099.5	123,459	1,079,340	5,708.5

* Partly estimated ‡ And other days

RIO GRANDE AT COUNTY LINE STATION

DESCRIPTION: Water-stage recorder and cable with sit-down cable car equipped for winch and heavy weights, located .8 mile downstream from the El Paso-Hudspeth county line. This gaging station is on the rectified channel of the Rio Grande, 47.3 river miles below the American Dam at El Paso, Texas. The zero of the gage is 3,547.59 feet above mean sea level, U.S.C. & G.S. datum.

RECORDS: Based on 4 meter measurements during the year and a continuous record of gage heights. Computations by shifting channel methods. Records available: January 1, 1938 through December 1953.

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

EXTREME FLOWS FROM RECORDS: Momentary: Max. 6,340 second-feet on May 19, 1942, with a gage height of 8.66 feet. Min. frequently no flow.

Average Flow in Second-Feet

Daily:	Max.	6,180	May 18, 1942	Min.	0	Frequently
Monthly:	Max.	4,920	May 1942	Min.	0	Frequently
Yearly:	Max.	1,720	1942	Min.	.5	1952

Mean Daily Discharge in Second-Feet 1953 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	0	4.2	0	0	0	0	0	0	0	0	0	0
2	0	4.4	0	0	0	0	0	0	0	0	0	0
3	12.0	2.2	0	0	0	0	0	0	0	0	0	0
4	9.4	0	0	0	0	0	0	0	0	0	0	0
5	10.8	0	0	0	0	0	0	0	0	0	0	0
6	11.0	0	0	0	0	0	0	0	0	0	0	0
7	8.4	0	.4	0	0	0	0	0	0	0	0	0
8	3.2	0	1.0	0	0	0	0	0	0	0	0	0
9	10.0	0	1.0	0	0	0	0	0	0	0	0	0
10	0	0	1.0	0	0	0	0	0	0	0	0	0
11	0	0	1.0	0	0	0	0	0	0	0	0	0
12	0	0	1.0	0	0	0	.1	0	0	0	0	0
13	0	0	.5	0	0	0	189	0	0	0	0	0
14	0	0	.2	0	0	0	296	0	0	0	0	0
15	0	0	0	0	0	0	215	0	0	0	0	0
16	0	0	0	0	0	0	60.5	0	0	0	0	0
17	0	0	67.2	0	0	0	5.9	0	0	0	0	0
18	0	0	3.0	0	0	0	1.6	0	0	0	0	0
19	0	0	0	0	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0	0	0	0	0
21	0	0	0	0	0	0	0	0	0	0	0	0
22	0	0	0	0	0	0	0	0	0	0	0	0
23	0	0	0	0	0	0	0	0	0	0	0	0
24	0	0	0	0	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0	0	0	0	0
26	0	0	0	0	0	0	0	0	0	0	0	0
27	8.7	0	0	0	0	0	0	0	0	0	0	4.4
28	4.4	0	0	0	0	0	0	0	0	0	0	0
29	4.2		0	0	0	0	0	0	0	0	0	0
30	4.2		0	0	0	0	0	0	0	0	0	0
31	4.2		0		0		0	0		0		0
Sum	90.5	10.8	76.3	0	0	0	768.1	0	0	0	0	4.4

Month	Current Year 1953: 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 1938-1953 Acre-Feet Average	Maximum	Minimum
Jan.	3.21		27	49.0	‡ 1	0	2.9	180	12,374	20,000	0
Feb.	2.32		3	4.5	‡ 3	0	.4	21.4	10,688	47,900	0
Mar.	4.13		17	243	‡ 1	0	2.5	151	9,369	38,900	0
Apr.				0		0	0	0	14,177	84,200	0
May				0		0	0	0	27,326	303,000	0
June				0		0	0	0	24,139	239,000	0
July	5.65		13	577	‡ 1	0	24.8	1,520	22,136	140,000	0
Aug.				0		0	0	0	21,131	123,000	0
Sept.				0		0	0	0	24,176	140,000	0
Oct.				0		0	0	0	16,121	61,400	0
Nov.				0		0	0	0	10,893	20,400	0
Dec.	2.96		27	28.3	‡ 1	0	.1	8.7	11,999	29,700	0
Yearly	5.65			577		0	2.6	1,881.1	204,529	1,247,500	347.5

‡ And other days

RIO GRANDE AT FORT QUITMAN, TEXAS

DESCRIPTION: Water-stage recorder and cable with sit-down cable car equipped for winch and heavy weights, located on the rectified channel of the Rio Grande, 1.5 miles below Old Fort Quitman and 81.1 river miles below the American Dam at El Paso, Texas. The zero of the gage is 3,450.57 feet above mean sea level, U.S.C. & G.S. datum.

RECORDS: Based on 48 meter measurements during the year, 43 by the United States and 5 by the Mexican Section of this Commission, and a continuous record of gage heights. Computations by shifting channel methods. Records available: January 1923 through December 1953.

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

EXTREME FLOWS FROM RECORDS: Momentary: Max. 10,600 second-feet on October 5, 1946, with a gage height of 10.00 feet. Min. frequently no flow.

Average Flow in Second-Feet

Daily:	Max.	5,890	May 19, 1942	Min.	0	Frequently
Monthly:	Max.	5,030	May 1942	Min.	0	April & May 1952
Yearly:	Max.	1,750	1942	Min.	15.3	1952

Mean Daily Discharge in Second-Feet 1953 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	34.0	10.1	8.7	6.0	1.5	* 28.8	.6	* 157	5.6	.7	1.9	2.3
2	24.6	9.6	8.1	6.0	0	* 6.5	1.3	" 3.4	105	.6	1.9	2.1
3	21.4	9.2	7.9	5.6	1.6	* .3	1.4	" 1.5	1.1	.6	2.1	2.1
4	20.3	9.6	6.6	6.0	2.9	* .1	1.3	* 1.4	1.0	.6	2.2	2.1
5	22.0	11.8	6.8	6.4	3.3	0	1.3	* 2.1	.9	.6	2.4	2.1
6	25.5	12.4	6.3	3.5	2.2	0	113	35.5	.9	.6	2.2	1.9
7	25.3	12.0	6.1	2.7	3.2	0	* 3.2	43.3	.8	.6	2.4	1.9
8	30.8	11.8	7.7	3.5	1.3	0	366	33.3	* .6	.6	2.4	1.9
9	21.9	11.2	7.6	4.2	1.1	0	* 223	16.9	* .6	.6	2.2	2.0
10	22.9	11.3	7.4	3.6	.1	0	* 14.9	8.3	3.3	.7	2.5	2.1
11	32.4	10.7	7.3	2.9	.6	0	9.2	12.8	1.3	.7	2.3	1.9
12	43.7	10.5	6.9	2.7	.1	0	6.9	7.9	1.1	.8	2.3	2.0
13	30.8	9.6	6.9	3.0	.1	0	*4,370	29.9	.9	.7	2.3	1.8
14	26.2	9.1	5.2	3.8	.1	0	* 828	10.2	.9	.6	2.8	1.7
15	30.2	8.4	2.2	4.5	0	0	* 357	17.8	.8	.9	2.4	1.6
16	25.3	8.8	11.8	4.4	0	* .4	324	22.6	.7	.8	2.4	1.7
17	22.1	9.0	7.7	2.5	.3	* 0	208	193	.6	.9	2.4	1.8
18	28.9	8.5	5.4	3.6	.1	* 2.5	148	* 473	.6	.9	2.4	1.8
19	23.1	9.4	5.7	3.3	.1	" 1.1	* 30.2	" 42.9	.6	.7	2.1	1.8
20	36.0	9.2	5.6	3.4	.1	" .1	* 29.7	* 2.2	.3	.7	2.7	1.9
21	27.6	9.8	5.5	2.7	.1	" .2	* 90.0	2.9	0	.6	2.8	1.8
22	18.6	10.5	5.9	3.9	0	" .9	26.1	2.7	0	.6	2.7	1.9
23	17.3	11.1	5.3	4.1	0	" .4	10.3	2.9	0	.7	3.0	2.5
24	16.5	13.8	5.2	5.1	0	" .2	5.1	3.0	.6	.7	2.5	3.4
25	15.1	10.7	5.6	4.5	0	" .6	34.0	2.7	.8	.5	2.4	2.9
26	14.3	9.4	6.2	2.4	0	" 1.3	36.5	2.6	.7	.5	2.5	2.4
27	15.6	8.8	6.4	1.9	0	" 1.3	44.4	2.8	.7	.5	2.5	2.4
28	14.8	8.9	6.5	1.4	.8	" 1.8	17.5	2.7	.6	.5	2.4	2.2
29	13.8		6.1	3.3	0	" 1.8	12.1	2.8	.6	1.7	2.4	2.4
30	12.0		6.2	3.2	0	" 1.2	16.8	2.8	.6	3.7	2.4	3.0
31	10.6		5.9		0		97.3	2.8		2.1		2.6
Sum	723.6	285.2	202.7	114.1	19.6	* 49.5	*7,427.1	*1,145.7	132.2	26.0	71.9	66.0

Month	Current Year 1953								Period 1924-1953		
	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.	2.63	2.10	1	58.2	31	10.2	23.3	1,440	12,165	20,900	1,440
Feb.	2.25	2.02	24	16.8	17	6.8	10.2	566	12,058	50,100	566
Mar.	2.28	1.92	16	18.1	‡15	2.1	6.5	402	9,992	38,900	332
Apr.	2.07	1.76	5	6.9	30	.1	3.8	226	12,415	* 77,000	0
May	2.64		3	67.4	‡ 1	0	.6	38.9	22,484	309,000	0
June	3.51		1	457	‡ 1	0	* 1.6	* 98.2	20,501	240,000	" 20.2
July	10.40	1.78	13	9,660	1	.3	*240	*14,700	21,330	140,000	973
Aug.	6.86	2.33	18	3,620	10	.1	* 37.0	* 2,270	26,005	* 127,000	185
Sept.	4.90		2	1,210	‡20	0	4.4	262	29,632	147,000	260
Oct.	3.08	2.59	29	9.5	‡25	.5	.8	51.6	21,862	66,500	51.6
Nov.	2.80	2.58	23	3.8	1	1.8	2.4	143	14,103	24,500	143
Dec.	3.00	2.63	24	8.1	‡15	1.5	2.1	131	14,601	31,000	131
Yearly	10.40			9,660		0	* 28.1	*20,328.7	217,148	1,270,400	11,129

" Estimated * Partly estimated ‡ And other days

RIO GRANDE AT UPPER PRESIDIO STATION

DESCRIPTION: Water-stage recorder and cable with sit-down cable car equipped for winch and heavy weights, located 7.8 river miles above the confluence of the Río Conchos, about 10 miles northwest of Presidio, Texas and Ojinaga, Chihuahua, and 285.7 river miles below the American Dam at El Paso, Texas. The zero of the gage is 2,576.66 feet above mean sea level, U.S.C. & G.S. datum.

RECORDS: Based on 19 meter measurements during the year and a continuous record of gage heights. Computations by shifting channel methods. Records available: May 1900 to March 1914 and August 1923 through December 1953.

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

EXTREME FLOWS FROM RECORDS: Momentary: Max. # 14,000 second-feet on June 14, 1905. A gage height of 10.57 feet was recorded on May 26, 1942, with a flow of 5,160 second-feet. This level was the highest reached during the years 1923-1953, inclusive. Min. frequently no flow.

Average Flow in Second-Feet

Daily:	Max. # 13,700	June 13 & 14, 1905	Min.	0	Frequently
Monthly:	Max. 10,150	June 1905	Min.	0	Frequently
Yearly:	Max. 1,970	1907	Min.	12.5	1953

Mean Daily Discharge in Second-Feet 1953 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	0	0	0	0	0	0	* .9	194	55.3	0	0	0
2	0	0	0	0	0	0	0	280	9.2	0	0	0
3	0	0	0	0	0	0	0	299	2.7	0	0	0
4	0	0	0	0	0	0	0	211	121	0	0	0
5	0	0	0	0	0	0	0	* 51.6	29.4	61.9	0	0
6	0	0	0	0	0	0	0	11.9	3.2	18.0	0	0
7	0	0	0	0	0	0	0	2.2	.1	.1	0	0
8	0	0	0	0	0	0	0	0	0	0	0	0
9	0	0	0	0	0	0	0	0	0	0	0	0
10	0	0	0	0	0	165	0	0	0	0	0	0
11	0	0	0	0	0	* 8.0	0	0	0	0	0	0
12	0	0	0	0	0	* .8	0	0	0	0	0	0
13	0	0	0	0	0	0	.1	0	0	0	0	0
14	0	0	0	0	0	0	212	0	0	0	0	0
15	0	0	0	0	0	0	36.5	0	0	0	0	0
16	0	0	0	0	0	0	.5	0	0	0	0	0
17	0	0	0	0	0	0	266	0	0	0	0	0
18	0	0	0	0	0	0	117	0	0	0	0	0
19	0	0	0	0	0	0	186	0	0	0	0	0
20	0	0	0	0	0	0	312	83.3	0	0	0	0
21	0	0	0	0	0	0	361	330	0	0	0	0
22	0	0	0	0	0	0	166	109	0	0	0	0
23	0	0	0	0	0	0	43.8	14.1	0	0	0	0
24	0	0	0	0	0	0	60.7	3.1	0	0	0	0
25	0	0	0	0	0	0	57.2	.2	0	0	0	0
26	0	0	0	0	0	0	206	0	0	0	0	0
27	0	0	0	0	0	0	204	0	0	0	0	0
28	0	0	0	0	0	0	56.5	0	0	0	0	0
29	0		0	0	0	0	121	0	0	0	0	0
30	0		0	0	0	¤ 1.4	31.4	0	0	0	0	0
31	0		0		0		43.2	32.1		0		0
Sum	0	0	0	0	0	175.2	2,481.8	1,621.5	220.9	80.0	0	0

Month	Current Year 1953: 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 1924-1953: Acre-Feet Average	Acre-Feet Maximum	Acre-Feet Minimum
Jan.							0	0	11,345	24,400	0
Feb.							0	0	10,508	40,800	0
Mar.							0	0	8,328	39,100	0
Apr.							0	0	6,842	41,600	0
May							0	0	16,367	240,000	0
June	7.28		10	647	‡ 1	0	5.8	348	15,937	216,000	* 218
July	7.70		14	731	‡ 1	0	80.1	4,920	22,188	158,000	* 13.1
Aug.	6.07		2	439	‡ 8	0	52.3	3,220	28,099	133,000	120
Sept.	4.99		4	271	‡ 8	0	7.4	438	32,075	* 151,000	0
Oct.	4.78		5	236	‡ 1	0	2.6	159	27,292	105,000	0
Nov.							0	0	13,213	34,500	0
Dec.							0	0	12,836	30,900	0
Yearly	7.70			731		0	12.5	9,085	205,030	1,176,700	9,085

¤ Estimated * Partly estimated ‡ And other days # Previously published discharges and dates are erroneous. The figures and dates shown above are based on a recent study of records for the period 1900-1914.

RIO CONCHOS AT CUCHILLO PARADO, CHIHUAHUA

DESCRIPTION: Water-stage recorder and cable with cable car, located in Salineta Canyon, 3.1 miles north of the town of Cuchillo Parado, Chihuahua, 28.6 air-line miles westward from Ojinaga, Chihuahua, and 49.1 river miles above the confluence of the Río Conchos with the Río Grande, which is 293.5 river miles below the American Dam at El Paso, Texas. The zero of the gage is 2,914.23 feet above mean sea level, U.S.C. & G.S. datum.

RECORDS: Based on 160 meter measurements during the year and a continuous record of gage heights. Computations by shifting channel methods. Records available: January 1, 1945 through December 1953.

REMARKS: The flow of this stream is modified by irrigation diversions and drainage returns and by the operation of La Rosetilla, La Colina, and La Boquilla reservoirs situated 139, 199, and 206 river miles, respectively, above this station and also by Madero Reservoir on the Río San Pedro, which enters the Río Conchos 122 river miles above this station.

EXTREME FLOWS FROM RECORDS: Momentary: Max. 39,200 second-feet on July 12, 1952, with a gage height of 17.19 feet. Min. .7 second-foot on July 13, 1953, with a gage height of 2.30 feet.

Average Flow in Second-Feet

Daily:	Max.	19,950	July 13, 1952	Min.	.7	July 13, 1953
Monthly:	Max.	3,580	Sept. 1946	Min.	7.5	Apr. 1953
Yearly:	Max.	972	1946	Min.	176	1953

Mean Daily Discharge in Second-Feet 1953 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	208	477	192	11.3	8.8	77.0	6.7	424	347	147	152	166
2	255	288	196	15.2	9.2	65.0	1.8	136	1,150	121	204	164
3	247	229	199	15.2	9.5	51.6	1.1	115	1,470	119	193	161
4	222	202	238	15.2	9.9	41.7	1.8	431	706	116	192	177
5	210	189	194	15.5	8.8	125	1.4	224	735	114	203	177
6	257	178	163	11.7	8.1	226	1.1	134	1,080	106	204	167
7	288	177	171	9.5	8.8	141	1.8	185	1,240	127	195	150
8	232	168	165	6.4	9.9	118	7.1	229	717	165	195	163
9	214	161	330	7.4	9.9	180	1.8	961	802	147	186	169
10	216	155	717	4.6	9.5	292	1.4	268	664	119	177	175
11	208	143	318	3.5	9.5	170	1.1	133	530	120	206	154
12	221	155	209	2.8	8.1	317	1.4	84.0	280	132	206	157
13	230	155	217	2.1	3.5	162	.7	70.6	208	139	196	178
14	227	147	193	4.2	3.5	132	251	56.1	221	139	185	172
15	206	194	158	3.2	4.9	93.2	593	45.5	222	137	333	160
16	265	331	136	4.2	4.9	74.9	470	625	261	127	317	158
17	263	307	129	6.7	3.5	63.2	165	89.0	212	119	230	178
18	226	298	116	5.0	6.0	65.0	90.1	80.1	184	129	199	189
19	202	220	99.9	6.4	5.7	89.7	434	76.3	172	130	178	192
20	207	180	96.7	7.4	3.9	108	207	50.5	225	121	176	176
21	242	164	87.5	3.9	3.2	89.0	188	66.0	270	116	178	169
22	216	164	73.8	4.2	4.6	69.9	341	24.7	221	115	170	191
23	201	162	62.1	3.9	4.6	36.7	823	19.8	229	128	171	173
24	204	166	46.3	2.5	6.0	30.4	547	23.6	199	129	159	171
25	207	177	36.7	3.5	6.0	28.6	348	22.6	201	137	149	170
26	221	166	25.4	8.5	6.4	23.3	1,610	64.2	195	138	150	185
27	220	153	26.1	11.7	660	17.3	590	37.4	174	137	159	181
28	209	144	25.7	9.9	487	10.9	501	207	148	150	155	194
29	220		25.7	9.5	219	12.0	367	146	141	181	145	188
30	240		19.4	10.6	144	13.4	249	121	133	166	135	190
31	301		14.8		104		226	172		153		203
Sum	7,085	5,650	4,681.1	225.7	1,790.7	2,923.8	8,029.3	5,321.4	13,337	4,124	5,698	5,398

Month	Current Year 1953: 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 1945-1953: Acre-Feet Average	Acre-Feet Maximum	Acre-Feet Minimum
Jan.	4.13	3.61	31	438	23	189	229	14,050	37,417	55,810	14,050
Feb.	4.36	3.41	1	604	15	142	202	11,210	39,583	62,420	11,210
Mar.	5.25	2.56	9	1,110	31	9.5	151	9,280	34,342	49,780	9,280
Apr.	2.69	2.36	3	17.3	24	1.8	7.5	448	13,742	29,110	448
May	6.07	2.40	27	2,090	14	2.5	57.8	3,550	15,733	36,080	3,550
June	7.22	2.53	9	4,310	28	7.8	97.5	5,800	25,529	54,920	5,800
July	7.22	2.30	26	4,030	13	.7	259	15,930	77,711	193,000	11,570
Aug.	5.94	2.69	9	1,870	22	16.6	172	10,550	49,821	142,100	10,550
Sept.	6.43	3.35	3	2,520	30	126	445	26,450	76,011	213,300	7,150
Oct.	3.58	3.25	28	187	7	106	133	8,180	63,978	180,200	8,180
Nov.	4.27	3.35	15	540	30	128	190	11,300	39,709	62,870	10,920
Dec.	3.71	3.41	28	228	7	150	174	10,710	28,842	45,570	10,710
Yearly	7.22	2.30		4,310		.7	176	127,458	502,418	703,660	127,458

RIO CONCHOS NEAR OJINAGA, CHIHUAHUA

DESCRIPTION: The Río Conchos enters the Rio Grande 3.7 miles above the international highway bridge between Presidio, Texas and Ojinaga, Chihuahua, 2.0 miles above the Lower Presidio gaging station on the Rio Grande, 7.8 miles below the Upper Presidio gaging station on the Rio Grande, and 293.5 river miles below the American Dam at El Paso, Texas.

RECORDS: Based on discharge records of the Rio Grande at Upper Presidio and Lower Presidio stations and estimated irrigation diversions and arroyo inflow between these two stations. Records available: May 1900 to March 1914 and August 1923 through December 1953.

REMARKS: Reservoirs, diversions, and drainage returns modify the river flow at this station. La Colina Reservoir, with 19,500 acre-feet capacity and a maximum surface area of 1,160 acres, located about 10.5 miles downstream from La Boquilla Dam and La Rosetilla Reservoir located about 52.7 miles farther downstream, with a capacity of 15,400 acre-feet and a maximum surface area of 840 acres, are used for power development. Francisco I. Madero Reservoir, located on the Río San Pedro, a tributary to the Río Conchos, has a capacity of about 344,550 acre-feet. Power generation facilities: La Boquilla 14,647 kw., La Colina 3,620 kw., La Rosetilla 5,150 kw., Francisco I. Madero none.

EXTREME FLOWS FROM RECORDS: Momentary: Max. 162,000 second-feet on September 11, 1904. Min. no flow several days in May, June, and July 1953.

Average Flow in Second-Feet

Daily:	Max.	148,900	Sept. 11, 1904	Min.	0	Several days 1953
Monthly:	Max.	24,540	Sept. 1904	Min.	11.0	May 1902
Yearly:	Max.	3,710	1906	Min.	155	1953

Month	Current Year 1953						Period 1924-1953			1945-1953
	Extreme Second-Feet				Average Second-Feet	Total Acre-Feet	Acre-Feet			# Average Acre-Feet
	Day	High	Day	Low			Average	Maximum	Minimum	
Jan.	7	319	29	182	233	14,300	55,290	147,000	14,300	38,078
Feb.	2	436	16	136	203	11,300	48,480	87,700	11,300	39,533
Mar.	10	720	31	20.0	139	8,560	43,358	80,800	8,560	34,459
Apr.	1	20.8	‡22	3.1	14.4	855	29,138	79,700	855	12,919
May	27	1,380	‡ 2	0	36.4	2,240	35,072	148,000	2,240	14,512
June	10	4,100	30	0	81.2	4,830	41,282	91,900	4,830	23,470
July	26	3,160	‡ 1	0	216	13,300	90,640	502,000	8,890	80,199
Aug.	9	1,150	‡28	.3	125	7,660	118,085	601,000	7,660	49,307
Sept.	2	3,510	1	31.0	394	23,500	240,052	1,173,000	6,770	76,508
Oct.	30	152	4	70.3	95.8	5,890	148,106	798,000	5,890	68,999
Nov.	16	378	26	107	160	9,510	57,814	110,000	9,510	40,534
Dec.	29	218	1	104	162	9,940	50,181	97,700	9,940	30,238
Yearly		4,100		0	155	111,885	957,498	2,431,850	111,885	508,756

‡ And other days # Cuchillo Parado Station began operating January 1, 1945

RIO GRANDE AT LOWER PRESIDIO STATION

DESCRIPTION: Water-stage recorder and cable with sit-down cable car equipped for winch and heavy weights, located about 1.7 miles above the international highway bridge between Presidio, Texas and Ojinaga, Chihuahua, 2.0 miles below the confluence of the Río Conchos with the Río Grande, and 295.5 river miles below the American Dam at El Paso, Texas. The zero of the gage is 2,556.42 feet above mean sea level, U.S.C. & G.S. datum.

RECORDS: Based on 119 meter measurements during the year and a continuous record of gage heights. Computations by shifting channel methods. Records available: May 1900 to July 1915 and August 1923 through December 1953.

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

EXTREME FLOWS FROM RECORDS: Momentary: Max. 162,000 second-feet on September 11, 1904. Min. 0 occasionally in 1953.

Average Flow in Second-Feet

Daily:	Max.	149,200	Sept. 11, 1904	Min.	.1	May 10, 1953
Monthly:	Max.	24,870	Sept. 1904	Min.	7.8	Apr. 1953
Yearly:	Max.	4,870	1906	Min.	163	1953

Mean Daily Discharge in Second-Feet 1953 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	229	280	130	16.7	3.1	28.8	1.7	440	146	88.1	114	114
2	218	388	133	16.0	1.5	17.9	1.1	565	1,300	81.5	124	124
3	257	284	144	16.6	2.2	10.2	2.2	562	1,220	87.1	147	124
4	256	234	145	16.4	1.5	8.5	1.9	361	1,220	80.1	174	125
5	246	216	187	15.8	1.9	8.0	4.3	333	587	109	159	145
6	233	206	172	14.2	3.1	4.3	5.2	208	812	140	179	152
7	263	188	128	11.6	1.0	38.8	3.5	96.5	919	92.6	189	145
8	302	183	119	8.5	1.2	39.7	2.2	87.4	922	86.6	163	140
9	260	187	150	8.5	1.3	28.6	1.2	357	414	121	140	136
10	232	178	326	6.4	.1	1,170	1.7	527	770	114	154	140
11	231	168	504	5.7	.8	216	1.5	187	520	103	147	168
12	232	157	296	5.7	2.2	74.2	3.5	102	422	100	166	162
13	242	155	226	6.4	1.1	219	2.8	60.4	254	97.4	184	169
14	246	152	208	5.2	2.0	94.4	114	43.8	187	90.7	162	193
15	250	144	190	4.8	1.0	57.1	320	24.6	170	88.3	173	166
16	239	151	151	4.3	.3	36.3	425	11.8	169	99.6	284	150
17	248	255	124	6.4	2.8	29.6	482	191	223	92.3	260	149
18	282	267	112	5.2	2.8	23.1	268	72.0	186	88.7	222	155
19	253	261	104	5.2	2.8	47.8	278	35.4	138	91.4	177	177
20	225	214	85.1	8.0	1.3	28.0	462	98.6	122	98.9	157	185
21	211	199	75.2	4.3	.4	25.8	630	358	170	93.6	146	156
22	226	189	73.7	3.9	2.0	31.1	346	197	200	84.8	126	168
23	222	189	68.0	5.2	.6	22.9	300	39.2	144	86.5	146	196
24	209	189	54.6	5.7	1.5	9.6	630	15.5	155	82.9	152	170
25	206	180	42.8	5.2	2.2	4.8	360	9.4	134	89.8	137	172
26	208	168	39.0	4.8	2.2	3.5	1,300	6.4	113	96.8	121	178
27	190	160	30.8	4.8	217	2.8	1,440	3.1	128	95.3	* 115	203
28	198	152	27.9	3.9	219	4.3	457	1.0	119	98.8	* 127	183
29	187		26.3	4.8	262	2.8	546	6.7	97.7	105	* 126	200
30	195		24.7	3.9	108	2.4	278	47.5	92.5	144	* 126	190
31	214		21.4		40.8		184	99.3		122		175
Sum	7,210	5,694	4,118.5	234.1	889.7	2,290.3	8,852.8	5,146.6	12,054.2	3,049.8	4,797	5,010

Month	Current Year 1953								Period 1924-1953		
	Extreme Gage Feet		Extreme Second-Feet				Average Second-Feet	Total Acre-Feet	Acre-Feet		
			High		Low						
	High	Low	Day		Day				Average	Maximum	Minimum
Jan.	2.00	1.59	7	319	29	182	233	14,300	66,723	164,000	14,300
Feb.	2.30	1.45	2	436	16	136	203	11,300	58,983	99,700	11,300
Mar.	2.94	.93	10	720	31	20.0	133	8,170	51,642	89,400	8,170
Apr.	.94	.69	1	20.8	‡22	3.1	7.8	464	35,405	84,100	464
May	3.85		27	1,380	‡ 2	0	28.7	1,760	51,125	270,000	1,760
June	6.38		10	4,100	30	0	76.3	4,540	56,916	267,000	4,540
July	6.16		27	3,710	‡ 1	0	286	17,600	112,057	564,000	8,910
Aug.	3.80	.60	3	1,280	‡28	.3	166	10,200	145,780	675,000	10,200
Sept.	5.92	1.07	2	3,520	1	31.0	402	23,900	272,139	1,324,000	7,370
Oct.	1.87	1.18	5	276	4	70.3	98.4	6,050	175,402	864,000	6,050
Nov.	2.24	1.37	16	378	26	107	160	9,510	71,037	141,000	9,510
Dec.	1.74	1.35	29	218	1	104	162	9,940	63,011	116,000	9,940
Yearly	6.38			4,100		0	163	117,734	1,160,220	3,466,700	117,734

* Partly estimated ‡ And other days

ALAMITO CREEK NEAR PRESIDIO, TEXAS

DESCRIPTION: Water-stage recorder about 1,800 feet above the confluence with the Rio Grande and 6 miles below Presidio, Texas and Ojinaga, Chihuahua. This creek enters the Rio Grande near the lower end of Presidio Valley and 306.9 river miles below the American Dam at El Paso, Texas. The zero of the gage is 2,541.61 feet above mean sea level, U.S.C. & G.S. datum.

RECORDS: Based on 59 meter measurements of low and medium flows, a high flow rating curve determined by slope-area calculations, and a continuous record of gage heights. Computations by shifting channel methods. Records available: January 1932 through December 1953.

REMARKS: A small irrigation reservoir (San Estaban) 10.5 miles south of Marfa, Texas and irrigation diversions below the reservoir modify the flow of this spring-fed creek. On October 2, 1932, backwater from the Rio Grande reached a gage height of 8.33 feet at this station. This is the highest recorded gage height.

EXTREME FLOWS FROM RECORDS: Momentary: Max. * 13,900 second-feet on July 8, 1952, with a gage height of 6.99 feet. Min. ϕ .1 second-foot on July 25, 1953.

Average Flow in Second-Feet

Daily:	Max.	3,290	Oct. 24, 1941	Min.	.1	July 25, 1953
Monthly:	Max.	329	Sept. 1936	Min.	.6	Oct., Nov., & Dec. 1953
Yearly:	Max.	55.9	1941	Min.	* 4.3	1951

Mean Daily Discharge in Second-Feet 1953 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	1.2	1.1	1.2	1.0	.8	.7	.6	.8	* 39.6	.6	.6	.6
2	1.2	1.1	1.2	1.0	.8	.7	.6	.7	* 13.2	.6	.6	.6
3	1.2	1.1	1.2	1.0	.8	.7	.6	.7	* 418	.6	.6	.6
4	1.2	1.1	1.2	1.0	.9	.7	.6	* 1.0	* 2.0	.6	.6	.6
5	1.2	1.1	1.2	1.0	.9	.8	.6	.7	.7	.6	.6	.6
6	1.2	1.1	1.2	1.0	.9	.8	.6	.7	.7	.6	.6	.6
7	1.0	1.2	1.2	1.0	.9	.8	.6	.7	.7	.6	.6	.6
8	.8	1.2	1.2	1.0	.8	.8	.7	.6	.7	.6	.6	.6
9	.9	1.2	51.1	1.0	.8	.8	.9	.6	.7	.6	.6	.6
10	.9	1.2	14.8	1.0	.8	.8	.6	.6	.7	.6	.6	.6
11	1.0	1.2	1.2	1.0	.8	4.3	.6	.6	.7	.6	.6	.6
12	1.0	1.2	1.2	1.0	.8	.8	.6	.6	.6	.6	.6	.6
13	1.1	1.2	1.2	1.0	.8	.8	.6	.6	.6	.6	.6	.6
14	1.2	1.2	1.2	1.0	.8	.8	* 370	.6	.6	.6	.6	.6
15	1.2	1.1	1.2	1.0	.9	.8	* 2.6	.6	.6	.6	.6	.6
16	1.2	1.1	1.2	1.0	.9	.8	.7	* 347	.6	.6	.6	.6
17	1.2	1.1	1.2	1.0	.9	.8	.7	* 355	.6	.6	.6	.6
18	1.1	1.1	1.2	1.0	.9	31.3	.6	* 1.2	.6	.6	.6	.6
19	1.1	1.1	1.2	1.0	.9	.6	.6	1.0	.6	.6	.6	.6
20	1.1	1.1	1.2	1.0	.9	.6	.5	1.0	.6	.6	.6	.6
21	1.1	1.2	1.3	1.0	.9	.6	.4	.9	.6	.6	.6	.6
22	1.1	1.2	1.3	1.0	1.0	.6	.4	.8	.6	.6	.6	.6
23	1.1	1.2	1.3	1.0	1.0	.6	.4	.7	.6	.6	.6	.6
24	1.1	1.2	1.3	1.0	1.0	.6	1.7	.7	.6	.6	.6	.7
25	1.1	1.2	1.3	.9	1.0	.6	.1	.6	.6	.6	.6	.7
26	1.1	1.2	1.2	.9	1.0	.6	* 386	.6	.6	.6	.6	.7
27	1.1	1.2	1.2	.9	39.5	.6	* 439	.6	.6	.6	.6	.7
28	1.1	1.2	1.1	.9	.9	.6	* 14.1	.6	.6	.6	.6	.8
29	1.1		1.1	.8	.7	.6	.8	.6	.6	.6	.6	.8
30	1.1		1.0	.8	.7	.6	.8	1.8	.6	.6	.6	.8
31	1.1		1.0		.7		.8	* 380		.6		.8
Sum	34.1	32.4	100.6	29.2	65.4	55.2	*1,228.4	*1,103.2	* 489.1	18.6	18.0	19.8

Month	Current Year 1953: Extreme Gage Feet High	Low	Extreme Second-Feet High Day	High	Low Day	Low	Average Second-Feet	Total Acre-Feet	Period 1932-1953: Acre-Feet Average	Maximum	Minimum
Jan.	2.92	2.91	‡ 1	1.2	8	.8	1.1	67.6	187	* 273	67.6
Feb.	2.91	2.89	‡ 7	1.2	‡ 1	1.1	1.2	64.3	172	234	64.3
Mar.	3.52	2.81	9	138	‡30	1.0	3.2	200	191	270	71.4
Apr.	2.84	2.80	5	1.5	‡29	.8	1.0	57.9	226	743	57.9
May	3.54	2.67	27	146	‡28	.7	2.1	130	1,161	8,520	88.3
June	3.66		18	210	‡19	.6	1.8	109	* 1,795	* 6,360	50.8
July	5.55	2.60	26	* 6,290	25	ϕ .1	* 39.6	* 2,440	* 3,345	* 18,500	122
Aug.	5.28	3.16	16	* 2,850	‡ 8	.6	* 35.6	* 2,190	* 2,977	* 16,330	73.0
Sept.	4.74	3.20	3	* 1,250	‡12	.6	* 16.3	* 970	* 3,306	19,600	* 175
Oct.	3.27	3.21	‡ 1	.6	‡ 1	.6	.6	36.9	2,091	19,200	36.9
Nov.	3.30	3.27	‡ 1	.6	‡ 1	.6	.6	35.7	219	807	35.7
Dec.	3.32	3.27	‡28	.8	‡ 1	.6	.6	39.3	199	408	39.3
Yearly	5.55			* 6,290		ϕ .1	* 8.8	* 6,340.7	* 15,869	40,444	* 3,109.2

* Partly estimated ‡ And other days ϕ Mean daily

TERLINGUA CREEK NEAR TERLINGUA, TEXAS

DESCRIPTION: Water-stage recorder and cable with sit-down cable car equipped for winch and heavy weights, located 2.4 river miles above the confluence with the Rio Grande. This creek enters the Rio Grande at the lower end of Santa Helena Canyon, 371.6 river miles below the American Dam at El Paso, Texas. The zero of the gage is 2,195.99 feet above mean sea level, U.S.C. & G.S. datum.

RECORDS: Based on 54 meter measurements of low and medium flows, a continuous record of gage heights for medium and high flows, and a high water rating curve determined by slope-area claculations. Computations by shifting channel methods. Records available: January 1, 1932 through December 1953.

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

EXTREME FLOWS FROM RECORDS: Momentary: Max. 34,900 second-feet on May 24, 1935, with a gage height of 17.59 feet. Min. no flow on September 29-30, 1937.

Average Flow in Second-Feet

Daily:	Max.	17,200	June 1, 1937	Min.	" 0	Sept. 29-30, 1937
Monthly:	Max.	921	June 1937	Min.	.83	Oct. 1934
Yearly:	Max.	146	1937	Min.	5.5	1943

Mean Daily Discharge in Second-Feet 1953 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	2.0	2.0	2.1	2.0	2.1	1.3	* 129	3.1	* 59.7	1.5	1.7	1.5
2	2.0	2.0	2.1	2.0	2.1	1.3	121	1.8	* 303	1.7	1.6	1.5
3	2.0	2.0	2.1	2.0	2.1	1.3	8.0	1.5	* 927	1.8	1.5	1.5
4	2.0	2.1	2.1	2.0	2.0	1.3	3.4	* 48.2	* 276	2.0	1.5	1.5
5	2.0	2.1	2.1	2.9	2.0	1.2	2.0	70.4	* 32.5	2.1	1.5	1.5
6	2.0	2.1	2.1	1.8	1.9	1.2	1.9	25.5	* 4.6	2.3	1.5	1.5
7	2.0	2.1	2.1	1.8	1.8	1.2	* 421	* 38.9	* 2.4	2.4	1.5	1.5
8	2.0	2.2	2.1	1.8	1.8	1.2	* 296	* 3.4	2.4	2.6	1.5	1.5
9	2.0	2.2	3.1	1.8	1.8	1.2	62.8	1.5	2.4	2.5	1.5	1.5
10	2.0	2.2	21.4	1.8	1.8	1.2	13.5	1.5	2.4	2.4	1.5	1.5
11	2.0	2.2	11.8	1.8	1.8	1.2	7.0	1.5	2.4	2.4	1.5	1.5
12	2.0	2.2	3.9	1.8	1.8	1.2	6.2	1.5	2.4	2.3	1.5	1.4
13	2.0	2.1	3.6	1.8	1.8	1.2	6.2	1.5	2.4	2.2	1.5	1.4
14	2.0	2.1	2.5	1.8	1.8	1.2	*1,830	* 50.7	2.4	2.2	1.5	1.4
15	2.0	2.1	2.5	1.8	1.8	1.2	244	2.7	2.4	2.1	1.5	1.4
16	2.0	2.1	2.5	1.8	1.8	1.2	40.9	* 76.3	2.4	2.0	1.5	1.4
17	2.0	2.2	2.4	1.8	1.8	8.2	15.3	4.3	5.9	2.0	1.5	1.4
18	2.0	2.3	2.3	1.8	1.8	* 402	6.4	2.8	2.5	2.0	1.5	1.5
19	2.0	2.4	2.2	1.8	1.8	* 280	1.9	5.4	1.5	2.0	1.5	1.5
20	2.0	2.5	2.2	2.0	1.8	* 1.9	1.2	2.0	1.5	2.1	1.5	1.5
21	2.0	2.6	2.1	2.0	1.8	1.2	* 194	1.5	1.5	2.1	1.5	1.5
22	2.0	2.7	2.0	2.0	2.0	1.2	* 632	1.5	1.7	2.1	1.5	1.5
23	1.9	2.8	1.9	2.0	2.0	1.2	93.0	2.9	1.8	2.1	1.5	1.5
24	1.9	2.9	1.9	2.0	2.0	1.2	41.8	8.9	2.0	* 86.8	1.5	1.5
25	1.9	2.8	1.9	2.0	2.0	1.2	20.0	1.1	1.9	* 166	1.5	1.5
26	1.9	2.6	1.9	2.0	115	1.2	* 90.3	1.1	1.9	3.3	1.5	1.5
27	1.9	2.5	1.9	2.0	94.8	1.2	50.3	1.1	1.8	2.1	1.5	1.5
28	1.9	2.4	1.9	2.0	37.1	1.2	63.5	1.1	1.7	2.0	1.5	1.5
29	1.9		2.0	2.1	7.5	1.2	16.0	1.1	1.6	1.9	1.5	1.5
30	2.0		2.0	2.1	1.3	1.2	9.9	* 11.4	1.6	1.8	1.5	1.5
31	2.0		2.0		1.3		7.9	* 626		1.8		1.5
Sum	61.3	64.5	98.7	58.3	304.2	* 723.7	*4,436.4	*1,002.2	*1,655.7	* 314.6	45.3	45.9

Month	Current Year 1953: 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 1932-1953: Acre-Feet Average	Acre-Feet Maximum	Acre-Feet Minimum
Jan.	1.89	1.73	‡ 1	2.0	‡23	1.9	2.0	122	194	743	82.7
Feb.	1.78	1.72	24	2.9	‡ 1	2.0	2.3	128	140	267	73.4
Mar.	2.27	1.70	10	66.0	‡ 9	1.9	3.2	196	* 278	* 2,410	72.4
Apr.	1.92	1.70	5	5.7	‡ 6	1.8	1.9	116	* 1,108	15,500	55.1
May	3.80	1.75	26	1,320	‡30	1.3	9.8	603	* 4,328	* 26,000	117
June	5.56	1.71	18	* 3,560	‡ 5	1.2	* 24.1	* 1,440	* 6,732	54,800	59.5
July	8.30	.21	14	* 8,200	‡20	1.1	*143	* 8,800	* 7,998	* 28,700	621
Aug.	4.37	1.44	31	* 1,200	‡25	1.1	* 32.3	* 1,990	* 4,063	* 26,680	123
Sept.	6.42		3	* 3,400	‡19	1.5	* 55.2	* 3,280	* 6,391	24,600	123
Oct.	3.66	1.44	24	* 1,180	1	1.5	* 10.1	* 624	* 2,243	8,100	50.8
Nov.	1.80	1.79	1	1.7	‡ 3	1.5	1.5	89.9	* 333	" 2,980	64.9
Dec.	1.82	1.79	2	2.1	‡12	1.4	1.5	91.0	* 371	3,080	90.0
Yearly	8.30			* 8,200		1.1	* 24.1	*17,479.9	* 34,179	105,807	3,958.0

" Estimated * Partly estimated ‡ And other days

RIO GRANDE AT JOHNSON RANCH, TEXAS

DESCRIPTION: Water-stage recorder and cable with stand-up cable car equipped for winch and heavy weights, located about 2 miles above Johnson Ranch, 14 miles below Castolon, Brewster County, Texas and Santa Elena Ranch, Chihuahua, and 392.9 river miles below the American Dam at El Paso, Texas. The zero of the gage is 2,045.30 feet above mean sea level, U.S.C. & G.S. datum.

RECORDS: Based on 137 meter measurements during the year and a continuous record of gage heights. Computations by shifting channel methods. Records available: April 1936 through December 1953.

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

EXTREME FLOWS FROM RECORDS: Momentary: Max. 58,800 second-feet on September 23, 1938, with a gage height of 19.75 feet. Min. 0 several days in 1953.

Average Flow in Second-Feet

Daily:	Max.	56,900	Sept. 10, 1942	Min.	0	Several days 1953
Monthly:	Max.	23,600	Sept. 1942	Min.	0	May 1953
Yearly:	Max.	4,780	1942	Min.	167	1953

Mean Daily Discharge in Second-Feet 1953 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	239	196	138	23.3	0	.1	0	233	423	68.9	77.0	135
2	222	212	129	22.1	0	15.3	0	162	297	54.7	98.3	142
3	222	246	123	22.5	0	19.4	22.9	329	1,530	47.3	99.3	140
4	226	335	113	18.1	0	11.2	8.9	431	1,210	50.4	100	129
5	239	301	102	16.9	0	6.5	2.4	412	929	45.4	112	124
6	262	259	110	17.3	0	4.6	.3	332	640	40.8	127	124
7	254	242	112	16.0	0	1.4	61.7	213	353	48.9	142	121
8	250	240	128	12.2	0	.6	720	252	660	46.9	142	139
9	241	228	394	11.0	0	.2	130	112	716	68.6	140	150
10	284	212	251	10.1	0	0	34.2	79.3	584	62.9	142	146
11	268	193	235	10.0	0	0	26.9	76.7	417	54.5	138	138
12	244	177	271	9.2	0	258	35.5	302	571	58.7	129	137
13	231	171	421	8.6	0	203	16.1	165	435	67.8	136	142
14	211	164	296	7.5	0	84.2	1,940	89.9	340	69.0	140	154
15	206	156	225	5.7	0	44.1	976	92.5	256	68.0	166	162
16	188	157	198	4.9	0	23.4	401	56.3	192	58.4	170	175
17	195	161	190	3.9	0	17.9	219	137	151	53.1	166	172
18	194	153	175	2.7	0	412	99.6	39.5	162	49.5	190	158
19	202	170	141	2.0	0	313	198	37.8	165	47.7	230	149
20	240	230	119	1.8	0	123	198	1,120	150	47.9	202	149
21	234	242	104	2.0	0	53.6	193	141	108	49.9	174	154
22	216	205	85.5	1.9	0	26.4	1,760	62.9	89.8	65.5	163	169
23	202	175	82.1	.4	0	15.2	740	51.5	81.7	287	159	172
24	191	178	70.6	.2	0	9.1	309	199	91.8	144	152	163
25	201	156	80.3	.1	0	5.3	230	105	104	311	145	184
26	214	166	152	0	0	1.9	475	56.1	85.6	147	150	194
27	226	156	108	0	0	1.2	1,150	40.0	85.0	77.9	147	177
28	218	150	57.4	0	0	.3	1,570	27.5	79.2	75.9	140	173
29	201		47.8	0	0	0	636	31.2	74.2	73.8	131	174
30	195		38.3	0	0	0	328	170	75.7	72.7	130	182
31	194		28.7		0		351	628		76.0		165
Sum	6,910	5,631	4,725.7	230.4	0	1,650.9	12,832.5	6,184.2	11,056.0	2,490.1	4,337.6	4,793

Month	Current Year 1953								Period Apr. 1936-1953		
	Extreme Gage Feet		Extreme Second-Feet				Average Second-Feet	Total Acre-Feet	Acre-Feet		
			High		Low						
	High	Low	Day		Day				Average	Maximum	Minimum
Jan.	1.44	1.19	10	294	16	176	223	13,700	56,918	86,400	13,700
Feb.	1.57	1.13	4	357	28	143	201	11,200	53,047	80,900	11,200
Mar.	2.27	.76	9	888	31	27.1	152	9,370	44,751	85,300	9,370
Apr.	.77		1	26.5	‡26	0	7.7	457	22,382	79,300	457
May				0		0	0	0	49,635	240,000	0
June	2.46		18	1,130	‡ 1	0	55.0	3,270	64,154	251,000	3,270
July	6.87		14	8,120	‡ 1	0	414	25,500	143,194	620,000	10,700
Aug.	4.66	.48	20	4,020	30	15.1	199	12,300	126,939	485,000	12,300
Sept.	4.38	.83	3	3,490	30	66.9	369	21,900	300,308	1,404,000	9,350
Oct.	2.24	.67	23	712	6	38.0	80.3	4,940	173,541	929,000	4,940
Nov.	1.42	.86	19	253	1	72.7	145	8,600	65,399	164,000	8,600
Dec.	1.27	1.00	‡25	194	7	118	155	9,510	55,912	110,000	9,510
Yearly	6.87			8,120		0	167	120,747	1,156,180	3,461,400	120,747

‡ And other days

RIO GRANDE AT AGUA VERDE STATION

DESCRIPTION: Water-stage recorder and cable with stand-up cable car equipped for winch and heavy weights, located near Agua Verde Dam site, 571.7 river miles below the American Dam at El Paso, Texas. The zero of the gage is 1,241.07 feet above mean sea level, U.S.C. & G.S. datum.

RECORDS: Based on 55 meter measurements during the year and a continuous record of gage heights. Computations by shifting channel methods. Records available: With some days missing, April to September and December 1947; January to June 1948; May 1949; January through May 1950; and continuous records from November 12, 1952 through December 1953.

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

EXTREME FLOWS FROM RECORDS: ● Momentary: Max. 2,440 second-feet on July 23, 1953, at a gage height of 4.98 feet. Min. 132 second-feet on April 29, 1953, at a gage height of .42 foot.

Average Flow in Second-Feet

Daily:	Max.	1,800	July 24, 1953	Min.	145	June 15, 16, & 17, 1953
Monthly:	Max.	553	July 1953	Min.	182	May 1953

Mean Daily Discharge in Second-Feet 1953 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	438	379	336	246	158	260	159	686	* 212	231	260	316
2	573	364	335	227	157	204	165	535	487	230	246	310
3	461	357	323	219	159	182	175	502	727	231	240	303
4	433	354	314	213	156	170	158	454	1,210	245	239	291
5	390	355	305	205	158	165	156	419	1,180	235	245	290
6	371	369	299	360	157	164	154	465	1,250	229	251	297
7	372	425	300	449	158	167	155	525	904	219	259	295
8	370	463	300	257	159	158	572	523	816	212	255	294
9	392	435	304	205	163	157	263	479	634	209	256	291
10	400	414	345	195	158	153	166	409	540	207	259	292
11	394	392	1,060	189	155	152	230	401	718	199	287	* 290
12	386	379	616	185	152	150	349	355	759	197	293	* 290
13	397	370	574	183	149	149	249	302	616	197	298	* 312
14	416	351	500	179	153	148	216	265	578	205	304	* 310
15	397	343	409	177	158	145	199	242	615	210	304	307
16	388	334	486	176	160	145	681	355	539	203	296	301
17	369	319	451	174	157	145	1,220	321	486	202	304	304
18	354	310	425	174	163	198	809	306	445	204	306	316
19	359	297	393	170	164	248	534	251	406	217	317	322
20	357	297	355	168	159	226	391	300	361	221	314	333
21	364	299	346	168	160	271	326	290	336	214	311	332
22	362	293	330	170	159	296	297	611	316	213	348	321
23	365	305	305	176	158	338	1,440	550	314	219	365	303
24	396	363	285	173	159	254	1,800	365	303	241	348	303
25	389	382	276	169	154	223	1,180	822	287	656	331	309
26	377	365	267	168	161	201	804	472	275	934	322	329
27	364	350	256	166	183	184	513	270	268	645	322	333
28	359	352	248	169	319	175	454	340	262	457	316	327
29	362		244	152	388	169	805	* 252	258	398	309	338
30	374		287	154	305	162	1,600	* 204	244	329	319	345
31	386		287		329		932	* 204		283		340
Sum	12,115	10,016	11,561	6,016	5,628	5,759	17,152	12,475	16,346	8,892	8,824	9,644

Month	Current Year 1953								Period Dec. 1952-1953		
	Extreme Gage Feet		Extreme Second-Feet				Average Second-Feet	Total Acre-Feet	Acre-Feet		
	High	Low	Day	High	Day	Low			Average	Maximum	Minimum
Jan.	2.07	1.34	2	624	18	345	391	24,000			
Feb.	1.69	1.18	8	470	‡22	284	358	19,900			
Mar.	3.48	.94	11	1,440	30	240	373	22,900			
Apr.	2.22	.42	6	691	29	132	201	11,900			
May	2.42	.55	28	787	12	146	182	11,200			
June	1.40	.50	23	376	17	139	192	11,400			
July	4.98	.51	23	2,440	6	150	553	34,000			
Aug.	3.56	* .72	25	1,240	30	* 198	402	24,700			
Sept.	4.56	* .72	4	1,850	1	* 212	545	32,400			
Oct.	3.89	.64	26	1,480	12	194	287	17,600			
Nov.	1.23	.79	‡22	371	3	237	294	17,500			
Dec.	1.17	.87	30	348	5	263	311	19,100	20,350'	21,600	19,100
Yearly	4.98	.42		2,440		132	341	246,600			

* Partly estimated ‡ And other days ● Period November 12, 1952 through December 1953

RIO GRANDE AT LANGTRY, TEXAS

DESCRIPTION: Water-stage recorder and cable with stand-up cable car equipped for winch and heavy weights, located at Langtry, Texas, 24.1 river miles above the confluence with the Pecos River, and 614.1 river miles below the American Dam at El Paso, Texas. The zero of the gage is 1,091.69 feet above mean sea level, U.S.C. & G.S. datum.

RECORDS: Based on 58 meter measurements during the year and a continuous record of gage heights. Computations by shifting channel methods. Records available: May 1900 to October 1914; December 1919 to March 1920; January 1924 through December 1953.

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

EXTREME FLOWS FROM RECORDS: The highest known gage height was 56.9 feet, which occurred about 3:00 P.M. on June 17, 1922. The discharge for this stage was 204,000 second-feet, which was estimated by extension of the rating curve. The lowest recorded flow was 208 second-feet, which occurred July 12, 1953.

Mean Daily Discharge in Second-Feet 1953 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	464	491	455	359	236	427	231	895	290	329	353	420
2	557	475	436	327	244	332	226	718	380	325	344	416
3	650	456	430	308	251	270	231	616	3,450	320	337	411
4	551	459	412	301	249	245	245	545	3,790	407	341	403
5	521	461	400	306	252	241	226	459	1,640	334	339	397
6	484	456	401	305	255	238	221	430	1,630	322	337	395
7	479	472	402	563	257	244	221	554	1,200	316	346	407
8	472	542	410	518	255	240	221	596	1,090	304	350	403
9	473	567	424	377	248	237	612	572	928	298	348	393
10	490	548	402	321	249	229	312	506	748	298	346	390
11	499	506	755	303	251	230	223	425	753	297	349	393
12	500	487	871	284	243	231	302	432	895	291	373	400
13	494	462	712	276	236	231	390	371	893	286	382	396
14	510	451	665	269	233	231	320	327	718	287	383	404
15	517	440	553	271	240	225	267	305	770	294	390	407
16	486	429	504	259	243	220	245	306	723	300	391	397
17	463	416	636	259	246	216	993	402	681	289	379	400
18	455	410	581	264	249	216	1,060	583	617	285	382	403
19	447	404	536	253	252	262	810	386	565	291	377	410
20	462	392	509	247	250	307	609	339	509	291	387	418
21	457	386	474	246	248	275	472	432	463	297	391	426
22	458	381	449	262	242	329	704	396	434	291	395	411
23	460	375	424	266	240	369	1,520	871	411	291	447	392
24	468	409	401	270	239	384	1,810	648	403	297	454	384
25	492	466	379	270	237	306	1,410	594	395	472	433	377
26	493	483	363	265	235	275	1,170	979	361	724	412	389
27	477	464	354	259	237	253	774	524	346	1,090	406	415
28	461	452	345	258	299	248	546	350	326	654	408	414
29	453		331	252	368	241	480	450	321	530	410	409
30	458		328	237	477	235	1,270	350	328	470	405	412
31	478		375		395		1,230	313		401		400
Sum	15,129	12,740	14,717	8,955	8,156	7,987	19,351	15,674	26,058	11,681	11,395	12,492

Month	Current Year 1953								Period 1924-1953		
	Extreme Gage Feet		Extreme Second-Feet				Average Second-Feet	Total Acre-Feet	Acre-Feet		
	High	Low	Day	High	Day	Low			Average	Maximum	Minimum
Jan.	.89	.54	3	703	19	433	488	30,000	88,089	* 245,000	30,000
Feb.	.71	.45	8	573	23	369	455	25,300	76,799	* 117,000	25,300
Mar.	1.53	.35	11	1,260	29	326	475	29,200	73,597	118,000	25,200
Apr.	.93	.17	7	778	30	233	298	17,800	57,867	105,000	17,800
May	.73	.16	28	592	13	231	263	16,200	91,325	271,000	16,200
June	.57	.12	1	469	18	212	266	15,800	96,459	299,000	15,800
July	3.40	.13	23	3,530	12	208	624	38,400	155,804	719,000	31,700
Aug.	2.50	.32	18	2,320	15	288	506	31,100	185,793	* 730,000	31,100
Sept.	6.14	.30	3	8,060	2	278	869	51,700	331,596	1,410,000	19,600
Oct.	1.76	.29	27	1,400	13	281	377	23,200	229,381	1,063,000	23,200
Nov.	.58	.35	‡23	468	3	331	380	22,600	94,713	* 211,000	22,600
Dec.	.55	.42	21	433	25	364	403	24,800	83,742	135,000	24,800
Yearly	6.14	.12		8,060		208	450	326,100	1,565,165	3,851,500	326,100

* Partly estimated ‡ And other days

PECOS RIVER NEAR COMSTOCK, TEXAS

DESCRIPTION: Water-stage recorder and cable with sit-down cable car equipped for winch and heavy weights, located at the Pecos High Bridge on the railroad, 12 miles northwest of Comstock, Texas, and 5.5 miles above the confluence with the Rio Grande. This river enters the Rio Grande 638.2 river miles below the American Dam at El Paso, Texas. The zero of the gage is 1,058.01 feet above mean sea level, U.S.C. & G.S. datum.

RECORDS: Based on 27 meter measurements during the year and a continuous record of gage heights. Water-stage recorder was installed May 11, 1942. Computations by shifting channel methods. Records available: March 17, 1898 to December 3, 1898 and May 1900 through December 1953.

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

EXTREME FLOWS FROM RECORDS: The greatest recorded flow was 116,000 second-feet, which occurred September 1, 1932, with a gage height of 38.25 feet. The lowest recorded flow was 71.3 second-feet, which occurred July 2, 1953, with a gage height of -.28 foot.

Mean Daily Discharge in Second-Feet 1953 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	177	153	162	146	116	90.5	72.4	112	196	118	177	156
2	177	152	155	145	116	88.3	72.3	109	367	119	176	157
3	183	154	153	145	114	86.0	107	112	359	126	174	156
4	185	155	141	142	111	85.0	117	115	474	996	169	155
5	186	153	139	142	111	81.9	92.7	110	254	294	171	152
6	187	152	139	141	112	81.1	90.4	105	460	191	164	145
7	189	155	145	139	111	85.7	85.9	103	323	342	160	144
8	186	158	152	137	110	91.6	88.0	97.9	262	342	156	145
9	180	161	177	135	108	91.9	86.7	95.1	232	281	155	146
10	175	166	177	132	105	90.0	86.6	90.3	207	232	153	146
11	174	167	200	129	110	85.9	88.6	91.1	190	204	149	146
12	174	170	253	125	109	84.1	88.4	91.9	179	198	148	157
13	171	172	214	121	101	83.3	88.4	91.7	169	188	143	163
14	168	177	195	118	97.8	83.6	90.4	91.6	159	181	144	159
15	167	180	177	120	99.2	83.9	92.2	91.4	151	174	142	161
16	157	181	165	118	101	82.0	90.4	91.2	151	170	145	161
17	154	184	163	113	101	80.0	90.4	91.0	149	163	145	157
18	153	185	161	113	101	78.2	90.4	90.9	152	161	146	153
19	157	183	159	112	100	78.1	90.4	120	152	160	144	152
20	152	180	154	110	97.7	78.0	88.8	118	146	162	141	152
21	147	173	150	112	95.5	77.9	85.4	116	139	161	137	150
22	146	168	146	113	96.7	75.6	366	128	136	162	137	148
23	141	170	142	116	95.6	73.3	1,220	122	134	163	138	144
24	137	170	142	118	95.6	73.2	168	4,030	129	166	141	143
25	140	174	139	121	94.6	72.1	122	596	127	168	142	145
26	146	174	140	117	93.5	72.0	116	* 280	126	293	142	146
27	148	172	143	118	93.6	71.9	110	* 221	124	205	145	148
28	147	164	143	117	92.5	71.7	107	202	124	181	148	148
29	150		144	121	92.6	72.6	103	246	119	183	151	149
30	151		153	116	91.6	73.6	107	218	116	185	154	152
31	152		155		90.4		112	200		179		153
Sum	5,057	4,703	4,978	3,752	3,163.9	2,423.0	4,413.8	8,377.1	6,006	6,848	4,537	4,689

Month	Current Year 1953: 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 1924-1953: Acre-Feet Average	Acre-Feet Maximum	Acre-Feet Minimum
Jan.	.30	.23	7	191	24	137	163	10,000	22,781	78,200	9,680
Feb.	.28	.19	‡18	185	2	149	168	9,330	18,381	62,300	9,330
Mar.	.69	.17	11	274	4	138	161	9,870	17,517	40,700	9,140
Apr.	.21	.00	1	150	‡20	110	125	7,440	16,816	42,400	7,440
May	.16	- .08	11	142	28	90.2	102	6,280	31,838	156,000	6,280
June	- .05	- .28	9	95.3	28	71.7	80.8	4,810	31,223	197,000	4,810
July	4.80	- .28	23	3,900	2	71.3	142	8,750	24,596	84,200	7,120
Aug.	10.72	- .19	24	14,800	11	89.3	270	16,600	18,876	50,400	5,740
Sept.	2.28	.03	4	1,090	29	115	200	11,900	38,221	324,420	6,190
Oct.	3.57	.03	4	2,350	1	116	221	13,600	47,259	486,000	6,050
Nov.	.24	.11	1	177	22	135	151	9,000	26,267	209,000	7,300
Dec.	.25	.12	13	166	24	140	151	9,300	22,201	91,800	9,300
Yearly	10.72	- .28		14,800		71.3	161	116,880	315,976	1,330,900	100,920

* Partly estimated ‡ And other days

GOODENOUGH SPRING NEAR COMSTOCK, TEXAS

DESCRIPTION: Staff gage located 4,000 feet above the confluence with the Rio Grande and 11.75 miles southwest of Comstock, Val Verde County, Texas. The stream from this spring enters the Rio Grande 664.9 river miles below the American Dam at El Paso, Texas. The zero of the gage is 968.42 feet above mean sea level, U.S.C. & G.S. datum.

RECORDS: Based on 26 meter measurements during the year with the discharge estimated between measurements. Records available: February 23, 1929 through December 1953.

REMARKS: The flow of this spring is very uniform and not modified by diversions or storage. Backwater reaches the station when the Rio Grande reaches a discharge of about 35,000 second-feet near this spring. A maximum gage height of 17.30 feet was reached by backwater on September 1, 1932.

EXTREME FLOWS FROM RECORDS: Momentary: Max. 846 second-feet on September 18, 1941, with a gage height of 4.57 feet. Min. 71.2 second-feet on July 22, 1953.

Average Flow in Second-Feet

Daily:	Max.	# 455	Oct. 1, 1932	Min.	71.2	July 22, 1953
Monthly:	Max.	* 421	Oct. 1932	Min.	* 73.1	July 1953
Yearly:	Max.	266	1933	Min.	* 83.1	1952

Mean Daily Discharge in Second-Feet 1953 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	# 77.8	# 82.7	# 78.3	# 94.3	# 79.2	# 79.2	# 72.5	# 80.3	# 108	# 107	# 91.2	# 86.3
2	# 77.6	# 82.3	# 80.1	# 95.6	# 79.1	# 78.9	# 72.5	# 81.3	# 108	# 107	# 91.7	85.9
3	# 77.4	# 81.8	# 81.9	# 96.9	# 79.0	# 78.5	# 72.5	# 82.2	# 109	# 107	# 92.1	# 85.8
4	# 77.2	# 81.3	# 83.7	# 98.2	# 78.9	# 78.2	# 72.5	# 83.1	# 109	# 107	# 92.6	# 85.6
5	# 77.0	# 80.8	# 85.5	# 99.4	# 78.9	# 77.9	# 72.4	84.0	# 109	# 108	# 93.0	# 85.5
6	# 76.8	# 80.3	# 87.3	# 101	# 78.8	# 77.6	# 72.4	# 84.5	# 109	# 108	# 93.5	# 85.4
7	# 76.6	# 79.8	# 89.2	102	# 78.7	# 77.3	# 72.4	# 84.9	# 109	# 108	# 93.9	# 85.3
8	# 76.4	# 79.4	# 91.0	# 101	# 78.6	# 77.0	# 72.4	# 85.4	# 109	# 108	# 94.4	# 85.1
9	# 76.2	# 78.9	# 92.8	# 99.8	# 78.6	# 76.7	# 72.3	# 85.9	# 109	# 109	# 94.8	85.0
10	# 76.0	# 78.4	# 94.6	# 98.8	# 78.5	76.4	# 72.3	# 86.3	# 109	# 109	95.3	# 85.0
11	# 75.8	77.9	# 96.4	# 97.7	# 78.4	# 76.1	72.3	# 86.8	# 109	# 109	# 94.9	# 85.0
12	# 75.6	# 77.7	# 98.2	# 96.6	# 78.3	# 75.9	# 72.2	# 87.3	# 110	# 109	# 94.5	# 85.0
13	# 75.4	# 77.5	100	# 95.5	# 78.3	# 75.6	# 72.1	# 87.7	# 110	# 110	# 94.0	# 85.0
14	# 75.2	# 77.3	# 99.1	# 94.5	# 78.2	# 75.3	# 72.0	88.2	# 110	110	# 93.6	# 85.1
15	# 75.0	# 77.1	# 98.3	# 93.4	78.1	# 75.1	# 71.9	# 89.5	# 110	# 109	# 93.2	# 85.1
16	# 74.8	# 76.9	# 97.4	# 92.3	# 78.4	# 74.8	# 71.8	# 90.8	110	# 107	# 92.8	# 85.1
17	# 74.6	# 76.7	# 96.5	# 91.2	# 78.6	# 74.6	# 71.7	# 92.2	# 110	# 106	# 92.3	# 85.1
18	# 74.4	# 76.5	# 95.7	# 90.2	# 78.9	# 74.3	# 71.6	# 93.5	# 109	# 104	# 91.9	# 85.1
19	74.2	# 76.3	# 94.8	# 89.1	# 79.2	# 74.0	# 71.5	# 94.8	# 109	# 103	# 91.5	# 85.1
20	# 75.2	# 76.1	# 93.9	# 88.0	# 79.4	# 73.8	# 71.4	# 96.1	# 109	# 101	# 91.0	# 85.1
21	# 76.2	# 75.9	# 93.1	# 86.9	# 79.7	# 73.5	# 71.3	# 97.4	# 108	# 99.7	# 90.6	# 85.1
22	# 77.2	# 75.7	# 92.2	# 85.9	# 79.9	# 73.2	71.2	# 98.8	# 108	# 98.2	# 90.2	# 85.1
23	# 78.2	# 75.5	# 91.4	# 84.8	# 80.2	# 73.0	# 72.1	# 100	# 108	# 96.8	89.8	# 85.1
24	# 79.2	# 75.3	# 90.5	# 83.7	# 80.5	72.7	# 73.0	# 101	# 108	# 95.3	# 89.4	# 85.2
25	# 80.2	# 75.1	# 89.6	# 82.6	# 80.7	# 72.7	# 73.9	# 103	# 107	# 93.8	# 88.9	# 85.2
26	# 81.2	# 74.9	# 88.8	# 81.5	81.0	# 72.7	# 74.9	# 104	# 107	# 92.3	# 88.5	# 85.2
27	# 82.2	74.7	87.9	# 80.5	# 80.7	# 72.6	# 75.8	# 105	# 107	# 90.9	# 88.1	# 85.2
28	# 83.2	# 76.5	# 89.2	79.4	# 80.4	# 72.6	# 76.7	# 107	# 106	89.4	# 87.6	85.2
29	84.2		# 90.5	# 79.3	# 80.1	# 72.6	# 77.6	108	106	# 89.9	# 87.2	# 84.9
30	# 83.7		# 91.7	# 79.2	# 79.8	# 72.6	# 78.5	# 108	# 106	# 90.3	# 86.8	# 84.6
31	# 83.2		# 93.0		# 79.5	#	# 79.4	# 108		# 90.8		# 84.4
Sum	*2,179.3	*2,739.3				*2,255.4		*2,885.0		*3,173.4		*2,640.8
	*2,407.9	*2,832.6			*2,456.6		*2,267.1		*3,255		*2,749.3	

Month	Current Year 1953: Extreme Gage Feet High	Extreme Gage Feet Low	ϕ Extreme Second-Feet High Day	High	Low Day	Low	Average Second-Feet *	Total Acre-Feet*	Period March 1929-1953: Acre-Feet Average*	Maximum	Minimum
Jan.			29	84.2	19	74.2	77.7	4,780	8,092	19,620	* 4,520
Feb.			1	# 82.7	27	74.7	77.8	4,320	7,207	17,030	* 4,320
Mar.			13	100	1	# 78.3	91.4	5,620	7,869	17,770	* 5,030
Apr.			7	102	30	# 79.2	91.3	5,430	7,547	16,580	* 4,980
May			26	81.0	15	78.1	79.2	4,870	8,146	16,840	* 4,870
June			1	# 79.2	‡27	# 72.6	75.2	4,470	8,159	16,040	* 4,470
July			31	# 79.4	22	71.2	73.1	4,500	8,680	16,460	* 4,500
Aug.			‡29	108	1	# 80.3	93.1	5,720	8,376	15,840	5,450
Sept.			‡12	# 110	‡28	# 106	108	6,460	8,990	# 25,000	* 5,120
Oct.			‡13	110	28	89.4	102	6,290	9,260	* 25,870	* 5,150
Nov.			10	95.3	30	# 86.8	91.6	5,450	8,513	21,850	* 4,750
Dec.			1	# 86.3	31	# 84.4	85.2	5,240	8,367	20,470	* 4,780
Yearly				110		71.2	87.2	63,150	99,206	192,840	* 60,320

Estimated * Partly estimated ‡ And other days ϕ Mean daily

DEVILS RIVER NEAR DEL RIO, TEXAS

DESCRIPTION: Water-stage recorder on the main highway bridge, 12 miles northwest of Del Rio, Texas and 4.5 miles above the confluence with the Rio Grande. Devils River enters the Rio Grande 680.1 river miles below the American Dam at El Paso, Texas. The zero of the gage is 951.80 feet above mean sea level, U.S.C. & G.S. datum.

RECORDS: Based on 18 meter measurements during the year and a continuous record of gage heights. Computations by shifting channel methods. Records available: September 2, 1932 through December 1953. Records are also available from May 1900 to March 1914 for a point 2.8 miles below the highway bridge and from December 1923 to September 1, 1932 for a point 1.8 miles below the highway bridge.

REMARKS: The monthly flow of this spring-fed river is not modified, but the daily flow is modified by two power dams with a combined hydroelectric generating capacity of 3,100 kva, the operation of which began in 1929.

EXTREME FLOWS FROM RECORDS: The greatest recorded flow was 597,000 second-feet, which occurred September 1, 1932, with a gage height of 41.0 feet at the present station. Zero flow sometimes occurs for a few hours.

Mean Daily Discharge in Second-Feet 1953 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	185	199	207	203	113	108	116	108	1,030	171	202	* 202
2	185	179	233	221	122	113	126	97.4	475	179	214	210
3	215	219	229	162	158	119	139	100	404	195	204	193
4	188	185	237	146	139	124	146	105	735	491	221	193
5	181	226	162	146	125	129	139	125	308	424	203	207
6	231	194	149	146	131	120	130	121	274	272	195	182
7	223	194	175	139	146	134	130	115	228	251	203	177
8	287	170	228	146	165	157	125	113	180	250	200	177
9	172	182	1,330	147	162	139	129	109	195	255	190	177
10	148	247	305	140	221	167	134	104	198	208	180	187
11	166	234	293	148	178	187	134	124	237	222	184	189
12	211	129	325	185	192	182	142	129	248	211	189	202
13	184	178	308	149	218	187	142	120	196	199	189	181
14	214	327	234	143	192	165	134	126	165	188	200	186
15	204	153	176	128	175	113	124	126	230	215	184	197
16	285	177	170	103	172	113	119	119	267	200	184	196
17	166	163	217	104	188	113	145	141	209	213	200	185
18	147	179	192	83.8	209	124	182	138	183	202	204	175
19	219	276	182	84.4	218	144	161	162	182	198	216	185
20	166	201	177	85.1	175	139	154	298	182	198	187	179
21	248	168	195	80.6	179	163	155	249	174	196	187	189
22	315	153	328	81.3	210	128	186	358	151	214	182	189
23	168	228	216	97.2	194	128	327	227	130	200	181	189
24	144	211	173	138	166	127	275	312	165	191	186	173
25	161	250	172	146	165	132	246	249	174	194	185	173
26	178	202	180	119	151	132	172	266	174	234	185	168
27	185	196	187	107	124	132	148	569	182	210	195	168
28	233	236	202	132	124	132	150	182	186	209	201	177
29	186		204	197	129	127	147	151	182	216	¤ 200	172
30	184		188	140	124	97.9	164	165	189	202	¤ 200	182
31	252		196		119		181	144		212		180
Sum	6,231	5,656	7,770	4,047.4	5,084	4,075.9	4,902	5,452.4	7,833	7,020	5,851	5,740

Month	Current Year 1953								Period 1924-1953		
	Extreme Gage Feet		Extreme Second-Feet				Average Second-Feet	Total Acre-Feet	Acre-Feet		
				High		Low					
	High	Low	Day		Day				Average	Maximum	Minimum
Jan.	1.62	.92	22	785	‡ 8	108	201	12,400	21,703	45,250	9,150
Feb.	1.55	.80	10	708	12	79.9	202	11,200	20,578	54,500	9,630
Mar.	2.32	.98	9	1,830	‡ 5	123	251	15,400	21,053	43,300	9,250
Apr.	1.41	1.01	29	490	22	71.0	135	8,030	23,068	67,800	8,030
May	1.46	.92	19	576	11	46.9	164	10,100	39,478	356,900	10,100
June	1.43	.86	‡10	519	30	37.1	136	8,080	46,146	380,000	8,080
July	1.58	1.05	23	740	‡26	108	158	9,720	47,259	377,000	8,460
Aug.	2.72	1.06	27	1,890	23	76.1	176	10,800	25,177	107,000	8,050
Sept.	2.93	1.13	1	2,440	22	94.4	261	15,500	71,193	895,990	8,660
Oct.	2.48	1.26	4	1,360	30	106	226	13,900	43,938	349,000	9,780
Nov.	1.71	1.42	4	356	‡17	173	195	11,600	23,766	60,300	9,820
Dec.	1.73	1.28	2	366	31	104	185	11,400	22,177	49,520	9,330
Yearly	2.93	.80		2,440		37.1	191	138,130	405,536	1,284,080	131,830

¤ Estimated * Partly estimated ‡ And other days

ARROYO LAS VACAS NEAR CD. ACUNA, COAHUILA

DESCRIPTION: Water-stage recorder and cable with sit-down cable car, located 1.5 miles upstream from Cd. Acuña, Coahuila and 1.8 miles upstream from the confluence of Arroyo las Vacas with the Rio Grande at a point just above the Del Rio-Cd. Acuña International Bridge. This confluence is 693.5 river miles below the American Dam at El Paso, Texas. The zero of the gage is 884.15 feet above mean sea level, U.S.C. & G.S. datum.

RECORDS: Based on 164 meter measurements during the year, 162 by the Mexican and 2 by the United States Section of this Commission, and a continuous record of gage heights. Computations by shifting channel methods. Records available: Occasional estimates from June 1935 to March 19, 1938, and continuous records from March 20, 1938 through December 1953.

REMARKS: The low flow of this stream is from springs. Backwater from the Rio Grande reaches this station when the stage at Del Rio Station reaches about 21.0 feet, or a flow of about 110,000 second-feet.

EXTREME FLOWS FROM RECORDS: Momentary: Max. 25,640 second-feet on October 3, 1944, with a gage height of 17.45 feet. Min. .3 second-foot on various days in 1952 and 1953, with gage heights varying from 1.12 to 1.44 feet.

Average Flow in Second-Feet

Daily:	Max.	3,530	Oct. 3, 1944	Min.	.3	Several days 1952 & 1953
Monthly:	Max.	153	Oct. 1944	Min.	.4	Oct., Nov., Dec. 1952 & July 1953
Yearly:	Max.	25.9	1944	Min.	2.8	1952

Mean Daily Discharge in Second-Feet 1953 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	.3	39.2	.7	1.4	1.1	1.1	.7	.4	583	.7	.7	.7
2	.4	.7	.7	1.4	1.1	1.1	.7	.4	147	.7	.7	.7
3	.3	.7	.7	1.4	1.1	.8	.7	.4	19.8	2.5	.7	.3
4	.4	.7	.7	1.4	1.1	.7	.7	.4	166	.8	.3	.3
5	.3	.7	.7	1.4	1.1	.7	.7	.4	2.1	.8	.7	.4
6	.4	.7	.7	1.4	1.1	.7	.3	.4	2.1	.7	.7	.7
7	.3	.7	.7	1.4	1.1	.7	.3	.4	2.1	.7	.3	.7
8	.4	.7	.7	1.4	1.1	.7	.7	.4	1.8	.7	.3	.7
9	.3	.7	530	1.4	1.1	.7	.7	.4	1.4	.7	.7	.7
10	.4	.7	3.5	1.4	1.0	.7	.3	.4	1.4	.7	.7	.7
11	.3	.7	2.5	1.4	1.1	.7	.3	.4	1.4	.7	.7	.7
12	.4	.7	2.1	1.0	1.0	.7	.3	.4	1.4	.7	.4	.7
13	.3	.7	1.8	1.0	1.1	.7	.3	.4	1.4	.7	.4	.4
14	.4	.7	1.8	1.4	1.0	.7	.3	.4	1.1	.7	.7	.4
15	.3	.7	1.4	1.4	1.1	.7	.3	.4	1.1	.7	.7	.7
16	.4	.7	1.4	1.4	1.0	.8	.3	.4	1.1	.7	.7	.7
17	.3	.7	1.4	1.4	1.1	.7	.3	.4	1.1	.7	.7	.7
18	.4	.7	1.4	1.4	12.0	.7	.4	.4	1.1	.7	.7	.7
19	.3	.7	1.4	1.0	1.8	.7	.4	220	1.1	.7	.7	.7
20	.4	.4	1.4	1.0	1.4	.7	.4	3.2	1.1	.7	.7	.7
21	.3	.4	1.4	1.4	1.4	.7	.4	40.6	.7	.7	.7	.7
22	.4	.7	1.4	1.4	1.1	.7	.4	2.8	.7	.7	.4	.7
23	.3	.7	1.4	1.1	1.0	.7	.4	126	.7	.7	.4	.7
24	.4	.7	1.4	1.1	1.1	.7	.4	76.3	.7	.7	.4	.7
25	.3	.4	1.4	1.1	1.0	.7	.4	14.5	.7	.7	.4	.7
26	.4	.7	1.4	1.1	1.1	.7	.4	12.7	.7	.7	.7	.7
27	.3	.7	1.4	1.1	1.0	.7	.4	1.4	.7	.7	.7	.7
28	.4	.7	1.4	1.1	1.1	.7	.4	1.4	.7	.7	.7	.7
29	.3		1.4	1.1	1.0	.7	.4	1.4	.7	.7	.7	.7
30	.4		1.4	1.1	1.1	.8	.4	.7	.7	.7	.7	.7
31	176		1.4		1.0		.4	1.1		.7		.7
Sum	186.5	57.2	571.1	38.0	45.4	22.1	13.5	509.3	945.6	23.7	18.0	20.0

Month	Current Year 1953: Extreme Gage Feet High	Extreme Gage Feet Low	Extreme Second-Feet High Day	High	Low Day	Low	Average Second-Feet	Total Acre-Feet	Period 1938-1953: Acre-Feet Average	Maximum	Minimum
Jan.	4.43	1.12	31	1,690	‡ 1	.3	6.0	370	375	910	43.8
Feb.	2.46	1.21	1	275	‡20	.4	2.0	113	705	5,950	50.4
Mar.	4.56	1.21	9	1,960	‡ 1	.7	18.4	1,130	791	2,600	59.3
Apr.	1.25	1.18	‡ 1	1.4	29	.7	1.3	75.4	932	4,580	75.4
May	2.13	1.25	18	105	‡ 1	1.0	1.5	90.0	1,381	5,090	90.0
June	1.28	1.25	‡ 4	1.8	‡ 3	.7	.7	43.8	757	3,900	43.8
July	1.25	1.25	‡ 1	.7	‡ 6	.3	.4	26.8	1,488	8,230	26.8
Aug.	5.28	1.25	19	2,970	‡ 1	.4	16.4	1,010	871	3,850	42.2
Sept.	6.20	1.28	1	4,730	21	.7	31.5	1,880	1,372	6,850	37.3
Oct.	1.71	1.44	3	31.4	‡ 1	.7	.8	47.0	900	9,390	22.6
Nov.	1.51	1.44	12	2.1	‡ 4	.3	.6	35.7	333	u 1,670	21.0
Dec.	1.44	1.41	‡ 1	.7	‡ 3	.3	.6	39.7	291	704	22.0
Yearly	6.20	1.12		4,730		.3	6.7	4,861.4	10,196	18,808	2,066.7

u Estimated ‡ And other days

RIO GRANDE NEAR DEL RIO, TEXAS

DESCRIPTION: Water-stage recorder located on the downstream side of a pier of the international highway bridge between Del Rio, Texas and Cd. Acuña, Coahuila, and 693.6 river miles below the American Dam at El Paso, Texas. Measurements from highway bridge. The zero of the gage is 864.30 feet above mean sea level, U.S.C. & G.S. datum.

RECORDS: Based on 53 meter measurements during the year, 49 by the United States and 4 by the Mexican Section of this Commission, and a continuous record of gage heights. Computations by shifting channel methods. Records available: July 2, 1941 through December 1953. Records are also available from May 1900 to April 1915 for a station 11 miles upstream, from December 1919 to March 1920 for a station 7.5 miles upstream at McKee's Switch, and from December 1923 to July 2, 1941 for a station 900 feet above the international highway bridge.

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

EXTREME FLOWS FROM RECORDS: The greatest recorded flow was 605,000 second-feet, which occurred September 1, 1932, with a gage height of 34.5 feet. This is the greatest rate of discharge recorded at any point on the Rio Grande. The lowest recorded flow was 519 second-feet, which occurred July 1, 1953, with a gage height of .28 foot.

Mean Daily Discharge in Second-Feet 1953 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	989	1,030	952	821	639	782	568	1,720	2,400	833	997	906
2	976	966	929	856	629	744	562	1,380	4,020	840	942	910
3	1,000	967	924	820	634	747	543	1,200	2,600	892	929	915
4	1,110	951	892	777	639	655	543	1,050	8,030	2,510	917	893
5	1,050	929	874	767	622	619	600	1,000	3,870	2,830	915	889
6	1,030	924	847	758	619	613	593	953	2,400	1,250	890	885
7	1,020	911	847	749	617	614	572	919	2,520	1,050	888	862
8	984	907	892	772	620	607	565	951	2,050	1,170	874	876
9	972	948	3,100	1,000	629	594	565	1,040	1,870	1,160	872	878
10	945	1,000	1,560	838	624	595	674	1,050	1,690	1,080	869	880
11	938	977	1,050	769	649	589	850	1,000	1,460	976	867	882
12	950	945	1,160	727	702	588	648	957	1,370	952	863	920
13	961	892	1,490	711	728	587	568	914	1,520	918	884	931
14	934	912	1,290	702	641	578	675	893	1,500	897	890	915
15	936	914	1,180	703	637	555	700	823	1,330	875	906	926
16	958	880	1,120	678	643	547	631	756	1,310	876	900	935
17	952	883	1,040	694	648	548	588	719	1,290	864	906	927
18	917	867	1,080	674	704	542	796	803	1,230	843	900	918
19	910	887	1,070	671	675	550	1,320	918	1,170	844	896	918
20	941	889	1,040	674	672	552	1,150	1,140	1,120	844	886	937
21	916	867	999	677	671	610	986	1,500	1,060	856	876	937
22	928	847	961	672	668	663	885	940	1,010	868	888	946
23	913	852	952	691	673	620	3,550	3,670	952	901	889	929
24	899	892	907	694	656	673	2,430	4,220	942	879	922	920
25	902	898	862	714	646	744	2,320	2,920	930	879	947	911
26	933	957	836	689	636	715	1,970	1,550	940	1,180	930	912
27	954	970	818	664	620	669	1,680	1,960	929	1,430	892	912
28	949	956	811	668	600	641	1,360	1,270	917	1,580	886	921
29	942		819	644	602	619	1,090	1,030	871	1,230	901	949
30	934		820	649	709	607	997	1,050	846	1,100	895	940
31	991		803		756		1,510	1,010		1,050		936
Sum	29,734	25,818	32,925	21,923	20,208	18,767	32,489	41,306	54,147	34,457	27,017	28,316

Month	Current Year 1953								Period 1924-1953		
	Extreme Gage Feet		Extreme Second-Feet				Average Second-Feet	Total Acre-Feet	Acre-Feet		
				High		Low					
	High	Low	Day		Day				Average	Maximum	Minimum
Jan.	1.25	.82	31	1,300	22	856	959	59,000	153,126	344,000	59,000
Feb.	1.22	.76	1	1,270	21	832	922	51,200	137,156	261,000	51,200
Mar.	3.42	.68	9	5,360	31	787	1,060	65,300	133,295	224,670	56,900
Apr.	.99	.38	9	1,060	30	605	731	43,500	120,628	222,000	43,500
May	.79	.33	12	928	28	585	652	40,100	187,588	* 742,000	40,100
June	.70	.30	1	848	18	528	626	37,200	204,508	704,000	37,200
July	3.34	.28	23	5,160	1	519	1,050	64,400	247,967	* 1,228,000	64,400
Aug.	6.45	.42	23	13,800	‡17	701	1,330	81,900	249,832	865,000	68,700
Sept.	5.75	.67	4	11,600	30	815	1,800	107,000	478,296	2,754,590	46,800
Oct.	4.07	.67	4	7,060	18	810	1,110	68,300	354,715	1,634,000	56,200
Nov.	.96	.75	1	1,060	‡ 7	850	901	53,600	167,430	467,000	53,100
Dec.	.92	.76	3	961	5	845	913	56,200	150,798	295,180	56,200
Yearly	6.45	.28		13,800		519	1,010	727,700	2,585,339	6,041,720	727,700

* Partly estimated ‡ And other days

SAN FELIPE CREEK NEAR DEL RIO, TEXAS

DESCRIPTION: Water-stage recorder at Silos farm road bridge 1.75 miles south of Del Rio, Texas, 2 miles above the confluence with the Rio Grande, which is 1.6 river miles below the Del Rio gaging station on the Rio Grande. This stream enters the Rio Grande 695.2 river miles below the American Dam at El Paso, Texas. The zero of the gage is 875.05 feet above mean sea level, U.S.C. & G.S. datum.

RECORDS: Based on 24 meter measurements during the year and a continuous record of gage heights. Computations by shifting channel methods. Rating curves based on low and medium-flow measurements by wading or from bridge and high-flow measurements by slope-area computations. Records available: September 1, 1931 through December 1953.

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 or a flow of about 60,000 second-feet.

EXTREME FLOWS FROM RECORDS: Momentary: Max. 45,000 second-feet on June 14, 1935, with a gage height of 23.20 feet. Min. .4 second-foot on July 20, 1953.

Average Flow in Second-Feet

Daily:	Max.	# 16,200	June 14, 1935	Min.	1.5	July 21, 1953
Monthly:	Max.	* 805	June 1935	Min.	4.6	July 1953
Yearly:	Max.	* 136	1935	Min.	25.1	1953

Mean Daily Discharge in Second-Feet 1953 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	18.6	21.7	16.3	11.6	11.4	10.6	6.3	3.7	1,760	29.9	27.4	25.1
2	17.9	22.3	15.3	12.2	11.1	8.8	4.6	3.9	57.3	29.9	26.8	27.3
3	17.9	21.4	14.2	12.1	11.7	8.1	4.0	4.2	47.7	29.9	26.8	26.7
4	17.8	22.6	14.2	12.8	13.5	8.4	3.6	4.2	105	152	25.4	25.5
5	17.7	21.9	14.9	13.0	12.9	8.7	3.9	4.2	52.0	42.2	26.9	25.6
6	17.6	19.9	15.0	12.7	12.6	8.5	5.9	4.3	51.1	35.8	27.6	25.7
7	17.6	20.9	14.5	11.9	12.3	6.2	3.9	4.5	51.1	35.1	28.4	25.8
8	16.2	31.0	17.5	11.8	12.7	5.4	4.3	4.7	46.1	34.3	27.7	25.2
9	16.3	33.1	135	11.1	12.6	4.9	2.7	4.6	42.7	32.1	28.5	24.0
10	17.0	33.0	26.0	11.0	12.3	4.7	2.7	5.1	48.3	31.4	29.2	24.1
11	15.9	27.7	35.4	11.7	12.8	4.8	2.9	5.0	55.8	31.4	36.5	24.9
12	17.2	17.9	35.6	12.3	13.2	5.2	3.6	4.6	50.1	30.6	30.7	26.3
13	17.3	11.5	37.3	15.3	15.4	3.4	4.9	4.5	49.0	30.6	35.1	24.9
14	17.3	11.4	31.4	13.8	15.8	3.5	4.5	4.5	50.4	31.5	35.2	24.2
15	16.8	11.7	19.2	10.3	15.5	4.3	4.4	4.3	38.4	36.0	35.2	23.5
16	18.2	18.0	19.4	10.7	12.6	3.0	3.2	4.5	37.2	39.3	34.5	23.5
17	18.9	13.7	19.6	10.9	11.8	3.2	3.1	4.5	37.7	39.4	34.6	22.8
18	17.7	14.8	19.8	10.5	14.2	3.1	1.7	4.3	41.5	39.5	32.4	24.2
19	17.2	15.1	17.5	11.1	13.8	3.4	2.3	16.3	49.5	39.6	28.2	33.5
20	16.7	14.5	16.7	11.3	10.6	3.2	2.8	10.6	46.4	38.9	25.4	33.5
21	16.3	15.7	17.4	12.0	9.2	3.0	1.5	65.3	35.3	39.0	24.4	32.7
22	18.8	16.4	17.3	12.2	9.0	3.5	5.6	7.8	32.6	37.6	23.4	32.7
23	20.0	17.7	17.2	11.8	9.7	2.6	13.1	10.5	36.0	36.9	23.2	32.0
24	18.9	19.0	15.8	12.3	9.2	2.4	10.3	49.1	35.6	37.8	21.6	32.0
25	19.6	17.9	14.1	11.9	10.6	3.1	8.4	22.6	34.3	41.1	21.3	32.0
26	19.7	17.4	14.1	12.1	10.0	3.1	4.7	22.6	32.5	34.2	21.0	31.2
27	22.3	16.8	14.3	12.8	10.6	4.0	6.2	22.6	31.4	32.1	23.4	32.7
28	18.0	17.5	13.9	13.0	10.4	4.6	3.9	25.8	31.0	28.6	23.1	32.0
29	16.9		13.8	12.6	11.8	6.3	5.0	25.8	30.6	30.8	26.4	32.0
30	16.9		13.7	* 14.0	11.5	7.5	5.2	25.8	30.6	32.3	26.8	31.2
31	19.3		12.0		11.6		4.7	22.0		28.1		31.2
Sum	554.5	542.5	698.4	362.8	372.4	151.5	143.9	406.4	3,047.2	1,187.9	837.1	868.0

Month	Current Year 1953: Extreme Gage Feet High	Extreme Gage Feet Low	Extreme Second-Feet High Day	High	Low Day	Low	Average Second-Feet	Total Acre-Feet	Period Sept. 1931-1953: Acre-Feet Average	Maximum	Minimum
Jan.	.68	.33	31	36.3	8	12.3	17.9	1,100	3,727	7,070	934
Feb.	.69	.26	4	36.7	13	8.5	19.4	1,080	2,957	8,630	487
Mar.	3.54	.23	9	471	31	11.3	22.5	1,390	2,526	5,030	798
Apr.	.57	.20	13	27.0	15	9.2	12.1	720	2,773	* 8,120	566
May	.68	.26	15	20.7	21	6.1	12.0	739	4,058	* 14,800	739
June	.61		1	16.4	24	ϕ 2.4	5.0	301	5,556	* 47,900	301
July	.92	.21	22	35.5	20	.4	4.6	285	3,202	* 8,800	285
Aug.	4.49	.19	21	739	ǂ 1	3.0	13.1	806	2,867	6,060	806
Sept.	13.00	.48	1	7,600	30	27.0	102	6,040	4,278	19,100	872
Oct.	4.48	.31	4	738	31	17.4	38.3	2,360	3,693	8,470	1,000
Nov.	.61	.33	11	38.8	25	18.1	27.9	1,660	2,946	5,570	526
Dec.	.58	.38	19	35.0	8	20.4	28.0	1,720	2,958	5,870	496
Yearly	13.00			7,600		.4	25.1	18,201	41,541	* 98,137	18,201

Estimated * Partly estimated ǂ And other days ϕ Mean daily

PINTO CREEK NEAR DEL RIO, TEXAS

DESCRIPTION: Water-stage recorder and concrete control dam, .6 mile below the Del Rio-Eagle Pass highway and 5.5 miles above the confluence with the Rio Grande. This creek enters the Rio Grande 717.7 river miles below the American Dam at El Paso, Texas. The zero of the gage is 854.61 feet above mean sea level, U.S.C. & G.S. datum.

RECORDS: Based on 2 meter measurements during the year by wading and a continuous record of gage heights. During periods of low flow, which occurred most of the year, the only flow at this station was leakage through the control dam, and the discharge is based on hydrographer's estimates. The station has a stable rating curve defined by low-flow measurements by wading, medium-flow measurements made from the cable prior to its destruction in 1948, and high-flow measurements by slope-area computations. Records available: November 22, 1928 through December 1953.

REMARKS: Small irrigation diversions modify the flow of this spring-fed creek at this station.

EXTREME FLOWS FROM RECORDS: Momentary: Max. 186,000 second-feet on June 24, 1948, with a gage height of 32.0 feet. Min. frequently no flow.

Average Flow in Second-Feet

Daily:	Max.	* 28,200	June 24, 1948	Min.	0	Frequently
Monthly:	Max.	* 953	June 1948	Min.	0	Frequently
Yearly:	Max.	105	1932	Min.	1.8	1945

Mean Daily Discharge in Second-Feet 1953 — 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	u1,500	0	0	0
2	0	0	0	0	0	0	0	0	u 220	0	0	0
3	0	0	0	0	0	0	0	0	u 205	0	0	0
4	0	0	0	0	0	0	0	0	u 845	0	0	0
5	0	0	0	0	0	0	0	0	24.3	0	0	0
6	0	0	0	0	0	0	0	0	10.2	0	0	0
7	0	0	0	0	0	0	0	0	3.8	0	0	0
8	0	0	0	0	0	0	0	0	1.7	0	0	0
9	0	0	9.2	0	0	0	0	0	1.7	0	0	0
10	0	0	4.9	0	0	0	0	0	1.6	0	0	0
11	0	0	1.4	0	0	0	0	0	1.5	0	0	0
12	0	0	.9	0	0	0	0	0	1.4	0	0	0
13	0	0	.8	0	0	0	0	0	1.3	0	0	0
14	0	0	.7	0	0	0	0	0	1.1	0	0	0
15	0	0	.6	0	0	0	0	0	1.0	0	0	0
16	0	0	.5	0	0	0	0	0	1.0	0	0	0
17	0	0	.3	0	0	0	0	0	1.0	0	0	0
18	0	0	.2	0	0	0	0	0	.9	0	0	0
19	0	0	.1	0	0	0	0	0	.8	0	0	0
20	0	0	0	0	0	0	0	0	.7	0	0	0
21	0	0	0	0	0	0	0	264	.6	0	0	0
22	0	0	0	0	0	0	0	u 2.4	.5	0	0	0
23	0	0	0	0	0	0	0	u 1.7	.4	0	0	0
24	0	0	0	0	0	0	0	u 458	.3	0	0	0
25	0	0	0	0	0	0	0	u 3.9	.2	.1	0	0
26	0	0	0	0	0	0	0	u 1.4	.1	3.3	0	0
27	0	0	0	0	0	0	0	u 1.1	0	1.4	0	0
28	0	0	0	0	0	0	0	u .9	0	1.1	0	0
29	0		0	0	0	0	0	u .8	0	1.0	0	0
30	0		0	0	0	0	0	u .6	0	1.0	0	0
31	0		0		0		0	u .3		.5		0
Sum	0	0	19.6	0	0	0	0	u 735.1	u2,826.1	8.4	0	0

Month	Current Year 1953: 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. 1928-1953: Acre-Feet Average	Acre-Feet Maximum	Acre-Feet Minimum
Jan.				0		0	0	0	366	2,110	0
Feb.				0		0	0	0	570	5,760	0
Mar.	3.63		9	30.8	‡ 1	0	.6	38.9	457	2,500	0
Apr.				0		0	0	0	652	3,600	0
May				0		0	0	0	2,058	20,500	0
June				0		0	0	0	* 4,095	* 56,700	0
July				0		0	0	0	2,448	30,000	0
Aug.	7.72		u24	3,040	‡ 1	0	u 23.7	u 1,460	2,288	48,700	0
Sept.	* 11.70		1	*10,400	‡ 1	0	u 94.2	u 5,610	1,656	17,300	0
Oct.	3.47		26	10.2	‡ 1	0	.3	16.7	732	4,000	0
Nov.				0		0	0	0	307	2,150	0
Dec.				0		0	0	0	381	2,180	0
Yearly	* 11.70			*10,400		0	u 9.8	u 7,125.6	* 16,010	76,259.3	1,325.2

u Estimated * Partly estimated ‡ And other days

RIO SAN DIEGO AT JIMENEZ, COAHUILA

DESCRIPTION: Water-stage recorder and cable with sit-down cable car and masonry and concrete Cipoletti weir control for measuring flows up to 706 second-feet, located 4.4 miles west of Jiménez, Coahuila and 5.0 miles above the confluence with the Rio Grande. This stream enters the Rio Grande 722.4 river miles below the American Dam at El Paso, Texas. The zero of the gage is 828.90 feet above mean sea level, U.S.C. & G.S. datum.

RECORDS: Based on 3 meter measurements made at high flow during the year, the weir discharge table, and a continuous record of gage heights. The discharge did not exceed the capacity of the weir, except on August 23, 24, and 30, September 1, 2, and 4, and October 25. Records available: 1922 through December 1953. The records from 1922 to September 1932 are considered doubtful.

REMARKS: Reservoirs and irrigation diversions modify the flow of this spring-fed stream at this station.

EXTREME FLOWS FROM RECORDS: ● Momentary: Max. about 75,200 second-feet on September 18, 1941, with a gage height of 20.96 feet. Min. no flow on several occasions from April to June 1939, May 7 and August 6, 1952, and July and August 1953.

Average Flow in Second-Feet

Daily:	Max.	* 23,200	Sept. 18,	1941	Min.	0	Occasionally
Monthly:	Max.	2,380	Oct.	1932	Min.	9.1	June 1953
Yearly:	Max.	527		1935	Min.	37.9	1939

Mean Daily Discharge in Second-Feet 1953 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	32.9	42.0	28.3	16.2	9.9	9.9	9.9	0	2,240	100	52.3	63.2
2	32.9	42.0	32.8	24.0	13.1	9.9	9.9	9.8	519	87.2	52.3	63.2
3	42.0	42.0	32.8	24.0	16.2	9.9	9.9	9.8	346	87.2	52.3	63.2
4	47.3	42.0	32.8	28.3	16.2	9.9	9.9	9.8	604	114	42.0	63.2
5	47.3	42.0	32.8	24.0	20.1	9.9	9.9	9.8	413	114	42.0	63.2
6	47.3	42.0	32.8	24.0	24.0	9.9	9.9	9.8	325	114	42.0	63.2
7	47.3	42.0	32.8	24.0	24.0	9.9	9.9	9.8	304	114	42.0	63.2
8	47.3	42.0	24.0	24.0	16.2	9.9	9.9	9.8	284	114	52.3	63.2
9	47.3	42.0	28.3	24.0	13.1	9.9	9.9	9.8	304	114	52.3	42.0
10	47.3	42.0	42.0	24.0	13.1	16.2	9.9	9.8	304	114	52.3	42.0
11	47.3	42.0	42.0	24.0	16.3	16.2	9.9	9.8	304	114	52.3	52.3
12	42.0	42.0	52.3	37.4	13.1	16.2	9.9	9.8	284	114	52.3	42.0
13	37.5	42.0	52.3	42.0	13.1	16.2	24.0	9.8	284	114	52.3	52.3
14	32.9	57.9	47.3	42.0	13.1	9.9	63.2	16.2	265	100	52.3	63.2
15	37.5	57.9	42.0	42.0	9.9	9.9	24.0	16.2	245	100	52.3	63.2
16	42.0	52.3	42.0	28.3	9.9	9.9	16.2	16.2	265	100	52.3	52.3
17	42.0	52.3	42.0	16.2	16.2	4.2	9.9	9.9	245	100	42.0	52.3
18	42.0	52.3	42.0	9.9	16.2	4.2	4.2	4.2	245	100	42.0	52.3
19	42.0	42.0	47.3	9.9	16.2	4.2	0	9.9	245	114	52.3	63.2
20	47.3	32.8	47.3	16.2	16.2	4.2	0	9.9	227	100	52.3	63.2
21	42.0	28.3	37.4	16.2	16.2	7.1	0	24.0	227	87.2	52.3	63.2
22	42.0	28.3	37.4	16.2	16.2	7.1	0	74.9	227	87.2	52.3	63.2
23	42.0	24.0	37.4	13.1	16.2	7.1	42.0	381	209	87.2	52.3	63.2
24	42.0	24.0	32.8	13.1	9.9	9.9	192	1,480	209	87.2	52.3	63.2
25	42.0	24.0	28.3	13.1	9.9	9.9	87.2	284	209	118	52.3	63.2
26	42.0	24.0	24.0	13.1	9.9	9.9	42.0	209	209	129	52.3	63.2
27	42.0	24.0	24.0	9.9	9.9	4.2	16.2	227	175	87.2	42.0	63.2
28	42.0	24.0	24.0	9.9	9.9	7.1	9.9	245	129	87.2	42.0	63.2
29	42.0		16.2	9.9	9.9	7.1	0	245	114	74.9	52.3	63.2
30	42.0		13.1	9.9	9.9	4.2	0	299	100	63.2	52.3	63.2
31	42.0		9.9		9.9		0	245		63.2		63.2
Sum	1,313.4	1,094.1	1,060.4	628.8	433.9	274.0	649.6	3,914.0	10,060	3,099.9	1,486.6	1,841.1

Month	Current Year 1953: 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 Oct. 1932-1953: Acre-Feet Average	Acre-Feet Maximum	Acre-Feet Minimum
Jan.	2.82	2.76	‡ 3	47.3	2	28.3	42.4	2,610	7,121	36,430	2,610
Feb.	2.87	2.74	‡14	57.9	27	20.1	39.1	2,170	5,701	25,760	1,970
Mar.	2.85	2.69	‡12	52.3	31	9.9	34.2	2,100	5,484	27,040	2,100
Apr.	2.84	2.69	‡12	47.3	‡ 1	9.9	21.0	1,250	5,477	21,650	1,110
May	2.76	2.64	‡ 5	24.0	‡15	2.1	14.0	861	* 13,723	* 120,200	861
June	2.74	2.62	‡10	20.1	‡ 8	2.1	9.1	543	10,030	62,240	543
July	3.31		24	265	‡19	0	21.0	1,290	9,083	34,430	836
Aug.	6.27		24	3,670	1	0	126	7,760	8,054	32,180	1,250
Sept.	8.50	2.99	1	7,950	30	100	335	19,950	* 15,136	* 84,620	1,480
Oct.	3.94	2.89	25	724	30	63.2	100	6,150	18,622	146,640	1,720
Nov.	2.89	2.82	13	63.2	‡ 4	42.0	49.6	2,950	11,628	68,290	1,430
Dec.	2.89	2.82	‡ 1	63.2	9	42.0	59.4	3,650	7,783	45,160	2,050
Yearly	8.50			7,950		0	70.8	51,284	117,842	* 381,720	27,460

* Partly estimated ‡ And other days ● Period Oct. 1932-1953

RIO GRANDE NEAR JIMENEZ, COAHUILA

DESCRIPTION: Temporary water-stage recorder located 5.0 miles below Jiménez, Coahuila, 26.7 miles above Eagle Pass, Texas and Piedras Negras, Coahuila, and 728.0 miles below the American Dam at El Paso, Texas. The zero of the gage is 755.86 feet above mean sea level, U.S.C. & G.S. datum.

RECORDS: Based on 81 meter measurements, by wading during low flow, and a continuous record of gage heights during periods of low and medium flows. Computations by shifting channel methods. Records available: May 9 through 23, October, November and December 1952; January 1 through March 8, March 17 through July 21, July 28 through August 20, and October 14 through December 31, 1953.

REMARKS: This station was installed for temporary use in connection with a loss and gain study made in 1952 on the Rio Grande between this station and San Antonio Crossing station. Operation was resumed in October 1952 and continued during periods of low and medium flows through December 1953.

Mean Daily Discharge in Second-Feet 1953 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	56.5	357	19.8	18.4	6.7	3.5	3.9	23.7			52.6	55.8
2	56.1	487	19.8	18.4	6.7	3.9	4.9	101			46.6	54.0
3	50.5	86.9	21.9	21.9	6.7	4.2	5.3	31.1			41.0	51.9
4	54.7	50.5	24.0	24.7	7.4	3.9	4.2	15.2			39.9	55.4
5	60.0	41.3	20.1	24.0	6.4	3.9	3.9	8.5			35.3	59.7
6	65.0	37.4	19.1	23.0	8.8	4.2	3.2	6.0			38.5	48.4
7	64.3	33.9	23.3	19.1	10.6	4.2	3.5	4.2			48.7	47.3
8	63.6	26.8	24.0	15.5	9.5	4.2	3.2	3.5			45.2	49.1
9	52.3	29.7		12.7	14.1	3.9	3.5	3.5			41.7	45.9
10	52.3	29.7		10.9	23.0	3.9	2.8	2.8			41.7	38.1
11	52.3	23.0		9.5	19.1	3.9	2.8	1.8			41.3	49.4
12	47.3	20.8		14.5	21.2	3.9	2.8	1.4			45.9	48.4
13	45.9	27.2		14.8	13.8	3.9	6.4	1.1			45.9	52.6
14	36.4	35.0		24.4	9.9	3.9	9.2	1.1		62.9	50.9	51.6
15	38.8	36.4		24.4	6.4	3.9	13.1	1.1		62.9	41.0	56.5
16	39.6	40.6		20.5	14.1	3.9	6.7	1.1		68.9	45.9	61.4
17	40.3	33.5	73.4	20.1	11.7	3.5	5.3	1.1		69.9	46.6	50.1
18	40.6	33.9	61.1	18.7	8.1	3.5	5.7	1.4		71.0	47.3	49.8
19	45.6	38.5	55.1	11.7	7.1	3.9	6.0	2.5		71.7	48.0	65.3
20	47.3	26.1	49.4	10.2	6.7	3.9	6.0	31.4		72.7	43.4	70.3
21	48.7	18.0	43.1	9.2	6.7	3.9	14.8			71.3	43.8	75.2
22	55.4	17.7	41.0	8.5	6.0	3.9				69.6	43.8	74.9
23	41.0	22.2	35.7	11.3	5.0	4.2				68.2	49.4	67.5
24	40.6	27.2	36.4	9.9	4.2	3.9				64.3	44.5	73.8
25	44.1	26.5	33.5	8.5	4.2	4.2				72.7	43.8	73.1
26	48.0	22.2	27.5	5.3	4.2	3.9				* 86.8	43.4	70.6
27	47.3	20.1	21.9	6.4	4.3	3.9				101	48.0	67.8
28	46.6	15.5	22.2	6.7	3.5	3.9	107			204	44.1	65.0
29	45.9		20.8	10.2	3.2	3.9	46.6			132	50.5	66.7
30	45.2		26.5	5.7	3.2	4.2	27.2			114	57.6	68.5
31	44.5		22.9		3.5		16.2			78.4		57.9
Sum	1,516.7	1,664.6		439.1	266.0	117.9					1,356.3	1,822.0

Month	Current Year 1953								Period 1952-1953		
	Extreme Gage Feet		Extreme Second-Feet				Average Second-Feet	Total Acre-Feet	Acre-Feet		
			High		Low						
	High	Low	Day		Day				Average	Maximum	Minimum
Jan.	1.31	.98	22	73.1	31	23.3	48.9	3,010			
Feb.	2.76	.85	1	893	20	13.8	59.4	3,300			
Mar.	6.82	.85			4	12.7					
Apr.	1.05	.72	18	30.7	27	4.2	14.6	871			
May	1.08	.49	10	33.9	28	1.8	8.6	528			
June	.62	.46	8	4.6	27	2.8	3.9	234			
July		.39			5	2.1					
Aug.											
Sept.											
Oct.											
Nov.	1.31	1.12	1	66.4	5	31.4	45.2	2,690	2,040	2,690	1,390
Dec.	1.35	1.15	25	84.8	10	38.1	58.8	3,610	3,060	3,610	2,510
Yearly											

* Partly estimated

RIO SAN RODRIGO NEAR EL MORAL, COAHUILA

DESCRIPTION: Water-stage recorder and cable with sit-down cable car and reinforced concrete control weir for measuring flows up to 177 second-feet. This station is located 10.6 miles west of the town of El Moral, Coahuila, 19.3 miles northwest from Piedras Negras, Coahuila and 11.2 river miles above the confluence with the Rio Grande. The stream enters the Rio Grande 735.4 river miles below the American Dam at El Paso, Texas. The zero of the gage is 879.95 feet above mean sea level, U.S.C. & G.S. datum.

RECORDS: Based on 3 meter measurements made at high flow during the year, the weir discharge table, and a continuous record of gage heights. The discharge did not exceed the capacity of the weir, except on August 27 and 31, September 1 to 15, and October 5. Records available: 1922 through December 1953. The records from 1922 to 1931 are considered doubtful.

REMARKS: The flow of this spring-fed stream is modified by irrigation diversions above this station.

EXTREME FLOWS FROM RECORDS: ● Momentary: Max. * 81,200 second-feet on September 7, 1932, with a gage height of 16.08 feet on the original gage (See Water Bulletin No. 16). Min. frequently no flow, which occurs at a gage height of 0.0 feet.

Average Flow in Second-Feet

Daily:	Max.	* 27,900	Sept. 7, 1932	Min.	0	Frequently
Monthly:	Max.	4,270	Sept. 1932	Min.	0	Several months in 1939, 1952 & 1953
Yearly:	Max.	571	1932	Min.	7.4	1952

Mean Daily Discharge in Second-Feet 1953 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	12.0	8.1	5.0	5.0	0	0	0	0	1,090	96.1	87.6	57.2
2	8.2	8.1	4.9	5.0	0	0	0	0	4,700	96.1	87.6	57.2
3	8.1	8.1	5.0	5.0	0	0	0	0	2,620	113	87.6	57.2
4	8.1	8.1	4.9	5.0	0	0	0	0	1,950	123	87.6	57.2
5	8.1	8.1	8.1	5.0	0	0	0	0	1,140	162	87.6	50.1
6	8.1	6.7	8.1	5.0	0	0	0	0	823	132	87.6	50.1
7	8.1	8.1	8.1	2.1	0	0	0	0	635	122	87.6	50.1
8	5.0	8.1	12.0	5.0	0	0	0	0	551	122	79.5	50.1
9	5.0	6.7	12.0	4.9	0	0	0	0	438	113	79.5	43.8
10	8.1	6.7	33.5	4.9	0	0	0	0	374	113	79.5	43.8
11	8.1	6.7	12.0	8.1	0	0	0	0	334	105	79.5	43.8
12	8.1	6.7	8.1	12.0	0	0	0	0	280	105	79.5	50.1
13	8.1	6.7	8.1	8.1	0	0	0	0	254	105	79.5	50.1
14	8.1	6.7	8.1	12.0	0	0	0	0	205	105	71.7	43.8
15	8.1	6.7	8.1	8.1	0	0	0	0	173	96.1	71.7	43.8
16	8.1	5.0	8.1	8.1	0	0	0	0	152	96.1	64.3	43.8
17	8.1	5.0	8.1	8.1	0	0	0	0	132	96.1	64.3	43.8
18	8.1	6.7	8.1	4.9	0	0	0	0	113	96.1	64.3	43.8
19	8.1	4.9	8.1	2.1	0	0	0	0	104	96.1	57.2	43.8
20	8.1	4.9	8.1	2.1	0	0	0	0	104	96.1	57.2	50.1
21	8.1	6.7	8.1	2.1	0	0	0	0	96.1	96.1	57.2	43.8
22	8.1	6.7	8.1	2.1	0	0	0	0	96.1	105	57.2	43.8
23	8.1	8.1	5.0	2.1	0	0	0	0	96.1	105	57.2	43.8
24	8.1	8.1	4.9	2.1	0	0	0	0	96.1	105	57.2	43.8
25	8.1	6.7	5.0	2.1	0	0	0	31.1	96.1	105	57.2	43.8
26	8.1	4.9	4.9	2.1	0	0	0	64.3	96.1	96.1	57.2	43.8
27	5.0	4.9	5.0	2.1	0	0	0	227	96.1	87.6	57.2	43.8
28	8.1	4.9	4.9	2.1	0	0	0	123	96.1	87.6	57.2	43.8
29	8.1		5.0	2.1	0	0	0	87.6	96.1	87.6	57.2	43.8
30	8.1		4.9	2.1	0	0	0	87.6	96.1	87.6	57.2	43.8
31	8.1		5.0		0		0	152		87.6		43.8
Sum	245.8	187.8	247.3	141.5	0	0	0	772.6	17,133.0	3,239.0	2,112.9	1,455.5

Month	Current Year 1953: Extreme Gage Feet High	Extreme Gage Feet Low	Extreme Second-Feet High Day	High	Low Day	Low	Average Second-Feet	Total Acre-Feet	Period 1932-1953: Acre-Feet Average	Maximum	Minimum
Jan.	.13	.07	1	12.0	‡ 8	4.9	7.9	488	3,261	14,850	171
Feb.	.10	.07	‡ 1	8.1	‡ 3	4.9	6.7	373	2,663	11,580	373
Mar.	.72	.07	10	142	‡ 1	4.9	8.0	491	2,418	9,900	491
Apr.	.16	.03	11	16.2	‡ 7	2.1	4.7	281	2,753	21,160	281
May				0		0	0	0	5,424	42,330	0
June				0		0	0	0	5,935	41,660	0
July				0		0	0	0	3,601	12,170	0
Aug.	1.41		31	406	‡ 1	0	24.9	1,530	4,485	23,580	0
Sept.	11.06	.52	2	10,910	29	87.6	571	33,980	* 19,850	* 253,960	0
Oct.	.85	.51	5	189	29	83.3	104	6,420	9,510	81,360	0
Nov.	.52	.39	‡ 1	87.6	‡19	57.2	70.4	4,190	4,792	24,450	0
Dec.	.39	.30	‡ 1	57.2	‡29	37.4	47.0	2,890	3,948	19,060	131
Yearly	11.06			10,910		0	70.0	50,643	* 68,640	* 414,310	5,353

* Partly estimated ‡ And other days ● Period 1932-1953

RETURN FLOW TO THE RIO GRANDE 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 near Eagle Pass, Texas, at a point about 32.2 canal miles below the point of diversion, and about 744.9 river miles below the American Dam at El Paso, Texas.

RECORDS: Based on records furnished by the Maverick County Water Control and Improvement District No. 1, showing hourly manometer readings of discharge, in cubic feet per second, 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 check measurements of flow made by current meter by hydrographers of this Commission under stable flow conditions. Records available: January 1949 through December 1953.

REMARKS: This power plant began operating April 16, 1932. 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, however, it has operated almost continuously. This plant contains 3 vertical turbine generators of 4,000 kw. capacity each, operating under a normal head of about 84 feet.

Mean Daily Discharge in Second-Feet 1953 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	652	483	435	259	0	5.5	141	728	980	426	750	526
2	654	77.4	445	209	0	6.1	108	837	1,010	392	669	535
3	639	442	404	283	0	25.2	54.0	745	1,090	430	580	534
4	650	520	400	253	29.9	24.7	24.0	624	1,120	484	561	563
5	766	518	331	185	0	15.0	54.0	438	1,070	889	524	565
6	686	508	321	208	11.5	0	78.0	398	1,120	1,040	517	563
7	652	476	303	109	0	0	104.0	355	1,190	930	512	546
8	637	507	354	106	0	0	93.9	328	1,160	756	501	500
9	599	507	562	106	0	0	92.5	345	1,200	759	485	501
10	574	521	832	222	97.5	0	68.5	431	1,290	776	471	487
11	578	591	842	172	36.5	0	106	414	1,230	709	470	520
12	557	553	706	187	50.0	0	149	373	1,190	611	470	565
13	540	517	763	113	156	0	146	347	1,210	575	470	591
14	582	457	541	106	294	0	211	309	1,220	539	504	609
15	588	489	676	64.7	149	0	177	284	1,150	488	546	612
16	589	506	845	63.4	102	0	185	264	1,100	487	549	605
17	635	442	789	63.4	95.1	0	190	189	1,120	495	534	611
18	622	449	700	59.9	80.5	0	150	160	1,080	508	550	598
19	535	422	723	59.9	29.7	0	392	209	1,090	506	550	597
20	522	406	687	13.2	18.8	0	617	600	1,040	449	553	635
21	466	326	644	0	0	0	400	849	960	459	548	641
22	426	326	549	0	0	0	316	1,010	846	464	538	634
23	485	370	519	0	0	46.2	328	704	742	465	537	626
24	478	441	463	0	0	98.7	536	1,030	656	519	530	634
25	501	489	382	31.9	0	17.7	645	1,230	563	497	540	653
26	439	390	277	66.1	0	0	778	1,210	582	516	554	636
27	457	398	273	0	0	0	822	1,150	561	805	562	617
28	481	440	250	0	0	0	775	1,180	503	977	555	618
29	463		280	66.9	0	52.8	573	1,040	475	1,000	555	618
30	442		263	55.6	0	132	356	787	423	916	555	592
31	427		240		0		323	841		791		592
Sum	17,322	12,571.4	15,799	3,063.0	1,150.5	423.9	8,992.9	19,409	28,971	19,658	16,240	18,124

Month	Current Year 1953: Extreme Gage Feet High	Extreme Gage Feet Low	ϕ Extreme Second-Feet High Day	High	Low Day	Low	Average Second-Feet	Total Acre-Feet	Period 1949-1953: Acre-Feet Average	Maximum	Minimum
Jan.			5	766	22	426	559	34,400	51,120	64,700	34,400
Feb.			11	591	2	77.4	449	24,900	45,080	57,200	24,900
Mar.			16	845	31	240	510	31,300	49,140	65,400	30,500
Apr.			3	283	‡21	0	102	6,080	38,316	58,600	6,080
May			14	294	‡ 1	0	37.1	2,280	45,136	64,900	2,280
June			30	132	‡ 6	0	14.1	841	46,648	68,900	841
July			27	822	4	24.0	290	17,800	48,960	63,000	17,800
Aug.			25	1,230	18	160	626	38,500	51,720	68,900	30,200
Sept.			10	1,290	30	423	966	57,500	52,880	67,500	18,500
Oct.			6	1,040	2	392	634	39,000	48,240	69,000	23,000
Nov.			1	750	‡11	470	541	32,200	45,220	63,500	27,300
Dec.			25	653	10	487	585	35,900	48,860	65,500	35,900
Yearly				1,290		0	443	320,701	571,320	740,000	320,701

‡ And other days ϕ Mean daily

RIO GRANDE AT EAGLE PASS, TEXAS

DESCRIPTION: Water-stage recorder and cable with stand-up cable car and winch, located .5 mile above the international highway bridge between Eagle Pass, Texas and Piedras Negras, Coahuila, and 754.6 river miles below the American Dam at El Paso, Texas. The zero of the gage is 682.91 feet above mean sea level, U.S.C. & G.S. datum.

RECORDS: Based on 144 meter measurements during the year and a continuous record of gage heights. Computations by shifting channel methods. Records available: May 1900 to March 1914; August 1914 to 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 January 1924 through December 1953.

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

EXTREME FLOWS FROM RECORDS: The greatest recorded flow was 569,000 second-feet, which occurred September 2, 1932, with a gage height of 49.00 feet. The lowest recorded flow was 24.4 second-feet, which occurred June 22, 1953, with a gage height of .07 foot.

Mean Daily Discharge in Second-Feet 1953 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	713	657	558	466	101	91.8	184	675	25,360	671	1,030	713
2	742	872	593	378	99.2	131	182	961	32,380	667	964	710
3	770	675	544	339	107	119	156	936	14,480	664	833	706
4	770	671	526	385	125	118	65.0	703	14,620	689	745	703
5	865	639	509	413	126	107	63.9	547	11,190	2,450	706	699
6	841	607	512	441	125	98.5	102	484	5,190	2,610	671	696
7	780	576	470	378	108	108	119	466	3,670	1,510	681	692
8	777	579	456	297	113	108	98.9	434	3,670	1,250	664	689
9	742	579	689	273	102	95.0	121	424	3,050	1,140	674	685
10	717	593	2,670	322	120	83.3	79.5	484	2,810	1,070	667	692
11	717	706	1,770	441	142	41.7	103	519	2,380	1,040	635	646
12	692	667	1,170	323	145	41.7	138	501	1,920	900	632	703
13	678	597	964	287	181	38.5	209	459	1,820	833	632	710
14	692	590	1,110	256	346	38.1	298	441	1,800	802	636	763
15	689	600	1,180	170	267	38.1	284	441	1,840	727	643	770
16	685	639	1,100	173	212	33.5	258	445	1,870	689	678	830
17	710	586	957	174	216	35.3	296	420	1,840	685	699	826
18	731	537	848	188	203	33.2	254	332	1,800	685	689	823
19	675	544	851	186	181	33.9	317	311	1,630	682	664	816
20	639	554	855	169	118	33.9	752	742	1,510	674	664	812
21	632	551	770	138	120	37.4	509	1,000	1,360	643	636	809
22	611	519	727	109	123	30.7	357	1,320	1,190	660	639	802
23	646	519	685	95.3	123	34.3	410	1,580	1,110	706	639	798
24	643	551	590	106	124	98.2	2,310	9,850	1,050	710	628	890
25	639	586	554	106	113	118	1,810	6,680	1,040	717	618	791
26	639	554	547	179	109	43.1	1,230	4,340	982	795	632	883
27	618	523	512	176	96.1	86.2	1,290	2,390	922	936	650	879
28	653	526	494	166	82.3	102	982	2,130	865	999	643	780
29	629		484	132	71.3	118	766	2,000	731	1,060	639	777
30	600		494	180	73.8	188	554	1,500	703	1,130	636	763
31	586		470		75.9		463	2,860		1,140		749
Sum	21,521	16,797	24,659	7,446.3	4,248.6	2,283.4	14,761.3	46,375	144,783	29,934	20,567	23,605

Month	Current Year 1953								Period 1924-1953		
	Extreme Gage Feet		Extreme Second-Feet				Average Second-Feet	Total Acre-Feet	Acre-Feet		
	High	Low	Day	High	Day	Low			Average	Maximum	Minimum
Jan.	1.48	1.05	5	929	25	554	694	42,690	165,209	365,000	42,690
Feb.	1.64	1.08	2	1,170	22	519	600	33,320	147,452	398,200	33,320
Mar.	3.61	.92	10	4,170	8	456	795	48,910	138,774	247,440	40,230
Apr.	1.02	.26	1	466	23	84.8	248	14,770	127,567	270,700	14,770
May	.98	.16	14	392	30	67.1	137	8,430	218,932	* 918,000	8,430
June	.95	.07	30	203	22	24.4	76.1	4,530	248,671	1,005,000	4,530
July	3.67	.46	24	4,630	10	50.1	476	29,300	260,873	* 1,255,000	29,300
Aug.	6.69	.92	24	12,360	28	314	1,500	91,980	261,767	* 947,000	50,080
Sept.	16.37	1.31	1	58,620	30	703	4,830	287,200	517,633	3,079,000	27,050
Oct.	4.00	1.25	5	5,330	3	632	966	59,370	387,977	1,680,300	31,560
Nov.	1.67	1.25	1	1,110	25	618	686	40,790	187,631	512,800	35,630
Dec.	1.35	1.21	23	897	11	646	761	46,820	162,705	369,760	41,000
Yearly	16.37	.07		58,620		24.4	978	708,110	2,825,191	6,946,510	708,110

* Partly estimated

RIO ESCONDIDO AT VILLA DE FUENTE, COAHUILA

DESCRIPTION: Water-stage recorder and cable with sit-down cable car, located 3.1 miles southwest of Piedras Negras, Coahuila, on the outskirts of Villa de Fuente, 5 miles above the confluence with the Rio Grande. This stream enters the Rio Grande 758.2 river miles below the American Dam at El Paso, Texas. The zero of the gage is 717.78 feet above mean sea level, U.S.C. & G.S. datum.

RECORDS: Based on 52 meter measurements during the year and a continuous record of gage heights. Computations by shifting channel methods. Records available: 1922 through December 1953. The records from 1922 to September 1932 are considered doubtful.

REMARKS: Diversions and drainage returns modify the flow of this spring-fed stream at this station. Backwater reaches this station when the flow of the Rio Grande at Eagle Pass reaches approximately 380,000 second-feet.

EXTREME FLOWS FROM RECORDS: ● Momentary: Max. 24,000 second-feet on June 29, 1936, with a gage height of 19.13 feet. Min. .4 second-foot on November 4, 1934, with a gage height of .75 foot, and in June, July, and August 1953, with a gage height of 2.17, 1.05, and .92 feet, respectively.

Average Flow in Second-Feet

Daily:	Max.	6,710	June 29, 1936	Min.	.4	Several days 1953
Monthly:	Max.	647	Oct. 1932	Min.	1.0	Sept. 1945
Yearly:	Max.	83.2	1935	Min.	11.0	1943

Mean Daily Discharge in Second-Feet 1953 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	6.4	5.0	5.6	6.3	3.9	3.5	.4	.4	788	5.3	5.6	6.0
2	4.6	4.6	4.6	7.1	3.9	3.5	.4	.4	3,000	5.3	6.7	6.0
3	4.2	4.6	4.6	7.8	3.9	3.2	.4	.4	4,550	5.3	6.7	6.0
4	4.2	4.6	4.6	7.4	3.5	3.2	.4	.4	720	5.3	6.7	4.9
5	4.2	4.6	4.6	7.4	3.5	3.2	.4	.4	463	5.3	6.7	4.9
6	3.5	4.2	4.6	6.3	3.5	1.8	6.0	.4	252	4.6	6.4	4.9
7	3.5	4.2	4.6	6.3	3.5	2.1	6.0	.4	169	4.6	6.0	4.2
8	4.2	4.2	4.6	6.0	3.2	2.1	6.0	.4	119	4.6	5.7	4.6
9	4.6	4.2	4.9	5.6	3.2	2.5	5.9	.4	88.3	4.6	5.7	4.2
10	4.6	4.6	4.9	75.9	3.5	2.1	5.2	.4	68.9	4.2	5.3	4.6
11	4.6	4.6	5.6	109	3.6	2.1	4.2	.4	60.7	4.2	4.9	4.6
12	3.9	4.6	80.2	6.7	3.5	1.7	3.5	.4	53.0	4.9	4.6	5.7
13	3.9	4.6	12.0	5.3	3.5	2.1	2.8	.4	43.1	4.6	4.6	6.0
14	3.9	4.6	8.5	4.2	3.5	1.7	2.1	.4	43.1	4.6	4.9	6.0
15	3.9	4.2	7.4	4.2	3.5	1.7	1.0	.4	43.4	5.7	4.9	5.3
16	3.9	4.2	6.7	3.9	3.9	1.4	.4	.4	37.4	5.7	5.3	5.3
17	3.9	4.2	6.4	3.9	3.9	1.0	.4	.4	35.3	5.7	6.7	12.0
18	3.9	4.2	6.0	3.9	3.9	.7	.4	.4	37.1	5.7	6.7	6.7
19	4.2	3.9	6.4	4.6	111	.7	.4	.4	36.4	6.0	7.1	7.4
20	4.2	4.6	6.4	4.6	24.7	.7	.4	.4	36.0	6.0	7.1	6.4
21	4.2	4.6	6.4	4.6	8.1	.7	.4	29.0	35.7	6.0	7.1	5.3
22	4.2	4.6	6.4	4.6	6.4	.7	.4	39.9	37.4	6.0	7.1	5.3
23	4.6	5.0	6.0	4.6	5.3	.7	.4	271	40.3	4.2	7.1	4.9
24	4.6	5.0	6.0	4.6	4.6	.7	.4	347	36.4	3.9	7.1	4.9
25	4.6	5.0	6.0	4.6	4.2	.4	.4	56.9	30.4	4.2	7.1	5.3
26	4.2	5.0	6.0	4.9	3.9	.4	.4	53.7	19.8	4.2	7.1	4.9
27	4.2	5.0	6.0	4.2	3.9	.4	.4	200	14.8	4.6	6.7	4.9
28	4.2	5.7	6.0	4.2	3.9	.4	.4	139	12.7	4.6	6.7	4.6
29	5.0		6.0	4.6	3.5	.4	.4	108	6.4	5.7	6.4	4.2
30	5.0		6.0	4.6	3.5	.4	.4	81.9	5.3	5.7	6.0	3.9
31	5.0		5.6		3.5		.4	26.1		5.7		3.9
Sum	134.1	128.4	259.6	331.9	251.4	46.2	51.1	1,360.5	10,882.9	157.0	186.7	167.8

Month	Current Year 1953: Extreme Gage Feet High	Extreme Gage Feet Low	Extreme Second-Feet High Day	High	Low Day	Low	Average Second-Feet	Total Acre-Feet	Period Oct. 1932-1953: Acre-Feet Average	Maximum	Minimum
Jan.	2.33	2.20	1	6.4	‡ 6	3.5	4.3	266	2,334	15,990	266
Feb.	2.33	2.26	28	5.7	19	3.9	4.6	255	1,551	9,990	179
Mar.	3.81	2.30	12	258	‡ 1	4.6	8.4	515	1,353	6,910	206
Apr.	5.74	2.43	10	968	‡16	3.9	11.1	658	1,617	7,510	195
May	4.40	2.36	19	509	‡ 8	3.2	8.1	499	3,630	23,850	494
June	2.40	2.17	‡ 1	3.5	‡26	.4	1.5	91.6	2,766	19,730	91.6
July	2.17	1.05	‡ 6	6.0	‡ 1	.4	1.6	101	1,927	9,740	101
Aug.	11.48	.92	25	5,690	‡ 1	.4	43.9	2,700	* 2,376	* 20,830	77.8
Sept.	14.21	1.28	‡ 2	9,820	30	5.3	363	21,590	3,386	21,590	57.5
Oct.	1.54	1.21	23	20.1	24	3.9	5.1	311	3,303	39,790	109
Nov.	1.31	1.25	‡19	7.1	‡12	4.6	6.2	370	2,094	25,590	101
Dec.	1.64	1.31	17	15.2	9	3.9	5.4	333	2,138	20,720	260
Yearly	14.21	.92		9,820		.4	38.2	27,689.6	28,475	60,241	7,969

* Partly estimated ‡ And other days ● Period October 1932-1953

RIO GRANDE AT SAN ANTONIO CROSSING NEAR VILLA GUERRERO, COAHUILA

DESCRIPTION: Temporary water-stage recorder, located at San Antonio Crossing, which is 5.0 miles northeast of Villa Guerrero, Coahuila, 34.6 river miles below Eagle Pass, Texas and Piedras Negras, Coahuila, and 789.2 river miles below the American Dam at El Paso, Texas. The zero of the gage is 581.53 feet above mean sea level, U.S.C. & G.S. datum.

RECORDS: Based on 55 meter measurements during the year, by wading during low flow, by boat during medium flow, and a continuous record of gage heights during the periods of low and medium flows. Computations by shifting channel methods. Records available: March, April, May, October, November, and December 1952, with some days missing; January 1 through August 20, and September 23 through December 31, 1953.

REMARKS: This station was installed for temporary use in connection with a loss and gain study made in 1952 on the Rio Grande between Jimenez station and this station, and was continued during periods of low and medium flows in 1953. The recorder was out of operation from August 21 to September 23, 1953.

Mean Daily Discharge in Second-Feet 1953 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	1,060	770	752	537	274	146	221	544		961	1,190	915
2	1,010	922	777	646	224	151	288	936		939	1,120	936
3	1,010	1,040	759	523	209	194	236	1,190		922	1,040	915
4	996	805	657	547	247	198	171	1,060		1,060	932	897
5	1,010	840	657	604	286	194	115	858		1,310	887	936
6	1,140	876	600	547	305	194	83.0	671		2,410	841	915
7	1,060	848	565	561	257	203	104	611		1,870	830	936
8	978	798	583	494	240	203	136	579		1,420	837	915
9	950	816	756	431	229	194	123	554		1,250	830	862
10	893	812	2,050	494	251	179	103	558		1,220	802	826
11	893	819	2,150	1,610	256	155	120	660		1,250	795	844
12	872	869	2,460	664	268	146	86.9	646		1,200	805	880
13	872	830	1,380	579	646	146	145	569		1,120	798	971
14	858	773	1,250	484	699	151	232	554		1,030	823	971
15	908	742	1,340	434	607	138	274	512		968	851	992
16	890	749	1,380	312	463	121	264	498		901	915	992
17	943	777	1,140	300	381	117	244	484		897	925	971
18	999	717	1,180	311	346	101	300	456		890	894	971
19	932	696	996	324	357	89.3	256	413		883	865	971
20	823	653	1,030	335	332	81.9	277	551		876	837	1,010
21	759	618	968	323	272	81.9	632			855	844	1,030
22	696	653	932	278	245	78.3	526			904	816	992
23	636	696	848	266	239	81.9	417		1,430	918	805	992
24	713	759	770	265	234	71.3	431		1,330	932	781	1,010
25	752	763	692	243	228	97.1	1,760		1,250	989	784	1,010
26	727	805	678	262	233	213	1,290		1,180	1,020	791	1,030
27	745	685	590	314	214	165	1,460		1,220	1,300	834	1,030
28	745	685	632	335	182	89.3	1,290		1,120	1,350	823	971
29	745		579	323	154	85.8	1,090		1,020	1,440	826	971
30	727		583	249	130	101	869		999	1,490	851	971
31	749		590		135		636			1,330		954
Sum	27,091	21,816	30,324	13,595	9,143	4,166.8	14,179.9			35,905	25,972	29,587

Month	Current Year 1953								Period 1952-1953		
	Extreme Gage Feet		Extreme Second-Feet				Average Second-Feet	Total Acre-Feet	Acre-Feet		
			High		Low						
	High	Low	Day		Day				Average	Maximum	Minimum
Jan.	3.02	2.23	6	1,230	22	618	874	53,730			
Feb.	3.05	2.20	3	1,180	20	611	779	43,270			
Mar.	4.63	1.97	10	3,160	31	530	978	60,150	56,100	60,150	52,050
Apr.	4.79	1.05	11	3,430	30	209	453	26,970			
May	3.02	.79	13	1,160	30	126	295	18,140			
June	1.12	.43	26	233	24	54.4	139	8,260			
July	4.46	.52	25	2,090	6	69.9	457	28,130			
Aug.											
Sept.											
Oct.	5.05	2.53	6	2,700	21	837	1,160	71,220			
Nov.	3.18	2.49	1	1,240	25	752	866	51,520	47,745	51,520	43,970
Dec.	2.89	2.46	24	1,050	10	809	954	58,690	55,940	58,690	53,190
Yearly											

RIO GRANDE AT LAREDO, TEXAS

DESCRIPTION: Water-stage recorder and cable with stand-up cable car. The recorder is located on the downstream side of the first pier from the Mexican end of the railroad bridge between Laredo, Texas and Nuevo Laredo, Tamaulipas, 884.3 river miles below the American Dam at El Paso, Texas. The cable is located 1.4 miles upstream from the railroad bridge. The zeros of the gages at the recorder and at the cable are 351.51 feet and 352.89 feet, respectively, above mean sea level, U.S.C. & G.S. datum.

RECORDS: Based on 135 meter measurements during the year, 131 by the Mexican and 4 by the United States Section of this Commission, and a continuous record of gage heights. Computations by shifting channel methods. Records available: May 1900 through December 1913; May, June, and October 1914; September 1916; September and October 1917; October 1918; September and October 1919; August and September 1920; June, November, and December 1922; and January 1923 through December 1953. Gage-height records are available for January, February, and March 1914.

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

EXTREME FLOWS FROM RECORDS: The greatest recorded flow at this station was 335,000 second-feet, which occurred September 3, 1932, with a gage height of 52.20 feet. The lowest recorded flow was zero second-feet, which occurred various days in June and July, 1953, with a gage height of 2.30 feet.

Mean Daily Discharge in Second-Feet 1953 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	1,260	773	682	625	163	61.1	0	826	12,290	833	1,430	840
2	1,080	706	607	1,200	162	20.4	0	724	32,980	780	1,200	869
3	1,020	770	650	982	158	2.1	0	526	41,320	901	1,080	862
4	992	932	671	724	128	0	0	809	35,670	1,220	1,010	858
5	968	996	657	724	105	0	0	1,010	16,740	883	915	816
6	943	837	569	551	74.2	0	0	837	13,280	1,770	816	812
7	985	816	565	516	72.4	0	0	675	6,500	2,700	816	805
8	1,030	791	561	512	98.9	0	0	576	4,450	2,360	749	802
9	946	742	537	473	153	0	0	452	3,880	1,760	745	802
10	893	713	576	438	156	27.2	0	441	3,530	1,310	745	770
11	925	777	932	388	138	24.7	0	410	3,070	1,240	749	735
12	890	720	2,970	1,490	103	21.9	0	353	2,830	1,250	728	735
13	879	692	2,470	1,100	1,120	12.7	0	403	2,480	1,320	706	735
14	869	745	1,930	667	2,740	0	0	487	2,210	1,170	713	798
15	865	706	1,250	516	1,340	0	0	399	2,100	1,020	717	830
16	862	636	1,230	427	830	0	0	406	2,140	929	721	830
17	862	629	1,340	350	636	0	0	381	2,130	840	773	858
18	893	618	1,340	296	646	0	79.8	325	1,900	805	844	851
19	890	696	1,190	267	5,010	0	149	346	1,770	812	848	879
20	975	646	1,080	222	1,240	0	112	335	1,710	816	784	872
21	929	646	975	209	389	0	118	576	1,660	749	763	869
22	826	643	1,010	198	299	0	143	1,740	1,610	872	766	893
23	766	643	901	215	245	0	242	4,590	1,510	1,450	834	908
24	689	731	830	237	213	0	526	4,910	1,360	1,800	809	886
25	664	763	724	217	142	0	347	9,080	1,260	1,910	781	901
26	742	766	675	185	98.5	0	650	14,660	1,150	1,570	756	943
27	791	756	600	154	89.0	0	1,730	18,570	1,110	961	703	957
28	819	805	4,170	117	81.2	0	1,250	9,850	1,010	915	752	968
29	788		1,470	116	62.5	0	1,450	3,000	1,010	1,060	802	946
30	791		699	150	59.0	0	1,100	2,270	918	1,320	823	893
31	795		547		65.3		911	14,480		1,420		876
Sum	27,627	20,694	34,408	14,266	16,817.0	170.1	8,807.8	94,447	205,578	38,746	24,878	26,399

Month	Current Year 1953								Period 1924-1953		
	Extreme Gage Feet		Extreme Second-Feet				Average Second-Feet	Total Acre-Feet	Acre-Feet		
				High		Low					
	High	Low	Day		Day				Average	Maximum	Minimum
Jan.	4.53	3.77	1	1,390	25	664	891	54,800	167,209	351,700	54,800
Feb.	4.10	3.64	5	1,180	17	597	739	41,050	149,234	423,700	41,050
Mar.	7.32	3.64	28	8,510	31	498	1,110	68,250	140,027	223,400	46,500
Apr.	4.99	2.82	12	2,690	29	100	476	28,300	135,826	316,300	28,300
May	7.55	2.62	19	10,030	29	44.8	542	33,360	251,788	856,000	33,360
June	2.72	2.30	1	61.1	‡ 3	0	5.5	337	282,995	1,357,000	337
July	4.92	2.30	26	2,450	‡ 1	0	284	17,470	271,560	1,250,000	17,470
Aug.	11.81	3.15	31	25,250	18	299	3,050	187,300	273,161	883,000	56,080
Sept.	18.60	4.07	3	53,680	30	890	6,850	407,800	538,958	2,943,000	30,900
Oct.	5.74	3.87	24	3,960	21	749	1,250	76,850	420,590	1,951,000	31,910
Nov.	4.63	3.87	1	1,530	27	703	829	49,350	194,271	570,800	43,110
Dec.	4.20	3.94	‡23	968	‡11	735	852	52,360	167,289	352,700	52,230
Yearly	18.60	2.30		53,680		0	1,410	1,017,227	2,992,908	7,017,110	1,010,830

‡ And other days

RIO SALADO AT CD. GUERRERO AND LAS TORTILLAS, TAMAULIPAS

DESCRIPTION: At Cd. Guerrero station, water-stage recorder and cable with sit-down cable car, and two reinforced concrete Cipoletti weirs with a combined capacity of 636 second-feet, located at a place called "El Cable," 2 miles southwest of Cd. Guerrero, Tamaulipas and about 6.2 miles above the confluence of the Río Salado with the Rio Grande, which is 946.1 river miles below the American Dam at El Paso, Texas. The zero of the gage is 265.75 feet above mean sea level, U.S.C. & G.S. datum. At Las Tortillas station, water-stage recorder and cable with stand-up cable car, located 18.6 river miles upstream from the Cd. Guerrero station, 2 miles below the confluence of Río Sabinas and 6.2 miles southeast of the town of Las Tortillas, Tamaulipas. The zero of this gage is 325.72 feet above mean sea level, U.S.C. & G.S. datum.

RECORDS: Based on 56 meter measurements and the weir discharge table at Cd. Guerrero, 41 meter measurements at Las Tortillas, and a continuous record of gage heights at each station. Computations by shifting channel methods for flows above 636 second-feet at Cd. Guerrero and for all flows at Las Tortillas. Records available: For station at Cd. Guerrero, 1900 to 1913 and 1923 to September 8, 1953; at Las Tortillas, September 9 through December 1953.

REMARKS: On September 4, 1953, backwater from Falcón Reservoir began to affect the gage height of the Río Salado at Cd. Guerrero station. Discharges were measured several times each day until September 8 when the station was abandoned and operation began at the new station at Las Tortillas, where the zero of the gage is about 11.5 feet above the maximum water surface of Falcón Reservoir. Reservoirs and irrigation diversions modify the flow at these stations.

EXTREME FLOWS FROM RECORDS: Momentary: Max. 46,620 second-feet on August 27, 1953, at a gage height of 20.01 feet. Min. frequently no flow.

Average Flow in Second-Feet

Daily:	Max.	40,260	Aug. 27, 1953	Min.	0	Frequently
Monthly:	Max.	10,950	Oct. 1932	Min.	0	Several months 1940, 1952, & 1953
Yearly:	Max.	1,850	1932	Min.	34.6	1952

Mean Daily Discharge in Second-Feet 1953 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	0	0	0	72.1	0	0	420	0	8,860	43.8	110	" 4.9
2	0	0	0	3,030	0	0	431	0	8,760	32.9	75.9	" 4.6
3	0	0	0	1,920	0	0	119	0	6,500	851	61.4	" 4.6
4	0	0	0	1,230	0	0	43.1	0	2,880	2,610	49.1	" 4.2
5	0	0	0	260	0	0	22.2	0	3,670	3,140	49.4	" 4.2
6	0	0	0	143	0	0	11.3	0	6,460	1,180	37.8	" 4.2
7	0	0	0	84.1	0	0	9.9	0	6,570	632	29.7	" 3.9
8	0	0	0	45.9	0	0	5.3	0	1,950	255	22.2	" 3.9
9	0	0	0	28.6	0	0	3.9	0	"1,270	177	29.3	" 3.9
10	0	0	0	18.4	0	0	1.4	0	"1,180	110	27.5	" 3.5
11	0	0	0	12.7	0	0	1.4	0	"1,090	90.4	26.1	" 3.5
12	0	0	0	9.9	0	0	0	0	" 996	60.0	17.7	" 3.2
13	0	0	0	9.9	0	0	0	0	" 908	61.5	19.1	" 3.2
14	0	0	0	8.5	1,320	0	7.1	0	" 816	49.5	19.1	" 3.2
15	0	0	0	8.5	703	0	216	0	" 727	49.1	19.1	" 2.8
16	0	0	0	6.7	190	0	38.1	0	" 636	48.7	13.1	" 2.8
17	0	0	0	6.7	84.0	0	14.5	0	" 547	39.2	13.1	" 2.5
18	0	0	0	5.3	48.7	0	8.5	0	" 455	37.8	13.1	" 2.5
19	0	0	0	5.3	28.6	0	6.7	0	" 367	27.2	13.1	" 2.5
20	0	0	0	3.9	18.4	0	3.9	0	" 275	27.9	8.5	" 2.1
21	0	0	0	2.8	11.3	0	1.4	494	" 185	28.6	8.5	" 2.1
22	0	0	0	1.4	9.9	0	.7	4,800	*1,500	63.6	8.5	" 1.8
23	0	0	0	.7	8.5	0	0	3,090	784	583	8.5	" 1.8
24	0	0	0	0	6.7	0	0	4,450	413	755	4.9	" 1.8
25	0	0	0	0	5.3	0	0	17,980	98.5	526	4.9	" 1.4
26	0	0	0	0	3.9	0	0	32,170	78.0	226	4.9	" 1.4
27	0	0	0	0	2.8	0	0	40,260	77.3	434	4.9	" 1.4
28	0	0	331	0	2.8	0	0	27,230	60.7	417	4.9	" 1.1
29	0		130	0	1.4	0	0	22,040	60.4	188	4.9	" 1.0
30	0		92.9	0	.7	0	0	12,680	47.0	176	4.9	" .7
31	0		45.9		0		0	3,240		130		" .7
Sum	0	0	599.8	6,914.4	2,446.0	0	1,365.4	168,434	58,220.9	13,050.2	714.1	" 85.4

Month	Current Year 1953: Extreme Gage Feet High	Extreme Gage Feet Low	Extreme Second-Feet High Day	High	Low Day	Low	Average Second-Feet	Total Acre-Feet	Period 1924-1953: Acre-Feet Average	Maximum	Minimum
Jan.				0	‡ 1	0	0	0	12,621	144,110	0
Feb.				0	‡ 1	0	0	0	8,844	98,520	0
Mar.	4.69		28	689	‡ 1	0	19.3	1,190	9,404	95,740	0
Apr.	8.50	1.31	2	5,160	‡24	0	230	13,710	13,257	82,660	0
May	6.36	1.31	14	2,190	‡ 1	0	78.9	4,850	39,791	* 253,000	3,200
June				0	‡ 1	0	0	0	34,863	192,000	0
July	6.14		1	1,790	‡ 1	0	44.0	2,710	17,172	100,000	228
Aug.	20.01		27	46,620	‡ 1	0	5,430	334,100	38,895	334,100	0
Sept. #	11.29	.33	1	10,280	30	35.3	1,940	115,500	86,403	600,000	3,310
Oct. #	1.44	.26	5	3,140	21	20.5	421	25,890	60,517	673,070	28.4
Nov. #	.52	.16	1	133	24	4.9	23.8	1,420	19,799	248,590	0
Dec. #			1	" 4.9	30	" .7	" 2.8	" 169	13,956	198,160	0
Yearly	20.01			46,620		0	690	499,539	355,522	1,350,260	25,132.4

" Estimated * Partly estimated ‡ And other days # Records for September 9, 1953 to December 31, 1953 are for station at Las Tortillas, Tamaulipas and are included in the records shown above for the Period 1924-1953.

RIO GRANDE NEAR ZAPATA, TEXAS

DESCRIPTION: Water-stage recorder and cable with stand-up cable car equipped for winch and heavy weights, located about 3 miles below the town of Zapata, Texas, 7.5 miles northeast of Guerrero, Tamaulipas, 1.4 river miles below the confluence of the Río Salado with the Rio Grande, and 947.5 river miles below the American Dam at El Paso, Texas. The zero of the gage is at mean sea level, U.S.C. & G.S. datum.

RECORDS: Based on 34 meter measurements during the year and a continuous record of gage heights. Computations by shifting channel methods. Records available: January 1932 through August 23, 1953.

REMARKS: Reservoirs, diversions, and drainage returns modify the river flow at this station. Records of discharge were discontinued on August 23, 1953 when water stored in Falcón Reservoir inundated this station.

EXTREME FLOWS FROM RECORDS: The greatest recorded flow was 261,000 second-feet, which occurred September 4, 1932, with a gage height of 262.07 feet. There was no flow on May 10, 1953, and from June 10 through July 1, 1953.

Mean Daily Discharge in Second-Feet 1953 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	964	664	685	601	24.2	4.5	34.3	938				
2	1,130	694	692	4,210	17.8	2.5	630	773				
3	1,040	672	576	3,900	23.4	.8	187	581				
4	981	641	522	3,330	194	.5	66.9	452				
5	950	702	546	1,270	40.2	.4	40.2	300				
6	901	930	543	935	46.1	.3	23.6	802				
7	881	733	524	706	40.2	.2	12.6	911				
8	861	668	510	533	24.9	.2	8.0	724				
9	966	712	518	516	12.8	.1	5.5	542				
10	935	682	513	460	4.4	0	3.2	433				
11	858	627	493	439	1.0	0	1.6	349				
12	857	599	527	408	1.5	0	.5	313				
13	803	619	2,810	980	2,410	0	.4	292				
14	767	598	2,500	1,180	5,520	0	1.0	267				
15	768	640	1,950	704	4,170	0	184	297				
16	768	* 717	1,310	491	1,720	0	86.6	367				
17	760	* 669	1,160	430	1,060	0	37.3	348				
18	788	* 598	1,230	358	715	0	19.7	324				
19	798	* 547	1,260	295	1,810	0	12.2	289				
20	815	* 533	1,100	252	3,370	0	8.7	253				
21	839	* 556	968	198	1,400	0	4.7	273				
22	846	* 587	848	151	550	0	2.6	4,830				
23	770	* 611	841	131	310	0	.5	5,060				
24	682	636	787	148	215	0	.4					
25	655	666	667	93.8	162	0	.5					
26	621	731	595	87.8	137	0	.5					
27	618	738	542	84.3	93.9	0	.5					
28	666	696	933	72.4	64.2	0	843					
29	696		3,810	62.1	35.0	0	1,180					
30	669		1,640	48.1	20.4	0	1,290					
31	658		785		11.1		1,150					
Sum	25,311	*18,466	32,385	23,074.5	24,204.1	9.5	5,836.0					

Month	Current Year 1953								Period 1932-1953		
	Extreme Gage Feet		Extreme Second-Feet				Average Second-Feet	Total Acre-Feet	Acre-Feet		
	High	Low	Day	High	Day	Low			Average	Maximum	Minimum
Jan.	219.93	219.26	2	1,180	27	587	816	50,200	172,490	* 484,450	50,200
Feb.	219.72	219.14	6	997	19	* 532	* 660	*36,600	155,795	399,000	* 36,600
Mar.	222.22	218.98	29	6,720	11	484	1,040	64,200	153,430	292,000	43,200
Apr.	222.23	217.61	2	6,770	30	34.8	769	45,800	156,799	662,000	45,800
May	222.46		14	7,750	10	0	781	48,000	286,575	682,000	48,000
June	217.37		1	6.8	‡10	0	.3	18.8	327,008	1,517,000	18.8
July	220.19		28	1,540	1	0	188	11,600	315,705	1,238,000	11,600
Aug.											
Sept.											
Oct.											
Nov.											
Dec.											
Yearly											

* Partly estimated ‡ And other days

RIO GRANDE AT CHAPENO, TEXAS

DESCRIPTION: A temporary water stage recorder, located 2.5 miles below Falcón Dam, 973.4 river miles below the American Dam at El Paso, and 11.2 river miles above the confluence of the Río Alamo with the Río Grande. The zero of the temporary gage is 173.26 feet above mean sea level, U.S.C. & G.S. datum.

RECORDS: Based on 37 meter measurements made during the year, by wading during low flow, by boat during medium flow, and a continuous record of gage heights. Computations by shifting channel methods. Records available: December 17, 1952 through December 1953.

REMARKS: This station was placed in operation on December 17, 1952. Except for tributary inflows below Falcón Dam, flow at this station, after August 25, 1953, was controlled largely by requested releases and spill from Falcón Reservoir 2.5 miles upstream. See page 56.

EXTREME FLOWS FROM RECORDS: Momentary: Max. 22,600 second-feet on August 27, 1953, with a gage height of 7.98 feet. Min. zero flow occurred on June 17 through July 1, 1953.

Average Flow in Second-Feet

Daily:	Max.	* 7,460	Aug. 27, 1953	Min.	0	June 17 through July 1, 1953
Monthly:	Max.	2,580	Sept. 1953	Min.	7.8	June 1953
Yearly:	Max.	943	1953	Min.	943	1953

Mean Daily Discharge in Second-Feet 1953 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	# Sept.	# Oct.	Nov.	Dec.
1	814	646	680	1,180	70.1	59.1	0	923	¤ 32.8	2,940	16.8	2,600
2	911	634	681	1,800	58.3	42.8	2.0	* 885	¤ 32.8	2,960	22.8	2,600
3	1,000	635	668	4,050	51.4	31.2	159	* 779	¤ 32.8	3,190	26.0	2,420
4	1,000	636	569	4,100	912	25.2	196	661	* 566	2,430	57.2	2,190
5	961	625	520	3,140	1,070	12.4	154	514	*1,580	1,180	313	2,190
6	960	692	524	1,990	433	11.0	111	390	*2,650	1,180	314	2,190
7	933	862	517	1,230	212	10.4	77.2	563	*4,290	1,140	463	2,170
8	893	738	506	800	147	9.2	55.0	667	4,870	1,160	743	2,130
9	866	666	480	594	105	6.8	41.6	657	4,760	1,100	672	1,790
10	891	681	484	506	76.1	6.3	34.5	554	4,510	1,060	636	1,360
11	891	667	483	445	51.2	5.2	27.2	462	4,330	622	626	895
12	851	606	468	407	37.2	3.7	15.9	379	4,060	102	606	750
13	839	583	827	363	34.4	3.1	10.5	338	3,750	51.1	606	437
14	815	608	1,960	817	2,060	3.0	9.0	305	3,510	95.1	606	257
15	780	585	2,290	1,000	4,010	2.8	1,360	278	3,310	543	606	163
16	764	610	1,980	775	2,940	.3	668	278	3,090	1,030	707	916
17	760	645	1,480	572	1,650	0	258	318	2,830	1,290	994	1,070
18	755	619	1,210	468	1,420	0	158	323	2,660	1,750	1,310	656
19	763	550	1,180	397	1,020	0	109	323	2,520	1,760	1,500	656
20	774	533	1,160	304	1,890	0	73.4	300	2,390	1,800	1,580	667
21	784	521	1,040	256	2,460	0	48.0	316	2,280	1,830	1,720	721
22	796	524	952	216	1,570	0	35.9	1,080	2,200	3,180	1,860	647
23	806	527	858	193	963	0	21.4	1,940	2,200	538	1,970	586
24	738	545	850	170	612	0	14.9	2,880	2,160	102	2,270	687
25	663	572	778	160	362	0	10.3	892	2,060	71.7	2,290	687
26	643	610	709	135	251	0	6.4	757	1,910	53.5	2,290	974
27	622	661	692	108	196	0	4.3	*7,460	1,780	25.1	2,360	1,200
28	611	692	2,530	97.6	164	0	2.1	* 696	1,590	11.9	2,620	1,220
29	621		2,150	93.1	129	0	186	¤ 98.5	2,070	11.3	2,620	1,220
30	651		3,130	80.9	99.2	0	825	¤ 56.0	3,330	10.8	2,600	1,240
31	661		2,040		76.2		886	¤ 37.7		13.2		1,290
Sum	24,817	17,473	34,376	26,447.6	25,130.1	232.5	5,559.6	*26,110.2	77,354.4	33,230.7	35,004.8	38,579

Month	Current Year 1953								Period		
	Extreme Gage Feet		Extreme Second-Feet				Average Second-Feet	Total Acre-Feet	Acre-Feet		
				High		Low			Average	Maximum	Minimum
	High	Low	Day		Day						
Jan.	1.26	.94	3	1,020	28	611	801	49,200			
Feb.	1.14	.84	7	879	21	516	624	34,700			
Mar.	2.76	.75	28	5,860	12	461	1,110	68,200			
Apr.	2.66	- .31	3	4,270	30	73.0	882	52,500			
May	2.64	- .65	15	4,200	13	33.6	811	49,800			
June	- .35		1	67.2	‡16	0	7.8	461			
July	1.67		15	1,740	‡ 1	0	179	11,000			
Aug.	7.98	¤- .67	27	22,600	31	¤ 33.6	* 842	* 51,800			
Sept.	3.01	¤- .68	8	4,950	‡ 1	¤ϕ 32.8	2,580	153,000			
Oct.	3.95	- .87	22	9,460	29	10.6	1,070	65,900			
Nov.	2.18	- .82	‡27	2,620	1	15.0	1,170	69,400			
Dec.	2.20	- .45	1	2,670	15	57.5	1,240	76,500			
Yearly	7.98			22,600		0	943	682,461			

¤ Estimated * Partly estimated ‡ And other days # The mean daily figures listed above include estimated amounts of arroyo inflow in mean daily second feet, between Falcón Dam and Chapeño for the following days: September 4, ¤ 505 second-feet; September 5, ¤ 80 second-feet; October 22, ¤ 1,580 second-feet; October 23, ¤ 53 second-feet. ϕ Mean daily

RIO ALAMO AT CD. MIER, TAMAULIPAS

DESCRIPTION: Water-stage recorder and cable with sit-down cable car and reinforced concrete weir for measuring flows up to 177 second-feet, located 3.1 miles above the confluence of the Río Alamo with the Rio Grande, and .6 mile west of Cd. Mier, Tamaulipas, at a point called "El Paso del Cántaro." This stream enters the Rio Grande 984.6 river miles below the American Dam at El Paso, Texas. On June 11, 1952, the recorder was moved from a point 230 feet above a new highway bridge to a point 285 feet below the bridge and 312 feet above the weir. The zero of the gage is 188.35 feet above mean sea level, U.S.C. & G.S. datum.

RECORDS: Based on 24 meter measurements 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 channel methods. Records available: July 1, 1923 through December 1953.

REMARKS: Small reservoirs and irrigation diversions modify the flow of this spring-fed stream at this station.

EXTREME FLOWS FROM RECORDS: Momentary: Max. 144,800 second-feet on September 11, 1948, with a gage height of 33.56 feet. Periods of no flow have occurred at times during all years of records, except 1934 and 1935.

Average Flow in Second-Feet

Daily:	Max.	87,230	Sept. 11, 1948	Min.	0	Frequently
Monthly:	Max.	5,170	Sept. 1948	Min.	0	Frequently
Yearly:	Max.	536	1953	Min.	16.4	1929

Mean Daily Discharge in Second-Feet 1953 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	0	0	0	2.5	0	0	0	0	3,570	53.7	144	92.5
2	0	0	0	396	0	0	0	0	3,850	52.6	147	102
3	0	0	0	579	0	0	0	0	2,020	328	146	54.7
4	0	0	0	305	0	0	0	0	10,030	5,080	142	43.8
5	0	0	0	59.0	0	0	0	0	13,490	19,490	135	40.3
6	0	0	0	21.5	0	0	0	0	1,820	2,740	130	33.9
7	0	0	0	10.6	0	0	0	0	1,090	1,390	131	33.9
8	0	0	0	8.1	0	0	0	0	809	897	129	33.9
9	0	0	0	6.0	0	0	0	0	646	586	118	33.9
10	0	0	0	4.2	0	0	0	0	537	445	119	33.9
11	0	0	0	2.4	0	0	0	0	456	374	129	27.9
12	0	0	0	2.4	0	0	0	0	396	307	123	27.9
13	0	0	0	0	0	0	0	0	335	269	113	27.9
14	0	0	0	0	0	0	56.6	0	305	243	109	27.9
15	0	0	17.3	0	0	0	1,120	0	260	224	104	27.9
16	0	0	0	0	0	0	40.7	0	184	220	100	27.9
17	0	0	0	0	0	0	13.2	0	160	218	94.3	24.7
18	0	0	0	0	0	0	8.2	0	131	194	93.9	18.7
19	0	0	0	0	0	0	6.1	0	115	183	86.9	18.7
20	0	0	0	0	0	0	4.3	238	109	182	74.2	18.7
21	0	0	0	0	0	0	2.6	770	109	178	70.3	18.7
22	0	0	0	0	0	0	1.2	2,320	448	3,190	63.2	15.9
23	0	0	0	0	0	0	0	1,920	456	4,240	61.8	15.9
24	0	0	0	0	0	0	0	2,210	178	374	59.0	15.9
25	0	0	0	0	0	0	0	14,020	137	183	57.6	15.9
26	0	0	0	0	0	0	0	20,090	115	174	48.0	13.1
27	0	0	0	0	0	0	0	21,860	104	231	47.3	15.9
28	0	0	509	0	0	0	0	27,020	89.7	167	47.3	15.9
29	0		18.7	0	0	0	0	9,250	75.9	156	51.9	13.1
30	0		15.5	0	0	0	0	2,240	59.0	148	45.2	10.6
31	0		15.2		0		0	1,790		148		13.1
Sum	0	0	575.7	1,396.7	0	0	1,252.9	103,728	42,044.6	42,665.3	2,919.9	915.0

Month	Current Year 1953: 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 1924-1953: Acre-Feet Average	Acre-Feet Maximum	Acre-Feet Minimum
Jan.			‡ 1	0	‡ 1	0	0	0	4,192	34,920	0
Feb.			‡ 1	0	‡ 1	0	0	0	2,966	25,550	0
Mar.	4.92		28	3,190	‡ 1	0	18.6	1,140	3,031	19,830	0
Apr.	2.69		2	1,040	‡13	0	46.6	2,770	6,590	33,990	0
May			‡ 1	0	‡ 1	0	0	0	14,970	* 137,000	0
June			‡ 1	0	‡ 1	0	0	0	13,970	83,240	0
July	5.12		15	3,390	‡ 1	0	40.4	2,490	7,252	37,590	0
Aug.	22.38		27	43,080	‡ 1	0	3,350	205,700	21,501	205,700	0
Sept.	12.24	.59	5	17,340	30	54.7	1,400	83,470	39,201	307,900	* 135
Oct.	16.54	.56	5	27,120	‡ 1	47.3	1,380	84,630	16,380	84,630	0
Nov.	1.15	.52	‡ 1	148	30	43.8	97.3	5,790	3,682	21,940	0
Dec.	1.71	.20	1	374	‡30	10.6	29.5	1,810	3,555	15,000	0
Yearly	22.38			43,080		0	536	387,800	137,290	387,800	11,908.7

‡ And other days * Partly estimated

RIO GRANDE AT ROMA, TEXAS

DESCRIPTION: Water-stage recorder at the international bridge between Roma, Texas and Cd. Miguel Alemán (formerly San Pedro), Tamaulipas, 14.9 river miles above the confluence of the Río San Juan from Mexico, and 992.0 river miles below the American Dam at El Paso, Texas. Measurements are made from the bridge. The zero of the gage was lowered 3.28 feet on January 1, 1951 and is now 142.65 feet above mean sea level, U.S.C. & G.S. datum.

RECORDS: Based on 149 meter measurements during the year, 138 by the Mexican and 11 by the United States Section of this Commission, and a continuous record of gage heights. Computations by shifting channel methods. Records available: May 1900 and September 1900 through December 1913; October 1914; September and October 1917; September and October 1919; August and September 1920; June 1922; and November 1922 through December 1953.

REMARKS: Reservoirs, diversions, and drainage returns modify the river flow at this station. Except for tributary inflows below Falcón Dam, flow at this station, after August 25, 1953, was controlled largely by releases from Falcón Reservoir, 21 miles upstream, and intervening diversions.

EXTREME FLOWS FROM RECORDS: The greatest recorded flow was 203,000 second-feet, which occurred September 5, 1932, with a gage height of 35.4 feet. There was no flow several days of June and July, 1953.

Mean Daily Discharge in Second-Feet 1953 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	819	583	675	1,470	23.0	28.6	0	915	3,090	3,160	182	2,750
2	883	590	660	1,550	23.7	13.1	0	915	4,870	3,140	212	2,860
3	1,030	636	664	4,060	16.2	8.8	0	819	2,970	3,600	203	2,590
4	1,050	639	604	4,270	195	4.3	0	703	12,780	8,690	190	2,290
5	1,000	604	519	3,440	1,280	0	91.8	576	18,120	24,300	302	2,280
6	996	611	487	2,230	639	0	141	441	5,830	5,580	466	2,270
7	961	724	498	1,430	242	0	95.7	406	5,190	2,670	487	2,250
8	918	742	491	964	119	0	48.4	618	5,440	1,990	876	2,240
9	855	660	466	671	75.6	0	32.5	636	5,260	1,700	823	2,120
10	897	682	434	569	35.7	0	26.1	576	5,010	1,620	766	1,730
11	918	703	424	530	24.7	0	18.4	494	4,840	1,250	745	1,070
12	865	632	413	420	16.2	0	11.3	388	4,660	614	727	932
13	848	586	466	349	12.7	0	3.5	305	4,450	385	696	512
14	830	575	1,640	470	745	0	2.1	274	4,130	331	696	434
15	823	565	2,120	1,050	3,570	0	2,780	249	3,880	463	756	159
16	837	533	2,040	802	3,600	0	1,070	222	3,570	1,180	749	441
17	809	604	1,670	562	2,450	0	434	249	3,350	1,310	1,070	1,250
18	777	614	1,310	445	1,610	0	218	274	3,120	2,070	1,240	671
19	752	551	1,260	353	1,120	0	149	274	2,980	2,120	1,570	607
20	770	487	1,290	299	1,260	0	97.5	339	2,800	2,130	1,650	607
21	770	487	1,180	231	2,440	0	60.7	600	2,670	2,190	1,880	607
22	791	512	1,020	196	1,890	0	33.2	3,280	2,760	11,970	2,030	646
23	816	561	922	169	1,130	0	23.0	5,400	3,120	10,060	2,000	519
24	780	576	865	131	713	0	19.1	5,050	2,590	943	2,440	565
25	703	636	816	116	406	0	7.4	13,560	2,460	360	2,520	579
26	671	622	731	101	250	0	4.2	22,640	2,340	293	2,470	667
27	653	653	675	87.2	170	0	2.1	26,940	2,180	306	2,420	1,080
28	636	639	3,850	62.5	124	0	2.1	42,020	2,020	248	2,830	1,080
29	625		1,930	48.7	92.5	0	1.1	13,530	1,620	213	2,820	1,050
30	629		2,840	35.0	60.7	0	152	3,010	3,670	198	2,760	1,060
31	583		2,210		39.2		780	1,900		188		1,080
Sum	25,295	17,007	35,170	27,111.4	24,373.2	54.8	6,304.2	147,603	131,770	95,272	38,576	38,996

Month	Current Year 1953								Period 1924-1953		
	Extreme Gage Feet		Extreme Second-Feet				Average Second-Feet	Total Acre-Feet	Acre-Feet		
			High		Low						
	High	Low	Day		Day				Average	Maximum	Minimum
Jan.	2.53	1.84	‡ 3	1,050	30	547	816	50,170	189,796	467,400	50,170
Feb.	2.20	1.71	7	798	20	466	607	33,730	165,944	402,000	33,730
Mar.	7.68	1.61	28	8,760	13	410	1,130	69,760	163,553	325,500	43,160
Apr.	5.22	.49	3	4,770	30	35.0	904	53,780	176,208	855,700	41,870
May	4.72	.30	16	3,920	‡13	8.1	786	48,340	329,799	706,300	48,340
June	.49		1	30.4	‡ 5	0	1.8	109	357,278	1,586,000	109
July	5.41		15	5,160	‡ 1	0	203	12,500	314,618	1,217,000	12,500
Aug.	23.26	1.12	27	56,500	16	222	4,760	292,800	325,421	" 904,000	53,280
Sept.	13.35	2.82	4	22,280	29	1,370	4,390	261,400	669,738	3,048,000	40,800
Oct.	16.57	1.84	22	36,370	31	174	3,070	189,000	515,929	2,372,000	24,040
Nov.	4.36	1.97	‡28	2,860	‡ 1	182	1,290	76,520	222,576	736,000	35,340
Dec.	4.46	.98	1	3,110	15	102	1,260	77,350	189,909	565,100	43,200
Yearly	23.26			56,500		0	1,610	1,165,459	3,620,765	8,098,000	1,024,030

" Estimated ‡ And other days

RIO GRANDE NEAR RIO GRANDE CITY, TEXAS

DESCRIPTION: Water-stage recorder and cable with stand-up cable car equipped for winch and heavy weights, located about 4 river miles below Rio Grande City, Texas, 3.7 miles northeast of Camargo, Tamaulipas, 7.9 river miles below the confluence of the Río San Juan with the Rio Grande and 1,013.1 river miles below the American Dam at El Paso, Texas. The zero of the gage is at mean sea level, U.S.C. & G.S. datum.

RECORDS: Based on 102 meter measurements during the year, 94 by the United States and 8 by the Mexican Section of this Commission, and a continuous record of gage heights. Computations by shifting channel methods. Records available: 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; January 1924 through December 1953.

REMARKS: Reservoirs, diversions, and drainage returns modify the river flow at this station. Except for tributary inflows below Falcón Dam, flow at this station after August 25, 1953 was controlled largely by releases from Falcón Reservoir, 44 miles upstream, and intervening diversions.

EXTREME FLOWS FROM RECORDS: The greatest recorded flow was 198,800 second-feet, which occurred September 5, 1932, with a gage height of 157.4 feet. The lowest recorded flow was 0 second-foot, which occurred several days in June and July 1953.

Mean Daily Discharge in Second-Feet 1953 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	728	591	668	1,730	13.3	24.3	0	800	15,300	3,220	2,060	2,770
2	840	590	648	2,040	8.6	8.6	346	899	19,100	3,100	1,790	2,920
3	960	578	620	2,860	9.3	2.6	149	832	18,300	4,410	1,590	2,840
4	1,060	587	587	4,300	40.0	.8	46.7	693	24,900	8,820	1,470	2,570
5	1,020	580	514	3,750	1,330	0	24.8	559	40,300	23,700	1,350	2,430
6	970	546	465	2,530	1,060	0	18.2	440	32,400	21,300	1,390	2,440
7	934	614	470	1,650	455	0	31.3	343	24,100	13,400	1,390	2,420
8	899	739	495	1,190	204	0	64.6	422	18,800	10,800	1,480	2,310
9	855	682	488	887	117	0	52.7	583	14,500	8,960	1,580	2,210
10	854	609	444	656	76.3	0	38.8	568	11,500	7,530	1,380	1,900
11	919	605	434	550	48.5	0	28.5	472	9,350	6,010	1,280	1,560
12	885	592	440	489	33.0	0	25.1	391	7,940	4,560	1,200	1,340
13	846	551	417	394	17.3	0	25.7	312	6,850	3,520	1,190	1,160
14	814	580	811	348	4.3	0	20.0	270	5,880	2,600	1,170	620
15	762	583	1,890	698	2,210	0	2,210	243	5,200	2,100	1,150	487
16	752	558	2,090	872	4,010	0	2,330	245	4,620	2,370	1,130	336
17	767	546	1,760	685	3,040	0	777	227	4,060	2,480	1,220	1,040
18	772	596	1,400	529	1,960	0	390	224	3,410	2,830	1,490	1,140
19	767	583	1,230	418	1,580	0	247	247	3,050	3,010	1,850	765
20	753	494	1,210	330	964	0	149	331	2,730	2,760	2,030	721
21	753	455	1,160	264	2,020	0	95.9	421	2,480	2,660	2,090	693
22	758	503	1,050	201	2,030	0	59.3	u 2,160	2,450	5,750	2,260	695
23	763	568	934	160	1,370	0	42.1	u 4,760	3,660	22,100	2,240	660
24	760	570	823	134	893	0	36.8	* 5,620	2,780	10,900	2,380	626
25	728	590	777	97.8	600	0	25.8	9,140	2,580	8,080	2,550	658
26	670	614	721	92.4	378	0	18.6	16,500	2,390	6,910	2,570	642
27	606	621	662	69.9	200	0	15.9	25,100	2,170	5,740	2,560	904
28	554	651	4,780	54.7	127	0	9.6	42,400	1,970	4,740	2,700	1,180
29	531		3,490	38.3	86.4	0	4.0	26,900	1,630	3,950	2,810	1,170
30	540		2,400	28.9	60.6	0	3.6	16,900	2,950	3,000	2,780	1,100
31	587		2,430		39.6		229	16,400		2,430		1,080
Sum	24,407	16,376	36,308	28,047.0	24,985.2	36.3	7,515.0	175,402	297,350	213,760	54,130	43,387

Month	Current Year 1953: 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 1924-1953: Acre-Feet Average	Acre-Feet Maximum	Acre-Feet Minimum
Jan.	122.99	121.95	4	1,070	29	511	787	48,400	221,872	521,000	48,400
Feb.	122.40	121.75	8	758	21	434	585	32,500	186,720	410,000	32,500
Mar.	127.88	121.63	28	7,690	13	403	1,170	72,000	182,219	401,000	40,800
Apr.	126.82	120.22	4	4,500	30	23.4	935	55,600	191,704	* 850,000	39,900
May	125.89	119.83	16	4,110	14	3.3	806	49,600	377,419	833,000	49,600
June	120.25		1	32.5	‡ 5	0	1.2	72	449,546	1,737,000	72
July	126.49		15	5,010	‡ 1	0	242	14,900	381,666	1,240,000	14,900
Aug.	145.34	120.92	28	46,400	‡17	190	5,660	348,000	386,645	1,280,000	55,800
Sept.	142.59	123.63	5	41,100	30	1,310	9,910	590,000	883,196	3,723,800	43,200
Oct.	139.87	124.34	‡ 5	29,500	15	1,960	6,900	424,000	665,993	2,852,270	24,600
Nov.	125.00	123.06	29	2,840	‡16	1,120	1,800	107,000	269,504	829,260	38,200
Dec.	125.15	121.30	2	3,010	16	288	1,400	86,100	224,412	625,260	46,100
Yearly	145.34			46,400		0	2,530	1,828,172	4,420,896	9,554,530	1,007,100

u Estimated * Partly estimated ‡ And other days

CONTRIBUTIONS FROM RIO SAN JUAN

DESCRIPTION: The discharges reported below are summations of flows which entered the Rio Grande between the gaging stations at Roma and Below Anzaldúas Dam site via various drains and the Río San Juan Channel. The confluence of the Río San Juan and the Rio Grande is 1,007.4 river miles below the American Dam at El Paso, Texas, 7.9 river miles above the Rio Grande City gaging station on the Rio Grande, and 12.4 river miles below Marte Gómez Dam on the Río San Juan.

RECORDS: The water reaching the Rio Grande above the Rio Grande City gaging station was measured at open channel gaging stations on the Rancherías and Los Fresnos Drains, the Río San Juan channel flow was measured as flow over the Marte Gómez spillway by spillway discharge rating curve and as seepage through the dam by small weir through September 1953. After September, the Río San Juan channel flow was measured by boat and current meter opposite Camargo, 3.1 river miles above the confluence with the Rio Grande. The water reaching the Rio Grande below Rio Grande City gaging station was measured at open channel gaging stations on the Puertecitos, Huisache, and Morillo Drains. This flow includes 372 acre-feet in April and 1,680 acre-feet in May released from Marte Gómez Reservoir to supply adequate water for municipal uses in the United States. Records furnished by the Ministry of Hydraulic Resources, except those in the Río San Juan Channel opposite Camargo, which were obtained by the Mexican Section of this Commission.

REMARKS: Storm water measured at the above-mentioned drains was deducted and is not reported here. In previous water bulletins, under this page heading, mention was made of additional water from drains not being accounted for in the tables. For this reason, the former period totals are not usable and new period totals will be accumulated beginning with 1953.

Above Rio Grande City Station

Month	Current Year 1953								Period		
	Extreme Gage Feet		ϕ Extreme Second-Feet				Average Second-Feet	Total Acre-Feet	Acre-Feet		
			High		Low						
	High	Low	Day		Day				Average	Maximum	Minimum
Jan.			‡ 1	* 3.0	31	* 2.6	* 2.8	* 182			
Feb.			‡ 1	* 3.0	31	* 2.6	* 2.8	* 182			
Mar.			‡ 1	3.0	31	2.6	2.8	182			
Apr.			‡ 1	2.6	‡20	1.8	2.1	131			
May			‡ 1	2.0	‡24	1.5	1.8	111			
June			‡ 1	1.4	‡27	.7	1.4	78.6			
July			‡ 1	.7	‡ 1	.7	.7	43.8			
Aug.			30	15,930	‡ 1	1.1	1,070	66,040			
Sept.			6	19,810	‡26	2.2	4,940	294,800			
Oct.			6	11,020	‡ 1	2.6	3,810	235,600			
Nov.			1	1,900	30	131	597	35,510			
Dec.			12	287	31	20.1	78.8	4,840			
Yearly				19,810		.7	881	637,700.4			

Below Rio Grande City Station

Month	Current Year 1953								Period		
	Extreme Gage Feet		ϕ Extreme Second-Feet				Average Second-Feet	Total Acre-Feet	Acre-Feet		
			High		Low						
	High	Low	Day		Day				Average	Maximum	Minimum
Jan.			28	* 107	‡ 5	* 24.3	* 30.0	* 1,850			
Feb.			28	* 107	‡ 5	* 24.3	* 30.0	* 1,850			
Mar.			28	107	‡ 5	24.3	30.0	1,850			
Apr.			‡ 1	259	14	19.4	53.3	3,170			
May			4	130	‡27	40.3	63.9	3,930			
June			‡ 1	36.7	‡25	17.4	24.4	1,460			
July			2	198	‡11	12.3	22.6	1,380			
Aug.			‡ 1	11.6	‡16	8.0	8.8	535			
Sept.			23	58.7	1	8.0	18.7	1,110			
Oct.			‡16	24.5	‡ 1	18.5	21.5	1,330			
Nov.			‡ 9	22.5	‡25	14.3	18.4	1,090			
Dec.			‡21	39.9	31	16.9	33.2	2,040			
Yearly				259		8.0	29.8	21,595			

* Partly estimated ‡ And other days ϕ Mean daily

RIO GRANDE BELOW ANZALDUAS DAM SITE

DESCRIPTION: Water-stage recorder and cable with stand-up cable car equipped for winch and heavy weights, located .5 mile below the Headworks of the Anzaldúas Canal and Anzaldúas Dam site, 11.7 river miles above the international highway bridge between Hidalgo, Texas and Reynosa, Tamaulipas, 1,073.1 river miles below the American Dam at El Paso, Texas, and 168.3 river miles from the Gulf of Mexico. The zero of the gage is 82.61 feet above mean sea level, U.S.C. & G.S. datum. It was erroneously published in Water Bulletin No. 22 as 84.51 feet.

RECORDS: Based on 125 meter measurements during the year, 117 by the Mexican and 8 by the United States Section of this Commission, by wading during low flow, by boat during medium flow until April 20, 1953, when the cable was installed, and a continuous graph of gage heights constructed from three or more gage height readings per day, until May 30, 1953, when a continuous recorder was installed. Computations by shifting channel methods. Records available: January 1, 1952 to December 31, 1953.

REMARKS: Reservoirs, diversions, and drainage returns modify the river flow at this station. Except for tributary inflows below Falcón Dam, flow at this station, after August 25, 1953, was controlled largely by releases from Falcón Reservoir, 102.2 miles upstream, and diversions into Anzaldúas Canal, .5 mile upstream.

Mean Daily Discharge in Second-Feet 1953 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	434	420	547	2,140	145	60.0	19.8	0	15,710	237	2,300	93.2
2	364	495	547	2,350	119	50.9	64.6	0	15,040	360	1,990	56.1
3	530	466	586	2,240	132	44.8	25.4	9.5	15,570	459	1,610	20.8
4	607	374	512	2,380	131	41.7	4.9	23.3	14,870	1,780	1,230	7.8
5	745	371	484	3,320	139	32.5	4.9	0	21,400	10,630	1,100	7.1
6	731	424	410	3,170	187	26.5	11.7	0	27,440	21,580	975	6.7
7	682	381	396	2,470	738	23.3	21.2	0	25,320	17,660	968	42.4
8	685	378	378	1,570	448	23.3	21.2	0	19,600	11,900	1,020	97.8
9	558	441	385	1,120	217	27.5	18.7	0	14,300	9,430	975	104
10	650	530	374	798	133	24.0	18.7	0	11,190	7,730	982	77.7
11	597	438	364	646	100	24.7	17.3	0	9,110	6,140	947	87.2
12	689	381	325	519	84.4	26.1	18.7	0	7,520	4,800	908	51.9
13	579	378	286	452	83.0	27.9	18.7	0	6,430	3,330	876	2.1
14	597	420	289	392	98.2	15.9	18.7	0	5,230	2,230	805	1.8
15	420	338	371	434	106	20.1	17.3	0	4,340	1,750	777	1.8
16	427	410	1,220	424	501	26.5	157	0	3,670	886	752	1.4
17	410	374	1,610	692	2,320	18.4	1,370	0	3,090	742	749	1.4
18	441	339	1,490	576	2,260	19.8	611	0	2,540	823	678	1.1
19	360	378	1,170	445	1,600	24.4	194	0	2,160	731	707	18.0
20	445	448	946	357	1,110	21.9	136	0	1,970	597	805	45.9
21	374	417	943	275	847	21.2	81.2	0	1,820	364	926	23.7
22	494	342	964	291	1,250	19.8	53.3	0	1,650	340	1,030	7.8
23	480	353	922	253	1,590	17.3	22.6	0	1,610	12,220	1,040	3.5
24	576	470	780	189	1,060	16.2	14.5	720	1,830	18,150	926	6.0
25	551	551	720	155	914	16.6	0	2,920	1,260	12,430	632	17.7
26	547	487	618	112	557	17.0	0	9,180	614	9,640	466	20.1
27	494	484	597	101	374	16.6	0	16,670	283	7,270	406	26.5
28	410	452	745	89.7	205	14.1	0	22,740	256	5,830	259	19.8
29	357		2,810	103	126	14.1	0	26,490	212	4,660	194	35.7
30	378		2,590	122	98.9	14.1	0	23,840	173	3,640	159	37.1
31	420		2,110		70.3		0	19,030		2,750		31.8
Sum	16,032	11,740	26,489	28,185.7	17,743.8	747.2	2,941.4	121,622.8	236,208	181,089	27,192	955.9

Month	Current Year 1953: Extreme Gage Feet High	Low	Extreme Second-Feet High Day	High	Low Day	Low	Average Second-Feet	Total Acre-Feet	Period 1952-1953: Acre-Feet Average	Maximum	Minimum
Jan.	4.13	3.08	5	851	2	323	517	31,800	43,010	54,220	31,800
Feb.	3.74	2.99	25	586	22	286	419	23,290	31,475	39,660	23,290
Mar.	7.38	2.82	29	3,320	13	243	854	52,540	51,870	52,540	51,200
Apr.	7.45	2.13	5	3,390	28	84.0	940	55,910	42,110	55,910	28,310
May	6.36	1.97	17	2,520	31	61.1	572	35,190	82,495	* 129,800	35,190
June	1.97	1.21	1	63.2	15	7.1	24.9	1,480	65,640	129,800	1,480
July	4.89	1.08	17	1,550	‡25	0	94.9	5,830	129,115	252,400	5,830
Aug.	22.57	1.12	29	27,120	‡ 1	0	3,920	241,200	145,025	241,200	48,850
Sept.	21.85	2.76	6	27,900	30	159	7,870	468,500	253,395	468,500	38,290
Oct.	20.67	2.82	6	24,160	1	180	5,840	359,200	190,340	359,200	21,480
Nov.	6.76	2.46	1	2,360	30	95.3	906	53,940	40,270	53,940	26,600
Dec.	2.72	1.44	1	147	13	.7	30.8	1,900	18,985	36,070	1,900
Yearly	22.57	1.08		27,900		0	1,840	1,330,780	1,093,730	1,330,780	856,680

* Partly estimated ‡ And other days

RIO GRANDE FLOODWAY DISCHARGES
LOWER RIO GRANDE VALLEY

On the United States Side

During floods, water is diverted from the Rio Grande to the United States floodway system at the Mission Inlet and the Hackney Lake Inlet to the Main Floodway. These inlets are located, respectively, approximately 6 miles above and 5 miles below the gaging station at Anzaldúas Dam site, 11.7 river miles above the international highway bridge between Hidalgo, Texas and Reynosa, Tamaulipas. Flood water entering the Mission Inlet is measured at the North Floodway Station south of McAllen and flood water entering the Hackney Lake Inlet is measured at the South Floodway Station south of McAllen. These waters join at a point about 5 miles northeast of Hidalgo and flow eastward in the Main Floodway for about 19 miles to a point approximately 3 miles southwest of Mercedes. Here 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. The Arroyo Colorado Floodway is measured at U. S. 83 Highway Bridge near Harlingen, and the North Floodway flow is measured at U. S. 77 Highway Bridge near Sebastian.

In 1953, there was no flow from the Rio Grande through these floodways.

On the Mexican Side

There are several regular floodways on the Mexican side which divert excess Rio Grande floodwater to the Gulf of Mexico. During 1953, no flow was diverted from the Rio Grande into these regular floodways.

Records of flows through Retamal Canal, which serves as a floodway during periods of high flow, are shown on page 64.

RETURN FLOWS AT PONIENTE DRAIN AND RETAMAL CANAL

Poniente Drain West of Reynosa, Tamaulipas

DESCRIPTION: Not regularly, but at times, part of the water diverted from the river into the Anzaldúas Canal is returned to the Rio Grande through this drain which branches off the left side of the Anzaldúas Canal 5.16 miles below its intake by means of two gates and three siphons. This drain enters the Rio Grande about 1,084.2 river miles below the American Dam at El Paso, Texas.

RECORDS: The drain flows reported here were determined by subtracting, from the flows at the gaging station near the head of the Anzaldúas Canal, the flows passing the Monterrey Bridge, .1 mile below this drain. The flows at the Monterrey Bridge were calculated by a rating curve, previously established, by using measurements at the gaging station and gage heights at the bridge.

REMARKS: The flows reported here are the first flows through this drain and were made to facilitate the construction of a low earth and rock dam in the Rio Grande, just below Anzaldúas Canal headgates.

Mean Daily Discharge in Second-Feet 1953 — Annual Summary

Day	Sept.	Oct.	Nov.	Dec.	Day	Sept.	Oct.	Nov.	Dec.	Day	Sept.	Oct.	Nov.	Dec.
1	0	614	0	2,050	11	0	0	0	1,620	21	0	441	0	632
2	0	1,670	0	2,220	12	0	0	0	1,310	22	0	1,140	637	547
3	0	1,980	0	2,350	13	0	0	0	1,130	23	0	1,040	958	544
4	0	2,400	0	2,440	14	0	0	0	1,010	24	0	0	414	593
5	368	2,340	0	2,240	15	0	562	0	685	25	0	0	633	622
6	0	1,320	0	2,010	16	0	431	0	519	26	0	0	1,250	657
7	0	0	0	1,950	17	0	0	0	410	27	0	0	1,480	653
8	0	0	0	1,890	18	0	0	0	353	28	0	0	1,570	600
9	0	0	0	1,800	19	0	0	0	357	29	0	0	1,820	731
10	0	0	0	1,800	20	0	0	0	731	30	0	0	1,970	766
										31		0		714
										SUM	368	13,938	10,732	35,934

Month	Current Year 1953								Period		
	Extreme Gage Feet		Extreme Second-Feet				Average Second-Feet	Total Acre-Feet	Acre-Feet		
			High		Low						
	High	Low	Day	ϕ	Day	ϕ			Average	Maximum	Minimum
Jan.											
Feb.											
Mar.											
Apr.											
May											
June											
July											
Aug.											
Sept.			5	368	‡ 1	0	12.3	730			
Oct.			4	2,400	‡ 7	0	450	27,650			
Nov.			30	1,970	‡ 1	0	358	21,290			
Dec.			4	2,440	18	353	1,160	71,280			
Yearly				2,440		0	167	120,950			

Retamal Canal near Rio Bravo, Tamaulipas

On two days of 1953, water returned to the Rio Grande through the Retamal Canal at its heading, about 24 river miles below the Hidalgo-Reynosa Bridge near Hidalgo, Texas. These flows were as follows: September 30 and October 14, with 260 and 686 mean daily second-feet, respectively, totaling 1,876 acre-feet. This water came from the Anzaldúas Canal through the Culebrón Lateral, which connects with the Retamal Canal 600 feet below its intake gate. (See page 64 hereof for Retamal Canal diversions from the Rio Grande.)

‡ And other days ϕ Mean daily

RIO GRANDE AT PROGRESO BRIDGE, TEXAS

DESCRIPTION: Temporary water-stage recorder, operated during periods of low and medium flow, located on the United States side at the site of a proposed bridge, .8 mile below Progreso pumping plant, 1,117.5 river miles below the American Dam at El Paso, Texas, and 123.9 river miles above the Gulf of Mexico. The zero of the gage is mean sea level, U.S.C. & G.S. datum.

RECORDS: Based on 24 meter measurements during the year, by wading during low flow, by boat during medium flow, and a continuous record of gage heights. Computations by shifting channel methods. Records available: December 1, 1952 through August 24, 1953 and December 1 through 31, 1953.

REMARKS: Reservoirs, diversions, and drainage returns modify the river flow at this station. Except for tributary inflows below Falcón Dam, flow at this station, after August 25, 1953, was controlled largely by releases from Falcón Reservoir, 147 miles upstream, and intervening diversions.

EXTREME FLOWS FROM RECORDS: Momentary: Max. not recorded. Min. no flow several days in June, July, and August 1953.

Average Flow in Second-Feet

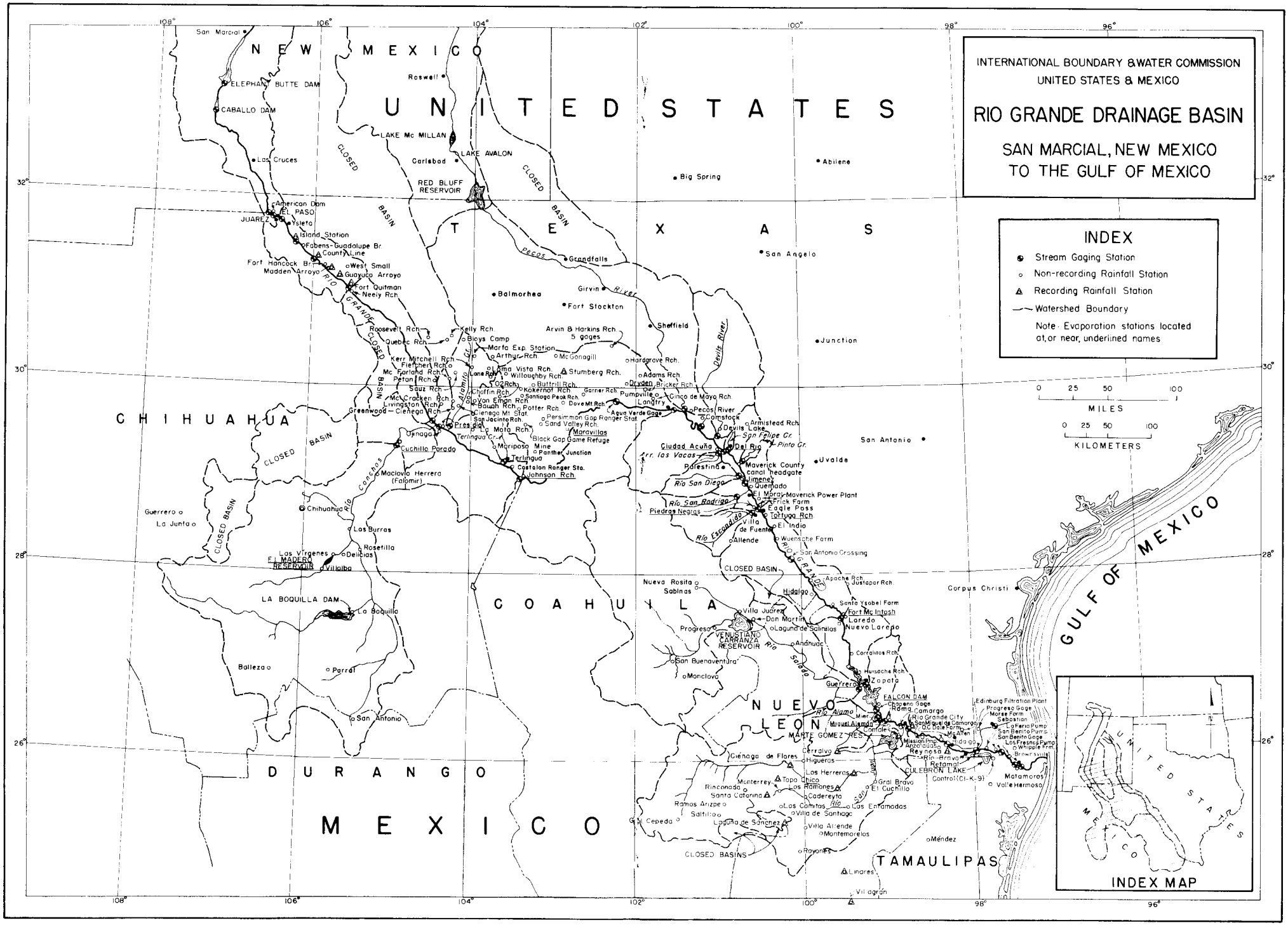
Daily:	Max.	Not recorded	Min.	0	Frequently 1953
Monthly:	Max.	Not recorded	Min.	5.1	June 1953
Yearly:	Max.	Not recorded	Min.	No record	No record

Mean Daily Discharge in Second-Feet 1953 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	404	185	380	1,280	51.4	48.8	0	0				1,730
2	365	257	378	1,260	72.6	48.0	0	0				1,800
3	315	323	376	1,430	94.1	3.8	0	0				1,840
4	286	308	371	1,360	84.7	24.6	0	0				1,950
5	334	240	347	*1,440	77.0	8.6	0	0				1,980
6	426	205	277	*2,180	100	7.8	0	0				1,960
7	443	190	200	*2,160	95.3	4.3	0	0				1,880
8	411	216	263	*1,470	251	5.2	0	0				1,620
9	409	201	258	*1,030	228	2.1	0	0				1,580
10	373	226	223	746	165	.6	0	0				1,650
11	394	310	258	552	87.5	0	0	0				1,660
12	392	306	224	432	66.5	0	0	0				1,580
13	423	199	175	300	41.9	0	0	0				1,350
14	411	152	114	273	60.5	0	0	0				1,200
15	399	202	115	203	60.5	0	0	0				1,070
16	351	252	155	212	69.5	0	0	0				799
17	378	234	443	192	151	0	0	0				597
18	348	261	910	270	1,170	0	280	0				454
19	341	186	1,020	257	1,380	0	282	0				402
20	309	97.4	861	275	997	0	70.1	0				494
21	298	156	635	219	614	0	22.5	0				683
22	283	296	572	142	488	0	6.8	0				518
23	283	289	586	168	520	0	.3	0				391
24	268	277	578	173	895	0	0	0				388
25	302	337	515	162	736	0	0	Station				475
26	313	413	442	103	661	0	0	inundated				537
27	325	411	361	102	488	0	0	August 25				582
28	290	390	329	72.0	313	0	0					574
29	273		434	68.4	199	0	0					450
30	181		1,600	53.8	107	0	0					489
31	174		1,700		65.5	0	0					546
Sum	10,502	7,119.4	15,100	*18,585.2	10,390.0	153.8	661.7					33,229

Month	Current Year 1953								Period Dec. 1952-1953		
	Extreme Gage Feet		Extreme Second-Feet				Average Second-Feet	Total Acre-Feet	Acre-Feet		
				High		Low					
	High	Low	Day		Day				Average	Maximum	Minimum
Jan.	56.35	55.20	7	463	30	136	339	20,800			
Feb.	56.07	54.90	27	437	20	75.5	254	14,100			
Mar.	59.17	54.85	30	1,970	15	82.0	487	30,000			
Apr.	59.69	54.25	6	2,350	30	43.0	* 620	* 36,900			
May	58.20	54.01	19	1,440	13	30.7	335	20,600			
June	54.30		‡ 1	53.1	‡ 3	0	5.1	305			
July	56.24		18	461	‡ 1	0	21.3	1,310			
Aug.											
Sept.											
Oct.											
Nov.											
Dec.	58.85	55.19	5	1,990	24	358	1,070	65,900	42,950	65,900	20,000
Yearly											

* Partly estimated ‡ And other days


INTERNATIONAL BOUNDARY & WATER COMMISSION
UNITED STATES & MEXICO
RIO GRANDE DRAINAGE BASIN
SAN MARCIAL, NEW MEXICO
TO THE GULF OF MEXICO
INDEX
Stream Gaging Station
Non-recording Rainfall Station
Recording Rainfall Station
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Note: Evaporation stations located at, or near, underlined names
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Maverick Power Plant
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Justapor Rch.
Santa Ysobel Farm
Fort Mc Intosh
Corralitos Rch.
Huisache Rch.
Edinburg Filtration Plant
Progreso Gage
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Lateria Pump
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Hidalgo
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Mc Allen
Rio Alamo
Rio Salado
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Rio Conchos
Rio Salado
Rio San Juan
Pecos River
Devils River
San Felipe Cr.
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Arr. los Vacas
Roosevelt Rch.
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Marfa Exp. Station
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Garner Rch.
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Choffin Rch.
Van Emon Rch.
Bough Rch.
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San Jacinto Rch.
La Mota Rch.
Persimmon Gap Ranger Stat.
Sand Valley Rch.
Marathon
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Panther Junction
Terlingua
Castolon Ranger Sta.
Johnson Rch.
Maclovio Herrera (Falomir)
Ojinaga
Alamito Cr.
Alamito Cr.

RIO GRANDE NEAR SAN BENITO, TEXAS

DESCRIPTION: Temporary water-stage recorder, operated during periods of low and medium flows, located on the United States side, 5.4 miles below San Benito pumping plant, 1,142.5 river miles below the American Dam at El Paso, Texas and 98.9 river miles above the Gulf of Mexico. The zero of the gage is mean sea level, U.S.C. & G.S. datum.

RECORDS: Based on 32 measurements during the year, by wading during low flow, by boat during medium flow, and a continuous record of gage heights. Computations by shifting channel methods. Records available: November 26, 1952 through August 25, 1953 and December 1 to December 31, 1953.

REMARKS: Reservoirs, diversions, and drainage returns modify the river flow at this station. Except for tributary inflows below Falcón Dam, flow at this station, after August 25, 1953, was controlled largely by releases from Falcón Reservoir, 172 miles upstream, and intervening diversions.

EXTREME FLOWS FROM RECORDS: Momentary: Max. not recorded. Min. no flow several days in June, July, and August 1953.

Average Flow in Second-Feet

Daily:	Max.	Not recorded	Min.	0	Frequently 1953
Monthly:	Max.	Not recorded	Min.	.6	July 1953
Yearly:	Max.	Not recorded	Min.	No record	No record

Mean Daily Discharge in Second-Feet 1953 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	167	93.7	139	378	60.4	23.1	0	0				450
2	103	82.6	172	480	45.9	3.4	0	0				693
3	77.3	96.4	104	479	31.4	.3	0	0				1,000
4	87.9	192	153	532	50.7	.3	0	0				844
5	61.8	174	171	468	57.6	0	0	0				831
6	94.8	130	139	664	53.1	0	0	0				916
7	138	120	140	865	55.9	0	0	0				816
8	189	86.7	138	722	25.9	0	0	0				713
9	164	76.8	168	391	44.8	0	0	0				731
10	143	48.3	140	259	16.5	0	0	0				731
11	99.4	95.8	139	189	13.9	0	0	0				925
12	50.5	151	172	152	15.4	0	0	0				1,020
13	76.4	141	145	99.3	.7	0	0	0				1,160
14	158	94.7	107	* 65.3	.2	0	0	0				828
15	112	73.8	101	* 95.5	32.8	0	0	0				677
16	126	93.3	125	* 88.4	52.5	0	0	0				507
17	96.7	104	139	* 91.2	54.6	0	0	0				318
18	155	128	199	* 75.7	211	0	0	0				193
19	82.2	121	362	73.3	525	0	13.8	0				32.8
20	75.7	86.0	445	* 90.0	314	0	3.8	0				67.7
21	77.8	34.6	354	104	252	0	0	0				85.6
22	76.8	91.9	259	* 90.1	309	0	0	0				150
23	66.4	170	220	* 70.9	219	0	0	0				19.5
24	70.8	147	202	89.9	283	0	0	0				3.6
25	79.1	152	208	85.0	242	0	0	0				32.5
26	74.1	146	174	118	284	0	0	Station				164
27	71.9	159	148	84.3	267	0	0	Inundated				159
28	128	190	143	77.2	188	0	0	11:00 P.M.				142
29	105		187	75.0	80.0	0	0	August 26				31.7
30	89.5		275	* 50.1	75.0	0	0					5.0
31	57.9		465		57.2		0					6.7
Sum	3,155.0	3,279.6	6,033	7,102.2	3,918.5	27.1	17.6					14,253.1

Month	Current Year 1953								Period Dec. 1952-1953		
	Extreme Gage Feet		Extreme Second-Feet				Average Second-Feet	Total Acre-Feet	Acre-Feet		
	High	Low	Day	High	Day	Low			Average	Maximum	Minimum
Jan.	36.56	35.48	14	212	13	24.7	102	6,260			
Feb.	36.88		28	230	21	0	117	6,510			
Mar.	37.97	35.67	31	610	3	51.3	195	12,000			
Apr.	38.92	35.38	7	919	30	31.0	237	14,100			
May	38.13	34.68	19	663	‡14	.2	126	7,770			
June	35.46		1	38.0	‡ 5	0	.9	53.8			
July	35.49		19	40.4	‡ 1	0	.6	34.9			
Aug.											
Sept.											
Oct.											
Nov.											
Dec.	39.12	34.05	13	1,240	31	3.6	460	28,300	16,625	28,300	4,950
Yearly											

* Partly estimated ‡ And other days

RIO GRANDE AT MATAMOROS, TAMAULIPAS

DESCRIPTION: Water-stage recorder with sit-down cable car and winch. The recorder is attached to the left pier on the downstream side of the railroad bridge between Matamoros, Tamaulipas and Brownsville, Texas, 57.6 miles upstream from the Gulf of Mexico and 1,183.8 river miles below the American Dam at El Paso, Texas. The cable is located .3 mile upstream from the bridge. The zero of the gage is 12.11 feet above mean sea level, U.S.C. & G.S. datum.

RECORDS: Based on 165 meter measurements during the year, 160 by the Mexican and 5 by the United States Section of this Commission, and a continuous record of gage heights. The river bottom shifts greatly at this station. At low flow, the recorder was affected by a small earth dam that was built below the railroad bridge to impound water for the City of Matamoros. Computations by shifting channel methods. Records available: 1901 to 1913 and 1923 through December 1953.

REMARKS: Reservoirs, irrigation and flood flow diversions, and drainage returns greatly modify the flow at this station. Except for tributary inflows below Falcón Dam, flow at this station, after August 25, 1953, was controlled largely by releases from Falcón Reservoir, 212.9 river miles upstream, and intervening diversions.

EXTREME FLOWS FROM RECORDS: The greatest recorded flow was 36,320 second-feet on June 22, 1903. The greatest flow since 1923 was 32,950 second-feet, which occurred April 30, 1949, with a gage height of 24.89 feet on the present gage. There was no flow at this station on a few occasions in March and April 1930, January and February 1951, February through May 1952, and June through October 1953.

Mean Daily Discharge in Second-Feet 1953 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	24.7	32.5	28.6	74.9	4.9	0	0	0	13,560	0	2,770	185
2	30.0	30.4	34.3	66.4	12.4	1.4	0	0	12,430	0	2,210	278
3	35.7	24.7	23.3	99.9	19.4	3.2	0	0	11,020	0	1,830	554
4	37.1	16.2	21.5	132	26.8	3.9	0	0	10,280	0	1,450	830
5	49.8	13.1	12.0	170	25.1	1.1	0	0	10,140	0	1,110	830
6	38.1	32.5	2.8	157	23.3	.7	0	0	11,230	1,550	763	833
7	29.0	23.7	14.5	257	37.4	0	0	0	13,740	9,890	646	833
8	26.1	19.1	20.5	441	51.6	0	0	0	14,970	12,640	526	675
9	31.1	13.4	26.5	340	36.0	0	0	0	14,900	10,280	410	516
10	48.4	* 16.2	23.7	65.7	20.5	0	0	0	12,110	7,800	375	537
11	36.4	* 15.5	20.8	58.6	5.0	0	0	0	9,610	5,900	342	558
12	35.0	* 4.9	2.8	57.2	2.8	0	0	0	7,240	4,770	307	703
13	26.5	* 4.2	9.5	46.6	3.5	0	0	0	5,330	3,670	273	844
14	* 28.3	51.2	8.8	33.2	3.2	0	0	0	4,270	2,780	238	989
15	* 30.4	51.2	8.5	24.4	2.8	0	0	0	3,240	2,060	203	735
16	32.8	34.3	7.8	9.2	2.5	0	0	0	2,410	1,460	167	477
17	24.4	26.1	4.9	4.2	2.1	0	0	0	1,700	1,070	123	335
18	30.0	23.3	2.1	21.6	2.1	0	0	0	1,020	685	78.4	194
19	32.1	11.7	1.8	22.2	2.1	0	0	0	657	292	59.0	172
20	23.3	8.1	34.3	24.7	* 33.5	0	0	0	473	35.3	39.2	150
21	25.1	25.8	104	12.4	5.7	0	0	0	406	29.3	36.0	128
22	26.1	18.7	124	5.7	5.7	0	0	0	222	23.0	32.8	106
23	28.3	14.5	67.5	5.7	5.7	0	0	0	40.6	17.0	23.7	83.3
24	34.6	29.7	49.1	5.3	* 79.5	0	0	0	20.5	1,950	14.1	61.4
25	26.5	50.5	19.8	18.4	29.7	0	0	0	0	8,550	4.9	39.2
26	28.6	26.5	8.1	30.0	15.9	0	0	0	0	9,920	26.1	30.4
27	25.1	25.1	32.8	44.8	2.5	0	0	0	0	8,690	47.3	21.5
28	23.0	19.4	25.1	43.1	2.1	0	0	1,880	0	7,520	62.2	12.7
29	16.6		29.7	28.3	2.8	0	0	7,770	0	6,000	77.3	12.7
30	23.7		34.6	7.1	3.2	0	0	11,940	0	4,410	92.2	12.4
31	36.0		* 34.6		1.4		0	13,520		3,380		12.4
Sum	942.8	662.5	838.3	2,306.6	471.2	10.3	0	35,110	161,019.1	115,371.6	14,336.2	11,748.0

Month	Current Year 1953: Extreme Gage Feet High	Extreme Gage Feet Low	Extreme Second-Feet High Day	High	Low Day	Low	Average Second-Feet	Total Acre-Feet	Period 1924-1953: Acre-Feet Average	Maximum	Minimum
Jan.		2.10	5	ϕ 49.8	29	10.9	30.4	1,870	174,818	490,800	842
Feb.	2.69	1.87	24	77.3	13	4.2	23.7	1,310	125,911	328,300	1,160
Mar.	2.92	1.74	21	129	19	1.8	27.0	1,660	104,805	313,600	748
Apr.	3.87		9	459	17	ϕ 4.2	76.9	4,580	102,853	425,800	627
May	2.76	1.74	24	* 120	31	1.4	15.2	935	249,077	721,000	935
June	1.71	1.67	4	3.9	1	0	.3	20.3	313,169	1,180,500	20.3
July				0	∓ 1	0	0	0	271,948	756,600	0
Aug.	20.87		31	13,810	1	0	1,130	69,640	251,427	833,700	7,110
Sept.	21.52	4.27	8	15,290	30	0	5,370	319,400	539,196	1,363,200	3,780
Oct.	19.03		8	12,890	5	0	3,720	228,800	500,759	1,408,500	2,990
Nov.	9.65		1	3,040	25	ϕ 4.9	478	28,440	224,165	827,500	2,870
Dec.			14	ϕ 989	30	ϕ 12.4	379	23,300	170,930	594,200	2,230
Yearly				15,290		0	939	679,955.3	3,034,058	6,579,500	223,875

* Partly estimated ∓ And other days ϕ Mean daily

RIO GRANDE AT LOWER BROWNSVILLE, TEXAS

DESCRIPTION: Water-stage recorder and cable with stand-up cable car equipped for winch and heavy weights, located about 1,000 feet below the El Jardin pumping plant, about 6.6 river miles below Brownsville, Texas and Matamoros, Tamaulipas, 50.4 river miles upstream from the Gulf of Mexico, and 1,191.0 river miles below the American Dam at El Paso, Texas. The zero of the gage is at mean sea level, U.S.C. & G.S. datum. An auxiliary water-stage recorder located at the El Jardin pumping plant was used during periods of low flow.

RECORDS: Based on 37 meter measurements during the year and a continuous record of gage heights. Computations by shifting channel methods. Records available: January 1934 through December 1953.

REMARKS: Except for tributary inflows below Falcón Dam, flow at this station after August 25, 1953 was controlled largely by releases from Falcón Reservoir, 220 miles upstream, and intervening diversions. When the Rio Grande flow at the Hidalgo-Reynosa international highway bridge reaches about 60,000 second-feet or more, then a portion of the upstream river flow finds outlet to the Gulf of Mexico through flood channels, in both countries, which divert from the Rio Grande within 124.6 miles above this station.

EXTREME FLOWS FROM RECORDS: The greatest recorded flow was 31,700 second-feet, which occurred October 8, 1945, with a gage height of 31.48 feet. Zero flow occurs frequently.

Mean Daily Discharge in Second-Feet 1953 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	7.2	7.5	11.5	14.0	.2	0	0	0	12,800	1.0	3,090	10.3
2	7.1	12.8	7.2	4.7	0	0	0	0	11,600	1.0	2,520	40.3
3	9.6	15.3	5.9	3.1	2.2	0	0	0	10,000	1.0	1,770	336
4	9.3	10.8	9.0	6.7	4.7	0	0	0	9,670	1.0	1,400	563
5	9.2	6.1	9.1	34.2	2.7	0	0	0	9,910	4.1	1,110	518
6	8.1	9.7	2.2	46.5	2.4	0	0	0	10,500	1,400	785	597
7	8.2	10.4	4.8	57.6	2.5	0	0	0	12,600	8,230	736	652
8	8.6	7.4	11.0	169	2.5	0	0	0	14,800	12,000	637	553
9	12.3	6.9	11.7	177	2.9	0	0	0	14,700	10,900	434	489
10	7.2	2.5	7.6	18.3	2.7	0	0	0	12,800	8,500	353	516
11	8.8	5.9	8.2	4.2	2.3	0	0	0	10,100	6,620	328	519
12	13.5	5.7	2.9	14.4	0	0	0	0	7,670	5,150	308	610
13	8.8	2.4	0	8.0	0	0	0	0	5,570	4,000	249	742
14	6.3	9.4	0	4.6	0	0	0	0	4,290	3,070	234	760
15	9.4	16.0	0	5.0	0	0	0	0	3,360	2,210	222	497
16	7.2	18.3	0	4.9	0	0	0	0	2,250	1,550	133	402
17	6.5	13.3	0	3.7	0	0	0	0	1,500	1,300	48.4	324
18	11.0	14.7	0	4.2	0	0	0	0	903	862	13.4	176
19	10.0	14.2	0	.8	0	0	0	0	633	331	10.6	u 64.5
20	10.0	3.8	0	4.2	0	0	0	0	467	30.8	4.3	u 5.0
21	13.8	6.4	6.9	3.1	0	0	0	0	292	4.7	8.7	u 0
22	3.6	8.5	7.6	.6	0	0	0	0	62.4	1.5	16.1	u 5.0
23	8.5	10.1	8.2	0	0	0	0	0	2.3	0	10.6	u 5.0
24	11.3	6.4	9.8	0	.8	0	0	0	1.0	1,200	6.8	u 20.0
25	12.7	35.7	5.7	0	.1	0	0	0	1.0	8,330	6.1	u 10.0
26	9.2	25.5	1.8	2.1	1.0	0	0	0	1.0	10,200	3.8	u 15.0
27	10.0	16.3	6.1	0	0	0	0	0	1.0	8,710	2.2	u 5.0
28	8.6	13.6	3.7	1.4	0	0	0	* 1,230	1.0	7,240	5.8	u 25.0
29	6.7		6.2	3.6	0	0	0	* 6,940	1.0	6,290	6.9	u 40.0
30	3.4		9.1	3.2	0	0	0	* 11,000	1.0	5,080	11.5	u 40.0
31	12.2		19.8		0		0	* 12,600		3,870		u 45.0
Sum	278.3	315.6	176.0	599.1	27.0	0	0	* 31,770	156,486.7	117,088.1	14,464.2	8,584.1

Current Year 1953

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
Jan.	9.72		12	29.8	‡22	0	9.0	552
Feb.	9.90		25	40.5	13	0	11.3	626
Mar.	9.63		31	23.2	‡ 2	0	5.7	349
Apr.	10.76		9	197	‡22	0	20.0	1,190
May	9.38		24	7.7	‡ 1	0	1.1	53.6
June				0		0	0	0
July				0		0	* 0	0
Aug.	* 28.37		31	*12,900	‡ 1	0	1,020	*63,000
Sept.	29.04		‡ 8	15,100	‡23	0	5,220	310,000
Oct.	26.64		8	12,300	‡ 1	0	3,780	232,000
Nov.	17.68		1	3,450	‡27	0	482	28,700
Dec.	12.97		14	823	21	0	277	17,000
Yearly	29.04			15,100		0	903	653,470.6

Period 1934-1953

Acre-Feet Average	Maximum	Minimum
132,712	299,000	u 55.9
98,548	237,000	137
89,035	311,000	40.5
82,353	* 372,000	221
223,585	717,000	53.6
271,279	* 1,161,000	0
241,632	759,000	0
199,222	679,000	6,000
470,514	1,337,000	981
* 414,832	* 1,427,000	350
152,378	614,000	1,070
117,993	341,000	337
2,494,138	* 6,526,000	185,928.5

u Estimated * Partly estimated ‡ And other days

OUTFALLS FROM WELLS AND SEWERS INTO THE RIO GRANDE
In Acre-Feet

EL PASO ELECTRIC COMPANY SANTA FE STREET PLANT COOLING WATER WASTE

This outfall enters the Rio Grande 3.3 miles below the American Dam. The 1953 record of outfall was obtained from records of water pumped from the company's wells and use of such water by the City of El Paso.

Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Yearly
1953	0	0	24.8	29.6	5.1	47.6	32.3	15.5	8.0	37.2	10.9	.4	211.4
* Average	54.2	50.7	70.7	48.4	88.4	85.2	73.2	61.6	40.7	48.9	36.2	41.8	700.0

EL PASO SEWAGE OUTFALL

This sewage outfall enters the Rio Grande 6.6 river miles below the American Dam. The 1953 record of outfall consists of flows, measured by a Parshall meter and estimates by the Department of Water and Sewerage of the City of El Paso, of amounts which by-passed the meter, minus estimated diversions between the Sewage Plant and the Rio Grande for irrigation use on 120 acres of land.

Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Yearly
1953	951	887	915	945	936	1,150	1,210	1,290	1,210	1,210	1,120	1,130	12,954
ϕ Average	754	708	762	741	798	849	915	902	852	864	805	792	9,742

EL PASO COUNTY WATER CONTROL AND IMPROVEMENT DISTRICT NO. 1 SEWAGE OUTFALLS

This water enters the Rio Grande through the sewer system of the El Paso County Water Control and Improvement District No. 1 between Ascarate and Yaleta, Texas, 9 and 15 miles, respectively, below the American Dam. The tabulation includes the outfalls from Disposal Plant No. 1 at Ascarate, Texas and Disposal Plant No. 2, a few miles downstream. Records furnished by the El Paso County Water Control and Improvement District No. 1.

Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Yearly
1953	42.8	41.8	44.0	49.4	49.5	52.7	53.1	55.6	53.1	49.7	44.6	41.7	578.0
# Average	44.0	41.0	30.0	24.6	15.6	17.4	23.1	26.8	31.6	42.4	47.4	45.9	389.8

LAREDO SEWAGE OUTFALL

This sewage outfall enters the Rio Grande 885.7 river miles below the American Dam at El Paso, Texas and 1.4 river miles below the Laredo Gaging Station. The record is based on estimates by the Texas State Health Department.

Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Yearly
1953	173	159	194	210	226	163	205	173	161	148	177	164	2,153
# Average	161	158	179	184	187	162	183	180	164	156	163	157	2,034

* Period 1940-1953, some years missing ϕ Period 1936-1953 # Period 1950-1953

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, and also for International Falcón Reservoir on the Río 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 sources of the data are: Rio Grande, Continental, Santa Maria, Terrace, and Mountain Home from the Colorado State Engineer; Sánchez and Costilla from the San Luís Power and Water Company; El Vado from the Middle Rio Grande Conservancy District; Elephant Butte, Caballo, Alamogordo, McMillan, and Avalon from the United States Bureau of Reclamation; Red Bluff from the Red Bluff Water Power Control District; Willacy from the Willacy County Water Control and Improvement District No. 1; Boquilla, Colina, and Rosetilla from the Río Conchos Agriculture and the Electric Power Company of Mexico; Francisco I. Madero, Centenario and San Miguel, Venustiano Carranza, Marte Gómez, Culebrón, Villa Cárdenas, and Palito Blanco from the Ministry of Hydraulic Resources of Mexico; International Falcón Reservoir from International Boundary and Water Commission.

The capacities shown below for Culebrón and Palito Blanco Reservoirs in Mexico are revised figures furnished by the Lower Rio Grande Irrigation District.

In the United States

Month	Rio Grande (Capacity 51.1)		Continental (Capacity 26.7)		Santa Maria (Capacity 43.6)		Terrace (Capacity 17.7)		Mountain Home (Capacity 20.1)		Sanchez (Capacity 103.2)	
	1953	# Average 1927-1953	1953	# Average 1928-1953	1953	# Average 1928-1953	1953	# Average 1925-1953	1953	# Average 1924-1953	1953	# Average 1927-1953
Jan.	15.3	14.0	4.5	5.3	9.4	7.9	4.6	2.7	2.1	4.0	4.8	10.9
Feb.	16.5	15.2	5.6	5.6	9.7	8.6	4.6	3.1	2.2	4.4	5.4	11.1
Mar.	17.6	16.5	6.3	5.8	9.9	9.6	5.4	3.5	2.5	4.8	6.1	11.8
Apr.	17.6	16.0	6.3	6.3	9.9	11.2	6.0	4.1	2.8	5.4	6.5	13.6
May	21.7	24.1	7.8	8.6	10.5	16.3	6.3	7.3	3.7	7.8	7.9	18.9
June	0	25.6	5.8	9.3	4.6	18.8	5.9	9.1	3.5	7.8	11.5	18.2
July	0	15.2	2.0	6.9	.8	12.8	4.0	5.7	1.9	5.5	7.0	12.6
Aug.	0	6.7	2.0	4.8	.5	6.0	.7	2.9	1.1	3.4	2.6	9.1
Sept.	0	6.4	2.0	4.9	.5	5.5	.8	2.4	.8	3.0	1.4	9.2
Oct.	0	7.7	2.0	4.6	.5	5.8	1.3	2.6	.7	3.0	1.8	9.9
Nov.	22.3	11.5	" 2.8	4.8	1.4	6.6	1.4	2.2	1.3	3.3	1.5	10.0
Dec.	36.1	13.6	" 3.6	5.1	1.8	7.1	1.4	2.5	1.7	3.6	2.1	10.3
Avg.	12.3	14.4	4.2	6.0	5.0	9.7	3.5	4.0	2.0	4.7	4.9	12.1
Max.	36.1	51.8	7.8	26.7	10.5	42.1	6.3	17.7	3.7	16.4	11.5	62.4
Min.	0	0	2.0	0	.5	0	.7	0	.7	0	1.4	0

Month	Costilla (Capacity 15.7)		El Vado (Capacity 200.3)		Bluewater (Capacity 43.5)		Elephant Butte (Capacity 2,185.4)		Caballo (Capacity 346.0)	
	1953	# Average 1922-1953	1953	Average 1935-1953	1953	# Average 1927-1953	1953	Average 1915-1953	1953	# Average 1938-1953
Jan.	9.8	4.1	9.0	56.9	1953 Data Not Available		351.6	942.1	87.0	176.1
Feb.	10.0	4.4	" 11.6	50.5			311.8	942.0	156.8	193.2
Mar.	10.2	5.0	" 14.1	47.0			277.4	929.6	136.9	173.3
Apr.	11.0	6.1	16.7	100.0			232.3	932.4	132.5	143.7
May	12.2	8.7	53.5	158.9			228.7	1,059.3	107.7	132.9
June	12.6	8.0	14.0	145.9			209.2	1,111.0	88.8	108.8
July	9.8	5.0	11.3	117.7			162.8	1,053.2	60.0	77.8
Aug.	6.3	3.3	0	85.8			109.6	982.2	27.5	39.9
Sept.	5.1	2.8	0	69.1			88.5	941.0	6.6	33.5
Oct.	5.2	3.1	0	63.2			90.6	931.8	9.4	61.2
Nov.	5.4	3.4	0	56.3			93.9	931.1	11.8	91.6
Dec.	5.7	3.8	0	54.3			110.6	935.9	14.1	123.5
Avg.	8.6	4.8	10.8	83.8			188.9	974.3	69.9	113.0
Max.	12.6	15.1	53.5	203.5			ϕ 378.1	ϕ 2,302.8	ϕ 174.2	ϕ 346.6
Min.	5.1	0	0	0			ϕ 87.6	ϕ 3.3	ϕ 4.3	ϕ .1

Some months missing " Estimated ϕ Daily extreme

STORED WATER IN LARGE RESERVOIRS OF THE RIO GRANDE BASIN

In Thousands of Acre-Feet

In the United States

Month	Alamogordo (Capacity 132.2)		McMillan and Avalon (Capacity 43.5)		Red Bluff (Capacity 310.0)		Willacy (Capacity 25.0)		Total in United States Reservoirs (Capacity 3,520.5)	
	1953	# Average 1937-1953	1953	# Average 1908-1953	1953	# Average 1936-1953	1953	# Average 1939-1953	1953	Estimated Average
Jan.	35.0	61.3	3.1	28.8	28.7	118.5	0	13.0	564.9	1,445.6
Feb.	39.1	65.4	4.8	29.0	31.0	122.1	0	12.1	609.1	1,466.7
Mar.	32.0	55.7	3.8	27.1	31.9	119.6	0	11.4	554.1	1,420.7
Apr.	13.2	43.8	.6	18.9	30.7	99.5	0	10.3	486.1	1,411.3
May	14.5	55.1	2.8	22.2	30.5	109.4	0	11.7	507.8	1,641.2
June	17.8	49.0	2.1	21.4	28.9	118.3	0	12.4	404.7	1,663.6
July	25.5	51.9	.2	18.5	27.0	104.0	0	12.6	312.3	1,499.4
Aug.	12.8	50.9	2.9	16.5	24.5	88.9	0	11.6	190.5	1,312.0
Sept.	10.4	49.1	1.9	18.7	23.3	91.5	15.5	14.2	156.8	1,251.3
Oct.	11.0	51.5	2.2	21.2	33.4	97.2	18.8	14.6	176.9	1,277.4
Nov.	15.9	50.9	3.9	22.7	33.8	101.8	19.2	13.5	214.6	1,309.7
Dec.	23.4	55.2	5.4	26.4	34.4	107.9	18.4	14.6	258.7	1,363.8
Avg.	20.9	53.3	2.8	22.6	29.8	106.6	6.0	12.7	369.7	1,421.9
Max.	39.1	156.3	5.4	85.5	34.4	327.5	19.2	22.0	609.1	
Min.	10.4	.4	.2	0	23.3	10.0	0	0	156.8	

In Mexico

Month	● Boquilla (Capacity 2,417.5)		La Colina (Capacity 19.5)		Rosetilla (Capacity 15.4)		Madero (Capacity 344.6)		Centenario and San Miguel (Capacity 19.9)	
	1953	# Average 1914-1953	1953	Average 1940-1953	1953	Average 1940-1953	1953	# Average 1948-1953	1953	Average 1934-1953
Jan.	446.2	1,421.2	16.8	17.8	13.6	13.6	165.0	148.4	3.0	12.3
Feb.	437.5	1,389.8	17.2	18.0	15.2	14.7	168.0	149.6	0	11.9
Mar.	425.3	1,339.7	15.0	17.6	14.3	14.1	163.6	145.1	0	8.8
Apr.	372.9	1,274.6	15.0	18.2	13.5	13.1	131.6	128.2	1.9	7.3
May	321.0	1,220.3	15.2	18.4	12.0	11.2	110.5	114.0	1.3	8.7
June	274.0	1,136.1	15.8	18.2	7.7	13.0	83.5	101.5	1.1	7.8
July	340.0	1,178.6	17.9	18.4	6.8	12.8	110.5	121.9	.6	7.5
Aug.	451.6	1,336.2	18.0	18.0	13.7	12.6	114.6	116.9	.1	8.3
Sept.	533.9	1,482.9	18.0	18.2	15.3	14.4	127.6	142.6	2.3	10.7
Oct.	525.5	1,474.2	18.1	17.9	15.6	14.2	125.7	145.8	5.9	12.2
Nov.	518.6	1,436.8	18.2	17.7	15.6	13.5	126.1	145.6	11.0	11.6
Dec.	511.8	1,419.2	17.0	17.4	15.6	14.3	125.5	144.7	12.4	11.6
Avg.	429.8	1,342.5	16.8	18.0	13.2	13.5	129.6	133.7	3.3	9.9
Max.	533.9	2,224.5	18.2	20.4	15.6	19.4	168.0	268.5	12.4	20.7
Min.	274.0	16.9	15.0	13.5	6.8	.4	83.5	1.4	0	0

Month	Venustiano Carranza (Capacity 1,123.0)		Marte Gómez (Capacity 876.4)		+ Culebrón (Capacity 90.0)		Palito Blanco (Capacity 124.0)		Total in Mexican Reservoirs (Capacity 5,030.3)	
	1953	Average 1930-1953	1953	# Average 1943-1953	1953	# Average 1939-1953	1953	Average 1942-1953	1953	Estimated Average
Jan.	4.5	388.2	298.3	487.3	0	44.0	0	36.2	950.4	2,569.0
Feb.	1.5	372.1	180.3	436.7	0	39.0	0	27.9	819.7	2,459.7
Mar.	1.9	351.2	169.8	373.8	0	30.8	0	28.1	789.9	2,309.2
Apr.	3.1	339.7	148.8	357.9	0	28.8	0	19.0	686.8	2,186.8
May	3.0	328.2	35.2	346.1	0	36.1	0	16.0	498.2	2,099.0
June	2.8	320.6	17.8	326.8	0	47.9	0	19.7	402.7	1,991.6
July	2.1	311.5	38.1	300.8	0	43.4	0	29.0	516.0	2,023.9
Aug.	74.4	315.1	991.5	427.1	21.8	42.8	6.6	30.6	1,692.3	2,307.6
Sept.	130.7	364.8	861.0	507.9	54.5	57.0	121.3	45.5	1,864.6	2,644.0
Oct.	125.1	385.2	910.4	549.0	79.1	62.4	124.2	60.0	1,929.6	2,720.9
Nov.	118.4	394.7	882.1	541.6	67.0	52.6	125.2	59.2	1,882.2	2,673.3
Dec.	114.3	395.5	869.9	543.5	61.0	50.9	117.5	53.5	1,845.0	2,650.6
Avg.	48.5	355.6	450.3	433.2	23.6	44.6	41.2	35.4	1,156.4	2,386.3
Max.	130.7	1,163.4	991.5	991.5	79.1	116.8	125.2	140.1		
Min.	1.5	* 1.0	17.8	ϕ 17.8	0	0	0	0		

Some months missing 8 Excludes Bluewater Reservoir ● In May 1952, a new and lower outlet was installed, thereby increasing the usable storage 402,900 acre-feet. + Includes Villa Cárdenas. * Minimum since full reservoir in 1932. ϕ Minimum since full reservoir in 1947.

INTERNATIONAL FALCON RESERVOIR

Falcón 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 river miles downstream from Laredo, Texas and Nuevo Laredo, Tamaulipas, 105 river miles upstream from Hidalgo, Texas and Reynosa, Tamaulipas, 970.9 river miles below American Dam, and 270.5 river miles above the Gulf of Mexico.

Falcón Dam and Reservoir serves to control and regulate floods and other flows of the Rio Grande for domestic and irrigation uses downstream in the two countries, and serves incidental purposes, including the generation of hydroelectric energy at two identical power plants, one on each side of the river immediately below the dam. In the course of construction of Falcón Dam, the flow of the Rio Grande was diverted through the temporary outlets on December 29, 1952. These outlets were closed and permanent storage began on August 25, 1953, although some small storage occurred prior to that time when the flow of the river exceeded the capacity of the temporary outlets.

The stored water belonging to each country is based on their respective river and tributary flows, consumptive uses, and losses, as specified in the Water Treaty.

STORAGE CAPACITIES

Elevation	Description	At Indicated Elevation		Between Indicated Elevations	
		Reservoir Capacity Acre-Feet	Reservoir Area Acres	Storage Volume Acre-Feet	Type of Storage
175.0	River Bed at Dam Axis	0	0		
				16,455	Silt and Dead
204.34	Lowest Outlet (Mexican Penstock)	16,455	1,449		
				2,424,073	Silt and Conservation
296.4	Top of Conservation Storage	2,440,528	78,451		
				908,759	Ordinary Flood
306.7	Top of Spillway Gates	3,349,287	98,805		
				801,684	Super Flood
314.2	Maximum Water Surface	4,150,971	115,581		

During the winter months, 400,000 acre-feet of the flood control capacity may be utilized for additional conservation storage.

WATER SURFACE ELEVATIONS AND STORED WATER

Water Surface Elevations in Feet above mean sea level, U.S.C. & G.S. datum
Storage in Thousands of Acre-Feet

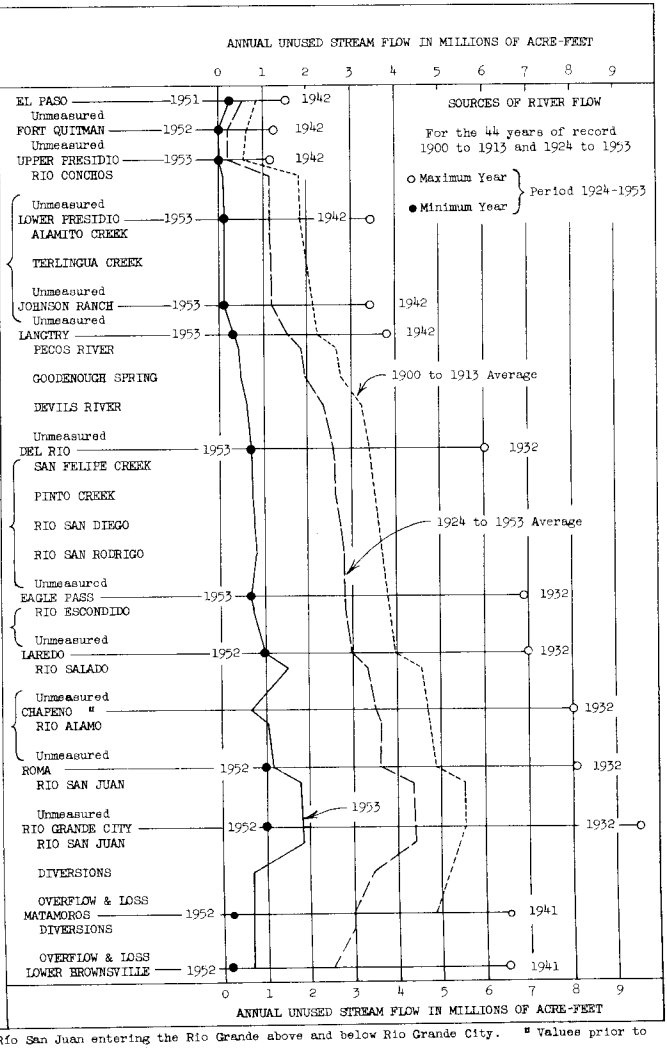
Month	Last Day of Month at Midnight		MONTHLY						
			AVERAGE	MAXIMUM			MINIMUM		
1953	Elevation	Storage	Storage	Elevation	Storage	Day	Elevation	Storage	Day
*Dec.	187.60	2.4							
Jan.	187.10	2.1	2.3	188.55	2.8	3	186.85	2.0	‡26
Feb.	187.25	2.2	2.1	187.60	2.4	6	186.65	1.9	‡20
Mar.	190.40	3.9	3.0	195.85	7.5	30	186.40	1.8	‡ 9
Apr.	183.10	.7	2.6	199.45	10.4	4	183.10	.7	30
May	182.95	.7	2.8	200.60	11.6	15	181.80	.5	13
June	180.30	.3	.4	182.95	.7	1	180.25	.3	29
July	190.35	3.8	1.0	190.90	4.1	15	180.30	.3	1
Aug.	259.70	564.5	97.8	259.70	564.5	31	185.60	1.5	20
Sept.	269.67	902.2	907.9	271.25	965.5	7	261.30	611.9	1
Oct.	272.50	1,017.8	945.1	272.50	1,017.8	31	269.38	890.9	3
Nov.	271.57	979.0	1,012.7	272.67	1,025.1	‡ 6	271.57	979.0	30
Dec.	270.76	945.5	952.2	271.57	979.0	1	270.76	945.5	‡28
Yearly			32.8	272.67	1,025.1		180.25	.3	

* December 1952 ‡ And other days

SOURCES OF RIVER FLOW

The graph and the column of figures on this page represent data on the annual yield of the drainage areas tributary to various stream gaging stations in the Rio Grande watershed. The graphic values are for the entire tributary area, while the column figures are reduced to the yield from one average square mile of the tributary area. Because more than 10,000,000 acre-feet of reservoir capacity have been developed on the watershed since 1913, in which large volumes of unused runoff are stored in some years and released in later years as unused streamflow (thus reducing the unused streamflow in some years and adding thereto in others), it is significant to differentiate between the unused runoff and unused streamflow.

AVERAGE ANNUAL UNUSED Acre-Feet per Square Mile			
RUNOFF		STREAMFLOW	
1900-1913	1924-1953	1924-1953	
29.7	17.4	18.8	EL PASO
			Unmeasured
19.6	5.5	6.8	FORT QUITMAN
			Unmeasured
16.4	4.7	5.9	UPPER PRESIDIO
51.0	36.2	38.7	RIO CONCHOS
			Unmeasured
			LOWER PRESIDIO
			ALAMITO CREEK
20.7	20.5	20.5	TERLINGUA CREEK
			Unmeasured
			JOHNSON RANCH
			Unmeasured
28.2	18.4	19.7	LANGTRY
12.4	9.0	9.0	PECOS RIVER
			GOODENOUGH SPRING
106.1	96.9	96.9	DEVILS RIVER
			Unmeasured
55.7	65.0	64.9	DEL RIO
28.0	20.4	21.2	SAN FELIPE CREEK
			PINTO CREEK
112.6	67.2	67.1	RIO SAN DIEGO
			RIO SAN RODRIGO
			Unmeasured
30.4	21.7	22.5	EAGLE PASS
32.7	31.3	31.3	RIO ESCONDIDO
			Unmeasured
30.5	22.1	22.9	LAREDO
27.2	16.7	16.5	RIO SALADO
			Unmeasured
			CHAPENO "
65.1	59.7	53.5	RIO ALAMO
			Unmeasured
31.1	22.6	23.0	ROMA
52.8	* 64.2	61.9	RIO SAN JUAN
			Unmeasured
			RIO GRANDE CITY
			RIO SAN JUAN
			DIVERSIONS
			OVERFLOW & LOSS
			MATAMOROS
			DIVERSIONS
			OVERFLOW & LOSS
			LOWER BROWNSVILLE



* Includes contributions of the Río San Juan entering the Rio Grande above and below Rio Grande City. " Values prior to 1953 considered the same as for Zapata gaging station.

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

DESCRIPTION: An open channel rating station in a concrete-lined canal with a water-stage recorder located 2,350 feet below the head gates at the American Dam near El Paso, Texas. Measurements are made at the downstream end of the first covered section of this canal, 835 feet below the recorder. The zero of the gage is 3,712.09 feet above mean sea level, U.S.C. & G.S datum.

RECORDS: Based on 37 meter measurements during the year, a stable rating curve, and a continuous record of gage heights. Records available: June 2, 1938 through December 1953.

REMARKS: This canal diverts water from the Rio Grande at the American Dam near El Paso, Texas, 2.1 river miles above the International Dam near Juárez, Chihuahua. Water from this canal discharges into the Franklin Canal from which water is frequently returned to the Rio Grande at spillways 2.2, 2.7, and 3.6 river miles below the American Dam.

EXTREME FLOWS FROM RECORDS: Momentary: Max. 1,840 second-feet on March 27, 1944. Min. frequently no flow.

Average Flow in Second-Feet

Daily:	Max.	1,510	Aug. 13, 1945	Min.	0	Frequently
Monthly:	Max.	1,210	Aug. 1943	Min.	0	Jan. & Feb. 1952; Jan. 1953
Yearly:	Max.	748	1943	Min.	277	1951

Mean Daily Discharge in Second-Feet 1953 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	0	0	54.0	918	133	283	397	734	704	96.3	0	60.1
2	0	0	43.6	753	136	286	419	731	729	98.0	0	59.5
3	0	0	43.6	600	202	283	466	699	832	90.6	0	57.2
4	0	0	43.6	676	224	336	456	561	897	86.5	0	57.7
5	0	0	39.8	792	252	445	527	524	797	89.7	0	57.2
6	0	0	35.5	889	366	470	685	533	772	84.2	0	57.2
7	0	0	33.2	848	406	512	692	543	706	86.5	26.4	58.3
8	0	0	31.6	715	418	575	743	711	706	88.1	65.1	58.9
9	0	0	34.9	583	392	561	758	758	602	88.1	64.5	57.2
10	0	0	33.2	557	394	551	669	830	418	86.5	65.8	57.2
11	0	0	33.2	583	370	583	602	780	553	86.5	67.8	58.9
12	0	0	31.6	510	267	604	627	720	551	85.7	62.6	60.3
13	0	0	43.5	465	313	753	974	715	586	78.9	64.5	61.4
14	0	0	573	466	320	653	1,130	619	465	81.2	65.1	59.5
15	0	0	924	459	319	632	619	653	165	85.0	68.4	60.1
16	0	0	825	454	260	559	404	653	0	85.0	69.1	58.9
17	0	0	701	402	251	561	* 216	667	0	30.7	69.1	54.3
18	0	0	539	324	239	533	283	697	0	0	25.6	53.1
19	0	u 25.3	623	319	212	619	289	757	0	0	0	56.0
20	0	u 43.4	963	331	228	545	279	738	0	0	0	58.3
21	0	u 43.4	929	331	258	492	289	565	0	0	0	60.1
22	0	u 43.4	957	342	233	486	320	566	0	0	0	58.3
23	0	u 43.4	1,070	319	175	474	309	442	0	0	0	45.6
24	0	u 43.4	910	312	205	516	271	337	0	0	0	59.3
25	0	u 43.4	929	318	141	499	256	292	70.0	0	0	64.2
26	0	u 43.4	892	234	156	466	350	258	120	0	0	53.8
27	0	u 43.4	946	259	228	418	669	490	117	0	0	65.1
28	0	49.3	1,080	135	201	400	706	543	111	0	0	20.9
29	0		1,050	176	254	368	727	577	101	0	24.1	0
30	0		1,120	175	245	409	736	619	98.8	0	58.9	0
31	0		1,220		261		632	713		0		0
Sum	0	u421.8	16,752.3	14,245	8,059	14,872	16,500	19,025	10,100.8	1,427.5	797.0	1,588.6

Month	Current Year 1953: 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 June 1938-1953: Acre-Feet Average	Acre-Feet Maximum	Acre-Feet Minimum
Jan.				0		0	0	0	1,772	8,110	0
Feb.			28	ϕ 49.3	‡ 1	0	u 15.1	u 837	8,730	19,500	0
Mar.	10.83	2.76	30	1,670	13	29.0	540	33,200	34,075	50,100	7,470
Apr.	9.06	3.69	1	1,060	28	91.1	475	28,300	49,807	70,900	22,000
May	6.49	3.22	8	459	25	59.3	260	16,000	42,187	69,000	12,200
June	8.23	4.90	13	835	1	223	496	29,500	48,938	65,700	26,200
July	10.78		12	1,650	17	0	532	32,700	56,150	70,700	32,700
Aug.	9.01	4.95	‡19	1,050	26	230	614	37,700	57,062	74,600	37,300
Sept.	8.63		4	940	‡15	0	337	20,000	38,731	63,100	16,200
Oct.	4.20		12	132	‡17	0	46.0	2,830	19,266	39,100	2,830
Nov.	3.68		29	85.0	‡ 1	0	26.6	1,580	11,124	21,000	1,580
Dec.	3.88		26	101	‡28	0	51.2	3,150	11,669	25,500	1,940
Yearly	10.83			1,670		0	284	205,797	379,511	541,610	200,791

u Estimated * Partly estimated ‡ And other days ϕ Mean daily

DIVERSIONS FROM THE RIO GRANDE
ACEQUIA MADRE NEAR JUAREZ, CHIHUAHUA

DESCRIPTION: Water-stage recorder and bridge for meter measurements, located about 260 feet below the canal intake at the International Dam at Juárez, Chihuahua, which is 2.1 river miles below the American Dam at El Paso, Texas.

RECORDS: Based on 95 meter measurements during the year, 71 by the Mexican and 24 by the United States Section of this Commission, and a continuous record of gage heights. Computations by shifting channel methods. Records available: 1938 through December 1953. 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 waters are included in the record of "Rio Grande below American Dam", see page 8 herein.

REMARKS: In 1953, all of the 37,760 acre-feet tabulated below were distributed to land irrigated in the first unit under the canal.

EXTREME FLOWS FROM RECORDS: Momentary: Max. 480 second-feet on July 21, 1944, with a gage height of 6.00 feet. Min. no flow through the winter months.

Average Flow in Second-Feet

Daily:	Max.	339	May 10, 1942	Min.	0	Several months each year
Monthly:	Max.	283	May 1938	Min.	0	Several months each year
Yearly:	Max.	116	1942	Min.	45.7	1951

Mean Daily Discharge in Second-Feet 1953 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	0	0	0	41.3	117	114	94.6	140	159	0	0	0
2	0	0	0	73.5	142	101	106	138	153	0	0	0
3	0	0	0	69.9	136	103	109	138	156	0	0	0
4	0	0	0	75.9	138	95.7	104	134	148	0	0	0
5	0	0	0	72.0	143	79.1	103	130	144	0	0	0
6	0	0	0	68.5	134	82.3	103	136	150	0	0	0
7	0	0	0	65.7	132	83.7	102	137	149	0	0	0
8	0	0	0	67.1	135	80.9	105	131	157	0	0	0
9	0	0	0	74.5	135	90.1	102	135	158	0	0	0
10	0	0	0	70.6	138	91.8	101	132	189	0	0	0
11	0	0	0	71.7	141	86.9	97.5	126	10.6	0	0	0
12	0	0	0	70.6	133	81.2	93.9	126	0	0	0	0
13	0	0	0	71.3	131	84.0	100	129	0	0	0	0
14	0	0	0	78.8	130	84.8	123	126	0	0	0	0
15	0	0	0	71.3	128	85.5	101	122	0	0	0	0
16	0	0	0	69.9	125	88.6	99.6	114	0	0	0	0
17	0	0	0	68.9	130	84.8	109	120	0	0	0	0
18	0	0	0	68.5	129	83.0	99.6	123	0	0	0	0
19	0	0	0	71.0	125	85.1	99.9	118	0	0	0	0
20	0	0	0	67.8	136	82.6	132	123	0	0	0	0
21	0	0	0	66.7	137	82.3	180	129	0	0	0	0
22	0	0	0	64.6	143	81.9	184	162	0	0	0	0
23	0	0	0	65.7	143	86.5	183	166	0	0	0	0
24	0	0	0	72.7	138	84.8	171	175	0	0	0	0
25	0	0	0	75.6	141	85.5	159	178	0	0	0	0
26	0	0	0	74.9	144	84.8	178	187	0	0	0	0
27	0	0	0	73.1	138	84.8	177	195	0	0	0	0
28	0	0	0	67.8	140	85.8	175	196	0	0	0	0
29	0		0	69.9	140	84.8	176	186	0	0	0	0
30	0		0	74.2	133	91.8	182	181	0	0	0	0
31	0		0		138		185	191		0		0
Sum	0	0	0	2,094.0	4,193	2,621.1	4,035.1	4,524	1,573.6	0	0	0

Month	1938-1953 Average Rainfall Inches **	Current Year 1953 Rainfall Inches	Extreme Second-Feet High Day	High	Low Day	Low	Average Second-Feet	Total Acre-Feet	Period 1938-1953 Acre-Feet Average	Maximum	Minimum
Jan.	.44	0		0		0	0	0	0	0	0
Feb.	.27	.29		0		0	0	0	0	0	0
Mar.	.27	.07		0		0	0	0	1,479	5,540	0
Apr.	.23	.34	27	82.3	1	0	69.8	4,150	6,549	11,720	2,030
May	.43	.16	1	168	2	127	135	8,320	12,453	17,380	5,260
June	.78	.25	1	114	5	79.1	87.4	5,200	10,127	15,700	5,200
July	1.56	4.00	31	185	10	88.3	130	8,000	9,978	15,170	7,910
Aug.	1.21	.56	28	198	16	97.1	146	8,970	9,876	12,410	5,200
Sept.	1.01	.12	10	217	‡12	0	52.5	3,120	7,125	12,380	18.6
Oct.	.80	.56		0		0	0	0	96.5	328	0
Nov.	.26	.02		0		0	0	0	0	0	0
Dec.	.55	.28		0		0	0	0	0	0	0
Yearly	7.81	6.65		0		0	52.2	37,760	57,683.5	83,930	33,058.6

‡ And other days ** Average for Valley floor from El Paso to Island Station

DIVERSIONS FROM THE RIO GRANDE
MAVERICK CANAL AT MILE 13
NEAR QUEMADO, TEXAS

DESCRIPTION: For power generation and irrigation use, water is diverted into the main Maverick Canal from the Rio Grande at a point 17.4 river miles below the international bridge between Del Rio, Texas and Cd. Acuña, Coahuila and 711.0 river miles below the American Dam at El Paso, Texas. At a point 31.8 canal miles below the headworks of this canal, a portion of the diverted water returns to the river through the Maverick Power Plant and the remainder enters the Maverick Canal Extension. The discharges shown below are based on records of stage and measurements of discharge at a point approximately 13 canal miles below the diversion point.

RECORDS: Based on 24 meter measurements and a continuous record of gage heights. Computations by shifting channel methods. Records available: June 21, 1949 through December 1953.

REMARKS: In 1953, a total of 41,761 acres of land was irrigated from this canal and its extension, of which 655 acres were above this gaging station, 11,663 acres were between this point and the Canal Extension, and 29,443 acres were irrigated from the Maverick Canal Extension. A total of 320,701 acre-feet of water returned to the Rio Grande at the power plant and some returned through the irrigation system.

EXTREME FLOWS FROM RECORDS: Momentary peak: Max. 1,650 second-feet on May 27, 1952. Min. 320 second-feet on July 5, 1953.

Average Flow in Second-Feet

Daily:	Max.	1,620	July 13, 1952	Min.	372	July 4, 1953
Monthly:	Max.	* 1,530	July 1952	Min.	578	June 1953
Yearly:	Max.	1,390	1950	Min.	935	1953

Mean Daily Discharge in Second-Feet 1953 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	1,010	u 800	1,080	833	623	817	456	1,360	1,230	927	1,140	990
2	1,000	u 600	1,040	889	608	* 790	434	1,370	1,250	937	1,050	1,010
3	992	u1,010	1,020	930	610	u 750	392	1,160	1,360	952	1,010	1,020
4	1,080	u1,000	969	860	622	* 708	372	* 991	1,310	1,060	975	1,000
5	1,130	*1,000	926	803	632	599	379	u 902	1,330	1,430	966	975
6	1,070	1,000	876	791	611	602	547	* 926	1,320	1,460	958	951
7	1,050	981	856	741	602	583	501	862	1,420	1,280	948	913
8	1,020	972	885	719	608	564	444	836	1,440	1,220	943	892
9	1,010	994	1,120	* 919	616	586	507	964	1,480	1,270	919	913
10	1,020	*1,090	1,280	* 909	607	552	503	1,020	1,490	1,260	925	903
11	1,010	1,090	1,230	u 808	630	513	785	968	1,490	1,140	922	921
12	1,020	1,020	1,110	u 759	672	480	726	909	1,470	1,070	927	962
13	1,060	946	1,280	u 745	721	442	486	834	1,460	* 1,020	938	1,010
14	1,060	962	*1,330	u 728	641	516	397	832	1,470	* 986	976	1,000
15	1,040	1,020	*1,280	u 728	639	522	636	772	1,460	* 971	999	985
16	1,060	987	1,240	u 722	633	468	658	704	1,400	* 994	996	1,010
17	1,080	952	1,160	u 738	640	490	575	678	1,460	978	999	1,010
18	1,040	933	1,130	u 708	703	475	569	728	1,390	973	1,020	990
19	994	917	1,170	u 698	673	* 487	864	862	1,370	952	1,020	985
20	1,000	936	1,120	u 702	666	500	1,140	1,160	1,320	937	1,000	1,020
21	983	890	1,070	u 711	667	556	971	1,290	1,250	952	971	1,040
22	1,030	859	1,030	u 710	664	640	829	1,220	1,170	965	975	1,050
23	1,070	844	998	u 725	670	648	913	1,050	1,100	991	977	1,040
24	1,040	894	956	u 730	650	571	1,180	1,480	1,070	986	982	1,030
25	1,000	911	* 911	u 752	633	619	1,280	1,510	1,030	954	1,030	1,020
26	1,010	976	* 956	u 728	617	753	1,320	1,480	1,030	993	1,040	998
27	1,060	1,070	938	u 717	601	625	1,360	1,490	1,010	1,400	1,020	993
28	1,080	1,060	906	u 721	584	518	1,260	1,500	980	1,440	1,010	1,010
29	1,050		883	u 689	588	486	1,030	1,290	964	1,460	1,000	1,030
30	1,030		863	u 694	692	470	855	1,110	936	1,290	995	1,040
31	1,040		848		739		839	1,160		1,190		993
Sum	32,139	26,714	32,461	*22,907	u19,862	17,330	23,208	33,418	38,460	34,438	29,631	30,704

Month	Current Year 1953: 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 July 1949-1953 **: Acre-Feet Average	Acre-Feet Maximum	Acre-Feet Minimum
Jan.	3.44	2.58	4	1,170	9	959	1,040	63,700	76,475	89,500	63,700
Feb.	4.40	.82	1	u 1,150	2	ϕu 600	954	53,000	68,675	82,500	53,000
Mar.	4.02	2.09	13	1,360	‡ 6	830	1,050	64,400	74,800	90,700	60,900
Apr.			9	* 1,060	29	ϕu 689	* 764	* 45,400	63,750	81,000	* 45,400
May			31	uϕ 739	28	ϕu 584	u 641	u 39,400	65,675	82,200	u 39,400
June	2.80	1.37	1	881	12	432	578	34,400	70,650	86,800	34,400
July	4.70	1.08	27	1,370	5	320	749	46,000	78,240	* 93,900	46,000
Aug.	4.88	1.78	25	1,570	17	651	1,080	66,300	76,360	88,500	64,100
Sept.	4.58	2.20	10	1,510	30	914	1,280	76,300	73,620	* 84,500	47,000
Oct.	4.60	2.18	‡ 6	1,480	1	912	1,110	68,300	72,680	* 87,200	* 54,300
Nov.	3.43	2.55	1	1,170	9	906	988	58,800	69,640	82,800	55,900
Dec.	3.48	2.75	22	1,070	8	882	990	60,900	72,380	85,600	58,600
Yearly				1,570		320	935	676,900	862,945	1,004,200	676,900

u Estimated * Partly estimated ‡ And other days ϕ Mean daily ** Records from July 1949 to March 1952 are for Maverick Canal at Las Moras Creek Station, April through July 1952 from Maverick Canal at Mile 3 Station, and August 1952 through 1953 from Maverick Canal at Mile 13 Station

DIVERSIONS FROM THE RIO GRANDE
MAVERICK CANAL EXTENSION BELOW THE POWER PLANT
NEAR EAGLE PASS, TEXAS

DESCRIPTION: The main Maverick Canal divides into two branches at a point about 31.8 canal miles below 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. The other branch forms this Maverick Canal Extension which is used to transmit irrigation water. The water-stage recorder is located at a wood pile bridge about 1 mile below the heading of this canal extension. Meter measurements are made from the bridge.

RECORDS: Based on 24 meter measurements during the year and a continuous record of gage heights. Computations by shifting channel methods. Records available: April 1, 1939 through December 1953.

REMARKS: Irrigation from this canal extension began in June 1938, and in 1953, 29,443 acres of land north and south of Eagle Pass were irrigated. Some water from this canal extension returns to the river below the power plant.

EXTREME FLOWS FROM RECORDS: Momentary: Max. 488 second-feet on July 26, 1953. Min. occasionally no flow.

Average Flow in Second-Feet

Daily:	Max.	441	July 25, 1953	Min.	0	Occasionally	
Monthly:	Max.	394	July 1951	Min.	¤ 18.7	March	1939
Yearly:	Max.	321	1952	Min.	62.1		1939

Mean Daily Discharge in Second-Feet 1953 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	¤ 289	331	322	364	380	384	300	364	243	329	273	268
2	¤ 286	166	320	389	380	388	195	353	172	333	268	279
3	¤ 283	351	322	376	383	384	182	340	151	331	271	280
4	¤ 280	341	329	356	377	387	214	315	146	336	277	274
5	¤ 277	325	332	369	383	388	229	311	144	304	275	255
6	* 278	314	336	343	382	364	298	319	143	252	281	259
7	292	326	325	364	379	363	338	302	144	252	265	253
8	* 284	320	313	358	376	363	288	291	143	275	272	256
9	* 278	311	293	355	375	364	186	300	144	335	265	266
10	* 285	318	268	395	370	356	177	292	140	331	272	273
11	* 295	314	259	357	381	345	189	287	127	326	269	275
12	* 279	312	263	310	380	331	347	286	128	318	266	275
13	* 299	310	278	309	340	326	261	275	129	293	270	284
14	* 309	300	261	321	278	323	189	273	146	291	283	273
15	* 295	313	282	380	292	320	220	284	166	292	280	* 258
16	* 292	306	271	390	321	306	244	284	176	294	280	* 262
17	* 280	299	269	387	336	295	198	283	180	296	274	* 269
18	* 276	302	270	397	341	294	242	283	179	289	276	274
19	* 273	292	277	393	343	285	313	305	179	283	282	264
20	* 290	304	267	392	361	290	422	309	179	298	280	266
21	* 311	314	270	407	364	228	437	249	178	306	274	265
22	327	310	277	389	363	247	414	¤ 218	185	309	270	263
23	332	312	289	392	362	350	310	¤ 249	217	307	275	* 265
24	330	291	318	399	366	443	418	¤ 247	242	287	269	¤ 255
25	326	277	317	386	363	380	441	¤ 247	288	271	277	¤ 255
26	329	298	344	361	351	315	426	¤ 255	288	289	277	¤ 255
27	336	344	361	366	334	322	431	¤ 226	322	284	274	¤ 255
28	332	328	368	374	331	306	420	¤ 237	324	279	271	¤ 255
29	331		361	380	325	300	411	¤ 230	325	285	269	¤ 260
30	336		359	360	319	345	396	¤ 224	326	274	269	¤ 278
31	342		360		352		387	¤ 233		274		* 275
Sum	*9,352	8,629	9,481	11,119	10,988	10,092	9,523	* 8,671	5,854	9,223	8,204	*8,244

Month	1939-1953 Average Rainfall Inches **	Current Year 1953 Rainfall Inches	Extreme Second-Feet High Day	High	Low Day	Low	Average Second-Feet	Total Acre-Feet	Period 1939-1953 Acre-Feet Average	Maximum	Minimum
Jan.	.96	.33	25	358	¤ 6	258	* 302	* 18,500	10,607	19,800	¤ 2,140
Feb.	1.02	.19	1	366	2	140	308	17,100	9,739	18,200	¤ 2,120
Mar.	.88	.99	29	380	14	242	306	18,800	10,781	19,800	¤ 1,150
Apr.	1.42	.65	10	452	13	295	371	22,100	10,922	22,100	3,430
May	3.26	.83	‡ 2	394	14	272	354	21,800	9,136	21,800	2,840
June	1.81	T	24	462	21	145	336	20,000	9,759	20,000	3,750
July	1.21	.14	26	488	11	136	307	18,900	11,851	24,300	4,510
Aug.	2.47	5.72	1	427	22	¤ϕ 218	* 280	* 17,200	10,583	20,300	3,480
Sept.	2.58	3.62	26	345	26	124	195	11,600	9,455	18,300	4,600
Oct.	1.53	.75	9	346	‡ 7	245	298	18,300	11,307	* 21,800	5,130
Nov.	.65	T	6	292	7	254	273	16,300	11,537	* 20,000	4,170
Dec.	.72	.34	2	302	¤24	247	* 266	* 16,400	11,993	20,200	4,280
Yearly	18.51	13.56		488		124	300	217,000	127,670	* 233,300	44,950

¤ Estimated * Partly estimated ‡ And other days ϕ Mean daily ** On U.S. Side from Quemado to El Indio, Texas

DIVERSIONS FROM THE RIO GRANDE
UNITED STATES SIDE BELOW RIO GRANDE CITY, TEXAS

The total diversion of 719,880 acre-feet to this area was made almost entirely by pumping from the river to irrigate 466,891 acres. Diversions were actually measured for 85% of the acreage. Diversions to the remainder were estimated. Measurements in general were made by Venturi meters, by open channel rating stations, and deflection meters developed by this Commission. There is some re-use of drainage water within the area. Drainage water which escapes from the area does not return to the Rio Grande. In addition to the irrigated area, there were 191,173 acres of land cultivated within the area of which at least 1,855 acres were irrigated by wells. More than one crop per year is often grown on some of the land.

Average Flow in Second-Feet

Daily ⊕:	Max.	5,400	June 15, 1951	Min.	0	Sept. 25, 1949; Oct. 25, 1951
Monthly:	Max.	3,660	June 1949	Min.	25.2	June 1930
Yearly:	Max.	2,060	1950	Min.	653	1941

Mean Daily Discharge in Second-Feet 1953 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	649	357	458	2,530	100	38.0	29.0	1.0	2,420	1,130	708	2,410
2	758	324	457	2,220	137	26.0	80.0	112	2,360	1,620	1,410	2,330
3	767	388	488	2,480	119	30.0	200	291	2,940	2,460	1,360	2,160
4	772	319	296	2,500	170	52.0	304	393	3,000	2,170	1,300	2,620
5	725	419	446	2,390	87.0	23.0	177	383	2,540	2,830	1,300	2,410
6	954	375	319	2,680	163	32.0	74.0	429	1,940	3,310	1,030	1,850
7	935	384	249	3,080	394	54.0	24.0	514	2,720	3,260	971	2,420
8	827	330	172	2,870	324	47.0	35.0	538	3,190	3,100	779	2,500
9	914	333	174	2,290	350	28.0	20.0	176	2,850	2,640	1,140	2,040
10	891	302	180	1,590	158	40.0	38.0	266	2,290	2,520	1,390	1,870
11	992	340	251	1,120	40.0	33.0	46.0	462	2,390	1,880	1,230	1,450
12	816	313	204	739	65.0	46.0	20.0	489	2,350	2,440	1,230	976
13	704	382	270	800	27.0	49.0	68.0	458	2,290	2,630	1,210	616
14	728	377	148	450	77.0	54.0	23.0	362	2,930	2,720	1,300	1,380
15	875	360	120	429	46.0	31.0	38.0	239	3,080	2,230	1,090	1,570
16	776	333	290	225	280	25.0	482	189	3,230	2,070	1,480	1,340
17	834	298	667	481	708	45.0	901	152	3,400	2,070	1,360	1,250
18	882	330	1,130	518	983	22.0	1,050	126	3,420	1,630	1,390	1,280
19	828	271	1,120	517	1,710	11.0	1,080	122	3,300	1,920	1,510	1,280
20	731	264	1,190	413	1,540	16.0	724	125	3,060	2,040	1,360	962
21	634	226	1,140	366	850	3.0	329	127	3,010	1,850	1,390	1,260
22	660	225	1,140	91.0	944	12.0	246	135	3,020	1,820	1,260	1,270
23	587	278	997	124	926	17.0	81.0	162	3,020	2,220	1,970	1,080
24	568	329	832	82.0	1,230	12.0	104	508	2,900	1,870	2,580	817
25	575	286	701	140	575	13.0	44.0	865	2,960	1,460	2,690	546
26	565	434	700	76.0	581	15.0	54.0	1,400	2,530	1,210	2,490	650
27	554	526	635	172	424	17.0	22.0	2,490	1,660	944	2,570	883
28	492	489	450	101	411	18.0	35.0	3,280	1,420	915	2,560	1,300
29	463		970	120	259	21.0	7.0	2,970	1,260	1,270	2,480	1,300
30	468		1,980	64.0	98.0	17.0	3.0	2,290	1,190	1,300	2,610	1,240
31	375		2,560		35.0		2.0	2,420		1,270		1,340
Sum	22,299	9,592	20,734	31,658.0	13,811.0	847.0	6,340.0	22,474.0	78,670	62,799	47,148	46,400

Month	1922-1953 Average Rainfall Inches **		Current Year 1953 ϕ Extreme Second-Feet High Day	High	Low Day	Low	Average Second-Feet	Total Acre-Feet	Period 1922-1953 Acre-Feet Average	Maximum	Minimum
Jan.	1.39	.35	11	992	31	375	719	44,200	46,381	117,000	7,700
Feb.	1.02	.94	27	526	22	225	343	19,000	61,982	134,000	6,960
Mar.	1.16	.81	31	2,560	15	120	669	41,100	83,707	156,000	14,100
Apr.	1.25	.58	7	3,080	30	64.0	1,060	62,800	74,313	125,000	29,300
May	3.33	.81	19	1,710	13	27.0	446	27,400	70,044	135,000	4,510
June	2.64	.14	‡ 7	54.0	21	3.0	28.2	1,680	73,403	218,000	1,500
July	1.80	1.15	19	1,080	31	2.0	205	12,600	75,687	161,000	10,000
Aug.	2.25	7.14	28	3,280	1	1.0	725	44,600	79,645	157,000	19,100
Sept.	4.44	.69	18	3,420	30	1,190	2,620	156,000	62,237	156,000	8,020
Oct.	2.20	4.34	6	3,310	28	915	2,030	125,000	63,650	131,000	21,400
Nov.	1.21	.60	25	2,690	1	708	1,570	93,500	63,622	128,000	11,500
Dec.	1.57	.74	4	2,620	25	546	1,500	92,000	51,238	124,000	10,400
Yearly	24.26	18.29		3,420		1.0	994	719,880	805,909	1,489,800	472,500

‡ And other days ϕ Mean daily ⊕ Period 1938-1953 ** Lower Rio Grande Valley area on United States side from Rio Grande City to the Gulf of Mexico

DIVERSIONS FROM THE RIO GRANDE
ANZALDUAS CANAL NEAR REYNOSA, TAMAULIPAS

DESCRIPTION: Water-stage recorder and cable with stand-up cable car, located .5 mile below the canal intake. The zero of the gage is 86.32 feet above mean sea level, U.S.C. & G.S. datum. This canal diverts water from the Rio Grande at a point 12.2 river miles above the international bridge between Hidalgo, Texas and Reynosa, Tamaulipas, 1,072.6 river miles below the American Dam at El Paso, Texas, and 168.8 river miles upstream from the Gulf of Mexico.

RECORDS: Based on 63 meter measurements during the year, by wading during low flow, by boat during high flow at a point 2.6 miles below this station, until August 23, and subsequently from the cable at the station. Computations by shifting channel methods. Records available: 1952 through December 1953.

REMARKS: Diversions from the Rio Grande into this canal began May 26, 1952. The recorder began operating December 31, 1953. Water surface elevations in the canal were obtained in the following manner. January 1 to August 23 from a staff gage 2.6 miles below this station, with its zero at 85.04 feet above mean sea level, U.S.C. & G.S. datum; August 24 to December 20 from canal staff gage No. 3, about 60 feet downstream from the canal intake, with its zero at 86.84 feet on the same datum; and the rest of the year from the staff gage at the station. Flow at this station is affected by backwater from the operation of canal gates 4.5, 11.3, and 22.5 miles below this station. Part of the water diverted through this canal was returned to the Rio Grande through the Poniente Drain, near Reynosa, and through the Retamal Canal via the Culebrón Lateral (see page 46 in this bulletin). After July 1953, diversion into this canal was facilitated by an earth and rock dam, with crest at elevation 98.13, placed in the Rio Grande just below this canal intake. This diversion is for irrigation and domestic use in Mexico and for conveying water for storage in Culebrón, Villa Cárdenas, and Palito Blanco reservoirs, about 23 canal miles below this station.

Mean Daily Discharge in Second-Feet 1953 —— Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	0	0	0	66.4	0	0	0	0	1,910	1,310	470	2,350
2	0	0	0	95.3	0	0	0	0	2,050	1,860	305	2,380
3	0	0	0	92.5	0	0	0	106	2,410	1,990	463	2,480
4	0	0	0	89.7	0	0	0	237	2,790	2,430	625	2,500
5	0	0	0	351	0	0	0	191	5,470	3,640	558	2,310
6	0	0	0	339	0	0	0	133	4,100	3,020	516	2,070
7	0	0	0	151	0	0	0	54.7	4,240	2,040	512	1,990
8	0	0	0	20.1	0	0	0	0	4,240	1,400	537	1,930
9	0	0	0	0	0	0	0	0	3,670	1,040	523	1,830
10	0	0	0	0	0	0	0	0	2,860	1,090	547	1,820
11	0	0	0	0	0	0	0	33.5	2,340	1,160	512	1,710
12	0	0	0	0	0	0	0	30.4	2,040	1,070	516	1,430
13	0	0	0	0	0	0	0	0	1,870	1,190	498	1,250
14	0	0	0	0	0	0	0	0	1,690	932	466	1,140
15	0	0	0	0	0	0	0	0	1,540	992	438	784
16	0	0	0	0	0	0	5.0	0	1,430	1,340	420	569
17	0	0	0	0	92.9	0	148	0	1,330	1,490	438	427
18	0	0	0	0	88.7	0	7.1	0	1,230	1,660	466	367
19	0	0	0	0	9.3	0	0	0	1,150	1,660	498	367
20	0	0	0	0	0	0	0	0	1,090	1,840	579	752
21	0	0	0	0	0	0	0	0	1,070	1,960	724	653
22	0	0	0	0	0	0	0	41.7	1,030	2,000	872	561
23	0	0	0	0	0	0	0	777	1,010	1,560	957	558
24	0	0	0	0	0	0	0	2,210	1,050	145	893	607
25	0	0	0	0	0	0	0	2,320	1,070	297	1,080	639
26	0	0	0	0	0	0	0	1,650	1,150	199	1,580	674
27	0	0	0	0	0	0	0	1,860	1,330	129	1,740	674
28	0	0	0	0	0	0	0	1,240	1,290	241	1,840	625
29	0		265	0	0	0	0	3,310	1,170	257	2,100	759
30	0		165	0	0	0	0	3,080	1,080	459	2,260	798
31	0		53.0		0		0	2,270		529		749
Sum	0	0	483.0	1,205.0	190.9	0	160.1	19,544.3	60,700	40,930	23,933	37,753

Month	1952-1953		Current Year 1953						Period 1952-1953		
	Average Rainfall Inches **		Extreme Second-Feet				Average Second-Feet	Total Acre-Feet	Acre-Feet		
			High		Low				Average	Maximum	Minimum
			Day		Day						
Jan.	.27	.40	‡ 1	0	‡ 1	0	0	0	0	0	0
Feb.	.56	.61	‡ 1	0	‡ 1	0	0	0	0	0	0
Mar.	.38	.56	29	374	‡ 1	0	15.6	958	479	958	0
Apr.	.57	.40	5	420	‡ 8	0	40.2	2,390	1,195	2,390	0
May	1.68	.67	‡17	135	‡ 1	0	6.2	379	16,650	32,920	379
June	1.99	.37	‡ 1	0	‡ 1	0	0	0	8,430	16,860	0
July	1.94	1.24	17	247	‡ 1	0	5.2	318	29,574	58,830	318
Aug.	2.34	4.59	29	3,510	‡ 1	0	630	38,770	19,668	38,770	566
Sept.	1.86	.45	5	7,560	23	992	2,020	120,400	60,253	120,400	106
Oct.	2.25	4.35	5	4,130	‡14	0	1,320	81,180	40,590	81,180	0
Nov.	1.31	.39	30	2,300	‡ 2	281	798	47,470	23,735	47,470	0
Dec.	.56	.69	4	2,540	19	0	1,220	74,880	37,440	74,880	0
Yearly	15.71	14.72		7,560		0	507	# 366,745	238,014	366,745	109,282

‡ And other days ** Mean rainfall Control (C1-K-9) to Matamoros # During various days of the months of September, October, November and December, a total of 120,950 acre-feet were returned to the Rio Grande through the Reynosa Poniente Drain, located 5.0 miles below Anzaldúas Canal Intake.

DIVERSIONS FROM THE RIO GRANDE

RETAMAL CANAL NEAR RIO BRAVO, TAMAULIPAS

DESCRIPTION: Water-stage recorder and cable with car, located .87 mile below head gate, which is about 1,000 feet from the Rio Grande. This canal has a capacity of about 7,000 second-feet. It diverts from the Rio Grande at a point about 24 river miles below the Hidalgo-Reynosa Bridge near Hidalgo, Texas and 1,108.8 river miles below the American Dam at El Paso, Texas. The zero of the gage is .85 foot above mean sea level, U.S.C. & G.S. datum.

RECORDS: Based on 60 meter measurements during the year. Computations by shifting channel methods. Records available: September 1939 through December 1953.

REMARKS: Retamal Canal empties into Culebrón Reservoir, which in turn discharges into Villa Cárdenas Reservoir, from which a canal leads to Palito Blanco Reservoir. These reservoirs are used for irrigation purposes. During Rio Grande floods, floodwater may escape from Villa Cárdenas via Floodway No. 1 to the Gulf of Mexico. In 1953, 1,436 acre-feet of such floodwater escaped to the Gulf of Mexico as a mean daily flow of 636 and 88.2 second-feet on September 27 and October 11, respectively. The Culebrón Lateral of the Anzaldúas Canal was connected to the Retamal Canal 600 feet below its intake gate, and spilled water into it as follows: September 8, 216 mean daily second-feet; October 6 through 14, 21, and 22, 230, 706, 777, 777, 738, 961, 848, 622, 417, 1.8, and 200 mean daily second-feet, respectively. This water is not included in the tabulation below. In addition to this, there were on September 30 and October 14, 260 and 686 mean daily second-feet, respectively, of such Culebrón Lateral water which returned to the Rio Grande via the Retamal Canal (see page 46 herein). This water is not included in the tabulation below. In the Lower Rio Grande Irrigation District, 39,740 acres of land were irrigated mostly with water from this canal and these reservoirs.

EXTREME FLOWS FROM RECORDS: Momentary: Max. 6,990 second-feet on September 12, 1944, with a gage height of 76.31 feet. Min. frequently no flow.

Average Flow in Second-Feet

Daily:	Max.	6,920	Sept. 12, 1944	Min.	0	Frequently
Monthly:	Max.	3,280	Sept. 1944	Min.	0	Frequently
Yearly:	Max.	769	1949	Min.	92.6	1952

Mean Daily Discharge in Second-Feet 1953 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	0	0	0	182	0	0	0	0	3,570	0	0	0
2	0	0	0	185	0	0	0	0	3,100	0	0	0
3	0	0	0	209	0	0	0	0	3,110	154	0	0
4	0	0	0	168	0	0	0	0	3,030	350	0	0
5	0	0	0	232	0	0	0	0	3,340	1,330	0	0
6	0	0	0	385	0	0	0	0	4,450	3,100	0	0
7	0	0	0	301	0	0	0	0	5,190	3,460	0	0
8	0	0	0	175	0	0	0	0	4,270	2,290	0	0
9	0	0	0	66.7	0	0	0	0	3,210	1,440	0	0
10	0	0	0	19.8	0	0	0	0	2,380	1,030	0	0
11	0	0	0	7.1	0	0	0	0	1,720	442	0	0
12	0	0	0	1.4	0	0	0	0	1,310	350	0	0
13	0	0	0	0	0	0	0	0	1,070	272	0	0
14	0	0	0	0	0	0	0	0	848	244	0	0
15	0	0	0	0	0	0	0	0	646	224	0	0
16	0	0	0	0	0	0	0	0	484	47.7	0	0
17	0	0	15.5	0	7.4	0	0	0	360	0	0	0
18	0	0	68.2	0	208	0	0	0	242	0	0	0
19	0	0	68.2	0	189	0	0	0	154	0	0	0
20	0	0	36.7	0	46.6	0	0	0	115	0	0	0
21	0	0	12.7	0	13.4	0	0	0	84.0	0	0	0
22	0	0	9.9	0	3.9	0	0	0	42.4	0	0	0
23	0	0	11.3	0	11.3	0	0	0	0	693	0	0
24	0	0	8.5	0	37.8	0	0	0	0	3,060	0	0
25	0	0	3.5	0	14.5	0	0	1.4	0	2,660	0	0
26	0	0	1.1	0	9.2	0	0	735	0	1,970	0	0
27	0	0	0	0	1.8	0	0	2,270	0	0	0	0
28	0	0	0	0	0	0	0	3,510	0	0	0	0
29	0		21.2	0	0	0	0	4,450	0	0	0	0
30	0		330	0	0	0	0	4,800	0	0	0	0
31	0		262		0		0	4,310		0		0
Sum	0	0	848.8	1,932.0	542.9	0	0	20,076.4	42,725.4	23,116.7	0	0

Month	1940-1953 Average Rainfall Inches **		Current Year 1953 Extreme Second-Feet High Day	High	Day	Low	Average Second-Feet	Total Acre-Feet	Period Sept. 1939-1953 Acre-Feet Average	Maximum	Minimum
Jan.	1.33	.29	‡ 1	0	‡ 1	0	0	0	11,535	25,790	0
Feb.	.94	.46	‡ 1	0	‡ 1	0	0	0	9,239	38,200	0
Mar.	1.19	.34	30	374	‡ 1	0	27.4	1,680	10,040	54,110	0
Apr.	1.17	.48	6	403	‡13	0	64.4	3,830	13,208	98,580	0
May	3.28	.16	18	310	‡ 1	0	17.5	1,080	25,864	82,980	1,080
June	2.59	.05	‡ 1	0	‡ 1	0	0	0	28,555	82,400	0
July	1.28	1.28	‡ 1	0	‡ 1	0	0	0	24,259	110,700	0
Aug.	2.87	4.91	30	4,870	‡ 1	0	648	39,820	29,434	96,180	138
Sept.	3.69	.40	7	5,260	‡23	0	1,420	84,750	60,415	195,100	0
Oct.	2.57	3.49		u 3,900	‡ 1	0	746	45,850	50,751	124,600	0
Nov.	.94	.34	‡ 1	0	‡ 1	0	0	0	13,484	32,300	0
Dec.	1.19	.58	‡ 1	0	‡ 1	0	0	0	10,353	21,080	0
Yearly	23.04	12.78		5,260		0	244	177,010	287,137	556,590	67,230

u Estimated ‡ And other days ** Mean rainfall Reynosa to Matamoros

MUNICIPAL WATER USES

In Acre-Feet

Tabulated below are yearly and monthly amounts of water pumped from the Rio Grande or tributaries into the municipal distribution systems of several cities along the border. The basic data are furnished by the municipalities. During 1953, the city of El Paso pumped water from wells near Canutillo, Texas into the Rio Grande. This water, minus transportation losses from Canutillo to El Paso, estimated by the Bureau of Reclamation, amounted to 5,826.2 acre-feet and is included in the figures below. The Del Rio water came from San Felipe Springs. The Guerrero water came from the Río Salado through September, and from Falcón Reservoir after the population was moved to Nuevo Cd. Guerrero in October. All other diversions are from the Rio Grande. Because of changing conditions, the period records are limited here to the past ten years.

The population figures for Mexico are from 1950 census, except for Nuevo Laredo, which is an estimate made by the city for 1953. Population figures for United States cities are estimates made by the Chamber of Commerce in each city, except for El Paso where the estimate was made by the El Paso Herald-Post newspaper, and Falcón Village which was estimated by the International Boundary and Water Commission.

In the United States

Month	El Paso (Pop. 165,000)				Del Rio (Pop. 17,500)				Eagle Pass (Pop. 9,600)			
	1953	Period 1944-1953			1953	Period 1944-1953			1953	Period 1944-1953		
		Average	Maximum	Minimum		Average	Maximum	Minimum		Average	Maximum	Minimum
Jan.	764.9	288.8	963.2	0	198.9	137.1	198.9	87.5	89.3	64.7	89.3	44.9
Feb.	823.4	376.4	843.0	0	191.3	139.0	198.0	90.0	90.6	63.2	90.6	51.1
Mar.	1,016.2	453.3	1,016.2	63.4	247.5	183.3	247.5	129.1	101.0	80.4	101.0	64.6
Apr.	1,016.5	520.2	1,016.5	28.5	348.8	207.0	348.8	135.0	117.8	82.6	117.8	64.5
May	1,103.7	615.0	1,103.7	43.0	422.9	244.6	422.9	154.2	148.4	85.6	148.4	55.0
June	1,064.8	792.4	1,093.6	519.9	531.6	293.3	531.6	196.2	173.4	100.6	173.4	40.0
July	1,065.1	821.2	1,065.1	538.1	606.5	322.6	606.5	218.7	196.5	120.6	196.5	95.6
Aug.	1,139.0	827.4	1,139.0	514.4	479.1	309.0	479.1	180.3	145.3	110.2	178.4	75.4
Sept.	1,158.0	752.5	1,158.0	207.7	300.8	240.1	347.6	157.2	99.0	92.5	146.3	65.2
Oct.	809.7	630.0	917.9	193.4	272.1	176.7	272.1	84.8	92.6	74.7	107.7	48.4
Nov.	842.7	479.0	842.7	0	227.2	158.5	227.2	85.4	76.7	64.0	79.1	47.8
Dec.	580.6	520.0	952.8	0	211.6	142.5	211.6	78.5	77.3	66.2	81.9	55.6
Yearly	11,384.6	7,076.2	11,384.6	4,049.5	4,038.3	2,553.7	4,038.3	1,807.4	1,407.9	1,005.3	1,407.9	771.5

Month	Laredo (Pop. 56,910)				Falcón Village (Pop. 123)					
	1953	Period 1944-1953			1951	Period May 1951-1953				
		Average	Maximum	Minimum		1952	1953	Average	Maximum	Minimum
Jan.	446.3	365.8	446.3	310.5		2.5	3.6	3.0	3.6	2.5
Feb.	393.7	353.1	411.3	297.4		2.7	3.1	2.9	3.1	2.7
Mar.	522.3	459.4	522.3	391.0		3.5	3.7	3.6	3.7	3.5
Apr.	643.4	505.9	643.4	386.0		4.3	4.9	4.6	4.9	4.3
May	699.8	548.6	699.8	384.8	3.1	4.5	3.4	3.7	4.5	3.1
June	578.8	570.8	660.7	413.8	2.9	4.5	6.3	4.6	6.3	2.9
July	818.6	669.7	818.6	601.4	6.8	7.3	6.5	6.9	7.3	6.5
Aug.	710.1	658.8	818.4	474.1	5.8	9.2	7.4	7.5	9.2	5.8
Sept.	580.2	534.0	668.6	389.0	4.7	8.2	2.8	5.2	8.2	2.8
Oct.	509.0	483.8	590.7	404.8	4.1	6.8	4.0	5.0	6.8	4.0
Nov.	464.7	402.6	464.7	350.5	2.5	3.4	3.3	3.1	3.4	2.5
Dec.	415.7	366.8	415.7	292.4	2.7	2.6	2.9	2.7	2.9	2.6
Yearly	6,782.6	5,919.3	6,782.6	5,237.9		59.5	51.9	52.8	59.5	51.9

Month	Roma * (Pop. 4,100)				Rio Grande City (Pop. 3,500)				Brownsville (Pop. 40,000)			
	1953	Period 1944-1953			1953	Period 1944-1953			1953	Period 1944-1953		
		Average	Maximum	Minimum		Average	Maximum	Minimum		Average	Maximum	Minimum
Jan.	14.9	8.2	14.9	3.4	54.2	30.7	54.2	14.7	590.8	365.2	590.8	130.4
Feb.	13.1	8.3	14.2	4.0	56.5	31.1	56.5	14.8	491.7	340.0	520.4	147.2
Mar.	17.3	10.7	17.3	5.2	49.9	35.2	55.9	20.0	619.0	376.8	619.0	173.4
Apr.	19.8	11.3	19.8	6.8	57.4	37.7	57.4	18.8	617.1	391.8	617.1	185.4
May	20.5	12.6	20.5	5.9	76.0	42.8	76.0	21.1	481.8	407.5	699.7	189.0
June	19.8	13.0	19.8	6.2	57.4	40.2	64.1	19.4	108.7	402.1	711.7	108.7
July	21.4	13.9	21.4	7.4	56.2	48.2	79.0	17.1	0	463.8	830.5	0
Aug.	19.0	13.4	20.4	6.8	63.2	48.3	70.4	18.5	65.4	443.2	763.4	65.4
Sept.	17.1	11.9	18.8	5.3	47.1	43.1	69.6	17.1	535.8	435.3	645.8	163.8
Oct.	14.4	10.8	17.5	6.1	44.7	40.3	62.1	19.0	489.0	404.3	569.2	154.8
Nov.	12.7	9.3	13.8	4.7	34.3	35.0	51.7	15.9	428.0	367.9	491.0	132.5
Dec.	12.0	8.8	13.0	4.0	37.7	34.6	67.9	13.9	434.0	370.2	514.5	121.2
Yearly	202.0	132.2	202.0	65.8	634.6	467.2	687.4	218.0	4,861.3	4,768.1	7,180.8	2,038.3

In Mexico

Month	Nuevo Laredo (Pop. 67,000)				Cd. Guerrero (Pop. 1,995)				Matamoros (Pop. 42,897)			
	1953	Period 1944-1953			1953	Period 1944-1953			1953	Period 1944-1953		
		Average	Maximum	Minimum		Average	Maximum	Minimum		Average	Maximum	Minimum
Jan.	398.6	246.5	398.6	125.0	4.5	4.9	5.5	4.3	261.2	121.8	261.2	72.1
Feb.	357.7	238.6	357.7	130.0	5.0	4.7	5.2	4.3	230.6	107.0	230.6	64.0
Mar.	432.9	296.9	432.9	154.0	5.1	5.4	6.0	5.0	262.2	126.8	262.2	80.9
Apr.	468.5	312.1	468.5	176.0	5.5	5.9	7.3	5.3	303.0	122.1	303.0	79.4
May	463.2	340.2	469.0	194.3	5.8	6.8	7.8	5.8	298.1	125.9	298.1	80.8
June	397.7	342.9	471.3	224.1	6.5	7.4	8.5	6.3	136.0	120.0	239.2	84.3
July	450.6	380.7	487.2	265.9	6.9	8.4	10.1	6.9	135.5	123.7	251.9	90.5
Aug.	451.5	388.1	540.9	290.3	7.9	9.7	11.3	7.9	158.1	125.0	249.6	82.2
Sept.	426.9	340.6	470.2	251.0	8.9	8.8	9.2	8.5	281.8	134.1	281.8	82.9
Oct.	432.8	329.4	464.1	215.4					306.6	142.4	306.6	78.5
Nov.	405.4	288.9	405.4	179.7	19.0				234.9	126.1	234.9	77.2
Dec.	390.4	274.0	390.4	146.7	20.8				226.4	125.5	237.5	74.8
Yearly	5,076.2	3,778.9	5,154.9	2,452.7					2,834.4	1,500.4	2,834.4	996.8

* Includes Los Sáenz, Escobares and Cd. Miguel Alemán, Mexico

SUSPENDED SILT IN THE RIO GRANDE AND SOME TRIBUTARIES

At each station, during each month of sampling, several water samples were taken by one or more of the three following methods:

A. By lowering an open small-necked bottle in one or more verticals in the stream cross section, being careful to approach but not to strike bottom, thus securing an integrated sample at all depths. A monthly composite sample was later made by using, from each sample, a quantity proportional to the river flow volume represented by each sample. The gravimetric percentage of silt in this composite represented that in the monthly river flow.

B. By obtaining one depth integrated sample with a U.S.-D43 sampler at each of three verticals, spaced at 1|6, 1|2, and 5|6 of the stream width. The gravimetric percentage of silt, for each measurement, was computed by weighting the percentage of silt represented by each of three samples by the partial flow in its section of the stream. These measurements were plotted on the station gage-height hydrograph, from which a silt concentration graph was then drawn between plotted points. From this graph, mean daily silt concentrations were then determined.

C. By sampling at the stream surface with a separate bottle at each of three points, spaced 1|6, 1|2, and 5|6 of the stream width. A coefficient of 1.10 was applied to the average gravimetric percentage of silt in the three bottles and this product was applied to the volume of streamflow represented by that set of samples.

For ease of comparison, the assumption is made that one cubic foot of silt weighs 66.7 pounds, or one acre-foot of silt weighs 1,452 tons.

At Lower Presidio, Johnson Ranch, and Agua Verde stations, three independent sets of samples were taken: two by method A and one by method B. The results by method A show much greater consistency among themselves than exists between them and method B.

Month	1953							Period of Record		
	Tons		Number of Samples	Gravimetric Percentages			Acre-Feet at 1,452 Tons Per Acre Foot			
	Water	Silt		Average	Maximum Sample	Minimum Sample		Average	Maximum	Minimum

Rio Grande at El Paso, Texas — Period September 1947-1953

Jan.	5,871,000	291	31	.004959			.20	.42	1.4	.04
Feb.	3,903,000	234	28	.005992			.16	.64	2.2	.08
Mar.	47,496,000	23,400	30	.04936			16.1	15.5	33.7	3.1
Apr.	44,843,000	65,600	30	.1462			45.2	24.3	45.2	3.9
May	33,521,000	7,340	31	.02190			5.1	18.5	63.3	1.9
June	47,864,000	15,000	30	.03134			10.3	45.1	152	10.3
July	57,626,000	52,600	31	.09136			36.2	50.6	124	18.8
Aug.	63,594,000	48,100	31	.07556			33.1	35.5	56.8	11.9
Sept.	36,486,000	11,900	30	.03248			8.2	24.0	92.3	1.7
Oct.	7,510,000	414	31	.005517			.29	2.6	11.8	.19
Nov.	5,824,000	74.5	30	.001279			.05	.61	1.5	.05
Dec.	5,013,000	54.8	31	.001093			.04	.55	2.1	.04
Yearly	359,551,000	225,008.3	364	.06258			154.94	218.32	436.87	76.94

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

Río Conchos at Cuchillo Parado, Chihuahua — Period 1945-1953

Jan.	19,099,000	0	14	0	0	0	0	0	0	0
Feb.	15,231,000	0	12	0	0	0	0	.57	4.0	0
Mar.	12,619,000	0	13	0	0	0	0	.33	3.0	0
Apr.	608,000	0	13	0	0	0	0	0	0	0
May	4,827,000	2,820	14	.0584	.1509	0	1.9	5.9	28.2	0
June	7,882,000	3,820	13	.0485	.2749	0	2.6	95.8	676	0
July	21,644,000	141,000	16	.6501	3.0454	0	97.1	517	1,820	0
Aug.	14,345,000	8,080	13	.0563	.4140	0	5.6	225	948	.79
Sept.	35,952,000	184,000	13	.5123	2.7409	0	127	351	1,190	.32
Oct.	11,117,000	0	13	0	0	0	0	201	997	0
Nov.	15,360,000	0	13	0	0	0	0	.42	3.6	0
Dec.	14,551,000	0	13	0	0	0	0	.09	.83	0
Yearly	173,235,000	339,720	160	.1960	3.0454	0	234.2	1,397.11	2,590.4	119.9

Samples and Analyses by Mexican Section, Method C

Rio Grande at Lower Presidio Station — Period October 1949-1953

Jan.	19,436,000	1,690	12	.0087	.0131	.0052	1.2	4.2	10.3	.98
Feb.	15,349,000	1,300	10	.0085	.0125	.0062	.90	5.9	13.0	.15
Mar.	11,102,000	1,600	13	.0144	.0286	.0027	1.1	5.6	14.6	.28
Apr.	631,000	102	12	.0161	.0227	.0083	.07	1.5	2.5	.07
May	2,398,000	3,670	12	.1530	.2999	.0103	2.5	5.1	15.1	.98
June	6,174,000	1,960	13	.0318	1.2024	.0085	1.3	159	510	1.3
July	23,864,000	163,000	11	.6810	1.8240	.0009	112	816	1,810	112
Aug.	13,874,000	88,700	13	.6390	2.6637	.0111	61.1	164	506	3.3
Sept.	32,494,000	8,550	13	.0257	.3974	.0064	5.8	403	1,440	5.8
Oct.	8,221,000	1,480	13	.0180	.0557	.0070	1.0	123	509	1.0
Nov.	12,931,000	1,650	13	.0126	.0246	.0068	1.1	5.4	13.1	.45
Dec.	15,505,000	770	12	.0057	.0071	.0039	.53	3.0	7.6	.53
Yearly	159,979,000	274,252	147	.1711	2.6637	.0009	188.60	1,695.7	3,780.9	188.60

Samples and Analyses by U. S. Section, Method B. (Compare with Method A, Page 69)

SUSPENDED SILT IN THE RIO GRANDE AND SOME TRIBUTARIES

Month	1953							Period of Record		
	Tons		Number of Samples	Gravimetric Percentages			Acre-Feet at 1,452 Tons Per Acre Foot			
	Water	Silt		Average	Maximum Sample	Minimum Sample		Average	Maximum	Minimum
Rio Grande at Johnson Ranch, Texas										Period 1951-1953
Jan.	18,627,000	2,940	12	.0158	.0302	.0099	2.0	3.1	5.8	1.4
Feb.	15,179,000	1,620	11	.0107	.0156	.0023	1.1	5.8	15.6	.84
Mar.	12,739,000	8,710	14	.0684	.4281	.0040	6.0	9.1	20.3	1.0
Apr.	621,000	173	10	.0279	.0371	.0063	.12	37.3	110	.12
May	0	0	0				0	106	236	0
June	4,450,000	30,100	12	.6762	2.1827	.0040	20.7	554	1,330	20.7
July	34,592,000	583,000	16	1.6849	5.8143	.0081	402	2,012	4,920	402
Aug.	16,671,000	141,000	14	.8429	4.8341	.0116	97.1	134	302	3.4
Sept.	29,803,000	330,000	15	1.1084	3.4645	.0065	227	233	413	58.3
Oct.	6,713,000	13,700	9	.2047	.5288	.0044	9.4	19.4	47.5	1.4
Nov.	11,693,000	2,140	13	.0183	.0257	.0107	1.5	2.2	4.7	.41
Dec.	12,920,000	1,210	13	.0094	.0186	.0063	.83	9.3	25.3	.83
Yearly	164,008,000	1,114,593	139	.6794	5.8143	.0023	767.75	3,125.2	6,688.05	767.75

Samples and Analyses by U. S. Section, Method B. (Compare with Method A, Page 69)

Rio Grande at Agua Verde Station										Period January-December 1953
Jan.	32,658,000	2,380	4	.0073	.0119	.0004	1.6			
Feb.	27,000,000	297	4	.0011	.0012	.0004	.20			
Mar.	31,165,000	21,700	6	.0696	.0618	.0001	14.9			
Apr.	16,217,000	1,850	4	.0114	.0217	.0073	1.3			
May	15,171,000	1,620	4	.0107	.0060	.0014	1.1			
June	15,524,000	2,580	6	.0166	.0217	.0076	1.8			
July	46,236,000	427,000	6	.9242	1.4636	.0109	294			
Aug.	33,629,000	92,800	4	.2761	1.0171	.0144	63.9			
Sept.	44,064,000	502,000	5	1.1402	2.0013	.0144	346			
Oct.	23,970,000	71,800	4	.2996	.5599	.0113	49.4			
Nov.	23,787,000	7,750	4	.0326	.0360	.0114	5.3			
Dec.	25,997,000	2,110	4	.0081	.0106	.0028	1.5			
Yearly	335,418,000	1,133,887	55	.3383	2.0013	.0001	781.0			

Samples and Analyses by U. S. Section, Method B. (Compare with Method A, Page 69)

Rio Grande at Langtry, Texas										Period April 1944-1953
Jan.	40,783,000	1,370	6	.003349			.94	6.1	11.4	.94
Feb.	34,343,000	1,530	7	.004455			1.1	8.2	36.9	1.1
Mar.	39,672,000	4,960	8	.01249			3.4	8.6	27.0	2.6
Apr.	24,140,000	2,000	6	.008296			1.4	17.6	66.4	1.1
May	21,986,000	1,380	10	.006295			.95	125	448	.95
June	21,530,000	1,320	8	.006154			.91	412	1,220	.91
July	52,164,000	518,000	10	.9929			357	1,657	5,780	60.9
Aug.	42,252,000	99,800	8	.2361			68.7	800	3,130	4.7
Sept.	70,244,000	284,000	6	.4049			196	1,358	3,280	1.0
Oct.	31,488,000	12,100	7	.03851			8.3	786	3,261	5.1
Nov.	30,717,000	7,580	8	.02468			5.2	28.8	88.2	1.3
Dec.	33,674,000	1,800	10	.005339			1.2	9.9	46.8	.18
Yearly	442,993,000	935,840	94	.2113			645.10	5,217.2	8,747.7	645.10

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

Pecos River near Comstock, Texas										Period June 1943-1953
Jan.	13,632,000	1,070	15	.007878			.74	.48	.96	.15
Feb.	12,678,000	1,070	14	.008443			.74	.73	2.1	.13
Mar.	13,419,000	1,480	15	.01103			1.0	.69	1.4	.29
Apr.	10,114,000	1,130	11	.01120			.78	4.7	41.7	.19
May	8,529,000	577	16	.006761			.40	5.3	21.7	.40
June	6,532,000	231	15	.003529			.16	3.5	15.7	.16
July	11,898,000	1,770	16	.01488			1.2	17.3	67.1	.19
Aug.	22,582,000	9,990	15	.04425			6.9	3.0	20.0	.03
Sept.	16,190,000	19.7	15	.0001215			.01	2.3	9.4	.01
Oct.	18,460,000	790	14	.004280			.54	24.2	176	.22
Nov.	12,230,000	1,680	14	.01377			1.2	.50	1.2	.05
Dec.	12,640,000	121	16	.0009562			.08	.51	1.3	.01
Yearly	158,904,000	19,928.7	176	.01255			13.75	63.21	199.36	5.81

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

SUSPENDED SILT IN THE RIO GRANDE AND SOME TRIBUTARIES

Month	1953							Period of Record		
	Tons		Number of Samples	Gravimetric Percentages			Acre-Feet at 1,452 Tons Per Acre Foot			
	Water	Silt		Average	Maximum Sample	Minimum Sample		Average	Maximum	Minimum

Rio Grande at Eagle Pass, Texas

Period 1934-1953

Jan.	58,014,000	4,730	27	.008159			3.3	20.7	124	.07
Feb.	45,279,000	5,560	24	.01229			3.8	52.0	768	2.6
Mar.	66,473,000	12,800	25	.01932			8.8	25.8	188	3.8
Apr.	20,073,000	5,000	24	.02490			3.4	66.2	466	3.0
May	11,453,000	2,790	25	.02436			1.9	505	4,220	1.9
June	6,155,000	860	25	.01397			.59	944	4,340	.59
July	39,792,000	43,100	26	.1082			29.7	1,324	7,840	12.0
Aug.	125,012,000	172,000	26	.1376			118	1,014	5,310	14.8
Sept.	390,289,000	810,000	25	.2075			558	2,461	10,800	7.0
Oct.	80,692,000	23,500	26	.02914			16.2	971	5,820	3.7
Nov.	55,442,000	6,460	25	.01165			4.4	107	562	4.4
Dec.	63,632,000		0					22.2	84.1	1.1
Yearly	962,306,000		278					7,512.9	20,842.8	1,633.2

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

Rio Grande at Laredo, Texas

Period January-December 1953

Jan.	74,474,000	6,530	7	.008764			4.5			
Feb.	55,784,000	3,180	9	.005696			2.2			
Mar.	92,753,000	38,900	13	.04190			26.8			
Apr.	38,457,000	5,330	12	.01385			3.7			
May	45,333,000	105,000	13	.2306			72.3			
June	458,000		0							
July	23,743,000		0							
Aug.	254,599,000	82,900	2	.03258			57.1			
Sept.	554,173,000	60,000	3	.01083			41.3			
Oct.	104,447,000	43,100	6	.04129			29.7			
Nov.	67,063,000	8,860	8	.01321			6.1			
Dec.	71,165,000	5,660	5	.00795			3.9			
Yearly	1,382,447,000		78							

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

Río Alamo at Cd. Mier, Tamaulipas

Period 1934-1953

Jan.	0	0	0	0	0	0	0	2.4	21.8	0
Feb.	0	0	0	0	0	0	0	.36	6.6	0
Mar.	1,552,000		0					8.6	91.6	0
Apr.	3,765,000	8,170	1	.2170	.222	0	5.6	25.2	227	0
May	0	0	0	0	0	0	0	45.4	230	0
June	0	0	0	0	0	0	0	69.2	471	0
July	3,377,000	6,630	1	.1962	.204	0	4.6	18.3	92.8	0
Aug.	279,617,000	1,613,000	4	.5769	.671	0	1,110	208	1,610	0
Sept.	113,447,000	266,000	3	.2348	.254	.031	183	260	2,920	1.5
Oct.	115,012,000	270,000	3	.2349	.534	0	186	87.3	558	0
Nov.	7,871,000	" 7,870	0	" .1			" 5.4	1.0	" 5.4	0
Dec.	2,467,000		0					1.2	16.1	0
Yearly	527,108,000		12		.671	0		726.96	3,156.57	126.7

Samples and Analyses by Mexican Section, Method C

Rio Grande at Roma, Texas

Period March 1929-1953

Jan.	68,187,000	2,570	31	.003776			1.8	34.0	169	.41
Feb.	45,845,000	2,890	28	.006295			2.0	63.0	1,010	.83
Mar.	94,807,000	67,200	31	.07092			46.3	115	1,830	1.3
Apr.	73,084,000	19,800	30	.02710			13.6	319	2,780	.76
May	65,702,000	7,870	31	.01198			5.4	1,149	5,230	5.4
June	148,000	21.6	4	.01457			.01	1,201	7,220	.01
July	16,994,000	39,800	31	.2344			27.4	1,329	9,070	4.7
Aug.	397,890,000	764,000	22	.1920			526	1,276	3,720	9.3
Sept.	355,210,000	586,000	30	.1650			404	3,269	18,000	13.4
Oct.	256,823,000	466,000	31	.1814			321	1,831	9,240	.52
Nov.	103,989,000	9,010	30	.008669			6.2	132	660	1.3
Dec.	105,121,000	5,870	31	.005587			4.0	47.0	319	1.0
Yearly	1,583,800,000	1,971,031.6	330	.1245			1,357.71	10,765.0	30,839	1,357.71

Samples by Mexican Section and Analyses by U. S. Section, Method A # Some months missing " Estimated

SUSPENDED SILT IN THE RIO GRANDE AND SOME TRIBUTARIES

Month	1953							Period of Record		
	Tons			Number of Samples	Gravimetric Percentages		Acre-Feet at 1.452 Tons Per Acre Foot			
	Water	Silt			Samples Set No. 1	Samples Set No. 2	Average of Sets #1 & #2	Average	Maximum	Minimum
		Samples Set No. 1	Samples Set No. 2							

Rio Grande at Lower Presidio Station

Period October 1951-1953

Jan.	19,436,000	428		12	.0022		.29	.23	.29	.17
Feb.	15,349,000	614	952	20	.0040	.0062	.54	.34	.54	.15
Mar.	11,102,000	1,840	1,670	26	.0166	.0150	1.2	.74	1.2	.28
Apr.	631,000	132	127	26	.0209	.0201	.09	3.1	6.1	.09
May	2,398,000	4,470	3,980	26	.1866	.1661	2.9	1.9	2.9	.87
June	6,174,000	40,400	43,300	24	.6547	.7011	28.8	222	415	28.8
July	23,864,000	212,000	208,000	22	.8894	.8736	145	1,022	1,900	145
Aug.	13,874,000	129,000	147,000	26	.9329	1.0587	95.0	49.8	95.0	4.5
Sept.	32,494,000	48,900	44,800	26	.1504	.1379	32.3	63.4	94.4	32.3
Oct.	8,221,000	1,550	1,610	26	.0188	.0196	1.1	1.8	3.4	1.0
Nov.	12,931,000	1,840	1,340	26	.0142	.0104	1.1	1.2	1.7	.70
Dec.	13,505,000	986	810	24	.0073	.0060	.62	.94	1.3	.62
Yearly	159,979,000	442,160		284	.2768		308.94	1,367.45	2,424.47	308.94
*Feb.-Dec	140,543,000	441,732	453,589		.3148	.3230				

Samples and Analyses by U. S. Section, Method A. (Compare with Method B, Page 66)

Rio Grande at Johnson Ranch, Texas

Period October 1951-1953

Jan.	18,627,000	1,300		12	.0070		.90	.87	.90	.84
Feb.	15,179,000	1,140	987	22	.0075	.0065	.73	.86	1.0	.73
Mar.	12,739,000	6,960	5,610	28	.0546	.0440	4.3	2.2	4.3	.20
Apr.	621,000	114	110	20	.0183	.0177	.08	85.0	170	.08
May	0	0	0	0			0	150	300	0
June	4,450,000	43,400	48,400	24	.9763	1.0874	31.6	801	1,570	31.6
July	34,592,000	947,000	983,000	32	2.7367	2.8421	665	2,348	4,030	665
Aug.	16,671,000	212,000	222,000	28	1.2701	1.3287	149	75.9	149	2.8
Sept.	29,803,000	453,000	448,000	30	1.5196	1.5042	310	204	310	98.5
Oct.	6,713,000	13,900	14,700	22	.2071	.2186	9.8	24.5	61.2	2.4
Nov.	11,693,000	1,720	1,940	26	.0147	.0166	1.3	1.1	1.6	.28
Dec.	12,920,000	1,670	1,620	26	.0129	.0125	1.1	17.8	48.3	1.1
Yearly	164,008,000	1,682,204		270	1.0253		1,173.81	3,711.23	6,224.32	1,173.81
*Feb.-Dec	145,381,000	1,680,904	1,726,367		1.156	1.187				

Samples and Analyses by U. S. Section, Method A. (Compare with Method B, Page 67)

Rio Grande at Agua Verde Station

Jan.	32,658,000	3,530		4	.0108		2.4			
Feb.	27,000,000	162	270	8	.0006	.0010	.15			
Mar.	31,165,000	9,570	8,700	12	.0307	.0279	6.3			
Apr.	16,217,000	3,680	3,500	8	.0227	.0216	2.5			
May	15,171,000	743	1,000	8	.0049	.0066	.60			
June	15,524,000	1,540	310	12	.0099	.0020	.64			
July	46,236,000	348,000	349,000	12	.7520	.7544	240			
Aug.	33,629,000	156,000	161,000	8	.4653	.4787	109			
Sept.	44,064,000	327,000	335,000	10	.7410	.7599	228			
Oct.	23,970,000	63,300	58,200	8	.2639	.2428	41.8			
Nov.	23,787,000	5,420	5,710	8	.0228	.0240	3.8			
Dec.	25,997,000	2,160	2,440	10	.0083	.0094	1.6			
Yearly	335,418,000	921,105		108	.2745		636.79			
*Feb.-Dec	302,760,000	917,575	925,130		.3030	.3054				

Samples and Analyses by U. S. Section, Method A. (Compare with Method B, Page 67) * Months in which two sets of samples were taken by Method A.

CHEMICAL ANALYSIS OF WATER SAMPLES FROM THE RIO GRANDE AND TRIBUTARIES - 1953

The following chemical analyses are from composites made up periodically from independent water samples composed by taking from each sample an amount of water proportional to the volume of river flow represented by that sample. This compositing and the determination of the electrical conductivity of the individual water samples were done by the United States Section of the International Boundary and Water Commission. The chemical analyses were made by the Rubidoux Laboratory of the U. S. Department of Agriculture at Riverside, California.

To convert "Milligram Equivalents" to parts per million by weight, multiply each ion by its appropriate conversion factor. These factors are (HCO_3 plus CO_3), 30.5; Cl, 35.5; SO_4, 48; Ca, 20; Mg, 12.16; Na, 23; NO_3, 62. To convert tons per acre-foot to parts per million, multiply tons per acre-foot by 735.5.

Electrical conductivity, reported in the following tables as $EC \times 10^6$ at 25°C, is a relative measure of the total salt concentration in the water samples.

Month	No. of Samples	Dissolved Solids: Tons Per Acre Foot	Dissolved Solids: Total Tons	Mean $EC \times 10^6$ @25°C	Boron p.p.m.	pH	% Na **	% Cl ***	Mean Milligram Equivalents per Liter: Ca	Mg	Na	CO_3 + HCO_3	SO_4	Cl	NO_3
Rio Grande at El Paso, Texas															
Sampling by U. S. Section															
Jan.	31	1.91	8,250	2,130	.42	8.1	62	36	5.28	2.45	13.7	4.71	9.21	7.92	.02
Feb.	28	2.09	6,000	2,310	.42	8.0	66	37	5.44	2.57	15.4	4.95	9.92	8.80	.01
Mar.	30	.84	29,300	905	.08	7.8	47	27	3.56	1.25	4.26	3.00	3.57	2.50	.04
Apr.	30	.89	29,400	1,020	.14	8.1	48	27	3.89	1.33	4.78	3.33	4.13	2.75	.02
May	31	.97	24,000	1,120	.21	8.0	46	30	4.52	1.76	5.35	3.55	4.58	3.50	.02
June	30	.91	32,000	1,010	.18	8.0	49	26	3.86	1.34	4.90	3.40	4.10	2.60	.01
July	31	.93	39,400	1,020	.15	7.8	48	26	3.79	1.31	5.00	3.45	4.19	2.70	.02
Aug.	31	.94	44,000	1,060	.20	7.8	50	29	4.02	1.31	5.40	3.45	4.25	3.10	.03
Sept.	30	1.13	30,300	1,270	.23	8.0	53	30	4.39	1.72	6.82	3.57	5.51	3.90	.01
Oct.	31	1.80	9,950	1,990	.33	8.0	63	35	5.35	2.05	12.8	4.95	8.38	7.30	.01
Nov.	30	1.87	8,020	2,100	.34	8.0	65	38	5.35	2.08	14.0	4.65	8.63	8.25	.02
Dec.	31	2.08	7,680	2,290	.34	8.0	66	40	5.61	2.23	15.4	5.00	9.03	9.30	.01
Mean ⊕	ϕ 364	1.01	ϕ 268,300	1,130	.183	7.9	51	29	4.08	1.47	5.86	3.50	4.64	3.36	.022
Period Average		1.10	585,000	1,220			53	30	4.35	1.61	6.62	3.47	5.42	3.76	
Tons of Constituents, 1953									29,400	6,430	48,500	38,400	80,200	42,900	
Average Tons Period 1930-1953									62,900	14,100	110,000	76,400	188,000	96,200	
Rio Grande at Fort Quitman, Texas															
Sampling by U. S. Section															
Jan.	6	6.41	9,230	7,010	.71	8.0	64	65	17.50	8.73	47.4	4.26	21.67	48.60	.01
Feb.	6	9.42	5,330	10,010	.82	7.8	65	70	25.22	13.46	71.2	4.66	28.79	76.9	.01
Mar.	6	10.60	4,260	11,240	1.05	7.7	66	71	27.66	15.08	82.0	4.51	32.02	88.25	T
Apr.	6	11.8	2,670	12,400	1.06	7.8	66	71	29.75	17.32	91.0	4.40	35.56	98.50	T
May	4	13.0	506	13,000	.97	8.0	64	75	34.15	19.76	96.0	2.71	35.35	112.1	T
June	3	14.6	1,430	15,200	.9	8.0	61	78	43.5	24.1	106	2.22	35.6	136	.01
July	9	1.50	22,000	1,790	.23	7.8	57	56	3.24	1.94	10.00	2.55	5.00	9.80	.09
Aug.	5	7.51	17,000	8,170	.54	7.8	59	74	23.68	12.13	50.5	2.77	19.58	64.25	.03
Sept.	5	4.68	1,230	5,390	.43	7.8	59	71	15.42	6.85	32.6	2.65	13.56	39.00	.08
Oct.	4	12.4	640	12,800	.68	7.8	58	78	39.6	20.9	82.5	2.60	29.6	111.5	T
Nov.	4	8.15	1,170	9,060	.69	7.8	62	71	24.55	12.25	61.0	4.00	23.99	70.22	.01
Dec.	5	10.31	1,550	10,600	.68	8.0	60	73	30.82	15.18	70.0	4.00	27.16	84.75	.01
Mean ⊕	ϕ 63	3.29	ϕ 66,816	3,670	.355	7.8	61	66	10.20	4.72	23.05	2.83	10.00	25.38	.007
Period Average		2.37	481,000	2,940			61	55	7.61	3.10	16.70	3.55	8.75	15.22	
Tons of Constituents, 1953									5,650	1,590	14,700	2,390	13,300	24,900	
Average Tons Period 1930-1953									42,100	10,400	106,000	29,900	116,000	149,000	
Rio Grande at Upper Presidio Station															
Sampling by U. S. Section															
Jan.			No Flow												
Feb.			No Flow												
Mar.			No Flow												
Apr.			No Flow												
May			No Flow												
June	3	.98	341	989			40		# 5.95		4.05	2.70		1.20	
July	12	.68	3,350	748	.15	7.7	49	22	# 3.10	.46	3.62	2.60	3.10	1.60	.09
Aug.	10	.66	2,130	729		8.0	45		# 4.05		3.28	2.71		2.00	
Sept.	2	.90	394	967			40		# 5.75		3.90	2.35		2.20	
Oct.	1	.72	114	745			47		# 3.95		3.50	2.20		1.15	
Nov.			No Flow												
Dec.			No Flow												
Mean ⊕	ϕ 28	.697	ϕ 6,329	761			47		# 3.94		3.53	2.62		1.75	
Period Average		1.94	375,000	2,200			59		# 9.01		13.12	3.09		11.28	
Tons of Constituents, 1953											1,003	987		767	
Average Tons Period 1935-1953											79,200	24,700		105,000	

T Trace ϕ Total ⊕ Weighted mean ** Percent of total cations *** Percent of total anions # Sum of calcium and magnesium

CHEMICAL ANALYSIS OF WATER SAMPLES FROM THE RIO GRANDE AND TRIBUTARIES – 1953

Month	No. of Samples	Dissolved Solids: Tons Per Acre Foot	Dissolved Solids: Total Tons	Mean ECx10⁶ @25°C	Boron p.p.m.	pH	% Na **	% Cl ***	Mean Milligram Equivalents per Liter: Ca	Mg	Na	CO_3 + HCO_3	SO_4	Cl	NO_3
Río Conchos at Cuchillo Parado, Chihuahua															
Sampling by Mexican Section															
Jan.	14	1.32	18,500	1,370	.35	8.0	48	19	5.34	1.75	6.90	2.97	8.43	2.75	.06
Feb.	12	1.33	14,900	1,370			50		# 6.95		6.99	2.81		2.60	
Mar.	12	1.27	11,800	1,320			51		# 6.54		6.94	2.55		2.85	
Apr.	12	1.73	775	1,980			62		# 7.49		12.4	2.65		8.30	
May	16	1.61	5,720	1,750			50		# 8.68		8.80	2.83		6.75	
June	11	1.57	9,110	1,620			50		# 8.40		8.30	2.75		3.90	
July	17	1.32	21,000	1,480	.23	7.9	53	37	5.74	.93	7.70	2.60	6.53	5.45	.06
Aug.	16	1.04	11,000	1,080		8.0	43		# 6.36		4.78	2.70		2.30	
Sept.	14	.84	22,200	871			37		# 5.67		3.30	2.75		1.25	
Oct.	13	1.41	11,500	1,440			51		# 7.08		7.50	2.75		2.20	
Nov.	13	1.36	15,400	1,390			51		# 6.87		7.25	2.90		2.70	
Dec.	13	1.42	15,200	1,470			50		# 7.44		7.55	3.07		3.05	
Mean ⊕	ϕ 163	1.23	ϕ 157,105	1,290			49		# 6.74		6.35	2.78		2.90	
Period Average		.778	378,000	808			41		# 4.84		3.32	2.56		1.07	
Tons of Constituents, 1953											25,300	14,700		17,800	
Average Tons Period 1946-1953											50,400	51,700		25,000	
Río Conchos near Ojinaga, Chihuahua															
Sampling by U. S. Section															
Jan.	6	1.34	19,200	1,400	.34	8.1	48	21	5.56	1.79	7.05	3.25	8.27	3.00	.04
Feb.	5	1.33	15,000	1,380			52		# 6.62		7.30	2.62		3.10	
Mar.	6	1.32	11,300	1,370			50		# 6.88		7.02	2.57		3.05	
Apr.	6	1.39	1,190	1,440			45		# 7.99		6.55	2.65		3.30	
May	7	1.64	3,670	1,760			46		# 9.51		8.05	2.40		5.75	
June	9	1.32	6,380	1,390			46		# 7.56		6.55	2.33		3.50	
July	12	1.23	16,400	1,180	.18	8.0	30	12	7.59	1.11	3.88	1.77	9.34	1.60	.10
Aug.	9	1.09	8,350	1,130		7.9	36		# 7.40		4.22	2.35		1.95	
Sept.	8	.95	22,300	976			37		# 6.38		3.80	3.00		1.70	
Oct.	6	1.45	8,540	1,510			51		# 7.39		7.80	2.85		4.05	
Nov.	6	1.39	13,200	1,460			52		# 7.06		7.70	2.85		3.40	
Dec.	6	1.43	14,200	1,480			51		# 7.36		7.70	2.95		3.50	
Mean ⊕	ϕ 86	1.25	ϕ 139,730	1,290			45		# 7.24		5.97	2.70		2.72	
Period Average		.618	528,000	661			38		# 4.18		2.60	2.56		.945	
Tons of Constituents, 1953											20,900	12,500		14,700	
Average Tons Period 1935-1953											69,500	90,600		38,900	
Rio Grande at Johnson Ranch, Texas															
Sampling by U. S. Section															
Jan.	5	1.41	19,300	1,470	.32	8.0	50	23	5.60	1.73	7.60	2.87	8.84	3.50	.05
Feb.	4	1.43	16,000	1,490			52		# 7.12		7.80	2.70		3.60	
Mar.	7	1.35	12,600	1,410			51		# 6.98		7.18	2.65		3.35	
Apr.	4	1.48	676	1,580			51		# 7.69		8.10	2.60		3.75	
May			No Flow												
June	6	1.34	4,380	1,380			47		# 7.51		6.60	2.30		2.55	
July	11	.91	23,200	923	.18	8.0	39	12	4.96	.80	3.78	2.45	6.00	1.20	.12
Aug.	7	.89	10,900	933		7.8	40		# 5.77		3.80	2.31		1.35	
Sept.	8	1.00	21,900	982			37		# 6.60		3.80	2.50		1.10	
Oct.	4	1.40	6,920	1,430			48		# 7.59		7.10	2.40		3.15	
Nov.	5	1.48	12,700	1,540			53		# 7.46		8.25	2.95		3.70	
Dec.	11	1.49	14,200	1,540			50		# 7.76		7.85	3.10		3.70	
Mean ⊕	ϕ 72	1.18	ϕ 142,776	1,220			46		# 6.72		5.72	2.61		2.35	
Period Average		.943	511,000	1,000			45		# 5.51		4.58	2.63		2.11	
Tons of Constituents, 1953											21,600	13,100		13,700	
Average Tons Period 1948-1953											77,600	59,200		55,200	
Rio Grande at Langtry, Texas															
Sampling by U. S. Section															
Jan.	6	.91	27,300	983	.18	8.1	45	21	3.72	1.64	4.62	3.21	4.71	2.10	.05
Feb.	7	.92	23,300	989	.24	7.9	42	21	3.91	2.02	4.30	3.05	5.02	2.10	.05
Mar.	8	.94	27,400	1,010	.21	8.0	43	21	4.01	1.90	4.45	2.91	5.25	2.20	.05
Apr.	6	.70	12,500	801	.17	8.0	38	20	3.11	1.85	3.05	3.00	3.44	1.60	.05
May	10	.60	9,720	697	.18	8.0	36	21	2.80	1.85	2.56	2.70	3.05	1.50	.05
June	8	.71	11,200	787	.20	8.0	38	20	3.01	1.95	3.10	2.83	3.62	1.60	.04
July	10	.74	28,400	779	.17	7.9	39	14	3.61	1.20	3.23	2.80	4.07	1.15	.14
Aug.	8	.84	26,100	874	.17	7.9	38	17	4.28	1.25	3.38	2.70	4.65	1.55	.09
Sept.	7	.70	36,200	723	.09	8.0	35	17	3.85	1.06	2.69	2.85	3.41	1.30	.10
Oct.	7	.72	16,700	773	.15	7.8	37	19	3.38	1.69	2.95	3.00	3.56	1.50	.04
Nov.	8	.79	17,900	856	.13	7.9	39	19	3.85	1.47	3.45	3.10	4.06	1.65	.07
Dec.	10	.91	22,600	962	.20	8.0	40	19	4.10	1.84	3.92	3.20	4.77	1.90	.05
Mean ⊕	ϕ 95	.795	ϕ 259,320	851	.167	8.0	40	19	3.72	1.55	3.48	2.94	4.17	1.65	.073
Period Average		.790	742,000	805			44	22	3.67	1.15	3.81	2.57	4.19	1.95	
Tons of Constituents, 1953									33,100	8,360	35,500	39,800	88,800	25,900	
Average Tons Period 1945-1953									93,900	17,900	112,000	100,000	257,000	88,200	

ϕ Total ⊕ Weighted mean ** Percent of total cations *** Percent of total anions # Sum of calcium and magnesium

CHEMICAL ANALYSIS OF WATER SAMPLES FROM THE RIO GRANDE AND TRIBUTARIES - 1953

Month	No. of Samples	Dissolved Solids: Tons Per Acre Foot	Dissolved Solids: Total Tons	Mean ECx10⁶ @25°C	Boron p.p.m.	pH	% Na **	% Cl ***	Mean Milligram Equivalents per Liter: Ca	Mg	Na	CO_3 + HCO_3	SO_4	Cl	NO_3
Pecos River near Comstock, Texas															
Sampling by U. S. Section															
Jan.	15	3.77	37,700	4,320	.29	8.0	58	63	9.82	8.61	26.0	2.96	13.73	28.20	.07
Feb.	14	3.92	36,600	4,440	.30	7.8	59	63	9.88	9.04	26.8	3.04	13.79	29.2	.02
Mar.	15	4.23	41,800	4,880	.32	7.8	60	64	10.40	9.40	30.2	2.58	15.31	32.27	.03
Apr.	11	3.46	25,700	3,980	.28	8.0	60	65	8.28	7.46	23.7	2.45	11.47	25.90	.05
May	16	2.85	17,900	3,350	.27	7.9	59	63	7.42	6.24	19.5	2.35	10.04	21.20	.05
June	15	2.39	11,500	2,810	.25	8.0	58	62	6.32	5.37	16.05	2.31	8.31	17.20	.05
July	17	1.37	12,000	1,670	.15	7.9	54	58	4.30	3.05	8.80	2.20	4.55	9.55	.09
Aug.	16	.92	15,300	1,140	.13	7.8	48	49	3.81	1.96	5.25	2.31	3.14	5.50	.18
Sept.	15	1.55	18,400	1,860	.17	8.0	53	56	5.28	3.43	9.75	3.15	4.99	10.30	.09
Oct.	14	1.75	23,800	2,070	.19	7.7	55	58	5.54	3.60	11.2	2.75	5.81	11.90	.07
Nov.	14	2.01	18,100	2,400	.21	7.9	57	59	5.79	4.53	13.6	2.85	6.87	14.20	.05
Dec.	16	2.45	22,800	2,870	.20	7.8	56	60	7.18	5.42	15.8	2.97	8.35	17.20	.04
Mean ●	ϕ 178	2.41	ϕ 281,600	2,820	.220	7.9	57	61	6.76	5.34	16.1	2.68	8.34	17.36	.075
Period Average		3.91	1,236,000	4,150			55	56	12.08	7.77	24.28	2.49	17.10	24.61	
Tons of Constituents, 1953									21,500	10,300	58,900	13,000	63,700	97,800	
Average Tons Period 1935-1953									104,000	40,600	240,000	32,600	353,000	375,000	
Rio San Diego at Jiménez, Coahuila															
Sampling by Mexican Section															
Jan.	2	.42	1,100	448	.10	8.2	17	15	3.10	.76	.78	2.79	1.12	.71	.04
Feb.	4	.42	911	473			16		# 4.13		.78	3.12		.65	
Mar.	3	.42	882	465			18		# 3.95		.85	2.85		.65	
Apr.	4	.45	562	517			18		# 4.45		.95	3.05		.75	
May	3	.43	370	478			21		# 3.74		1.02	2.47		.85	
June	3	.48	261	515			24		# 3.97		1.22	2.70		.92	
July	3	.51	658	513	.17	8.0	24	18	2.87	1.02	1.22	2.33	1.88	.92	.04
Aug.	4	.37	2,870	402		7.8	14		# 3.66		.58	2.85		.35	
Sept.	5	.43	8,580	469			11		# 4.45		.54	2.65		.55	
Oct.	4	.34	2,090	374			12		# 3.38		.45	2.45		.40	
Nov.	2	.45	1,330	488			12		# 4.48		.62	3.75		.50	
Dec.	3	.45	1,640	474			11		# 4.46		.55	3.47		.50	
Mean ●	ϕ 40	.414	ϕ 21,254	451			13		# 4.11		.618	2.81		.535	
Period Average		.409	18,900	450			17		# 3.89		.782	2.73		.669	
Tons of Constituents, 1953											991	5,980		1,320	
Average Tons Period 1950-1953											1,130	5,230		1,490	
Rio San Rodrigo near El Moral, Coahuila															
Sampling by Mexican Section															
Jan.	1	.41	200	442	.03	8.1	9	6	3.54	.58	.44	2.86	1.41	.30	.06
Feb.	1	.39	145	446		8.0	10		# 4.21		.45	3.00		.30	
Mar.	1	.32	157	357			12		# 3.26		.45	2.30		.30	
Apr.	1	.36	101	419			13		# 3.84		.56	3.00		.30	
May			No Flow												
June			No Flow												
July			No Flow												
Aug. ■	0	.34	520	380			16		# 3.32		.63	2.55		.30	
Sept.	2	.35	11,900	367			7		# 3.44		.24	2.50		.30	
Oct. ■	0	.38	2,440	420			16		# 3.67		.70	2.82		.30	
Nov.	1	.28	1,170	299			8		# 2.89		.25	2.43		.30	
Dec.	1	.34	983	351			5		# 3.48		.19	2.95		.30	
Mean ●	ϕ 8	.348	ϕ 17,616	369			8		# 3.44		.315	2.57		.300	
Period Average		.363	10,600	393			13		# 3.53		.526	2.68		.460	
Tons of Constituents, 1953											499	5,400		733	
Average Tons Period 1950-1953											480	3,250		648	
Rio Grande at Eagle Pass, Texas															
Sampling by Mexican Section															
Jan.	27	1.13	48,200	1,280	.16	8.1	46	40	4.24	2.59	5.98	3.00	4.67	5.20	.07
Feb.	24	1.14	38,000	1,300			48		# 6.51		6.10	2.77		5.30	
Mar.	26	1.09	53,300	1,260			50		# 6.32		6.25	2.71		5.15	
Apr.	24	1.12	16,500	1,320			50		# 6.38		6.35	2.63		5.80	
May	25	1.00	8,430	1,190			49		# 5.87		5.60	2.63		5.00	
June	25	1.04	4,710	1,210			50		# 5.82		5.90	2.55		4.90	
July	27	.79	23,100	894	.15	8.0	41	29	3.54	1.62	3.78	2.85	3.50	2.60	.10
Aug.	26	.49	45,100	566		8.0	29		# 4.07		1.63	2.70		1.20	
Sept.	25	.53	152,000	501			30		# 3.68		1.56	2.95		.95	
Oct.	26	.65	38,600	762			38		# 4.66		2.85	2.80		2.55	
Nov.	25	.79	32,200	891			40		# 5.37		3.55	3.15		2.90	
Dec. ■	0	.92	43,100	1,050			47		# 5.57		4.87	2.21		4.03	
Mean ●	ϕ 280	.711	ϕ 503,240	773			40		# 4.70		3.08	2.83		2.43	
Period Average		1.01	2,490,000	1,140			47		# 6.08		5.29	2.42		4.38	
Tons of Constituents, 1953											68,200	83,100		83,000	
Average Tons Period 1938-1953											408,000	248,000		521,000	

■ Estimated ϕ Total ● Weighted mean ** Percent of total cations *** Percent of total anions # Sum of calcium and magnesium

CHEMICAL ANALYSIS OF WATER SAMPLES FROM THE RIO GRANDE AND TRIBUTARIES - 1953

* Rio Salado at Cd. Guerrero, Tamaulipas

Sampling by Mexican Section

Month	No. of Samples	Dissolved Solids: Tons Per Acre Foot	Dissolved Solids: Total Tons	Mean ECx10⁶ @25°C	Boron p.p.m.	pH	% Na **	% Cl ***	Mean Milligram Equivalents per Liter: Ca	Mg	Na	CO_3 + HCO_3	SO_4	Cl	NO_3
Jan.			No Flow												
Feb.			No Flow												
Mar.	3		Composite	Sample	Contaminated										
Apr.	4	.73	10,000	818			38		# 5.06		3.05	1.85		2.30	
May	2	.52	2,520	566			33		# 3.79		1.90	2.20		1.40	
June			No Flow												
July	1	.43	1,170	459	.1	8.1	31	22	2.48	.61	1.46	1.80	1.73	1.00	.10
Aug.	7	.31	104,000	374		8.0	15		# 3.40		.62	2.51		.40	
Sept.	5	.62	71,600	618			18		# 5.16		1.15	2.40		.70	
Oct.			No Samples	Collected											
Nov.	1	1.39	1,970	1,480			39		# 9.15		5.95	2.37		5.00	
Dec.	1	1.69	286	1,780			40		# 10.75		7.25	2.20		6.80	
Mean @ Period Average	ϕ 24														
Tons of Constituents, 1953 / Average Tons Period 1935-1953															

Rio Grande at Roma, Texas

Sampling by Mexican Section

Month	No. of Samples	Dissolved Solids: Tons Per Acre Foot	Dissolved Solids: Total Tons	Mean ECx10⁶ @25°C	Boron p.p.m.	pH	% Na **	% Cl ***	Mean Milligram Equivalents per Liter: Ca	Mg	Na	CO_3 + HCO_3	SO_4	Cl	NO_3
Jan.	31	1.10	55,200	1,280	.19	8.1	48	41	3.98	2.44	6.00	2.55	4.86	5.15	.05
Feb.	28	1.18	39,800	1,360	.23	7.8	49	43	4.11	2.82	6.78	2.60	5.31	5.90	.03
Mar.	31	1.11	77,400	1,140	.22	8.2	56	41	2.56	2.30	6.20	2.05	4.43	4.60	.03
Apr.	30	.74	39,800	854	.19	7.8	46	36	3.25	1.19	3.79	2.07	3.19	3.00	.05
May	31	.77	37,200	877	.24	7.9	48	38	3.22	1.15	4.05	2.15	3.06	3.28	.08
June	4	.75	81.8	904	.4	8.1	73	60	1.38	.81	6.00	.79	2.53	4.90	.01
July	31	.68	8,500	747	.2	8.1	44	34	3.26	.86	3.40	2.40	2.66	2.60	.05
Aug.	31	.40	117,000	449	.12	7.8	27	18	2.74	.66	1.25	2.30	1.35	.85	.16
Sept.	30	.33	86,300	376	.08	7.9	21	15	2.56	.55	.85	2.15	1.09	.60	.15
Oct.	30	.36	68,000	405	.06	7.9	25	17	2.59	.45	1.02	2.10	1.17	.70	.12
Nov.	28	.45	34,400	503	.13	7.8	30	21	2.84	.66	1.50	2.35	1.69	1.10	.09
Dec.	29	.44	34,000	512	.12	7.8	31	23	2.90	.64	1.62	2.30	1.65	1.20	.04
Mean @ Period Average	ϕ 334	.513 .734	ϕ 597,681.8 1,914,000	576 847	.123	7.9	36 45	27 35	2.82 3.25	.884 1.27	2.08 3.75	2.23 2.24	1.92 3.18	1.58 2.89	.113
Tons of Constituents, 1953 / Average Tons Period 1944-1953									89,600 231,000	17,000 54,700	75,800 306,000	108,000 242,000	146,000 542,000	88,800 363,000	

ϕ Total @ Weighted mean ** Percent of total cations *** Percent of total anions # Sum of calcium and magnesium * Gaging station moved to Las Tortillas, Tamaulipas on September 9, 1953. See page 37. November and December samples were collected at this new location.

ELECTRICAL CONDUCTIVITY OF WATER SAMPLES

1953

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

Rio Grande at El Paso, Texas

Date	ECx10⁶ @25°C
January	
1	2,100
2	2,080
3	2,000
4	2,010
5	2,080
6	2,090
7	2,040
8	2,120
9	2,140
10	2,130
11	2,050
12	2,070
13	2,190
14	2,060
15	2,100
16	2,130
17	2,130
18	2,210
19	2,210
20	2,220
21	2,190
22	2,240
23	2,210
24	2,190
25	2,210
26	2,130
27	2,150
28	2,190
29	2,140
30	2,160
31	2,140
February	
1	2,170
2	2,160
3	2,190
4	2,190
5	2,260
6	2,230
February	
7	2,260
8	2,250
9	2,260
10	2,250
11	2,260
12	2,310
13	2,400
14	2,430
15	2,420
16	2,430
17	2,400
18	2,350
19	2,500
20	2,470
21	2,400
22	2,400
23	2,400
24	2,330
25	2,310
26	2,300
27	2,310
28	2,340
March	
1	2,320
2	2,180
3	2,270
4	2,300
5	2,320
6	2,380
7	2,360
8	2,440
9	2,420
10	2,370
11	2,480
12	2,430
13	2,500
14	1,110
15	885
March	
17	863
18	892
19	890
20	816
21	810
22	807
23	808
24	854
25	840
26	810
27	840
28	809
29	825
30	805
31	817
April	
1	843
2	860
3	896
4	882
5	866
6	834
7	912
8	876
9	896
10	962
11	977
12	1,018
13	1,030
14	1,055
15	1,033
16	1,062
17	1,030
18	1,170
19	1,140
20	1,170
21	1,170
April	
22	1,150
23	1,150
24	1,210
25	1,090
26	1,260
27	1,220
28	1,330
29	1,460
30	1,330
May	
1	1,310
2	1,370
3	1,160
4	1,170
5	1,130
6	1,050
7	1,000
8	972
9	997
10	1,029
11	988
12	1,060
13	996
14	1,050
15	1,040
16	1,110
17	1,040
18	1,110
19	1,200
20	1,150
21	1,160
22	1,110
23	1,220
24	1,190
25	1,190
26	1,250
27	1,130
28	1,160
May	
29	1,120
30	1,130
31	1,090
June	
1	1,130
2	1,090
3	1,030
4	1,100
5	1,010
6	971
7	966
8	923
9	937
10	949
11	941
12	920
13	900
14	920
15	962
16	969
17	992
18	970
19	972
20	951
21	1,000
22	1,020
23	1,020
24	983
25	978
26	1,000
27	1,050
28	1,050
29	1,110
30	1,040
July	
1	1,070
2	997
3	989
July	
4	1,020
5	990
6	941
7	884
8	907
9	923
10	958
11	1,000
12	985
13	798
14	922
15	932
16	1,060
17	1,180
18	1,300
19	1,250
20	1,230
21	1,760
22	1,120
23	1,080
24	1,130
25	1,180
26	1,070
27	967
28	966
29	943
30	961
31	988
August	
1	991
2	972
3	1,000
4	1,000
5	1,070
6	1,090
7	1,060
8	997
9	961
August	
10	995
11	1,010
12	1,010
13	1,030
14	1,000
15	1,060
16	1,050
17	1,050
18	1,040
19	1,050
20	984
21	1,090
22	1,150
23	1,040
24	1,150
25	1,220
26	1,250
27	1,150
28	1,110
29	1,100
30	1,090
31	1,080
September	
1	1,070
2	1,030
3	1,060
4	1,040
5	1,070
6	1,090
7	1,120
8	1,170
9	1,230
10	1,250
11	1,320
12	1,330
13	1,340
14	1,360
15	1,480
September	
16	1,660
17	1,690
18	1,760
19	1,840
20	1,870
21	1,890
22	1,880
23	1,870
24	1,820
25	1,910
26	1,980
27	1,930
28	1,950
29	1,990
30	2,030
October	
1	2,050
2	2,050
3	2,020
4	2,080
5	2,000
6	2,040
7	1,970
8	1,960
9	1,980
10	1,960
11	1,970
12	2,030
13	1,990
14	2,010
15	1,930
16	1,940
17	2,000
18	1,960
19	1,950
20	2,010
21	2,010
22	1,980
October	
23	2,020
24	2,010
25	2,000
26	2,030
27	2,050
28	2,070
29	2,030
30	1,920
31	1,880
November	
1	1,930
2	1,930
3	1,870
4	1,970
5	2,010
6	2,100
7	2,170
8	2,110
9	2,060
10	2,050
11	2,080
12	2,100
13	2,100
14	2,110
15	2,060
16	2,090
17	2,100
18	2,090
19	2,180
20	2,180
21	2,160
22	2,130
23	2,130
24	2,130
25	2,190
26	2,240
27	2,260
28	2,260
November	
29	2,270
30	2,270
December	
1	2,250
2	2,260
3	2,250
4	2,260
5	2,290
6	2,300
7	2,280
8	2,250
9	2,250
10	2,270
11	2,270
12	2,210
13	2,250
14	2,240
15	2,250
16	2,260
17	2,380
18	2,410
19	2,380
20	2,350
21	2,270
22	2,110
23	2,630
24	2,420
25	2,390
26	2,450
27	2,170
28	2,240
29	2,230
30	2,230
31	2,210

Rio Grande at Fort Quitman, Texas

Date	ECx10⁶ @25°C
January	
7	6,930
13	6,210
14	7,640
21	6,730
27	7,890
28	8,160
February	
4	10,310
February	
10	10,420
11	10,090
18	10,770
24	8,970
25	9,990
March	
1	11,200
8	12,170
14	12,320
March	
11	11,000
18	11,900
25	12,200
31	11,900
April	
6	12,810
12	14,500
13	15,170
20	14,940
April	
15	12,320
22	12,800
29	14,090
May	
6	12,810
12	14,500
13	15,170
20	14,940
June	
3	15,290
24	17,170
30	15,540
July	
1	17,530
8	1,080
9	1,080
13	886
July	
14	899
15	1,040
22	7,750
28	3,860
29	8,550
August	
5	11,560
12	11,840
August	
18	3,650
19	2,590
26	12,000
September	
2	3,780
3	3,780
9	12,100
16	14,500
September	
30	13,700
October	
7	13,900
14	13,510
21	12,800
29	12,320
November	
4	9,510
12	11,010
18	11,140
25	9,070
December	
2	11,820
9	11,670
16	11,820
23	11,400
30	7,340

Rio Grande at Upper Presidio Station

Date	ECx10⁶ @25°C
June	
9	956
10	1,010
11	700
July	
15	969
16	756
17	753
July	
18	718
19	720
21	568
July	
22	566
23	1,230
25	492
July	
26	709
27	700
30	1,020
August	
1	880
2	877
3	562
August	
4	562
6	842
20	699
August	
21	643
22	648
23	645
August	
24	1,480
September	
3	939
September	
5	924
October	
6	640

Río Conchos at Cuchillo Parado, Chihuahua

Date	ECx10⁶ @25°C
January	
1	1,320
2	1,300
5	1,380
7	1,340
9	1,430
12	1,360
14	1,380
16	1,380
19	1,330
21	1,320
23	1,410
26	1,340
28	1,370
30	1,330
February	
2	1,320
4	1,340
6	1,330
February	
9	1,380
11	1,300
13	1,380
16	1,360
18	1,340
20	1,350
23	1,380
25	1,370
27	1,370
March	
2	1,380
4	1,390
6	1,350
9	1,410
11	1,194
13	1,070
18	1,100
20	1,080
March	
23	1,520
25	1,590
27	1,560
30	1,750
April	
1	1,650
3	1,680
6	1,670
10	1,690
13	1,730
15	2,520
17	1,750
20	1,840
22	2,370
24	1,770
27	2,510
29	2,420
May	
1	2,140
4	2,160
6	2,410
8	2,160
11	2,140
13	2,080
15	3,310
18	3,430
20	3,260
22	3,170
25	3,160
27	1,740
27	1,740
27	1,490
27	1,490
29	1,630
June	
1	1,850
June	
3	1,950
5	1,960
8	2,300
10	928
12	1,360
17	1,460
19	1,500
22	1,420
24	1,520
26	1,660
July	
1	2,510
1	1,773
3	4,680
6	5,610
8	3,100
10	5,040
13	1,240
July	
15	1,210
15	1,210
17	6,720
20	903
22	1,150
24	974
26	717
26	721
26	1,030
27	530
29	1,130
31	1,230
August	
3	1,200
5	1,270
7	1,380
10	845
12	947
August	
14	1,150
16	858
17	853
19	903
21	1,240
24	1,490
26	1,470
27	1,510
28	1,480
29	1,470
31	658
September	
2	690
2	668
4	909
7	790
9	733
11	793
September	
14	847
16	951
18	1,030
21	1,240
23	1,130
25	1,340
28	1,260
30	1,350
October	
2	1,370
5	1,410
7	1,470
9	1,460
12	1,480
14	1,490
16	1,470
19	1,430
21	1,450
October	
23	1,460
26	1,460
28	1,450
30	1,410
November	
2	1,400
4	1,390
7	1,370
9	1,370
11	1,340
13	1,330
16	1,320
18	1,320
20	1,360
23	1,420
25	1,410
27	1,470
30	1,380
December	
2	1,420
4	1,400
7	1,470
9	1,470
11	1,470
14	1,480
16	1,470
18	1,460
21	1,460
23	1,420
25	1,480
28	1,450
30	1,470

ELECTRICAL CONDUCTIVITY OF WATER SAMPLES

1953

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

Río Conchos near Ojinaga, Chihuahua

Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C
January		February		April		May		June		July		August		September		October	
2	1,420	26	1,440	11	1,360	28	1,690	10	1,570	13	1,460	3	1,010	9	764	22	1,520
7	1,390	March		17	1,530	28	1,700	13	1,540	15	1,480	8	1,310	14	753	28	1,550
12	1,370	2	1,360	22	1,540	29	1,810	13	990	15	1,480	12	1,040	14	956	November	
19	1,380	6	1,410	28	1,470	29	1,810	18	1,390	18	1,400	16	1,210	19	1,120	2	1,480
23	1,390	11	1,490	May		June		23	1,480	18	1,410	16	1,220	23	1,350	7	1,470
29	1,390	18	1,220	4	1,540	1	1,200	26	1,540	23	1,290	22	1,390	29	1,380	12	1,460
February		24	1,360	8	1,520	1	1,180	29	1,530	23	1,300	22	1,390	October		17	1,390
2	1,380	27	1,390	14	1,440	3	1,090	July		28	1,020	28	1,400	3	1,400	23	1,440
7	1,390	April		18	1,430	3	1,080	1	1,590	28	1,010	September		8	1,500	30	1,420
13	1,410	1	1,350	22	1,530	9	1,810	6	1,410	August		2	968	13	1,500		
23	1,410	6	1,370	22	1,690	9	1,800	9	1,580	3	1,010	2	970	17	1,540		

December	
3	1,470
8	1,470
12	1,500
18	1,490
24	1,460
28	1,460

Rio Grande at Johnson Ranch, Texas

Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C
January		February		March		June		July		July		August		September		November	
1	1,410	16	1,510	22	1,510	3	1,790	8	1,450	27	740	24	1,080	13	815	2	1,630
9	1,480	25	1,510	30	1,250	7	1,800	10	1,210	28	799	31	1,270	21	1,020	9	1,620
12	1,480	March		April		12	2,450	12	1,060	August		September		28	1,230	16	1,540
22	1,480	3	1,470	6	1,500	14	1,760	12	1,170	3	1,020	1	485	October		23	1,470
25	1,460	9	1,570	13	1,570	18	878	14	1,140	10	881	2	395	6	1,450	30	1,480
February		10	643	20	1,630	20	1,484	20	378	12	844	3	1,430	12	1,530	December	
1	1,500	13	1,580	24	1,700	July		22	856	17	1,330	7	650	19	1,490	7	1,520
9	1,430	16	1,490			3	1,740	24	921	20	449	9	900	26	1,290	9	1,530

December	
12	1,550
14	1,540
16	1,560
18	1,550
21	1,520
23	1,540
26	1,540
28	1,530
30	1,510

Rio Grande at Langtry, Texas

Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C
January		February		March		May		June		July		August		September		November	
2	999	20	960	28	872	8	679	12	661	20	1,010	16	850	27	710	4	584
11	873	25	963	April		9	646	13	643	21	1,010	19	813			10	782
14	986	28	978	1	913	14	673	17	691	23	662	23	835	October		13	847
18	951	March		4	838	17	651	20	637	26	697	27	911	7	715	16	866
19	1,020	2	1,010	9	865	19	663	25	761	27	592	September		12	745	19	950
26	1,000	7	987	11	835	23	637	29	1,010	30	779	3	300	16	736	23	957
February		9	1,000	15	784	28	668	July		August		12	1,030	19	740	27	992
1	986	15	1,170	23	622	30	782	9	797	2	1,020	14	850	23	744	30	989
2	990	16	1,040	May		June		13	627	4	922	20	890	27	933		
9	998	22	803	1	639	3	796	16	739	9	758	22	800	29	755		
16	1,040	25	997	2	685	6	829	17	991	12	768	27	710				

December	
3	960
7	936
9	924
11	926
14	918
16	937
18	931
21	950
28	988
31	995

Pecos River near Comstock, Texas

Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C
January		February		March		May		June		July		August		September		October	
2	4,330	7	4,430	15	5,860	1	3,750	8	2,810	16	2,260	18	2,350	22	1,890	26	1,660
4	4,240	9	4,300	17	5,860	3	3,750	10	2,830	18	2,340	20	2,260	24	1,950	28	2,060
6	4,430	11	3,930	19	5,960	5	3,750	12	2,920	20	2,350	22	2,310	26	2,110	30	2,060
8	4,490	13	4,320	21	4,450	7	3,580	14	2,800	22	2,450	25	473	28	2,120	November	
10	4,390	15	4,600	23	4,990	9	3,440	16	2,740	23	561	25	479	30	2,060	1	2,340
12	4,370	17	4,450	25	5,120	11	3,310	18	2,710	23	536	27	778	October		3	2,330
14	4,330	19	4,670	29	4,350	13	3,420	20	2,810	25	689	29	771	2	2,060	5	2,330
16	4,310	21	4,670	31	4,350	15	3,420	22	2,720	27	674	31	1,750	6	560	7	2,420
18	4,050	23	4,390	April		17	3,300	24	2,790	29	1,150	September		6	557	9	2,410
20	4,260	25	4,410	2	4,060	19	3,110	26	2,690	31	1,490	2	1,780	8	2,300	11	2,410
22	4,260	27	4,610	10	4,140	21	3,100	28	2,590	August		4	1,620	10	2,290	13	2,410
24	4,260	March		13	4,143	23	3,100	30	2,720	2	2,290	4	1,590	12	2,270	15	2,330
26	4,260	1	4,350	15	4,010	25	3,060	July		4	2,350	6	1,790	14	2,570	17	2,330
28	4,200	3	4,640	17	3,990	27	2,930	2	2,750	6	2,400	10	2,020	16	2,570	19	2,330
30	4,330	5	4,600	19	3,720	29	3,000	4	2,720	8	2,560	12	2,030	18	3,470	23	2,380
February		7	4,470	21	3,670	31	2,930	6	2,720	10	2,550	14	1,860	20	3,470	25	2,440
1	4,320	9	4,660	23	3,900	June		8	2,640	12	2,220	16	1,850	22	3,470	27	2,450
3	4,150	11	4,450	25	4,040	2	2,930	10	2,950	14	2,340	18	1,980	24	3,430	29	2,530
5	4,430	13	4,640	27	3,610	4	2,940	12	2,228	16	2,500	20	1,890	26	1,610		
				29	3,900	6	2,810	14	2,280								

December	
1	2,570
3	2,720
5	2,780
7	2,780
9	2,780
11	2,850
13	2,840
15	2,840
17	2,740
19	2,770
21	2,750
23	3,110
25	3,110
27	3,110
29	3,110
31	3,110

Río San Diego at Jiménez, Coahuila

Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C
January		February		April		May		June		August		September		October		November	
2	398	18	468	1	450	1	477	10	468	2	479	1	628	1	302	1	477
20	487	25	495	11	505	11	435	25	555	11	415	1	469	10	325	18	478
February		March		18	561	27	560	July		24	355	9	404	21	431		
1	509	1	504	25	510	June		1	492	26	363	14	420	26	422		
10	503	12	419			1	483	11	514			24	418				
		22	483					23	478								

December	
1	488
9	514
27	429

Río San Rodrigo near El Moral, Coahuila

Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C
January		February		March		April		September		September		November		December			
3	438	3	436	3	364	2	390	3	402	18	329	3	336	2	353		

ELECTRICAL CONDUCTIVITY OF WATER SAMPLES

1953

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

Rio Grande at Eagle Pass, Texas

January		**February**		**March**		**April**		**May**		**June**		**July**		**August**		**September**		**October**	
1	1,250	2	1,190	6	1,350	10	1,280	14	1,080	17	1,210	20	810	21	477	25	757	30	998
2	1,280	3	1,190	7	1,450	11	1,270	15	1,080	18	1,190	21	746	22	472	26	741	31	871
3	1,290	4	1,270	9	1,410	13	1,270	16	1,080	19	1,230	22	869	24	376	28	700	**November**	
5	1,230	5	1,300	10	909	14	1,280	18	1,080	20	1,230	23	1,020	25	387	29	738	2	900
6	1,270	6	1,320	11	907	15	1,280	19	1,160	22	1,230	24	1,010	26	722	30	735	3	920
7	1,270	7	1,310	12	911	16	1,280	20	1,160	23	1,220	25	897	27	714	**October**		4	841
8	1,240	9	1,310	13	986	17	1,280	21	1,110	24	1,300	27	764	28	607	1	710	5	834
9	1,200	10	1,260	14	1,300	18	1,310	22	1,190	25	1,160	28	756	29	614	2	759	6	836
10	1,310	11	1,330	16	1,270	20	1,310	23	1,180	26	1,150	29	754	31	298	5	545	7	835
12	1,250	12	1,270	17	1,380	21	1,280	25	1,170	28	1,150	30	753	**September**		6	521	9	870
13	1,320	13	1,270	18	1,390	22	1,340	26	1,170	29	1,150	31	747	1	294	7	527	10	841
14	1,340	14	1,330	19	1,400	23	1,380	27	1,200	30	1,150	**August**		2	307	8	649	11	827
15	1,320	16	1,330	20	1,440	24	1,350	28	1,230	**July**		1	760	3	431	9	644	12	821
16	1,300	17	1,320	21	1,470	25	1,380	29	1,230	1	801	3	750	4	439	10	676	13	826
17	1,320	18	1,320	23	1,470	27	1,230	30	1,260	2	813	4	850	5	452	12	674	14	825
19	1,280	19	1,320	24	1,480	28	1,230	**June**		3	822	5	851	7	666	13	815	16	858
20	1,280	20	1,360	25	1,360	29	1,190	2	1,180	4	1,240	6	918	8	682	14	846	17	855
21	1,280	21	1,330	26	1,360	30	1,183	3	1,190	6	1,240	7	880	9	676	15	851	18	877
22	1,250	23	1,360	27	1,360	**May**		4	1,210	7	1,250	8	916	10	682	16	887	19	885
23	1,240	24	1,360	28	1,350	1	1,190	5	1,210	8	970	10	938	12	735	17	782	20	886
24	1,270	25	1,360	30	1,420	2	1,210	6	1,140	9	970	11	915	14	734	19	781	21	882
26	1,280	26	1,340	31	1,420	4	1,200	8	1,190	10	959	12	850	15	694	20	787	23	884
27	1,300	27	1,350	**April**		5	1,200	9	1,180	11	959	13	890	16	715	21	796	24	948
28	1,290	28	1,340	1	1,420	6	1,220	10	1,110	13	1,080	14	864	17	799	22	944	25	944
29	1,300	**March**		2	1,420	7	1,240	11	1,120	14	1,190	15	798	18	794	23	915	26	950
30	1,290	2	1,260	4	1,310	8	1,240	12	1,120	15	1,170	17	840	19	733	24	890	27	947
31	1,290	3	1,300	6	1,320	11	1,200	13	1,110	16	1,090	18	889	21	737	26	887	28	937
		4	1,330	7	1,300	12	1,190	15	1,160	17	965	19	848	22	757	27	1,050	30	948
		5	1,350	8	1,290	13	1,190	16	1,150	18	957	20	465	23	741	28	1,000	**December**	
														24	716	29	988	1	934

Rio Grande at Laredo, Texas

January		**February**		**March**		**March**		**April**		**May**		**May**		**September**		**October**		**November**	
14	1,320	2	1,310	2	1,330	25	1,400	13	1,500	2	1,510	23	375	25	831	24	653	28	815
17	1,260	4	1,310	4	1,390	27	1,420	15	1,050	4	1,460	25	478	28	820	26	551	**December**	
19	1,270	6	1,310	9	1,380	28	1,290	17	857	6	1,440	27	660	30	830	**November**		1	913
21	1,350	9	1,320	11	1,380	31	517	20	1,060	7	1,430	29	955	**October**		3	920	8	989
26	1,320	12	1,340	12	1,330	**April**		21	1,200	11	1,490	**August**		2	830	10	956	16	1,050
28	1,320	21	1,320	16	890	1	435	24	1,310	13	1,500	3	990	5	763	12	988	22	1,020
30	1,320	24	1,360	18	804	6	1,190	27	1,340	14	566	21	960	7	646	18	888	29	1,040
		26	1,360	20	1,030	8	1,330	29	1,390	18	884			15	798	23	845		
		28	1,180	23	1,340	10	1,310			19	475			15	823	27	884		

Río Salado at Cd. Guerrero, Tamaulipas

March		**April**		**April**		**May**		**August**		**August**		**September**		**September**		**November**		**December**	
27	362	1	361	3	377	14	559	22	525	26	346	1	455	7	870	14	1,480	24	1,780
28	422	2	1,290	7	347	**July**		23	398	29	349	2	315	8	845				
29	343	2	1,300	**May**		2	437	24	817	30	381	3	382						
		3	429	14	520			25	363										

Río Alamo at Cd. Mier, Tamaulipas

March		**March**		**April**		**July**		**August**		**August**		**September**		**September**		**October**		**October**	
15	372	29	336	4	1,080	15	463	20	610	24	480	4	400	30	596	6	487	17	622
27	368			5	362			22	470	30	450	22	555						

ELECTRICAL CONDUCTIVITY OF WATER SAMPLES
1953

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

Rio Grande at Roma, Texas

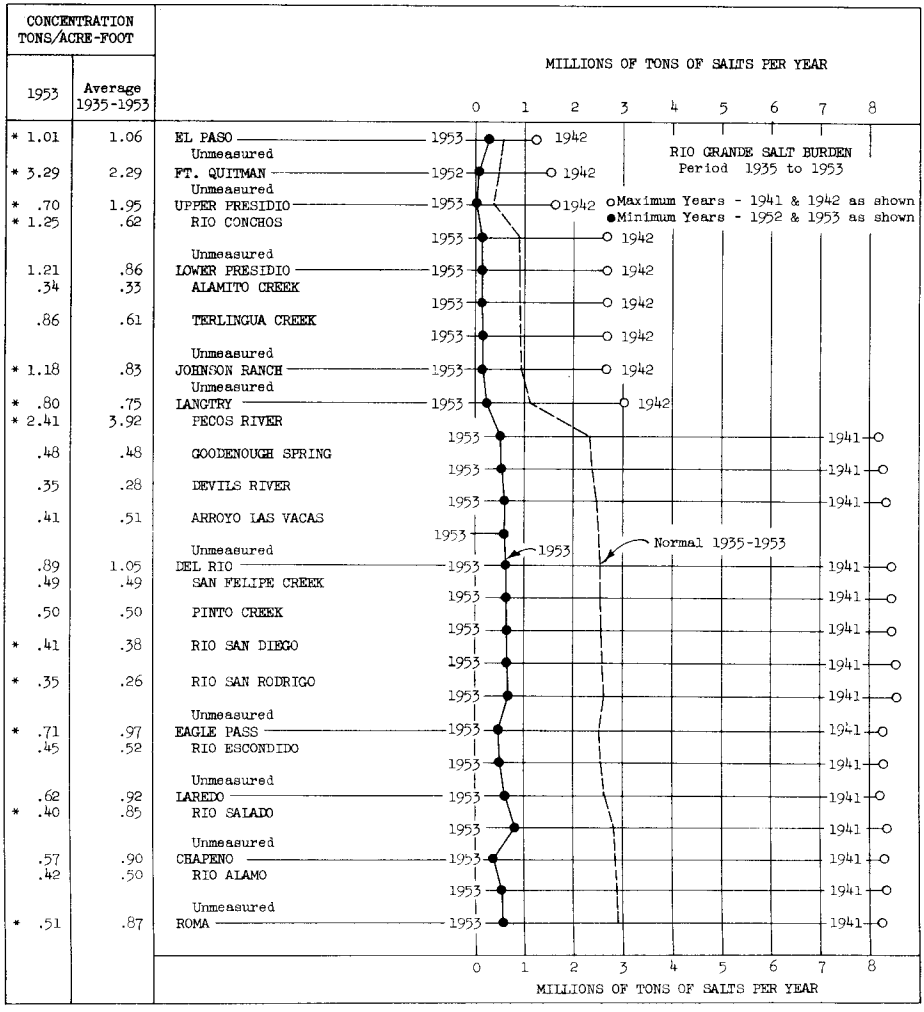
Date	ECx10⁶ @25°C
January	
1	1,200
2	1,210
3	1,230
4	1,240
5	1,250
6	1,230
7	1,220
8	1,220
9	1,260
10	1,230
11	1,250
12	1,240
13	1,250
14	1,240
15	1,280
16	1,300
17	1,310
18	1,310
19	1,310
20	1,310
21	1,330
22	1,340
23	1,350
24	1,370
25	1,340
26	1,320
27	1,340
28	1,320
29	1,340
30	1,340
31	1,380
February	
1	1,410
2	1,420
3	1,390
February	
4	1,370
5	1,370
6	1,370
7	1,340
8	1,340
9	1,360
10	1,370
11	1,360
12	1,350
13	1,340
14	1,340
15	1,360
16	1,380
17	1,380
18	1,360
19	1,370
20	1,360
21	1,360
22	1,330
23	1,270
24	1,280
25	1,340
26	1,370
27	1,360
28	1,380
March	
1	1,385
2	1,370
3	1,380
4	1,390
5	1,400
6	1,398
7	1,380
8	1,390
9	1,400
March	
10	1,410
11	1,400
12	1,420
13	1,430
14	1,440
15	1,480
16	1,460
17	1,360
18	1,330
19	1,290
20	1,300
21	1,330
22	1,220
23	1,010
24	906
25	860
26	861
27	926
28	554
29	677
30	961
31	1,250
April	
1	1,390
2	1,320
3	613
4	628
5	720
6	518
7	499
8	576
9	647
10	701
11	799
12	945
April	
13	1,050
14	1,050
15	1,020
16	1,250
17	1,290
18	1,320
19	1,340
20	1,360
21	1,390
22	1,410
23	1,450
24	1,530
25	1,560
26	1,610
27	1,620
28	1,680
29	1,710
30	1,720
May	
1	1,750
2	1,790
3	1,930
4	1,900
5	1,320
6	583
7	558
8	594
9	644
10	704
11	757
12	991
13	1,380
14	1,200
15	821
16	741
May	
17	849
18	944
19	943
20	832
21	555
22	893
23	951
24	891
25	709
26	644
27	596
28	598
29	609
30	628
31	663
June	
1	715
2	916
3	1,290
4	1,730
July	
1	5,790
2	5,820
3	5,820
4	5,820
5	4,800
6	1,560
7	1,040
8	999
9	1,000
10	1,070
11	1,140
12	1,240
13	1,520
14	1,640
July	
15	510
16	528
17	500
18	531
19	553
20	610
21	689
22	768
23	884
24	990
25	1,180
26	1,340
27	1,670
28	1,860
29	2,090
30	2,250
31	887
August	
1	1,900
2	1,630
3	1,530
4	1,420
5	1,250
6	1,150
7	1,140
8	1,190
9	1,280
10	1,140
11	1,070
12	1,080
13	1,090
14	1,080
15	1,070
16	1,080
17	1,060
August	
18	998
19	980
20	946
21	878
22	578
23	492
24	480
25	434
26	386
27	332
28	314
29	336
30	428
31	460
September	
1	455
2	355
3	333
4	319
5	290
6	377
7	393
8	397
9	403
10	410
11	393
12	387
13	419
14	400
15	400
16	409
17	409
18	391
19	376
20	382
September	
21	392
22	404
23	395
24	445
25	389
26	398
27	399
28	388
29	395
30	395
October	
1	395
2	401
3	432
4	435
5	292
6	406
7	434
8	426
9	450
10	437
11	473
12	515
13	616
14	635
15	682
16	472
17	456
18	459
19	446
20	445
21	470
22	490
23	312
24	376
October	
25	448
27	619
28	645
29	691
30	741
31	784
November	
1	805
2	813
3	794
4	801
5	817
6	598
7	556
9	497
11	493
12	495
13	502
14	491
15	496
16	503
17	479
18	481
19	494
20	485
21	485
22	485
23	475
24	483
25	475
26	488
27	485
28	482
29	476
30	483
December	
1	490
2	520
4	506
5	493
6	504
7	500
8	490
9	504
10	506
11	508
12	517
13	541
14	569
15	589
16	732
17	510
18	523
19	530
20	526
22	520
23	537
24	543
25	531
26	530
27	509
28	510
29	509
30	508
31	507

Rio Grande at Mercedes, Texas, Pumps

Date	ECx10⁶ @25°C
January	
1	1,860
2	1,830
3	1,890
4	1,860
5	1,870
6	2,230
7	2,090
8	1,850
9	1,710
10	1,730
11	1,800
12	1,830
13	1,850
15	1,840
16	1,820
17	1,850
18	1,850
19	1,940
20	1,950
21	1,960
22	1,960
23	2,020
24	2,030
25	2,120
26	2,090
27	2,160
28	2,020
29	2,040
30	2,040
31	2,130
February	
1	2,200
2	2,260
3	2,390
4	2,560
5	2,360
6	2,380
7	2,290
8	2,390
February	
9	2,380
10	2,520
11	2,560
12	2,750
13	2,840
14	2,520
15	2,530
16	2,570
17	2,700
18	2,830
19	2,930
20	2,810
21	2,660
22	2,820
23	2,930
24	3,170
25	3,040
26	2,940
27	3,070
28	2,940
March	
1	2,750
2	2,730
3	2,680
4	2,660
6	2,680
7	2,710
8	2,740
9	2,760
10	2,710
11	2,730
12	2,920
13	3,040
14	2,990
15	3,010
17	3,040
17	3,120
17	3,460
18	3,450
March	
19	2,010
20	1,800
21	1,840
22	1,900
23	1,950
25	1,950
26	1,940
27	1,980
28	2,030
29	2,090
30	2,180
30	2,180
30	1,180
31	1,180
April	
1	890
2	845
3	888
4	1,560
5	1,190
6	1,470
7	953
8	795
9	878
10	973
11	1,000
12	1,030
13	1,100
14	1,260
15	1,350
16	1,570
17	1,680
18	1,850
19	2,090
20	2,490
21	2,030
22	2,110
23	2,100
24	2,060
April	
25	2,230
26	2,330
27	2,510
28	2,750
29	2,810
30	2,850
May	
1	2,860
2	2,710
3	2,960
4	3,720
5	4,170
6	4,660
7	6,310
8	4,190
9	4,170
10	3,570
11	3,320
12	2,490
13	2,360
14	2,270
15	2,550
17	2,740
18	5,600
19	1,490
20	1,220
21	1,170
22	1,410
23	1,560
24	2,020
25	1,620
26	1,360
27	1,410
28	1,670
29	1,960
30	2,170
31	2,330
June	
1	2,340
2	2,490
3	2,600
4	2,480
5	2,660
6	2,650
7	2,680
8	2,680
9	2,680
10	2,600
11	2,420
12	2,460
13	2,510
14	2,490
15	2,390
16	2,320
17	2,300
18	2,250
19	2,170
21	2,200
22	2,000
23	1,930
24	1,900
25	2,030
26	1,930
27	1,940
28	1,860
29	1,800
30	1,770
July	
1	1,500
2	1,610
3	1,540
4	1,690
5	1,760
6	1,930
7	1,980
8	1,970
9	1,940
July	
10	1,900
11	1,980
12	1,880
13	1,830
14	1,850
15	2,060
16	1,820
17	2,100
18	1,790
19	7,930
20	1,900
21	1,500
22	1,670
23	1,880
24	2,180
25	2,250
26	2,300
27	2,380
28	2,080
29	2,310
30	2,040
31	2,490
August	
1	2,490
2	2,480
3	2,430
4	2,170
5	2,480
6	2,500
7	2,150
8	2,470
9	1,990
10	2,260
11	2,100
12	2,210
13	2,180
14	2,330
15	2,380
16	2,030
August	
17	2,240
18	2,200
19	2,140
20	2,230
21	2,320
22	2,260
23	2,230
24	2,210
25	2,220
26	1,970
26	3,070
26	840
26	730
27	660
27	680
28	440
28	480
29	420
30	390
31	340
September	
1	422
2	378
3	412
4	375
5	355
6	420
7	335
8	340
9	365
10	389
11	396
13	414
14	420
15	432
16	435
17	451
18	465
19	480
September	
20	495
21	515
22	528
23	556
24	556
25	544
26	777
27	539
28	517
29	592
30	662
October	
1	638
2 -	648
3	684
4	632
5	575
6	601
7	388
8	347
9	391
10	424
11	438
12	461
13	497
14	556
15	575
16	587
17	685
18	699
19	679
20	763
21	764
22	754
23	742
24	660
25	417
26	442
27	485
October	
28	465
29	530
30	540
31	568
November	
1	657
2	682
3	732
4	786
5	820
6	873
7	974
8	987
9	1,040
10	1,110
11	1,130
12	1,120
13	1,150
14	1,080
15	1,070
16	1,080
17	1,100
18	1,150
19	1,170
20	1,180
21	1,330
22	1,150
23	1,160
24	962
25	892
26	865
27	864
28	830
29	784
30	791
December	
1	785
2	774
3	749
4	766
5	786
6	755
7	795
8	824
9	816
10	801
11	845
12	824
13	882
14	878
15	963
16	1,010
17	1,050
18	1,100
19	1,110
20	1,140
21	1,480
22	1,940
23	1,650
24	1,600
25	1,690
26	1,680
27	1,720
28	1,600
29	1,580
30	1,520
31	1,580

RIO GRANDE SALT BURDEN

The term "salt," as used herein, means total dissolved solids. The 1953 concentrations, which are marked by an asterisk (*), are based on the chemical analyses shown on preceding pages of this bulletin. Those not asterisked are either based on chemical analyses reported in previous water bulletins, or have been arrived at by deduction. The average concentrations shown for the period 1935 to 1953 are the weighted means of the values determined for the 19-year period indicated.



* Based on 1953 Chemical Analyses

SANITARY ASPECTS OF WATER QUALITY

The United States and Mexican Sections of this Commission and the Texas State Department of Health co-operate in the joint sanitary water-sampling program along the Rio Grande. All analyses below have been made under the "Rules of Laboratory Procedure," as approved by the participating agencies, and which conform with the procedures set out in the manual "Standard Methods for the Examination of Water and Sewage," Ninth Edition (1946), prepared by the American Public Health Association and the American Water Works Association. These analyses were made in the laboratories of the El Paso Water Plant, the Cameron County Health Unit, and the International Boundary and Water Commission. The percentages of Dissolved Oxygen (D.O.) shown below are the per cent saturation at the elevation of the sampling station.

Rio Grande at El Paso, Texas, Water Plant

Date 1953	D. O. Percent Saturation	B. O. D. Parts Per Million	Coliform Organisms per 100 c. c.	Total Bacteria per c. c. (plate count)	Date 1953	D. O. Percent Saturation	B. O. D. Parts Per Million	Coliform Organisms per 100 c. c.	Total Bacteria per c. c. (plate count)
Jan. 6	98.5	1.0	2,300	3,100	Oct. 20	116	1.5	24,000	53,500
13	107	1.7	6,200	3,300	27	116	1.7	70,000	52,500
20	106	3.4	2,300	3,650	Nov. 3	114	1.3	24,000	48,900
27	110	3.1	3,600	3,900	24	106	1.3	2,300	13,900
Feb. 3	108	2.3	2,100	2,600	Dec. 29	99.8	1.5	1,100	10,300
10	91.7	7.1	6,200	3,250					
17	107	2.5	1,100	3,200					
24	93.8	2.4	5,500	5,100	Total	1,476.8	32.3	290,700	229,150
Sept. 22	103	1.5	140,000	21,950	Average	105.5	2.3	20,800	16,400

Franklin Canal at El Paso, Texas, Water Plant

Mar. 3	87.4	6.8	38,000	9,850	July 28	88.9	1.2	140,000	32,250
10	111	2.5	70,000	12,350	Aug. 4	93.1	1.4	16,000	16,150
17	95.2	3.7	11,000	21,100	11	96.5	1.3	22,000	10,700
24	97.2	1.9	22,000	6,350	18	96.1	2.2	94,000	7,950
31	97.3	2.1	70,000	7,700	25	93.1	1.3	36,000	17,000
Apr. 7	95.8	2.0	38,000	4,050	Sept. 1	93.1	2.2	160,000	18,100
14	97.0	1.1	70,000	3,700	8	96.1	2.0	94,000	20,950
21	107	1.3	38,000	5,300	15	91.1	2.8	38,000	10,450
28	91.8	1.5	22,000	7,400	29	135	1.4	38,000	79,950
May 5	106	1.9	6,200	3,500	Oct. 6	177	2.6	11,000	51,600
12	103	1.6	8,100	5,700	13	155	1.5	24,000	25,300
19	106	1.5	24,000	4,900	Nov. 10	112	1.5	24,000	20,500
26	107	2.0	140,000	5,500	17	118	.4	38,000	16,800
June 2	99.5	1.5	9,400	3,100	Dec. 1	104	.8	24,000	14,300
9	96.9	2.0	70,000	5,050	8	118	1.1	24,000	11,600
16	98.8	2.3	70,000	7,600	15	106	1.0	2,300	6,400
23	88.9	1.5	70,000	8,500	22	93.4	1.8	3,600	4,900
30	96.5	2.1	38,000	9,550					
July 7	97.8	2.3	24,000	16,450					
14	75.4	1.0	140,000	44,050	Total	3,914.0	70.8	1,783,600	583,150
21	92.1	1.7	16,000	26,550	Average	103.0	1.9	46,900	15,300

Rio Grande at Ysleta, Texas-Zaragoza, Chih. Bridge

Jan. 6	49.9	33.3	22,000,000	1,255,000	July 14	55.3	2.3	1,600,000	750,000
13	34.7	50.0	9,400,000	1,460,000	21	48.9	8.2	140,000,000	4,190,000
20	31.7	34.4	24,000,000	1,230,000	28	48.8	1.5	1,600,000	355,000
27	42.5	29.0	3,600,000	1,530,000	Aug. 4	47.7	2.0	1,100,000	1,090,000
Feb. 3	32.0	48.6	11,000,000	1,705,000	11	57.2	2.5	3,600,000	535,000
10	5.8	56.4	24,000,000	2,680,000	18	49.2	2.7	2,100,000	510,000
17	22.2	76.4	24,000,000	2,025,000	25	53.2	3.8	5,500,000	2,200,000
24	26.5	47.8	70,000,000	1,775,000	Sept. 1	52.1	3.8	5,500,000	640,000
Mar. 3	37.2	25.8	11,000,000	1,785,000	8	58.3	5.0	930,000	1,040,000
10	0	46.2	16,000,000	3,990,000	15	72.4	6.6	3,600,000	965,000
17	73.4	5.2	3,600,000	780,000	22	42.6	50.0	2,300,000	1,285,000
24	72.8	15.3	11,000,000	640,000	Oct. 6	0	89.0	70,000,000	5,520,000
31	81.0	16.9	2,100,000	350,000	13	0	50.0	38,000,000	5,135,000
Apr. 7	78.2	3.4	930,000	145,000	20	0	32.0	24,000,000	6,000,000
14	72.8	5.5	2,300,000	53,500	27	71.5	24.0	3,600,000	2,390,000
21	54.9	16.4	38,000,000	970,000	Nov. 3	0	20.0	24,000,000	2,070,000
28	62.2	9.8	11,000,000	1,280,000	10	0	128.0	70,000,000	5,930,000
May 5	48.2	4.6	16,000,000	405,000	17	0	97.0	240,000,000	7,500,000
12	62.7	4.6	24,000,000	635,000	24	0	49.0	24,000,000	3,330,000
19	58.1	4.8	38,000,000	1,177,000	Dec. 1	0	134.0	140,000,000	8,040,000
26	0	28.4	140,000,000	3,975,000	8	0	116.0	360,000,000	4,580,000
June 2	73.9	6.6	6,200,000	875,000	15	42.7	36.0	3,600,000	1,690,000
9	35.5	8.2	11,000,000	725,000	29	34.6	55.5	3,600,000	1,000,000
16	45.8	11.0	11,000,000	590,000					
23	47.3	8.5	6,200,000	1,115,000					
30	43.7	13.8	11,000,000	1,050,000	Total	1,976.3	1,532.9	1,722,160,000	101,680,500
July 7	48.8	3.1	6,200,000	735,000	Average	39.5	30.7	34,400,000	2,030,000

SANITARY ASPECTS OF WATER QUALITY

Rio Grande at Laredo, Texas, Water Plant

Date 1953	Coliform Organisms per 100 c. c.	Total Bacteria per c. c. (plate count)	Date 1953	Coliform Organisms per 100 c. c.	Total Bacteria per c. c. (plate count)	Date 1953	Coliform Organisms per 100 c. c.	Total Bacteria per c. c. (plate count)
Jan. 5	360	1,400	May 11	930	1,800	Sept.21	550	1,250
12	36	700	18	11,000	12,300	28	230	750
19	36	650	25	210	3,000	Oct. 5	1,100	1,850
26	36	650	June 1	620	750	12	930	1,500
Feb. 2	110	450	8	2,300	2,750	19	3,600	700
9	110	800	15	230	2,250	26	11,000	12,100
16	110	500	22	3,600	3,400	Nov. 2	620	1,200
24	110	750	29	360	1,700	9	210	1,000
Mar. 2	23	700	July 6	110	1,000	16	160	950
9	210	750	13	110	400	23	160	500
16	1,600	2,100	20	160	1,300	30	160	300
23	360	1,050	27	950	2,400	Dec. 7	160	650
30	620	14,750	Aug. 3	930	1,200	14	60	400
Apr. 6	6,200	2,200	10	110	950	21	6	550
13	620	750	17	230	600			
20	620	1,600	24	140,000	16,000			
27	620	1,050	31	620,000	45,000	Total	813,797	157,750
May 4	620	900	Sept.14	600	5,500	Average	16,300	3,160

Rio Grande 5.6 Miles Below Laredo, Texas, R.R. Bridge

Date 1953	Coliform Organisms per 100 c. c.	Total Bacteria per c. c. (plate count)	Date 1953	Coliform Organisms per 100 c. c.	Total Bacteria per c. c. (plate count)	Date 1953	Coliform Organisms per 100 c. c.	Total Bacteria per c. c. (plate count)
Jan. 5	5,400	7,000	Apr. 20	110,000	25,500	Oct. 5	62,000	10,000
12	6,200	7,500	27	16,000	7,500	19	36,000	11,500
19	5,400	9,500	May 4	23,000	14,500	Nov. 9	21,000	11,000
26	5,400	12,000	18	62,000	123,000	23	28,000	11,500
Feb. 2	36,000	9,500	25	240,000	52,500	30	16,000	3,500
9	3,600	13,500	June 1	600	8,500	Dec. 7	62,000	3,500
16	6,200	7,000	July 7	2,600	90,000	14	23,000	8,000
Mar. 2	55,000	11,000	10	2,300	4,000	21	28,000	12,500
9	21,000	12,000	13	5,400	4,000			
16	110,000	17,000	21	600	5,000			
23	62,000	15,000	Aug. 3	6,200	5,500			
Apr. 6	36,000	17,000	10	11,000	11,000	Total	1,354,400	631,500
13	240,000	48,000	Sept.28	6,500	23,000	Average	39,800	18,600

Rio Grande near Zapata, Texas

Date 1953	Coliform Organisms per 100 c. c.	Total Bacteria per c. c. (plate count)	Date 1953	Coliform Organisms per 100 c. c.	Total Bacteria per c. c. (plate count)	Date 1953	Coliform Organisms per 100 c. c.	Total Bacteria per c. c. (plate count)
Jan. 5	360	950	Mar. 23	3,600	4,800	July 6	2,300	6,850
12	1,100	1,000	30	6,200	35,000	13	110	600
19	620	1,050	Apr. 6	2,700	7,450	20	360	1,200
26	350	950	13	2,300	2,850	28	3,600	2,800
Feb. 2	210	850	20	360	2,000	Aug. 3	620	1,200
9	620	1,200	27	360	3,500	10	340	1,650
16	360	1,000	May 4	6,200	47,000	17	620	1,100
24	230	950	11	620	1,700			
Mar. 2	620	1,050	18	3,600	16,200			
9	230	1,350	25	540	5,250	Total	45,356	170,200
16	6,200	16,100	June 1	26	2,600	Average	1,560	5,870

* Rio Grande at Chapeño, Texas

Date 1953	Coliform Organisms per 100 c. c.	Total Bacteria per c. c. (plate count)	Date 1953	Coliform Organisms per 100 c. c.	Total Bacteria per c. c. (plate count)	Date 1953	Coliform Organisms per 100 c. c.	Total Bacteria per c. c. (plate count)
Sept.14	210	1,150	Nov. 23	1,100	1,250	Dec. 21	23	1,200
Nov. 2	1,600	1,500	30	230	400			
9	270	650	Dec. 7	210	800	Total	4,633	8,100
16	930	800	14	60	350	Average	515	900

Rio Grande at Mercedes, Texas, Pumps

Date 1953	Coliform Organisms per 100 c. c.	Total Bacteria per c. c. (plate count)	Date 1953	Coliform Organisms per 100 c. c.	Total Bacteria per c. c. (plate count)	Date 1953	Coliform Organisms per 100 c. c.	Total Bacteria per c. c. (plate count)
Jan. 12	1,100		Apr. 27	1,600		Nov. 2	3,600	
19	2,400		May 4	24,000		9	2,300	
26	2,400		11	5,500		16	930	
Feb. 2	620		18	16,000		23	360	
9	1,600		June 1	3,400		30	2,300	
16	1,100		Sept. 8	22,000		Dec. 7	2,300	
Mar. 9	1,600		14	3,600		14	3,600	
16	3,800		21	2,300		21	540	
23	940		28	1,100		28	1,100	
30	7,000		Oct. 5	11,000				
Apr. 6	3,800		13	1,600				
13	2,400		20	1,100		Total	164,790	
20	3,800		26	22,000		Average	4,710	

* 2.5 river miles below Falcón Dam

RAINFALL ON THE RIO GRANDE WATERSHED IN INCHES

In the United States

The monthly records of rainfall shown below, for the stations in the United States, are tabulated in their downstream order. These records have not been published elsewhere. On page 87, these same stations are listed in alphabetical order, showing the location, elevation, period of record, type of gage in use, tributary or subdivision of the Rio Grande watershed on which the station is located, and the observer. Records of daily rainfall amounts, for 1953, where available, are on file in the office of the United States Section of this Commission. For daily records, prior to 1953, see previous issues of these bulletins.

Month	American Dam		Island Station		Fabens-Guadalupe Bridge		County Line		Fort Hancock Bridge		Madden Arroyo		West Small	
	1953	Average	1953	Average	1953	Average	1953	Average	1953	Average	1953	Average	1953	Average
Jan.	0	.46	0	.36	0	.42	0	.45	0	.47	0	.38	0	.43
Feb.	.54	.40	.34	.28	.33	.31	.23	.23	.27	.28	.26	.14	.24	.31
Mar.	.13	.37	.04	.28	0	.33	.04	.33	.03	.27	0	.16	0	.22
Apr.	.36	.31	.43	.25	.49	.35	.54	.34	.59	.40	.51	.41	.50	.46
May	.02	.30	.10	.43	.22	.44	.08	.35	.05	.55	.08	.47	0	.60
June	.16	.82	.30	.51	.23	.63	.06	.62	.41	.97	.05	.64	0	.98
July	1.57	1.48	2.94	1.06	6.67	1.15	2.74	1.12	3.58	1.18	3.74	1.26	3.30	1.80
Aug.	.16	1.07	.34	1.14	.02	1.36	.31	1.32	.69	1.10	1.92	1.32	.64	1.60
Sept.	.19	.84	0	.96	.22	1.09	.82	1.08	0	1.07	0	1.07	0	1.36
Oct.	.65	.67	.36	.80	.53	1.01	.65	.85	.73	.99	.86	1.19	.60	1.28
Nov.	0	.21	0	.24	.02	.23	0	.24	T	.21	0	.16	T	.20
Dec.	.45	.46	.29	.45	.49	.51	.14	.45	.13	.54	.05	.49	.38	.71
Yearly	4.23	7.39	5.14	6.76	9.22	7.83	5.61	7.38	6.48	8.03	7.47	7.69	5.66	9.95

Month	Guayuco Arroyo		Fort Quitman		Neely Ranch		Al Roosevelt Ranch		Quebec Ranch		Kelly Ranch		Petan Ranch	
	1953	Average	1953	Average	1953	Average	1953	Average	1953	Average	1953	Average	1953	Average
Jan.	0	.40	0	.51	0	.43	0	.22	0	.38	0	.41	0	.30
Feb.	.20	.14	.22	.22	.21	.12	.45	.22	0	.10	0	.06	.20	.14
Mar.	0	.17	.01	.25	0	.17	.10	.42	.20	.35	.20	.38	.90	.54
Apr.	.34	.27	.19	.34	0	.15	.10	.10	.10	.44	0	.80	.50	.32
May	.42	.44	.20	.47	.04	.49	T	.21	0	.42	.10	1.16	.25	1.16
June	.08	.57	.15	.82	.45	.79	T	.49	0	1.86	1.70	2.07	.10	2.64
July	3.81	1.67	2.77	1.50	2.25	1.65	2.40	2.47	.59	2.05	4.00	3.27	3.40	4.49
Aug.	1.14	1.47	.45	1.22	.15	1.30	.55	.27	1.25	1.38	1.70	1.58	.20	1.55
Sept.	0	1.30	.12	1.06	.23	1.53	.20	.82	.30	1.58	3.25	3.01	2.10	2.38
Oct.	.93	1.18	.56	.73	.66	.85	1.35	.45	.50	.34	.55	.83	0	.39
Nov.	0	.17	.17	.24	0	.15	0	.03	0	.05	0	.08	.15	.29
Dec.	.10	.48	.14	.41	.12	.46	.90	.63	0	.27	.30	.42	0	.42
Yearly	7.02	8.26	4.98	7.77	4.09	8.09	6.05	6.33	2.94	9.22	11.80	14.07	7.80	14.62

Month	Livingston Ranch		Presidio (IBWC Gage)		Bloys Camp		Marfa Experiment Station		Kerr Mitchell Ranch		Joe Lane Ranch		Loma Vista Ranch	
	1953	Average	1953	Average	1953	Average	1953	Average	1953	Average	1953	Average	1953	Average
Jan.		.12	0	.18	.12	.52	0	.32	T	.55	0		0	.95
Feb.		0	.02	.12	.30	.48	.42	.18	.35	.09	0		0	.15
Mar.		.18	.60	.32	.60	.41	.32	.52	.56	.21	0		0	.19
Apr.		0	0	.17	1.10	.49	T	.21	0	.66	.15		0	.78
May		.70	0	.24	1.00	1.57	T	1.07	0	1.13	.24		.15	1.09
June		1.30	.52	.94	.30	2.46	.04	1.65	.14	1.86	.40		0	1.85
July	2.85	1.11	1.29	1.84	5.00	3.30	1.91	2.59	.26	2.22	2.23		.40	2.33
Aug.		.61	.62	.39	4.40	3.34	1.24	1.12	3.26	2.12	2.33		2.47	1.62
Sept.		.80	.16	.63	3.00	3.06	.27	1.56	0	1.84	0		0	2.00
Oct.		1.62	.17	.39	.65	1.53	.50	.21	.34	1.32	.10		0	1.34
Nov.		.62	0	.12	0	.43	0	T	0	.23	0		0	.37
Dec.		.50	.07	.25	.50	.67	.25	.28	.10	.53	.15		.10	.69
Yearly		7.56	3.45	5.59	16.97	18.26	4.95	9.71	5.01	12.76	5.60		3.12	13.36

Month	H. T. Fletcher Ranch		Sauz Ranch		McFarland Ranch		N. B. Chaffin Ranch		A. L. Baugh Ranch		San Jacinto Ranch		McCracken Ranch	
	1953	Average	1953	Average	1953	Average	1953	Average	1953	Average	1953	Average	1953	Average
Jan.	T	.86	T	.62	0	.90	0	.53	0	.72	1.32		0	.64
Feb.	.18	.13	.20	.10	.35	.22	.25	.22	0	.08	.25		.15	.13
Mar.	.32	.34	.56	.50	.60	.42	.61	.42	.60	.32	1.75		.58	.20
Apr.	.11	.54	.05	.22	0	.67	0	.45	0	.37	0		.09	.57
May	.26	1.25	.20	1.28	1.27	1.52	0	.79	0	.66	0		0	.82
June	.07	1.45	T	1.19	T	1.10	0	1.52	0	1.26	0		.97	1.26
July	1.86	2.76	3.50	2.89	3.54	3.27	1.11	1.77	1.52	2.07	1.95		1.72	2.50
Aug.	.59	2.98	2.22	2.04	2.62	2.47	1.00	1.48	.75	1.88	3.40		1.86	2.05
Sept.	.30	1.62	.19	2.04	.40	2.15	.20	1.98	0	1.46	.80		.59	1.81
Oct.	.28	1.41	.24	1.47	.20	1.45	0	.15	0	.93	0		.14	1.22
Nov.	0	.33	0	.32	0	.43	.30	.30	0	.33	0		0	.31
Dec.	.33	.42	.27	.53	.35	.68	0	.65	0	.65	0		.02	.60
Yearly	4.30	14.09	7.43	13.20	9.33	15.28	3.47	10.26	2.87	10.73	9.47		6.12	12.11

Month	H. M. Greenwood (Cienega Ranch)		Cienega Mountain		Mariposa Mine				Van Eman Ranch		02 Ranch		Terlingua Creek Station	
	1953	Average	1953	Average	1951	1952	1953	Average	1953	Average	1953	Average	1953	Average
Jan.	0	.59	0	0	0		0	0	0	.42	0	.54	0	
Feb.	.10	.10	.18	.06	1.60		.19	.90	0	.09	0	.37	0	
Mar.	.80	.22	1.70	.95	.20		.77	.48	1.10	.51	.50	.46	.43	.48
Apr.	.04	.72	0	.33	0		.01	T	0	.40	.30	.43	.08	.92
May	0	.90	0	0	0	No	.06	.03		.52	.40	1.13	.06	.13
June	.57	1.68	0	1.48	0		.05	.02		1.08	0	1.29	.10	.34
July	1.45	2.06	0	1.71	1.50	Record	.57	1.04		2.88		1.62	.64	1.25
Aug.	2.39	1.87	1.00	.33	0		.13	.06		1.91		2.86	.66	.39
Sept.	.31	2.45		1.38	.50		1.68	1.09		1.67		1.85	.81	.42
Oct.	.30	1.23		0	.40		.12	.26		.37		1.86	.79	.40
Nov.	0	.27	0	.02	0		0	0		.31		.77	0	.08
Dec.	.22	.65	.20	.16	.40		T	.20		.74		.40	0	.48
Yearly	6.18	12.74		6.40	4.60		3.58	4.08		10.90		13.58	3.57	

RAINFALL ON THE RIO GRANDE WATERSHED IN INCHES

In the United States

Month	Castalon Ranger Station		Johnson Ranch		Panther Junction		Ray Willoughby Ranch		Buttrill Ranch		Santiago Peak Ranch		Kokernot Ranch - Headquarters	
	1953	Average	1953	Average	1953	Average	1953	Average	1953	Average	1953	Average	1953	Average
Jan.			0	.48			0	.25	0		0		0	.12
Feb.			T	.12			.25	.12	.12		0		0	0
Mar.	1.18		1.15	.22			1.00	.75	.55	.28	.06		.55	.36
Apr.	.13		T	.46			0	0	.08	.28	0		0	.20
May	0		.09	.90			0	1.10	0	1.16	.30		.08	.22
June	.41		.02	1.12	.20		0.75	1.39	0	.29	.50		.30	.20
July	2.64		1.64	1.35	3.09		3.00	4.60	1.00	1.26	0		.10	1.54
Aug.	1.04		1.61	.76	.59		2.00	1.00	.57	.28	1.90		1.10	.55
Sept.	.78		.30	1.41	.76		1.45	.72	0	.05	0		.83	.42
Oct.			.37	.62	.29		.20	.10	0	0	0		.20	.10
Nov.			0	.23	0		0	0	0	.10	0		0	.35
Dec.			0	.36	.11		0	.25	T	T	0		0	.30
Yearly			5.18	8.03			8.65	10.28	2.32		2.76		3.16	4.36

Month	Kokernot Ranch - No. 2		A. M. Potter Ranch		Black Gap Game Refuge		Sand Valley Ranch		Persimmon Gap Ranger Station		Dove Mountain Ranch		Maravillas	
	1953	Average	1953	Average	1953	Average	1953	Average	1953	Average	1953	Average	1953	Average
Jan.	0	.34	0	.03	.10	.18	0	.12		.08	.47		.05	.10
Feb.	0	.04	0	.02	0	.02	.23	.18		.04	.40		.05	.06
Mar.	.55	.39	0	.02	.98	.55	1.19	.73		.42	.87	.44	.98	.48
Apr.	0	.37	0	.15	0	.30	.12	.36		.26	0	.08	.41	.82
May	0	.41	.50	.76	.50	1.35	.96	.70	.32	.76	.25	.78	.17	.97
June	.25	.70	1.00	.50	.41	.70	.53	1.24	.02	1.13	1.15	.89	.94	1.60
July	.10	1.80	0	.88	.39	.32	1.33	1.74	1.37	1.16	0	.82	.26	.93
Aug.	1.00	1.32	.62	.31	.32	.16	0	.01	.18	.49	0	0	.78	1.52
Sept.	.85	2.26	.72	.36	0	.08	1.99	1.00	.40	.46	0	0	.75	.94
Oct.	.20	.62	0	0	0	0	.33	.16	.34	.17	1.20	.60	.09	.44
Nov.	0	.14	0	.15	0	.20	0	.12	0	.10	0	0	0	.07
Dec.	0	.34	.30	.15	.21	.68	.32	.52	.15	.22	T	.57	.17	.23
Yearly	2.93	8.73	3.14	3.33	2.91	4.54	7.00	6.88		5.29	4.34	4.62	4.65	8.16

Month	Garner Ranch						Steve Stumberg Ranch		Cinco de Mayo Ranch		McGonagill Ranch - Headquarters		McGonagill Ranch - East Mill	
	1949	1950	1951	1952	1953	Average	1953	Average	1953	Average	1953	Average	1953	Average
Jan.	1.70	.50	0	0	.20	.48	.11	.83	.12		0		0	
Feb.	.20	0	0	0	0	.04	.38	.23	0		.11		.10	
Mar.	.10	0	.30	0	.80	.24	1.15	.26	.68		1.11		1.30	
Apr.	1.30	.90	0	1.10	0	.66	.45	.56	.03		.40	.35	.40	
May	.20	1.10	2.70	1.60	0	1.12	.05	1.90	0	1.30	.40	.84	0	.50
June	.80	.50	2.70	1.10	1.20	1.26	1.52	1.08	0	.22	.29	.29	0	0
July	0	1.80	0	1.90	0	.74	.15	2.06	.40	.20	.85	1.91	0	.65
Aug.	1.75	1.95	0	0	.50	.84	1.53	1.34	0	0	2.28	1.19	.75	.38
Sept.	1.00	.60	1.00	0	.80	.68	1.62	2.17	1.96	.98	0	.41	1.20	1.30
Oct.	4.20	0	.30	0	.60	1.02	.76	1.14	0	0	.38	.19	.70	.35
Nov.	0	0	0	.40	0	.08	0	.49			0	.34	0	.30
Dec.	0	0	0	.80	0	.16	.04	.90			0	.50	0	1.15
Yearly	11.25	7.35	7.00	6.90	4.10	7.32	7.76	12.96			5.82		4.45	

Month	Arvin and Harkins Ranch - Header		Arvin and Harkins Ranch - Bean		Arvin and Harkins Ranch - Camel		Arvin and Harkins Ranch - Hqtrs.		Arvin and Harkins Ranch-Monty Corder		E. W. Hardgrave Ranch		Adams Bros. Ranch	
	1953	Average	1953	Average	1953	Average	1953	Average	1953	Average	1953	Average	1953	Average
Jan.	0	.52	0	.54	0	.32	0	.60	0	.52	.15		.26	
Feb.	.60	.18	.30	.08	.20	.08	.20	.16	.20	.12	.15		.08	
Mar.	.80	.54	.90	.52	.70	.50	.70	.48	.70	.56	.97		.73	
Apr.	.20	1.50	.20	1.44	.30	1.28	.20	1.31	.30	1.42	.37	1.51	.16	.88
May	0	1.76	0	1.44	0	1.40	0	2.07	0	1.64	.02	1.11	0	1.10
June	.80	1.22	.70	1.14	0	.50	0	.63	0	.60	.03	.29	0	.16
July	.70	1.26	.30	1.14	0	.92	.50	1.16	.10	.90	.06	.33	.13	.27
Aug.	.80	2.16	1.90	2.46	.20	1.44	1.00	1.84	.70	1.02	.53	.26	1.28	.64
Sept.	.90	1.10	1.00	.88	.50	.86	1.10	.94	.60	1.00	2.44	1.30	1.25	1.08
Oct.	.80	.80	1.50	1.02	1.60	.92	1.40	.92	1.40	.72	1.31	.66	.97	.52
Nov.	0	.32	0	.17	0	.12	0	.14	0	.15	.02	.22	0	.25
Dec.	.25	.32	.25	.38	.25	.28	.25	.29	.25	.29	.15	.39	.14	.42
Yearly	5.85	11.68	7.05	11.21	3.75	8.62	5.35	10.54	4.25	8.94	6.20		5.00	

Month	Bricker Ranch		Dryden		Pumpville		C. L. Arthur Ranch		Pecos River		Comstock		Devils Lake	
	1953	Average	1953	Average	1953	Average	1953	Average	1953	Average	1953	Average	1953	Average
Jan.	.01		.02	.62	.25	.70	0	.96	.05	.87	.22	.73	.15	.73
Feb.	.09		.18	.40	.10	.37	.35	.14	.07	.67	.12	.84	.27	.74
Mar.	.91		.58	.43	.75	.59	.23	.48	1.42	.76	1.52	.87	2.31	.84
Apr.	.28		.05	.87	.03	.75	0	.46	0	1.30	0	1.46	0	1.51
May	0	1.00	.11	2.10	T	1.79	.70	1.84	.58	1.86	.01	1.91	.08	1.62
June	.05	1.00	.14	1.05	.15	.99	.53	1.79	0	1.59	0	1.52	0	1.75
July	.43	.22	.96	1.23	1.21	.44	2.93	2.72	.52	1.52	.37	.98	.51	.88
Aug.	.95	.48	.24	1.36	.08	.56	3.68	1.68	1.87	1.72	.40	2.38	2.96	1.55
Sept.	3.31	1.66	1.40	1.68	1.20	1.70	.25	1.58	1.59	1.87	1.76	1.77	1.80	1.61
Oct.	.51	.26	.63	1.10	.80	1.46	0	.89	1.59	1.12	.85	1.39	1.19	1.35
Nov.	0	.18	T	.38	T	.10	0	.31	.05	.44	.07	.45	.01	.61
Dec.	.20	.42	.11	.59		.67	0	.28	.53	.77	.57	.94	.49	.83
Yearly	6.74		4.42	11.81		10.12	8.69	13.13	8.25	14.49	5.89	15.24	9.77	14.02

Month	Armistead Ranch		Maverick County Canal Headgate		Quemado		Maverick Power Plant		Frick Farm		Tortuga Ranch		El Indio	
	1953	Average	1953	Average	1953	Average	1953	Average	1953	Average	1953	Average	1953	Average
Jan.	.22	.15	.20	.40	.28	.80	0		0	0	.73	.24	.22	.78
Feb.	.14	.42	.35	1.73	T	1.38	0		.30	.40	0	.09	.25	.70
Mar.	3.45	1.91	1.73	.89	1.23	.82	1.54		1.65	1.04	1.32	.92	.37	.71
Apr.	T	.91	0	1.07	T	1.55	.13		.26	.73	.23	.16	1.12	1.00
May	.14	2.30	.15	1.43	.12	2.69	0		.45	.22	.98	3.00	1.60	3.73
June	T	.22	.06	1.35	0	1.59	0	1.00	0	0	T	.47	0	1.67
July	T	.36	0	2.39	.70	1.17	0	.32	0	.26	0	.19	0	.69
Aug.	7.27	3.64	3.58	1.44	3.47	1.58	6.23	3.12	5.38	2.69	6.44	2.76	8.00	2.51
Sept.	2.13	1.29	7.71	3.14	1.80	2.94	4.05	2.02	3.94	1.97	5.91	2.76	4.20	2.84
Oct.	2.69	1.34	1.12	1.19	.66	1.44	1.78	.89	T	T	.15	.32	.75	.95
Nov.	T	.60	0	.29	.02	.52	0	.60	0	.71	0	.22	0	.49
Dec.	.48	.50	.51	.68	.27	.63	.50	.27	.65	1.06	.15	.10	.40	.69
Yearly	16.52	13.64	15.41	16.00	8.55	17.11	14.23		12.63	9.08	15.91	11.23	16.91	16.76

RAINFALL ON THE RIO GRANDE WATERSHED IN INCHES

In the United States

Month	Wuensche Farm		Apache Ranch	Justapor Ranch			Santa Ysabel Farm		Laredo Water Plant		Fort McIntosh		Laredo International Bridge	
	1953	Average	1953	1952	1953	Average	1953	Average	1953	Average	1953	Average	1953	Average
Jan.	.22	.11			0		0		.03	.86	.04	.72	0	.61
Feb.	.48				.70		.68		.78	.70	.79	.83	.75	.66
Mar.	.75	.83			.65		.95		.38	.71	.40	.78	.60	.68
Apr.	1.55	.86			1.90		0		.62	1.11	.79	1.34	.70	1.65
May	1.00	2.36	3.20		1.50		.19		1.30	2.52	1.19	2.68	1.45	1.98
June	0	.13	0		0		0		.06	2.18	.03	2.12	.25	1.95
July	0	.18	0		0		.08		0	1.29	0	1.48	0	1.56
Aug.			4.10		3.75		12.57		6.00	1.52	5.41	1.72		1.25
Sept.	2.62	1.32	0		1.00		2.30		2.31	3.00	2.18	2.82		3.13
Oct.			2.60	0	3.50	1.75	2.62		1.55	1.50	1.59	1.59		1.14
Nov.	0	.66	0	.80	0	.40	0		0	.70	0	1.13		.45
Dec.			.50	.80	.04	.42	.23		.39	1.04	.63	.90		.61
Yearly					13.04		19.62		13.42	17.13	13.05	18.11		15.47

Month	Corralitos Ranch		Huisache Ranch		Zapata Station	Falcón Dam		Roma		Rio Grande City Gaging Station		HCWCID #6 (Avg. of 3 gages)		Mission Pump
	1953	Average	1953	Average	1953	1953	Average	1953	Average	1953	Average	1953	Average	1952
Jan.	0					.09	.05	0	.77	0	.66	.48		.06
Feb.	.52					.77	.31	.62	.82	.57	.64	1.01		.43
Mar.	.01					2.86	1.38	2.25	1.11	2.63	1.06	.58		.63
Apr.	.68					.64	.81	0	1.21	0	.84	.70		.49
May	1.30				.91	1.47	1.92	.25	1.68	.52	1.37	1.67		3.43
June	0				0	0	1.68	0	2.35	0	2.30	0		2.77
July	T				1.45	.25	.36	.50	1.07	0	.60	.14		2.81
Aug.	8.70		5.10		4.05	12.61	3.41	4.20	2.07	2.68	1.67	6.61		0
Sept.	.30		2.13		1.47	2.46	2.80	3.46	3.59	1.21	2.57	.31		.29
Oct.	3.12		5.60		3.15	5.06	1.55	7.03	2.41	6.36	1.81	4.62		0
Nov.	0		0		T	T	.18	T	.29	T	.36	.35		1.82
Dec.	.40		.69		.70	1.18	.41	.85	.46	T	.65	.71		.62
Yearly	15.03					27.39	14.86	19.16	17.83	13.97	14.53	17.18		13.35

Month	Mission Pump		HCWCID #7			O. C. Dale Farm			HCWCID #15			Edinburg Filtration Plant		
	1953	Average	1952	1953	Average	1952	1953	Average	1952	1953	Average	1952	1953	Average
Jan.	0	.03	.13	.88	.50	.20	.95	.58	.28	.20	.24	.14	.36	.25
Feb.	1.16	.80	.23	1.04	.64	.72	1.09	.90	.12	1.04	.58	.39	1.11	.75
Mar.	1.00	.82	.65	.36	.50	.65	.53	.59	1.00	.35	.68	.59	.27	.43
Apr.	2.11	1.30	.46	1.13	.80	.45	1.51	.98	.30	.46	.38	.45	.58	.52
May	.46	1.94	2.77	1.44	2.10	2.86	.90	1.88	2.81	2.91	2.86	4.64	1.75	3.20
June	0	1.38	4.41	.07	2.24	4.79	0	2.40	4.50	0	2.25	2.45	0	1.22
July	.50	1.66	1.93	.53	1.23	2.66	.46	1.56	0	.61	.30	1.45	.07	.76
Aug.	7.05	3.52	1.62	4.43	3.05	0	5.03	2.52	0	6.06	3.03	.12	4.30	2.21
Sept.	.19	.24	.37	0	.18	.76	.06	.41	1.49	0	.74	1.63	.10	.86
Oct.	4.44	2.22	0	4.57	2.28	0	3.28	1.64	0	1.85	.92	.08	2.69	1.38
Nov.	.38	1.10	1.26	.36	.81	1.55	.47	1.01	.80	0	.40	1.47	.41	.94
Dec.	.82	.72	.52	.92	.72	.60	.95	.78	.35	.80	.58	.28	.95	.62
Yearly	18.11	15.73	14.35	15.78	15.05	15.24	15.23	15.25	11.65	14.28	12.96	13.69	12.59	13.14

Month	HCWCID #6			Murse Farm			CCWCID #3 (Avg. of 6 gages)			La Feria Pump			CCWCID #19
	1952	1953	Average	1952	1953	Average	1952	1953	Average	1952	1953	Average	1952
Jan.	.10	.34	.22	.20	.25	.22	.09	.38	.24	0	.60	.30	.15
Feb.	.39	1.19	.79	.20	1.45	.82	.14	1.21	.68	.35	.50	.42	.10
Mar.	.20	.42	.31	.62	.30	.46	0	.48	.24	0	.57	.28	.06
Apr.	.39	.42	.40	.61	.30	.46	.80	.46	.63	.80	.40	.60	.56
May	3.92	1.48	2.70	3.05	1.65	2.35	4.87	.44	2.66	5.82	.65	3.24	4.94
June	2.48	.10	1.29	2.37	0	1.18	2.22	.70	1.46	3.35	.03	1.69	3.04
July	1.11	.28	.70	.67	.32	.50	1.02	.30	.66	1.90	0	.95	.41
Aug.	.03	5.75	2.89	.42	10.09	5.26	.23	10.46	5.34	0	4.82	2.41	.28
Sept.	3.36	.39	1.88	5.52	.90	3.21	7.90	1.44	4.67	12.10	2.00	7.05	5.71
Oct.	0	4.01	2.00	0	4.80	2.40	0	4.43	2.22	0	5.35	2.68	0
Nov.	2.09	1.08	1.58	2.70	.35	1.52	3.84	.68	2.26	3.60	.25	1.92	3.02
Dec.	.60	.80	.70	.40	.57	.48	.72	.85	.78	.40	.80	.60	.64
Yearly	14.67	16.26	15.46	16.76	20.98	18.86	21.83	21.83	21.84	28.32	15.97	22.14	18.91

Month	CCWCID #19		San Benito Pump		Whipple Farm			CCWCID #11 (Avg. of 18 gages)			Los Fresnos Pump		
	1953	Average	1953	Average	1952	1953	Average	1952	1953	Average	1952	1953	Average
Jan.	.30	.22	.50	1.29	.50	0	.15	0	0	0	T	0	T
Feb.	.96	.53	.62	.66	.28	.74	.51	0	.69	.34	.61	.52	.56
Mar.	.36	.21	.17	1.11	.17	.30	.24	.25	.31	.28	.11	.70	.40
Apr.	.44	.50	.41	1.06	.34	.80	.57	.26	.69	.48	.35	1.15	.75
May	.09	2.52	.06	2.72	6.25	.10	3.18	3.36	.39	1.88	4.15	.30	2.22
June	.44	1.74	0	2.40	1.67	.35	1.01	2.73	.11	1.42	6.75	.45	3.60
July	.40	.40	1.70	1.68	1.40	4.10	2.75	2.21	2.21	2.21	1.18	2.95	2.06
Aug.	8.55	4.42	7.91	2.17	1.00	6.00	3.50	.59	10.84	5.72	0	6.60	3.30
Sept.	.81	3.26	.61	3.75	9.05	.65	4.85	5.17	.94	3.06	8.00	.35	4.18
Oct.	2.34	1.17	1.86	1.91	.25	1.95	1.10	0	2.27	1.14	0	4.30	2.15
Nov.	.70	1.86	.18	.83	2.60	1.05	1.82	2.00	2.22	2.11	4.90	.50	2.70
Dec.	.95	.80	.43	1.51	.75	.72	.73	.75	.65	.70	.67	.50	.58
Yearly	16.34	17.63	14.45	21.09	24.06	16.76	20.41	17.32	21.32	19.34	26.72	18.32	22.50

RAINFALL ON THE RIO GRANDE WATERSHED IN INCHES

In Mexico

The monthly records for Mexican rainfall stations, with averages for their periods of record, are tabulated below in their downstream order. These records have not been published elsewhere. On page 88, the same rainfall stations are listed in alphabetical order, showing the location, elevation, period of record, type of gage in use, tributary or subdivision of the Rio Grande watershed on which the station is located, and the observer. Daily rainfall records of these stations appear in Water Bulletin No. 23 published by the Mexican Section of this Commission.

Month	San Antonio, Durango		Parral, Chih.		Balleza, Chih.		La Boquilla, Chih.		Ojo Caliente, Chih.					
	1953	Average	1953	Average	1953	Average	1953	Average	1942	1943	1944	1945	1946	1947
Jan.	T	.36		.15	0	.29	0	.31	0	T	T	T	T	T
Feb.	.08	.05		.19	.16	.42	T	.14	T	0	T	T	0	.28
Mar.	.12	.05		.13	.08	.08	T	.18	T	0	T	0	T	T
Apr.	.45	.26	.02	.12	.08	.21	T	.17	0	T	.31	T	.58	.03
May	.89	.40	T	.33	T	.16	.30	.62	T	T	T	T	.80	.47
June	.39	2.05	.31	1.61	.10	1.16	.42	1.47	.46	2.22	.93	.94	1.38	2.24
July	.53	4.32	2.99	4.27	5.50	4.56	4.37	2.99	.09	5.21	6.93	3.90	1.25	1.22
Aug.	3.72	3.06	1.95	3.89		4.40	2.73	2.87	4.20	.94	2.81	T	2.80	3.61
Sept.	1.99	3.54	1.59	4.16	1.93	3.44	1.34	2.97	2.08	4.04	3.76	T	3.98	3.27
Oct.	1.00	1.11	.35	1.19	1.02	.71	.60	.96	.27	1.28	0	4.52	4.35	.57
Nov.	.57	.26	0	.62	0	.59	0	.39	T	.10	.68	0	0	T
Dec.	T	.32	.08	.48	.98	.48	.10	.42	0	.91	T	0	T	.08
Yearly	9.74	15.78		17.14		16.50	9.86	13.49	7.10	14.70	15.42	9.36	15.14	11.77

Month	Ojo Caliente, Chih.						Rosetilla, Chih.			Villalba, Chih.		Las Vírgenes, Chih.	
	1948	1949	1950	1951	1952	1953	Average		1953	Average	1953	Average	1953	Average
Jan.	T	.94	T	0	0	0	.08		0	.52	0	.39	0	.26
Feb.	0	T	0	0	T	0	.02		0	.05	0	.09	T	.03
Mar.	0	0	2.44	.24	0	T	.22		.10	.20	.12	.04	0	.05
Apr.	T	T	0	0	.39	T	.11		.03	.12	.04	.06	.01	.11
May	.16	T	.24	T	.86	.56	.26		.37	.27	.30	.16	.22	.17
June	1.06	.61	.35	0	11.12	.32	1.80		.05	1.41	.24	.90	.56	1.07
July	3.81	3.27	3.13	3.91	6.14	4.72	3.63		1.83	2.46	2.23	3.56	1.85	2.36
Aug.	1.16	3.22	1.30	.41	T	4.13	2.05		1.54	2.24	1.48	2.25	1.22	1.69
Sept.	2.10	3.40	1.87	1.33	T	2.72	2.38		2.28	2.27	2.54	2.83	2.31	1.63
Oct.	T	T	0	1.10	0	.24	1.03		.47	.90	1.26	1.23	.67	.67
Nov.	T	0	0	.20	T	0	.08		0	.22	0	.20	0	.16
Dec.	T	.54	0	1.02	..52	T	.26		0	.38	.05	.42	.04	.43
Yearly	8.29	11.98	9.33	8.21	19.03	12.69	11.92		6.67	11.04	8.06	12.13	6.88	8.63

Month	Delicias, Chih.		Guerrero, Chih.		La Junta, Chih.		Chihuahua, Chih.		Las Burras, Chih.					
	1953	Average	1953	Average	1953	Average	1953	Average	1949	1950	1951	1952	1953	Average
Jan.	0	.41	0	.55	0	.97	0	.30		.25	T	T	0	.06
Feb.	T	.10	.83	.43	1.75	.58	.04	.21		.01	.20	.06	.01	.07
Mar.	.18	.13	.07	.21	.04	.30	T	.23		.12	.70	0	.21	.26
Apr.	T	.10	.11	.18	.65	.20	T	.18		T	.01	.36	.02	.10
May	.20	.22	.06	.25	.04	.27	T	.35		.08	.04	.15	1.30	.39
June	.30	1.16	2.08	1.65	1.36	1.64	.08	1.48		.80	.80	3.16	.20	1.24
July	1.69	2.30	4.93	4.40	3.59	5.09	1.59	3.52	3.74	5.06	2.78	3.10	2.27	3.39
Aug.	1.42	2.10	3.04	4.87	3.92	4.93	1.44	3.32	2.66	1.41	.73	1.22	1.24	1.45
Sept.	1.41	2.11	.19	3.24	.17	2.32	.69	3.15	2.24	3.80	.37	1.54	.82	1.75
Oct.	.52	.85	.08	1.17	.19	1.30	.28	.88	.83	.01	.03	0	.21	.22
Nov.	0	.27	.08	.54	.09	.37	0	.49	0	0	0	.30	0	.06
Dec.	0	.42	.26	.74	.31	.88	.15	.41	.33	0	.33	.35	0	.20
Yearly	5.72	10.26	11.73	18.23	12.11	18.85	4.27	14.52		11.54	5.99	10.24	6.28	9.19

Month	Maclovio Herrera, Chih.		Cuchillo Parado, Chih.		Ojinaga, Chih.		Cd. Acuña, Coah.		Palestina, Coah.		Jiménez, Coah.		Piedras Negras, Coah.	
	1953	Average	1953	Average	1953	Average	1953	Average	1953	Average	1953	Average	1953	Average
Jan.	0	.38	0	.06	0	.24	.96	.37		1.23	.37	.14	.15	.09
Feb.	.06	.11	.07	.10	T	.16	.14	.14		1.07	.28	.80	.21	.20
Mar.	.63	.29	.11	.37	.47	.21	2.32	1.47		.76	1.87	1.79	1.72	1.37
Apr.	0	.28	.04	.12	T	.23	T	.48		1.56	0	1.08	.39	.37
May	.75	.70	.78	.56	.08	.53	.49	1.93		3.01	.12	2.57	.40	2.48
June	.71	1.73	.79	.88	.47	.77	0	.51	T	2.10	0	.86	0	.32
July	2.20	3.26	2.02	2.95	1.81	1.16	T	T	0	2.16	.08	.15	0	.20
Aug.	T	3.03	.61	.49	.20	1.24	4.65	1.65	3.44	2.44	8.21	2.77	7.31	2.61
Sept.	.74	4.04	.46	.24	.20	1.18	1.10	1.27	.47	3.16	2.48	2.06	1.61	1.62
Oct.	0	.64	T	T	.12	.90	1.06	.61	.51	1.31	1.85	1.35	.91	1.27
Nov.	0	.13	0	.17		.42	.06	.28	T	.71	.06	.39	.01	.54
Dec.	.08	1.11	.12	.23	.16	.42	.47	.48	.31	1.06	.43	.76	.48	.58
Yearly	5.17	15.70	5.00	6.17		7.46	11.25	9.19		20.57	15.75	14.72	13.19	11.65

Month	Allende, Coah.		Villa Hidalgo, Coah.		Nuevo Laredo, Tamps.		Monclova, Coah.		San Buenaventura, Coah.		Progreso, Coah.		Nueva Rosita, Coah.	
	1953	Average	1953	Average	1953	Average	1953	Average	1953	Average	1953	Average	1953	Average
Jan.	0	.50	T	T	T	.73	0	.44	0	.64	0	.49	0	.71
Feb.	.28	1.58	.71	.30	.79	.74	.78	.45	.99	.45	.47	.34	T	.46
Mar.	1.36	.67	.22	.76	.09	.80	.03	.31	T	.22	.90	.29	.79	.37
Apr.	0	.68	.08	.28	.63	1.14	.12	.55	.14	.54	.30	1.43	0	1.18
May	0	2.54	2.97	2.43	.73	2.33	.01	1.49	T	1.42	.19	2.20	T	2.69
June	0	2.10	T	.73	.07	1.88	.83	1.17	T	1.64	.11	1.61	T	1.93
July	0	1.04	T	.01	.17	1.36	.10	1.57	T	1.68	.08	.63	.28	1.50
Aug.	6.81	2.29	3.62	1.42	5.16	1.17	3.15	1.64	4.79	1.95	6.85	2.29	5.59	1.90
Sept.	1.26	2.60	1.06	1.81	1.26	2.69	.64	2.88	.25	2.04	.24	2.77	.87	2.29
Oct.	1.10	1.23	2.48	1.04	1.57	1.24	1.91	1.23	1.62	1.32	.85	1.95	1.38	1.55
Nov.	T	.25	T	.37	T	.78	.02	.56	T	.40	.10	.22	0	.49
Dec.	.39	.41	.59	.55	.53	1.05	.52	.59	.44	.73	.72	.65	.39	.72
Yearly	11.20	15.89	11.73	9.70	11.00	15.89	8.11	12.88	8.23	13.11	10.79	14.87	9.30	15.79

RAINFALL ON THE RIO GRANDE WATERSHED IN INCHES

In Mexico

Month	Sabinas, Coah.		Villa Juárez, Coah.		Don Martín, Coah.		Laguna de Salinillas, N.L.		Anáhuac, N.L.		Guerrero, Tamps.		Cd. Miguel Alemán, Tamps.	
	1953	Average	1953	Average	1953	Average	1953	Average	1953	Average	1953	Average	1953	Average
Jan.	T	.75	0	.62	T	.79	0	.65	0	.74	.12	.65	T	T
Feb.	.45	.88	.67	.38	.64	.65	.63	.68	.73	.49	.59	.63	.91	.30
Mar.	.30	.60	.24	.27	.39	.62	.83	.70	.69	.73	.71	.88	2.64	1.67
Apr.	T	1.24	T	.94	.01	1.25	.01	.85	0	1.06	.87	1.43	.16	.55
May	1.04	2.97	T	1.67	.03	2.17	1.73	2.42	1.30	2.57	.89	2.63	1.02	1.65
June	0	2.22	T	1.24	0	1.81	0	1.33	0	1.53	.04	1.54	T	1.94
July	.46	1.34	.16	.52	.41	1.04	0	.56	.30	1.31	.51	1.19	.63	1.14
Aug.	5.77	2.65	4.90	1.93	5.09	1.98	5.75	3.46	7.06	2.04	8.19	2.51	10.05	3.62
Sept.	1.09	3.60	.98	3.24	.98	2.85	.65	2.22	.33	2.79	2.19	3.16	3.35	4.87
Oct.	2.62	1.76	1.38	1.97	1.57	1.60	2.61	1.56	1.99	1.43	3.50	1.56	7.83	3.20
Nov.	T	.40	0	.50	T	.55	T	.38	T	.44		.51	T	.25
Dec.	.50	.59	.94	.40	.60	.78	.54	.53	.50	.84	.63	1.00	.91	.38
Yearly	12.23	19.00	9.27	13.68	9.72	16.07	12.75	15.34	12.90	15.97		17.69	27.50	19.57

Month	Rayones, N.L.		Montemorelos, N.L.		Laguna de Sánchez, N.L.		Villa Allende, N.L.		Santa Catarina, N.L.		Monterrey, N.L.		Las Comitas, N.L.	
	1953	Average	1953	Average	1953	Average	1953	Average	1953	Average	1953	Average	1953	Average
Jan.	0	.41	0	.81	0	.54	0	.88	0	1.05	0	.66	0	.34
Feb.	.52	.42	.93	.86	.47	.46	.63	.97	0	.40		.61	.27	.29
Mar.	2.10	.42	1.86	1.20	1.69	.68	1.84	1.48	.63	.35		.80	.61	.41
Apr.	.37	.75	1.06	2.14	1.20	1.26	1.60	2.19	T	.69	.24	1.18	.52	.92
May	T	1.27	.08	2.74	.57	1.67	T	3.01	.04	.64	.03	1.59	.33	.83
June	T	2.33	.28	3.74	1.91	3.66	.28	5.12	0	2.34	.02	2.87	.50	2.78
July	.37	1.05	.84	2.13	1.85	2.75	2.90	2.61	1.23	1.38	0	2.47	1.52	1.49
Aug.	5.84	3.33	14.31	4.21	7.50	5.18	15.11	5.53	2.09	3.27	3.28	3.12	5.84	3.89
Sept.	0	2.77	3.76	5.15	1.93	5.62	4.71	6.93	.25	3.15	1.06	5.70	1.56	4.59
Oct.	.29	1.66	11.57	3.57	5.71	2.96	10.61	5.68	3.49	1.82	3.80	3.24	3.93	2.11
Nov.	.43	.34	.39	1.52	T	.30	1.17	1.12	.08	.36	.02	1.31	.15	.31
Dec.	.54	.28	.65	1.02	.85	.51	.79	1.10	.46	.75	.75	.82	.27	.50
Yearly	10.46	15.03	35.71	29.09	23.68	25.59	39.64	36.62	8.27	16.23		24.37	15.50	18.46

Month	Villa de Santiago, N.L.		Cadereyta, N.L.		Las Enramadas, N.L.		El Cuchillo, N.L.		Gral. Bravo, N.L.		Gral. Cepeda, Coah.		Saltillo, Coah.	
	1953	Average	1953	Average	1953	Average	1953	Average	1953	Average	1953	Average	1953	Average
Jan.	0	.86	0	.80	0	.99	0	.84	0	.76	0	.52	0	.59
Feb.	.33	.92	.74	.90	.73	.63	.63	.56	.72	.42	.41	.43	.56	.49
Mar.	2.15	1.18	1.36	1.39	.94	.72	.91	.48	1.71	.65	.01	.29	.50	.39
Apr.	.18	1.69	.81	1.97	1.69	1.64	.22	1.60	.64	1.53	0	.36	.15	.71
May	.16	2.68	.13	2.28	.18	2.98	.14	1.84	.56	2.56	0	.77	.22	1.00
June	1.14	5.26	.04	3.66	0	3.62	.14	2.49	T	2.69	1.30	2.37	.43	2.14
July	.49	3.13	.05	2.49	1.38	2.28	.76	1.44	2.99	2.50	1.88	3.72	2.93	2.73
Aug.	7.69	5.39	13.36	3.67	12.50	3.34	17.21	3.31	17.68	2.62	2.97	2.99	2.47	2.37
Sept.	3.67	8.73	2.49	4.62	1.10	5.20	.24	3.79	1.20	3.59	.02	3.06	.71	2.53
Oct.	10.30	5.11	8.20	3.19	7.09	2.52	6.05	2.27	11.50	1.88	2.63	1.34	1.47	1.25
Nov.	.33	1.29	.19	1.23	.18	.62	0	.36	T	.85	0	.49	.06	.92
Dec.	.87	1.03	.54	.79	.86	.75	.53	.48	.83	.83	1.20	.61	1.86	.66
Yearly	27.31	37.27	27.91	26.99	26.65	25.29	26.83	19.46	37.83	20.88	10.42	16.95	10.96	15.78

Month	Ramos Arizpe, Coah.		Rinconada, N.L.		Ciénaga de Flores, N.L.		Topo Chico, N.L.		Higueras, N.L.		Los Ramones, N.L.		Los Herreras, N.L.	
	1953	Average	1953	Average	1953	Average	1953	Average	1953	Average	1953	Average	1953	Average
Jan.	0	.45	0	.26	0	1.30	0	.57	0	.81	0	.63	0	.64
Feb.	.61	.33	.47	.43	.42	.57	.17	.80	.35	.56	.79	.65	.63	.54
Mar.	.37	.34	.33	.29	1.73	.94	1.06	.83	.83	.62	1.42	.80	.85	.79
Apr.	.20	.47	.20	.71	1.12	1.07	0	1.20	.33	1.18	.39	2.06	.46	1.49
May	.24	.70	0	.48	T	1.93	0	1.10	0	1.71	.08	1.83	.03	2.69
June	T	1.16	0	1.12	1.13	2.72	0	2.34	1.22	2.64	.71	3.21	.28	3.16
July	.55	1.45	.10	.44	T	2.05	.16	1.50	.45	2.15	.26	1.97	4.29	1.31
Aug.	2.80	1.42	.81	1.75	22.22	4.80	9.96	3.54	7.01	3.07	16.28	4.16	9.69	2.92
Sept.	.35	1.76	.04	1.86	1.79	4.77	1.18	4.59	2.64	4.32	1.38	4.10	1.79	4.02
Oct.	.79	.65	.55	.88	2.60	2.05	3.70	2.25	4.90	1.72	4.13	2.33	4.76	2.21
Nov.	.24	.45	T	.21	T	.64	0	.82	0	.81	.12	.36	0	.44
Dec.	1.20	.57	.89	.29	.63	.75	.35	.72	0	.72	.26	.28	.32	.49
Yearly	7.35	9.75	3.39	8.72	31.64	23.59	16.58	20.26	17.73	20.31	25.82	22.38	23.10	20.70

Month	Cerralvo, N.L.		Comales, Tamps.		Anzaldúas, Tamps.		Camargo, Tamps.	San Miguel de Camargo, Tamps.		Río Bravo, Tamps.				
	1953	Average	1953	Average	1953	Average	1953	1953	Average	1950	1951	1952	1953	Average
Jan.	0	.69	0	.71	.18		.08	0			.22	.14	.67	.34
Feb.	.74	.56	.83	.64	.85		1.16	0			.04	.40	.63	.36
Mar.	.94	.89	.41	.80	1.90		1.87	2.09			.53	.06	.69	.43
Apr.	.57	1.52	.67	1.43	1.24		.20	.98			.16	.69	.65	.50
May	0	3.09	.45	1.89	.20		.39	.45			1.71	2.74	1.73	2.06
June	.06	2.80	.13	2.01	.02		.01	0			3.72	4.88	.02	2.97
July	1.79	1.35	2.68	1.10	.55		.35	.10			.26	4.67	1.00	1.98
Aug.	18.77	3.99	6.77	2.85	6.41		3.64	4.25			2.62	.06	5.75	2.81
Sept.	2.46	5.03	4.48	3.19	.24			0		2.42	5.93	1.52	1.04	2.73
Oct.	5.00	2.39	8.04	2.02	4.94		6.48	7.58		2.48	.57	T	3.48	1.63
Nov.	0	.41	0	.39	.33		.04			T	.83	1.95	.43	.80
Dec.	.43	.43	.29	.75	.22	.40	.39	.43		T	.08	.45	.77	.52
Yearly	30.76	23.15	24.75	17.78	17.08						16.67	17.56	16.86	16.83

Month	Reynosa, Tamps.		Retamal, Tamps.		Control (C-1-K-9), Tamps.		Matamoros, Tamps.		Valle Hermoso, Tamps.		Méndez, Tamps.		Linares, N.L.		Villagrán, Tamps.	
	1953	Average	1953	Average	1953	Average	1953	Average	1953	Average	1953	Average	1953	Average	1953	Average
Jan.	.20	1.08	.57	.36		1.21	T	1.46	.94	.32	0	.93	0	.95	0	.32
Feb.	.98	.46	.82	.33	.76	.67	.47	.86	T	.48	T	.58	.63	.83	.12	.78
Mar.	.71	.64	.67	.76	.51	.88	.33	1.05	.43	.52	2.81	1.10	1.03	1.23	.67	1.09
Apr.		.90	.44	.40	.43	.65	.79	1.43	.07	.25	0	1.18	.30	2.40	.71	2.64
May	.96	2.73	.81	2.45	.24	2.97	.26	2.85	.03	4.11	.48	3.20	.13	3.48	.24	5.19
June	.03	1.93	1.93	2.88	0	2.14	.10	3.32	.14	3.61	0	2.57	.52	3.74	.45	4.45
July	1.10	1.33	1.17	.96	1.61	1.12	1.97	2.14	.57	1.69	2.72	1.01	1.44	2.99	3.64	2.43
Aug.	5.35	1.85	4.81	1.98	3.56	3.00	2.68	2.09	5.43	1.99	5.50	4.23	13.10	3.42	14.25	6.83
Sept.	.55	2.47	.24	2.34	.31	4.22	.51	5.10	.07	5.17	0	3.60	2.72	6.26	.18	6.27
Oct.	5.05	1.77	4.89	1.44	3.05	2.01	3.53	2.82	5.98	3.32	3.37	1.96	6.19	3.23	6.04	3.56
Nov.	.46	.68	.33	.73	.39	1.09	.71	1.48	.04	.46	T	.29	.06	1.22	.18	.75
Dec.	.78	.70	.79	.46	.67	.63	.75	1.78	.41	.12	.60	.48	.87	1.03	.79	.32
Yearly		16.54	17.47	15.09		20.59	12.15	26.48	14.11	22.04	15.48	21.13	26.99	30.78	27.27	34.63

AVERAGE RAINFALL ON SUBDIVISIONS OF THE RIO GRANDE WATERSHED IN INCHES

With Totals and Averages for the 83 Years 1871-1953, Inclusive

Watershed Subdivision	Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
El Paso to Fort Quitman	1953	0	.36	.09	.41	.20	.30	4.89	.68	.15	.68	.02	.34	8.12
	Total	38.52	31.23	28.57	25.07	34.20	67.95	199.50	160.99	116.60	75.71	37.50	52.88	868.72
	Average	.46	.38	.34	.30	.41	.82	2.40	1.94	1.40	.91	.45	.64	10.45
Fort Quitman to Upper Presidio	1953	T	.12	.29	.07	.12	.70	2.38	.67	.14	1.36	.05	.18	6.08
	Total	32.29	20.75	22.03	32.01	50.73	100.90	271.12	204.78	163.81	81.00	33.66	48.30	1,061.38
	Average	.39	.25	.27	.39	.61	1.22	3.27	2.47	1.97	.98	.41	.58	12.81
* Upper Presidio to Johnson Ranch	1953	.06	.08	.68	.04	.13	.26	1.34	.75	.81	.33	T	.04	4.52
	Total	28.64	22.84	16.24	34.56	65.04	88.88	155.38	154.82	119.22	69.09	28.53	36.10	819.34
	Average	.35	.28	.20	.42	.78	1.07	1.87	1.86	1.44	.83	.34	.43	9.87
* Excluding Río Conchos, Alamito and Terlingua Creeks														
Johnson Ranch to Langtry	1953	.06	.10	.91	.16	.15	.37	.91	.91	.88	.39	T	.09	4.93
	Total	42.19	27.05	37.39	66.54	126.52	147.40	163.33	188.32	185.14	98.02	51.51	49.23	1,182.64
	Average	.51	.33	.45	.80	1.52	1.78	1.97	2.27	2.23	1.18	.62	.59	14.25
Pecos River Sheffield to Pecos River Station	1953	.09	.30	1.25	.63	.34	.36	.49	1.59	.87	2.01	.08	.29	8.30
	Total	59.93	72.99	69.91	165.43	145.59	201.64	161.51	173.66	200.62	149.97	80.56	67.75	1,549.56
	Average	.72	.88	.84	1.99	1.75	2.43	1.95	2.09	2.42	1.81	.97	.82	18.67
* Langtry to Del Rio	1953	.10	.10	1.53	.57	.19	T	.73	1.53	1.40	1.48	.02	.27	7.92
	Total	44.33	51.93	71.79	111.03	165.61	184.92	101.91	139.91	190.10	108.76	68.11	57.01	1,295.41
	Average	.53	.63	.86	1.34	2.00	2.23	1.23	1.69	2.29	1.31	.82	.69	15.62
* Excluding Pecos and Devils Rivers and Arroyo las Vacas														
Devils River	1953	.14	.20	2.21	.55	.90	.33	.76	3.05	1.40	2.30	.03	.42	12.29
	Total	56.47	52.53	97.88	149.33	215.40	220.05	148.83	178.18	245.14	176.67	139.11	91.31	1,770.90
	Average	.68	.63	1.18	1.80	2.60	2.65	1.79	2.15	2.95	2.13	1.68	1.10	21.34
* Del Rio to Eagle Pass	1953	.25	.17	2.05	.03	.16	.05	.13	5.73	3.00	1.61	.01	.45	13.64
	Total	63.79	73.90	91.36	136.36	247.92	201.80	160.05	161.75	253.15	156.93	89.27	78.20	1,714.48
	Average	.77	.89	1.10	1.64	2.99	2.43	1.93	1.95	3.05	1.89	1.08	.94	20.66
* Excluding San Felipe and Pinto Creeks, Río San Diego, and Río San Rodrigo														
* Eagle Pass to Laredo	1953	.07	.43	1.36	.40	1.21	T	.02	6.38	1.64	1.71	T	.40	13.62
	Total	62.45	65.14	86.79	129.28	267.22	208.91	117.18	197.41	248.38	145.69	80.82	87.50	1,696.77
	Average	.75	.78	1.05	1.56	3.22	2.52	1.41	2.38	2.99	1.76	.97	1.05	20.44
* Excluding Río Escondido														
* Laredo to Falcón	1953	.04	.70	.64	.72	1.14	.05	.39	6.68	1.60	4.02	.01	.68	16.67
	Total	61.87	62.07	73.68	119.63	283.19	151.68	193.08	152.62	238.36	125.39	138.75	69.85	1,670.17
	Average	.75	.75	.89	1.44	3.41	1.83	2.33	1.84	2.87	1.51	1.67	.84	20.13
* Excluding Río Salado														
* Falcón Dam to Rio Grande City	1953	.04	.81	1.99	.54	.73	.05	1.27	8.05	2.87	6.60	.02	.61	23.58
	Total	73.18	64.58	88.95	95.66	203.65	167.55	172.90	176.36	266.13	155.00	58.35	55.51	1,577.82
	Average	.88	.78	1.07	1.15	2.45	2.02	2.08	2.12	3.21	1.87	.70	.67	19.00
* Excluding Río Alamo and Río San Juan														
United States Side Below Rio Grande City	1953	.35	.94	.81	.58	.81	.14	1.15	7.14	.69	4.34	.60	.74	18.29
	Total	101.28	84.74	95.24	107.22	241.53	202.74	150.17	192.85	356.31	198.49	115.71	107.88	1,954.16
	Average	1.22	1.02	1.15	1.29	2.91	2.44	1.81	2.32	4.29	2.39	1.39	1.30	23.53

LOCATION OF RAINFALL STATIONS ON THE RIO GRANDE WATERSHED

For detailed information regarding the particular months or years missing from the periods of record shown below, see "Index to Precipitation Records" in Water Bulletins Nos. 10, 14, and 22. These indexes also include the sources of data and the years and months included in the periods of record through 1952 for all stations on or adjacent to the watershed of the Rio Grande in the United States and Mexico.

In the United States

STATION	LATITUDE	LONGITUDE	ELEVATION (FEET)	PERIOD OF RECORD	TYPE OF GAGE	WATERSHED SUBDIVISION	OBSERVER
Adams Bros. Ranch	30° 10'	101° 58'	2,150	Apr. 1952-1953	Standard	Johnson Ranch to Langtry	George Adams
American Dam	31° 47'	106° 32'	3,730	1938-1953	Standard	El Paso to Fort Quitman	IBWC
Apache Ranch	27° 56'	99° 56'	500	May 1953	Cumulative	Eagle Pass to Laredo	Joe Sitarski
Armistead Ranch	29° 35'	100° 39'	1,510	Dec. 1951-1953	Standard	Del Rio to Eagle Pass	Floyd Rodges
Arthur, C. L. Ranch	30° 23'	103° 45'	4,900	# 1946-1953	Standard	Adjacent to Pecos River Sheffield to Pecos River Station	C. L. Arthur
Arvin & Harkins - Bean	30° 26'	102° 23'	3,100	Nov. 1948-1953	Visual	Johnson Ranch to Langtry	Sid Harkins
Arvin & Harkins - Camel	30° 25'	102° 20'	2,890	Nov. 1948-1953	Visual	Johnson Ranch to Langtry	Sid Harkins
Arvin & Harkins - Header	30° 27'	102° 26'	3,400	Nov. 1948-1953	Visual	Johnson Ranch to Langtry	Sid Harkins
Arvin & Harkins - Headquarters	30° 27'	102° 19'	2,930	Nov. 1948-1953	Visual	Johnson Ranch to Langtry	Sid Harkins
Arvin & Harkins - Monty Corder	30° 27'	102° 14'	2,850	Nov. 1948-1953	Visual	Johnson Ranch to Langtry	Sid Harkins
Baugh, A. L. Ranch	29° 52'	104° 02'	3,820	# July 1942-1953	Standard	Alamito Creek	A. L. Baugh
Black Gap Game Refuge	29° 35'	103° 21'	2,250	1952-1953	Standard	Johnson Ranch to Langtry	F. O. Moore
Blogs Camp	30° 33'	104° 07'	5,650	# 1941-1953	Standard	Alamito Creek	J. H. McMichael
Bricker Ranch	29° 59'	101° 52'	1,680	May 1952-1953	Standard	Johnson Ranch to Langtry	Lena Mae Bricker
Buttrill Ranch	30° 00'	103° 16'	3,500	Mar. 1952-1953	Standard	Johnson Ranch to Langtry	Mrs. L. F. Buttrill
Castelon Ranger Station	29° 07'	103° 30'	2,100	# Mar. 1953	Standard	Upper Presidio to Johnson Ranch	Park Ranger
CCWCID #3 (La Feria District Office) Avg. of 6 gages	26° 09'	97° 49'	50	1952-1953	Standard	Lower Rio Grande Valley	CCWCID #3
CCWCID #11 (Bayview District Office) Avg. of 18 gages	26° 08'	97° 21'	25	1952-1953	Standard	Lower Rio Grande Valley	CCWCID #11
CCWCID #19 (Adams Gardens)	26° 10'	97° 47'	30	1952-1953	Standard	Lower Rio Grande Valley	CCWCID #19
Chaffin, N. B. Ranch	29° 54'	104° 02'	3,800	# 1947-1953	Standard	Alamito Creek	N. B. Chaffin
Cienega Mountain	29° 47'	104° 11'	4,100	# Sept. 1950-1953	Visual	Alamito Creek	H. M. Greenwood
Cinco de Mayo Ranch	29° 50'	101° 51'	1,680	# May 1952-1953	Standard	Johnson Ranch to Langtry	Louis Arledge
Comstock	29° 41'	101° 11'	1,530	May 1939-1953	Standard	Langtry to Del Rio	George Humphries
Corralitos Ranch	27° 07'	99° 27'	346	1953	Cumulative	Laredo to Falcón Dam	IBWC
County Line	31° 23'	105° 39'	3,550	1938-1953	Recording	El Paso to Fort Quitman	IBWC
Dale, O. C. Farm	26° 15'	98° 16'	150	1952-1953	Standard	Lower Rio Grande Valley	O. C. Dale
Devils Lake	29° 34'	100° 59'	1,080	May 1939-1953	Standard	Devils River	Central Power & Light Co.
Dove Mountain Ranch	29° 49'	102° 53'	2,770	Mar. 1952-1953	Standard	Johnson Ranch to Langtry	Roy McCracken
Dryden	30° 03'	102° 08'	2,160	# 1931-1953	Standard	Johnson Ranch to Langtry	IBWC
Edinburg Filtration Plant	26° 18'	98° 10'	100	1952-1953	Standard	Lower Rio Grande Valley	City of Edinburg
El Indio	26° 31'	100° 19'	725	June 1941-1953	Standard	Eagle Pass to Laredo	W. C. Smith
Fabens-Guadalupe Bridge	31° 26'	106° 08'	3,610	Apr. 1940-1953	Standard	El Paso to Fort Quitman	IBWC
Falcón Dam	26° 34'	99° 08'	323	Apr. 1950-1953	Standard	Laredo to Falcón Dam	IBWC
Fletcher, H. T. Ranch	30° 12'	104° 16'	5,100	# 1939-1953	Standard	Alamito Creek	H. T. Fletcher
Fort Bancock Bridge	31° 16'	105° 51'	3,500	Apr. 1940-1953	Standard	El Paso to Fort Quitman	IBWC
Fort McIntosh	27° 30'	99° 31'	410	# 1850-1953	Standard	Laredo to Falcón Dam	IBWC
Fort Quitman	31° 06'	105° 36'	3,430	# 1937-1953	Recording	El Paso to Fort Quitman	IBWC
Frick Farm	28° 45'	100° 31'	750	1952-1953	Standard	Del Rio to Eagle Pass	Maverick Co. WC&ID #1
Garner Ranch	29° 56'	102° 39'	2,600	1949-1953	Visual	Johnson Ranch to Langtry	Mrs. J. Garner
Greenwood, H.M.(Cienega Ranch)	29° 48'	104° 13'	4,000	Mar. 1941-1953	Standard	Alamito Creek	H. M. Greenwood
Guayuco Arroyo	31° 10'	105° 40'	3,600	# May 1940-1953	Recording	El Paso to Fort Quitman	IBWC
Hardgrave, E. W. Ranch	30° 18'	102° 09'	2,650	Apr. 1952-1953	Standard	Johnson Ranch to Langtry	Jack Hardgrave
HCWID #6 (Kies Office)	26° 19'	98° 01'	70	1952-1953	Standard	Lower Rio Grande Valley	HCWID #6
HCWID #6 (Goodwin Pump #4) Avg. of 3 gages	26° 18'	98° 22'	185	1953	Standard	Lower Rio Grande Valley	HCWID #6
HCWID #7 (Mission Office)	26° 17'	98° 18'	155	1952-1953	Standard	Lower Rio Grande Valley	HCWID #7
HCWID #15 (Edinburg Office)	26° 23'	98° 09'	95	1952-1953	Standard	Lower Rio Grande Valley	HCWID #15
Huisache Ranch	26° 57'	99° 20'	383	Aug. 1953	Cumulative	Laredo to Falcón Dam	IBWC
Island Station	31° 32'	106° 14'	3,630	1939-1953	Recording	El Paso to Fort Quitman	IBWC
Johnson Ranch	29° 01'	103° 23'	2,050	# July 1933-1953	Standard	Upper Presidio to Johnson Ranch	IBWC
Justapor Ranch	27° 53'	99° 27'	720	Oct. 1952-1953	Cumulative	Adjacent to Eagle Pass to Laredo	Mrs. M. A. Ray
Kelly Ranch	30° 32'	104° 16'	5,320	# 1941-1953	Visual	Adjacent to Alamito Creek	George Jones
Kokernot Ranch - Headquarters	29° 58'	103° 34'	4,120	1952-1953	Standard	Johnson Ranch to Langtry	David Kokernot
Kokernot Ranch - No. 2	29° 59'	103° 35'	4,170	1949-1953	Visual	Johnson Ranch to Langtry	David Kokernot
La Feria Pump	26° 03'	97° 50'	60	1952-1953	Standard	Lower Rio Grande Valley	CCWCID #3
Lane, Joe Ranch	30° 08'	103° 47'	4,960	1953	Recording	Alamito Creek	Joe Lane
Laredo Water Plant	27° 33'	99° 31'	410	1930-1953	Standard	Eagle Pass to Laredo	Laredo Water Plant
Laredo International Bridge	27° 30'	99° 29'	400	# 1941-1953	Standard	Laredo to Falcón Dam	U.S. Weather Bureau
Livingston Ranch	29° 49'	104° 22'	4,150	# 1951-1953	Standard	Upper Presidio to Johnson Ranch	J. S. Livingston
Loma Vista Ranch	30° 13'	103° 47'	5,450	# 1941-1953	Standard	Alamito Creek	Haye Mitchell
Los Fresnos Pump	25° 57'	97° 34'	30	1952-1953	Standard	Lower Rio Grande Valley	CCWCID #6
Madden Arroyo	31° 13'	105° 46'	3,500	Sept. 1941-1953	Recording	El Paso to Fort Quitman	IBWC
Maravillas	29° 34'	102° 47'	1,810	Oct. 1949-1953	Standard	Johnson Ranch to Langtry	IBWC
Marfa Experiment Station	30° 20'	103° 59'	4,800	1950-1953	Standard	Alamito Creek	P. H. Vardiman
Mariposa Mine	29° 20'	103° 43'	3,500	# 1951-1953	Visual	Upper Presidio to Johnson Ranch	Frank Duncan
Maverick County Canal Headgate	29° 10'	100° 46'	870	Mar. 1948-1953	Standard	Del Rio to Eagle Pass	Gate Tender
Maverick Power Plant	28° 50'	100° 33'	800	June 1952-1953	Standard	Del Rio to Eagle Pass	Central Power & Light Co.
McCracken Ranch	29° 51'	104° 14'	4,250	# 1941-1953	Standard	Alamito Creek	J. M. Humphreys
McFarland Ranch	30° 06'	104° 16'	5,310	# 1941-1953	Standard	Alamito Creek	M. E. Bomar
McDonagill Ranch-East Windmill	30° 20'	102° 55'	4,050	May 1952-1953	Visual	Johnson Ranch to Langtry	W. E. McDonagill
McDonagill Ranch-Headquarters	30° 20'	102° 58'	4,150	Apr. 1952-1953	Standard	Johnson Ranch to Langtry	W. E. McDonagill
Mission Pump	26° 10'	98° 20'	100	1952-1953	Standard	Lower Rio Grande Valley	HCWCID #14
Mitchell, Kerr Ranch	30° 13'	104° 00'	4,450	# 1941-1953	Standard	Alamito Creek	Mrs. Kerr Mitchell
Murse Farm	26° 19'	97° 55'	65	1952-1953	Standard	Lower Rio Grande Valley	Mr. Murse
Neely Ranch	30° 59'	105° 32'	3,350	Aug. 1941-1953	Standard	Fort Quitman to Upper Presidio	Mrs. Tom Neely
OZ Ranch	29° 51'	103° 45'	3,780	# 1914-1953	Standard	Terlingua Creek	Cavin Woodward
Panther Junction	29° 19'	103° 13'	4,100	June 1953	Standard	Johnson Ranch to Langtry	Park Ranger
Pecos River	29° 45'	101° 21'	1,060	# Mar. 1938-1953	Standard	Pecos River Sheffield to Pecos River Station	IBWC
Persimmon Gap Ranger Station	29° 40'	103° 10'	2,900	# Mar. 1948-1953	Standard	Johnson Ranch to Langtry	Park Ranger
Petan Ranch	30° 04'	104° 29'	5,400	1950-1953	Standard	Adjacent to Fort Quitman to Upper Presidio	Mr. Harrington
Potter, A. M. Ranch	29° 46'	103° 25'	3,440	1952-1953	Standard	Johnson Ranch to Langtry	A. M. Potter
Presidio (IBWC Gage)	29° 34'	104° 23'	2,550	Oct. 1949-1953	Standard	Upper Presidio to Johnson Ranch	IBWC
Pumpville	29° 57'	101° 44'	1,800	# Oct. 1946-1953	Standard	Johnson Ranch to Langtry	C. Cash
Quebec Ranch	30° 31'	104° 24'	4,600	1949-1953	Visual	Adjacent to Upper Presidio to Johnson Ranch	George Jones
Quemado	28° 56'	100° 37'	765	# Nov. 1941-1953	Standard	Del Rio to Eagle Pass	Walter P. Cox
Rio Grande City Gaging Station	26° 20'	98° 47'	150	July 1939-1953	Standard	Falcón Dam to Rio Grande City	IBWC
Roma	26° 24'	99° 01'	230	1941-1953	Standard	Falcón Dam to Rio Grande City	IBWC
Roosevelt, Al Ranch	30° 32'	104° 33'	4,330	1951-1953	Visual	Adjacent to Fort Quitman to Upper Presidio	Al Roosevelt
San Benito Pump	26° 03'	97° 45'	50	Oct. 1933-1953	Standard	Lower Rio Grande Valley	IBWC
San Jacinto Ranch	29° 44'	103° 59'	3,560	1953	Visual	Alamito Creek	N. B. Chaffin
Sand Valley Ranch	29° 33'	103° 16'	3,950	1952-1953	Standard	Johnson Ranch to Langtry	Mrs. W. G. Gulliher
Santa Yesabel Farm	27° 39'	99° 37'	440	Nov. 1952-1953	Standard	Eagle Pass to Laredo	Robert Cunningham
Santiago Peak Ranch	29° 55'	103° 23'	3,730	1953	Standard	Johnson Ranch to Langtry	Ellis Owens
Saur Ranch	30° 10'	104° 12'	4,880	# 1940-1953	Standard	Alamito Creek	H. T. Fletcher, Jr.
Stamberg, Steve Ranch	30° 11'	102° 53'	4,300	# 1943-1953	Recording	Johnson Ranch to Langtry	IBWC
Terlingua Creek Station	29° 12'	103° 36'	2,260	Mar. 1952-1953	Recording	Terlingua Creek	IBWC
Tortuga Ranch	28° 39'	100° 26'	780	May 1950-1953	Standard	Eagle Pass to Laredo	W. H. Brown
Van Emon Ranch	30° 52'	103° 59'	3,890	# 1947-1953	Standard	Alamito Creek	L. T. Van Emon
West Small	31° 16'	105° 33'	4,070	# May 1940-1953	Standard	El Paso to Fort Quitman	C. E. Chandler
Whipple Farm	26° 04'	97° 29'	25	1952-1953	Standard	Lower Rio Grande Valley	Harry Whipple
Willoughby, Ray Ranch	30° 12'	103° 33'	5,050	1952-1953	Standard	Johnson Ranch to Langtry	Cliff St. Clair
Wuensche Farm	28° 24'	100° 19'	640	# 1952-1953	Standard	Eagle Pass to Laredo	W. E. Brown
Zapata Station	26° 52'	99° 17'	300	May 1953	Cumulative	Laredo to Falcón Dam	IBWC

Some months or years missing

LOCATION OF RAINFALL STATIONS ON THE RIO GRANDE WATERSHED

In Mexico

STATION	LATITUDE	LONGITUDE	ELEVATION (FEET)	PERIOD OF RECORD	TYPE OF GAGE	WATERSHED SUBDIVISION	OBSERVER
Allende, Coah.	28° 21'	100° 51'	1,170	# 1947-1953	Standard	Río Escondido	Hydraulic Resources
Anáhuac, N.L.	27° 15'	100° 07'	650	# June 1933-1953	Standard	Río Salado	Hydraulic Resources
Anzalduas, Tamps.	26° 09'	98° 25'	110	Dec. 1952-1953	Standard	Lower Río Grande Valley	Hydraulic Resources
Balleza, Chih.	26° 57'	106° 21'	5,870	# 1903-1953	Standard	Río Conchos	Meteor. Service of Mexico
Cadereyta, N.L.	25° 36'	99° 59'	1,180	# 1904-1953	Standard	Río San Juan	Hydraulic Resources
Camargo, Tamps.	26° 20'	98° 49'	175	# 1953	Standard	Río San Juan	Hydraulic Resources
Cerralvo, N.L.	26° 06'	99° 37'	1,130	# 1938-1953	Recording	Río San Juan	Hydraulic Resources
Chihuahua, Chih.	28° 38'	106° 04'	4,690	# 1900-1953	Standard	Río Conchos	Meteor. Service of Mexico
Ciénaga de Flores, N.L.	25° 58'	100° 10'	1,760	Apr. 1938-1953	Recording	Río San Juan	Hydraulic Resources
Cd. Acuña, Coah.	29° 20'	100° 53'	919	1951-1953	Standard	Langtry to Del Río	Mexican Section IB&WC
Cd. Miguel Alemán, Tamps.	26° 24'	99° 02'	180	1951-1953	Standard	Falcón to Río Grande City	Mexican Section IB&WC
Comales, Tamps.	26° 14'	98° 58'	270	# Mar. 1938-1953	Recording	Río San Juan	Hydraulic Resources
Control (C1-K-9), Tamps.	25° 58'	97° 49'	59	# 1942-1953	Standard	Lower Río Grande Valley	Hydraulic Resources
Cuchillo Parado, Chih.	29° 26'	104° 53'	2,982	1951-1953	Standard	Río Conchos	Mexican Section IB&WC
Delicias, Chih.	28° 11'	105° 31'	3,710	# 1933-1953	Standard	Río Conchos	Hydraulic Resources
Don Martín, Coah.	27° 30'	100° 36'	790	# 1927-1953	Standard	Río Salado	Hydraulic Resources
El Cuchillo, N.L.	25° 43'	99° 16'	590	June 1938-1953	Standard	Río San Juan	Hydraulic Resources
Gral. Bravo, N.L.	25° 48'	99° 09'	390	# 1906-1953	Standard	Río San Juan	Meteor. Service of Mexico
Gral. Cepeda, Coah.	25° 24'	101° 29'	4,920	Aug. 1926-1953	Standard	Río San Juan	Hydraulic Resources
Guerrero, Chih.	28° 33'	107° 30'	6,560	# 1903-1953	Standard	Adjacent to Río Conchos	Meteor. Service of Mexico
Guerrero, Tamps.	26° 47'	99° 20'	295	# 1936-1953	Standard	Río Salado	Mexican Section IB&WC
Higueras, N.L.	25° 59'	100° 01'	1,640	# 1906-1953	Standard	Río San Juan	Meteor. Service of Mexico
Jiménez, Coah.	29° 04'	100° 40'	814	1951-1953	Standard	Del Río to Eagle Pass	Mexican Section IB&WC
La Boquilla, Chih.	27° 32'	105° 25'	4,320	# 1910-1953	Standard	Río Conchos	Río Conchos Hydroelectric Co.
La Junta, Chih.	28° 26'	107° 20'	6,730	# 1925-1953	Standard	Adjacent to Río Conchos	Hydraulic Resources
Laguna de Salinillas, N.L.	27° 26'	100° 22'	750	# 1940-1953	Standard	Río Salado	Hydraulic Resources
Laguna de Sánchez, N.L.	25° 21'	100° 16'	6,500	Apr. 1941-1953	Recording	Río San Juan	Hydraulic Resources
Las Burras, Chih.	28° 27'	105° 26'	3,586	July 1949-1953	Standard	Río Conchos	Hydraulic Resources
Las Comitas, N.L.	25° 26'	99° 07'	1,670	1940-1953	Standard	Río San Juan	Hydraulic Resources
Las Enramadas, N.L.	25° 48'	99° 16'	730	# 1926-1953	Standard	Río San Juan	Hydraulic Resources
Las Vírgenes, Chih.	28° 10'	105° 38'	4,068	# 1943-1953	Standard	Río Conchos	Hydraulic Resources
Linares, N.L.	24° 52'	99° 34'	1,180	# 1900-1953	Recording	Adjacent to Río San Juan	Hydraulic Resources
Los Herreras, N.L.	25° 55'	99° 24'	820	Sept. 1939-1953	Recording	Río San Juan	Hydraulic Resources
Los Ramones, N.L.	25° 42'	99° 13'	270	# 1939-1953	Recording	Río San Juan	Hydraulic Resources
Maclovio Herrera, Chih.	29° 03'	105° 08'	3,380	# 1924-1953	Standard	Río Conchos	Meteor. Service of Mexico
Matamoros, Tamps.	25° 52'	97° 30'	40	# 1912-1953	Standard	Lower Río Grande Valley	Meteor. Service of Mexico
Méndez, Tamps.	25° 07'	98° 35'	420	# 1939-1953	Standard	Adjacent to Lower Río Grande Valley	Hydraulic Resources
Monclova, Coah.	26° 54'	101° 25'	1,940	# 1897-1953	Standard	Río Salado	Meteor. Service of Mexico
Montemorelos, N.L.	25° 12'	99° 50'	1,420	# 1904-1953	Standard	Río San Juan	Hydraulic Resources
Monterrey, N.L.	25° 40'	100° 18'	1,730	# 1896-1953	Standard	Río San Juan	Hydraulic Resources
Nueva Rosita, Coah.	27° 55'	101° 17'	1,410	# 1925-1953	Standard	Río Salado	Meteor. Service of Mexico
Nuevo Laredo, Tamps.	27° 29'	99° 31'	420	# 1909-1953	Standard	Laredo to Falcón	Meteor. Service of Mexico
Ojinaga, Chih.	29° 34'	104° 25'	2,620	# 1906-1953	Standard	Río Conchos	Meteor. Service of Mexico
Ojo Caliente, Chih.	27° 37'	105° 16'	4,010	1942-1953	Standard	Río Conchos	Hydraulic Resources
Palestina, Coah.	29° 08'	100° 57'	1,080	# 1931-1953	Standard	Del Río To Eagle Pass	Hydraulic Resources
Parral, Chih.	26° 56'	105° 39'	5,740	# 1903-1953	Standard	Río Conchos	Meteor. Service of Mexico
Piedras Negras, Coah.	28° 42'	100° 31'	715	1951-1953	Standard	Del Río to Eagle Pass	Mexican Section IB&WC
Progreso, Coah.	27° 28'	101° 03'	1,200	# 1943-1953	Standard	Río Salado	Hydraulic Resources
Ramos Arizpe, Coah.	25° 32'	100° 58'	4,590	# 1907-1953	Standard	Río San Juan	Meteor. Service of Mexico
Rayones, N.L.	25° 01'	100° 05'	1,970	# 1926-1953	Standard	Río San Juan	Hydraulic Resources
Retamal, Tamps.	26° 02'	98° 02'	82	Oct. 1949-1953	Standard	Lower Río Grande Valley	Mexican Section IB&WC
Reynosa, Tamps.	26° 06'	98° 17'	130	# 1941-1953	Recording	Lower Río Grande Valley	Hydraulic Resources
Rinconada, N.L.	25° 40'	100° 40'	4,790	# Apr. 1944-1953	Standard	Río San Juan	Hydraulic Resources
Río Bravo, Tamps.	26° 00'	98° 06'	85	Sept. 1950-1953	Standard	Lower Río Grande Valley	Hydraulic Resources
Rosetilla, Chih.	28° 14'	105° 19'	3,780	1940-1953	Standard	Río Conchos	Río Conchos Hydroelectric Co.
Sabinas, Coah.	27° 54'	101° 17'	1,430	# 1922-1953	Standard	Río Salado	Hydraulic Resources
Saltillo, Coah.	25° 26'	101° 00'	5,280	# 1886-1953	Standard	Río San Juan	Hydraulic Resources
San Antonio, Dgo.	26° 25'	105° 21'	5,430	1943-1953	Standard	Río Conchos	Hydraulic Resources
San Buenaventura, Coah.	27° 05'	101° 33'	2,300	# 1926-1953	Standard	Río Salado	Meteor. Service of Mexico
San Miguel de Camargo, Tamps.	26° 14'	98° 36'	130	# 1953	Standard	Lower Río Grande Valley	Hydraulic Resources
Santa Catarina, N.L.	25° 41'	100° 26'	1,970	Oct. 1937-1953	Recording	Río San Juan	Hydraulic Resources
Topo Chico, N. L.	25° 49'	100° 20'	1,640	# 1939-1953	Recording	Río San Juan	Hydraulic Resources
Valle Hermoso, Tamps. (formerly 18 de Marzo)	25° 41'	97° 48'	56	# June 1949-1953	Standard	Lower Río Grande Valley	Hydraulic Resources
Villa Allende, N.L.	25° 17'	100° 01'	2,210	# 1938-1953	Standard	Río San Juan	Hydraulic Resources
Villa de Santiago, N.L.	25° 25'	100° 07'	1,460	# 1923-1953	Standard	Río San Juan	Hydraulic Resources
Villa Hidalgo, Coah.	27° 47'	99° 52'	499	1951-1953	Standard	Eagle Pass to Laredo	Mexican Section IB&WC
Villa Juárez, Coah.	27° 36'	100° 46'	900	# 1943-1953	Standard	Río Salado	Hydraulic Resources
Villagrán, Tamps.	24° 29'	99° 29'	1,260	# 1939-1953	Recording	Adjacent to Río San Juan	Hydraulic Resources
Villalba, Chih.	28° 01'	105° 46'	3,940	Oct. 1940-1953	Standard	Río Conchos	Hydraulic Resources

Some months missing

EVAPORATION IN THE RIO GRANDE BASIN IN INCHES

In the United States

Tabulated below are records of evaporation observed at eight stations from Presidio, Texas to Falcón Dam near Roma, Texas. All of these stations are operated and maintained by the United States Section of this Commission, except two. The one at Del Rio, Texas is operated by the U. S. Weather Bureau and the one at Tortuga Ranch near Eagle Pass, Texas is operated by the Maverick Irrigation District. At all stations, the exposure to wind is uniform and relatively unimpeded. The sites are 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. Within the enclosures, all vegetation either has been eradicated or is kept trimmed to within 3 inches of the ground surface. No water barrels, tanks or objects of similar size are stored within 100 feet of the enclosures.

Three types of pans are in use at these stations:

1. U. S. Weather Bureau Standard 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. This type of pan is in operation at Dryden, Fort McIntosh (Laredo), and Del Rio, Texas.

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 is in operation at Presidio, Johnson Ranch, Maravillas Creek, Dryden, Tortuga Ranch near Eagle Pass, Fort McIntosh (Laredo), and Falcón Dam, Texas.

3. A circular pan, 12 feet in diameter and 36 inches deep, made of 20-gage galvanized iron, is set in the ground with the rim of the pan 3 inches above the ground surface. The water level is maintained between 2.5 and 3.5 inches below the rim of the pan. This type of pan is in operation at Dryden and Fort McIntosh (Laredo), Texas.

Month	Presidio, Texas		Johnson Ranch, Texas		Maravillas, Texas		Dryden, Texas					
							2-Foot Pan		4-Foot Pan		12-Foot Pan	
	1953	Average Nov. 1949 -1953	1953	Average Oct. 1949 -1953	1953	Average Nov. 1949 -1953	1953	Average Sept. 1949 -1953	1953	Average Oct. 1944 -1953	1953	Average Oct. 1949 -1953
Jan.	4.51	4.23	5.13	4.70	5.18	4.72	5.92	4.34	8.39	4.69	5.40	4.14
Feb.	6.10	5.22	6.62	5.94	5.82	4.98	5.80	4.92	7.77	6.07	5.51	4.71
Mar.	8.51	8.88	8.04	9.06	7.12	7.40	6.07	7.56	9.17	10.22	6.25	7.07
Apr.	12.26	11.20	13.50	11.62	12.34	10.78	11.80	9.45	16.17	13.03	11.74	9.99
May	13.92	13.49	16.02	13.92	11.66	10.57	13.53	10.97	18.83	14.89	13.09	11.40
June	16.09	14.63	17.98	15.52	12.23	12.23	15.43	11.96	19.97	16.23	14.72	12.56
July	14.49	13.43	17.03	14.94	14.04	12.22	15.96	13.72	21.27	16.95	15.13	13.20
Aug.	13.49	14.63	13.79	15.09	8.88	11.66	12.85	12.63	14.80	15.73	12.96	12.37
Sept.	13.12	12.24	10.93	12.05	8.45	9.86	8.97	8.93	12.05	11.95	9.06	9.08
Oct.	9.40	9.26	9.28	9.33	8.06	7.87	7.23	6.88	9.94	8.00	7.14	6.56
Nov.	5.69	5.63	6.08	5.88	5.58	5.66	5.16	5.22	5.98	5.88	4.59	4.75
Dec.	3.97	3.89	4.86	4.66	5.32	4.38	4.27	4.16	4.65	4.63	3.51	3.59
Total	121.55	116.73	129.26	122.71	104.68	102.33	112.99	100.74	148.99	128.27	109.10	99.42

Month	Del Rio, Texas		Tortuga Ranch, Texas		Fort McIntosh, Texas						Falcón Dam, Texas	
					2-Foot Pan		4-Foot Pan		12-Foot Pan			
	1953	Average June 1952 -1953	1953	# Average 1952-1953	1953	Average Feb. 1950 -1953	1953	Average Feb. 1950 -1953	1953	Average Feb. 1950 -1953	1953	Average Apr. 1950 -1953
Jan.	6.22		4.20	4.22	4.78	4.61	6.46	5.77	4.11	3.94	5.36	5.03
Feb.	6.33		5.01	5.48	4.89	4.64	6.12	6.06	4.28	4.14	6.44	6.16
Mar.	8.69		5.18	5.92	6.65	7.00	9.20	9.01	5.72	6.48	7.58	8.48
Apr.	12.38		9.69	8.88	10.12	8.95	12.70	11.31	8.82	7.75	9.81	9.29
May	15.72		11.38	10.66	12.08	9.96	14.87	13.60	10.31	9.32	11.01	11.50
June	18.24	16.29	14.82	13.18	14.95	12.23	16.94	14.66	12.48	10.72	13.57	12.98
July	19.80	17.74	15.60	14.77	16.19	14.49	17.17	16.80	13.90	12.64	14.45	14.35
Aug.	13.99	15.56			11.70	12.78	13.49	15.08	9.91	10.90	10.98	12.49
Sept.	9.56	10.88			8.09	9.40	10.04	11.46	7.31	8.74	7.12	9.28
Oct.	7.10	8.52	5.74	7.22	5.87	7.46	6.38	8.05	5.05	6.29	5.55	7.48
Nov.	5.27	4.96	4.74	4.41	4.13	4.84	4.86	5.30	3.66	4.23	4.18	5.71
Dec.	3.76	3.79	3.19	3.27	3.65	3.87	3.72	4.38	3.11	3.22	3.95	4.56
Total	127.06				103.10	100.23	121.95	121.48	88.66	88.37	100.00	107.31

Some months missing

EVAPORATION IN THE RIO GRANDE BASIN IN INCHES

In Mexico

Tabulated below are records of evaporation observed at nine stations which are operated and maintained by the Mexican Section of this Commission. Eight stations are along the Rio Grande from Cd. Acuña, Coahuila to Matamoros, Tamaulipas and one is on the Río Conchos at Cuchillo Parado, Chihuahua. At all stations, the sites are 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. Inside the enclosures, all vegetation either has been eradicated or is 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 is uniform and relatively unimpeded.

The type of pan used at all of these stations is a U. S. Weather Bureau Standard 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 is maintained between 2 and 3 inches below the rim of the pan and is measured with a micrometer gage.

Data for other evaporation stations in the Rio Grande Basin in Mexico, which are operated by various Mexican Agencies, are available in Water Bulletin No. 23 published by the Mexican Section of this Commission.

Month	Cuchillo Parado, Chih.		Cd. Acuña, Coah.		Jiménez, Coah.		Piedras Negras, Coah.		Hidalgo, Coah.	
	1953	Average 1951-1953	1953	Average 1951-1953	1953	Average 1951-1953	1953	Average 1951-1953	1953	Average 1951-1953
Jan.	5.00	4.89	5.48	4.97	8.17	5.24	3.94	4.05	7.28	5.47
Feb.	7.06	6.36	5.46	5.66	4.76	5.34	5.63	5.45	6.66	6.14
Mar.	10.78	10.52	8.03	8.70	6.74	7.70	5.91	6.95	9.38	8.81
Apr.	14.32	13.69	11.67	10.96	9.93	9.29	10.59	9.90	14.25	11.80
May	16.98	16.38	13.14	11.64	12.02	10.23	13.67	11.71	15.26	14.00
June	18.06	17.61	15.09	13.43	14.19	11.96	12.85	11.77	19.17	15.02
July	17.01	15.54	16.28	15.22	15.65	13.89	16.41	15.11	20.59	17.78
Aug.	14.59	15.42	12.33	13.97	11.69	12.71	12.34	13.72	15.88	17.18
Sept.	12.54	12.88	8.13	9.57	6.56	8.20	6.41	9.10	10.86	11.98
Oct.	9.54	9.61	5.67	6.76	5.16	5.94	4.81	6.25	6.89	8.20
Nov.	5.97	5.54	4.11	4.12	3.48	3.56	3.38	3.56	6.41	5.81
Dec.	3.77	4.06	3.46	3.48	3.01	3.02	3.01	3.17	4.42	4.81
Total	135.62	132.50	108.85	108.48	101.36	97.08	98.95	100.74	137.05	127.00

Month	Cd. Guerrero, Tamps.		Cd. Miguel Alemán, Tamps.		Retamal, Tamps.		Matamoros, Tamps.	
	1953	# Average 1951-1953	1953	Average 1951-1953	1953	Average 1951-1953	1953	Average 1951-1953
Jan.	6.35	5.86	6.90	6.35	5.52	5.49	4.68	4.39
Feb.	5.76	6.40	6.96	7.55	5.24	5.72	4.04	4.47
Mar.	9.04	8.80	9.28	9.11	8.00	7.68	5.43	4.95
Apr.	12.41	11.69	11.59	11.05	9.83	9.11	6.15	6.23
May	14.00	13.27	13.07	12.56	10.31	10.43	6.22	7.89
June	17.60	15.53	17.11	14.35	12.19	10.57	10.11	8.59
July	18.00	16.79	18.18	16.13	11.65	10.66	9.96	9.91
Aug.	14.67	16.04	14.72	15.58	9.32	10.21	9.31	10.85
Sept.	10.31	10.91	7.97	9.19	8.21	8.04	7.14	8.72
Oct.	6.83	7.94	5.59	7.35	5.59	6.42	5.42	6.96
Nov.		5.07	4.07	4.84	3.99	3.96	3.61	3.90
Dec.	3.85	4.39	3.49	4.28	3.56	3.92	2.84	3.07
Total		122.69	118.93	118.34	93.41	92.21	74.91	79.93

Some months missing

TEMPERATURE, HUMIDITY, AND WIND

The mean monthly temperatures shown for Johnson Ranch in the United States and all stations in Mexico are averages of daily maximum and minimum thermometer observations.

The mean monthly temperatures and relative humidities at the Dryden, Fort McIntosh, and Falcón Dam evaporation stations 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.

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 Weather Bureau evaporation station.

Mean Temperature – Degrees Fahrenheit

In the United States

Month	Johnson Ranch, Texas		Dryden, Texas		Fort McIntosh, Texas		Falcón Dam, Texas	
	1953	Average Aug. 1945-1953	1953	Average July 1947-1953	1953	Average Feb. 1950-1953	1953	Average July 1950-1953
Jan.	57.6	53.4	54.5	48.4	61.8	61.6	61.1	62.8
Feb.	61.0	59.2	52.8	53.3	61.9	62.5	61.2	63.5
Mar.	72.8	67.6	65.4	60.6	75.9	69.8	74.9	71.6
Apr.	76.4	75.8	70.2	68.6	79.7	76.2	78.5	76.7
May	84.8	83.6	77.9	76.6	83.2	81.5	81.9	81.4
June	94.8	89.8	88.0	83.0	90.9	86.2	90.0	86.9
July	93.5	89.5	86.9	84.3	90.9	88.6	88.2	88.1
Aug.	89.8	89.3	83.3	83.4	89.8	88.7	85.4	87.8
Sept.	82.2	83.4	76.9	77.4	83.7	83.8	80.8	83.6
Oct.	75.4	74.8	68.1	68.9	75.0	75.8	72.0	75.8
Nov.	61.6	62.0	56.4	55.6	64.9	64.0	63.6	65.0
Dec.	51.3	54.9	44.2	49.2	53.7	56.8	53.2	58.7
Yearly	75.1	73.6	68.7	67.4	76.0	74.6	74.2	75.2

In Mexico

Month	Cuchillo Parado, Chih.		Cd. Acuña, Coah.		Jiménez, Coah.		Piedras Negras, Coah.	
	1953	Average 1951-1953	1953	Average Apr. 1951-1953	1953	Average Mar. 1951-1953	1953	Average Apr. 1951-1953
Jan.	52.7	53.2	55.8	57.4	57.2	58.6	55.4	56.8
Feb.	53.2	53.7	56.8	58.2	57.6	58.8	56.1	57.1
Mar.	64.0	61.1	69.1	65.8	68.9	65.5	67.6	64.4
Apr.	69.3	68.1	74.5	72.6	72.7	71.6	73.4	71.6
May	74.8	76.0	81.9	79.8	80.2	78.2	80.6	77.9
June	87.8	86.5	91.0	88.1	88.9	85.9	87.8	86.0
July	86.0	85.2	92.1	90.1	89.4	88.3	90.0	88.9
Aug.	84.6	85.8	88.9	90.6	86.7	88.0	84.6	87.6
Sept.	76.8	78.8	80.2	83.0	78.1	80.7	75.9	79.3
Oct.	69.8	69.7	72.0	72.6	72.0	71.7	68.7	69.5
Nov.	56.1	56.1	59.5	59.6	60.1	60.0	56.1	57.6
Dec.	44.6	49.3	48.2	51.9	50.0	52.8	47.1	50.9
Yearly	68.3	68.6	72.5	72.5	71.8	71.7	70.3	70.6

Month	Villa Hidalgo, Coah.		Cd. Guerrero, Tamps.		Cd. Miguel Alemán, Tamps.		Retamal, Tamps.		Matamoros, Tamps.	
	1953	Average Aug. 1951-1953	1953	# Average 1951-1953	1953	Average 1951-1953	1953	Average 1951-1953	1953	Average Apr. 1951-1953
Jan.	60.1	61.2	63.0	62.5	61.0	61.8	63.3	64.6	64.0	65.4
Feb.	57.6	59.2	61.9	63.4	61.5	63.0	63.5	64.3	64.0	65.4
Mar.	73.2	68.4	75.9	70.8	78.4	73.2	78.1	73.4	76.6	73.6
Apr.	77.4	75.8	78.6	76.3	80.6	77.6	80.1	77.2	81.0	75.2
May	79.9	79.4	82.4	80.9	84.6	82.4	83.1	81.6	82.4	79.9
June	89.2	87.0	88.9	85.6	90.9	88.0	88.9	86.5	84.7	82.8
July	89.4	88.4	87.3	86.3	90.5	89.1	88.5	87.7	85.6	85.0
Aug.	86.0	88.2	86.5	86.1	86.7	88.5	86.9	87.8	84.6	85.2
Sept.	81.0	82.5	82.0	82.6	82.8	84.0	82.6	83.2	81.1	81.6
Oct.	73.0	73.8	75.9	75.6	75.0	75.3	75.9	75.7	79.2	76.4
Nov.	60.8	61.5		64.6	65.1	65.2	67.3	66.7	71.6	68.3
Dec.	54.1	55.9	61.2	61.1	55.4	59.2	57.2	61.0	59.7	60.7
Yearly	73.5	73.4		74.6	76.0	75.6	76.3	75.8	76.2	75.0

Mean Relative Humidity – Percent

In the United States

Month	Dryden, Texas		Fort McIntosh, Texas		Falcón Dam, Texas	
	1953	Average July 1947-1953	1953	Average Feb. 1950-1953	1953	Average July 1950-1953
Jan.	39.2	50.8	33.2	47.6	48.5	54.3
Feb.	45.8	49.5	46.6	53.3	58.9	55.8
Mar.	49.7	42.0	50.3	50.0	62.9	58.6
Apr.	38.2	43.7	42.3	49.7	54.8	55.6
May	40.0	50.3	49.0	54.1	61.8	61.4
June	46.4	51.0	48.1	54.8	57.9	62.2
July	49.2	48.4	46.3	50.6	57.3	57.2
Aug.	56.0	49.0	56.2	52.4	69.0	59.4
Sept.	49.5	51.5	48.9	53.4	62.3	60.5
Oct.	60.5	54.4	61.3	54.1	73.5	61.6
Nov.	53.2	49.4	54.7	56.3	64.7	61.0
Dec.	48.9	52.0	56.3	55.1	64.3	57.8
Yearly	48.0	49.3	49.4	52.6	61.3	58.8

Some months missing

Mean Wind Speed – Miles Per Hour

In the United States

Month	Dryden, Texas		Fort McIntosh, Texas		Falcón Dam, Texas	
	1953	Average July 1947-1953	1953	Average Feb. 1950-1953	1953	Average July 1950-1953
Jan.	5.2	4.5	3.2	3.3	4.6	4.3
Feb.	5.3	5.0	4.1	4.0	5.5	5.5
Mar.	5.1	5.8	4.1	4.6	6.5	6.0
Apr.	6.4	6.1	4.5	4.6	6.2	6.5
May	7.3	6.8	5.2	5.0	7.2	7.3
June	7.9	7.0	5.4	5.1	7.5	7.9
July	7.1	5.9	5.3	4.9	7.5	7.6
Aug.	5.2	5.0	4.1	4.3	5.7	6.1
Sept.	4.0	4.3	2.3	3.2	3.5	4.9
Oct.	5.4	4.1	2.8	2.9	3.6	3.8
Nov.	4.5	4.1	2.4	3.0	3.1	4.3
Dec.	5.1	3.8	3.1	2.7	4.1	3.9
Yearly	5.7	5.2	3.9	4.0	5.4	5.7

DRAINAGE BASIN AND IRRIGATED AREAS
Along the Rio Grande and Tributaries – 1953

The total area within the outer rim of the Rio Grande Basin is about 335,500 square miles; however, in many places, particularly along the southwestern boundary of the basin, large areas contribute no surface runoff to the Rio Grande. Such non-contributive areas constitute about 48.8% of the total area, leaving 171,887 square miles of productive watershed. Only the productive part of the watershed is included in the list below.

The irrigated areas shown below are from the most reliable sources available and are listed according to the downstream sequence of the points of diversion of their irrigation water and, consequently, they may or may not be wholly within the indicated main river or tributary reach. They are all within the Rio Grande Basin, except in the Lower Rio Grande Valley below the Rio Grande City gaging station, where water is diverted at numerous points to irrigate lands which are adjacent to but do not contribute surface runoff to the Rio Grande. All of the areas listed are equipped with irrigation facilities. In the United States, all areas were irrigated in 1953. In Mexico, the areas classed as "Secondary" are those for which water is available only after the water requirements of the "Primary" areas have been satisfied.

DESIGNATIONS OF AREAS AND GAGING STATIONS	Drainage Basin Square Miles			Irrigated Areas—Acres			
	United States	Mexico	Total	United States	Mexico Primary	Mexico Secondary	Total
Above Elephant Butte Dam	25,923	0	25,923	a 726,000	0	0	726,000
Elephant Butte Dam to Caballo Dam	1,295	0	1,295	0	0	0	0
Above Caballo Dam	27,218	0	27,218	726,000	0	0	726,000
Caballo Dam to El Paso Station	2,049	0	2,049	104,020	0	0	104,020
Above El Paso Gaging Station	29,267	0	29,267	830,020	0	0	830,020
El Paso Station to American Dam	4	0	4	16,528	0	0	16,528
Above American Dam	29,271	0	29,271	846,548	0	0	846,548
American Dam to Juárez Station	41	47	88	0	18,039	0	18,039
Above Juárez Gaging Station	29,312	47	29,359	846,548	18,039	0	864,587
Juárez Station to Island Station	146	472	618	39,499	0	0	39,499
Above Island Gaging Station	29,458	519	29,977	886,047	18,039	0	904,086
Island Station to County Line Station	485	186	671	0	0	0	0
American Dam to County Line Station - Total	672	705	1,377	39,499	18,039	0	57,538
Above County Line Gaging Station	29,943	705	30,648	886,047	18,039	0	904,086
County Line Station to Fort Quitman Station	663	679	1,342	b 17,975	0	0	17,975
Above Fort Quitman Gaging Station	30,606	1,384	31,990	904,022	18,039	0	922,061
Fort Quitman Station to La Nutria	1,041	886	1,927	c 1,420	6,425	0	7,845
Above La Nutria Gaging Station (Inactive)	31,647	2,270	33,917	905,442	24,464	0	929,906
La Nutria to Upper Presidio Station	580	503	1,083	d 785	9,142	0	9,927
Above Upper Presidio Gaging Station	32,227	2,773	35,000	906,227	33,606	0	939,833
Río Conchos above Boquilla Dam	0	7,322	7,322	0	2,966	0	2,966
Río Conchos below Boquilla Dam	0	17,419	17,419	0	156,545	12,108	168,653
Río Conchos - Total	0	24,741	24,741	0	159,511	12,108	171,619
Upper to Lower Presidio Station - excluding Río Conchos	21	5	26	e 1,197	0	0	1,197
Upper to Lower Presidio Station - Total	21	24,746	24,767	1,197	159,511	12,108	172,816
Above Lower Presidio Gaging Station	32,248	27,519	59,767	907,424	193,117	12,108	1,112,649
Alamito Creek above gaging station	1,504	0	1,504	f 100	0	0	100
Terlingua Creek above gaging station	1,070	0	1,070	95	0	0	95
Lower Presidio to Johnson Ranch Station - excluding Alamito and Terlingua Creeks	1,439	2,671	4,110	g 3,807	3,682	1,977	9,466
Lower Presidio to Johnson Ranch - Total	4,013	2,671	6,684	4,002	3,682	1,977	9,661
Above Johnson Ranch Gaging Station	36,261	30,190	66,451	911,426	196,799	14,085	1,122,310
Johnson Ranch to Langtry Station	6,594	6,330	12,924	h 5,496	0	0	5,496
Above Langtry Gaging Station	42,855	36,520	79,375	916,922	196,799	14,085	1,127,806

a 1953 acreage not known. Latest available data from Water Bulletin No. 19. b Water for these 17,975 acres was supplied partly from wells. c Excludes 549 acres irrigated from wells and includes 1,309 acres supplied partly from wells. d Excludes 125 acres irrigated from wells. e Excludes 15 acres irrigated from wells. f Excludes 420 acres irrigated from wells and 35 acres irrigated from springs. g Excludes 817 acres irrigated from wells. h Excludes 100 acres irrigated from wells and 115 acres irrigated from springs, and includes 3,970 acres irrigated by spreader dams.

DRAINAGE BASIN AND IRRIGATED AREAS
Along the Rio Grande and Tributaries – 1953

DESIGNATIONS OF AREAS AND GAGING STATIONS	Drainage Basin Square Miles			Irrigated Areas—Acres			
	United States	Mexico	Total	United States	Mexico Primary	Mexico Secondary	Total
Pecos River above Girvin	29,562	0	29,562	i 116,860	0	0	116,860
Pecos River, Girvin to IBWC Gaging Station	5,731	0	5,731	j 255	0	0	255
Pecos River above IBWC Gaging Station	35,293	0	35,293	117,115	0	0	117,115
Goodenough Spring above Gaging Station	1	0	1	0	0	0	0
Devils River above IBWC Gaging Station	4,185	0	4,185	k 0	0	0	0
Arroyo las Vacas above Gaging Station	0	160	160	0	741	494	1,235
Langtry to Del Rio - excluding above tributaries	416	2,495	2,911	m 285	0	0	285
Langtry to Del Rio - Total	39,895	2,655	42,550	117,400	741	494	118,635
Above Del Rio Gaging Station	82,750	39,175	121,925	1,034,322	197,540	14,579	1,246,441
San Felipe Creek above Gaging Station	46	0	46	n 1,132	0	0	1,132
Pinto Creek above Gaging Station	236	0	236	p 0	0	0	0
Río San Diego above Gaging Station	0	916	916	0	6,054	0	6,054
Río San Diego - Total	0	926	926	0	7,290	741	8,031
Río San Rodrigo above Gaging Station	0	591	591	0	3,707	3,213	6,920
Río San Rodrigo - Total	0	842	842	0	6,178	3,954	10,132
Del Rio to Eagle Pass - excluding above tributaries	1,213	314	1,527	q 42,339	2,095	0	44,434
Del Rio to Eagle Pass - Total	1,495	2,082	3,577	43,471	15,563	4,695	63,729
Above Eagle Pass Gaging Station	84,245	41,257	125,502	1,077,793	213,103	19,274	1,310,170
Río Escondido above Gaging Station	0	1,279	1,279	0	6,178	8,649	14,827
Río Escondido - Total	0	1,320	1,320	0	6,178	8,649	14,827
Eagle Pass to San Antonio Crossing - excluding Río Escondido	237	186	423	210	264	0	474
Eagle Pass to San Antonio Crossing - Total	237	1,506	1,743	210	6,441	8,649	15,300
Above San Antonio Crossing	84,482	42,763	127,245	1,078,003	219,544	27,923	1,325,470
San Antonio Crossing to Laredo	1,236	2,378	3,614	5,872	9,074	0	14,946
Above Laredo Gaging Station	85,718	45,141	130,859	1,083,875	228,618	27,923	1,340,416
Río Salado above Venustiano Carranza Dam	0	13,819	13,819	0	54,363	8,896	63,259
Río Salado above Gaging Station *	0	21,503	21,503	0	68,942	19,027	87,969
Laredo to Zapata - excluding Río Salado	1,097	967	2,064	r 11,299	6,294	0	17,593
Laredo to Zapata - Total	1,097	22,470	23,567	11,299	75,236	19,027	105,562
Above Zapata Gaging Station	86,815	67,611	154,426	1,095,174	303,854	46,950	1,445,978
Zapata to Falcón Dam	945	169	1,114	s 610	t 247	0	857
Above Falcón Dam	87,760	67,780	155,540	1,095,784	304,101	46,950	1,446,835
Falcón Dam to Chapeño Gaging Station	2	40	42	195	0	0	195
Above Chapeño Gaging Station	87,762	67,820	155,582	1,095,979	304,101	46,950	1,447,030
Río Alamo above Gaging Station	0	1,663	1,663	0	4,942	5,436	10,378
Chapeño to Roma - excluding Río Alamo	85	118	203	2,709	2,965	0	5,674
Chapeño to Roma - Total	85	1,781	1,866	2,709	7,907	5,436	16,052
Above Roma Gaging Station	87,847	69,601	157,448	1,098,688	312,008	52,386	1,463,082
Río San Juan above Marte Gómez Dam	0	12,473	12,473	0	102,548	67,212	169,760
Río San Juan above Camargo Gaging Station	0	12,670	12,670	0		67,212	
Río San Juan - Total	0	12,679	12,679	0	264,765	67,212	331,977
Roma to Rio Grande City - excluding Río San Juan above Camargo Station	678	190	868		4,827	0	
Roma to Rio Grande City - excluding Río San Juan	678	181	859	4,827	1,977	0	6,804
Roma to Rio Grande City - Total	678	12,860	13,538	4,827	266,742	67,212	338,781
Above Rio Grande City Gaging Station	88,525	82,461	170,986	1,103,515	578,750	119,598	1,801,863
Rio Grande City to Anzaldúas Dam site	409	415	824	106,425	3,459	0	109,884
Above Anzaldúas Dam site	88,934	82,876	171,810	1,209,940	582,209	119,598	1,911,747
Anzaldúas to Matamoros	32	41	73	345,783	39,986	0	385,769
Above Matamoros Gaging Station	88,966	82,917	171,883	1,555,723	622,195	119,598	2,297,516
Matamoros to Lower Brownsville Station	2	2	4	10,562	0	0	10,562
Rio Grande City to Lower Brownsville Station	443	458	901	462,770	43,445	0	506,215
Above Lower Brownsville Gaging Station	88,968	82,919	171,887	1,566,285	622,195	119,598	2,308,078
Lower Brownsville to the Gulf of Mexico				4,121	0	0	4,121
Above Gulf of Mexico				1,570,406	622,195	119,598	2,312,199

* Río Salado at Cd. Guerrero, Tamaulipas gaging station. i Excludes 111,500 acres irrigated chiefly from wells, 1949 data. j Excludes 9,325 acres irrigated from wells and 125 acres irrigated from springs. k Excludes 815 acres irrigated from wells. m Excludes 64 acres irrigated from wells. n Excludes 125 acres irrigated from wells. p Excludes 490 acres irrigated from wells. q Excludes 175 acres irrigated from wells. r Includes 249 acres inundated by Falcón Reservoir in August 1953. s Includes 365 acres inundated by Falcón Reservoir in August 1953. t Includes 247 acres inundated by Falcón Reservoir in August 1953.

STREAM FLOW RECORDS

The following discharge records for 1952 were omitted from Water Bulletin Number 22 because the operation of these gaging stations began near the end of the year. For station descriptions, see pages 20, 47, and 50, respectively, in this water bulletin, Number 23.

Mean Daily Discharge in Second-Feet 1952

RIO GRANDE
AT AGUA VERDE STATION

Day	Nov.	Dec.
1		353
2		353
3		348
4		340
5		338
6		339
7		337
8		333
9		331
10		335
11		334
12	295	329
13	312	333
14	318	337
15	327	336
16	328	331
17	328	335
18	327	358
19	334	369
20	356	370
21	342	364
22	340	356
23	335	347
24	333	345
25	330	359
26	331	362
27	322	366
28	319	374
29	329	381
30	345	399
31		397
Sum		10,889

RIO GRANDE
AT PROGRESO BRIDGE, TEXAS

Day	Dec.
1	338
2	326
3	384
4	332
5	302
6	301
7	312
8	347
9	327
10	324
11	366
12	358
13	296
14	264
15	278
16	274
17	321
18	306
19	303
20	238
21	272
22	295
23	312
24	283
25	296
26	280
27	371
28	354
29	414
30	440
31	462
Sum	10,076

RIO GRANDE
NEAR SAN BENITO, TEXAS

Day	Nov.	Dec.
1		70.2
2		53.7
3		39.2
4		101
5		68.2
6		73.5
7		49.3
8		65.0
9		84.9
10		78.0
11		63.2
12		94.4
13		86.7
14		34.7
15		21.7
16		72.9
17		111
18		135
19		57.2
20		43.7
21		92.0
22		103
23		117
24		116
25		32.7
26	82.4	43.6
27	77.8	64.0
28	117	146
29	82.4	115
30		123
31		141
Sum		2,496.8

CORRECTIONS TO PREVIOUS WATER BULLETINS

RIO GRANDE AT ROMA, TEXAS

The Period Maximum acre-feet of 3,372,000 for October, as shown in Water Bulletins Numbers 19, 20, 21, and 22 is erroneous. The correct figure is 2,372,000 acre-feet.

INDEX TO PRECIPITATION RECORDS - United States

WATER Bulletin Number 22

1. The latitude for Kerr Mitchell Ranch should be 30° 13'.

2. Two stations should be shown for Presidio, namely:

a. Presidio, USWB Gage, Latitude 29° 33', Longitude 104° 24', and Elevation 2,582'. Monthly reports may be found in "Climatological Data, Texas" for the unbroken period 1945 through 1952.

b. Presidio, IB&WC Gage, Latitude 29° 34', Longitude 104° 23', and Elevation 2,550'. Monthly reports may be found in IB&WC Water Bulletins Numbers 19 to 22, inclusive, for the unbroken period November 1949 through 1952.

3. The longitude of the station at Roma should be 99° 01'.