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WATER BULLETIN NUMBER 11

Flow of the Rio Grande and Tributary Contributions

From San Marcial, New Mexico to the Gulf of Mexico

1941

WITH MAXIMUMS, MINIMUMS AND NORMALS

STORAGE CAPACITIES AND WATER STORED IN LARGE RESERVOIRS

SOURCES OF RIVER FLOW

DIVERSIONS

SILT, CHEMICAL CONSTITUENTS, SALT BURDEN

SANITARY ASPECTS OF WATER QUALITY

RAINFALL AND EVAPORATION

DRAINAGE BASIN AND IRRIGATED AREAS

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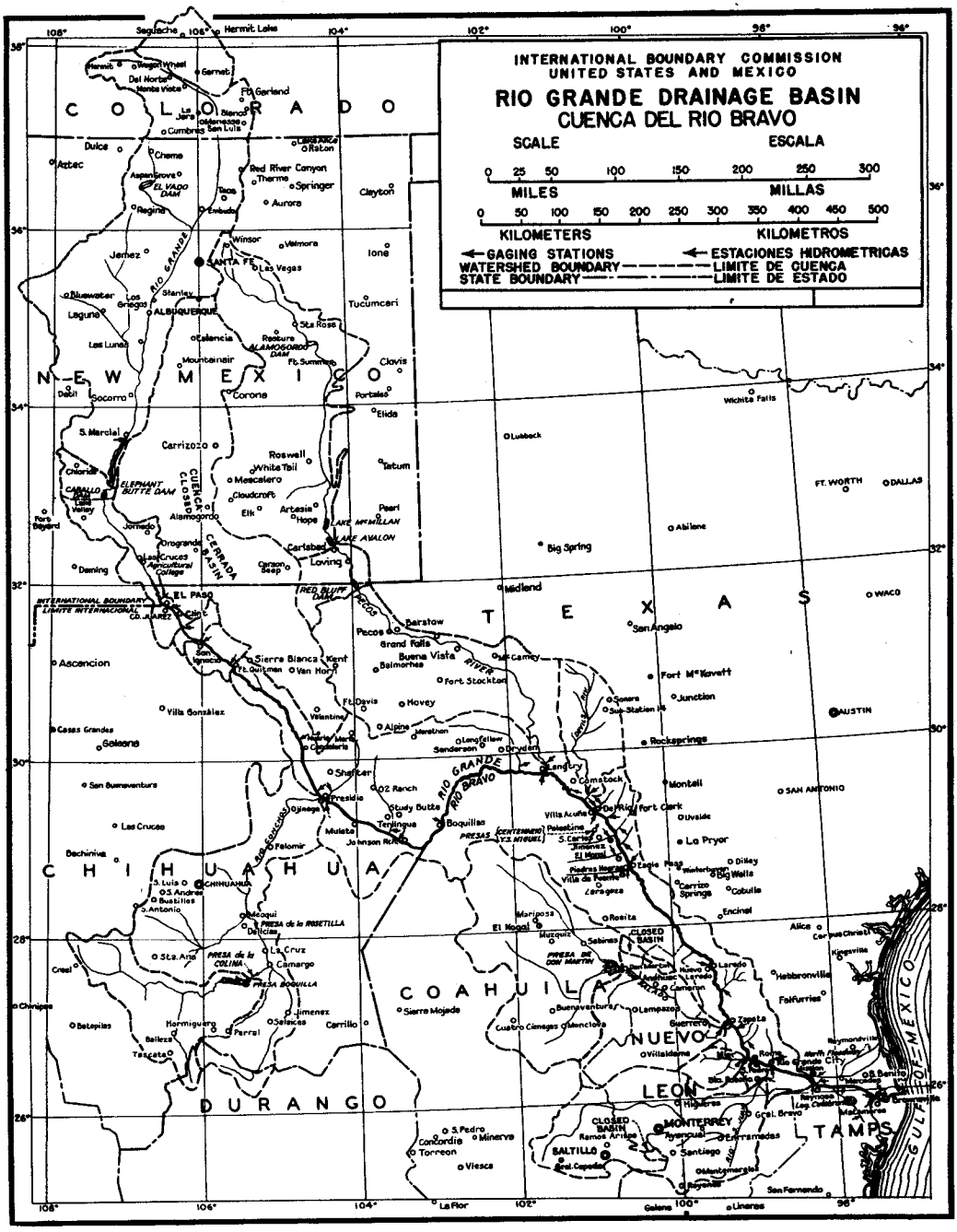

INTERNATIONAL BOUNDARY COMMISSION
UNITED STATES AND MEXICO
RIO GRANDE DRAINAGE BASIN
CUENCA DEL RIO BRAVO
SCALE
ESCALA
MILES
MILLAS
KILOMETERS
KILOMETROS
GAGING STATIONS
ESTACIONES HIDROMETRICAS
WATERSHED BOUNDARY
LIMITE DE CUENCA
STATE BOUNDARY
LIMITE DE ESTADO
COLORADO
NEW MEXICO
TEXAS
CHIHUAHUA
COAHUILA
NUEVO LEON
TAMPS.
DURANGO
GULF OF MEXICO
RIO GRANDE
RIO BRAVO
SANTA FE
ALBUQUERQUE
EL PASO
CD. JUAREZ
MONTERREY
SALTILLO
AUSTIN
SAN ANTONIO
DALLAS
FT. WORTH
WACO
Lubbock
Midland
Big Spring
Abilene
Del Rio
Laredo
Brownsville
Matamoros
Reynosa
Monclova
Torreon
Durango
Chihuahua
Saltillo
Monterrey
Nuevo Laredo
Piedras Negras
Ciudad Juarez
Chihuahua
Durango
Torreon
Saltillo
Monterrey
Nuevo Laredo
Matamoros
Reynosa
Brownsville
Corpus Christi
Kingsville
Alice
Falfurrias
Hebbronville
Encinal
Cotulla
Carrizo Springs
Uvalde
La Pryor
Eagle Pass
Del Rio
Fort Clark
Junction
Rocksprings
Sonora
Ft. Stockton
Pecos
Balmorhea
Marfa
Van Horn
Sierra Blanca
Kent
Ft. Quitman
Ft. Davis
Alpine
Marathon
Sanderson
Dryden
Langtry
Comstock
Presidio
Ojinaga
Boquillas
Terrazas
Juarez
Muleta
Palomas
Ascencion
Villa Ahumada
Villa Acuña
Palestina
Jiménez
Camargo
Delicias
Meoqui
Parral
Hidalgo
Guerrero
Zaragoza
Rosita
Muzquiz
Sabinas
Lampazos
Villaldama
Higueras
Santiago
Linares
Galeana
Cananea
Nogales
Douglas
Agua Prieta
Sierra Mojada
Cuatro Ciénegas
Monclova
Torreon
Durango
Chihuahua
Ciudad Juarez
Nuevo Laredo
Monterrey
Saltillo
Durango
Torreon

FOREWORD

This compilation of stream discharges and related data is the eleventh unified publication relative to the cooperative determination of the flow of the international portion of the Rio Grande. The first such publication was Water Bulletin No. 1, covering the year 1931. These data are published jointly by the United States and Mexican Sections of the International Boundary Commission and represent the results of stream flow measurements and related data from the Rio Grande and important tributaries near their confluence, from San Marcial, New Mexico, which is at the head of Elephant Butte reservoir, to the Gulf of Mexico, for the year 1941 as well as adjustments to and authentications of hydrographic records.

International stream gaging was begun in 1889, with the operation of the station at El Paso, Texas. A number of stations on the Lower Rio Grande and tributaries below El Paso were established in 1900 and operated until 1914. From 1914 to 1923, all such work was suspended except for a few months in 1919 and 1920. In 1923 the work was resumed and carried on independently by the two countries until 1931, when the present cooperative work began.

The duties and functions of the United States Section of the International Water Commission were transferred to the United States Section of the International Boundary Commission by Act of June 30, 1932. On January 1, 1932, the Mexican Section of the International Boundary Commission similarly took over the duties of the Mexican Section of the International Water Commission. On January 1, 1935, an International Water Commissioner for Mexico was again appointed, and though separated, the two Commissions functioned as one. In January 1941 the two Mexican Commissions were again combined into one.

This cooperative arrangement for obtaining hydrologic data is the result of the concurrence and agreement by both sections of the International Commission that a coordinated result should be insured and that an accurate and complete hydrographic record of international flow was necessary.

Of stream gaging stations on the Rio Grande, those at Juarez, Eagle Pass, Laredo, Roma and Matamoros were operated in 1941 by the Mexican Section of the Commission, the others by the United States Section. Each section operated the gaging stations on tributaries entering the Rio Grande from its own country, or on floodways or diversions within its borders.

Because of more recent maps and aerial photographs, the river mileages used herein are more accurate than those used in previous Water Bulletins.

As a wartime conservation measure the size of this Water Bulletin has been reduced, the mass of essential data in certain sections has been compressed on the pages, and the index to all Water Bulletins has been eliminated from this issue. For finding all of the data for a particular stream measuring station or a particular subject, etc., please refer to the index to all Water Bulletins, pages 106-111 in Water Bulletin No. 10.

A factual picture of the Rio Grande along the international boundary, the various important aspects of the quantity and quality of its water, and the uses thereof, is more easily gained from the mass of essential detailed data in the Water Bulletins if the reader will look to the generalizations of the data which appear at the lower side and right-hand side of the tabulations, and also to the maps and graphs.

ACKNOWLEDGMENTS

Some of the data published herein relative to drainage basin and irrigated areas, chemical and bacteriological analyses, silt, stored water, evaporation and rainfall have been furnished by the following agencies within the two countries: United States Department of Agriculture, United States Bureau of Reclamation, United States Army, Agriculture and Mechanical College of Texas, Middle Rio Grande Conservancy District, Texas State Board of Health, El Paso City-County Health Unit, the Department of Water and Sewage of the City of El Paso, Federal Board of Public Improvements of Nuevo Laredo, Tamaulipas, National Irrigation Commission of Mexico, Cia. Agricola y de Fuerza Electrica Del Rio Conchos, S. A., the Mexican Department of Agriculture and Development, National Bank of Agricultural Credit of Mexico, The Meteorological Service of Mexico, and private individuals and corporations. Specific acknowledgment is made where the data appear.

FOREWORD

General Hydrologic Conditions for 1941

Along and Adjacent to
The International Portion of the Rio Grande

During 1941 the precipitation was in general very much above normal and evaporation was decidedly below normal on both sides of the Rio Grande basin. On the United States side of the Lower Rio Grande Valley the 1941 annual rainfall was 38.84 inches. A yearly rainfall over the entire valley of this magnitude occurs on the average only once in 42 years.*

The yearly flow of the Rio Grande was very much above normal as were several of its large tributaries. At San Marcial the annual flow was the greatest ever recorded (47 years, 1895-1941), despite the fact that consumptive uses and storage accumulations in 1941 above San Marcial were much greater than in most of the former 46 years. The annual flow at Rio Grande City was 149% of the 1924-1941 normal. The monthly flow for May was the greatest of any May during the past 18 years of record at Rio Grande City and Roma.

The United States measured tributaries below Fort Quitman flowed about 167% of their annual average, while the Mexican measured tributaries flowed about 153% of their annual average.

During 1941 three flood peaks of note occurred at Rio Grande City. The first was on June 24 with a peak flow of 48,000 second feet. It came almost entirely from the Rio San Juan. The second flood occurred on September 11, with a peak of 72,100 second feet. It came principally from the Rio San Juan with some contribution from the Rio Grande. The third flood peak was on September 22 when the crest flow reached 55,600 second feet, only a small part of which came from the Rio San Juan. A major portion of this flood came from the Rio San Diego where a peak flow of 75,200 second feet occurred on September 18. Other contributions came from the Rio Grande above Devils River.

The monthly average amount of water in storage was very much above normal in all reservoirs of the basin except Don Martin on the Rio Salado of Mexico where storage was below normal. The monthly average in all reservoirs combined was about 122% of normal.

Reflecting the abnormal rainfall and subnormal evaporation over the basin the average amount of water consumed in irrigation per acre of land was, in general, below normal in the basin. The amount of water consumed in 1941 in the El Paso-Juarez Valley was the smallest in the period 1924-1941, being only about 62% of the normal for the period, whereas, the area irrigated was the largest in the period. On the American side below Rio Grande City the amount of water diverted from the Rio Grande per acre of land cultivated, was the smallest of any year of record (1922-1941) and on the Mexican side no water was diverted for irrigation because of excessive rainfall.

Municipal diversions from the Rio Grande were above normal.

At San Marcial, New Mexico, 15,900 acre-feet of suspended silt passed down the Rio Grande. This was 42% above normal. At Eagle Pass 20,800 acre-feet of suspended silt passed the station. This was 214% of normal and the largest annual amount of record. At Roma 195% of normal silt, or 25,700 acre-feet, passed the station. The silt coming from the Rio Alamo and the Rio San Juan was approximately normal.

The annual tonnage of salts, or total dissolved solids, carried by the Rio Grande at the various gaging stations and tributary contributions, were the greatest since full records began in 1935, except at Caballo Dam, Leasburg Dam, and El Paso. At most stations the salt burden was about twice normal. The inflow of salts to the Rio Grande from the Pecos during 1941 was about 3-1/3 times normal, and constituted a menacing development, particularly because the average concentration was also the greatest of record since 1935, being 4.36 tons per acre-foot of water. The concentration of salts in the water from other tributaries was not particularly above normal. The total tonnage of salts leaving the El Paso-Juarez Valley at Fort Quitman gaging station was greater than that entering the valley at the El Paso station. This is a very rare occurrence.

The 1941 sanitary sampling of Rio Grande water has shown conclusively that at all seasons of the year, and at all points along the Rio Grande, from El Paso to the Gulf, coliform organisms are present in the river water in such densities as to render the water unfit for human consumption without proper treatment.

* See p. 80, W.B. 10.

RIO GRANDE AT SAN MARCIAL STATION

DESCRIPTION: Water-stage recorder and cable with sit-down cable car and winch located at railroad bridge about one mile below San Marcial, New Mexico, and 177.1 miles above the American Dam at El Paso, Texas. The recorder is on the upstream end of the first bridge pier from the south abutment of the bridge and the zero of its gage is 4,455.38 feet, United States Coast and Geodetic Survey sea level datum. The recorder was moved to the downstream end of the south abutment of the bridge on May 17, 1941. Zero of this gage is 4,459.08 feet (same datum). The recorder was returned to the original location on June 19, 1941.

RECORDS: Based upon 187 meter measurements, by wading, and from cable about 1,000 feet above railroad bridge (119 measurements by I.B.C. and 68 by U.S.G.S.). Computations by shifting channel methods. 1941 records good. Records available: January 1895 to December 1941.

REMARKS: For gage history 1895 to 1938 see Water Bulletins Nos. 4, 7 and 8. During 1941 the river continued to flow through the Val Verde area. See Water Bulletin No. 7.

El Vado and smaller reservoirs and many irrigation diversions and drainage returns above this station in Colorado and New Mexico modify the river flow.

COMPARATIVE FLOWS FROM RECORDS: Momentary Peak: Max., Oct. 11, 1904, 50,000 sec. ft. with water surface level of 4,459.5 ft. on U.S.C. & G.S. datum about .25 mile above the present station gage. This is the greatest flood peak flow in at least the past 113 years, or since 1828. Min., sometimes dry. See Water Bulletin No. 6, page 79, for large peak flows since 1828 and their average frequency. Daily: Max., Oct. 11, 1904, 33,000 sec. ft. average. Min., sometimes dry. Monthly: Max., May 1941, 16,159 sec. ft. average. Min., sometimes dry. Yearly: Max., 1941, 3,911 sec. ft. average. Min., 1902, 277 sec. ft. average. Two Successive Years: Max., 1905 and 1906, 2,750 sec. ft. average. Min., 1899 and 1900, 487 sec. ft. average. Three Successive Years: Max., 1905 to 1907, 2,830 sec. ft. average. Min., 1900 to 1902, 609 sec. ft. average. Four Successive Years: Max., 1905 to 1908, 2,390 sec. ft. average. Min., 1899 to 1902, 539 sec. ft. average. Five Successive Years: Max., 1905 to 1909, 2,260 sec. ft. average. Min., 1898 to 1902, 697 sec. ft. average. Ten Successive Years: Max., 1903 to 1912, 1,980 sec. ft. average. Min., 1925 to 1934, 1,170 sec. ft. average. Forty-seven Year Average: 1,557 sec. ft.

Mean Daily Discharge in Second Feet 1941 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	793	877	1,330	2,150	4,200	18,100	9,630	868	1,240	5,280	4,430	1,600
2	823	979	1,130	2,250	5,020	16,900	8,510	727	1,870	3,280	4,250	1,670
3	856	842	987	2,160	6,260	15,200	7,540	623	1,110	2,370	4,420	1,560
4	890	831	974	2,300	7,910	13,500	6,790	593	977	3,320	4,310	1,640
5	939	762	971	2,200	9,630	13,500	6,030	523	698	6,110	4,070	1,640
6	852	881	1,040	1,950	12,800	13,200	5,510	461	566	4,260	4,030	1,740
7	818	1,650	1,110	2,040	13,300	12,400	5,550	396	587	2,520	4,000	2,000
8	749	1,520	1,080	2,530	11,700	12,500	4,870	416	489	1,850	3,700	1,780
9	598	1,320	1,170	2,280	12,300	12,300	4,570	554	325	1,900	3,440	1,680
10	652	1,210	1,280	1,620	14,300	12,400	4,360	1,320	321	1,940	3,200	1,560
11	707	1,160	1,280	1,520	15,300	13,000	4,360	2,110	346	2,360	2,600	1,630
12	766	1,060	1,220	1,600	16,300	12,000	4,210	3,190	244	2,590	2,370	1,870
13	803	1,080	923	1,990	17,500	11,200	4,180	1,990	200	2,600	2,220	1,820
14	747	1,110	898	2,170	17,500	*9,800	4,830	2,250	178	2,710	2,390	1,730
15	780	1,120	1,000	2,110	18,000	*8,730	3,650	2,540	159	2,640	2,420	1,770
16	851	1,120	1,080	2,250	21,300	7,630	3,290	1,920	154	3,640	2,500	1,750
17	777	1,070	1,260	2,150	23,900	7,050	3,470	1,820	324	3,630	2,560	1,720
18	781	953	1,100	1,850	23,200	6,490	2,900	1,380	496	3,130	2,580	1,600
19	795	1,110	1,300	1,980	22,300	*6,010	2,820	1,600	570	3,350	2,550	1,590
20	729	1,180	1,410	2,360	21,300	5,500	2,760	1,420	853	3,490	2,680	1,540
21	681	1,380	1,490	2,430	23,400	5,560	3,450	1,170	1,230	3,390	2,700	1,520
22	646	1,530	1,690	2,340	23,000	5,630	3,450	963	2,070	3,200	2,540	1,460
23	646	1,530	1,930	1,930	21,600	6,350	2,600	1,310	3,360	3,510	2,420	1,410
24	644	1,560	1,700	1,780	20,100	7,300	2,530	1,440	4,940	3,910	2,420	1,410
25	701	1,480	2,280	1,940	20,100	8,020	2,190	1,540	4,680	3,950	2,340	1,450
26	697	1,620	2,350	1,970	17,500	8,750	*1,940	* 951	1,550	7,120	2,180	1,250
27	752	1,500	2,450	2,290	16,500	9,810	*1,880	* 756	1,080	6,010	1,920	1,200
28	795	1,320	2,850	2,640	13,100	9,680	*1,850	472	1,320	4,020	1,580	1,150
29	939		2,550	3,130	16,400	9,270	1,960	356	3,540	3,620	1,640	1,040
30	913		2,310	3,240	17,000	9,170	*1,470	1,570	6,760	3,850	1,680	1,090
31	841		2,080		18,200		* 990	1,470		5,670		1,200
Sum	23,961	33,755	46,223	65,150	500,920	306,950	124,140	38,699	42,237	111,220	86,140	48,070

Month	Extreme Gage Feet — 1941 High	Extreme Gage Feet — 1941 Low	Extreme Second Feet — 1941 High Day	Extreme Second Feet — 1941 High	Extreme Second Feet — 1941 Low Day	Extreme Second Feet — 1941 Low	Average Second Feet 1941	Acre Feet Total 1941	Acre Feet Period 1924-1941 Normal	Acre Feet Period 1924-1941 Maximum	Acre Feet Period 1924-1941 Minimum
Jan.	1.90	1.25	5	1,000	18	524	773	47,500	42,553	56,000	17,400
Feb.	2.56	1.62	7	1,770	5	664	1,210	67,000	47,579	77,200	29,600
Mar.	3.27	1.60	28	2,920	4	877	1,490	91,700	60,262	119,000	23,400
Apr.	4.04	2.21	30	3,390	10	1,350	2,170	129,000	123,646	407,000	16,850
May	9.73	.22	17	24,600	1	3,710	16,200	994,000	280,363	994,000	4,450
June	4.36	- 1.52	1	18,500	21	5,270	10,200	609,000	157,215	609,000	228
July	4.14	- 1.16	1	9,970	31	944	4,000	246,000	61,539	246,000	0
Aug.	1.88	- 2.32	12	4,120	30	307	1,250	76,800	50,127	275,000	1,620
Sept.	4.30	- 2.65	24	10,400	16	148	1,410	83,800	59,201	308,000	2,920
Oct.	4.85	.19	26	8,180	10	1,860	3,590	221,000	44,040	221,000	0
Nov.	3.05	1.90	2	4,550	28	1,570	2,870	171,000	36,692	171,000	2,550
Dec.	3.53	3.44	7	2,500	29	1,030	1,550	95,300	43,865	95,300	15,100
Yearly	9.73	- 2.65		24,600		148	3,912	2,832,100	1,007,082	2,832,100	244,489

*Partly Estimated.

RIO GRANDE AT BELOW ELEPHANT BUTTE DAM STATION

DESCRIPTION: Water-stage recorder and cable with sit-down cable car with winch. Prior to January 17, 1939 the recorder was located at the south side of the pool immediately below the dam. The cable was .75 mile below this recorder. Zero of this gage was elevation 4,255.10 feet on United States Coast and Geodetic Survey sea level datum. On January 17, 1939 a temporary water-stage recorder was established 1900 feet below the dam with zero of the gage at elevation 4,242.24. On March 29, 1939 the zero of this gage was changed to elevation 4,240.94 on the above mentioned sea level datum. Elephant Butte Dam is 135.1 river miles above the American Dam at El Paso.

RECORDS: Based upon 69 meter measurements during the year and a stable rating curve. Records available 1915 to 1941. 1941 records good. Records furnished by the El Paso Office of the United States Bureau of Reclamation.

REMARKS: The station described here is operated by the Reclamation Bureau. It has been the official station since 1931. Prior to 1931 it was located at other points a little farther downstream. See United States Geological Survey Water Supply Papers. The river flow at this station is completely modified by irrigation diversions, drainage returns and reservoirs. Elephant Butte Dam is 42.0 river miles downstream from the San Marcial gaging station at the upper end of Elephant Butte Reservoir.

EXTREME FLOWS: The greatest mean daily flow to pass Elephant Butte Dam (since storage began on January 6, 1915) occurred June 4, 1915, when the flow was 7,500 second feet. Since this time the maximum daily flow was on November 19, 1941, when 3,410 second feet passed. The minimum flow sometimes reaches zero.

Mean Daily Discharge in Second Feet 1941 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	897	1,010	882	919	1,320	1,020	1,750	2,240	1,890	798	1,230	1,380
2	1,030	714	604	910	1,300	1,070	1,740	2,280	1,490	949	1,040	1,410
3	991	973	868	908	1,320	1,070	1,860	1,960	1,210	1,110	1,420	1,430
4	1,000	1,020	878	894	1,190	1,050	2,190	1,430	1,110	1,090	2,010	1,290
5	700	983	888	879	1,250	877	2,250	2,040	1,070	980	2,560	1,400
6	950	901	836	624	1,270	1,070	2,100	2,250	1,090	1,110	2,570	1,410
7	956	890	863	833	1,270	1,040	2,140	2,250	958	1,210	2,910	1,290
8	948	932	856	877	1,250	953	2,190	2,260	1,010	1,120	3,030	1,860
9	938	644	587	863	1,200	1,060	2,010	2,190	899	1,230	3,070	1,960
10	902	903	868	467	1,240	1,070	2,300	2,150	1,070	1,260	3,170	1,480
11	896	933	905	881	1,230	1,090	2,500	1,940	1,070	1,000	3,250	1,480
12	555	942	891	856	1,250	1,120	2,530	1,760	1,070	1,160	3,220	1,460
13	880	916	896	613	1,230	1,050	2,210	1,030	1,090	1,250	3,300	1,440
14	948	949	886	876	1,210	1,200	1,850	1,000	836	1,260	3,340	1,360
15	931	919	851	898	1,240	1,010	1,490	1,030	1,240	1,240	3,340	1,420
16	921	634	604	909	1,230	1,110	1,780	1,010	1,190	1,320	3,190	1,430
17	940	840	868	892	1,210	1,130	2,090	948	1,100	1,300	3,250	1,420
18	904	893	905	931	1,140	1,130	2,810	1,050	1,080	1,250	3,380	1,420
19	556	881	903	985	1,170	1,130	2,300	1,070	1,080	1,140	3,410	1,420
20	914	873	890	921	1,180	1,050	2,190	1,080	1,010	1,220	3,330	1,420
21	934	880	901	1,140	1,170	2,260	2,160	1,370	851	1,120	3,210	1,330
22	938	858	889	1,210	1,160	2,300	2,080	1,800	705	1,210	3,350	1,380
23	895	573	794	1,260	865	2,310	1,470	1,550	1,070	1,190	3,220	1,430
24	912	873	887	1,240	1,120	2,130	1,880	1,280	1,090	1,300	3,090	1,300
25	900	903	817	1,150	944	2,080	2,010	1,720	809	1,270	2,360	1,260
26	598	888	869	1,180	1,120	2,120	2,020	1,850	1,080	1,080	2,200	1,330
27	848	895	870	895	1,210	1,980	2,190	1,690	736	1,230	2,190	1,360
28	958	893	877	1,170	1,150	1,450	1,780	1,670	998	1,250	1,620	1,300
29	952		863	1,260	1,150	1,690	1,530	1,510	909	1,220	1,380	1,370
30	950		609	1,380	1,140	1,740	1,800	1,190	606	1,230	1,230	1,390
31	960		850		1,140		1,920	1,400		1,230		1,400
Sum	27,602	24,513	25,955	28,821	36,869	41,360	63,120	49,998	31,417	36,327	79,870	44,030

Month	Extreme Gage Feet — 1941 High	Extreme Gage Feet — 1941 Low	Extreme Second Feet — 1941 High Day	High	Low Day	Low	Average Second Feet 1941	Acre Feet Total 1941	Period 1924-1941 Normal	Maximum	Minimum
Jan.			2	1,030	12	555	890	54,800	7,482	54,800	184
Feb.			4	1,020	23	573	875	48,600	27,210	57,500	969
Mar.			‡ 11	905	9	587	837	51,500	59,729	88,500	1,520
Apr.			30	1,380	10	467	961	57,200	111,194	136,000	57,200
May			‡ 1	1,320	23	865	1,189	73,100	103,689	155,000	73,100
June			23	2,310	5	877	1,379	82,000	119,167	146,000	82,000
July			18	2,810	23	1,470	2,036	125,000	124,600	137,000	97,800
Aug.			2	2,280	17	948	1,613	99,200	121,489	162,000	78,700
Sept.			1	1,890	30	606	1,047	62,300	72,989	129,000	24,900
Oct.			16	1,320	1	798	1,172	72,000	20,679	72,000	506
Nov.			19	3,410	2	1,040	2,662	158,000	20,753	158,000	884
Dec.			9	1,960	25	1,260	1,420	87,300	18,185	87,300	916
Yearly				3,410		467	1,341	971,000	807,166	1,003,484	637,534

‡ And Other Days.

RIO GRANDE AT BELOW CABALLO DAM STATION

DESCRIPTION: Water-stage recorder and cable with sit-down cable car and winch located .80 river mile below Caballo Dam and 106.8 river miles above American Dam at El Paso. Elevation of zero of the gage was 4,147.03 feet from February 26 to October 7, 1938 when it was changed to 4,146.03 feet. On October 13, 1938 it was again changed to 4,145.03 feet. All elevations are on United States Coast and Geodetic Survey sea level datum.

RECORDS: Based upon 142 meter measurements during the year. Records available: February 26, 1938 to December 31, 1941. 1941 records good. Records furnished by the El Paso Office of the United States Bureau of Reclamation.

REMARKS: This gaging station was installed by the Bureau of Reclamation on the Rio Grande on February 26, 1938 to measure the flow from the Caballo reservoir. The river flow here is completely modified by reservoirs and irrigation diversions and drainage returns above this station. This station is about 1.5 miles upstream from Percha Dam (a low diversion dam) at which point records have been kept in past years. Small accretions to the river take place between this station and Percha Dam. 1,240 acre feet of water, not accounted for in the tables below, were diverted from Caballo reservoir into a small irrigation canal (Bonito Lateral) just below the dam.

EXTREME FLOWS: The greatest mean daily flow to pass Caballo Dam (since storage began February 8, 1938) occurred July 14, 1940 when the discharge was 2,550 second feet. The minimum discharge since records began occurred on December 12, 1940 and subsequent days when the mean daily flow was 1.3 second feet.

Mean Daily Discharge in Second Feet 1941— Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	1.4	2.2	361	1,850	1,380	1,670	2,000	1,980	1,880	5.8	4.0	8.8
2	1.4	2.1	193	1,960	1,310	1,660	1,740	2,080	1,770	5.8	4.2	9.2
3	1.4	2.0	4.2	1,960	1,260	1,770	1,840	2,070	1,590	4.9	4.3	10.7
4	1.4	2.0	3.9	1,990	1,250	1,810	1,840	2,070	1,550	4.5	4.3	11.1
5	1.4	2.0	3.9	2,110	1,250	1,810	2,000	2,070	1,590	4.0	4.4	259
6	1.4	2.0	3.9	2,180	1,270	1,810	2,170	2,070	1,700	3.7	4.4	835
7	1.5	2.1	3.9	2,210	1,530	1,810	2,110	1,980	1,680	3.1	4.4	738
8	1.5	2.1	3.9	2,120	1,540	1,810	2,100	1,900	1,680	3.1	4.5	678
9	1.5	2.2	3.9	2,050	1,690	1,810	2,180	2,250	1,660	104.	220.	678
10	1.5	2.2	3.9	1,940	1,770	1,810	2,360	2,130	1,530	330	770	673
11	1.5	2.3	512	1,930	1,730	1,790	2,290	2,120	1,480	330	647	558
12	1.5	2.3	842	2,150	1,730	1,770	2,290	2,180	1,400	330	618	19.9
13	1.5	2.3	971	2,150	1,660	1,750	2,280	1,530	1,290	330	458	19.9
14	1.5	2.3	1,090	2,160	1,880	1,640	2,150	1,150	1,270	296	8.1	21.2
15	1.5	2.3	1,080	2,140	1,850	2,030	2,110	1,170	1,270	203	7.1	25.1
16	1.4	2.2	1,030	2,110	1,770	2,030	2,170	1,510	1,210	124	5.6	26.4
17	1.4	2.2	790	2,110	1,690	2,120	2,180	1,610	1,080	3.3	5.8	29.0
18	1.4	2.2	546	2,110	1,650	2,300	2,190	1,560	1,040	3.3	5.8	32.0
19	1.4	2.2	715	2,090	1,690	2,340	2,270	1,500	1,030	3.3	5.1	35.0
20	1.4	2.2	871	1,990	1,630	2,280	2,260	1,560	1,170	3.3	5.3	38.0
21	1.4	27.3	947	1,990	1,640	2,310	2,180	1,570	871	3.3	5.5	42.5
22	1.4	631.	1,110	1,990	1,630	2,350	2,100	1,700	12.2	3.0	5.8	45.7
23	1.5	631.	1,210	2,050	1,430	2,270	2,010	1,780	6.4	3.1	5.8	50.8
24	1.6	557.	1,310	1,780	1,100	2,190	2,110	1,690	171	3.3	6.0	55.9
25	1.6	379.	1,420	1,740	1,200	2,060	2,070	1,650	233	3.4	6.0	57.6
26	1.6	470.	1,510	1,500	1,120	2,020	2,080	1,670	312	3.2	6.5	55.9
27	1.6	470.	1,490	1,400	1,210	2,020	2,050	1,770	529	3.3	6.8	59.3
28	1.8	453.	1,520	1,400	1,370	2,020	1,940	1,770	424	3.7	6.8	57.6
29	2.5		1,700	1,480	1,470	2,020	1,960	1,800	13.3	3.7	7.4	61.0
30	2.5		1,750	1,440	1,510	2,020	1,960	1,900	6.4	3.7	8.4	62.7
31	2.5		1,860		1,650		2,020	1,900		3.8		62.7
Sum	48.9	3,661.7	24,859.5	58,080	46,860	59,100	65,010	55,690	31,448.3	2,132.6	2,855.3	5,317.0

Month	Extreme Gage Feet — 1941 High	Extreme Gage Feet — 1941 Low	Extreme Second Feet — 1941 High Day	High	Low Day	Low	Average Second Feet 1941	Acre Feet Total 1941	Period 1938-1941 Average	Maximum	Minimum
Jan.			‡29	2.5	‡ 1	1.4	1.6	97	882	3,080	97
Feb.			‡22	631.	‡ 3	2.0	131	7,260	15,540	22,200	7,260
Mar.			31	1,860.	‡ 4	3.9	802	49,300	70,850	84,300	49,300
Apr.			7	2,210	‡27	1,400.	1,940	115,000	111,850	116,000	106,000
May			14	1,880	24	1,100	1,510	93,000	100,625	113,000	91,500
June			22	2,350	14	1,640	1,970	117,000	118,325	121,000	114,300
July			10	2,360	2	1,740	2,100	129,000	123,775	129,100	109,000
Aug.			9	2,250	14	1,150	1,800	110,000	118,325	131,000	110,000
Sept.			1	1,880	‡23	6.4	1,050	62,400	62,950	76,800	43,800
Oct.			‡10	330	22	3.0	68.8	4,230	13,118	26,100	2,840
Nov.			10	770	1	4.0	95.2	5,660	7,815	12,100	3,400
Dec.			6	835	1	8.8	171	10,600	7,166	10,600	83.3
Yearly				2,360		1.4	972	703,547	751,221	789,064	703,547

● Mean Daily. ‡ And Other Days.

RIO GRANDE AT EL PASO STATION

DESCRIPTION: Staff gage and cable with sit-down cable car and winch located in the pass opposite Courchesne quarry, 4 miles northwest of El Paso, Texas, and 5 miles northwest of Cd. Juarez, Chihuahua, and .9 river mile above the American Dam. Zero of gage is 3,720.51 feet above U.S.C. and G.S. mean sea level datum. Also water-stage recorder 1 mile farther upstream with zero of its gage 3,722.30 feet on the above mentioned datum. This later gage has been the official gage since August 3, 1938. This gage was lowered .22 foot on September 13, 1938. The elevation reported in Water Bulletins Nos. 8, 9 and 10 were accordingly erroneous.

RECORDS: The discharge for March 17, 1941 was based upon a meter measurement at this station on that date. All other discharges in 1941 were computed by taking the sum of the flows in the American Canal and the flows at the Below American Dam Station. 1941 record good. Records available 1889 to 1941, inclusive.

REMARKS: Reservoirs on the Rio Grande and its tributaries, also many irrigation diversions and drainage returns, completely modify the river flow at this station.

COMPARATIVE FLOWS FROM RECORDS: Momentary Peak: Max., June 12, 1905, 24,000 sec. ft., with 6.0 ft. stage (lower gage). This is the greatest peak flow in the past 113 years or since 1828, or possibly longer. Min., sometimes dry. Daily: Max., June 12, 1905, 23,680 sec. ft. average. Min., sometimes dry. Monthly: Max., June 1905, 14,300 sec. ft. average. Min., sometimes dry. Yearly: Max., 1905, 2,780 sec. ft. average. Min., 1902, 70.1 sec. ft. average. Two Successive Years: Max., 1905 and 1906, 2,160 sec. ft. average. Min., 1899 and 1900, 168 sec. ft. average. Three Successive Years: Max., 1905 to 1907, 2,280 sec. ft. average. Min., 1900 to 1902, 269 sec. ft. average. Four Successive Years: Max., 1904 to 1907, 1,880 sec. ft. average. Min., 1899 to 1902, 227 sec. ft. average. Five Successive Years: Max., 1903 to 1907, 1,790 sec. ft. average. Min., 1898 to 1902, 669 sec. ft. average. Ten Successive Years: Max., 1903 to 1912, 1,560 sec. ft. average. Min., 1932 to 1941, ‡716 sec. ft. average. Fifty-Three Years: Average 985 sec. ft. See Water Bulletin No. 6, page 79, for all large peak flows since 1828 and their average frequency. Since Elephant Butte Dam was closed in 1915 the largest peak flow to pass this station was 13,550 sec. ft. on September 3, 1925. See Water Bulletin No. 10, page 77 for peak flood flows, 1915 to 1937

Mean Daily Discharge in Second Feet 1941 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	161	124	229	809	1,020	815	1,080	1,300	1,240	1,240	211	198
2	156	136	267	924	1,060	884	1,050	1,080	1,280	678	230	204
3	156	134	337	856	1,100	882	1,050	1,080	1,320	594	197	207
4	149	131	361	930	932	889	999	1,170	1,160	578	223	179
5	143	132	291	803	1,010	914	988	1,130	966	493	223	185
6	147	139	215	936	887	1,010	1,090	1,060	925	479	217	180
7	142	123	189	993	857	959	1,180	1,050	998	458	197	176
8	142	127	165	1,220	818	983	1,220	1,140	1,090	398	204	180
9	147	124	164	1,130	897	1,030	1,040	1,470	1,010	401	243	258
10	143	126	160	893	737	1,080	997	1,220	952	392	283	367
11	137	128	148	893	879	1,080	1,000	1,500	981	371	221	521
12	132	130	137	798	1,120	998	1,320	1,140	936	351	218	646
13	137	117	126	913	949	977	1,350	2,780	1,010	358	364	832
14	134	126	156	1,150	962	961	1,590	3,360	1,080	439	537	522
15	137	124	537	1,010	962	960	1,400	1,490	1,050	470	544	347
16	136	121	562	966	1,100	994	1,190	1,130	927	405	536	317
17	139	121	1,020	952	1,060	984	1,120	1,410	882	423	357	298
18	135	122	753	872	1.040	929	1,090	1,300	815	399	319	271
19	133	119	639	1,040	1,040	930	1,080	1,640	758	415	269	239
20	134	119	414	948	952	1,180	1,150	1,270	712	340	337	214
21	137	120	356	1,180	992	1,210	1,620	1,290	1,130	311	337	204
22	135	122	464	1,200	1,010	1,140	1,310	1,150	2,010	317	317	195
23	135	127	566	1,190	977	1,190	1,260	1,160	2,360	323	266	177
24	130	123	618	1,180	1,120	1,240	1,200	1,250	904	378	245	190
25	132	122	590	1,060	1,160	1,260	1,180	1,410	654	330	245	181
26	130	151	610	1,320	913	1,190	1,150	1,150	566	328	234	181
27	130	194	687	1,460	941	1,170	1,290	1,080	530	320	208	181
28	128	165	683	1,240	847	1,040	1,410	1,030	660	303	205	185
29	134		626	1,040	606	1,070	1,820	1,060	2,960	278	206	193
30	128		572	1,050	764	1,120	1,100	1,090	4,230	223	203	223
31	124		704		842		1,080	1,190		204		221
Sum	4,283	3,647	13,346	30,956	29,554	31,069	37,404	41,580	36,096	12,997	8,396	8,472

Month	Extreme Gage Feet — 1941		Extreme Second Feet — 1941				Average Second Feet 1941	Acre Feet			
			High		Low			Total 1941	Period 1924-1941		
	High	Low	Day		Day				Normal	Maximum	Minimum
Jan.	3.39	3.28	29	161	25	130	138	8,500	10,921	17,500	8,180
Feb.	3.63	3.20	27	201	25	122	130	7,230	19,416	48,500	8,800
Mar.	5.89	3.25	17	2,350	14	105	431	26,500	38,577	56,800	18,400
Apr.	5.62	4.72	27	1,610	3	697	1,030	61,400	62,801	91,000	44,900
May	5.55	4.67	16	1,020	29	552	953	58,600	66,436	122,000	47,600
June	5.73	4.98	26	1,350	1	808	1,040	61,600	69,758	98,200	56,200
July	6.45	4.98	21	2,380	5	893	1,210	74,200	80,378	111,000	68,900
Aug.	7.30	4.80	14	4,110	6	1,000	1,340	82,500	85,796	107,000	61,000
Sept.	7.60	4.06	30	5,000	27	462	1,200	71,600	63,094	87,400	41,700
Oct.	5.32	3.70	1	1,840	22	301	419	25,800	25,724	34,860	17,800
Nov.	4.45	3.51	14	552	24	234	280	16,700	17,954	29,500	11,400
Dec.	5.47	3.50	13	1,480	23	163	273	16,800	16,543	27,700	9,590
Yearly	7.60	3.20		5,000		122	706	511,430	557,398	810,200	453,900

‡ In Water Bulletin No. 10 this figure should have been 717 sec. ft. for the period 1931-1940.

RIO GRANDE AT BELOW AMERICAN DAM, STATION

DESCRIPTION: From June 2, 1938 to February 28, 1941 the water-stage recorder was located at the lower side of the American Dam 2.1 miles above the International Dam near El Paso, Texas. Zero of the recorder gage is 3,712.30 feet. Prior to January 1, 1939, zero of this gage was 3,722.30 feet. From May 1, 1939, to March 1, 1941, the official gage was a staff gage located 3,200 feet below the American Dam, the zero of which was 3,716.28 feet. On March 1, 1941, the recorder was moved to this site and the zero of the gage changed to 3,712.30 feet. At this site there is also a cable with sit-down cable car equipped for winch and heavy weights. The above elevations are on U.S.C. & G.S. sea level datum. The American Dam is 1,241.4 river miles above the Gulf of Mexico.

RECORDS: Based upon 79 meter measurements at normal and low stages during the year, 59 by the United States and 20 by the Mexican Section. Computations by shifting channel methods. 1941 records good. Records available: June 1, 1938 to December 31, 1941.

REMARKS: The operation of this station began June 2, 1938, when the American Dam first began operating. At this dam part of the flow passing the El Paso Gaging station (see preceding page) was diverted into the American Canal (see records of "Diversions From The Rio Grande" elsewhere herein) and the remainder, including excess flood flows, passed this gaging station. Reservoirs, diversions and drainage returns in the United States above this point completely modify the river flow.

EXTREME FLOWS: The largest peak flow to pass this station since 1828, or possibly before, was 24,000 second feet on June 12, 1905. Since Elephant Butte Reservoir was closed in January 1915, the largest peak flow was 13,550 second feet on September 3, 1925. See Water Bulletins Nos. 6 and 10, for the average frequency of all floods since 1828. Minimum, sometimes dry.

Mean Daily Discharge in Second Feet 1941 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	161	123	29.1	72.2	202	144	195	156	158	1,240	208	11.8
2	156	66.9	28.4	77.4	194	162	185	132	237	468	227	11.8
3	156	25.0	28.7	87.8	195	181	191	132	335	208	194	9.7
4	149	65.5	26.6	86.3	183	172	179	139	160	* 187	220	65.4
5	142	57.5	20.0	80.6	206	160	186	151	154	* 170	220	182
6	147	41.7	20.0	87.4	185	160	179	162	166	* 156	214	177
7	142	10.0	22.0	81.9	196	201	179	163	177	147	194	173
8	142	82.3	20.0	79.1	194	208	183	175	181	79.0	201	177
9	147	123	21.0	72.8	206	189	168	564	167	10.8	240	69.3
10	142	125	24.6	71.4	190	172	165	527	163	8.9	151	3.4
11	‡ 87.7	128	22.8	80.7	207	176	164	703	158	7.0	17.0	3.4
12	132	64.8	21.0	70.5	200	159	185	383	148	225	16.2	ó 106
13	136	ó 7.0	21.0	79.5	204	162	186	1,760	162	355	15.4	ó 299
14	134	ó 4.0	20.0	77.1	204	160	419	2,320	148	436	14.6	ó 145
15	136	ó 12.0	15.8	76.0	200	149	194	758	150	208	14.3	ó 3.0
16	136	10.6	15.8	79.3	208	159	203	242	154	18.3	15.3	* 4.6
17	138	10.0	ó 263	87.0	217	176	171	313	158	16.2	15.4	4.7
18	135	8.8	30.0	84.1	292	164	166	239	153	14.7	16.2	5.3
19	132	8.2	27.8	90.0	234	164	168	470	153	13.1	92.1	7.0
20	134	8.2	27.8	80.0	218	159	165	233	171	12.4	334	9.1
21	136	7.7	28.4	198	237	192	575	183	483	10.0	334	9.7
22	135	7.7	28.7	208	214	178	212	146	1,360	8.9	314	8.7
23	134	7.7	27.8	196	221	173	181	153	1,650	8.2	263	50.4
24	130	7.2	26.6	165	232	181	171	142	419	8.1	242	187
25	131	6.7	22.0	152	210	202	160	415	155	7.5	242	178
26	130	6.7	19.0	130	229	190	169	180	171	7.9	231	178
27	129	6.7	15.8	124	238	194	187	169	181	8.8	99.1	178
28	128	6.7	49.3	151	198	192	298	173	267	8.2	15.6	182
29	133		14.6	242	183	190	779	166	2,960	65.2	13.5	70.9
30	128		54.0	183	195	195	188	173	3,930	220	12.4	3.2
31	123		25.9		175		165	179		201		3.2
Sum	4,221.7	1,038.6	1,017.5	3,350.1	6,467	5,264	6,916	11,801	15,029	4,534.2	4,386.1	2,516.6

Month	Extreme Gage Feet — 1941		Extreme Second Feet — 1941				Average Second Feet 1941	Acre Feet			
			High		Low			Total 1941	Period 1938–1941		
	High	Low	Day		Day				Average	Maximum	Minimum
Jan.	2.48	1.10	1	161	11	‡ 2.0	136	8,370	9,757	10,600	8,370
Feb.	‡ 2.42		8	‡ 132	14	‡ 0.3	37.1	2,060	2,590	3,810	1,900
Mar.	7.65	5.60	17	1,520	14	11.4	32.8	2,020	3,263	5,710	2,020
Apr.	6.53	5.72	29	288	7	53.2	112	6,640	8,333	12,000	6,360
May	7.33	6.25	18	1,000	10	125	209	12,800	12,933	13,500	12,500
June	6.69	6.28	27	308	12	146	175	10,400	15,168	24,400	9,770
July	7.87	6.20	14	1,640	24	151	223	13,700	14,200	18,300	11,900
Aug.	9.55	5.98	13	3,400	2	101	381	23,400	12,680	23,400	6,040
Sept.	9.81	6.20	30	5,090	12	103	501	29,800	16,582	29,800	3,530
Oct.	7.93	4.91	1	1,990	26	5.7	146	8,990	3,974	8,990	197
Nov.	6.14	4.83	21	364	30	11.8	146	8,700	6,140	8,700	4,460
Dec.	6.07	4.56	13	299	‡11	1.6	81.2	4,990	4,295	7,760	1,910
Yearly	9.81			5,090		‡ 0.3	182	131,870	109,915	131,870	96,740

‡ Estimated. * Partly Estimated. ‡ And Other Days. ó Deduced.

OUTFALLS FROM DEEP WELLS

Near El Paso, Texas, and Cd. Juarez, Chihuahua.

Between the Below American Dam Station and the Cd. Juarez Station several outfall ditches or pipe lines discharge water into the Rio Grande, the source of which is from deep wells in the vicinity of El Paso and Cd. Juarez. During 1941 such outfalls contributed a total of 10,049.7 acre feet of water to the Rio Grande flow, which is equivalent to an average steady flow of 13.9 second feet during the year. Of this total flow 12.9 second feet, or 9,325.7 acre feet, came from the United States side, while 1.0 second feet, or 724 acre feet, came from the Mexican side. On the remainder of this page will be found details concerning these outfalls.

El Paso Electric Company Santa Fe Street Plant Cooling Water Waste

This outfall enters the river 3.3 miles below the American Dam. From the company's pumping records it is calculated that 92.7 acre feet flowed into the river in 1941. This corresponds to an average flow of 0.1 second foot.

Cd. Juarez Sewage Outfall

This outfall enters the river 4.7 miles below the American Dam. From several inspections this outfall is estimated at 724 acre feet for 1941, which corresponds to an average flow of 1.0 second foot.

Peyton Packing Company Waste

This outfall enters the river 5.7 miles below the American Dam. From several inspections an average flow of 0.5 second foot, or 362 acre feet is estimated to have entered the river from this source.

El Paso Sewage Outfall

This outfall enters the river 6.6 miles downstream from the American Dam. The flow of sewage is usually measured by Venturi meter at the treatment plant which began operating in 1936. During the last 9 months of 1941 there were parts of days when the maximum flow exceeded the plant capacity and the capacity of the Venturi meter. During such times the excess flow passed to the river, but was estimated. The amounts of such excess are included in the following tabulation. The record below was furnished by the Department of Water and Sewage of the City of El Paso.

Month	1941		Period 1936 - 1941
	Mean Second Feet	Acre Feet	Average Acre Feet
January	10.2	627	518
February	11.1	618	512
March	11.5	708	522
April	12.6	748	562
May	13.0	798	579
June	13.6	808	604
July	14.6	899	624
August	12.5	766	589
September	11.8	704	556
October	12.5	766	567
November	12.0	714	544
December	11.6	715	551
Yearly	12.3	8,871	6,728

RIO GRANDE AT JUAREZ STATION

DESCRIPTION: Water-stage recorder and cable with sit-down cable car equipped for winch and heavy weights located 2.5 miles downstream from El Paso, Texas and Cd. Juarez, Chihuahua. This station is on the newly rectified channel of the Rio Grande, 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 3,687.26 feet above mean sea level, United States Coast and Geodetic Survey datum.

RECORDS: Based upon 205 meter measurements during the year, 171 by the Mexican and 34 by the United States Section. Computations by shifting channel methods. 1941 records good. Records available: April 1, 1938 to December 31, 1941.

REMARKS: The operation of this station began April 1, 1938. Reservoirs, irrigation diversions and drainage returns above this station completely modify the river flow.

EXTREME FLOWS: The greatest flow since April 1, 1938, occurred August 13, 1941, with a gage height of 8.66 feet and a flow of 5,190 second feet. The lowest flow since April 1, 1938 occurred February 25, 1940 with a gage height of 3.48 feet and a flow of 16.2 second feet.

Mean Daily Discharge in Second Feet 1941 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	169	153	30.0	526	724	350	576	823	809	1,260	295	57.6
2	172	164	31.8	628	720	381	523	675	816	763	293	62.2
3	162	146	62.5	558	756	402	558	742	957	515	291	50.5
4	156	138	61.8	667	576	367	593	731	773	395	268	197
5	161	142	102	523	558	406	484	675	623	305	247	237
6	167	152	38.1	572	452	526	554	597	636	275	248	256
7	151	141	30.4	883	374	448	622	576	614	267	239	254
8	161	138	30.4	872	344	516	749	629	625	229	241	274
9	169	144	26.8	809	396	512	576	964	544	185	262	242
10	166	150	26.8	590	342	597	526	752	512	182	226	228
11	153	142	26.8	512	396	597	519	1,120	516	296	61.8	238
12	176	124	26.5	473	579	530	727	696	501	327	61.8	484
13	162	77.7	24.7	519	438	470	770	3,000	530	360	102	664
14	138	37.8	25.8	833	417	477	1,450	3,270	650	410	321	353
15	170	36.4	353	692	431	470	1,070	1,180	604	431	335	173
16	150	38.5	392	583	572	508	777	893	477	364	360	151
17	142	40.3	798	576	537	491	703	1,260	417	284	161	123
18	159	42.0	530	505	526	459	692	1,120	367	236	274	96.8
19	175	38.5	452	625	480	463	622	1,040	323	235	305	79.1
20	179	37.8	213	590	456	653	766	855	305	186	282	60.4
21	136	37.1	116	660	470	685	1,190	791	597	133	258	51.2
22	125	39.9	174	689	494	699	855	724	1,790	126	244	55.4
23	143	35.3	270	734	540	710	763	713	2,120	132	252	197
24	148	34.3	357	745	770	717	667	777	660	166	237	223
25	143	36.0	330	643	897	699	632	1,010	424	131	235	224
26	137	36.4	385	1,030	558	675	583	728	323	119	218	240
27	144	49.1	403	1,210	674	703	717	646	374	107	216	219
28	133	31.1	466	879	448	544	886	565	773	122	90.1	229
29	149		427	597	290	551	1,340	593	2,630	237	54.4	256
30	137		470	621	351	600	569	604	3,400	304	53.3	236
31	125		448		392		579	735		297		216
Sum	4,758	2,382.2	7,128.4	20,344	15,958	16,206	22,638	29,484	24,690	9,379	6,731.4	6,427.2

Month	Extreme Gage Feet — 1941		Extreme Second Feet — 1941				Average Second Feet 1941	Acre Feet			
			High		Low			Total 1941	Period 1938–1941		
	High	Low	Day		Day				Average	Maximum	Minimum
Jan.	4.04	3.58	16	252	24	104	153	9,440	7,935	12,200	9,440
Feb.	3.84	2.95	2	195	21	26.5	85.1	4,730	5,488	9,090	4,730
Mar.	5.91	2.82	17	1,770	14	19.1	230	14,140	14,435	22,000	14,140
Apr.	5.61	3.94	26	1,810	12	388	678	40,350	34,938	40,350	30,900
May	5.18	3.41	25	1,270	10	262	515	31,650	28,088	31,650	23,400
June	4.79	3.64	22	1,110	1	313	540	32,140	38,160	44,300	32,140
July	7.45	3.64	14	4,410	5	417	730	44,900	44,850	49,400	42,400
Aug.	8.66	3.22	13	5,190	28	530	951	58,480	45,320	58,480	38,700
Sept.	8.56	2.76	30	4,870	20	269	823	48,970	37,268	48,970	22,300
Oct.	5.58	2.03	1	2,110	28	99.9	303	18,600	15,300	18,600	11,600
Nov.	2.92	2.07	18	413	30	42.7	224	13,350	12,002	13,350	9,360
Dec.	4.40	2.20	13	1,500	21	51.2	207	12,750	10,122	12,750	7,510
Yearly	8.66	2.03		5,190		19.1	455	329,500	293,906	329,500	269,460

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 Augustin, 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, United States Coast and Geodetic Survey datum.

RECORDS: Based upon 78 meter measurements during the year. 53 by the United States and 25 by the Mexican Section. Computations by shifting channel methods. 1941 records good. Records available August 17, 1938 to December 31, 1941.

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

EXTREME FLOWS: The greatest flow since August 17, 1938, occurred September 3, 1938, with a gage height of 15.50 feet and a flow of 4,570 second feet. The lowest flow is sometimes zero.

Mean Daily Discharge in Second Feet 1941 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	121	109	17.7	3.0	194	194	9.4	195	242	2,020	130	5.4
2	147	133	17.0	9.3	165	55.3	5.7	140	175	433	88.6	4.5
3	150	123	24.3	4.8	242	48.2	2.3	100	348	257	90.9	7.5
4	155	115	27.7	19.1	126	24.9	434	189	158	180	86.3	10.4
5	153	115	33.5	5.6	53.8	48.6	29.2	137	38.3	140	61.0	19.5
6	142	125	18.6	3.8	26.0	93.6	16.0	49.2	7.7	121	30.5	18.7
7	122	122	8.3	109	7.2	99.9	15.0	42.4	5.6	140	23.3	25.9
8	112	122	4.9	124	6.1	29.4	29.1	13.7	74.6	194	22.4	24.6
9	127	122	3.2	110	5.2	99.5	19.3	425	52.2	214	22.1	24.8
10	143	108	1.3	51.0	4.5	96.4	12.5	278	20.5	125	21.8	37.6
11	154	105	.3	8.2	4.2	110.6	6.7	615	5.3	57.5	22.5	66.0
12	136	98.7	.9	5.6	7.0	68.4	25.4	388	43.9	95.0	28.8	206
13	145	85.4	1.3	3.8	14.1	44.1	155	*1,400	91.8	118	28.8	236
14	149	95.3	1.1	38.6	3.7	9.8	421	3,320	202	131	53.1	266
15	153	88.6	21.0	50.8	3.3	8.2	298	1,600	171	151	73.8	85.0
16	136	76.6	105	4.3	3.2	12.7	167	287	80.0	157	86.5	24.8
17	99.7	71.1	747	3.5	3.3	10.1	58.2	512	42.6	118	59.8	21.6
18	104	64.0	523	2.9	8.1	5.4	50.0	725	39.1	61.3	20.2	21.3
19	114	61.6	200	19.9	6.9	3.8	52.5	467	18.9	48.3	5.5	20.2
20	138	34.9	35.4	46.1	2.7	32.4	31.8	395	14.7	44.4	3.9	20.5
21	157	22.3	10.7	56.8	28.4	64.8	90.8	294	42.6	21.9	3.2	20.5
22	144	18.9	9.8	8.4	8.1	7.0	355	198	1,870	21.2	3.8	19.0
23	144	20.3	14.5	32.0	122	49.8	64.7	180	2,300	21.1	2.6	196
24	136	21.8	9.0	23.6	326	8.8	20.0	310	1,040	21.8	1.9	269
25	94.3	24.5	6.5	24.4	556	30.9	11.0	520	471	24.2	1.5	260
26	92.1	18.8	5.1	424	552	12.6	6.8	122	460	26.5	1.6	260
27	93.3	15.4	5.1	770	357	27.2	94.1	44.0	349	28.8	1.7	260
28	114	32.8	4.5	605	372	6.9	381	22.3	564	31.1	1.9	256
29	102		3.6	99.0	117	3.1	652	25.6	2,210	75.1	1.8	274
30	99.2		2.7	93.7	79.1	16.3	132	89.6	3,180	213	1.7	263
31	108		2.7		257		27.6	219		290		263
Sum	3,984.6	2,150.0	1,865.7	2,760.2	3,660.9	1,322.7	3,673.1	13,302.8	14,317.8	5,580.2	981.5	3,486.8

Month	Extreme Gage Feet — 1941		Extreme Second Feet — 1941				Average Second Feet 1941	Acre Feet			
			High		Low			Total 1941	Period 1938–1941 ●		
	High	Low	Day		Day				Average	Maximum	Minimum
Jan.	12.37	11.65	6	302	29	17.1	129	7,900	8,533	8,900	7,900
Feb.	12.16	11.31	7	208	27	11.7	76.8	4,260	3,753	4,260	2,930
Mar.	13.40	10.78	17	1,260	11	‡ 0	60.2	3,700	1,843	3,700	876
Apr.	12.79	10.91	‡27	808	30	.9	92.0	5,470	2,940	5,470	1,190
May	13.04	10.93	25	950	20	2.6	118	7,260	3,293	7,260	1,050
June	12.42	11.06	1	371	30	2.3	44.1	2,620	4,810	10,500	1,310
July	13.12	10.39	29	996	4	0	118	7,290	5,977	7,290	4,840
Aug.	15.40	10.92	14	4,060	9	0	429	26,400	14,067	26,400	5,500
Sept.	15.60	10.95	30	4,360	7	1.2	477	28,400	17,890	29,400	1,760
Oct.	15.50	11.13	1	4,130	23	21.1	180	11,100	4,290	11,100	1,620
Nov.	12.02	10.48	1	253	30	1.6	32.7	1,950	1,120	2,220	11.5
Dec.	12.43	‡ 10.40	14	610	2	0	112	6,920	3,438	6,920	1,050
Yearly	15.60	10.39		4,360		0	156	113,270	71,954	113,270	43,965.5

‡ Estimated. * Partly Estimated. ‡ And Other Days.

● The average, maximum and minimum discharges for January through August are for the period 1939-1941.

RIO GRANDE AT COUNTY LINE STATION

DESCRIPTION: Water-stage recorder and cable with sit-down cable car equipped for winch and heavy weights located 0.8 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, United States Coast and Geodetic Survey datum.

RECORDS: Based upon 80 meter measurements during the year, 55 by the United States and 25 by the Mexican Section. Computations by shifting channel methods. 1941 records good. Records available: January 1, 1938 to December 31, 1941.

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

EXTREME FLOWS: The greatest flow since January 1, 1938, occurred September 3, 1938, with a gage height of 6.39 feet and a flow of 4,050 second feet. The lowest flow since January 1, 1938, occurred March 5, 1939 with a gage height of 2.23 feet and a flow of 44.3 second feet.

Mean Daily Discharge in Second Feet 1941 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	159	167	81.2	163	412	292	332	528	636	2,762	322	158
2	160	174	65.0	167	433	202	228	563	454	1,147	301	148
3	164	171	71.8	227	491	206	196	486	610	898	331	165
4	162	149	72.0	234	522	274	437	595	572	768	320	233
5	164	167	102	269	436	302	241	627	347	698	322	267
6	188	162	112	256	368	321	242	411	262	553	329	220
7	187	167	133	330	280	389	321	361	296	599	321	206
8	180	171	89.1	316	258	408	300	310	432	541	323	198
9	192	170	70.2	337	229	374	364	402	440	493	330	211
10	179	180	65.1	292	216	349	269	692	405	386	332	266
11	170	191	65.3	298	212	382	332	886	371	352	302	373
12	187	194	62.9	292	235	368	188	786	373	405	308	463
13	200	183	59.8	288	289	348	339	1,063	369	314	304	539
14	231	176	56.8	295	190	291	450	2,806	532	350	354	737
15	236	180	56.1	295	185	353	547	2,110	663	371	413	493
16	214	159	174	285	179	334	471	890	562	372	423	388
17	191	142	706	218	263	218	329	969	441	321	398	372
18	169	124	555	144	271	232	319	1,292	361	294	355	368
19	179	87.9	292	153	402	220	415	974	353	300	374	375
20	176	70.3	214	201	217	187	454	874	278	307	324	365
21	173	65.4	147	231	176	277	536	626	379	252	246	342
22	157	64.3	123	243	192	295	667	526	2,350	231	190	345
23	190	69.9	120	256	326	333	418	475	2,409	205	203	404
24	213	66.2	180	267	565	268	318	646	1,472	190	185	362
25	220	67.9	163	300	784	271	278	1,085	818	248	197	352
26	201	65.5	184	458	984	330	260	591	770	280	221	351
27	178	61.6	193	650	590	214	494	376	616	422	212	370
28	198	65.3	211	634	679	235	572	307	757	432	194	365
29	171		185	459	411	305	794	401	1,709	441	173	350
30	147		177	379	229	371	761	431	*2,871	*451	173	364
31	166		192		392		386	529		440		338
Sum	5,702	3,711.3	4,978.3	8,937	11,416	8,949	12,258	23,618	22,908	15,823	8,780	10,488

Month	Extreme Gage Feet — 1941		Extreme Second Feet — 1941				Average Second Feet 1941	Acre Feet			
			High		Low			Total 1941	Period 1938-1941		
	High	Low	Day		Day				Average	Maximum	Minimum
Jan.	3.18	2.65	15	382	30	125	184	11,300	14,350	16,500	11,300
Feb.	3.03	2.10	1	279	28	50.8	133	7,360	10,658	17,200	7,360
Mar.	4.34	2.10	17	1,310	16	52.2	161	9,870	9,820	15,200	6,370
Apr.	3.52	2.44	27	679	18	68.0	298	17,700	12,735	17,700	7,870
May	4.51	2.45	26	1,420	16	129	368	22,600	12,735	22,600	6,980
June	3.25	2.76	9	565	28	149	298	17,750	17,280	27,500	6,870
July	4.08	2.56	30	1,400	5	176	395	24,300	23,050	42,400	11,400
Aug.	6.13	2.62	14	3,160	8	283	762	46,800	24,275	46,800	15,500
Sept.	6.40	2.78	30	3,450	6	240	764	45,400	31,048	46,600	8,290
Oct.	6.74	2.82	1	3,900	23	147	510	31,400	17,850	31,400	11,200
Nov.	3.38	2.60	20	602	30	170	293	17,400	12,982	17,400	8,230
Dec.	3.82	2.57	14	1,050	3	135	338	20,800	14,092	20,800	8,770
Yearly	6.74	2.10		3,900		50.8	377	272,680	200,875	272,680	129,680

* Partly Estimated.

RIO GRANDE AT FORT QUITMAN STATION

DESCRIPTION: Water-stage recorder and cable with sit-down cable car equipped for winch and heavy weights located on the rectified Rio Grande channel 1.5 miles below Old Fort Quitman, and 81.1 river miles below the American Dam at El Paso. The zero of the new gage is 3,450.57 feet, U.S.C. and G.S. datum. See Water Bulletin No. 7 for a gage history of this station.

RECORDS: Based upon 85 meter measurements during the year, 58 by the United States and 27 by the Mexican Section. Computations by shifting channel methods. 1941 records good. Records available: January 1923 to December 1941.

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

COMPARATIVE FLOWS FROM RECORDS: Momentary Peak: Max., about June 20, 1905, 17,000 sec. ft.●. This is the greatest flow in the last 113 years. Max. since Jan. 1923, 9,780 sec. ft., June 5, 1941. Min., frequently dry prior to Jan. 1915**. Since Jan. 1923, dry only once, March 30, 1935. Daily: Max., about 17,000 sec. ft. June 20, 1905●. Since Jan. 1923, 4,980 sec. ft. average on June 5, 1941. Min., frequently dry prior to Jan. 1915. Since Jan. 1923, 0.9 sec. ft. average May 31 to June 4, 1935. Monthly: Max., since Jan. 1923, 1,190 sec. ft. average in Sept. 1941. Min., frequently dry prior to Jan. 1915. Since Jan. 1923, 14.3 sec. ft. average in May 1935. Yearly: Max., since Jan. 1923, 514 sec. ft. average in 1924. Min., since Jan. 1923, 141 sec. ft. average in 1934. Two Successive Years: Max., since Jan. 1923, 487 sec. ft. average 1923 and 1924. Min., 171 sec. ft. average 1934 and 1935. Three Successive Years: Max., since Jan. 1923, 448 sec. ft. average 1923 to 1925. Min., since Jan. 1923, 183 sec. ft. average 1934 to 1936. Four Successive Years: Max., since 1923, 431 sec. ft. average 1923 to 1926. Min., since Jan. 1923, 199 sec. ft. average 1934 to 1937. Five Successive Years: Max., since Jan. 1923, 412 sec. ft. average 1923 to 1927. Min., since 1923, 218 sec. ft. average 1933 to 1937. Nineteen Years: Average 309 sec. ft. See pages 71 and 72 of Water Bulletin No. 8 for the magnitude and average frequency of floods in the period 1828 to 1938.

Mean Daily Discharge in Second Feet 1941 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	154	135	76.5	43.3	395	402	345	535	803	3,120	527	335
2	160	135	90.7	35.5	394	362	337	520	784	3,000	418	324
3	159	137	68.6	40.6	420	319	275	538	692	1,380	439	347
4	157	133	85.0	67.4	558	374	223	585	769	980	443	355
5	158	124	73.1	46.3	430	4,980	338	555	548	833	414	409
6	175	148	72.0	51.4	379	1,120	243	474	460	708	408	389
7	171	126	99.6	56.8	279	893	256	432	709	667	408	376
8	157	136	97.3	153	226	863	235	381	493	667	412	349
9	154	154	92.7	257	177	870	190	368	448	680	393	341
10	166	154	78.6	210	124	746	155	680	423	564	386	350
11	158	150	72.0	130	106	651	94.0	712	411	469	364	431
12	168	152	78.3	55.3	106	566	77.0	900	404	510	349	624
13	168	125	69.5	62.8	95.3	503	197	1,140	414	509	353	667
14	160	122	68.3	51.2	* 114	383	328	1,520	506	500	375	886
15	172	125	53.6	71.6	80.0	349	470	2,480	* 655	550	484	668
16	154	118	59.0	56.2	75.3	358	456	1,950	* 598	534	495	506
17	161	117	436	42.6	92.0	260	390	1,390	617	508	566	429
18	162	91.9	780	43.2	144	195	342	1,770	480	450	442	415
19	179	108	332	49.0	144	202	295	1,020	492	440	455	382
20	172	92.4	220	53.2	141	207	293	1,100	641	462	403	363
21	163	80.2	164	58.1	128	211	313	795	1,200	437	407	347
22	126	74.0	111	56.0	105	258	457	660	6,690	394	432	360
23	122	81.9	77.8	84.4	107	262	437	739	4,400	364	420	420
24	121	87.2	70.6	91.2	421	269	398	832	3,100	495	396	418
25	131	76.1	100	164	779	268	257	984	1,870	* 806	383	410
26	119	81.4	75.6	383	1,120	317	238	947	1,260	460	* 382	389
27	115	80.6	52.9	881	702	279	500	* 534	1,190	474	356	387
28	112	70.7	49.9	960	747	334	585	427	921	446	370	385
29	130		54.3	636	569	351	692	404	1,260	446	336	382
30	134		53.2	367	500	445	816	619	2,360	564	326	380
31	131		43.5		258		857	803		674		378
Sum	4,669	3,215.4	3,855.6	5,257.1	9,915.6	17,597	11,089	26,794	35,598	23,091	12,342	13,202

Month	Extreme Gage Feet — 1941		Extreme Second Feet — 1941				Average Second Feet 1941	Acre Feet			
			High		Low			Total 1941	Period 1924-1941		
	High	Low	Day		Day				Normal	Maximum	Minimum
Jan.	3.82	2.93	21	298	27	94.0	151	9,260	11,991	19,200	5,370
Feb.	3.61	2.58	8	228	22	52.4	115	6,380	12,235	30,400	3,510
Mar.	4.43	2.42	18	972	31	37.7	124	7,650	10,730	28,500	1,090
Apr.	4.53	2.30	28	1,030	3	26.9	175	10,400	12,662	34,700	1,200
May	5.15	2.83	26	1,380	16	56.8	332	19,700	15,910	50,700	880
June	10.68	2.40	5	9,780	19	123	587	34,900	16,533	34,900	3,630
July	7.06	2.52	27	3,410	11	44.0	358	22,000	20,073	61,500	4,300
Aug.	7.72	3.55	15	4,032	9	333	864	53,100	30,254	66,400	4,430
Sept.	11.40	3.78	22	8,090	12	343	1,190	70,600	33,438	70,600	6,980
Oct.	7.08	3.73	2	3,502	23	300	745	45,800	22,461	45,800	4,520
Nov.	4.71	3.73	25	756	28	223	411	24,500	15,484	24,500	4,990
Dec.	5.03	3.74	14	1,072	8	251	426	26,200	15,874	26,200	5,640
Yearly	11.40	2.30		9,780		26.9	457	330,490	217,645	373,500	102,420

*Partly Estimated. ** Elephant Butte Reservoir closed January 1915.

● Estimated from peak flow at El Paso and Upper Presidio Stations.

RIO GRANDE AT LA NUTRIA STATION

DESCRIPTION: Water-stage recorder about 9.5 miles above Candelaria, Texas, 9.5 miles above San Antonio, Chihuahua, 64 miles above Presidio, Texas, and 62 miles above Ojinaga, Chihuahua, and 207.9 river miles below the American Dam at El Paso, Texas. Zero of gage is 2,871.42 feet above mean sea level. United States Coast and Geodetic Survey datum.

RECORDS: Based upon 15 meter measurements by wading during the year for stages below 650 second feet. Station rating curve extended above 650 second feet by means of areas and water surface slopes shown by maximum stage pipe gages. Computations by shifting channel methods. 1941 records fair. Records available: January 1935 to December 31, 1941. Records estimated from January 1 to June 15, 1935. The operation of this station was discontinued December 31, 1941.

REMARKS: Reservoirs in the United States as well as many irrigation diversions and drainage returns in the United States and Mexico completely modify the river flow.

EXTREME FLOWS: The greatest recorded flow was on August 31, 1935, when the peak discharge was 7,480 second feet. The river is sometimes dry. A careful survey of flood marks shows that about 30,000 second feet passed this point prior to the establishment of the station. From persons continuously resident in this region, since 1903 it is known that such a flow as 30,000 second feet has not occurred here since 1903.

Mean Daily Discharge in Second Feet 1941 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	155	150	74.8	51.6	497	* 512	" 1,090	992	800	4,050	849	320
2	162	168	76.3	49.6	480	* 441	" 1,110	713	* 802	3,220	761	302
3	159	162	72.3	49.2	" 356	* 318	" 800	448	* 1,000	" 3,080	608	305
4	163	160	69.6	43.4	" 355	* 413	" 459	521	* 925	" 3,000	545	290
5	158	160	84.9	37.8	" 355	377	" 388	509	* 1,010	" 2,650	536	278
6	154	160	80.1	36.0	" 355	1,230	" 350	608	* 777	" 1,200	507	290
7	153	156	71.4	34.2	" 358	2,500	" 300	526	* 706	" 970	471	324
8	155	156	78.8	41.7	" 318	1,310	" 424	444	* 653	" 915	459	284
9	169	168	69.0	34.0	* 243	1,000	335	423	700	" 925	444	278
10	162	154	88.8	33.6	* 201	865	460	584	530	" 1,000	437	267
11	148	160	93.8	39.6	* 151	747	212	1,570	500	" 1,250	425	264
12	195	168	97.8	105	* 97.1	623	160	847	500	" 1,060	422	293
13	210	162	90.9	88.5	* 77.3	512	141	905	500	" 910	379	480
14	185	150	82.9	65.9	* 82.3	450	138	1,720	460	" 790	389	555
15	185	145	89.5	49.2	* 71.3	465	236	2,140	550	" 660	400	647
16	177	134	81.5	32.5	* 72.7	400	313	2,140	610	" 630	413	716
17	179	130	75.7	26.3	* 69.6	325	417	2,930	641	" 615	527	546
18	171	128	71.6	21.7	* 89.3	300	387	*2,510	664	" 585	557	456
19	164	123	502	18.4	* 82.3	285	591	*1,640	582	" 535	519	404
20	165	120	457	20.7	* 52.3	244	416	*1,680	498	" 520	439	383
21	176	106	330	17.5	* 63.2	" 184	242	*1,590	515	" 520	457	363
22	180	117	300	15.5	* 133	" 187	294	993	1,900	" 975	416	356
23	173	104	209	13.7	* 720	" 194	1,220	1,050	5,990	" 1,150	391	340
24	158	99.0	189	14.1	" 1,240	" 194	1,300	2,920	6,660	" 1,190	405	324
25	133	98.2	145	14.1	" 883	" 250	851	*1,940	6,800	" 1,180	409	340
26	128	89.6	119	726	" 501	" 300	578	*1,410	6,610	" 1,380	394	336
27	130	94.3	96.5	* 727	" 353	" 400	434	*1,130	5,470	" 1,310	363	311
28	131	80.2	107	* 622	" 530	" 1,660	982	*1,240	2,250	" 1,280	359	305
29	128		80.7	1,730	" 706	" 1,550	1,110	*1,270	1,810	" 925	356	317
30	125		69.6	728	" 565	" 883	669	* 706	1,780	" 750	353	317
31	133		60.1		" 600		822	* 530		" 770		324
Sum	4,964	3,802.3	4,114.6	5,486.8	*10,657.4	*19,119	* 17,229	*38,629	53,253	"39,995	13,990	11,315

Month	Extreme Gage Feet — 1941 High	Extreme Gage Feet — 1941 Low	Extreme Second Feet — 1941 High Day	Extreme Second Feet — 1941 High	Extreme Second Feet — 1941 Low Day	Extreme Second Feet — 1941 Low	Average Second Feet 1941	Acre Feet Total 1941	Acre Feet Period 1935-1941 Average	Acre Feet Period 1935-1941 Maximum	Acre Feet Period 1935-1941 Minimum
Jan.	4.88	3.60	13	472	‡ 29	119	160	9,850	10,831	15,000	" 3,000
Feb.	3.88	3.28	2	177	28	72.5	136	7,540	8,446	14,400	" 2,500
Mar.	5.28	3.09	19	699	31	56.7	133	8,160	6,606	13,600	" 500
Apr.	7.27	2.57	26	2,380	23	12.9	183	10,900	5,216	13,000	" 0
May	9.39	3.10	23	4,680	20	40.3	* 344	* 21,100	8,731	21,100	" 0
June	7.73		7	2,780	21	# 184	* 637	* 37,900	13,509	37,900	" 5,290
July	7.30	3.82	23	2,400	15	124	* 556	* 34,200	17,344	57,900	2,780
Aug.	9.72	4.90	24	5,220	9	406	* 1,250	* 76,600	28,943	76,600	10,500
Sept.	10.82		25	6,880	14	# 460	1,780	105,600	51,314	105,600	13,100
Oct.	9.63		1	5,080	20	# 520	" 1,290	" 79,300	29,886	79,300	12,000
Nov.	5.45	4.27	1	861	30	336	466	27,700	14,771	27,700	10,300
Dec.	5.37	4.00	15	813	10	256	365	22,400	15,229	22,400	10,400
Yearly	10.82	2.57		6,880		12.9	608	441,250	210,826	441,250	132,150

‡ And Other Days. " Estimated. * Partly Estimated. # Mean Daily.

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 Rio Conchos and about 10 miles northwest of the towns of Presidio, Texas, and Ojinaga, Chihuahua, and 285.7 river miles below the American Dam at El Paso, Texas. Zero of gage is 2,579.82 feet above mean sea level, United States Coast and Geodetic Survey datum.

RECORDS: Based on 56 meter measurements during the year. Computations by shifting channel methods. 1941 records good. Records available: April 1900 to March 1914; September 1919 to March 1920; August 1923 to December 1941.

REMARKS: Reservoirs in the United States, as well as many irrigation diversions and drainage returns in the United States and Mexico, completely modify the river flow.

EXTREME FLOWS: The greatest recorded flow was on June 12, 1912, when peak discharge was 15,200 second feet. The river is sometimes dry. See pages 71 and 72 of Water Bulletin No. 8 for the magnitude and average frequency of floods during the previous periods of record. On October 1, 1941 a gage height of 10.05 feet was reached with a flow of 4,070 second feet. The level of the river water surface at this gage height was 2,589.87 feet above U.S.C. & G.S. mean sea level datum and was the highest level reached during the years 1923 to 1941, inclusive. According to local testimony this is the highest level reached in the past 50 years at least, being even higher than during the peak flow of 15,200 second feet on June 12, 1912. The datum of the gage in 1912 is unknown.

Mean Daily Discharge in Second Feet 1941 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	91.7	110	78.3	25.6	* 712	* 984	1,240	985	749	3,660	925	461
2	88.6	115	76.9	* 18.6	502	* 532	1,630	*1,100	884	2,980	923	451
3	119	126	71.8	* 13.1	* 575	455	1,500	* 700	880	2,870	832	444
4	133	130	63.3	12.0	* 428	514	*1,380	553	1,120	3,410	732	435
5	130	133	40.9	9.9	* 370	446	* 663	621	* 980	3,280	673	430
6	134	132	29.6	9.4	* 337	440	464	724	1,090	3,040	653	418
7	126	133	20.0	8.4	* 334	1,110	387	671	* 700	2,340	625	425
8	118	135	13.2	7.3	* 328	1,570	464	588	547	1,360	586	444
9	120	136	11.8	6.0	284	1,150	546	510	715	1,130	570	437
10	124	142	11.6	5.2	* 242	912	405	465	842	1,240	558	427
11	127	157	10.7	5.6	* 194	862	445	676	* 678	1,070	543	429
12	140	147	10.2	6.2	* 141	795	293	*1,160	667	2,050	534	428
13	159	150	11.5	5.9	* 95.3	686	225	719	632	1,960	532	425
14	192	152	12.9	5.7	* 70.1	583	199	1,260	831	1,520	528	504
15	165	145	16.5	5.2	* 57.2	565	227	1,330	611	1,090	504	611
16	163	137	22.6	5.1	52.1	546	395	1,460	523	758	502	668
17	168	135	23.9	4.4	173	387	428	1,560	662	708	507	735
18	162	129	24.4	4.0	289	348	415	1,700	690	704	539	639
19	158	124	19.2	3.6	* 108	369	383	1,730	682	694	576	568
20	152	118	131	3.4	* 89.2	489	587	1,720	* 646	665	587	516
21	148	106	316	3.5	65.2	390	* 599	1,650	* 568	629	542	494
22	147	101	233	2.8	63.9	381	* 396	1,600	* 655	605	533	472
23	145	101	171	2.4	78.4	* 274	387	*1,110	1,790	581	517	446
24	141	99.0	152	2.2	*2,860	* 210	1,030	* 840	1,970	1,570	495	427
25	142	95.8	125	2.2	*3,110	203	1,050	1,450	2,030	1,930	493	400
26	134	92.6	108	200	*2,650	306	1,410	1,730	2,350	2,030	494	406
27	119	84.2	87.6	1,100	1,620	404	* 862	*1,640	*3,000	1,860	489	430
28	114	78.6	68.1	746	1,040	584	711	*1,210	*3,470	1,960	481	407
29	120		50.8	855	994	1,920	1,110	1,360	3,770	2,260	477	398
30	117		42.5	1,180	758	1,760	* 992	*1,480	3,900	1,850	465	402
31	113		38.4		793		701	* 877		1,050		406
Sum	4,210.3	3,444.2	2,092.7	4,258.7	19,413.4	20,175	21,524	*35,179	38,632	52,854	17,415	14,583

Month	Extreme Gage Feet — 1941 High	Extreme Gage Feet — 1941 Low	Extreme Second Feet — 1941 High Day	Extreme Second Feet — 1941 High	Extreme Second Feet — 1941 Low Day	Extreme Second Feet — 1941 Low	Average Second Feet 1941	Acre Feet Total 1941	Acre Feet Period 1924-1941 Normal	Acre Feet Period 1924-1941 Maximum	Acre Feet Period 1924-1941 Minimum
Jan.	1.98	1.26	14	215	‡ 2	84.5	136	8,350	12,546	27,300	644
Feb.	1.72	1.17	11	161	28	75.0	123	6,830	11,302	29,400	1,420
Mar.	2.53	0.36	20	406	12	10.1	67.5	4,150	10,042	41,500	285
Apr.	6.00	0.30	27	1,660	25	1.9	142	8,450	9,433	39,900	0
May	* 9.70	1.15	24	3,440	15	49.8	626	38,500	15,010	55,300	0
June	8.04	1.74	29	2,500	25	190	672	40,000	15,592	62,100	830
July	6.17	1.80	2	1,790	15	189	694	42,700	19,364	68,800	13.3
Aug.	6.00	2.61	27	1,850	11	436	1,130	* 69,800	36,895	81,700	2,170
Sept.	9.92	2.83	30	3,970	22	507	1,290	76,600	39,505	82,500	3,140
Oct.	10.05	2.83	1	4,070	23	571	1,700	105,000	33,674	105,000	0
Nov.	4.20	* 2.27	1	961	30	462	580	34,500	16,523	34,500	0
Dec.	3.40	2.03	17	769	29	393	470	28,900	14,717	28,900	374
Yearly	10.05	0.30		4,070		1.9	641	463,780	234,603	531,300	54,315

‡ And Other Days. * Partly Estimated.

RIO CONCHOS NEAR OJINAGA, CHIHUAHUA

DESCRIPTION: The Rio 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. The normals shown here correspond with the revisions in Rio Conchos discharge shown in Water Bulletin No. 7, page 44. 1941 records fair. Records available: 1900 to 1913 and 1924 to 1941.

REMARKS: The Boquilla storage reservoir, as well as diversions for irrigation in the Rio Conchos basin greatly modify the river flow. The Colina reservoir with 21,900 acre feet capacity, located about 10.5 miles downstream from Boquilla Dam and the Rosetilla reservoir located about 52.7 miles farther downstream, with a capacity of 15,400 acre feet are used for power development only. The daily river flow may be modified by these reservoirs but, except for evaporation, the monthly flow is not.

EXTREME FLOWS: The greatest recorded flow occurred September 11, 1904, when the estimated peak was 162,000 second feet. See pages 71 and 72 of Water Bulletin No.8 for the magnitude and average frequency of floods from the Rio Conchos since 1828. The lowest recorded flow was 3.0 second feet which occurred on May 14, 1904. The second lowest recorded flow was 19.0 second feet which occurred on August 18, 1937.

Month	Extreme Gage Feet — 1941		Extreme Second Feet — 1941				Average Second Feet 1941	Acre Feet			
			High		Low			Total 1941	Period 1924-1941		
	High	Low	Day		Day				Normal	Maximum	Minimum
Jan.			26	826	4	257	511	31,500	53,248	147,500	14,410
Feb.			18	1,570	2	452	924	51,300	43,133	66,180	16,130
Mar.			4	1,080	31	239	553	34,000	38,967	70,240	20,870
Apr.			27	19,500	12	88.8	832	49,500	29,289	62,780	5,000
May			25	30,900	16	188	2,250	138,000	39,323	138,000	3,950
June			29	15,300	21	280	837	49,800	44,189	91,900	8,720
July			28	13,900	17	412	2,290	141,000	88,311	502,000	22,140
Aug.			29	8,170	24	1,790	3,810	234,000	128,211	435,400	18,900
Sept.			28	18,300	10	1,850	7,430	442,000	255,183	1,141,000	9,370
Oct.			15	34,500	31	2,620	12,300	759,000	170,301	798,000	34,600
Nov.			1	2,740	29	949	1,780	106,000	54,987	106,000	17,190
Dec.			16	1,690	13	631	1,100	67,400	49,666	76,000	15,280
Yearly				34,500		88.8	2,910	2,103,500	994,808	2,431,850	400,930

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 1.70 miles above the international highway bridge between Presidio, Texas, and Ojinaga, Chihuahua, 2.0 miles below the confluence of the Rio Conchos with the Rio Grande, and 295.5 river miles below the American Dam at El Paso, Texas. Zero of gage is 2,556.42 feet, United States Coast and Geodetic Survey sea level datum.

RECORDS: Based on 53 meter measurements during the year. Computations by shifting channel methods. 1941 records good. Records available: May 1900 to July 1915; September 1919 to March 1920; August 1923 to December 31, 1941.

REMARKS: Station moved to its present location on June 14, 1932. Previously it was located 11.1 miles farther downstream and .4 miles above the Alamito Creek confluence. See Water Bulletin No. 1 for description of the old station. Reservoirs in the United States, also Boquilla, Colina and Rosetilla reservoirs on the Rio Conchos, as well as many irrigation diversions and drainage returns in the United States and Mexico, greatly modify the river flow.

EXTREME FLOWS: The greatest recorded flow occurred in September, 1904, with a peak flow estimated at 162,000† second feet at the present station. The lowest recorded flow was 3.0 second feet on May 14,1904. See pages 71 and 72 of Water Bulletin No. 8 for the magnitude and average frequency of floods in the previous 109 years.

Mean Daily Discharge in Second Feet 1941 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	509	673	554	283	1,090	2,250	7,410	5,030	7,220	22,000	3,420	1,730
2	502	643	837	278	979	1,450	3,820	* 4,870	6,450	20,900	3,140	1,520
3	446	1,010	903	224	1,140	1,330	4,630	* 4,770	5,040	16,300	3,130	1,440
4	411	1,090	932	194	951	1,310	3,000	* 4,630	4,860	15,000	3,060	1,450
5	405	932	758	175	823	1,120	2,590	5,030	4,580	15,000	3,180	1,310
6	698	1,020	655	148	672	1,020	2,040	7,130	4,160	14,300	2,820	1,250
7	554	1,030	592	134	914	1,370	1,450	6,560	3,510	13,300	2,660	1,290
8	483	1,130	655	129	808	1,980	1,650	4,600	2,750	11,100	2,520	1,240
9	610	1,280	666	135	845	1,870	1,320	4,090	2,820	8,840	2,600	1,190
10	558	1,420	686	113	695	1,510	1,260	3,940	2,550	10,100	2,630	1,170
11	497	1,210	898	109	553	1,470	1,400	4,240	3,070	10,500	2,550	1,330
12	580	995	874	104	484	1,300	1,640	5,350	4,140	15,700	2,450	1,120
13	841	1,240	694	120	498	1,100	1,570	3,690	5,440	20,800	2,250	1,230
14	696	1,410	515	150	471	945	1,070	3,920	9,860	24,100	2,430	1,730
15	714	1,220	594	229	379	2,860	983	5,390	10,600	32,900	2,160	1,540
16	630	1,310	460	216	279	1,170	1,230	6,440	‡ 9,770	31,400	2,020	2,180
17	578	1,310	611	175	813	830	877	7,330	‡ 9,010	23,800	2,150	1,880
18	556	1,460	669	161	1,600	758	860	5,970	‡ 8,290	18,000	2,410	1,860
19	685	1,200	676	148	1,220	712	1,020	5,650	7,590	14,100	2,190	1,640
20	830	1,010	510	145	633	868	1,330	5,540	7,900	12,600	1,980	1,410
21	714	834	840	143	494	677	1,190	4,630	7,850	11,000	1,760	1,780
22	814	732	661	137	400	1,010	885	3,380	10,400	9,590	2,210	1,820
23	654	987	536	125	349	1,210	1,120	3,290	14,600	7,670	2,320	1,860
24	577	980	588	115	*19,000	784	2,530	2,970	8,610	10,800	2,130	1,710
25	667	961	595	102	*26,400	730	3,350	3,200	11,000	9,600	1,790	1,660
26	964	788	503	931	*10,900	835	8,710	3,990	13,900	8,110	2,150	1,630
27	910	730	442	15,800	* 4,030	856	7,750	4,300	18,000	6,740	2,060	1,880
28	850	717	374	3,380	3,840	1,660	10,800	4,110	21,500	6,230	1,580	1,730
29	824		341	2,850	3,110	7,240	5,440	5,740	19,500	5,720	1,470	1,790
30	641		315	1,860	2,540	2,890	5,370	7,020	16,400	5,510	1,680	1,680
31	668		293		2,150		3,750	6,270		3,920		1,500
Summ	20,066	29,322	19,227	28,813	89,060	45,115	92,045	153,070	261,370	435,630	70,900	48,550

Month	Extreme Gage Feet — 1941		Extreme Second Feet — 1941				Average Second Feet 1941	Acre Feet			
			High		Low			Total 1941	Period 1924-1941		
	High	Low	Day		Day				Normal	Maximum	Minimum
Jan.	2.41	1.50	26	1,120	‡ 4	393	647	39,800	65,788	174,800	24,500
Feb.	2.94	1.72	18	1,700	2	575	1,050	58,200	54,437	77,900	26,300
Mar.	2.46	1.26	4	1,150	31	280	620	38,100	48,962	76,300	21,200
Apr.	10.99	0.85	27	20,400	12	95.0	960	57,200	38,056	66,500	4,460
May	13.50	1.12	25	31,600	16	245	2,870	177,000	54,012	177,000	3,660
June	9.48	1.87	29	15,500	21	625	1,500	89,500	59,436	106,000	9,250
July	9.07	2.17	28	14,700	17	794	2,970	183,000	106,762	564,000	23,900
Aug.	7.09	3.63	29	9,640	24	2,500	4,940	304,000	164,609	509,000	38,000
Sept.	12.51	3.65	28	21,700	10	2,360	8,710	518,000	294,728	1,200,000	16,000
Oct.	14.88	5.23	15	35,500	31	3,580	14,100	864,000	204,027	864,000	41,000
Nov.	5.34	3.61	1	3,630	29	1,400	2,360	141,000	71,536	141,000	30,500
Dec.	4.32	3.38	16	2,300	13	1,030	1,570	96,300	64,381	96,300	28,900
Yearly	14.88	0.85		35,500		95.0	3,540	2,566,100	1,226,734	2,651,800	599,000

‡ And Other Days. ‡ Estimated. * Partly Estimated.
† Revised on account of better data after the 1938 flood.

ALAMITO CREEK STATION NEAR PRESIDIO, TEXAS

DESCRIPTION: Water-stage recorder, about 1,800 feet above confluence with the Rio Grande, and six miles below Presidio, Texas and Ojinaga, Chihuahua. This creek enters the Rio Grande .4 river mile below the lower end of the Presidio Valley and 306.9 river miles below the American Dam at El Paso, Texas. Zero of gage is 2,541.42 feet above mean sea level, United States Coast and Geodetic Survey datum.

RECORDS: Based upon 13 meter measurements during the year by wading and a rating curve, the high points of which are determined by slope-area calculations; also upon numerous estimates by the hydrographer at low flow. Computations by shifting channel methods. 1941 records good. Records available: January 1, 1932, to December 31, 1941.

REMARKS: The flow of this spring-fed creek is modified by a small irrigation reservoir (San Estaban) 10.5 miles south of Marfa and by irrigation diversions for about 805 acres of land below the reservoir. The low flow is steady, being from springs. The high flow is erratic, being from storms. The drainage area above this station is 1,504 square miles, all in the United States, 461 square miles of which are above San Estaban Dam and 1,043 square miles below it.

EXTREME FLOWS: The greatest recorded flow occurred July 20, 1937 with a gage height of 5.33 feet and a flow of 9,670 second feet. The lowest recorded flow was .87 second feet on several days in 1932. On June 28, 1941, a gage height of 6.68 feet was recorded with a flow of 9,550 second feet. On October 2, 1932, backwater from the Rio Grande caused a gage height of 8.33 feet. This is the highest recorded gage height.

Mean Daily Discharge in Second Feet 1941 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	3.0	4.0	3.5	3.0	3.5	331	82.1	3.5	4.5	247	60.0	3.5
2	3.0	4.0	3.5	3.0	3.5	50.0	118	2.5	4.5	7.0	50.0	3.5
3	3.0	4.0	3.5	3.0	3.5	15.0	5.4	2.5	4.5	7.0	40.0	3.5
4	3.0	4.0	3.5	3.5	3.5	8.0	3.5	2.5	4.5	7.0	30.0	4.0
5	3.0	4.0	3.5	3.5	3.5	3.5	3.5	2.5	4.5	7.0	20.0	4.0
6	3.0	4.0	3.5	3.5	3.5	3.5	3.5	2.5	4.5	7.0	9.0	4.0
7	3.0	3.0	3.5	3.5	3.5	3.5	3.5	2.5	4.5	6.5	8.5	4.0
8	3.0	3.0	3.5	3.5	2.0	3.5	90.2	2.5	4.5	6.0	8.0	4.0
9	3.0	3.0	3.5	3.5	2.0	3.5	151	2.5	4.5	6.0	7.5	4.0
10	3.0	3.0	3.5	3.5	2.0	3.5	3.5	2.5	4.5	6.0	7.0	14.0
11	3.0	3.0	3.5	3.5	2.0	3.5	3.5	2.5	4.5	6.0	6.5	17.7
12	3.0	3.0	3.5	3.5	2.0	3.5	3.5	143	8.0	6.0	6.0	11.9
13	3.0	3.0	3.5	3.5	2.0	3.5	3.5	23.1	49.0	6.0	6.0	10.0
14	3.0	3.0	3.5	3.5	2.0	3.5	3.5	55.4	8.3	6.0	84.5	9.0
15	3.0	3.0	3.5	3.5	2.0	182	3.5	29.7	6.0	6.0	4.0	8.0
16	3.0	3.0	3.5	3.5	43.6	8.5	3.5	6.0	4.5	6.0	4.0	7.0
17	3.0	3.0	3.5	3.5	634	35.4	3.0	8.3	4.5	6.0	4.0	7.0
18	3.0	3.0	3.5	3.5	501	12.4	3.0	139	10.0	6.0	4.0	7.0
19	3.0	3.0	3.5	3.5	36.5	3.5	3.0	6.0	10.0	6.0	4.0	7.0
20	3.0	3.0	3.5	3.5	2.0	3.5	3.0	5.0	8.0	6.0	4.0	7.0
21	3.0	3.0	3.5	3.5	2.0	3.5	3.0	5.0	6.0	6.0	4.0	7.0
22	3.0	3.0	3.5	3.5	2.0	3.5	3.0	5.0	8.5	1240	4.0	7.0
23	3.0	3.0	3.5	3.5	2.0	3.5	3.0	281	9.8	1210	4.0	7.0
24	3.0	3.0	3.5	3.5	1360	3.5	113	557	4.0	3290	4.0	7.0
25	3.0	3.0	3.5	3.5	300	3.5	136	27.1	4.0	2350	4.0	6.0
26	3.0	3.0	3.5	11.1	288	3.5	65.9	143	4.0	854	4.0	4.0
27	3.0	3.5	3.0	63.5	80.0	36.0	14.9	27.1	4.0	143	4.0	4.0
28	3.0	3.5	3.0	3.5	80.0	41.8	287	580	4.0	60.0	4.0	4.0
29	3.0		3.0	207	117	1390	3.5	55.8	4.0	60.0	4.0	4.0
30	3.0		3.0	3.5	5.0	186	3.5	4.5	7.7	60.0	4.0	4.0
31	4.0		3.0		108		3.5	4.5		60.0		4.5
Sum	94.0	91.0	106.0	374.6	3601.6	2359.1	1133.5	2134.0	213.8	9,699.5	407.0	198.6

Month	Extreme Gage Feet — 1941		Extreme Second Feet — 1941				Average Second Feet 1941	Acre Feet			
			High		Low			Total 1941	Period 1932-1941		
	High	Low	Day		Day				Normal	Maximum	Minimum
Jan.	2.09	2.08	31	4.0	‡ 1	3.0	3.0	186	199	273	123
Feb.	2.17	2.05	‡ 1	4.0	‡ 7	3.0	3.2	180	187	234	111
Mar.	2.08	1.99	‡ 1	3.5	‡ 27	3.0	3.4	210	200	270	123
Apr.	4.17	2.02	28	1,320	‡ 1	3.0	12.5	743	271	743	119
May	5.35	2.10	24	4,880	1	1.6	116	7,140	1,925	8,520	189
June	6.68	2.26	28	9,550	‡ 5	3.5	78.6	4,680	2,374	* 6,360	206
July	5.10	2.63	1	3,820	‡ 17	3.0	36.6	2,250	3,139	6,650	249
Aug.	6.41	2.80	28	8,700	‡ 2	2.5	68.8	4,230	4,660	16,330	378
Sept.	5.15	2.83	30	4,000	‡ 24	4.0	7.1	424	4,635	19,600	179
Oct.	5.64	2.50	24	6,450	9	6.0	313	19,200	3,204	19,200	157
Nov.	3.98	3.11	14	900	16	2.6	13.6	807	294	807	119
Dec.	3.47	3.00	11	41.5	4	1.0	6.4	394	221	394	117
Yearly	6.68	1.99		9,550		1.0	55.9	40,444	21,309	40,444	6,397

* Partly Estimated. ‡ And Other Days.

TERLINGUA CREEK STATION NEAR TERLINGUA, TEXAS

DESCRIPTION: Water-stage recorder and cable with sit-down cable car located about 12 miles south of Terlingua, Texas, 2.4 miles above the confluence with the Rio Grande at the lower end of Santa Helena Canyon. This recorder was moved 310 feet downstream December 28, 1939. Zero of gage is 2,192.01± .5 feet above mean sea level datum, United States Geological Survey datum. This creek enters the Rio Grande 371.6 river miles below the American Dam at El Paso, Texas.

RECORDS: Based upon 1 meter measurement and numerous estimates by hydrographer at low flow, and the rating curve, the higher points of which were determined by slope-area calculations. Computations by shifting channel methods. 1941 records fair. Records available: January 1, 1932 to December 31, 1941.

REMARKS: The flow of this spring-fed creek is modified by irrigation diversions above the station. The low flow is steady, being from springs. The high flows are erratic, being from storms.

EXTREME FLOWS: The greatest recorded flow was on May 24, 1935, when the extreme gage height was 17.59 feet, with a discharge of 34,900 second feet. The lowest flow recorded was on January 27 and February 3, 1935, and June 17, 1939, when the discharge was .20 of a second foot.

Mean Daily Discharge in Second Feet 1941 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	2.0	1.5	1.0	2.0	94.1	389	785	50.2	3.0	471	" 1.5	" 2.0
2	2.0	1.5	1.0	2.0	2.0	77.4	139	4.2	3.0	4.7	1.5	2.0
3	2.0	1.5	1.0	2.0	2.0	25.4	249	3.0	3.0	4.5	1.5	2.0
4	2.0	1.5	1.0	2.0	2.0	2.0	144	3.0	185	4.5	1.5	2.0
5	2.0	1.5	1.0	2.0	2.0	2.0	71.5	3.0	106	4.5	1.5	2.0
6	2.0	1.5	1.0	2.0	2.0	2.0	2.5	3.0	4.5	4.5	1.5	2.0
7	3.0	1.5	2.0	2.0	2.0	2.0	21.0	3.0	4.5	4.5	1.5	2.0
8	3.0	1.5	2.0	2.0	2.0	2.0	42.5	3.0	4.5	4.5	1.5	2.0
9	3.0	1.5	2.0	2.0	2.0	2.0	28.4	3.0	4.5	4.5	1.5	2.0
10	3.0	1.5	2.0	2.0	2.0	2.0	29.8	3.0	4.5	4.5	1.5	4.2
11	3.0	1.5	2.0	2.0	2.0	2.0	155	3.0	4.5	4.5	1.5	57.7
12	3.0	1.5	2.0	2.0	2.0	2.0	64.7	22.0	4.5	4.5	1.5	2.0
13	3.0	1.5	2.0	2.0	2.0	2.0	2.0	127	202	4.5	1.5	2.0
14	3.0	1.5	2.0	2.0	2.0	2.0	94.0	3.7	4.5	6.3	1.5	2.0
15	3.0	1.5	2.0	2.0	2.0	385	102	3.0	4.5	7.1	6.9	2.0
16	3.0	1.5	2.0	2.0	2.0	158	14.2	3.0	4.5	3.0	2.0	2.0
17	3.0	1.5	2.0	2.0	141	64.4	2.0	3.0	4.5	3.0	2.0	2.0
18	3.0	1.5	2.0	2.0	512	26.8	4.8	3.0	34.9	3.0	2.0	2.0
19	3.0	1.0	2.0	2.0	125	2.0	2.0	3.0	4.5	3.0	2.0	2.0
20	3.0	1.0	2.0	2.0	35.1	2.0	5.5	12.1	4.5	3.0	2.0	2.0
21	3.0	1.0	2.0	2.0	16.4	2.0	3.5	3.0	4.5	3.0	2.0	2.0
22	3.0	1.0	2.0	2.0	6.0	2.0	6.1	3.0	298	3.0	2.0	2.0
23	3.0	1.0	2.0	2.0	2.0	2.0	19.5	207	335	3.0	2.0	2.0
24	3.0	1.0	2.0	2.0	159	2.0	23.5	6.9	4.5	3.0	2.0	1.5
25	3.0	1.0	2.0	2.0	232	2.0	191	3.0	4.5	39.8	2.0	1.5
26	3.0	1.0	2.0	2.0	167	2.0	158	3.0	4.5	121	2.0	1.5
27	3.0	1.0	2.0	1,790	134	2.0	553	3.0	4.5	16.4	2.0	1.5
28	3.0	1.0	2.0	4,760	51.6	2.0	465	236	4.5	1.5	2.0	1.5
29	3.0		2.0	934	2.0	998	37.3	223	4.5	1.5	2.0	1.5
30	3.0		2.0	287	2.0	142	6.6	3.0	4.5	1.5	2.0	1.5
31	1.5		2.0		2.0		3.0	3.0		1.5		1.5
Sum	85.5	37.0	56.0	7,823.0	1,711.2	2,308.0	3,425.4	955.1	1,264.4	748.8	57.9	115.9

Month	Extreme Gage Feet — 1941		Extreme Second Feet — 1941				Average Second Feet 1941	Acre Feet			
			High		Low			Total 1941	Period 1932-1941		
	High	Low	Day		Day				Normal	Maximum	Minimum
Jan.	.02	0.00	‡ 7	3.0	31	1.5	2.8	170	207	743	82.7
Feb.	.02	0.00	‡ 1	1.5	‡19	1.0	1.3	73.4	130	223	73.4
Mar.	.00	-.01	‡ 7	2.0	‡ 1	1.0	1.8	111	195	489	74.4
Apr.	" 8.83	" 0.00	28	" 5,560	‡ 1	" 2.0	261	15,500	1,845	15,500	55.1
May	9.40	1.51	18	6,630	‡ 2	2.0	55.2	3,390	7,720	* 26,000	117
June	7.51	0.71	15	3,670	‡ 4	2.0	76.9	4,580	11,340	54,800	407
July	6.32	0.21	1	2,380	‡13	2.0	110.0	6,790	7,522	26,800	621
Aug.	5.24	0.24	23	1,500	‡ 2	3.0	30.8	1,890	5,622	* 26,680	254
Sept.	5.70	0.46	22	1,840	‡ 1	3.0	42.1	2,510	9,538	24,600	223
Oct.	10.51	0.01	1	8,990	‡28	1.5	24.2	1,490	3,104	8,100	50.8
Nov.	0.87	0.10	15	46.6	* 1	1.5	1.9	115	536	" 2,980	64.9
Dec.	2.81	0.06	11	361	*24	1.5	3.7	230	448	3,030	90.0
Yearly	10.51	-.01		8,990		1.0	50.9	36,849.4	43,207	105,807	6,470.2

" Estimated. * Partly Estimated. ‡ And Other Days.

RIO GRANDE AT JOHNSON RANCH STATION

DESCRIPTION: Water-stage recorder and cable with stand-up cable car, with winch, located about 2 miles above Johnson Ranch, about 14 miles below Castolon, Brewster County, Texas and Santa Helena Ranch, Chihuahua, Mexico, and 392.9 river miles below the American Dam at El Paso, Texas. Zero of the gage is 2,046.00 feet above mean sea level, United States Geological Survey datum.

RECORDS: Based upon 24 meter measurements during the year. Computations by shifting channel methods. 1941 records good. Records available: April 1936 to December 1941.

REMARKS: The river flow at this station is greatly modified by many irrigation diversions and drainage returns and by large reservoirs in the United States and Mexico.

EXTREME FLOWS: From high water marks it was determined that a stage of 24.6 feet was reached October 3, 1932; the estimated discharge for this stage was 97,000 second feet. The lowest flow to pass this station since records began was 23.1 second feet on June 6, 1938.

Mean Daily Discharge in Second Feet 1941 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	410	648	726	342	3,530	3,710	11,440	* 5,300	5,500	32,100	* 4,590	1,840
2	396	690	657	325	961	2,560	7,630	* 5,300	6,950	28,700	* 4,240	1,940
3	486	664	609	303	* 883	1,730	5,260	* 5,010	5,610	22,900	* 4,060	1,700
4	480	669	820	287	* 1,020	1,730	4,580	* 4,840	4,830	17,700	* 3,880	1,620
5	444	782	779	266	* 812	1,410	3,240	* 4,660	5,120	15,400	* 3,500	1,580
6	428	965	838	220	* 742	1,320	2,620	* 6,460	4,210	15,000	* 3,530	1,580
7	433	838	670	195	* 711	1,150	2,140	* 5,760	4,050	13,900	* 3,040	1,570
8	558	937	604	177	839	1,150	1,710	* 4,590	3,730	12,200	* 3,040	1,460
9	496	973	616	163	846	1,880	2,290	* 3,920	* 3,110	12,400	* 2,830	1,510
10	463	1,070	612	143	723	1,890	1,870	4,190	* 3,140	9,110	* 2,860	1,510
11	534	1,240	675	123	737	1,570	1,640	* 4,590	* 3,000	8,630	* 2,900	2,000
12	506	1,140	657	113	582	1,410	1,560	* 5,330	* 3,460	10,600	* 2,830	1,790
13	500	1,060	811	101	481	1,260	1,600	4,920	5,890	15,500	* 2,750	1,590
14	707	991	777	94.2	411	1,140	1,560	4,570	7,080	19,400	* 2,510	1,480
15	655	1,250	631	84.6	411	4,170	1,800	5,750	10,500	22,300	* 2,750	2,290
16	610	1,170	575	75.0	537	3,950	1,290	5,120	9,580	26,400	* 2,470	1,790
17	585	1,130	571	85.0	2,660	1,470	1,390	6,280	9,300	30,100	* 2,260	2,140
18	550	1,160	517	108	4,990	1,040	1,000	6,540	8,300	26,000	* 2,400	2,030
19	526	1,300	568	113	6,640	864	946	5,470	8,240	19,800	* 2,540	1,980
20	537	1,130	655	90.2	1,900	799	940	5,350	7,810	14,900	* 2,400	1,780
21	669	1,030	584	71.8	836	816	1,110	4,930	8,200	11,800	* 2,120	1,610
22	681	893	539	62.2	499	788	1,380	4,800	8.160	9,630	* 2,010	1,760
23	692	775	662	52.6	303	871	1,110	4,700	23,200	9,360	* 2,300	1,890
24	684	756	572	50.0	6,500	1,190	1,330	5,240	17,500	8,760	* 2,510	1,890
25	602	926	516	* 48.7	21,800	792	3,430	3,740	12,500	13,000	* 2,440	1,760
26	573	846	535	* 303	22,500	890	* 6,120	4,300	13,800	10,900	* 2,050	1,650
27	698	879	520	13,200	8,400	887	* 9,430	6,670	15,400	7,550	* 2,190	1,640
28	854	754	468	14,200	3,910	850	*10,700	5,390	22,100	6,650	* 2,190	1,760
29	781		435	6,400	3,910	9,650	*11,500	7,900	20,400	6,210	* 1,800	1,690
30	814		392	2,180	3,090	12,200	* 5,470	6,600	19,600	5,900	* 1,730	1,720
31	738		369		2,690		* 4,060	6,170		5,720		1,620
Sum	18,090	26,666	18,960	39,976.3	104,854	65,137	*112,146	*164,390	280,270	468,520	* 82,720	54,170

Month	Extreme Gage Feet — 1941 High	Extreme Gage Feet — 1941 Low	Extreme Second Feet — 1941 High Day	Extreme Second Feet — 1941 High	Extreme Second Feet — 1941 Low Day	Extreme Second Feet — 1941 Low	Average Second Feet 1941	Acre Feet Total 1941	Acre Feet Period 1924-1941 ϕ Normal	Acre Feet Period 1924-1941 ⊕ Maximum	Acre Feet Period 1924-1941 ⊕ Minimum
Jan.	2.90	2.15	28	898	2	396	584	35,900	72,391	74,900	35,900
Feb.	3.40	2.00	19	1,350	4	409	952	52,900	59,273	72,300	39,400
Mar.	2.93	2.11	6	912	31	360	612	37,600	53,009	57,600	31,100
Apr.	9.92	1.50	28	18,000	25	43.0	1,330	79,300	41,286	79,300	8,990
May	12.28	2.11	26	25,400	24	209	3,380	208,000	66,947	208,000	19,900
June	12.10	2.23	30	25,300	22	725	2,170	129,000	74,789	129,000	17,700
July	10.48	2.51	1	19,800	20	940	*3,620	* 222,000	120,511	620,000	43,900
Aug.	8.37	4.40	27	13,100	26	3,260	*5,300	* 326,000	185,509	326,000	52,100
Sept.	13.78	4.40	23	32,200	11	3,000	9,340	556,000	323,512	1,144,000	* 59,800
Oct.	16.95	4.62	1	45,900	31	4,480	15,100	929,000	224,374	929,000	* 75,600
Nov.			1	# 4,590	30	#1,730	*2,760	* 164,000	79,934	164,000	40,500
Dec.	3.65	2.52	11	2,860	14	1,420	1,750	107,000	70,232	107,000	29,600
Yearly	16.95	1.50		45,900		43	3,930	2,846,700	ϕ1,371,767	ϕ2,846,700	ϕ610,000

Mean Daily. * Partly Estimated.

⊕ The monthly maximums and minimums are for the period 1936 to 1941 only.

ϕ The monthly normals and the yearly normal, maximum, and minimum from January 1924 to March 1936, included in above table were estimated from Boquillas and Lower Presidio.

RIO GRANDE AT LANGTRY STATION, TEXAS

DESCRIPTION: Water-stage recorder and cable with stand-up cable car and winch, located at Langtry, Texas, 79.5 miles above Villa Acuña, Coahuila and 614.1 river miles below the American Dam at El Paso, Texas. Zero of gage is 1,091.69 feet above mean sea level, United States Coast and Geodetic Survey datum.

RECORDS: Based upon 31 meter measurements during the year, 29 by the United States Section and 2 by the Mexican Section. Computations by shifting channel methods. 1941 records good. Records available: May 1900 to October 1914; December 1919 to March 1920; and January 1924 to December 1941.

REMARKS: Large reservoirs and many irrigation diversions, and drainage returns in the United States and Mexico, greatly modify the river flow.

EXTREME FLOWS: The highest recorded gage height was on June 18, 1922, when the extreme gage height was 56.9 feet; the estimated discharge for this stage from extension of the rating curve was 204,000 second feet. The lowest flow ever recorded was in May 1904, with an extreme of 270 second feet. On pages 75 and 76 of Water Bulletin No. 9 will be found a record of flood occurrences since 1864 at this station.

Mean Daily Discharge in Second Feet 1941 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	805	1,120	1,200	783	4,780	3,600	14,800	*6,000	*7,540	21,900	7,070	2,390
2	786	1,130	1,230	738	9,270	4,680	9,800	*4,940	*7,650	27,400	*6,150	2,120
3	769	1,090	1,090	694	10,400	4,400	14,800	*5,830	*7,270	32,900	*5,380	2,090
4	790	960	1,050	675	2,400	3,080	9,300	*5,830	*7,870	26,700	*5,250	2,270
5	791	955	1,000	651	1,720	2,880	5,220	*5,730	*5,880	19,800	*4,860	2,140
6	786	988	931	627	1,460	2,700	4,270	*5,290	5,980	17,200	*4,570	2,020
7	882	984	1,040	604	1,520	1,890	3,610	*4,890	5,660	16,300	*4,210	1,950
8	840	1,230	1,070	575	1,480	2,180	3,100	*6,780	5,140	16,000	*4,060	1,990
9	812	1,290	1,100	558	1,370	1,630	2,800	*6,070	4,790	14,900	*3,400	1,980
10	784	1,160	979	536	1,300	1,400	2,270	*5,010	3,980	18,000	*3,370	1,850
11	863	1,240	906	514	1,340	1,680	3,400	*4,240	3,440	*10,600	*3,230	1,870
12	911	1,290	864	498	1,360	2,460	2,940	*4,590	3,510	*10,600	*3,250	1,880
13	868	1,360	906	2,120	1,300	2,090	2,190	*4,760	3,330	11,600	3,300	2,190
14	880	1,480	878	3,820	1,290	1,790	2,100	*6,240	3,820	14,700	3,240	2,220
15	900	1,400	949	665	1,220	1,750	1,940	*5,270	8,190	18,000	3,200	2,080
16	850	1,340	1,060	567	1,150	2,060	2,350	*5,570	8,640	21,500	3,010	1,860
17	955	1,300	1,120	533	1,090	5,370	2,470	*5,660	10,900	23,600	3,110	2,020
18	1,050	1,520	1,000	560	1,080	4,110	2,420	*5,350	19,000	27,200	3,080	2,120
19	974	1,460	899	474	3,400	2,430	2,340	*6,970	11,000	28,700	2,820	2,130
20	965	1,460	892	449	5,440	1,810	1,440	*6,310	8,650	23,100	2,870	2,430
21	928	1,470	857	434	3,820	1,450	1,440	*5,560	7,870	17,800	2,890	2,390
22	882	1,580	864	429	2,480	1,290	1,060	*5,630	7,460	18,000	2,980	2,320
23	849	1,460	906	444	2,110	1,220	987	*5,370	7,820	13,600	2,570	2,140
24	894	1,360	949	469	3,070	1,230	1,160	*5,550	12,800	12,200	2,420	2,040
25	978	1,260	864	459	2,950	1,210	2,170	*6,250	18,600	10,600	2,620	2,290
26	943	1,140	963	484	10,300	1,290	2,060	*5,610	13,500	14,000	2,920	2,220
27	992	1,090	927	864	24,000	1,910	4,460	*5,620	12,500	13,600	2,850	2,120
28	928	1,250	857	4,240	17,700	1,610	8,900	*8,150	13,900	10,900	2,480	2,040
29	868		810	13,700	6,390	1,660	10,600	*6,750	16,000	8,870	2,590	1,990
30	892		776	9,410	4,890	4,660	13,300	*8,200	18,800	8,050	2,670	2,030
31	1,140		823		4,620		8,320	*8,220		7,490		2,130
Sum	27,555	35,367	29,760	47,574	136,700	71,520	148,017	*182,240	271,490	535,810	*106,420	65,310

Month	Extreme Gage Feet — 1941		Extreme Second Feet — 1941				Average Second Feet 1941	Acre Feet			
			High		Low			Total 1941	Period 1924-1941		
	High	Low	Day		Day				Normal	Maximum	Minimum
Jan.	0.86	0.26	31	1,160	3	762	889	54,700	98,488	*245,000	52,300
Feb.	1.40	0.52	22	1,610	5	919	1,260	70,200	82,576	*117,000	48,900
Mar.	0.95	0.33	2	1,260	29	796	960	59,000	78,284	118,000	48,100
Apr.	11.35	-0.32	28	19,600	22	419	1,590	94,400	66,450	105,000	30,100
May	14.48	0.72	2	35,200	18	1,060	4,410	271,000	105,776	271,000	32,300
June	6.56	1.47	30	10,900	24	1,190	2,380	142,000	103,282	160,000	37,310
July	11.28	1.47	1	19,800	23	955	4,770	294,000	157,446	719,000	56,100
Aug.	6.75	3.29	31	10,300	27	4,120	*5,880	*361,000	226,939	730,000	78,100
Sept.	15.82	2.90	18	29,100	13	2,990	9,050	538,500	382,859	1,100,130	35,700
Oct.	18.26	4.83	3	35,400	31	7,420	17,300	1,063,000	271,834	1,063,000	55,200
Nov.	4.95	2.32	1	7,670	24	2,360	*3,550	*211,000	107,916	*211,000	56,600
Dec.	2.45	1.92	1	2,640	10	1,820	2,110	130,000	95,181	134,000	49,800
Yearly	18.26	-0.32		35,400		419	4,540	3,288,800	1,777,031	3,288,800	879,000

* Partly Estimated.

PECOS RIVER STATION NEAR COMSTOCK, TEXAS

DESCRIPTION: Staff-gage and cable with sit-down cable-car and winch, located at the Pecos high bridge on the railroad 12 miles northwest of Comstock, Texas, 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. Zero of the gage is 1,058.01 feet above mean sea level, United States Coast and Geodetic Survey datum.

RECORDS: Based upon 21 meter measurements during the year. Staff-gage read twice daily and more frequently during large changes of stage. Computations by shifting channel methods. 1941 records good. Records available: March 17, 1898 to December 3, 1898, and May 1900 to December 31, 1941.

REMARKS: The river flow is completely modified at this station by many irrigation diversions and drainage returns, and by the reservoirs of the Carlsbad irrigation project in New Mexico, and the Red Bluff reservoir in Texas. For dry weather losses and gains in the Pecos river channel from Sheffield to the Rio Grande, see page 47 of this Water Bulletin.

EXTREME FLOWS: The greatest recorded flow was on September 1, 1932, when the extreme gage height was 38.25 feet and the extreme flow was 116,000 second feet. An extreme gage height of 35.75 feet was reported on April 6, 1900; discharge based upon 1935 rating curve was 107,000 second feet. The lowest flow ever recorded was on August 31, 1930, when the extreme gage height was -0.15 foot and the extreme flow was 97 second feet. On pages 75 and 76 of Water Bulletin No.9 will be found a record of flood occurrences since 1899 at this station.

Mean Daily Discharge in Second Feet 1941 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	273	331	259	308	928	794	3,060	1,020	‡ 631	2,230	4,080	1,590
2	279	322	251	266	2,170	899	2,210	945	‡ 648	3,770	4,110	1,600
3	272	299	247	262	4,180	974	1,930	964	‡ 666	2,820	4,100	1,590
4	279	286	258	244	1,040	1,700	2,010	958	‡ 684	2,540	4,110	1,560
5	282	286	264	234	992	1,750	1,880	951	‡ 701	2,540	4,180	1,570
6	305	282	253	238	799	1,630	1,750	958	719	2,560	4,240	1,530
7	275	285	253	234	829	2,050	1,500	932	839	3,410	4,400	1,500
8	279	282	245	228	682	2,070	1,340	869	1,110	5,920	4,730	1,480
9	276	292	245	217	574	2,120	1,300	833	1,190	10,200	4,910	1,470
10	280	281	245	210	547	2,960	1,310	757	1,250	13,800	4,930	1,460
11	280	283	244	229	532	3,830	2,160	717	1,230	12,600	4,830	1,450
12	280	283	237	264	488	3,490	1,150	718	1,360	11,600	4,710	1,470
13	281	279	240	253	451	3,170	1,090	696	1,440	10,900	4,640	1,440
14	281	286	239	4,550	451	3,520	1,020	692	1,390	10,700	4,580	1,460
15	281	257	239	404	414	4,330	950	693	1,230	12,100	4,520	1,490
16	279	285	247	318	424	4,500	818	656	1,370	12,400	4,340	1,480
17	279	281	274	742	415	4,770	678	640	1,240	12,600	4,020	1,510
18	276	277	286	456	526	4,940	706	631	11,180	12,800	3,710	1,530
19	276	277	264	315	825	5,460	854	600	1,260	12,800	3,440	1,480
20	248	318	252	272	444	6,010	795	560	1,070	11,700	2,970	1,480
21	252	291	273	269	407	5,630	736	541	1,080	10,300	2,760	1,450
22	248	269	248	258	394	5,840	679	514	1,170	9,870	2,630	1,470
23	271	275	276	241	395	5,540	725	515	1,170	8,610	2,520	1,470
24	278	278	272	237	518	5,020	679	500	1,120	7,480	2,140	1,460
25	272	274	269	231	406	5,050	725	514	1,170	7,290	1,870	1,480
26	268	277	433	248	426	3,020	1,020	538	1,260	7,260	1,710	1,460
27	250	266	884	468	418	2,470	1,060	505	1,290	6,360	1,610	1,500
28	287	253	700	595	405	2,200	1,080	728	1,420	5,150	1,570	1,500
29	280		491	5,940	405	1,900	1,230	495	1,500	4,430	1,560	1,480
30	439		380	2,650	397	1,630	1,260	509	1,680	4,190	1,560	1,440
31	352		313		642		1,230	613		4,100		1,450
Sum	8,758	7,955	9,581	21,381	22,524	99,267	38,935	21,762	44,068	245,030	105,480	46,300

Month	Extreme Gage Feet — 1941 High	Extreme Gage Feet — 1941 Low	Extreme Second Feet — 1941 High Day	High	Low Day	Low	Average Second Feet 1941	Acre Feet Total 1941	Period 1924-1941 Normal	Maximum	Minimum
Jan.	.90	.38	30	462	20	245	283	17,400	22,792	55,880	12,900
Feb.	.60	.40	1	331	15	250	284	15,800	18,245	39,060	10,900
Mar.	‡ 2.00	.38	27	1,090	‡12	237	309	19,000	18,162	32,870	11,100
Apr.	11.40	.30	29	16,500	10	203	713	42,400	17,523	42,400	9,520
May	10.00	.76	‡ 2	13,100	‡22	389	727	44,700	39,804	156,000	10,800
June	6.44	* 1.47	22	6,380	1	* 752	3,310	197,000	41,997	197,000	13,300
July	6.10	1.30	1	5,730	‡15	678	1,260	77,200	25,674	84,200	7,620
Aug.	1.94	.90	1	1,080	24	486	702	43,200	20,846	50,400	7,620
Sept.	12.23		18	18,700	1	‡ 631	1,470	87,400	51,290	324,420	6,190
Oct.	9.80	2.81	10	14,300	1	1,800	7,900	486,000	61,082	486,000	9,520
Nov.	5.51	2.55	10	4,950	30	1,530	3,520	209,000	32,555	209,000	10,300
Dec.	2.67	2.42	3	1,620	‡30	1,440	1,490	91,800	25,808	91,800	12,200
Yearly	12.23	.30		18,700		203	1,840	1,330,900	375,778	1,330,900	176,780

‡ Estimated. * Partly Estimated. ‡ And Other Days.

GOODENOUGH SPRING STATION NEAR COMSTOCK, TEXAS

DESCRIPTION: Water-stage recorder and light cable (winch operated, for carrying current meter and light weights only), located 4,000 feet above confluence with 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. Zero of gage is 971.9 feet above mean sea level, United States Coast and Geodetic Survey datum.

RECORDS: Based upon 12 meter measurements during the year. Computations by shifting channel methods. 1941 records good. Records available: February 23, 1929 to December 1941. Annual discharges for the years 1924 to 1928, inclusive, were estimated as were the monthly discharges for January and February 1929. See page 52, Water Bulletin No. 6.

REMARKS: The flow of this spring channel is very uniform and is not modified by diversions or storage. When the Rio Grande reaches a flow of about 35,000 second feet near this station, then backwater from the Rio Grande reaches this gaging station.

EXTREME FLOWS: The highest recorded gage height was on September 18, 1941, when the extreme gage height was 4.57 feet, discharge 846 second feet. The lowest flow ever recorded was on April 4, 1930 when the extreme flow was 89.4 second feet, with a gage height of 0.30 feet. Backwater from the Rio Grande reached a gage height of 13.86 on September 4, 1935, and 17.30 on September 1, 1932.

Mean Daily Discharge in Second Feet 1941 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	102	103	103	114	121	119	127	134	126	193	164	173
2	100	103	105	114	136	119	133	134	125	197	164	170
3	101	103	105	115	144	120	129	134	122	214	165	170
4	102	103	103	113	143	120	130	135	120	217	165	171
5	102	103	104	115	143	120	130	134	119	210	164	169
6	102	104	104	116	142	119	130	133	118	206	165	168
7	102	104	102	114	141	119	130	133	119	201	164	169
8	102	104	103	114	139	119	130	133	118	193	163	170
9	102	104	104	116	136	119	131	134	116	189	165	171
10	103	105	103	117	133	122	135	133	115	191	167	170
11	105	105	103	119	133	127	152	134	125	185	167	171
12	105	107	102	125	132	131	170	134	142	181	166	172
13	107	105	101	143	130	135	162	145	161	179	168	168
14	107	103	102	147	129	136	157	158	155	176	169	168
15	107	103	104	133	127	139	146	159	145	177	171	168
16	107	104	104	124	125	135	145	148	137	179	173	169
17	106	104	106	124	124	135	144	155	138	184	174	169
18	106	104	107	119	126	134	143	142	431	195	174	169
19	106	105	108	114	126	132	139	138	426	227	175	169
20	105	104	109	108	124	132	138	137	386	197	173	167
21	105	104	108	99.4	122	131	136	136	332	163	173	169
22	105	106	109	94.9	120	129	137	134	301	157	176	169
23	105	106	111	89.5	120	129	136	134	280	152	173	167
24	104	105	112	94.9	152	129	136	133	262	154	171	167
25	103	104	112	93.8	132	129	135	132	250	161	173	167
26	103	104	111	89.4	125	128	136	131	239	163	171	164
27	103	101	110	94.8	122	127	135	129	229	161	172	163
28	103	102	109	104	120	127	135	129	215	159	172	163
29	103		110	129	119	126	136	129	206	159	173	163
30	103		112	123	119	126	135	128	197	161	173	163
31	103		113		119		134	126		161		164
Sum	3,219	2,912	3,299	3,416.7	4,024	3,813	4,292	4,228	5,955	5,642	5,083	5,210

Month	Extreme Gage Feet — 1941		Extreme Second Feet — 1941				Average Second Feet 1941	Acre Feet			
			High		Low			Total 1941	Period 1924-1941		
	High	Low	Day		Day				Normal	ϕ Maximum	ϕ Minimum
Jan.	.54	.40	15	108	2	100	104	6,380	8,892	19,620	6,380
Feb.	.45	.35	12	108	27	101	104	5,786	7,954	17,030	5,780
Mar.	.53	.30	17	117	13	101	106	6,540	8,399	17,770	6,210
Apr.	2.82	.44	13	552	26	89.4	114	6,780	7,940	16,580	5,850
May	2.39	1.32	2	278	29	118	130	7,980	8,605	16,840	6,950
June	2.05	1.31	15	220	9	118	127	7,560	8,756	16,040	7,020
July	2.18	1.34	14	241	1	127	138	8,510	9,071	16,460	7,170
Aug.	1.97	1.25	13	207	31	126	136	8,390	8,854	15,840	6,960
Sept.	4.57	1.20	18	846	10	114	199	11,800	11,676	‡41,490	6,550
Oct.	1.98	1.38	19	227	29	157	182	11,200	10,309	*25,870	6,840
Nov.	1.40	1.20	22	178	7	159	169	10,100	9,492	21,850	6,600
Dec.	1.22	1.07	1	174	28	162	168	10,300	9,334	20,470	6,660
Yearly	4.57	.30		846		89.4	140	101,320	109,282	192,840	85,000

‡ Estimated. * Partly Estimated. ϕ Maximum and Minimum figures are for period 1929 to 1941 only.

DEVILS RIVER STATION NEAR DEL RIO, TEXAS

DESCRIPTION: Water-stage recorder on main highway bridge, 12 miles northwest of Del Rio, Texas, and 4.5 miles above confluence with the Rio Grande. Devils River enters the Rio Grande 680.1 river miles below the American Dam at El Paso, Texas. High stage measurements from highway bridge, low stage measurements by wading. Zero of gage is 951.80 feet above mean sea level, United States Coast and Geodetic Survey datum.

RECORDS: Based upon 10 meter measurements during the year. Computations by shifting channel methods. 1941 records good. Records available: May 1900 to March 1914, at a point .8 mile below Southern Pacific Railroad bridge; December 1923 to September 1, 1932, at a point .2 mile above Southern Pacific Railroad bridge; September 2, 1932 to December 31, 1941, at highway bridge 2 miles upstream from railroad bridge.

REMARKS: The monthly flow of this spring-fed river is not modified, but the daily flow is modified by 2 power dams, the operation of which began in 1929. There are irrigation diversions for only 8 acres from this river.

EXTREME FLOWS: The highest recorded gage height was on September 1, 1932, when the extreme gage height was 41.0 feet at present station and the extreme flow was 597,000 second feet. (See Special Flood Report 1932 by United States Section of this Commission.) This corresponds to a flow of 147 second feet per square mile of watershed. Zero flow sometimes occurs for a few hours at this station. When this happens the gage height falls to .84 foot or below. On pages 75 and 76 of Water Bulletin No. 9 will be found a record of flood occurrences since 1832 at this station.

CORRECTION: In U.S.G.S. Water Supply Papers 358 and 84, and Water Bulletin No. 7, there is an error pertaining to the flow of the Devils River for November 1902. The correct November total acre-feet of discharge is 25,900, and the correct 1902 annual discharge is 355,200 acre-feet.

Mean Daily Discharge in Second Feet 1941 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	258	284	191	238	291	289	307	314	331	402	323	358
2	260	279	193	261	432	293	292	292	319	379	475	370
3	271	280	233	242	1,290	312	357	260	342	373	369	321
4	286	280	246	241	759	316	348	307	342	398	404	334
5	305	267	235	226	589	296	401	321	342	475	366	330
6	275	248	224	242	567	276	348	320	335	812	415	347
7	283	238	237	237	566	325	335	335	329	622	409	376
8	286	104	198	249	656	306	291	351	314	456	406	343
9	278	261	213	243	356	258	282	351	258	445	345	308
10	279	316	245	239	413	223	318	339	316	394	377	404
11	270	384	223	242	366	281	988	345	512	2,480	422	325
12	277	312	231	239	356	278	283	316	702	760	383	338
13	275	265	215	352	394	307	236	312	410	670	377	343
14	242	245	224	913	349	249	686	293	393	658	395	355
15	273	255	187	558	331	341	262	304	398	457	379	342
16	268	252	199	500	325	414	483	348	514	1,890	391	349
17	263	245	287	495	333	535	322	337	448	945	377	346
18	243	239	296	162	344	351	319	333	873	736	378	353
19	244	244	263	165	337	386	299	332	510	675	380	352
20	244	244	248	170	399	353	311	320	421	676	373	329
21	245	254	234	206	514	325	316	351	413	664	378	336
22	251	248	235	317	302	329	302	317	377	665	363	356
23	246	246	259	266	327	337	296	337	383	666	357	324
24	233	251	243	267	351	346	302	313	390	1,410	351	313
25	253	250	211	299	332	327	305	311	403	643	346	334
26	253	232	232	344	317	331	290	320	402	500	346	298
27	254	248	238	320	331	317	280	354	367	371	346	293
28	249	200	240	403	333	317	291	351	354	454	362	292
29	249		237	265	306	311	288	344	397	389	341	342
30	250		239	265	286	300	278	346	382	402	366	325
31	238		229		314		290	336		445		331
Sum	8,101	7,171	7,185	9,166	13,166	9,629	10,706	10,110	12,277	21,312	11,300	10,467

Month	Extreme Gage Feet — 1941		Extreme Second Feet — 1941				Average Second Feet 1941	Acre Feet			
			High		Low			Total 1941	Period 1924-1941		
	High	Low	Day		Day				Normal	Maximum	Minimum
Jan.	1.69	1.06	6	570	28	116	261	16,100	24,636	* 45,250	14,500
Feb.	1.72	0.85	10	625	26	80.0	256	14,200	21,972	* 36,880	13,300
Mar.	1.66	0.87	28	569	11	87.4	232	14,300	22,647	39,420	14,000
Apr.	2.23	1.02	14	1,520	1	153	306	18,200	25,878	67,800	11,100
May	2.31	0.98	3	1,710	18	130	425	26,100	46,419	301,000	10,500
June	1.72	0.95	8	625	14	92.2	321	19,100	44,028	285,000	16,100
July	2.78	1.15	11	2,830	13	135	345	21,200	49,756	377,000	19,600
Aug.	1.80	1.22	8	739	1	148	326	20,100	25,630	* 51,000	15,500
Sept.	2.40	1.24	17	1,890	1	187	409	24,400	102,646	895,990	13,900
Oct.	3.54	1.10	24	5,330	3	148	687	42,300	51,492	349,000	18,600
Nov.	1.70	1.10	15	620	28	167	377	22,400	26,019	56,350	15,900
Dec.	1.68	1.08	2	593	1	159	338	20,800	25,598	49,520	15,900
Yearly	3.54	0.85		5,330		80.0	358	259,200	466,721	1,284,080	237,400

* Partly Estimated.

RIO GRANDE AT DEL RIO STATION

DESCRIPTION: Water-stage recorder, located 900 feet upstream from international highway bridge between Del Rio, Texas and Villa Acuña, Coahuila, and 693.4 river miles below the American Dam at El Paso, Texas. High stage measurements from highway bridge, low stage measurements from boat on cable at gage well. Low water stages by frequent staff gage readings prior to July 3, 1941. Zero of gage 864.80 feet above mean sea level, United States Coast and Geodetic Survey datum. Beginning July 3, 1941, a new gage well with water-stage recorder was used. It is located on a pier of the highway bridge. The zero of the new gage is on the same level as the old one.

RECORDS: Based upon 16 meter measurements during the year. Computations by shifting channel methods. 1941 records fair. Records available: December 1923 to December 1941. Records are also available for station 11 miles upstream from May 1900 to April 1915; and for station 7.5 miles upstream at McKee's Switch from December 1919 to March 1920. Several small springs but no important tributaries enter the river between the various station sites.

REMARKS: The river flow is greatly modified at this station by many irrigation diversions and drainage returns and by large reservoirs in the United States and Mexico.

EXTREME FLOWS: The highest recorded gage height was on September 1, 1932, when the extreme gage height was 34.5 feet, discharge 605,000 second feet. This is the greatest rate of discharge ever recorded at any point on the Rio Grande. (See Special Flood Report 1932 by American Section of this Commission). The lowest flow ever recorded was in May 1940, when the extreme gage height was -.39 feet and the extreme flow 890 second feet. Numerous records of extreme flows may be found in previous Water Bulletins.

Mean Daily Discharge in Second Feet 1941 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	*1,590	2,240	1,990	* 1,620	12,700	5,370	8,670	8,190	8,260	*22,200	*11,700	5,050
2	*1,610	2,090	2,000	* 1,570	8,910	5,060	17,800	7,100	8,440	*27,600	*11,700	4,820
3	*1,610	2,060	*1,940	* 1,480	28,400	6,130	14,300	6,540	8,220	*36,200	*10,200	4,630
4	*1,560	2,060	*1,850	* 1,470	11,700	5,460	14,500	7,350	8,580	*38,500	* 9,710	4,650
5	*1,620	1,940	*1,750	* 1,380	4,840	* 5,300	8,800	6,920	7,760	*29,700	* 9,530	4,730
6	*1,620	1,880	*1,730	* 1,400	3,870	* 5,120	7,830	6,600	6,610	*22,000	* 9,330	4,600
7	*1,600	1,900	*1,610	* 1,310	3,440	* 4,870	6,380	6,340	7,170	*19,500	* 9,150	4,550
8	*1,680	1,850	*1,700	* 1,270	3,300	* 4,480	5,480	6,850	6,440	*20,300	* 9,240	4,460
9	*1,680	2,020	*1,770	* 1,200	3,150	* 4,940	4,870	7,670	6,260	*24,100	* 9,150	4,410
10	*1,620	2,120	*1,780	* 1,200	2,740	* 5,830	4,570	7,540	6,190	*28,900	* 8,850	4,460
11	*1,590	2,330	*1,700	* 1,180	2,500	5,050	6,540	6,430	6,990	*31,600	* 8,680	4,320
12	*1,610	2,260	*1,620	* 1,180	2,430	5,730	5,370	5,980	6,000	*22,600	* 8,460	4,390
13	*1,700	2,230	*1,580	1,300	2,460	5,810	4,580	6,060	5,840	*20,800	* 8,480	4,340
14	*1,660	2,230	*1,610	16,800	2,270	5,800	4,630	7,040	* 5.180	*22,100	* 8,400	4,630
15	*1,620	2,380	*1,590	5,370	2,190	6,630	4,300	7,150	* 6,750	*27,700	* 8,330	4,580
16	*1,640	2,290	1,780	1,870	2,090	6,830	4,180	6,260	* 8,560	*33,600	* 8.140	4,560
17	*1,620	2,200	1,970	1,910	2,000	8,250	4,100	7,190	*11,300	*37,900	* 7,800	4,360
18	*1,650	2,120	2,140	2,090	2,000	10,100	4,220	6,660	*46,900	*40,900	* 7,630	4,510
19	*1,780	2,340	1,940	1,590	2,040	8,260	3,810	7,200	*29,500	*46,100	* 7,240	4,600
20	*1,730	2,300	1,780	1,390	5,260	7,580	3,480	8.110	* 9,900	*45,400	* 6,820	4,670
21	*1,730	2,240	1,750	1,290	7,880	7,340	3,220	7,210	* 8,700	*35,800	* 6,480	4,680
22	*1,640	2,260	1,710	1,260	4,410	7,030	3,220	6,650	* 7,840	*31,000	* 6,430	4,680
23	*1,610	2,390	1,700	1,230	3,160	6,720	2,850	6,610	* 8,000	*25,400	* 6,210	4,560
24	*1,590	2,240	1,750	1,220	3,870	6,480	2,770	6,330	* 8,290	*28,000	* 5,810	4,390
25	*1,590	2,140	1,790	1,200	4,770	5,960	2,940	6,970	*19,100	*18,000	* 5,450	4,320
26	*1,940	2,040	1,800	1,580	3,770	5,080	3,960	6,370	*18,100	*16,900	* 5,450	4,460
27	*1,780	1,940	1,810	1,380	17,800	4,420	4,150	6,290	*13,900	*20,400	* 5,450	4,490
28	*1,800	1,900	2,220	2,560	23,100	4,510	7,230	7,560	*14,100	*17,300	* 5,320	4,440
29	*1,710		2,100	20,000	12,300	4,130	11,000	8,800	*16,200	*12,400	* 5,070	4,370
30	1,760		1,820	20,500	6,500	5,530	12,400	8,600	*18,900	*10,800	* 5,190	4,340
31	1,920		1,750		5,300		13,900	9,920		*10,100		4,390
Sum	51,860	59,990	56,030	100,800	201,150	179,800	206,050	220,490	343,980	823,800	235,400	140,440

Month	Extreme Gage Feet — 1941 High	Extreme Gage Feet — 1941 Low	Extreme Second Feet — 1941 High Day	Extreme Second Feet — 1941 High	Extreme Second Feet — 1941 Low Day	Extreme Second Feet — 1941 Low	Average Second Feet 1941	Acre Feet Total 1941	Acre Feet Period 1924-1941 Normal	Acre Feet Period 1924-1941 Maximum	Acre Feet Period 1924-1941 Minimum
Jan.	" .29	- .10	26	2,070	4	1,460	1,670	103,000	168,654	344,000	103,000
Feb.	" .80	.02	23	" 2,600	8	1,730	2,140	119,000	143,360	229,970	96,200
Mar.	" .60	- .07	28	" 2,380	15	1,560	1,810	111,000	142,081	224,670	94,700
Apr.	9.52	- .35	29	31,400	13	1,160	3,360	200,000	133,369	200,000	83,300
May	10.00	.35	3	34,000	18	1,760	6,490	399,000	218,392	* 700,000	68,200
June	4.59	1.37	18	10,500	30	3,570	5,990	357,000	219,779	704,000	107,000
July	* 8.91	.72	2	* 28,400	24	2,640	6,650	409,000	255,634	*1,228,000	97,800
Aug.	4.73	2.16	31	11,300	28	5,350	7,110	437,000	295,243	865,000	124,000
Sept.	16.90	2.13	18	81,600	14	4,980	11,500	682,000	584,004	2,754,590	72,600
Oct.	12.52	4.83	19	47,600	31	10,100	26,570	1,634,000	426,664	1,634,000	110,000
Nov.	4.88	1.88	1	12,100	29	4,880	7,850	467,000	192,984	467,000	108,000
Dec.	2.15	1.57	1	5,210	11	4,200	4,530	279,000	172,452	295,180	102,000
Yearly	16.90	- .35		81,900		1,160	7,180	5,197,000	2,952,616	6,041,720	1,639,000

" Estimated. * Partly Estimated.

ARROYO LAS VACAS NEAR VILLA ACUNA, COAHUILA

DESCRIPTION: Water-stage recorder and cable with sit-down cable car located 1.5 miles upstream from Villa Acuña, Coahuila, and 1.8 miles upstream from the confluence with the Rio Grande just above Del Rio-Villa Acuña international bridge. This confluence is 693.5 river miles below the American Dam at El Paso, Texas. Zero of the gage is 884.15 feet, United States Coast and Geodetic Survey sea level datum. Prior to September 7, 1939, a staff gage at the same location and on the same datum was used.

RECORDS: Based upon 122 meter measurements during the year, 119 by the Mexican and 3 by the United States Section. Computations by shifting channel methods. 1941 records only fair because of lack of high flow measurements. Records available: Occasional estimates from June 1935 to March 20, 1938, after which the present record extends to December 31, 1941.

REMARKS: This gaging station began operating March 20, 1938. From January 1 to September 7, 1939, a staff gage at the same location and on the same datum was used. The low flow of this stream is spring-fed. 1,977 acres of land are irrigated from this stream above this gaging station.

EXTREME FLOWS: The highest recorded flow was on April 5, 1940, when a flow of 39,200* second feet was recorded with a gage height of 8.14 feet. The lowest flow was 0.7 second foot during several days in November 1938.

Mean Daily Discharge in Second Feet 1941 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	4.2	6.3	4.9	10.6	5.7	5.3	4.9	8.1	8.1	4.9	18.7	7.1
2	5.3	5.3	6.7	10.9	6.0	5.3	4.6	7.4	6.4	5.3	10.9	8.8
3	5.3	5.3	6.7	11.3	8.1	6.4	5.3	6.7	5.3	5.3	3.5	9.5
4	5.3	5.3	6.7	9.5	6.7	6.4	6.7	7.4	5.3	5.3	3.9	9.9
5	6.7	6.3	7.1	9.9	7.1	8.5	5.7	7.1	5.3	4.6	4.6	9.9
6	6.7	8.5	7.1	9.9	6.0	6.4	5.3	6.0	4.9	5.3	4.9	9.9
7	6.7	6.7	7.4	9.9	5.7	6.4	5.3	4.9	4.6	4.9	4.9	11.0
8	6.7	8.5	7.4	8.5	4.6	6.4	6.0	5.3	4.2	4.6	3.9	11.0
9	6.7	8.5	7.4	12.0	4.6	5.3	6.4	5.7	4.9	4.6	2.5	8.5
10	6.7	6.7	7.8	8.5	4.6	5.3	9.9	5.7	5.3	9.2	1.4	6.4
11	6.7	8.5	7.8	8.1	4.9	4.9	16.6	6.0	13.8	8.1	2.8	7.4
12	6.7	8.5	8.8	7.7	4.9	5.3	7.1	6.4	7.8	3.9	3.9	8.5
13	6.7	8.1	6.4	7.4	6.0	5.3	7.4	6.7	7.1	3.9	4.2	8.8
14	6.7	8.1	7.1	7.0	4.9	6.4	15.9	7.1	5.6	3.9	4.2	8.8
15	6.7	7.8	6.0	7.4	5.7	5.3	13.1	7.4	5.3	4.2	4.6	9.2
16	6.7	7.8	7.1	7.0	6.0	5.3	11.6	7.4	8.5	4.9	4.6	9.2
17	7.0	7.4	8.1	7.7	5.7	4.6	9.2	7.8	7.0	5.3	4.9	9.9
18	7.0	7.4	9.5	6.0	5.3	4.2	6.7	6.4	3,070	4.6	5.3	11.6
19	7.0	5.7	9.9	4.9	4.9	4.6	7.1	6.4	160	4.9	5.7	9.9
20	7.4	5.3	10.6	5.7	4.6	4.9	6.7	5.7	23.3	4.2	6.4	9.5
21	7.4	5.3	10.9	6.0	4.9	4.9	5.7	5.3	16.2	5.6	6.4	9.5
22	7.4	6.7	10.2	5.7	4.9	4.9	6.4	4.9	10.2	5.6	6.7	9.5
23	7.8	6.3	10.2	5.3	4.6	4.9	6.7	4.9	9.5	6.7	7.0	10.6
24	6.0	6.3	10.2	5.3	4.2	4.9	6.7	4.9	9.5	68.2	7.4	11.0
25	6.4	6.0	10.9	6.7	4.9	4.9	6.7	4.9	8.5	13.8	7.4	9.9
26	5.7	6.0	10.9	9.2	5.7	5.3	6.7	4.9	7.0	6.7	7.8	9.9
27	6.0	6.3	11.0	8.5	5.7	5.3	6.4	4.9	7.4	6.0	9.2	9.9
28	6.0	6.3	10.6	7.1	6.0	5.3	6.4	4.9	7.8	5.7	9.5	9.9
29	5.7		9.9	5.7	5.7	5.3	6.0	4.9	8.1	3.2	8.5	9.9
30	5.7		10.6	5.7	5.3	5.3	6.7	6.4	6.0	4.6	7.4	9.9
31	5.7		10.6		5.3		6.7	6.7		4.6		9.9
Sum	198.7	191.2	266.5	235.1	169.2	163.5	232.6	189.2	3,452.9	232.6	183.1	294.7

Month	Extreme Gage Feet — 1941		Extreme Second Feet — 1941				Average Second Feet 1941	Acre Feet			
				High	Low			Total 1941	Period 1938-1941		
	High	Low	Day		Day				Average	Maximum	Minimum
Jan.	1.18	1.12	23	7.8	1	4.2	6.4	394	204	394	" 79.4
Feb.	1.18	1.12	11	8.5	2	5.3	6.8	379	219	379	" 113
Mar.	1.31	1.15	24	10.9	1	4.9	8.6	529	1,332	3,110	* 181
Apr.	1.44	1.12	25	12.7	19	4.2	7.8	466	3,744	13,300	168
May	1.18	1.12	3	8.1	24	4.2	5.5	336	432	747	156
June	1.18	1.12	5	8.5	18	4.2	5.4	324	387	953	122
July	4.72	1.08	11	298	#	4.6	7.5	461	2,346	7,900	461
Aug.	1.38	1.08	13	11.3	#	4.2	6.1	375	1,624	2,870	375
Sept.	14.01	.98	18	21,010	#	1.8	115	6,850	2,056	6,850	119
Oct.	3.81	.95	24	246	#	4.6	7.5	461	320	461	134
Nov.	1.38	1.25	10	18.7	10	1.4	6.1	363	277	426	106
Dec.	1.51	1.31	18	11.7	10	6.4	9.5	585	298	585	132
Yearly	14.01	0.95		21,010		1.4	15.9	11,523	13,239	22,418	7,392

Various Days of the Month. " Estimated. * Partly Estimated.

SAN FELIPE CREEK STATION 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, and 4 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. Low and medium flow measurements by wading or from bridge. High flows by slope-area measurements. Zero of gage is 875.05 feet above mean sea level, United States Coast and Geodetic Survey datum.

RECORDS: Based upon 15 meter measurements during the year, 13 by the United States and 2 by the Mexican Section. Computations by shifting channel methods. 1941 records good. Records available: September 1, 1931 to December 31, 1941.

REMARKS: The flow of this spring-fed creek was greatly modified in 1941 by municipal diversions at Del Rio of 1,407.3 acre feet and by irrigation diversions above this station.

EXTREME FLOWS: The highest recorded flow was on June 14, 1935, when a flow of 45,000 second feet was reached with a gage of 23.20 feet. With spring flow eliminated this storm flow corresponds to 726 second feet per square mile of watershed. The lowest flow was 2.2 second feet on December 19, 1934. Backwater from the Rio Grande reaches this station whenever the Rio Grande stage at Del Rio station gets above 14 feet or a flow of about 60,000 second feet.

Mean Daily Discharge in Second Feet 1941 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	53.8	58.1	25.2	27.3	32.5	33.8	27.5	29.5	24.7	46.9	55.1	38.6
2	54.7	57.7	25.7	26.8	95.0	33.7	26.9	28.3	24.1	46.8	52.0	38.6
3	54.7	44.3	24.8	25.6	44.9	31.5	26.3	24.7	25.3	46.8	50.5	38.6
4	54.0	32.7	24.6	24.4	36.0	31.4	27.0	24.3	25.2	46.0	50.5	38.6
5	54.0	33.2	25.1	24.4	36.0	31.2	27.1	27.5	24.6	44.3	50.1	37.8
6	54.0	33.1	25.5	24.5	36.7	32.4	26.4	27.7	23.9	43.6	49.4	37.8
7	53.2	31.7	24.7	23.9	36.7	33.6	27.2	27.2	24.5	42.7	49.4	37.8
8	53.2	30.4	24.5	24.6	38.1	32.7	27.8	28.0	25.1	42.7	49.4	37.8
9	53.3	29.8	26.2	24.6	41.1	31.2	28.6	28.7	26.3	44.2	48.7	37.8
10	52.5	29.7	25.3	24.0	41.1	31.0	29.2	26.6	26.9	65.3	48.7	37.1
11	53.1	29.5	23.8	24.6	43.4	32.3	1,400	26.0	220	40.5	48.7	37.1
12	52.0	28.6	22.7	25.2	42.7	31.7	86.7	25.4	44.4	39.8	48.0	37.1
13	51.8	29.1	21.8	27.1	44.2	29.1	49.3	24.8	42.1	39.0	48.1	37.1
14	51.5	27.6	22.0	31.8	42.7	28.5	149	25.3	38.3	39.9	45.9	37.1
15	51.2	26.3	22.0	27.7	40.4	37.6	53.9	24.7	38.2	40.6	45.9	36.4
16	50.1	26.7	21.5	27.1	40.4	30.6	41.3	24.7	89.5	45.2	45.2	33.8
17	49.8	25.9	27.8	26.5	39.6	30.6	41.3	24.6	69.0	41.4	44.4	32.4
18	50.5	26.8	27.9	25.9	38.9	30.7	38.5	24.1	145	40.7	44.4	32.4
19	50.2	27.9	27.4	24.6	38.1	29.4	35.7	24.1	55.8	40.0	43.6	32.4
20	49.9	27.0	28.0	25.9	37.4	29.5	37.9	24.5	50.6	39.2	43.6	32.4
21	49.7	26.8	29.5	25.9	35.3	26.9	43.8	24.5	50.5	38.6	42.9	32.4
22	50.2	26.6	30.2	27.1	31.1	28.9	44.7	24.0	48.1	38.6	42.9	31.8
23	51.7	27.1	27.6	27.1	31.1	28.3	43.1	23.4	47.2	39.3	42.1	31.8
24	50.6	26.9	27.6	27.7	31.6	27.8	36.7	23.9	47.1	1,600	42.1	31.2
25	48.6	27.3	28.3	29.0	33.5	27.8	31.3	23.9	46.3	88.5	41.4	31.2
26	50.1	26.5	32.5	82.2	33.3	29.1	32.0	28.4	45.4	78.0	40.7	30.5
27	51.5	25.6	29.8	31.1	34.5	28.0	31.9	26.8	46.2	72.8	40.0	30.5
28	51.3	25.4	28.4	30.5	34.4	26.7	30.4	26.1	46.2	66.2	40.0	30.5
29	51.0		27.2	30.5	32.9	26.8	29.0	24.9	46.1	65.4	39.3	30.5
30	51.6		27.2	31.8	32.7	27.4	27.9	24.8	46.1	59.8	39.3	30.5
31	52.1		27.3		32.0		29.3	24.8		57.4		34.4
Sum	1,605.9	868.3	812.1	859.4	1,208.3	910.2	2,587.7	796.2	1,512.7	3,080.2	1,372.3	1,074.0

Month	Extreme Gage Feet — 1941		Extreme Second Feet — 1941				Average Second Feet 1941	Acre Feet			
			High		Low			Total 1941	Period 1932-1941 ●		
	High	Low	Day		Day				Normal	Maximum	Minimum
Jan.	1.08	1.03	2	54.7	24	47.2	51.8	3,190	4,241	7,070	934
Feb.	1.23	0.70	1	65.7	28	24.8	31.0	1,720	2,871	5,490	487
Mar.	0.96	0.70	26	39.9	16	21.5	26.2	1,610	2,784	4,190	1,560
Apr.	3.10	0.70	26	366	7	22.6	28.6	1,700	2,938	* 6,120	566
May	3.03	0.77	2	350	29	26.0	39.0	2,400	3,866	6,700	2,310
June	1.77	0.70	15	126	28	22.0	30.3	1,810	7,786	* 47,900	1,510
July	12.30	0.68	11	6,450	6	21.1	83.5	5,130	3,466	* 5,350	1,550
Aug.	1.45	0.65	26	86.9	25	19.3	25.7	1,580	3,411	5,590	1,280
Sept.	5.60	0.66	11	1,160	7	22.8	50.4	3,000	5,105	19,100	2,070
Oct.	15.20	0.91	24	12,300	21	34.9	99.4	6,110	3,740	6,320	1,710
Nov.	1.07	0.84	1	48.0	29	30.2	45.7	2,720	3,131	5,560	526
Dec.	1.85	0.70	1	137	27	21.0	34.6	2,130	3,241	5,820	496
Yearly	15.20	0.65		12,300		19.3	45.7	33,100	46,580	98,137	22,202

* Partly Estimated. ● The average, maximum, and minimum discharges for September, October, November, and December are for the period 1931 to 1941.

PINTO CREEK STATION NEAR DEL RIO, TEXAS

DESCRIPTION: Water-stage recorder, cable with sit-down cable car equipped for winch and heavy weights, and concrete control dam, 0.6 mile below Del Rio-Eagle Pass highway and 5.5 miles above confluence with the Rio Grande. This creek enters the Rio Grande 717.7 river miles below the American Dam at El Paso, Texas. Zero of gage is 854.61 feet above mean sea level, United States Coast and Geodetic Survey datum. Also a series of pipe gages (high stage indicating gages) 750 feet upstream from the gage well.

RECORDS: Based upon 10 meter measurements during the year, 8 by the United States and 2 by the Mexican Section, and stable rating curve. 1941 records good. Records available: November 1928 to December 31, 1941.

REMARKS: The flow of this spring-fed creek is modified by small irrigation diversions above the gaging station.

EXTREME FLOWS: The greatest recorded flow was on August 31, 1932, when the extreme gage height was 21.08 feet and the extreme flow 54,650 second feet. This corresponds to a flood flow of 239 second feet per square mile of watershed. This spring-fed creek is often dry.

Mean Daily Discharge in Second Feet 1941 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	1.5	5.3	1.8	2.6	3.7	.2	0	2.7	0	.4	1.6	2.4
2	1.6	3.9	1.8	2.5	10.9	.2	0	2.6	0	.5	1.5	2.2
3	1.5	2.4	1.8	2.3	13.0	1.0	0	2.4	0	.5	1.4	2.0
4	1.4	2.0	1.8	2.1	6.1	5.1	0	2.1	0	.5	1.5	2.0
5	1.4	2.0	1.7	1.8	4.8	1.3	0	6.1	0	.3	1.5	2.0
6	1.3	2.6	4.7	1.5	4.6	.6	0	10.8	0	.2	1.4	1.6
7	1.3	2.5	3.0	1.4	4.3	.3	0	4.3	0	.2	1.4	1.1
8	1.5	2.5	2.1	1.2	3.9	.3	0	4.2	0	.1	1.3	.9
9	1.6	2.5	1.9	1.0	3.5	.2	0	2.7	0	0	1.3	2.2
10	1.6	2.3	1.8	.7	3.0	.2	0	2.4	0	8.4	1.3	2.2
11	1.5	2.3	1.7	.5	2.6	.2	276	2.2	22.8	1.4	1.3	2.3
12	1.5	2.3	1.7	.5	2.3	.2	8.7	1.9	14.5	1.0	1.3	2.4
13	1.7	2.2	1.7	.5	2.1	.2	2.4	1.5	.8	1.0	1.2	2.5
14	1.7	2.2	1.6	.5	1.8	.2	5,560	.9	.3	.9	1.2	2.4
15	1.8	2.2	1.6	.5	1.6	.1	25.6	.4	.2	.7	1.2	2.1
16	1.5	2.1	1.8	.5	1.4	0	12.8	.3	.1	.7	1.2	2.1
17	1.4	2.1	5.8	.5	1.2	0	10.6	.2	16.2	.7	1.3	2.1
18	1.4	2.1	7.5	.5	1.2	0	9.1	.1	17.6	.7	1.4	2.0
19	1.4	2.1	3.9	.5	1.5	0	8.2	0	1.5	.8	1.4	2.1
20	1.4	2.1	3.1	.5	1.3	0	6.8	0	.9	.7	1.4	2.2
21	1.4	2.1	2.9	.5	1.0	0	5.8	0	.8	.6	1.4	2.2
22	1.5	2.2	2.9	.5	.8	0	5.1	0	.7	.5	1.4	2.3
23	1.6	2.4	3.0	.5	.7	0	4.4	0	.6	.2	1.5	2.3
24	1.6	2.4	2.9	.5	.5	0	3.3	0	.6	71.7	1.6	2.3
25	1.8	2.1	2.9	.5	1.4	0	3.2	0	.6	57.4	1.7	2.2
26	1.8	2.0	3.3	7.2	2.5	0	2.9	0	.5	14.2	1.8	2.3
27	1.9	1.9	3.9	11.1	1.2	0	2.6	0	.5	2.7	2.0	2.3
28	2.5	1.9	3.2	6.9	.5	0	2.4	0	.5	1.9	2.2	2.3
29	2.2		2.7	4.7	.1	0	2.4	0	.4	1.7	2.2	2.3
30	2.0		2.6	4.5	.1	0	2.4	0	.4	1.7	2.2	2.4
31	2.3		2.6		.1		2.4	0		1.7		2.4
Sum	50.6	66.7	85.7	59.0	83.7	10.3	5,957.1	47.8	80.5	174.0	45.1	66.1

Month	Extreme Gage Feet — 1941		Extreme Second Feet — 1941					Average Second Feet 1941	Acre Feet			
				High		Low			Total 1941	⊕ Period 1924-1941		
	High	Low	Day		Day					Normal	Maximum	Minimum
Jan.	3.15	3.02	28	2.6	‡ 6	1.3		1.6	100	550	2,110	0
Feb.	3.39	3.01	1	6.5	28	1.8		2.4	132	478	1,860	8.3
Mar.	3.55	2.92	17	11.1	14	1.6		2.8	170	677	2,500	4.3
Apr.	3.74	1.62	26	24.3	‡ 11	0.5		2.0	117	839	3,600	43.0
May	4.07	1.68	2	64.7	‡ 29	0.1		2.7	166	2,637	20,500	28.0
June	3.55	0.00	3	11.6	‡ 16	0.0		0.3	20.4	2,808	30,000	0
July	20.30	0.00	14	48,600	‡ 1	0.0		192	11,800	4,170	30,000	0
Aug.	3.92	0.00	5	40.0	‡ 19	0.0		1.5	94.8	4,137	48,700	0
Sept.	4.14	0.00	11	114	‡ 1	0.0		2.7	160	2,438	17,300	0
Oct.	4.83	2.17	24	597	9	0.0		5.6	345	1,051	4,000	0
Nov.	2.54	2.38	30	2.3	13	1.2		1.5	89.5	498	2,150	0
Dec.	2.58	2.23	1	2.6	8	0.7		2.1	131	604	2,180	0
Yearly	20.30	0.00		48,600		0.0		18.4	13,325.7	20,863	76,259.3	2,651.4

‡ And Other Days.

⊕ The annual figures only (partly estimated) are for the period 1924-1941. The monthly figures are for the period 1929-1941.

RIO SAN DIEGO STATION AT JIMENEZ, COAHUILA

DESCRIPTION: Water-stage recorder and cable with sit-down cable car. Masonry Cipoletti weir control for measuring discharges up to 700 second feet. The station is located 4.4 miles west of Jimenez, Coahuila, and five 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. Zero of the gage is 828.90 feet above United States Coast and Geodetic Survey mean sea level datum.

RECORDS: Based upon 23 meter measurements and a rating table, the lower portion of which conforms to the weir table and the upper portion of which is based upon current meter measurements. 1941 records good. Records available: 1924 to 1941. The records from 1924 to September 1932 are considered doubtful.

REMARKS: The weir control at this station was constructed in November 1932. From 1924 to 1932 there was a staff-gage at Paso del Salto, 3.1 miles upstream from the present station, on which readings were made by agents of the Department of Agriculture, Monterrey, N. L. The flow of this spring-fed stream is modified by two small storage reservoirs, San Miguel and Centenario on the Irrigation District of San Carlos, Coahuila, and by irrigation of Dolores Hacienda just above this station. One-fourth mile downstream from this gaging station water was diverted for irrigating about 1,236 acres of land in the Jimenez Community.

EXTREME FLOWS: The highest determined flow was on September 18, 1941, when a peak flow of 75,220 second feet passed this station with a gage height of 20.67 feet on the present gage. From reports by local inhabitants the water level in 1905 reached a height of 20.67 feet on the present gage scale. It is thought that due to a more constricted channel and greater channel obstructions, the 1941 flow was greater than that of 1905 even though the gage heights were the same. The river was dry on several occasions from April to June in 1939.

Mean Daily Discharge in Second Feet 1941 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	52.3	74.9	32.8	42.0	100	52.3	63.2	63.2	63.2	862	1,140	284
2	63.2	74.9	32.8	52.3	114	42.0	63.2	63.2	63.2	840	1,230	284
3	63.2	63.2	32.8	52.3	143	126	63.2	63.2	63.2	788	1,100	284
4	63.2	74.9	42.0	63.2	143	244	63.2	63.2	52.3	734	1,060	284
5	74.8	63.2	42.0	63.2	159	159	63.2	63.2	52.3	717	1,020	284
6	74.8	63.2	32.8	63.2	175	129	63.2	63.2	63.2	667	989	284
7	74.8	63.2	42.0	52.3	192	114	63.2	63.2	52.3	650	953	265
8	74.9	63.2	42.0	32.8	143	100	52.3	63.2	63.2	664	922	265
9	74.9	63.2	42.0	32.8	159	100	52.3	63.2	52.3	653	890	265
10	63.2	63.2	42.0	32.8	209	100	52.3	63.2	52.3	667	823	245
11	74.9	63.2	42.0	23.7	227	100	703	63.2	63.2	650	724	245
12	74 9	63.2	42.0	23.7	227	100	211	52.3	87.2	664	667	245
13	74.9	63.2	42.0	32.8	209	87.2	114	42.0	74.9	650	558	227
14	74.9	63.2	42.0	32.8	175	87.2	763	52.3	74.9	643	558	227
15	74.9	63.2	42.0	32.8	128	87.2	175	42.0	74.9	611	508	227
16	74.9	52.3	32.8	42.0	114	74.9	114	63.2	114	607	533	209
17	74.9	52.3	52.3	32.8	100	87.2	114	52.3	287	604	484	209
18	74.9	52.3	63.2	32.8	87.2	87.2	100	52.3	23,200 *	576	459	209
19	74.9	52.3	63.2	42.0	87.2	74.9	87.2	52.3	4,800	569	434	209
20	74.9	52.3	52.3	42.0	74.9	63.2	52.3	52.3	1,900	540	412	209
21	74.9	52.3	42.0	42.0	74.9	42.0	74.9	52.3	1,590	519	412	192
22	87.2	52.3	42.0	32.8	74.9	52.3	87.2	52.3	1,450	519	412	192
23	74.9	52.3	42.0	32.8	63.2	52.3	87.2	52.3	1,270	523	412	175
24	74.9	52.3	42.6	32.8	52.3	42.0	100	52.3	1,190	7,880	413	192
25	74.9	52.3	42.0	32.8	52.3	42.0	87.2	52.3	1,100	4,660	413	227
26	74.9	52.3	52.3	42.0	63.2	52.3	87.2	83.0	1,020	1,620	388	245
27	87.2	52.3	52.3	63.2	63.2	52.3	74.9	100	989	1,390	346	245
28	87.2	52.3	52.3	74.9	52.3	52.3	74.9	74.9	953	1,280	325	209
29	87.2		52.3	74.9	52.3	63.2	74.9	74.9	922	1,310	325	227
30	74.9		42.0	86.9	52.3	63.2	63.2	74.9	922	1,170	304	227
31	74.9		42.0		52.3		74.9	74.9		1,110		209
Sum	2,301.4	1,663.0	1,360.2	1,339.4	3,619.5	2,529.2	3,919.3	1,900.3	42,659.6	35,337	19,214	7,300

Month	Extreme Gage Feet — 1941		Extreme Second Feet — 1941				Average Second Feet 1941	Acre Feet			
			High		Low			Total 1941	⊕ Period 1933-1941		
	High	Low	Day		Day				Average	Maximum	Minimum
Jan.	2.95	2.85	#	87.2	1	52.3	74.2	4,560	8,840	36,430	2,910
Feb.	2.92	2.85	#	74.9	#	52.3	59.4	3,300	5,960	25,760	1,970
Mar.	2.89	2.79	#	63.2	#	32.8	43.9	2,700	5,570	21,500	2,140
Apr.	2.99	2.76	30	100	12	24.0	44.6	2,660	5,904	16,800	1,110
May	3.25	2.85	#	227	#	52.3	117	7,180	18,651	120,000	1,290
June	3.71	2.82	3	553	#	42.0	84.3	5,020	12,159	62,200	1,420
July	6.56	2.82	14	4,200	#	42.0	126	7,770	8,858	21,500	1,210
Aug.	3.31	2.82	26	265	#	42.0	61.3	3,770	8,451	20,000	2,020
Sept.	20.67	2.85	18	75,220 ‡	#	52.3	1,420	84,620	22,448	84,620	2,210
Oct.	15.81	3.71	24	38,140	#	519	1,140	70,090	28,279	146,640	1,950
Nov.	4.40	3.35	1	1,230	30	284	640	38,110	15,871	68,290	1,960
Dec.	3.35	3.15	#	284	#	175	235	14,480	10,304	45,160	2,060
Yearly	20.67	2.76		75,220		24.0	337	244,260	151,295	381,320	27,460

‡ Estimated. * Partly Estimated. # Various Days of the Month.

⊕ The Average, Maximum and Minimum Discharges for October, November and December are for the period 1932-1941.

RIO SAN RODRIGO STATION NEAR EL MORAL, COAHUILA

DESCRIPTION: Water-stage recorder and cable with sit-down cable car. Masonry control weir for measuring the flow 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 and 11.2 miles above the conflusnce with the Rio Grande. Zero of the gage is 873.85 feet above sea level, United States Coast and Geodetic Survey datum. This stream enters the Rio Grande 735.4 river miles below the American Dam at El Paso, Texas.

RECORDS: Based upon 3 meter measurements and a rating table, the lower portion of which conforms to the weir table. The upper portion of the rating table is based upon meter measurements. 1941 records only fair because of lack of measurements at high flow. Records available: 1922 to 1941. The records from 1922 to September 1932 are considered doubtful.

REMARKS: From 1922 to 1932 there were made daily 3 staff-gage readings at this station, on the same gage used at this station prior to December 1938, but the results of these readings are doubtful. This station was constructed in October 1932, at a point 1,640 feet upstream from Paso de las Mulas. In December 1938 the station was moved 3,300 feet downstream to the present site. The flow of this spring-fed river was modified by irrigation diversions above and below this station.

EXTREME FLOWS: The greatest recorded flow was on September 7, 1932, when the extreme gage height was 16.08 feet and the extreme flow 81,200 second feet. The river is sometimes dry.

Mean Daily Discharge in Second Feet 1941 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	31.4	43.8	31.4	31.4	43.8	21.2	162	79.4	64.3	339	132	123
2	31.4	43.8	26.1	26.1	37.4	26.1	87.6	79.4	71.7	325	132	123
3	31.4	43.8	26.1	21.2	43.8	31.4	64.3	71.7	71.7	311	122	132
4	31.4	43.8	26.1	21.2	31.4	43.8	50.1	71.7	71.7	270	113	132
5	31.4	43.8	21.2	21.2	21.2	31.4	50.1	79.4	71.7	228	123	132
6	31.4	37.4	21.2	21.2	21.2	31.4	57.2	79.4	64.3	228	132	123
7	31.4	37.4	21.2	16.2	21.2	31.4	57.2	79.4	64.3	218	132	123
8	31.4	37.4	26.1	16.2	21.2	31.4	57.2	79.4	57.2	206	132	123
9	31.4	37.4	21.2	16.2	21.2	31.4	50.1	79.4	142	184	132	123
10	31.4	31.4	16.2	16.2	21.2	31.4	50.1	79.4	113	162	132	123
11	31.4	31.4	21.2	16.2	21.2	31.4	71.7	79.4	87.6	152	142	123
12	31.4	31.4	21.2	16.2	21.2	31.4	71.7	79.4	162	142	142	123
13	31.4	26.1	21.2	16.2	21.2	31.4	71.7	71.7	105	132	142	105
14	31.4	26.1	21.2	16.2	16.2	31.4	585	71.7	87.6	142	142	113
15	31.4	26.1	21.2	16.2	16.2	37.4	162	71.7	79.5	142	142	113
16	31.4	26.1	21.2	16.2	16.2	43.8	96.1	64.3	79.5	142	142	105
17	31.4	31.4	179	16.2	16.2	43.8	87.6	64.3	297	142	142	113
18	31.4	31.4	79.5	16.2	16.2	37.4	79.5	64.3	3,920	142	142	113
19	31.4	31.4	50.2	8.1	21.2	37.4	79.5	57.2	5,400	132	132	113
20	26.1	37.4	37.4	4.9	31.4	37.4	79.5	57.2	3,600	132	132	113
21	26.1	37.4	31.4	8.1	88.6	37.4	79.5	57.2	2,500	123	132	113
22	26.1	37.4	37.4	8.1	150	50.1	79.5	57.2	1,760	142	142	105
23	26.1	37.4	31.4	8.1	64.3	64.3	79.5	57.2	1,260	142	132	96.1
24	26.1	37.4	26.1	12.0	43.8	79.5	79.5	57.2	897	142	132	96.1
25	31.4	37.4	26.1	12.0	43.8	64.3	87.6	50.1	622	142	123	96.1
26	31.4	37.4	31.4	26.1	37.4	57.2	87.6	50.1	431	142	132	105
27	218	31.4	31.4	43.8	21.2	50.1	87.6	57.2	352	142	132	104
28	57.2	31.4	31.4	43.8	26.1	383	87.6	87.6	328	142	132	104
29	43.8		31.4	261	26.1	352	87.6	71.7	328	142	123	104
30	43.8		21.2	79.5	21.2	256	79.5	71.7	339	142	123	104
31	43.8		26.1		21.2		79.5	57.2		132		104
Sum	1,196.5	986.0	1,035.4	852.2	1,024.5	2,067.6	2,985.2	2,134.2	23,427.1	5,404	3,985	3,522.3

Month	Extreme Gage Feet — 1941 High	Extreme Gage Feet — 1941 Low	Extreme Second Feet — 1941 High Day	Extreme Second Feet — 1941 High	Extreme Second Feet — 1941 Low Day	Extreme Second Feet — 1941 Low	Average Second Feet 1941	Acre Feet Total 1941	Acre Feet Period 1932-1941 Normal	Acre Feet Period 1932-1941 Maximum	Acre Feet Period 1932-1941 Minimum
Jan.	.43	.23	27	218	#	26.1	38.6	2,370	3,711	14,850	171
Feb.	.33	.23	#	43.8	#	26.1	35.2	1,960	2,689	11,580	554
Mar.	1.64	.16	17	175	10	16.2	33.4	2,050	2,678	9,900	575
Apr.	2.10	.07	29	795	20	4.9	28.4	1,690	2,205	6,870	380
May	1.05	.16	22	256	#	16.2	33.0	2,030	6,435	42,300	57.5
June	1.48	.20	28	448	1	21.2	68.9	4,100	5,677	37,600	30.0
July	4.92	.36	14	3,200	#	50.1	96.3	5,920	4,265	12,200	0
Aug.	.62	.36	28	113	#	50.1	68.8	4,230	3,927	13,160	39.3
Sept.	10.27	.39	18	10,700	#	57.2	781	46,470	33,814	* 253,960	471
Oct.	1.25	.66	1	339	20	123	174	10,720	12,114	81,360	815
Nov.	.72	.59	#	142	4	105	133	7,900	5,567	24,450	534
Dec.	.69	.52	#	132	23	87.6	114	6,990	4,561	19,060	130
Yearly	10.27	.07		10,700		4.9	133	96,430	87,643	414,310	7,427

Various Days of the Month. * Partly Estimated.

RIO GRANDE AT EAGLE PASS STATION

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. Zero of gage is 682.91 feet above mean sea level, United States Coast and Geodetic Survey datum.

RECORDS: Based upon 183 meter measurements, 155 by the Mexican and 28 by the United States Section during the year. Computations by shifting channel methods. 1941 records good. Records available: May 1900 to April 1916; November 1923 to December 1941.

REMARKS: The river flow is greatly modified at this station by many irrigation diversions, drainage returns, and large reservoirs in the United States and Mexico. On April 10, 1939, the operation and maintenance of this station was turned over from the United States Section to the Mexican Section of the Commission.

EXTREME FLOWS: The greatest recorded flow was on September 2, 1932, when the extreme gage height was 49.00 feet, discharge 569,000 second feet. (See Special Flood Report 1932 by United States Section of this Commission.) The lowest flow ever recorded was on August 19, 1937 when the extreme gage height was 2.22 feet and the extreme flow 632 second feet. Numerous records of extremes may be found in previous Water Bulletins.

Mean Daily Discharge in Second Feet 1941 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	1,570	2,250	1,960	1,750	16,280	5,400	5,470	9,290	8,370	18,720	13,380	5,580
2	1,580	2,290	1,990	1,700	10,240	6,530	15,360	7,840	8,370	23,060	13,810	5,370
3	1,620	2,140	1,970	1,620	16,740	4,980	11,620	6,530	8,480	*30,020	13,630	5,190
4	1,590	2,080	1,960	1,500	21,330	6,750	16,070	6,920	7,700	*37,080	12,040	5,230
5	1,550	2,080	1,820	1,480	6,780	5,580	11,410	6,960	7,770	*33,550	11,020	5,260
6	1,640	2,020	1,770	1,430	4,910	5,440	8,620	6,570	6,530	24,260	10,950	5,330
7	1,600	1,930	1,770	1,450	4,060	5,120	6,640	6,290	5,090	20,240	10,280	5,010
8	1,570	1,930	1,630	1,360	3,670	4,870	5,720	6,180	7,170	20,160	9,430	4,800
9	1,650	1,880	1,710	1,290	3,370	4,700	4,980	7,130	7,060	*21,680	9,110	4,590
10	1,650	2,060	1,790	1,220	2,900	5,400	4,410	7,350	6,430	*24,900	8,300	4,590
11	1,600	2,210	1,750	1,230	2,850	5,370	9,360	6,390	6,780	*29,310	9,290	4,590
12	1,550	2,210	1,710	1,190	2,640	5,330	6,710	5,580	6,780	26,420	9,960	4,480
13	1,590	2,170	1,640	1,190	2,580	5,550	5,120	5,720	5,970	22,530	9,390	4,560
14	1,670	2,190	1,610	5,760	2,640	5,580	14,370	6,290	5,970	21,680	9,150	4,480
15	1,580	2,170	1,630	11,900	2,470	5,510	6,640	7,130	5,790	*24,760	8,970	4,980
16	1,580	2,360	1,630	3,160	2,260	6,890	4,700	6,390	9,320	*29,210	8,790	4,840
17	1,610	2,260	1,940	2,050	2,060	6,850	4,270	6,180	10,380	*35,310	8,230	4,840
18	1,560	2,200	2,230	2,150	2,060	9,220	4,340	6,850	31,430	*38,850	7,880	4,770
19	1,600	2,140	2,220	1,990	2,160	9,600	4,200	6,320	76,630	*40,960	7,660	4,870
20	1,720	2,440	2,060	1,670	3,100	8,370	3,990	7,770	25,530	*45,910	7,030	4,800
21	1,680	2,380	1,910	1,270	7,840	7,800	3,320	7,520	14,970	*42,380	6,600	4,980
22	1,670	2,360	1,800	1,250	6,750	7,340	3,070	6,500	12,960	*35,310	6,430	4,870
23	1,630	2,410	1,780	1,270	4,340	6,920	2,930	6,360	11,580	*29,590	6,600	4,770
24	1,620	2,500	1,730	1,240	3,500	6,670	2,590	6,040	11,230	*27,050	6,430	4,520
25	1,570	2,360	1,770	1,190	4,590	6,430	2,580	5,790	14,370	*34,470	6,320	4,380
26	1,600	2,320	1,810	1,240	5,230	5,830	2,960	6,110	19,280	22,280	5,790	4,450
27	2,590	2,170	1,790	1,710	8,510	4,870	3,530	5,930	16,990	22,920	5,540	4,480
28	2,200	2,020	1,890	1,620	18,580	4,380	4,450	5,830	15,790	21,720	5,690	4,480
29	1,880		2,250	5,690	16,990	4,200	8,860	8,690	16,780	16,240	5,440	4,410
30	1,730		2,030	22,500	8,370	3,850	11,020	7,310	17,550	13,770	5,400	4,410
31	2,380		1,820		5,720		9,710	8,550		12,820		4,560
Sum	52,630	61,530	57,370	86,070	205,520	181,330	209,020	210,310	409,050	*847,160	258,540	148,470

Month	Extreme Gage Feet — 1941 High	Extreme Gage Feet — 1941 Low	Extreme Second Feet — 1941 High Day	Extreme Second Feet — 1941 High	Extreme Second Feet — 1941 Low Day	Extreme Second Feet — 1941 Low	Average Second Feet 1941	Acre Feet Total 1941	Acre Feet Period 1924-1941 Normal	Acre Feet Period 1924-1941 Maximum	Acre Feet Period 1924-1941 Minimum
Jan.	4.59	2.62	27	4,980	19	1,480	1,700	104,400	186,923	365,000	104,400
Feb.	3.31	2.82	24	2,550	9	1,790	2,200	122,000	155,109	254,250	99,200
Mar.	3.25	2.62	28	2,400	14	1,540	1,850	113,800	152,771	247,440	95,900
Apr.	10.27	2.20	30	25,920	22	1,150	2,870	170,700	144,403	219,000	92,100
May	11.06	2.99	4	27,650	18	1,960	6,630	407,600	258,443	869,000	77,500
June	6.46	4.00	19	10,310	30	3,710	6,040	359,700	262,038	1,005,000	113,340
July	11.45	3.31	14	36,730	25	2,520	6,740	414,600	276,599	1,255,000	125,000
Aug.	6.30	4.66	29	9,610	28	5,120	6,780	417,100	313,472	969,000	136,000
Sept.	19.59	4.49	19	89,350	6	3,520	13,640	811,400	621,936	2,857,410	80,900
Oct.		7.32	20	# 45,910	31	12,110	*27,330	*1,680,300	474,548	1,680,300	121,000
Nov.	7.35	4.40	2	14,340	29	4,980	8,620	512,800	222,258	512,800	109,000
Dec.	4.69	4.07	1	5,930	26	4,240	4,790	294,500	192,581	369,760	105,620
Yearly	19.59	2.20		89,350		1,150	7,470	5,408,900	3,261,081	6,668,460	1,798,000

* Partly Estimated. # Mean Daily.

RIO ESCONDIDO STATION AT VILLA FUENTE, COAHUILA

DESCRIPTION: Water-stage recorder and cable with sit-down cable car, located 3.1 miles southwest of the City of Piedras Negras, Coahuila on the outskirts of Villa de Fuente, 5 miles above the confluence with the Rio Grande and 5.6 miles below the confluence of the Rio San Antonio. This stream enters the Rio Grande 758.2 river miles below the American Dam at El Paso, Texas. Zero of gage is 717.78 feet above mean sea level, United States Coast and Geodetic Survey datum.

RECORDS: Based upon 46 meter measurements. Computations by shifting channel methods. 1941 records good. Records available: 1922 to 1941.

REMARKS: This station was built in September 1932. From 1922 to 1932 there were made daily 3 staff-gage readings 2,300 feet downstream from the present station, but the results of these readings are doubtful. The elevation of the zero of this old gage was 0.79 foot above the zero of the gage at the present station, but the water surface is practically level between the two gages. The flow of this spring-fed stream is modified by irrigation diversions in the drainage basins of the San Antonio and the Escondido.

EXTREME FLOWS: The greatest recorded flow since January 1932 was May 14, 1935, when the extreme gage height was 17.06 feet and the extreme discharge was 17,700 second feet. The lowest recorded flow occurred November 4, 1934, when the extreme gage height was .75 foot and the extreme flow was .35 second foot.

Mean Daily Discharge in Second Feet 1941 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	41.3	49.8	18.0	12.4	28.6	20.8	15.2	3.5	3.2	19.1	12.4	31.1
2	41.0	29.7	15.9	14.8	840	20.8	14.8	3.5	3.5	15.9	12.4	29.3
3	41.0	24.0	14.1	14.1	126	22.6	14.1	3.5	5.7	15.9	12.0	27.5
4	41.0	20.8	13.8	15.2	57.9	20.8	14.8	3.9	3.2	16.2	12.0	27.5
5	4.06	18.7	13.4	15.5	54.7	19.1	14.8	3.9	3.2	16.2	12.0	25.4
6	40.6	19.8	13.1	15.9	36.4	17.3	14.1	5.0	3.5	15.2	10.9	23.7
7	40.6	17.7	12.7	16.2	36.4	16.6	14.5	9.2	3.5	13.1	10.2	24.0
8	40.2	17.3	12.4	16.6	33.9	15.9	11.3	9.5	3.5	13.1	9.5	21.9
9	40.2	17.0	11.7	17.0	31.4	14.5	7.1	9.9	5.3	11.7	8.5	22.3
10	40.2	16.6	11.3	16.2	31.1	14.1	5.7	10.2	8.5	12.0	13.1	22.3
11	39.9	16.2	10.9	16.2	29.0	13.4	13.1	10.6	89.0	12.4	13.1	22.3
12	39.9	14.1	10.6	16.6	28.6	13.4	11.3	12.0	78.4	12.4	12.4	22.6
13	39.6	14.5	7.4	19.1	28.3	13.8	9.9	12.4	29.7	12.7	13.8	22.6
14	39.6	15.2	7.8	20.1	26.1	13.8	12.7	14.8	25.8	12.7	13.8	23.0
15	36.0	17.3	8.1	21.1	24.4	13.8	32.1	14.8	22.9	13.1	15.9	23.0
16	28.2	18.0	8.5	22.6	20.8	14.1	17.0	13.7	22.2	13.4	17.7	23.3
17	26.5	20.1	43.1	18.7	20.1	13.1	13.4	13.7	49.1	14.1	18.7	23.3
18	24.7	20.5	24.0	14.1	20.5	12.4	10.6	12.0	34.9	14.5	20.1	24.0
19	22.2	19.8	23.0	14.5	21.9	15.9	10.2	7.4	22.2	14.8	25.4	24.7
20	20.5	21.2	20.5	15.5	29.7	21.9	11.3	7.4	20.1	15.2	27.5	27.6
21	16.6	21.2	16.2	14.8	81.9	18.4	11.3	6.0	20.1	15.5	27.5	30.7
22	8.8	20.8	15.2	12.4	35.3	17.0	9.9	3.5	19.4	12.0	27.2	31.4
23	7.0	23.0	12.7	12.7	30.7	17.7	7.8	3.5	18.4	10.2	26.8	32.1
24	7.0	23.0	12.0	12.7	25.8	20.5	5.7	3.5	17.3	8.5	26.5	32.8
25	5.3	22.6	11.3	12.7	25.8	31.1	4.6	3.5	17.6	10.9	26.5	32.1
26	5.3	20.5	11.7	15.2	25.1	23.7	4.6	3.5	17.6	9.2	26.1	31.1
27	417	18.7	11.7	15.5	23.0	19.1	3.9	3.5	18.0	12.0	30.0	30.0
28	107	18.4	11.7	15.5	22.6	18.7	3.9	4.6	18.4	9.9	30.4	29.0
29	23.3		11.7	285	22.6	17.3	3.9	3.2	16.6	12.7	30.7	28.0
30	17.7		12.7	52.6	22.0	15.5	4.2	3.2	18.7	12.7	30.7	26.8
31	50.1		12.4		22.6		3.5	3.2		12.7		25.8
Sum	1,388.9	576.5	439.6	781.5	1,863.8	527.1	331.3	222.1	619.5	410.0	573.8	821.2

Month	Extreme Gage Feet — 1941		Extreme Second Feet — 1941				Average Second Feet 1941	Acre Feet			
			High		Low			Total 1941	Period 1932-1941		
	High	Low	Day		Day				Normal	Maximum	Minimum
Jan.	7.38	1.48	27	2,360	26	5.3	44.8	2,750	3,556	15,990	375
Feb.	2.23	1.67	1	59.7	12	14.1	20.6	1,140	2,050	9,990	179
Mar.	2.85	1.54	14	132	12	5.7	14.2	872	1,848	6,910	219
Apr.	6.23	1.71	29	1,020	22	12.4	26.0	1,550	2,205	5,360	582
May	10.40	1.71	2	5,370	17	12.4	60.1	3,700	5,078	23,800	494
June	2.23	1.80	25	39.6	18	12.4	17.6	1,050	4,350	19,700	618
July	2.59	1.51	14	62.2	31	3.5	10.7	657	2,645	9,290	271
Aug.	1.74	1.44	18	14.8	31	3.2	7.2	441	2,561	14,530	174
Sept.	5.18	1.41	11	777	2	3.2	20.6	1,230	3,291	14,340	186
Oct.	1.90	1.54	1	19.1	22	7.8	13.2	813	5,547	39,790	117
Nov.	2.13	1.57	29	30.7	8	9.5	19.1	1,140	3,545	25,590	101
Dec.	2.13	1.94	24	32.8	17	22.2	26.5	1,630	3,605	20,720	336
Yearly	10.40	1.41		5,370		3.2	23.4	16,973	● 42,727	● 126,090	● 8,350

● Period 1924-1941.

RIO GRANDE AT LAREDO STATION

DESCRIPTION: Water-stage recorder and cable with sit-down cable car. Cable and car located about 2.5 miles above the cities of Laredo, Texas, and Nuevo Laredo, Tamaulipas. Water-stage recorder is attached to north abutment of railroad bridge at Laredo, 884.3 river miles below the American Dam at El Paso, Texas. Zero of gage at recorder is at elevation 351.50 feet. Zero of gage at the cable is elevation 353.15 feet. All gage elevations are on United States Coast and Geodetic Survey sea level datum.

RECORDS: Based upon 172 meter measurements, 166 by the Mexican and 6 by the United States Section. Computations by shifting channel methods. 1941 records fair. Records available: May 1900 to March 1914; from October 1922 to December 1941.

REMARKS: The river flow at this station is modified by many irrigation diversions, drainage returns, and large reservoirs in the United States and Mexico.

EXTREME FLOWS: The greatest recorded flow at this station was on September 3, 1932, when the peak gage reading was 52.20 feet, the flow being 402,000 second feet. On June 20, 1938, a minimum flow of 777 second feet was reached with a gage height of 4.4 feet. Numerous records of extreme flows may be found in previous Water Bulletins.

CORRECTION: The minimum annual figure for this station in Water Bulletins Nos. 8, 9 and 10 should be corrected to 1,864,000 acre-feet.

Mean Daily Discharge in Second Feet 1941 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	1,900	2,000	2,270	2,080	22,040	6,460	4,800	13,280	8,370	18,500	13,670	5,120
2	1,840	4,060	2,060	1,910	16,880	5,760	5,970	11,480	9,320	19,280	13,070	4,980
3	1,840	3,000	1,920	1,830	18,570	5,580	13,560	8,090	8,400	22,210	12,750	4,940
4	1,810	2,330	2,010	1,790	19,530	10,660	12,360	6,890	8,020	27,480	12,500	4,800
5	1,780	2,130	1,990	1,700	24,650	6,890	15,540	6,740	7,420	33,090	11,830	5,050
6	1,750	2,150	2,020	1,610	8,690	5,610	11,760	8,160	8,330	37,080	11,480	5,090
7	1,760	2,230	2,000	1,490	5,900	5,970	8,160	7,490	7,100	26,840	10,980	5,120
8	1,780	2,110	1,950	1,410	5,260	5,790	7,270	7,420	6,070	20,980	10,630	5,260
9	1,790	2,040	1,960	1,330	4,030	5,160	5,900	6,740	6,780	20,520	10,420	4,980
10	1,800	2,020	1,720	1,290	3,920	5,090	5,510	7,840	10,560	21,900	10,210	4,800
11	1,760	2,020	1,750	1,310	3,410	5,230	5,190	7,560	9,150	24,120	9,920	4,940
12	1,740	2,030	1,840	1,270	3,320	5,510	8,300	7,100	7,660	26,980	9,640	4,940
13	1,710	2,210	1,820	1,240	3,140	5,580	7,730	5,860	7,450	26,630	9,080	4,980
14	1,700	2,290	1,750	1,280	2,970	5,830	5,260	5,540	6,070	22,420	9,180	4,840
15	1,690	2,250	1,680	1,250	2,890	5,650	6,640	5,790	5,900	21,580	8,790	4,770
16	1,740	2,280	1,620	9,920	2,880	5,540	8,090	5,650	5,580	22,600	8,690	4,910
17	1,790	2,240	1,600	5,300	2,580	6,780	4,660	5,790	9,780	25,140	8,480	4,940
18	1,750	2,410	1,740	2,890	2,820	6,960	4,410	5,610	12,150	26,130	8,440	4,870
19	1,720	2,470	2,220	2,160	9,150	8,790	3,920	5,510	30,020	30,870	8,370	4,730
20	1,700	2,260	2,430	1,880	2,980	9,640	3,890	6,140	60,040	33,660	8,020	4,800
21	1,730	2,370	2,310	1,850	4,060	9,080	3,920	6,990	31,780	39,550	7,660	4,800
22	1,760	2,830	2,160	1,550	9,290	11,050	3,600	7,420	15,430	38,140	7,060	4,560
23	1,750	2,430	2,150	1,350	9,040	9,110	3,600	6,670	12,640	31,010	6,780	4,660
24	1,790	2,470	1,980	1,260	9,850	7,800	3,350	6,250	11,480	28,850	6,430	4,630
25	1,790	2,620	1,840	1,180	4,700	7,490	3,190	6,250	11,830	28,390	6,390	4,630
26	1,790	2,830	1,810	1,270	4,630	7,200	3,360	6,000	14,580	35,310	6,040	4,130
27	1,790	2,560	1,910	1,370	5,610	5,790	3,170	6,850	21,400	21,260	5,900	4,630
28	7,340	2,430	1,990	3,270	7,060	4,590	3,570	7,350	17,090	22,740	5,330	4,660
29	7,380		1,990	5,120	18,860	4,910	3,460	6,360	15,720	21,680	5,300	4,590
30	2,630		2,390	10,350	17,480	5,010	6,530	7,490	16,420	21,120	5,330	4,630
31	2,020		2,260		9,710		10,490	8,120		14,620		4,630
Sum	67,120	67,070	61,140	73,510	265,900	200,510	197,160	220,430	402,540	810,680	268,370	149,410

Month	Extreme Gage Feet — 1941		Extreme Second Feet — 1941				Average Second Feet 1941	Acre Feet			
			High		Low			Total 1941	Period 1924-1941		
	High	Low	Day		Day				Normal	Maximum	Minimum
Jan.	8.86	4.63	28	16,450	15	1,640	2,170	133,100	182,855	352,000	114,000
Feb.	5.94	4.79	2	4,340	1	1,900	2,400	133,000	151,301	237,380	99,400
Mar.	5.09	4.63	30	2,450	17	1,600	1,970	121,300	149,598	223,020	95,680
Apr.	8.73	4.27	16	14,800	25	1,180	2,450	145,800	150,913	401,000	95,640
May	11.75	5.18	5	27,440	21	2,390	8,580	527,400	292,081	906,000	113,000
June	9.55	5.97	4	18,120	28	4,410	6,680	397,700	302,678	1,357,000	89,190
July	9.51	5.41	3	18,820	27	3,100	6,360	391,100	283,593	1,250,000	128,770
Aug.	8.60	6.23	1	15,430	15	5,120	7,110	437,200	307,959	888,000	127,000
Sept.	20.31	6.23	20	68,860	16	5,230	13,420	798,400	659,648	3,116,670	87,260
Oct.	14.96	8.79	21	40,260	31	14,410	26,150	1,608,000	515,582	2,071,590	126,000
Nov.	8.73	6.36	1	14,060	28	5,230	8,950	532,300	228,020	570,800	122,000
Dec.	6.30	6.00	8	5,260	22	4,560	4,820	296,400	192,351	352,680	107,000
Yearly	20.31	4.27		68,860		1,180	7,630	5,521,700	3,416,579	7,310,310	1,864,000

RIO SALADO STATION AT CD. GUERRERO, TAMAULIPAS

DESCRIPTION: Water-stage recorder and cable with sit-down cable car and two masonry Cipoletti weirs, with a combined capacity of 670 second feet. This station is located at the place called "El Cable" about 6.2 miles above the confluence of the Rio Salado with the Rio Grande and 2 miles southwest of Ciudad Guerrero, Tamaulipas. This stream enters the Rio Grande 946.1 river miles below the American Dam at El Paso, Texas. Zero of gage is 265.74 feet above mean sea level, United States Coast and Geodetic Survey datum.

RECORDS: Based upon 94 meter measurements during the year and the weir discharge records. Computations by shifting channel methods. 1941 records good. Records available: 1901 to 1912; 1923 to 1941.

REMARKS: This station was entirely rebuilt by the Mexican Section of this Commission in December 1932, when the two weirs and an automatic water-stage recorder were installed. Prior to 1932,3 gage readings daily were made here. The flow of the Rio Salado was greatly modified by the Don Martin reservoir, which forms a part of National Irrigation System No. 4, Coahuila-Nuevo Leon, and by irrigation diversions above this station.

EXTREME FLOWS: The greatest recorded flow at this station was on September 7, 1933, when an extreme gage height of 18.86 feet was reached with a corresponding discharge of 43,800 second feet. The stream is sometimes dry. Numerous extremes may be found in previous Water Bulletins.

Mean Daily Discharge in Second Feet 1941 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	35.7	183	16.6	18.4	678	286	452	8.5	149	322	63.2	54.4
2	35.7	130	16.6	18.4	351	183	350	6.7	92.9	304	60.0	54.4
3	33.2	88.3	16.6	16.6	1,170	97.8	286	5.7	66.0	269	60.0	57.2
4	28.6	66.0	16.6	14.5	388	5,580	252	5.7	45.9	244	63.2	57.2
5	24.4	51.6	14.5	12.7	752	15,500	213	86.2	35.7	220	63.2	54.4
6	22.2	45.9	14.5	12.7	2,380	15,470	190	438	26.5	205	63.2	54.4
7	20.5	38.1	14.5	11.3	745	3,300	183	344	20.5	190	60.0	48.7
8	18.4	33.2	12.7	9.9	519	869	143	97.8	16.6	183	60.0	48.7
9	16.6	28.6	21.1	6.7	304	576	114	45.9	342	304	66.0	48.7
10	16.6	26.5	92.9	6.7	182	399	97.8	35.7	6,180	190	66.0	48.7
11	14.5	24.4	63.2	6.7	119	286	84.0	60.0	2,610	156	63.2	48.7
12	12.7	24.4	40.6	6.7	79.8	286	79.8	33.2	2,590	143	92.9	48.7
13	12.7	22.2	31.1	5.3	57.2	667	352	18.4	3,410	130	72.4	48.7
14	11.3	20.5	24.4	5.3	40.6	227	313	12.7	1,810	119	60.0	48.7
15	11.3	18.4	20.5	6.7	31.1	149	119	9.9	904	119	57.2	48.7
16	9.9	18.4	16.6	6.7	22.2	131	88.3	8.5	593	304	60.0	48.7
17	9.9	16.6	14.5	6.7	18.4	168	130	5.7	1,850	175	60.0	54.4
18	9.9	16.6	14.5	6.7	14.5	1,180	156	3.9	2,860	119	60.0	57.2
19	9.9	16.6	12.7	6.7	12.7	473	113	3.9	1,120	108	60.0	60.0
20	9.9	16.6	12.7	5.3	9.9	220	84.0	2.8	2,000	108	57.2	57.2
21	9.9	16.6	12.7	3.9	2,310	119	63.2	1.8	1,650	102	374	57.2
22	9.9	16.6	12.7	3.9	2,670	855	51.6	1.8	1,200	92.9	304	54.4
23	9.9	16.6	14.5	3.9	2,310	473	40.6	.7	749	92.9	103	54.4
24	9.9	16.6	16.6	2.8	1,310	990	35.7	.7	551	88.3	66.0	54.4
25	9.9	16.6	16.6	2.8	911	1,370	31.1	0	509	92.9	57.2	54.4
26	9.9	14.5	16.6	3.9	2,080	1,320	26.5	0	3,410	84.0	57.2	51.6
27	9.9	14.5	18.4	5.3	1,150	1,140	20.5	0	463	75.6	51.6	54.4
28	139	14.5	16.6	9.9	734	971	16.6	0	551	69.2	54.4	54.4
29	251		16.6	579	452	763	14.5	224	399	66.0	54.4	54.4
30	241		16.6	915	244	600	11.3	410	341	66.0	54.4	60.0
31	147		18.4		175		9.9	204		66.0		60.0
Sum	1,211.2	1,012.4	673.7	1,721.1	20,220.4	54,648.8	4,121.4	2,076.2	36,545.1	4,807.8	2,443.9	1,657.4

Month	Extreme Gage Feet — 1941 High	Extreme Gage Feet — 1941 Low	Extreme Second Feet — 1941 High Day	Extreme Second Feet — 1941 High	Extreme Second Feet — 1941 Low Day	Extreme Second Feet — 1941 Low	Average Second Feet 1941	Acre Feet Total 1941	Acre Feet Period 1924-1941 Normal	Acre Feet Period 1924-1941 Maximum	Acre Feet Period 1924-1941 Minimum
Jan.	3.48	1.54	#	277	#	8.5	39.1	2,400	19,626	144,110	0
Feb.	3.18	1.67	1	204	#	14.5	36.2	2,010	13,862	98,520	0
Mar.	2.66	1.64	#	103	#	12.7	21.7	1,340	14,245	95,740	52.0
Apr.	6.36	1.41	29	1,970	24	2.8	57.4	3,410	13,857	54,500	56.4
May	10.79	1.57	21	7,630	#	9.9	717	44,070	46,909	* 253,000	5,120
June	13.58	2.36	5	17,060	4	66.0	1,820	108,400	44,161	192,000	2,710
July	4.86	1.54	13	791	31	8.5	133	8,170	21,575	100,000	228
Aug.	6.82	1.21	5	2,930	#	0	67.0	4,120	19,238	67,200	81.0
Sept.	10.17	1.64	10	8,020	9	12.7	1,220	72,490	101,939	600,000	3,310
Oct.	4.23	2.33	16	509	31	63.2	155	9,540	81,965	673,070	1,710
Nov.	4.30	2.20	21	530	#	51.6	81.5	4,850	30,071	248,590	246
Dec.	2.30	2.17	#	60.0	#	48.7	53.5	3,290	21,821	198,160	46.0
Yearly	13.58	1.21		17,060		0	365	264,090	429,269	1,350,260	101,796

Various Days of the Month. * Partly Estimated.

RIO GRANDE AT ZAPATA STATION

DESCRIPTION: Water-stage recorder and cable with stand up cable car and winch located about 3 miles below the town of Zapata, Texas, 7.5 miles northeast of Guerrero, Tamaulipas, 1.4 miles below the confluence of the Rio Salado with the Rio Grande, and 947.5 river miles below the American Dam at El Paso, Texas. Zero of the gage is at mean sea level, United States Coast and Geodetic Survey datum.

RECORDS: Based upon 63 meter measurements during the year, 54 by the United States and 9 by the Mexican Section. Computations by shifting channel methods. 1941 records good. Records available: January 1932 to December 31, 1941.

REMARKS: The river flow is greatly modified at this station by many irrigation diversions, drainage returns, and large reservoirs in the United States and Mexico.

EXTREME FLOWS: The greatest recorded flow was on September 4, 1932, when the extreme gage height was 262.07 feet and the extreme flow was 261,160 second feet. (See Special Flood Report 1932, by the United States Section of this Commission.) The lowest flow recorded was on June 21, 1938, when the extreme gage height was 219.62 feet and the extreme flow 888 second feet.

Mean Daily Discharge in Second Feet 1941 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	* 1,800	2,410	2,370	2,390	15,100	9,640	4,790	11,000	7,770	17,400	14,400	5,610
2	* 1,800	2,530	2,260	2,230	20,500	6,630	4,550	13,400	9,050	19,100	13,600	5,400
3	* 1,790	4,660	2,130	1,990	26,200	5,970	6,330	9,120	8,290	22,200	13,000	5,540
4	* 1,750	3,498	2,040	1,800	19,400	11,200	16,300	7,770	8,340	25,900	13,100	5,560
5	* 1,710	2,500	2,020	1,700	24,400	23,200	12,600	6,710	8,350	28,800	11,900	5,280
6	* 1,700	2,270	2,040	1,610	21,200	21,200	15,400	7,460	7,870	31,900	11,000	5,080
7	* 1,670	2,220	2,120	1,550	9,720	9,970	11,000	7,860	7,930	28,000	10,800	5,080
8	* 1,630	2,240	2,140	1,440	6,390	6,380	9,340	6,930	6,820	21,400	10,500	5,180
9	* 1,690	2,120	1,960	1,390	5,100	5,730	7,460	7,160	7,240	19,400	10,300	5,090
10	1,700	2,020	1,880	1,360	4,420	5,480	6,140	6,720	18,300	20,400	10,300	5,060
11	1,670	2,040	1,780	1,350	4,140	5,190	5,580	7,940	12,700	22,600	10,300	4,980
12	1,730	1,910	1,790	1,320	3,720	5,910	5,020	7,620	9,660	25,400	9,900	4,950
13	1,800	2,120	1,930	1,300	3,370	7,350	10,000	7,060	11,000	27,900	9,680	4,960
14	1,740	2,310	1,850	1,310	3,200	5,960	7,080	5,980	9,040	22,800	9,330	4,880
15	1,730	2,330	1,840	1,270	3,010	6,010	5,350	5,760	7,040	* 21,100	9,200	4,910
16	1,750	2,300	1,720	4,550	3,010	6,290	13,000	6,130	6,580	22,900	9,190	4,820
17	1,780	2,320	1,700	9,900	2,910	6,630	6,490	7,200	7,710	25,600	9,100	5,060
18	1,750	2,380	1,720	4,310	2,710	7,840	5,000	6,480	15,500	28,800	8,920	5,100
19	1,680	2,510	1,800	2,640	4,960	7,280	4,650	6,320	19,400	31,700	8,770	5,070
20	1,730	2,430	2,270	2,000	9,520	9,610	4,340	6,810	38,800	33,400	8,380	4,930
21	1,680	2,330	2,480	1,800	13,500	8,630	4,360	6,340	52,700	36,500	8,670	5,050
22	1,680	2,320	2,460	1,850	24,700	13,200	4,060	7,580	22,300	37,500	7,480	5,140
23	1,830	2,940	2,260	1,680	20,700	12,900	3,650	7,290	15,900	34,000	6,910	5,180
24	1,800	2,630	2,100	1,430	15,900	8,210	3,470	6,490	13,400	27,500	6,890	5,180
25	1,780	2,650	2,000	1,320	10,100	9,850	3,190	6,220	12,300	24,800	6,790	5,130
26	1,770	2,570	2,000	1,280	7,830	9,010	2,890	6,030	15,600	32,800	6,490	4,980
27	1,780	2,620	1,940	1,310	6,530	7,350	2,610	5,740	19,300	25,300	6,090	4,840
28	3,890	2,490	1,950	1,920	6,670	6,340	2,480	6,720	19,700	20,000	5,840	4,840
29	11,540		2,010	4,480	10,300	5,350	3,160	6,200	16,400	21,300	5,790	4,940
30	6,340		1,940	9,270	17,700	4,830	3,940	6,380	16,100	19,300	5,760	4,960
31	3,140		2,060		17,000		8,940	8,860		16,100		4,940
Sum	71,830	69,668	62,560	73,750	343,910	259,140	203,170	225,280	431,090	789,100	278,380	157,720

Month	Extreme Gage Feet — 1941		Extreme Second Feet — 1941				Average Second Feet 1941	Acre Feet			
			High		Low			Total 1941	Period 1932-1941		
	High	Low	Day		Day				Normal	Maximum	Minimum
Jan.	224.16	220.27	29	15,500	8	1,620	2,320	142,500	203,477	* 484,450	119,000
Feb.	221.62	220.38	3	4,860	12	1,820	2,490	138,000	167,618	* 361,350	111,000
Mar.	220.72	220.28	21	2,580	17	1,650	2,020	124,000	179,207	292,000	124,000
Apr.	224.08	219.98	16	15,160	15	1,250	2,460	146,000	155,017	226,000	110,000
May	227.92	220.70	3	30,800	18	2,660	11,100	682,000	326,595	682,000	134,000
June	227.31	221.66	5	28,200	30	4,710	8,640	514,000	383,646	1,517,000	115,000
July	225.03	220.77	16	18,800	28	2,460	6,550	403,000	362,470	1,238,000	132,000
Aug.	223.98	221.78	2	14,840	16	5,460	7,270	447,000	315,138	665,000	163,000
Sept.	232.90	222.03	21	56,300	9	6,330	14,400	855,000	933,917	2,985,330	172,000
Oct.	229.86	224.18	26	40,000	31	15,100	25,500	1,565,000	710,774	2,396,440	165,000
Nov.	224.18	221.90	1	15,200	‡ 29	5,690	9,280	552,000	274,554	748,020	133,000
Dec.	221.90	221.50	1	5,720	16	4,740	5,090	313,000	226,416	591,380	116,000
Yearly	232.90	219.98		56,300		1,250	8,124	5,881,500	4,238,829	8,038,070	2,231,000

‡ And Other Days. * Partly Estimated.

RIO ALAMO STATION AT CD. MIER, TAMAULIPAS

DESCRIPTION: Water-stage recorder and cable with sit-down cable car and weir for measurement of flows up to 117 second feet, located about 3 miles from the confluence of the Rio Alamo with the Rio Grande and .7 of a mile west of Ciudad Mier, Tamaulipas, Mexico, at a point called "Paso del Cantaro". This stream enters the Rio Grande 984.6 river miles below the American Dam near El Paso, Texas. Zero of gage is 187.04 feet above mean sea level, United States Coast and Geodetic Survey datum.

RECORDS: Based upon 13 meter measurements during the year. Computations by shifting channel methods, except at low flows. 1941 records good. Records available: July 1, 1923 to December 31, 1941.

REMARKS: This station was rebuilt in December 1932. The flood of September 7, 1933 wrecked the tower on the left bank. In December 1933, the cable was moved 980 feet upstream. The zero of its staff gage remained the same as before. The recorder and its gage were not moved. In September 1934, a channel with a small weir of 12 second feet capacity was constructed for measuring low flows. In December 1938, a new weir of 177 second feet capacity was built to replace the smaller weir. The flow of this spring-fed stream is modified by small storage and irrigation diversions above this station.

RECORDED FLOWS: The greatest recorded flow occurred on September 7, 1933, with an extreme gage height of 26.9 feet and a corresponding flow of 76,600 second feet. The river is often dry. Numerous records of extreme flow may be found in previous Water Bulletins.

Mean Daily Discharge in Second Feet 1941 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	8.1	18.7	8.1	40.6	15.9	120	126	4.2	0	104	21.5	21.5
2	8.1	18.7	8.1	27.9	18.7	89.7	99.6	1.1	0	80.5	21.5	21.5
3	8.1	15.9	6.0	21.5	15.9	47.3	67.1	1.1	0	71.3	24.7	18.7
4	8.1	15.9	6.0	15.9	6.0	1,750	51.2	0	0	59.0	24.7	18.7
5	8.1	13.1	4.2	10.6	554	2,440	40.6	0	0	54.7	21.5	21.5
6	8.1	15.9	6.0	8.1	115	470	33.9	1,590	0	47.3	18.7	18.7
7	8.1	15.9	97.5	6.0	43.8	109	30.7	281	0	40.6	13.1	18.7
8	8.1	13.1	38.1	6.0	27.9	51.2	24.7	47.3	0	37.1	13.1	18.7
9	8.1	10.6	13.1	6.0	13.1	31.4	18.7	21.5	149	33.9	13.1	18.7
10	8.1	10.6	8.1	4.2	8.1	27.9	30.7	13.1	4,310	27.9	13.1	21.5
11	8.1	10.6	6.0	4.2	6.0	18.7	327	8.1	2,870	30.7	30.7	21.5
12	8.1	8.1	2.5	4.2	4.2	15.9	195	8.1	1,910	43.8	115	21.5
13	8.1	8.1	4.2	4.2	2.5	51.2	75.9	6.0	678	33.9	30.7	21.5
14	8.1	8.1	4.2	2.5	2.5	59.0	153	2.5	172	27.9	21.5	21.5
15	10.6	8.1	4.2	2.5	1.1	30.7	47.3	2.5	153	59.0	18.7	21.5
16	10.6	6.0	4.2	2.5	1.1	43.4	24.7	2.5	94.3	1,642	27.9	21.5
17	8.1	6.0	6.0	2.5	0	142	18.7	2.5	851	267	33.9	21.5
18	8.1	6.0	6.0	2.5	0	316	13.1	1.1	1,780	47.3	30.7	21.5
19	8.1	6.0	6.0	2.5	0	59.0	8.1	1.1	420	30.7	30.7	21.5
20	8.1	6.0	6.0	4.2	0	978	6.0	1.1	597	51.2	27.9	21.5
21	6.0	6.0	8.1	2.5	15.9	890	4.2	1.1	918	59.0	27.9	21.5
22	8.1	6.0	8.1	2.5	249	713	2.5	0	452	47.3	30.7	21.5
23	6.0	6.0	10.6	2.5	249	1,150	2.5	0	281	40.6	27.9	24.7
24	6.0	8.1	8.1	2.5	1,400	195	1.1	0	236	33.9	24.7	24.7
25	6.0	10.6	182	2.5	1,970	160	1.1	0	172	33.9	24.7	21.5
26	6.0	10.6	43.9	2.5	120	208	1.1	0	210	30.7	21.5	21.5
27	63.6	8.1	33.9	2.5	47.3	334	0	0	858	33.9	21.5	21.5
28	953	8.1	31.4	706	24.7	249	0	0	406	30.7	21.5	21.5
29	278		24.7	148	63.2	184	0	0	165	27.9	21.5	24.7
30	43.9		67.1	37.1	265	153	1.1	0	131	24.7	21.5	24.7
31	24.7		59.0		109		6.0	0		21.5		24.7
Sum	1,568.3	284.9	721.4	1,087.2	5,348.9	11,086.4	1,411.6	1,995.9	17,813.3	3,173.9	796.1	665.7

Month	Extreme Gage Feet — 1941 High	Extreme Gage Feet — 1941 Low	Extreme Second Feet — 1941 High Day	Extreme Second Feet — 1941 High	Extreme Second Feet — 1941 Low Day	Extreme Second Feet — 1941 Low	Average Second Feet 1941	Acre Feet Total 1941	Acre Feet Period 1924-1941 Normal	Acre Feet Period 1924-1941 Maximum	Acre Feet Period 1924-1941 Minimum
Jan.	4.46	1.44	28	1,210	#	6.0	50.6	3,110	5,977	34,900	0
Feb.	1.61	1.44	2	18.7	#	6.0	10.2	565	4,346	25,500	67.2
Mar.	3.87	1.38	25	759	12	2.5	23.3	1,430	3,920	19,800	63.0
Apr.	4.46	1.38	28	1,270	#	2.5	36.2	2,160	7,305	26,700	86.0
May	6.69	1.31	25	3,810	#	0	173	10,610	18,295	137,000*	209
June	8.33	1.57	5	6,000	#	15.9	370	21,990	16,973	83,230	0
July	5.84	1.31	11	2,720	#	0	45.5	2,800	9,204	37,590	256
Aug.	5.77	1.31	6	2,780	#	0	64.4	3,960	9,135	56,900	0
Sept.	8.79	1.31	10	7,060	#	0	594	35,330	29,584	190,520	* 135
Oct.	5.22	1.64	16	2,320	31	21.5	102	6,300	14,848	51,620	0
Nov.	3.05	1.54	12	297	#	13.1	26.5	1,580	4,696	21,940	0
Dec.	1.67	1.57	#	24.7	7	15.9	21.5	1,320	4,894	15,000	124
Yearly	8.79	1.31		7,060		0	126	91,155	129,177	316,803	11,898.7

Various Days of the Month. * Partly Estimated.

RIO GRANDE AT ROMA STATION

DESCRIPTION: Water-stage recorder at international bridge between Roma, Texas, and San Pedro, Tamaulipas, and 992.0 river miles below the American Dam at El Paso, Texas. Zero of gage is 145.90 feet above mean sea level, United States Coast and Geodetic Survey datum.

RECORDS: Based upon 213 meter measurements, 205 by the Mexican and 8 by the United States Section, during the year from bridge. Computations by shifting channel methods. 1941 records good. Records available: August 1900 to March 1914; November 1922 to December 1941.

REMARKS: The river flow is greatly modified at this station by many irrigation diversions, drainage returns, and large reservoirs in the United States and Mexico. This station was operated by the Mexican Section until March 1929 when operation and maintenance was taken over by the United States Section. On August 1, 1939, the operation and maintenance of this station was turned over again to the Mexican Section of the Commission. Datum of present gage is 1.1 foot lower than that used prior to 1922. Backwater from the Rio San Juan sometimes reaches this station. See Water Bulletin No. 3, page 50.

EXTREME FLOWS: The greatest recorded flow was on September 5, 1932, when the extreme gage height was 35.4 feet and the extreme flow 203,000 second feet. (See Special Flood Report 1932 by United States Section of this Commission.) The lowest flow ever recorded was on August 25, 1937, when the extreme flow was 914 second feet, at a stage of -.32 feet. Records of other extreme flows may be found in previous Water Bulletins.

Mean Daily Discharge in Second Feet 1941 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	1,780	2,960	2,520	2,060	11,510	10,560	5,790	10,420	8,050	17,910	14,620	6,000
2	1,790	2,570	2,390	2,180	21,290	7,730	5,690	12,640	8,230	20,020	13,910	5,720
3	1,780	3,850	2,260	2,140	26,310	6,320	5,510	10,880	8,690	22,250	13,670	5,720
4	1,770	4,520	2,110	1,960	20,980	6,990	13,380	8,120	7,560	23,800	13,490	5,720
5	1,780	3,100	2,010	1,810	25,810	25,960	12,610	7,030	8,510	27,930	12,890	5,550
6	1,740	2,670	2,040	1,720	27,760	22,250	15,220	8,830	7,870	32,280	11,830	5,230
7	1,750	2,390	2,080	1,660	12,360	15,040	12,080	8,970	8,470	30,900	11,410	5,050
8	1,720	2,300	2,100	1,560	7,310	7,700	9,710	7,270	7,170	24,510	11,090	5,160
9	1,690	2,250	2,030	1,450	5,690	6,390	8,400	7,060	5,970	21,150	10,450	5,190
10	1,730	2,050	1,960	1,380	4,700	6,080	6,670	6,360	20,870	21,080	11,020	5,160
11	1,720	2,060	1,920	1,350	3,960	5,690	6,460	7,840	18,120	22,810	11,050	5,050
12	1,740	2,080	1,820	1,320	3,740	5,400	8,020	7,950	12,180	25,820	10,880	4,730
13	1,780	2,030	1,830	1,250	3,420	8,050	8,230	7,420	11,260	29,840	10,380	4,730
14	1,760	2,210	1,840	1,250	3,280	6,390	8,690	5,930	11,830	26,270	10,030	4,700
15	1,690	2,390	1,830	1,220	2,990	6,070	5,970	5,650	7,980	22,880	9,960	4,630
16	1,670	2,300	1,760	1,220	2,810	6,070	10,060	5,610	6,780	25,390	10,030	4,800
17	1,640	2,320	1,670	9,890	2,800	7,950	8,970	6,670	7,030	26,350	9,960	4,840
18	1,660	2,260	1,670	6,500	2,660	7,910	5,370	6,820	14,870	28,290	9,820	5,260
19	1,650	2,370	1,660	3,480	2,810	8,300	5,050	5,830	15,110	31,680	9,460	5,400
20	1,650	2,470	1,830	2,340	10,210	11,690	4,660	6,710	27,400	34,500	9,320	5,010
21	1,680	2,350	2,230	2,000	8,260	12,250	4,240	6,070	45,560	35,170	9,750	4,910
22	1,670	2,220	2,410	1,860	26,450	20,660	4,450	6,750	32,770	37,430	8,860	5,190
23	1,730	2,250	2,250	1,830	22,070	19,000	4,130	8,160	16,920	36,020	8,120	4,840
24	1,850	2,800	2,020	1,520	16,920	11,120	3,670	6,890	14,690	30,870	7,560	5,190
25	1,830	2,560	2,170	1,220	13,880	12,110	3,350	6,220	14,020	28,430	7,270	5,120
26	1,840	2,540	2,200	1,110	8,230	12,430	3,220	5,970	17,730	31,040	6,960	4,980
27	1,950	2,620	2,050	1,510	6,710	9,710	2,900	5,650	20,090	31,110	6,640	4,840
28	4,940	2,650	1,960	3,530	6,850	8,510	2,760	6,320	22,710	20,130	6,290	4,770
29	8,090		1,900	2,650	7,560	6,890	2,850	6,390	18,260	22,490	6,110	4,980
30	9,570		2,000	6,390	18,890	5,790	3,570	6,390	16,320	20,620	6,070	4,980
31	4,770		1,770		17,870		5,370	8,160		17,520		4,940
Sum	74,410	71,140	62,490	71,360	356,090	307,010	207,050	226,980	443,020	826,490	298,900	158,390

Month	Extreme Gage Feet — 1941		Extreme Second Feet — 1941				Average Second Feet 1941	Acre Feet			
			High		Low			Total 1941	Period 1924-1941		
	High	Low	Day		Day				Normal	Maximum	Minimum
Jan.	5.81	.43	29	12,960	17	1,620	2,400	147,600	219,427	467,370	119,000
Feb.	2.95	.72	3	5,540	13	2,000	2,540	141,100	180,418	349,000	108,000
Mar.	1.18	.39	25	2,620	28	1,210	2,020	123,900	184,066	325,600	99,000
Apr.	5.77	.16	17	13,910	26	1,060	2,380	141,500	182,052	400,000	104,000
May	11.32	1.44	6	30,900	19	2,510	11,490	706,300	370,733	706,300	133,000
June	10.63	3.25	5	30,690	12	5,370	10,230	609,000	403,219	1,586,000	92,600
July	7.41	1.35	4	18,790	29	2,700	6,680	410,700	338,391	1,217,000	131,000
Aug.	6.79	3.08	2	13,420	16	5,370	7,320	450,200	325,423	743,000	157,000
Sept.	17.45	3.44	21	51,210	9	5,370	14,770	878,700	809,458	3,047,630	117,000
Oct.	13.25	7.22	22	37,790	31	16,000	26,660	1,639,300	625,352	2,371,870	163,000
Nov.	7.22	3.05	1	16,210	29	5,970	9,960	592,900	269,176	735,960	127,000
Dec.	3.12	2.36	1	6,140	14	4,560	5,110	314,200	226,812	565,140	114,000
Yearly	17.45	.16		51,210		1,060	8,500	6,155,400	4,134,527	8,098,030	2,227,000

RIO SAN JUAN STATION AT SANTA ROSALIA, TAMAULIPAS

DESCRIPTION: Water-stage recorder and cable with sit-down cable car, located about 27.5 miles above the confluence with the Rio Grande and 15 miles southwest of Ciudad Camargo, Tamaulipas, at a settlement called Santa Rosalia, 3 miles west of Ochoa Railway Station. This stream joins the Rio Grande 1,007.4 river miles below the American Dam at El Paso, Texas. Zero of gage is 205.15 feet, U.S.C. & G.S. sea level datum.

RECORDS: Based upon 213 meter measurements during the year, 205 by the Mexican and 8 by the United States Section. Computations by shifting channel methods. 1941 records good. Records available: May 1, 1900 to 1913; 1923 to 1941.

REMARKS: This station has not always been at its present site. For detailed history of gage changes see previous Water Bulletins. When the river at this station rises above a gage height of 36.1 feet, water overflows the west river bank above the station and returns to the river below. At a gage height of 42.6 feet, water submerges the right river bank at the station but follows the main river. The river flow is modified at this station by irrigation diversions and other uses along the San Juan river basin.

EXTREME FLOWS: On August 30, 1909, there occurred a flood which reached a height of 49.21 feet, present scale, and a discharge of approximately 353,000 second feet. On August 30, 1938, the peak discharge was 233,000 second feet, with a gage height of 42.65 feet. The river is dry at times.

Mean Daily Discharge in Second Feet 1941 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	590	674	491	1,260	576	2,190	5,400	862	238	1,820	925	1,000
2	579	572	491	1,060	501	1,730	4,700	794	223	1,800	872	996
3	551	530	491	996	441	982	4,100	720	210	1,760	862	1,000
4	512	501	487	953	427	904	3,600	738	201	1,830	840	1,020
5	498	519	470	904	1,240	14,120	3,270	713	191	1,620	837	1,230
6	487	537	463	830	756	6,710	3,030	777	195	1,480	812	1,170
7	473	579	466	759	448	2,410	2,830	1,150	197	1,440	788	1,080
8	441	674	456	717	330	1,730	2,560	1,440	169	1,430	819	1,040
9	441	692	452	660	294	1,310	2,380	784	179	1,520	812	992
10	462	667	427	583	276	1,100	2,130	671	37,430	1,400	773	971
11	466	678	403	512	258	1,580	1,920	625	37,790	1,300	943	1,090
12	484	635	395	480	234	1,450	2,270	583	30,760	1,550	1,510	1,180
13	473	607	357	477	214	1,920	8,760	554	11,120	1,450	985	1,330
14	452	590	371	498	194	4,910	8,790	512	4,940	1,340	1,240	1,330
15	450	554	347	505	175	2,380	3,880	459	2,950	1,240	1,060	1,270
16	441	533	338	618	167	1,510	2,050	434	2,120	3,220	985	1,220
17	441	544	332	611	142	1,250	1,800	424	1,890	1,870	943	1,190
18	413	537	343	558	128	1,900	1,690	410	3,310	2,010	929	1,180
19	381	523	344	780	101	2,430	1,610	367	3,810	1,420	968	1,140
20	364	505	338	459	95	3,600	1,540	335	6,990	1,180	936	1,070
21	352	498	357	402	283	5,650	1,480	314	6,500	1,090	904	1,030
22	337	484	403	360	2,530	7,170	1,400	288	4,060	999	918	996
23	330	530	441	334	851	19,990	1,410	266	3,430	964	932	989
24	315	598	445	314	2,990	40,260	1,260	254	2,820	922	1,030	975
25	305	611	526	388	1,510	29,030	1,140	243	2,250	883	1,030	936
26	299	554	950	477	2,000	33,690	1,080	226	2,240	855	982	918
27	329	501	607	8,620	1,700	25,460	1,040	224	3,530	848	960	915
28	11,160	491	526	3,780	7,730	13,000	953	276	4,100	971	968	912
29	5,510		1,510	1,780	3,710	8,470	865	336	2,760	1,170	968	830
30	1,550		1,760	865	1,830	6,250	837	238	2,160	1,120	1,020	823
31	939		1,490		2,370		823	209		975		819
Sum	30,825	15,918	17,277	31,540	34,501	245,086	80,598	16,226	178,763	43,477	28,551	32,642

Month	Extreme Gage Feet — 1941		Extreme Second Feet — 1941				Average Second Feet 1941	Acre Feet			
			High		Low			Total 1941	Period 1924-1941		
	High	Low	Day		Day				Normal	Maximum	Minimum
Jan.	16.67	3.22	28	15,860	27	292	994	61,140	35,008	93,500	7,580
Feb.	4.20	3.64	9	706	4	491	568	31,570	21,874	92,810	2,860
Mar.	7.41	3.38	29	2,060	16	338	557	34,270	17,507	56,570	1,810
Apr.	16.04	3.22	27	15,960	24	305	1,050	62,560	20,339	98,500	1,670
May	16.14	2.43	28	12,570	21	89.0	1,110	68,430	55,509	136,360	3,500
June	22.57	4.46	24	49,440	5	798	8,170	486,100	130,561	586,000	5,160
July	15.39	4.33	13	12,320	31	805	2,600	159,900	85,298	280,000	2,840
Aug.	6.46	2.95	8	2,010	31	209	523	32,180	106,277 ⊕	⊕ 802,000	2,120
Sept.	25.36	2.89	10	72,750	8	169	5,960	354,600	251,819 ⊕	1,411,080	22,790
Oct.	12.07	4.49	16	5,260	27	830	1,400	86,240	153,636	772,040	18,970
Nov.	6.89	4.23	12	1,990	10	759	952	56,630	55,902	221,640	12,900
Dec.	5.45	4.33	13	1,340	31	798	1,050	64,750	44,594	135,490	12,000
Yearly	25.36	2.43		72,750		89.0	2,070	1,498,370	978,324	3,387,480	328,180

⊕ Includes the water which by-passed to the west of the station.

RIO GRANDE AT RIO GRANDE CITY STATION

DESCRIPTION: Water-stage recorder and cable with stand up cable car and winch, located about 4 miles by river below Rio Grande City, Texas, 3.7 miles northeast of Camargo, Tamaulipas, 7.9 miles below the confluence of the Rio San Juan with the Rio Grande and 1,015.3 river miles below the American Dam at El Paso, Texas. Zero of gage is at mean sea level, United States Coast and Geodetic Survey datum.

RECORDS: Based upon 129 meter measurements during the year, 112 by the United States and 17 by the Mexican Section. Computations by shifting channel methods. 1941 records good. Records available: January 1, 1932 to December 31, 1941.

REMARKS: When the water at this station rises above a gage height of about 151 feet, water overflows the left river bank beyond the station cable, but such water is measured.

When floods in the Rio San Juan exceed a gage height of about 38 feet or a flow of about 172,000 second feet at the Santa Rosalia station, water begins to overflow the right bank of that river at several places from El Azucar (20 miles below Santa Rosalia station) downstream. This overflow water cuts across country and reaches the Rio Grande about 9 river miles below Rio Grande City gaging station and is therefore not measured there. In the 1932 flood 411,000 acre feet and in 1938, 12,000 acre feet of water are estimated to have thus by-passed the Rio Grande City station and reached the Rio Grande, but these estimated amounts of by-pass water are included in the tabulation below. The river flow here is greatly modified by many irrigation diversions, drainage returns, and large reservoirs in the United States and Mexico.

EXTREME FLOWS: The highest reported gage height was in 1909, when the extreme gage height was 159.2 feet, present gage datum, as reported by residents and confirmed by extreme gage height at Rio Grande City Weather Bureau gage and other points in the vicinity, as found in Joint Report of International Boundary Commission 1910-11. The lowest recorded flow was on May 9, 1940 when the extreme gage height was 124.10 feet and the extreme flow 946 second feet.

CORRECTION: In Water Bulletin No. 7 the total acre-feet flow for September 1937 should have been reported as 263,000. Accordingly the annual minimum in Water Bulletin Nos. 8, 9, and 10 was given as 1,000 acre-feet too low.

Mean Daily Discharge in Second Feet 1941 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	2,360	4,980	2,980	3,420	10,700	15,000	* 11,700	9,950	8,910	19,300	15,700	6,970
2	2,330	3,490	2,910	3,590	20,100	10,700	10,300	12,500	8,390	20,900	14,500	6,790
3	2,320	3,180	2,820	3,420	25,500	8,090	9,040	12,400	9,690	22,600	14,000	6,610
4	2,270	4,950	2,740	2,980	25,500	6,800	13,200	* 9,040	8,510	24,600	14,100	6,640
5	2,210	4,200	2,660	2,730	29,400	29,000	16,900	* 7,460	8,570	28,300	13,700	6,600
6	2,140	3,370	2,630	2,540	35,400	*31,200	17,200	* 8,360	8,370	32,600	12,400	6,560
7	2,120	3,080	2,750	2,390	20,600	*21,500	15,300	* 9,320	7,950	33,700	11,600	6,170
8	2,130	2,960	2,740	2,300	9,070	*10,000	11,900	8,890	7,760	28,000	11,300	6,130
9	2,100	3,010	2,740	2,190	6,140	* 8,120	11,200	8,850	6,670	23,400	11,000	6,240
10	2,100	2,920	2,460	2,070	5,280	7,110	9,500	7,520	32,400	22,200	10,700	6,160
11	2,030	2,820	2,400	2,000	4,690	7,740	8,710	7,360	70,100	22,800	10,800	6,140
12	2,070	2,840	2,250	1,900	4,420	6,980	10,600	8,230	49,400	26,300	11,400	6,020
13	2,140	2,740	2,140	1,820	4,000	7,870	13,200	8,080	28,900	30,900	11,100	6,010
14	2,220	2,740	2,190	1,740	3,590	12,200	18,200	7,500	18,600	28,200	10,600	6,200
15	2,210	2,810	2,170	1,730	3,270	9,790	12,100	6,490	13,100	23,700	10,600	6,090
16	2,160	2,850	2,180	1,720	3,130	8,130	10,500	6,080	11,000	27,100	10,300	6,030
17	2,130	2,810	2,100	4,500	3,120	8,580	12,700	6,560	8,910	28,000	10,200	5,910
18	2,120	2,800	2,120	8,300	3,080	8,420	8,350	7,530	14,400	28,500	10,000	6,110
19	2,080	2,810	2,090	5,470	2,980	10,400	7,070	6,780	17,700	31,700	9,790	6,160
20	2,000	2,900	2,100	3,590	6,000	12,200	6,490	6,680	27,400	34,200	9,400	6,090
21	2,040	2,910	2,370	2,690	7,730	20,000	5,990	7,190	47,500	35,300	9,490	5,950
22	2,070	2,890	2,820	2,310	26,300	23,600	5,770	6,940	49,600	38,400	9,360	6,040
23	2,040	2,800	2,970	2,170	29,000	*36,000	5,420	8,180	23,900	38,000	8,620	6,200
24	2,160	3,380	2,840	2,040	23,800	*44,500	5,050	7,830	18,400	33,400	8,040	6,250
25	2,240	3,440	2,820	1,810	20,400	*42,700	4,810	6,790	16,100	29,900	7,730	6,240
26	2,180	3,240	3,240	2,560	11,600	*42,300	4,530	6,370	17,400	28,500	7,660	6,180
27	2,220	3,140	3,240	9,990	10,000	*39,400	4,280	6,140	20,200	36,200	7,380	6,020
28	13,800	3,100	2,600	10,400	12,300	*23,300	4,000	6,080	26,000	24,200	7,050	5,970
29	15,900		2,500	7,540	11,800	*16,600	3,830	6,760	23,200	22,800	6,890	5,730
30	13,400		3,780	6,000	19,100	*13,200	4,110	6,450	19,300	22,200	6,910	5,850
31	8,000		3,750		22,100		4,840	6,840		18,800		5,900
Sum	109,290	89,160	82,100	107,910	420,100	*541,430	286,790	241,150	628,330	864,700	312,320	191,960

Month	Extreme Gage Feet — 1941		Extreme Second Feet — 1941				Average Second Feet 1941	Acre Feet			
								Total 1941	Period 1924-1941		
	High	Low	Day	High	Day	Low			Normal	Maximum†	Minimum
Jan.	133.10	125.04	29	20,500	20	1,980	3,530	217,000	260,281	521,000	140,000
Feb.	127.75	125.66	4	5,200	14	2,680	3,180	177,000	207,944	* 368,690	125,000
Mar.	126.62	124.91	30	4,120	17	2,040	2,650	163,000	209,987	401,000	108,000
Apr.	130.82	124.32	27	13,600	26	1,670	3,600	214,000	205,763	395,000	118,000
May	137.37	126.02	6	37,800	19	2,920	13,600	833,000	439,393	833,000	153,000
June	140.13	129.05	24	48,000	13	6,560	*18,000	*1,070,000	537,156	1,737,000	94,300
July	133.88	126.93	14	19,500	29	3,780	9,250	569,000	434,083	1,240,000	152,000
Aug.	131.92	128.61	2	13,400	16	5,750	7,780	478,000	412,387	1,280,000	163,000
Sept.	146.00	128.88	11	72,100	9	6,250	20,900	1,250,000	1,052,460	3,723,800	147,000
Oct.	138.86	133.25	22	39,100	31	16,800	27,900	1,720,000	799,288	2,852,270	204,000
Nov.	133.26	129.29	1	16,700	30	6,810	10,400	619,000	331,529	829,260	156,000
Dec.	129.37	128.59	1	7,030	29	5,670	6,190	381,000	277,336	625,260	143,000
Yearly	146.00	124.32		72,100		1,670	10,600	7,691,000	5,167,607	9,554,530	2,643,000

* Partly Estimated. † Includes San Juan water which by-passed this station in 1932 and 1938.

RIO GRANDE AT HIDALGO STATION

DESCRIPTION: Water-stage recorder on the downstream side of the United States end of the Hidalgo-Reynosa international bridge near Hidalgo, Texas, and Reynosa, Tamaulipas, 1,084.8 river miles below the American Dam at El Paso, Texas, and 156.6 river miles from the Gulf of Mexico. Zero of the gage is United States Coast and Geodetic Survey mean sea level datum. Meter measurements are from the bridge.

RECORDS: Discharges based upon 27 meter measurements during the year, 25 by the United States and 2 by the Mexican Section. Discharge computations by shifting channel methods. Discharge records available: July 1928 to December 1931; September and October 1932; peak flows in September 1933 and in 1934, also January to July, and September 1935; peak flows May and October, and full record July and September 1936; full record April 26 to December 31, 1938, and January to November 1939. Complete gage height record and discharges only during peaks in 1940 and 1941.

REMARKS: On July 28, 1941 the zero of the gage was changed to U.S.C. & G.S. mean sea level datum. At this time it was found that the elevation previously reported (79.28 feet) in these Water Bulletins as the elevation of the zero of the gage, was in error, the correct figure being 79.03 feet. All previously reported gage heights should be corrected accordingly. All gage heights reported here for 1941 are on this new datum. Another gage (Weather Bureau) at this bridge has a zero elevation of 79.03 feet. When the river at this station reaches a stage of about 100.5 feet, or a flow of about 60,000 second feet at this station, water begins to flow into two floodway inlets on the United States side, viz: Hackney Lake Inlet about 4 miles upstream and Mission Inlet about 15 miles above this station, but the river may begin to overflow at Granjeno and Jardin de Flores at stages about 3.5 feet lower. The bottom of the river at this station is subject to considerable erosion during floods. See Water Bulletin No. 3, page 38.

EXTREME FLOWS: The highest recorded stage was in 1909 when 106.92 feet on the present gage was reached. In 1910, 103.85 was reached. These were before the present river bridge and highway embankments were constructed at this point. In 1932 the peak stage was 104.88 and the peak flow was 83,870 second feet. See previous Water Bulletins and Special Flood Report 1932 by the United States Section.

Mean Daily Gage Height in Feet — 1941

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	* 83.23	86.14	83.38	83.72	86.29	91.02	90.08	84.61	86.08	91.83	91.68	86.54
2	* 83.16	85.20	83.31	83.66	88.71	88.73	89.43	87.39	86.78	91.88	90.91	86.51
3	* 82.93	84.59	* 83.20	83.58	91.03	87.76	88.86	88.86	86.60	92.25	90.46	86.56
4	* 82.84	84.25	* 83.03	83.50	92.54	87.00	88.57	88.09	87.09	92.82	90.20	86.38
5	* 82.83	84.82	* 82.86	83.23	92.60	88.21	91.02	87.01	86.87	93.59	90.09	86.38
6	* 82.83	84.91	* 82.55	82.88	94.86	94.47	91.07	86.73	86.82	94.56	89.83	86.41
7	* 82.83	84.40	* 82.54	82.65	94.05	93.85	91.31	87.03	86.88	95.38	89.40	86.38
8	* 82.83	84.03	* 82.66	82.39	90.44	90.55	90.06	87.22	86.57	95.17	89.16	86.16
9	* 82.76	83.73	82.72	82.18	89.10	87.98	89.20	87.06	86.33	93.71	89.05	86.16
10	* 82.55	83.66	82.59	82.04	87.61	87.21	88.69	86.79	87.53	92.84	88.81	86.12
11	* 82.53	83.60	82.35	81.93	86.82	87.00	87.96	86.43	96.28	92.76	88.67	86.20
12	* 82.53	83.47	82.39	81.84	86.21	87.40	87.84	86.32	99.13	93.32	88.77	86.22
13	* 82.49	83.37	82.36	81.77	85.85	87.00	88.59	86.56	98.92	93.99	88.98	86.18
14	* 82.34	83.28	82.23	81.54	85.47	87.75	90.79	86.60	94.50	94.59	88.73	86.13
15	* 82.33	83.16	82.23	81.30	85.08	88.82	90.20	86.18	91.35	95.55	88.56	86.17
16	* 82.33	83.23	82.28	81.25	84.77	87.91	88.15	85.70	89.53	93.36	88.70	86.17
17	* 82.35	83.27	82.27	81.11	84.51	87.29	88.64	85.73	88.63	94.42	88.56	86.05
18	* 82.33	83.09	82.24	83.33	84.25	87.47	88.37	85.78	88.52	94.30	88.44	86.01
19	* 82.25	83.11	82.21	85.79	83.87	87.53	86.98	86.09	90.95	94.86	88.37	86.00
20	* 82.00	83.10	82.20	85.01	83.56	88.27	86.42	85.88	91.92	95.36	88.33	86.08
21	* 81.80	83.16	82.18	83.94	85.81	89.96	85.93	85.78	95.94	95.90	88.27	86.08
22	82.01	83.25	82.26	82.86	88.58	91.15	85.60	85.83	98.49	96.47	88.39	85.95
23	82.12	83.25	82.67	82.21	92.72	93.53	85.57	85.84	97.89	97.01	88.25	85.87
24	81.91	83.16	82.90	81.92	91.99	95.75	85.79	86.52	93.26	96.97	87.84	85.93
25	81.86	83.24	82.93	81.75	91.22	97.09	85.11	86.25	91.82	95.97	87.46	85.97
26	82.29	83.54	82.83	81.87	89.58	97.25	84.70	85.78	91.14	95.12	87.19	85.95
27	82.55	83.51	82.95	82.52	87.84	97.66	84.60	85.48	91.94	96.04	87.28	85.87
28	84.01	83.41	83.21	86.49	87.61	96.59	84.16	85.42	93.35	95.47	87.04	85.50
29	88.58		82.90	86.85	88.98	93.23	83.68	85.46	93.67	93.23	86.74	85.57
30	88.46		82.61	86.01	89.28	91.26	83.51	85.92	92.56	93.41	86.72	85.50
31	87.69		82.84		91.30		83.64	85.97		92.99		85.63
Sum												

Month	Extreme Gage Feet — 1941		Extreme Second Feet — 1941				Average Second Feet 1941	Acre Feet			
			High		Low			Total 1941	Period 1924-1941		
	High	Low	Day		Day				Normal	Maximum	Minimum
Apr.		80.98			17	1,500					
May	95.32		6	39,700							
June	94.93		6	31,400							
June	97.90		27	43,600							
Sept.	99.56		13	52,300							
Sept.	99.16		23	49,900							
Sept.	94.00		28	27,900							
Oct.	95.53		8	34,500							
Oct.	94.72		14	30,300							
Oct.	97.15		24	37,800							
Oct.	96.87		27	35,800							
Yearly	99.56	80.98		52,300		1,500					

* Based on Weather Bureau Gage Heights at 8:00 A.M.

RIO GRANDE AT MERCEDES BRIDGE STATION

DESCRIPTION: Water-stage recorder located 380 feet downstream from the international bridge between Mercedes, Texas and Rio Rico, Tamaulipas and 1,122.1 river miles below the American Dam at El Paso, Texas. Zero of the gage is United States Coast and Geodetic Survey mean sea level datum. Meter measurements are made from the bridge.

RECORDS: Based upon 32 current meter measurements during the year, 29 by the United States and 3 by the Mexican Section, and the previous rating curve. Computations by shifting channel methods. 1941 gage height record fair and discharge records fair. Records of discharge are available for September and October 1932; April 28 to October 3, 1935; July 1 to 31, September 1 to October 3, 1936; October 24 to December 31, 1937; June 7 to June 17, July 26 to August 7, August 29 to September 6, and September 12 to October 7, 1938; May 5 to 8, June 5 to 12, July 6 to 8, September 22 and 23, and October 12 to 15, 1939. Mean daily gage height records for 1938 to 1941 are available in Water Bulletins. Unpublished records of daily river stage are available for each year from 1910 to 1937, except 1913, for a staff-gage located at the Mercedes pumping plant about 500 feet upstream from this station. The zero of this gage is 50.53 feet above the aforementioned sea level datum.

REMARKS: The river flow at this station is greatly modified by many irrigation diversions, drainage returns and large reservoirs in the United States and Mexico. During floods only a portion of the river flow discharges past this station through the channel of the Rio Grande, as part finds outlet to the Gulf of Mexico through flood channels in both countries, which divert from the Rio Grande within 54.5 miles above this station. The international bridge mentioned above was washed out by a flood on October 27, 1941 and the operation of this station was discontinued December 31, 1941.

EXTREME FLOWS: The highest recorded stage was on September 11, 1935, when a stage of 76.60 feet was reached, with a flow of 40,000 second feet.

Mean Daily Gage Height in Feet — 1941

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	57.28	*61.10	57.26	56.99	*59.71	66.47	66.25	*57.79	*60.24	*67.84	68.52	60.77
2	57.21	*59.77	57.20	57.12	*61.78	64.57	65.09	*60.23	*60.52	*66.13	67.25	60.88
3	57.06	*58.95	57.03	57.47	*64.45	62.69	64.27	*63.07	*60.94	*66.46	66.44	60.85
4	56.84	*58.57	56.78	57.56	*66.39	61.82	63.61	*62.70	*61.11	*66.99	66.03	60.85
5	56.74	58.51	56.44	57.47	*67.31	61.33	64.87	*61.39	*61.25	*67.84	65.69	60.72
6	56.67	58.76	56.64	57.20	*69.30	66.42	66.61	*60.87	*61.02	*69.05	65.62	60.16
7	56.42	58.89	56.51	56.36	*70.78	69.89	66.72	*60.83	*60.92	*70.23	64.95	60.92
8	56.07	58.52	56.46	*56.58	*68.07	67.98	65.94	*61.23	*60.69	*70.59	64.78	60.68
9	56.23	58.08	56.48	*56.30	*64.49	63.83	64.37	*61.44	*60.24	*69.60	64.65	60.85
10	56.25	57.83	56.51	*55.89	*62.78	62.20	63.69	*61.14	*60.54	*68.29	64.22	60.64
11	56.02	57.68	56.47	*55.39	*61.70	61.56	62.76	*60.69	*67.47	*67.65	64.17	60.87
12	56.13	57.58	56.36	*55.36	*60.85	61.40	62.29	*60.37	*71.66	*67.87	64.23	60.94
13	56.16	57.45	56.29	*55.38	*60.30	61.64	63.27	*60.62	*72.33	*68.52	64.29	60.91
14	55.89	57.30	56.24	*55.54	59.88	61.72	64.69	*60.53	*71.41	*69.29	63.97	61.05
15	55.88	57.01	56.17	*55.39	59.42	63.36	65.97	*60.32	*67.36	*68.85	63.78	61.03
16	55.59	57.13	56.14	*54.77	58.89	62.99	63.89	*60.01	64.71	*67.86	63.79	61.03
17	55.52	56.98	55.98	*55.29	58.74	61.80	62.57	*59.81	63.34	*68.63	*63.49	61.00
18	*55.81	*56.87	55.91	*55.04	58.50	61.72	63.65	*59.73	62.66	*69.75	*62.91	60.73
19	*56.08	*57.13	56.08	*58.53	57.97	62.15	62.11	*59.87	64.38	*70.38	*62.81	60.78
20	*56.22	*57.15	56.04	*59.84	*57.37	62.78	61.32	*60.06	65.74	*70.97	*62.78	61.00
21	*56.18	*57.15	56.01	*59.16	*57.64	63.57	60.59	*59.89	67.75	*71.53	*62.76	61.12
22	*55.54	*57.17	55.98	*57.56	*62.24	65.82	59.82	*59.54	70.72	*71.91	*68.89	61.03
23	*55.84	*57.24	56.24	*56.43	*66.91	67.95	59.64	*60.22	72.10	*72.22	*62.90	60.72
24	*55.86	*57.22	56.59	*56.51	*67.86	70.97	59.70	*60.32	70.42	*72.43	*62.67	60.80
25	*55.78	*57.18	56.79	*55.57	*67.13	72.09	59.20	*60.33	67.99	*72.36	*61.91	60.55
26	*55.98	*57.31	56.78	*55.72	*66.04	72.76	58.57	*60.09	66.63	*72.07	*61.52	60.37
27	*56.49	*57.55	56.72	*57.00	*63.37	72.70	58.67	*59.69	66.50	*71.90	*61.57	60.06
28	*57.32	*57.42	56.91	*59.01	*62.35	73.23	58.55	*59.50	66.87	*72.48	*61.68	60.24
29	*61.28		57.04	*60.78	*63.03	71.39	57.64	*59.58	68.22	*71.75	*61.39	59.97
30	*63.18		56.73	*60.30	*63.71	68.26	57.32	*59.77	67.60	*70.40	61.29	59.92
31	*62.71		56.53		*65.51		57.41	*59.98		*69.43		59.85
Sum												

Month	Extreme Gage Feet — 1941		Extreme Second Feet — 1941				Average Second Feet 1941	Acre Feet			
			High		Low			Total 1941	Period 1924-1941		
	High	Low	Day		Day				Normal	Maximum	Minimum
Apr.		54.60			16	2,270					
May	71.20		7	31,400							
May	68.00		24	23,100							
June	70.71		7	29,700							
June	73.33		28	33,900							
July	67.00		1	17,400							
Sept.	72.53		13	29,200							
Sept.	72.28		23	32,300							
Sept.	68.40		29	21,700							
Oct.	70.75		8	29,600							
Oct.	72.57		28	34,700							
Nov.	69.03		1	25,500							
Yearly				34,700		2,270					

* Deduced from Weather Bureau Readings at 7:00 A.M.

RIO GRANDE FLOODWAY DISCHARGES IN THE LOWER RIO GRANDE VALLEY

On The United States Side

There are three floodways on the United States side of the Rio Grande delta which divert excess Rio Grande flood waters to the Gulf of Mexico. Such floodway discharges are measured at gaging stations known as North Floodway South of McAllen, South Floodway South of McAllen, and Rancho Viejo Floodway near Brownsville. The first two of these gaging stations are described in Water Bulletin No. 2, page 41. The third one is described in Water Bulletin No. 6, page 41.

In 1941 no Rio Grande flood water passed through the first two of these floodways. A statement of the flood flow through the Rancho Viejo Floodway follows:

Rancho Viejo Floodway Near Brownsville, Texas

Mean Daily Discharge in Second Feet and Period Summary — 1941

Date	Second Feet	Date	Second Feet	Date	Second Feet	Date	Second Feet
June 27	* 186	Sept. 14	* 112	Oct. 19	* 12	Oct. 25	* 250
" 28	* 380	" 22	* 19	" 20	* 70	" 26	* 195
" 29	* 428	" 23	* 100	" 21	* 120	" 27	* 165
" 30	* 53	" 24	* 115	" 22	* 155	" 28	* 220
		" 25	* 35	" 23	* 175	" 29	* 230
				" 24	* 200	* 30	* 35
The Period	*1,047		* 381				*1,827

Period Summary			
Period	Gage	Second Feet	Acre Feet
	Extreme Feet High	Extreme High	Total
June	‡ 43.65	‡ 480	* 2,080
September	‡ 42.20	‡ 185	* 756
October	42.55	‡ 255	* 3,620
The Period	‡ 43.65	‡ 480	* 6,456

‡ Estimated. * Partly Estimated.

North Floodway Near Sebastian, Texas — 1941

The channel of the North Floodway in the vicinity of Sebastian, Texas, serves as a drainage channel as well as a floodway. During 1941 an average of two measurements per month was made of this drainage flow. From these measurements and rainfall records the following table of estimated drainage flow was made. The salt burden carried by this drainage flow will be found elsewhere in this bulletin under the heading, "Chemical Analyses of Water Samples".

Estimated Discharge

Mean Daily Second Feet — 1941				Acre Feet			
					Period 1940 — 1941		
Month	Maximum	Minimum	Average	Total 1941	Average	Maximum	Minimum
January	1,170	30.0	121	7,450			
February	300	36.0	108	6,010			
March	255	36.0	87.5	5,380			
April	358	24.0	99.2	5,900			
May	1,058	30.0	394	24,200			
June	400	58.0	153	9,090			
July	373	23.6	117	7,170			
August	130	15.3	30.9	1,900			
September	255	14.0	79.6	4,740			
October	118	15.0	37.8	2,330	1,233	2,330	136
November	50.0	15.0	23.3	1,390	1,126	1,390	861
December	80.0	15.0	35.8	2,200	3,340	4,480	2,200
Yearly	1,170	14.0	107	77,760			

On The Mexican Side — 1941

There are two floodways on the Mexican side of the Rio Grande delta which divert excess Rio Grande flood water, each being controlled by gates. These are the Retamal Canal and Floodway No. 3. On page 56 of this bulletin will be found a statement of all flow through Retamal Canal in 1941.

The gates of Floodway No.3 were closed until October 24 after which a large but undetermined amount of flood water passed through,reaching a peak for the year of about 3,420 second feet at a gage of 9.85 meters on October 30, as shown by a measurement.

During the September-October flood river water overflowed near Rio Rico, Tamaulipas, reaching an estimated 1,760 second feet on September 23, and an estimated peak of 3,530 second feet during the last days of October. The town of Rio Rico was flooded and abandoned on October 24. The Rio Grande bridge between Mercedes, Texas and Rio Rico was destroyed by the flood on October 27.

Through 4 small existing structures between Matamoros and Rio Rico an estimated 2,470 second feet were diverted for agricultural flooding during September floods.

RIO GRANDE AT MATAMOROS STATION

DESCRIPTION: Water-stage recorder and cable with sit-down cable car and winch. The water-stage recorder is attached to the central pier of the railroad bridge over the Rio Grande between Matamoros, Tamaulipas and Brownsville, Texas, about 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 and car are located 0.3 mile upstream from the bridge. Zero of present gage is 15.26 feet above mean sea level, United States Coast and Geodetic Survey datum.

RECORDS: Based upon 166 meter measurements during the year, 165 by the Mexican and 1 by the United States Section. The river bottom shifts greatly at this station. Computations by shifting channel methods. 1941 records good. Records available: 1901 to 1913; 1923 to December 1941.

REMARKS: The river flow at this station is greatly modified by many irrigation diversions and by large reservoirs in the United States and Mexico. During floods only a portion of the river flow discharges past this station through the channel of the Rio Grande as part finds outlet to the Gulf of Mexico through flood channels in both countries, which divert from the Rio Grande within 117.4 miles above this station. In May 1924 a recorder was established .6 mile upstream from the bridge. In September 1925 the recorder was moved to its present location. On October 3, 1930 the zero of the gage was lowered 5 feet.

EXTREME FLOWS: The greatest flow recorded here was on June 22, 1903, when a mean daily flow of 36,200 second feet occurred with a gage height of 13.2 feet. The greatest flow since 1923 was on June 10, 1935, when 31,400 second feet passed this station with a gage height of 22.21 feet. The highest gage reading was on October 2, 1936, when a reading of 22.57 feet, present gage, was reached, with a discharge of 29,600 second feet. In 1930 the river at this station was dry for a few days in March and April. On June 17, 1938, the minimum flow was 9.5 second feet with a stage of 1.44 feet.

Mean Daily Discharge in Second Feet 1941 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	2,550	9,960	3,020	2,540	7,060	19,490	20,240	2,340	5,650	18,260	20,100	6,040
2	2,530	6,110	3,130	2,740	6,990	17,200	14,620	2,940	5,260	16,740	17,240	5,760
3	2,440	4,380	3,330	2,910	12,680	11,830	12,150	6,750	5,900	17,370	14,760	5,970
4	2,350	3,950	2,970	3,090	17,200	8,760	10,840	11,510	6,180	18,330	13,740	5,650
5	2,290	3,740	2,490	3,170	21,220	8,090	10,740	9,780	6,670	19,530	13,170	5,370
6	2,250	3,850	2,260	3,150	23,240	15,470	15,610	7,840	6,570	21,510	13,350	5,370
7	2,140	4,100	2,300	3,050	26,700	24,080	16,920	7,310	6,530	23,270	12,500	5,510
8	1,890	3,920	2,320	2,780	24,510	24,000	16,950	7,590	6,390	24,970	11,760	5,790
9	1,800	3,510	2,310	2,580	16,240	16,350	13,740	8,050	6,360	24,760	11,720	5,860
10	1,930	3,210	2,270	2,270	10,950	9,710	11,370	8,050	6,360	22,040	11,300	5,790
11	1,940	3,040	2,200	1,970	8,620	7,630	9,990	7,520	16,100	19,850	10,590	5,690
12	1,890	2,920	2,110	1,680	7,170	6,850	8,790	6,850	26,630	19,600	10,560	5,720
13	1,900	2,860	2,020	1,880	6,110	7,030	9,220	6,390	27,230	20,690	10,700	5,690
14	1,830	2,920	2,010	1,940	5,090	7,170	10,950	6,110	27,400	22,210	10,420	5,650
15	1,680	2,800	1,950	1,740	4,560	8,260	16,280	6,250	24,300	23,030	9,780	5,610
16	1,680	2,620	2,090	1,550	4,340	9,930	14,410	6,040	15,150	21,540	9,850	5,610
17	1,580	2,600	2,160	1,320	3,740	8,790	10,240	5,760	10,560	22,350	9,750	5,650
18	1,470	2,380	2,050	1,100	3,530	7,420	11,020	5,260	9,040	23,800	8,930	5,650
19	1,670	2,230	2,080	1,010	3,250	7,490	10,310	4,660	9,780	24,120	8,790	5,440
20	1,680	2,330	2,190	3,780	2,830	8,550	8,050	5,370	14,370	24,830	8,620	5,440
21	1,540	2,390	2,190	4,870	2,620	10,170	6,710	5,510	19,000	25,600	8,370	5,720
22	1,390	2,560	2,180	4,100	4,660	16,810	5,230	5,160	25,780	26,240	8,480	5,860
23	1,140	2,750	2,170	3,010	15,890	20,380	4,380	4,800	26,700	25,960	8,930	5,720
24	1,150	2,800	2,390	2,170	23,060	26,060	4,480	5,090	27,790	27,580	8,760	5,400
25	1,290	2,800	2,590	1,820	23,030	28,000	4,660	5,930	24,510	27,510	8,050	5,470
26	1,480	2,720	2,720	1,680	20,130	28,000	4,200	5,900	18,820	26,200	7,450	5,470
27	1,620	2,800	2,730	1,910	13,810	27,440	3,780	5,190	16,810	25,430	6,990	5,160
28	1,960	2,900	2,670	2,420	8,830	28,000	3,710	4,590	17,230	25,530	6,960	4,940
29	3,950		2,750	6,390	8,760	28,640	3,290	4,730	20,200	25,600	6,320	4,910
30	13,630		2,810	8,370	11,550	27,400	2,600	4,660	20,620	23,700	6,290	4,770
31	13,000		2,720		15,220		2,240	5,260		22,000		4,840
Sum	81,640	95,150	75,180	82,990	363,590	475,900	297,720	189,190	459,890	710,150	314,230	171,520

Month	Extreme Gage Feet — 1941		Extreme Second Feet — 1941				Average Second Feet 1941	Acre Feet			
			High		Low			Total 1941	Period 1924-1941		
	High	Low	Day		Day				Normal	Maximum	Minimum
Jan.	12.93	4.00	30	15,010	23	1,080	2,630	161,900	224,559	491,000	92,230
Feb.	12.70	5.58	1	11,480	19	2,210	3,400	188,700	159,451	328,330	28,470
Mar.	6.53	4.92	3	3,360	15	1,930	2,430	149,100	131,638	240,770	27,860
Apr.	10.73	2.92	30	8,510	19	837	2,770	164,600	125,089	318,000	56,900
May	20.60	6.43	7	27,690	21	2,440	11,730	721,200	318,081	721,200	99,400
June	21.92	10.86	29	28,920	12	6,750	15,860	943,950	414,473	1,180,380	31,700
July	20.28	5.51	1	23,980	31	2,150	9,600	590,500	337,156	629,000	54,400
Aug.	12.80	5.54	4	11,970	1	2,270	6,100	375,300	313,342	834,000	73,200
Sept.	20.93	8.60	24	27,970	2	5,160	15,330	912,200	627,119	1,259,620	124,060
Oct.	21.46	16.86	25	27,860	2	16,600	22,910	1,408,600	601,768	1,408,600	124,280
Nov.	19.13	10.33	1	21,190	29	6,140	10,470	623,300	304,713	827,490	95,700
Dec.	10.47	8.50	1	6,360	30	4,730	5,530	340,200	236,522	594,220	69,700
Yearly	21.92	2.92		28,920		837	9,090	6,579,500	3,793,911	6,583,300	1,969,900

RIO GRANDE AT LOWER BROWNSVILLE STATION

DESCRIPTION: Water-stage recorder and cable with stand-up cable car and winch, located about 1,000 feet below the El Jardin pumping plant, about 6.6 river miles below Brownsville, Texas, and Matamoros, Tamaulipas, 50.4 miles upstream from the Gulf of Mexico, and 1,191.0 river miles below the American Dam at El Paso, Texas. Zero of gage is on United States Coast and Geodetic Survey mean sea level datum.

RECORDS: Based upon 60 current meter measurements, 52 by the United States and 8 by the Mexican Section, made during the year. Computations by shifting channel methods. 1941 records are only fair. Records available: January 1934 to December 1941.

REMARKS: The river flow at this station is greatly modified by many irrigation diversions, drainage returns, and large reservoirs in the United States and Mexico. During floods only a portion of the river flow discharges past this station through the channel of the Rio Grande as part 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: On June 10, 1935, a peak discharge of 31,000 second feet was reached with an estimated gage height of 32.10 feet. The highest gage height recorded was 32.32 feet on June 28, 1941, when the discharge was 27,900 second feet. Additional data concerning peaks may be found in previous Water Bulletins. The river was dry at this station a few days in 1930 and March 25-28, 1935; also June 16-19, 1938, and several days in 1940.

Mean Daily Discharge in Second Feet 1941 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	* 2,510	11,800	3,150	2,590	7,490	18,100	19,500	* 2,400	5,560	19,400	20,700	6,260
2	* 2,430	7,900	3,160	2,760	7,410	17,100	13,400	2,560	5,210	17,500	17,900	5,820
3	* 2,370	5,690	3,240	2,990	12,600	11,900	10,300	5,930	5,510	* 17,500	15,100	5,800
4	2,320	4,790	3,050	3,210	16,700	9,160	9,300	9,360	6,010	* 18,500	13,500	5,750
5	* 2,260	4,240	2,690	3,370	* 20,400	7,480	9,220	8,860	6,510	* 19,900	12,700	5,680
6	* 2,220	4,180	2,320	3,350	* 22,200	10,600	13,800	* 7,740	6,670	* 21,700	12,600	5,610
7	* 2,130	4,410	2,300	3,240	* 26,800	21,200	15,500	* 7,380	6,710	* 23,500	11,700	5,640
8	* 1,830	4,350	2,360	2,890	25,300	24,300	16,300	7,520	6,810	* 24,500	11,000	5,800
9	* 1,740	* 3,820	2,400	2,520	16,400	16,900	14,000	7,930	6,240	* 24,600	11,000	5,730
10	1,840	* 3,410	2,400	2,280	10,600	9,440	11,500	8,020	6,050	23,500	10,800	5,720
11	1,910	* 3,170	2,290	2,050	8,140	7,580	* 10,200	7,720	10,800	21,500	10,400	5,660
12	* 1,880	* 2,940	2,150	1,710	6,650	7,000	* 9,280	7,150	23,700	21,300	10,400	5,740
13	* 1,910	* 3,030	2,000	1,610	5,740	7,140	* 9,450	6,750	27,200	* 22,600	10,400	5,720
14	* 1,800	* 3,060	1,910	1,550	4,980	7,390	* 10,800	6,440	27,800	* 23,800	10,200	5,720
15	* 1,620	2,890	1,890	1,510	4,580	8,140	* 15,200	6,530	24,900	* 23,300	9,710	5,750
16	* 1,620	2,660	1,980	1,560	4,110	9,860	* 15,600	6,420	15,600	23,100	9,780	5,700
17	* 1,540	2,610	2,080	1,310	3,530	9,030	* 10,900	6,110	10,400	23,000	9,730	5,720
18	* 1,420	2,370	2,020	1,060	3,420	8,080	* 9,900	5,650	8,680	24,500	8,990	5,680
19	* 1,630	2,110	2,040	867	3,250	8,250	* 9,920	5,000	8,760	24,700	8,700	5,360
20	* 1,640	* 2,200	2,250	3,560	2,980	9,250	* 8,080	5,100	12,500	* 25,200	8,580	5,340
21	* 1,500	* 2,290	2,200	4,820	2,780	10,500	* 6,970	5,400	17,000	* 25,800	8,330	5,640
22	1,530	* 2,610	2,150	4,380	4,880	16,400	5,720	5,220	* 23,600	26,000	8,270	5,810
23	1,290	* 2,890	2,210	3,350	14,200	20,500	4,920	4,920	25,900	26,300	8,660	5,740
24	* 1,110	* 2,950	2,360	2,330	22,200	* 25,900	4,700	5,060	26,500	26,200	8,500	5,430
25	* 1,250	* 2,950	2,600	1,870	22,700	* 27,500	4,700	* 5,890	24,200	26,100	7,850	5,430
26	* 1,440	* 2,870	2,820	1,710	20,100	* 27,700	4,380	6,050	19,000	25,400	7,340	5,320
27	* 1,580	* 2,870	2,850	1,840	15,300	* 28,000	3,820	5,490	16,700	24,900	6,930	5,070
28	* 1,920	* 3,070	2,750	2,340	10,400	27,400	3,760	4,580	17,200	24,900	6,910	4,890
29	* 3,760		2,810	5,350	9,690	26,900	3,410	4,360	20,900	24,700	6,320	4,920
30	*12,600		2,870	8,090	11,700	25,500	2,720	4,370	21,700	23,500	6,380	4,680
31	13,600		2,840		14,100		* 2,260	4,990		22,200		4,700
Sum	* 104,130		82,067		464,200			186,900		* 719,600		171,830
	*80,200	76,140		361,330		* 289,510			444,320		309,380	

Month	Extreme Gage Feet — 1941		Extreme Second Feet — 1941				Average Second Feet 1941	Acre Feet			
			High		Low			Total 1941	Period 1934-1941		
	High	Low	Day		Day				Average	Maximum	Minimum
Jan.	24.45	* 13.94	31	13,700	24	* 1,020	* 2,590	* 159,000	190,275	299,000	88,200
Feb.	24.30	16.14	1	13,300	19	2,070	* 3,720	* 207,000	141,412	237,000	26,300
Mar.	17.18	15.20	3	3,260	14	1,850	2,460	151,000	130,538	199,000	29,700
Apr.	21.80	12.82	30	8,260	19	786	2,740	163,000	113,425	242,000	50,500
May	31.66	18.00	7	27,700	21	2,710	11,700	717,000	358,250	717,000	110,000
June	32.32	22.06	27	28,300	6	7,100	15,500	921,000	425,625	* 1,161,000	32,000
July	31.50	16.82	1	23,100	31	2,130	* 9,340	* 574,000	354,112	587,000	65,900
Aug.	24.36	16.95	4	9,740	1	2,230	6,030	371,000	281,988	679,000	77,900
Sept.	31.64	19.78	14	27,900	2	5,060	14,800	881,000	594,125	1,045,000	150,000
Oct.	31.72	28.30	23	26,700	2	16,300	*23,200	*1,427,000	531,750	* 1,427,000	200,000
Nov.	30.37	21.66	1	21,600	29	6,170	10,300	614,000	233,025	614,000	94,200
Dec.	21.82	19.17	1	6,480	30	4,620	5,540	341,000	193,950	341,000	64,800
Yearly	32.32	12.82		28,300		786	9,010	6,526,000	3,548,475	6,526,000	1,911,600

* Partly Estimated.

MEAN DRY WEATHER LOSSES AND GAINS IN RIVER CHANNEL

Dry weather losses and gains in the rectified Rio Grande channel from Below American Dam Station to Fort Quitman, investigated in 1940, are reported below.

Also reported below are the data from past years' records and from investigations in 1941 showing dry weather losses or gains in the Pecos River channel from Sheffield, Texas to a point 1.2 miles upstream from the Pecos confluence with the Rio Grande.

The loss and gain figures shown on the graphs represent the weighted mean of all determinations of loss or gain in each stretch of channel, giving a weight of 1 day to spot measurements, or to measurements covering only 1 day and giving a weight of 1 day for each day's duration of determinations covering several days.

These data represent significant characteristics of the stretches of river channel involved and should be considered in conjunction with similar data covering the Rio Grande channel from Fort Quitman to Rio Grande City and reported in Water Bulletin No.8, pages 48 and 49.

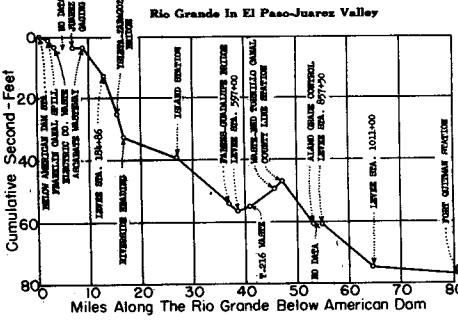
Rio Grande In El Paso-Juarez Valley

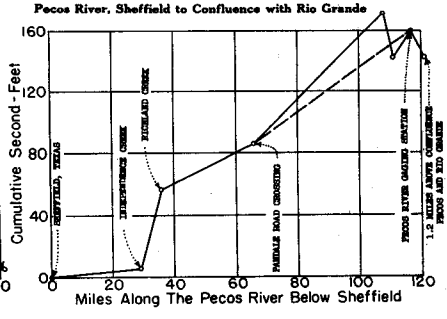
Location	River Miles	Date 1940	No. of Days	Second Feet: Average Flow at Upper Station	Second Feet: Average Gain + Loss —
Below American Dam Station to Spillway at Head Franklin Canal	1.6	Dec. 3	1	7.0	- 1.1
Franklin Canal Spillway to Electric Co. Wasteway	1.2	Dec. 3	1	31.9	- 2.4
Juarez Station to Asecurte Wasteway	2.0	Nov. 15	1	44.1	0
Asecurte Wasteway to U.S. Levee Sta. 184+86	4.1	Nov. 15	1	50.0	- 12.4
U.S. Levee Sta. 184+86 to Yaleta-Zaragoza Bridge	2.4	Nov. 15	1	37.6	- 9.6
Yaleta-Zaragoza Bridge to Riverside Heading	1.1	Nov. 15	1	28.0	- 7.5
Riverside Heading to Island Station	10.5	Feb. 26	1	20.5	- 7.0
		Aug. Sept. Oct. Nov.	9	0 to 0.5	at least 0 to at least - 0.5
	Total		10		- 7.0
Riverside Wasteway No. 1 19.0 miles Below Am. Dam to New Drain Spillway 39.1 miles Below Am. Dam	20.1	Dec. 27	1	27.9	- 21.0
Island Station to Fabens-Guadalupe Bridge	9.9	Feb. 26	1	34.1	- 15.7
		Aug. 31	1	13.5	at least - 13.5
		Sept. Oct.	5	0 to 1.0	at least 0 to at least - 1.0
	Total		7		- 15.7
Fabens-Guadalupe Bridge to Guadalupe Heading 38.5 miles Below Am. Dam	1.4	Sept. Oct. Nov.	8	0 to 2.0	at least 0 to at least - 2.0
Guadalupe Heading 38.5 miles Below Am. Dam to U.S. Levee Sta. 597+00	0.3	Nov. 26	1	10.0	0.0
U.S. Levee Sta. 597+00 to County Line Station	8.8	Feb. 27	1	65.0	+ 9.5
New Drain Spillway 39.1 miles Below Am. Dam to T-216 Waste	1.9	Nov. 7	1	11.3	+ 1.3
T-216 Waste to Tornillo Waste-and Canal	4.7	Sept. 18	1	8.0	+ 10.7
		Nov. 7	1	11.8	+ 1.4
	Total and Average		2		+ 6.0
County Line Station to Alamo Grade Control	6.0	Feb. 27	1	122	- 14.0
U.S. Levee Sta. 897+50 to U.S. Levee Sta. 1011+00	9.5	Feb. 28	1	50.0	- 14.0
U.S. Levee Sta. 1011+00 to Fort Quitman Station	16.7	Feb. 28	1	85.0	- 2.5

Pecos River, Sheffield to Confluence with Rio Grande

Location	River Miles	Date From	Dates	No. of Days	Second Feet: Average Flow at Upper Station	Second Feet: Average Gain + Loss —
Sheffield to Independence Creek	29	U.S.G.S.	July 1929	Spot Meas.	47.2	+ 3.9
Independence Creek to Richland Creek	7	U.S.G.S.	July 1929	Spot Meas.	51.1	+ 33.6
Richland Creek to Pendale Crossing	30	U.S.G.S.	July 1929	Spot Meas.	84.7	+ 20.3
Pendale Crossing to Pecos River Gaging Station	51	U.S. Sec. I.B.C.	Feb. 1941	1	203	+ 49.0
9.2 Miles above Pecos River Gaging Station to 5.2 miles above Pecos River Gaging Station	4	U.S. Sec. I.B.C.	Feb. 1932	1	346	- 20.0
5.2 miles above Pecos River Gaging Station to Pecos River Gaging Station	5.2	U.S. Sec. I.B.C.	Feb. 1932	1	326	+ 12.0
Pecos River Gaging Station to 1.2 miles above confluence with Rio Grande	4.5	U.S. Sec. I.B.C.	Feb. 1932	1	338	- 12.0
Sheffield, Texas to Pecos River Gaging Station	117	U.S.G.S. and U.S. Sec. I.B.C.	May - June 1924	39	59	+ 133
Sheffield, Texas to Pecos River Gaging Station	117	U.S.G.S. and U.S. Sec. I.B.C.	Dec. 1939 Jan. Feb. Apr. July. Sept. Dec. 1940 Feb. 1941	149	68	+ 167
	Total and Weighted Mean			188		+ 160

MEAN DRY WEATHER LOSSES AND GAINS IN RIVER CHANNEL





STORED WATER IN LARGE RESERVOIRS OF THE RIO GRANDE BASIN

The data below cover all reservoirs in the Rio Grande Basin having over 15,000 acre-foot capacity.

The names of the reservoirs and the sources of the data are: Mountain Home, Rio Grande, Continental, Santa Maria, Terrace and Sanchez data are from the office of Colorado Division Engineer W. B. Darroll. Elsewater data are from the Secretary of the Elsewater-Toltec Irrigation District. Costilla data are from the office of New Mexico State Engineer. El Vado data are from Middle Rio Grande Conservancy District. Elephant Butte, Caballo, Alamogordo, McMillan and Avalon data are from the United States Bureau of Reclamation. Red Bluff data are from the office of the Red Bluff Water Power Control District, Pecos, Texas.

The data for Boquilla Reservoir are from the Compañía Agricola y de Fuerza Electrica del Rio Conchos, S. A. The data for Don Martin, Centenario and San Miguel are from the Banco Nacional de Credito Agricola, S. A. Data for Calabrcn are from the Chief of the office of Obras de Defensa at Matamoros, Tamaulipas, Mexico. The data shown for Elephant Butte were modified to conform to capacity curves revised periodically for progressive silt deposition.

The monthly figures represent the acre feet of water in storage on the last day of each month.

In Thousands of Acre Feet

In The United States

Capacity 20,147 Acre feet	Mountain Home																			
Date	1924	1925	1926	1927	1928	1929	1930	1931	1932	1933	1934	1935	1936	1937	1938	1939	1940	1941	Total	*Normal
Jan.						3.3	5.1	5.6	3.6	4.6	5.6	1.1	5.4	5.6	6.1	7.3	3.0	2.5	58.8	4.5
Feb.					6.4	3.5	5.3	5.6	3.9	4.6	5.8	1.3	5.7	7.2	6.6	7.7	3.1	2.7	69.4	5.0
Mar.			3.5	6.5	6.6	3.7	5.6	6.1	5.1	5.6	6.2	1.6	6.0	6.1	6.7	8.7	3.4	3.3	84.7	5.3
Apr.	7.0	3.4	3.7	7.1	6.7	3.8	6.4	6.9	7.6	4.1	6.7	1.8	6.0	8.7	8.0	9.9	4.2	3.9	105.9	5.9
May	12.5	3.7	9.5	6.7	9.7	4.7	6.4	7.0	11.2	8.7	5.8	3.0	7.4	13.4	13.0	10.3	6.4	11.3	150.7	8.4
June	12.0	2.0	13.9	6.4	9.1	3.9	5.0	6.9	12.0	13.4	3.6	6.4	2.8	15.5	14.4	6.7	4.3	16.2	154.5	8.6
July	12.8	1.1	9.6	5.7	4.5	2.8	5.3	3.5	9.5	9.1	2.1	6.8	4.4	11.1	9.9	2.4	1.6	13.9	116.1	6.4
Aug.	1.3	.8	7.2	4.4	2.7	3.6	5.9	2.1	5.6	6.2	1.6	4.8	3.1	6.2	6.4	1.1	1.3	9.6	73.9	4.1
Sept.	.4	.5	6.6	4.5	3.0	4.3	4.6	2.4	4.8	5.6	1.3	4.3	3.6	5.3	6.1	1.3	1.1	8.7	68.4	3.8
Oct.	.3	1.1	6.4	5.0	2.0	4.1	5.1	2.9	4.6	4.9	0	4.6	4.3	5.3	6.1	1.6	1.3	9.9	69.5	3.9
Nov.						4.4	5.1	3.1	4.6	5.0	.3	4.9	4.9	5.7	6.7	1.6	1.2	10.9	58.4	4.5
Dec.					2.9	4.9	5.1	3.4	4.6	5.3	.7	5.2	5.3	5.8	6.7	2.9	2.1	11.3	66.2	4.7

Date	Rio Grande (Capacity 51.7)		Continental (Capacity 26.7)		Santa Maria (Capacity 43.6)		Terrace (Capacity 17.7)		Sanchez (Capacity 103.2)		Costilla (Capacity 15.7)		El Vado (Capacity 198.8)	
	Storage		Storage		Storage		Storage		Storage		Storage		Storage	
	1941	*Normal 1927-1941	1941	*Normal 1928-1941	1941	*Normal 1928-1941	1941	*Normal 1925-1941	1941	*Normal 1927-1941	1941	*Normal 1922-1941	1941	Average 1935-1941
Dec. 1940	2.1		0		2.3		1.3		6.3		2.0			
Jan. 1941	6.4	12.9	0	1.9	3.1	5.7	2.1	2.4	6.3	9.8	2.5	3.8	26.9	47.2
Feb.	6.0	14.2	0	1.9	3.9	6.4	2.8	2.8	6.4	9.9	2.9	4.1	16.7	46.8
Mar.	9.3	15.4	0	1.9	4.6	8.4	3.8	3.3	7.2	10.8	3.6	4.7	45.4	57.3
Apr.	8.4	15.5	0	2.6	4.6	10.7	3.8	3.9	8.6	13.0	5.5	6.1	125.0	119.3
May	30.0	25.2	7.3	4.5	20.8	15.4	10.7	7.3	27.0	18.4	13.0	8.7	182.3	170.9
June	30.0	27.7	10.2	5.1	39.5	17.4	15.3	9.5	42.0	17.0	13.1	7.7	195.1	158.7
July	44.8	16.6	10.4	3.5	37.9	11.1	12.2	6.4	38.1	11.7	9.0	4.4	195.4	126.4
Aug.	26.4	7.5	8.7	2.7	22.9	4.7	3.4	3.4	31.2	9.7	5.7	2.9	152.2	87.8
Sept.	30.9	6.9	9.2	2.8	21.6	4.7	1.7	2.9	30.0	11.1	5.2	2.5	134.3	67.6
Oct.	47.8	8.7	9.2	2.1	24.0	5.2	7.6	3.2	32.6	12.0	7.1	2.9	127.9	61.6
Nov.	47.1	12.9	9.2	2.5	24.6	6.1	7.8	2.3	33.3	11.7	8.2	3.3	108.8	56.8
Dec.	46.7	14.4	9.2	2.5	24.7	6.7	8.0	2.6	33.4	11.6	8.7	3.7	112.0	59.8
Average	29.5	14.8	6.1	2.8	19.4	8.5	6.6	4.2	24.7	12.2	7.2	4.6	118.5	88.4
Maximum	‡ 51.1	51.5	‡ 10.7	11.4	‡ 41.8	‡ 41.8	‡ 17.2	17.7	‡ 43.1	‡ 43.1	15.1	15.1	‡ 197.7	‡ 197.7
Minimum	6.0	0	0	0	3.1	0	1.7	0	6.3	1.6	2.5	‡ 0	15.1	2.3

Date	Elsewater (Capacity 50.3)		Elephant Butte (Capacity 2,219.0)		Caballo (Capacity 346.0)		Alamogordo (Capacity 157.0)		McMillan and Avalon (Capacity 44.8)		Red Bluff (Capacity 284.0)		Total in United States Reservoirs (Capacity 3,578.6)	
	Storage		Storage		Storage		Storage		Storage		Storage		Storage	
	1941	*Normal 1927-1941	1941	Normal 1915-1941	1941	*Average 1938-1941	1941	*Average 1937-1941	1941	Normal 1924-1941	1941	*Average 1936-1941	1941	Estimated Normal
Jan.	0	4.7	485.5	988.8	88.2	93.6	37.7	67.9	6.6	32.9	66.3	107.6	734.1	1,383.7
Feb.	7.0	5.7	501.6	994.7	124.1	73.0	42.0	72.0	7.3	32.2	72.9	113.2	796.3	1,381.9
Mar.	24.4	10.9	534.0	985.8	124.6	42.8	26.6	53.3	33.1	31.1	80.9	113.3	902.8	1,344.3
Apr.	47.1	15.0	595.7	993.0	67.7	33.7	48.6	56.4	34.8	20.5	53.0	89.2	1,006.7	1,386.8
May	46.0	12.9	1,390.6	1,148.9	51.9	27.8	146.6	80.0	37.4	29.1	326.6	141.0	2,301.5	1,698.5
June	42.2	10.2	1,850.2	1,207.5	18.2	19.6	138.4	63.9	38.5	24.0	318.0	186.4	2,788.9	1,765.3
July	38.6	8.7	1,924.0	1,148.0	18.5	17.6	148.0	79.4	38.5	21.2	315.4	169.6	2,844.7	1,691.0
Aug.	33.2	7.6	1,863.8	1,068.9	15.1	18.6	145.0	80.0	34.0	19.3	317.2	156.2	2,670.4	1,473.4
Sept.	33.6	7.4	1,855.1	1,026.2	27.3	27.9	146.6	84.7	37.4	26.1	327.5	131.4	2,669.1	1,406.0
Oct.	32.4	7.0	1,968.6	1,025.7	85.3	51.4	148.0	89.1	38.5	30.7	320.2	133.0	2,859.1	1,436.5
Nov.	31.6	6.9	1,949.7	1,032.9	216.8	87.5	156.3	79.1	37.5	30.8	315.6	134.5	2,957.4	1,471.6
Dec.	31.2	6.5	1,957.7	1,059.1	277.3	119.8	146.2	80.7	37.8	31.8	312.3	138.3	2,996.5	1,522.2
Average	30.8	8.6	1,404.7	1,055.0	92.9	51.3	110.8	73.9	32.0	27.5	235.5	134.5	2,127.3	1,491.6
Maximum	47.1	47.1	‡1,993.3	‡1,993.3	‡277.3	‡ 277.3	156.3	156.3	38.5	85.5	327.5	327.5	2,996.5	
Minimum	0	0	‡ 484.2	3.3	‡ 4.2	‡ .9	26.6	14.2	6.6	0	53.0	11.0	734.1	

In Mexico

Date	Boquilla (Capacity 2,116.0)		Centenario and San Miguel (Capacity 19.9)		Don Martin (Capacity 1,123.0)		Calabrcn (Capacity 66.5)		Total in Mexican Reservoirs (Capacity 3,325.4)	
	Storage		Storage		Storage		Storage		Storage	
	1941	Normal 1924-1941	1941	Normal 1934-1941	1941	Normal 1930-1941	1941	*Average 1939-1941	1941	Estimated Normal
Jan.	1,395.9	1,374.5	15.0	10.6	83.8	415.5	60.2	54.5	1,554.9	1,853.1
Feb.	1,345.3	1,340.6	17.9	10.8	82.0	400.6	54.2	46.7	1,499.4	1,798.7
Mar.	1,274.9	1,282.7	17.7	9.2	79.0	383.1	51.9	41.0	1,425.5	1,716.0
Apr.	1,189.4	1,214.6	13.1	7.8	74.9	370.1	52.8	41.4	1,330.2	1,633.9
May	1,125.3	1,139.5	18.3	8.8	132.3	361.6	62.1	60.4	1,336.0	1,570.3
June	1,070.9	1,080.9	16.9	7.9	229.5	372.5	59.9	61.6	1,375.2	1,588.9
July	1,242.4	1,135.3	18.7	8.7	268.3	371.4	48.0	52.3	1,977.4	1,567.7
Aug.	1,716.6	1,301.7	18.2	9.3	257.6	360.6	38.8	46.4	2,031.2	1,718.0
Sept.	2,163.6	1,487.5	18.8	11.2	288.3	418.4	74.1	61.4	2,544.8	1,978.5
Oct.	2,117.1	1,474.9	17.6	11.5	349.3	432.9	72.4	72.8	2,556.4	1,992.1
Nov.	2,064.2	1,425.7	15.0	10.5	372.0	447.5	62.0	62.9	2,513.2	1,946.6
Dec.	2,051.7	1,406.0	12.6	10.5	384.0	450.7	63.9	63.6	2,512.2	1,930.8
Average	1,562.9	1,303.3	16.6	9.7	216.4	398.7	58.4	55.4	1,854.4	1,769.2
Maximum	2,163.6	2,163.6	18.8	19.9	384.0	1,163.4	74.1	89.2	2,556.4	
Minimum	1,070.9	54.0	12.6	.6	74.9	.7	38.8	30.0	1,330.1	

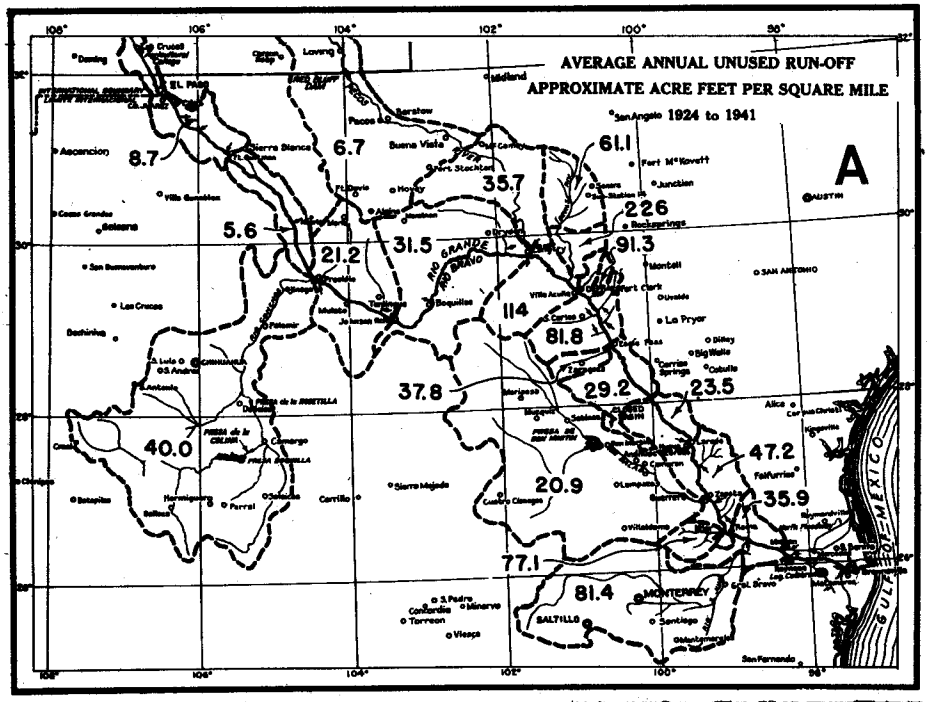
* Estimated. ‡ Some months missing. ‡ Daily maximum or minimum.

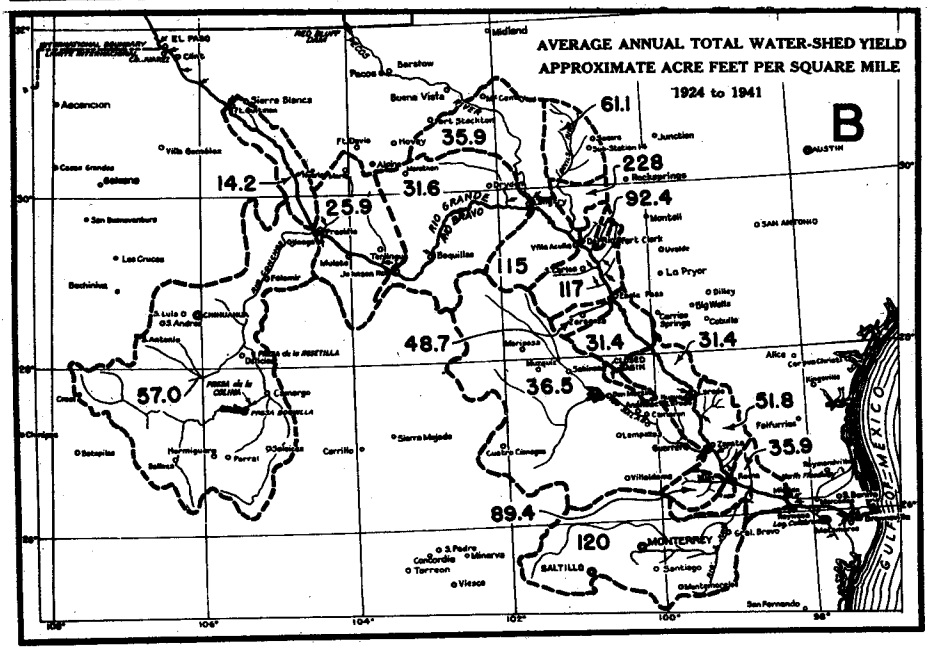
SOURCES OF RIVER FLOW

Subdivisions of the Rio Grande basin, especially below Fort Quitman on the main river, and below Girvin on the Pecos River, are shown on the maps below.

The large figures on map "A" show in terms of acre feet per square mile, the approximate average annual unused run-off which originated on each water-shed subdivision during the 18-year period, 1924 to 1941, and which either flowed from or was reservoired within the subdivision.

On map "B" there is shown, for each subdivision, the average annual total water-shed yield, sometimes called the virgin yield, that is, the sum of the unused water as shown on map "A" and the water estimated to have been consumed by irrigation and reservoir evaporation within each subdivision.

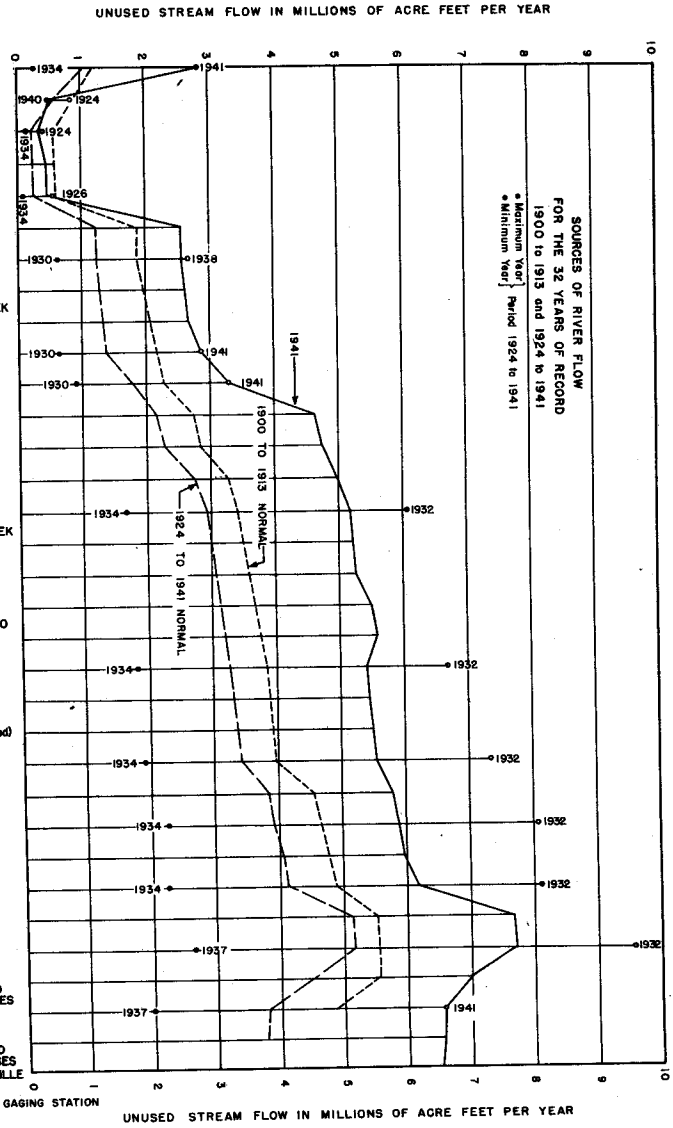




SOURCES OF RIVER FLOW

A distinction must be made clear between the figures in the table at the lower or left side of this page showing average annual unused run-off and the graphical part of the page showing average annual unused stream flow. As an illustration of this distinction, consider these two different values at Lower Presidio. Both values are expressed as average annual acre feet per square mile of water-shed tributary to the station. The amount shown graphically above or to the right of the page is the water which actually flowed past this station. On the other hand the amount shown by figures below or to the left of the page is the water which actually flowed past the station and from which a certain amount of water is subtracted and to which certain other amounts of water are added. In the case of Lower Presidio these subtractive and additive amounts of water are (a) Subtractive-the water which ran off the water-shed into Boquilla reservoir in years prior to 1924, and was drawn from the reservoir during the period 1924 to 1941. (b) Additive - the water impounded since 1924 and remaining in Caballo and Elephant Butte reservoirs at the close of 1941. (c) Additive- the water impounded since 1924 in El Vado and several small reservoirs on the upper Rio Grande in New Mexico and Colorado and which remained therein at the end of 1941. This additive carry-over storage in El Vado and the small reservoirs on the Rio Grande above San Marcial averaged 13,590 acre feet per year. In Caballo and Elephant Butte reservoirs the carry-over storage averaged 46,050 acre feet per year additive. The carry-over storage in Boquilla reservoir averaged 4,680 acre feet per year subtractive. Other carry-over storage figures are: Alamogordo, Avalon, McMillen, and Red Bluff on the Pecos River 25,010 acre feet per year additive. Conchas and San Miguel on the Rio San Rodrigo 700 acre feet per year additive. Don Martin on the Rio Salado 21,300 acre feet per year additive.

AVERAGE ANNUAL UNUSED RUN-OFF A.F. PER SQ. MI. 1900-1913	1924-1941	
46.8*	41.4*	SAN MARCIAL
		UNMEASURED
29.7*	21.1*	EL PASO
		UNMEASURED
†17.1*	8.7	FORT QUITMAN
		UNMEASURED
11.2†	5.6	LA NUTRIA
		UNMEASURED
16.6*	8.5*	UPPER PRESIDIO
51.0	40.0	RIO CONCHOS
		UNMEASURED
		LOWER PRESIDIO
		ALAMITO CREEK
23.6	28.0	TERLINGUA CREEK
		UNMEASURED
		JOHNSON RANCH
		UNMEASURED
28.6*	23.1*	LANGTRY
12.3	11.4	PECOS RIVER
115,000†	109,000	GOODENOUGH SPRING
106	115	DEVILS RIVER
55.3	76.9	UNMEASURED
28.1*	25.0*	DEL RIO
		SAN FELIPE CREEK
		PINTO CREEK
109	82.5	RIO SAN DIEGO
		RIO SAN RODRIGO
		UNMEASURED
30.5*	26.7*	EAGLE PASS
		RIO ESCONDIDO
29.7	29.0	UNMEASURED
		EL JARDIN (Estimated)
		UNMEASURED
30.5*	26.8*	LAREDO
27.2	20.9	RIO SALADO
		UNMEASURED
		ZAPATA
60.9	57.0	RIO ALAMO
		UNMEASURED
31.0*	27.0*	ROMA
52.9	81.4	RIO SAN JUAN
34.8†	35.9	UNMEASURED
32.6*	30.9*	RIO GRANDE CITY
		DIVERSIONS
		OVERFLOW AND CHANNEL LOSSES
		MATAMOROS
		DIVERSIONS
		OVERFLOW AND CHANNEL LOSSES
		LOWER BROWNSVILLE



* UNUSED RUN OFF AT AND ABOVE GAGING STATION
† ESTIMATED

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

This concrete-lined canal diverts water from the Rio Grande at the American Dam near El Paso, Texas, 2.1 river miles above the International Dam near Ciudad Juarez, Chihuahua. The gaging station is an open channel rating station with water-stage recorder located 396 feet below the canal head-gates. The zero of the gage is 3,712.30 feet above U.S.C. & G.S. sea level datum. 1941 record good.

This canal was constructed by the United States Section in connection with the American Dam. Operation began June 2, 1938. Water from this canal discharges into the Franklin Canal from which some is frequently returned to the Rio Grande at spillways 2.2, 2.7 and 3.6 river miles below the American Dam. At times 2 small diversions are made from this canal. See the lower part of this page for details.

RECORDS: Based upon 56 current meter measurements during the year and a stable rating curve. Records available June 2, 1938 (when the operation of this canal began) to December 31, 1941.

EXTREME FLOWS: The greatest mean daily flow in the canal occurred July 31, 1940, with a flow of 1,730 second feet. The lowest flow in the canal was .2 second foot on many occasions.

Mean Daily Discharge in Second Feet 1941 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	" .2	" .5	200	737	816	671	887	1,140	1,080	" 3.0	" 3.0	187
2	" .2	69.6	239	847	864	722	863	952	1,040	210	" 3.0	192
3	" .2	109	308	768	905	701	863	944	988	386	" 3.0	197
4	" .2	65.7	334	844	749	717	820	1,030	1,000	391	" 3.0	114
5	" .2	74.0	271	721	801	754	802	983	812	323	" 3.0	" 3.0
6	" .2	97.1	195	* 849	702	850	915	903	759	323	" 3.0	" 3.0
7	" .2	113	167	* 911	661	758	998	885	821	311	" 3.0	" 3.0
8	" .2	44.4	145	1,140	624	775	*1,040	962	912	319	" 3.0	" 3.0
9	" .2	" 1.0	143	1,060	691	845	875	902	845	390	" 3.0	189
10	" .2	" .7	135	822	547	907	832	689	789	383	132	364
11	49.3	" .4	125	812	672	899	838	799	823	364	204	518
12	" .5	65.3	116	728	920	839	1,130	753	788	126	202	540
13	" .5	110	105	833	745	815	1,160	1,020	844	" 3.0	349	533
14	" .5	122	136	1,070	758	801	1,170	1,040	934	" 3.0	522	377
15	" .5	112	521	938	762	811	1,210	729	899	262	530	344
16	" .5	110	546	887	890	835	990	887	773	387	521	312
17	" .5	111	758	865	846	808	952	1,100	724	407	342	293
18	" .5	113	723	788	751	765	925	1,060	662	384	303	266
19	" .5	111	611	947	802	766	912	1,170	605	402	177	232
20	" .5	111	386	868	734	1,020	982	1,040	541	328	3.0	205
21	" .5	112	328	983	755	1,020	1,050	1,110	647	301	3.0	194
22	" .5	114	435	995	793	966	1,100	1,000	* 651	308	3.0	186
23	" .5	119	538	990	756	1,020	1,080	1,010	707	315	3.0	127
24	" .5	116	591	1,020	885	1,060	1,030	1,110	485	371	3.0	3.0
25	" .5	115	568	911	950	1,060	1,020	993	499	323	3.0	3.0
26	" .5	144	591	1,190	684	1,000	979	967	395	320	3.0	3.0
27	" .5	187	671	1,340	703	972	1,100	906	349	311	109	3.0
28	" .5	158	634	1,090	649	853	1,110	854	393	295	189	3.0
29	" .5		611	803	423	878	1,040	895	" 3.0	213	192	122
30	" .5		518	870	569	925	912	920	301	" 3.0	191	220
31	" .5		678		667		910	1,010		" 3.0		218
Sum	" 61.3	2,605.7	12,327	27,627	23,074	25,813	30,495	29,763	21,069	8,468	4,011	5,957

Month	Extreme Gage Feet — 1941 High	Extreme Gage Feet — 1941 Low	Extreme Second Feet — 1941 High Day	High	Low Day	Low	Average Second Feet 1941	Acre Feet Total 1941	Acre Feet ⊕ Period 1938-1941 Average	Maximum	Minimum
Jan.	5.35		11	148	‡ 1	.2	2.0	122	81.7	122	61.5
Feb.	5.82		27	205	‡ 11	" .4	93.1	5,170	9,153	13,800	5,170
Mar.	8.56	3.52	17	944	10	" 3.0	398	24,450	30,683	34,600	24,450
Apr.	9.93	7.50	27	1,420	12	644	920	54,800	50,100	54,800	45,800
May	8.70	3.67	25	1,050	18	0	744	45,800	43,867	46,100	39,700
June	9.10	7.32	24	1,200	1	646	860	51,200	52,950	54,300	51,200
July	10.37	7.58	28	1,460	5	721	984	60,500	59,475	60,700	57,000
Aug.	10.75	7.71	13	1,520	16	672	960	59,000	58,475	61,000	55,000
Sept.	10.68		21	1,510	29	" 3.0	702	41,800	42,275	45,600	38,200
Oct.	7.39		2	592	‡ 1	" 3.0	273	16,800	20,900	27,300	13,100
Nov.	7.25		16	554	‡ 1	" 3.0	134	7,960	9,698	13,000	5,630
Dec.	9.73		13	1,200	‡ 5	" 3.0	192	11,800	10,642	13,600	8,440
Yearly	10.75			1,520		0	524	379,402	388,299.7	412,792	356,622

" Estimated. * Partly Estimated. ‡ And Other Days.

⊕ The average, maximum and minimum discharges for January through May are for the period 1939-1941.

DIVERSIONS FROM THE RIO GRANDE
BETWEEN AMERICAN DAM AND INTERNATIONAL DAM
Near El Paso, Texas

Two small diversions on the American side and none on the Mexican side were made in this section in 1941, either directly from the Rio Grande, or from the American Canal. From information furnished by the American Smelting and Refining Company and the Globe Mills, Inc., and from frequent inspections, it is estimated that the Smelter diversion averaged 1 second foot and the Globe Mill averaged .5 second foot. Thus a total of 1,086 acre feet were diverted in 1941.

DIVERSIONS FROM THE RIO GRANDE

INTO THE ACEQUIA MADRE (MEXICAN CANAL)

Near Juárez, Chihuahua, Together With Corresponding

ACREAGE CULTIVATED, WATER DUTY AND RAINFALL

This canal diverts water from the Rio Grande at the International Dam at Juarez, Chihuahua, 2.1 river miles below the American Dam at El Paso, Texas. The gaging station is an open channel rating station with water-stage recorder located 1 mile below the head of the canal and a few hundred feet above the first spillway on the canal. In 1941 water passed through this spillway on May 31 only.

The record is based upon 137 current meter measurements at this station during the year, 61 by the National Irrigation Commission of Mexico, 50 by the Mexican and 26 by the United States Section of this Commission. Computations by shifting channel methods. 1941 records good. This record began in June 1938, when the American Dam began operating.

In 1941, 47,334 acre feet were distributed to 16,880 acres of land irrigated in the first unit under the canal where a diversion duty of 2.80 acre feet per acre was obtained. The remainder of this water from this canal was used, together with drainage water (which entered the canal at the lower end of the first unit) to irrigate lands farther down the canal.

The average annual evaporation from standard United States Weather Bureau pan in this region is approximately 95 inches per year. See evaporation records elsewhere in this Water Bulletin.

Mean Daily Discharge in Second Feet 1941 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	0	0	19.1	69.2	196	140	191	152	154	0	0	0
2	0	0	21.5	78.0	198	158	181	128	154	0	0	0
3	0	0	23.0	84.0	193	177	186	128	165	0	0	0
4	0	0	23.0	92.2	179	168	175	135	156	0	0	0
5	0	0	14.1	82.6	193	156	182	147	150	0	0	0
6	0	0	12.7	85.5	188	156	175	158	162	0	0	0
7	0	0	14.8	81.6	200	197	175	159	173	0	0	0
8	0	0	14.1	68.5	188	204	179	171	177	0	0	0
9	0	0	15.9	68.9	203	185	164	193	163	0	0	0
10	0	0	18.7	69.2	163	168	161	188	159	0	0	0
11	0	0	19.4	80.2	208	172	160	222	154	0	0	0
12	0	0	16.2	70.6	191	155	181	190	144	0	0	0
13	0	0	15.9	74.9	199	158	139	57.9	158	0	0	0
14	0	0	17.3	71.7	194	156	76.3	81.9	144	0	0	0
15	0	0	17.3	74.9	196	145	171	135	146	0	0	0
16	0	0	16.2	73.8	201	155	199	214	150	0	0	0
17	0	0	65.7	83.7	213	172	167	160	154	0	0	0
18	0	0	21.2	78.0	236	160	162	113	149	0	0	0
19	0	0	17.0	82.3	241	160	164	163	149	0	0	0
20	0	0	18.4	71.7	205	155	161	129	167	0	0	0
21	0	0	21.2	180	218	188	177	179	126	0	0	0
22	0	0	24.7	220	210	174	208	142	0	0	0	0
23	0	0	20.1	185	170	169	177	149	0	0	0	0
24	0	0	19.1	156	109	177	167	138	0	0	0	0
25	0	0	15.5	131	83.7	198	156	167	0	0	0	0
26	0	0	10.9	145	154	186	165	176	0	0	0	0
27	0	0	12.0	130	17.0	190	147	165	0	0	0	0
28	0	0	9.2	143	171	188	160	169	0	0	0	0
29	0		8.8	214	156	186	172	162	0	0	0	0
30	0		12.7	201	149	191	184	169	0	0	0	0
31	0		9.9		222		161	175		0		0
Sum	0	0	565.6	3,246.5	5,644.7	5,144	5,223.3	4,815.8	3,254	0	0	0

Month	Rainfall: Average 1941	Rainfall: Normal 1924 to 1941	Extreme Second Feet — 1941: High Day	High	Low Day	Low	Average Second Feet 1941	Acre Feet: Total 1941	Period 1938–1941: Average	Maximum	Minimum
Jan.	.52	.38					0	0	0	0	0
Feb.	.65	.29					0	0	0	0	0
Mar.	1.72	.34	17	165	28	2.1	18.2	1,120	2,115	5,540	1,120
Apr.	.92	.30	21	279	1	25.7	108	6,440	6,050	11,720	6,040
May	1.35	.47	19	306	28	0	182	11,200	9,098	13,000	11,200
June	.75	.44	9	227	20	130	171	10,200	11,005	12,100	9,760
July	1.34	1.49	22	297	14	16.2	168	10,360	9,188	10,360	7,910
Aug.	2.76	1.67	16	396	13	0	155	9,550	7,768	9,920	5,200
Sept.	3.62	1.32	3	311	‡22	0	108	6,450	5,385	9,710	2,240
Oct.	1.37	.85					0	0	154	328	6.3
Nov.	.43	.40					0	0	0	0	0
Dec.	.56	.41					0	0	0	0	0
Yearly	15.99	8.36		396		0	76.4	55,320	50,763	60,558	55,320
Acreage Irrigated on the First Unit Only.								16,880	#15,980	# 17,090	#13,967
Mean Acre Feet Per Acre on the First Unit Only								2.80	# 3.15	# 3.90	# 2.80
Average Rainfall in Inches								15.99	ϕ 8.36	ϕ 15.99	ϕ 3.88

‡ And Other Days. # Period 1939-1941. ϕ Period 1924-1941.

DIVERSIONS FROM THE RIO GRANDE IN THE EL PASO VALLEY OF TEXAS
Together With Corresponding
ACREAGE CULTIVATED, WATER DUTY AND RAINFALL

The diversions of water listed below were made for use on lands in the El Paso Valley of Texas, lying between the American Dam and the Fort Quitman gaging station.

The diversions were measured for the 67,446 acres, or 98.7% of the total area. This area lies above the lower end of the Hudspeth County Conservation and Reclamation District Number One. These water measurement and acreage records were furnished by the El Paso office of United States Bureau of Reclamation. For the 864 acres, (or 1.3% of the total area) lying below the Hudspeth District and above the Fort Quitman gaging station, the diversions were estimated.

From the gross diversions into the Franklin Canal below the Leon Street Wasteway and from the Riverside Canal, there has been deducted the water spilled back to the river at 3 points, viz: 9.0, 19.0, and 26.1 river miles below the American Dam at El Paso. There is considerable re-use in this area of drainage and waste water from within the area. Final drainage water returns to the Rio Grande. This record began July 1, 1938.

The average annual evaporation from standard Weather Bureau pan in this region is approximately 95 inches per year. See evaporation records elsewhere in this Water Bulletin.

Mean Daily Discharge in Second Feet 1941 —— Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	45	96	125	735	689	525	927	939	876	51	125	191
2	44	105	194	769	708	634	899	855	908	78	165	198
3	44	1	229	734	645	668	921	801	775	219	150	105
4	17	100	258	901	665	712	367	880	999	61	154	176
5	3	0	303	775	796	669	782	973	1,013	181	174	191
6	3	0	240	806	736	708	944	887	816	244	232	236
7	1	0	175	971	730	689	996	830	858	226	215	219
8	0	0	153	955	610	710	1,143	889	883	217	198	164
9	0	0	152	1,056	688	722	959	867	1,016	263	215	210
10	0	11	139	977	655	707	893	674	805	223	193	331
11	0	9	134	859	671	769	847	675	854	339	253	317
12	0	21	126	834	944	756	1,041	751	834	111	263	187
13	0	47	127	752	793	812	1,050	707	801	204	311	296
14	0	34	121	1,134	772	828	1,078	636	730	243	496	61
15	0	20	340	1,015	768	804	1,139	638	800	268	419	259
16	0	24	375	1,016	917	825	1,198	718	782	251	359	258
17	0	45	155	983	865	882	1,129	676	715	208	280	225
18	0	148	288	932	821	816	1,106	710	657	343	322	264
19	0	122	536	1,001	823	847	1,135	883	685	281	267	237
20	0	116	417	954	809	926	1,049	889	568	301	243	225
21	0	123	321	1,008	747	1,139	1,054	933	515	274	216	205
22	0	121	339	1,063	861	942	1,128	889	153	325	253	118
23	0	126	474	1,114	625	1,032	1,199	879	159	324	236	20
24	0	125	577	1,065	575	1,037	1,124	799	141	360	222	10
25	0	118	538	787	560	1,074	1,094	846	167	333	216	8
26	0	101	553	713	316	1,065	1,063	936	204	330	145	6
27	0	129	742	564	372	1,094	933	951	59	295	285	4
28	0	131	677	698	369	843	902	892	11	226	172	2
29	37		572	835	435	901	1,110	912	47	191	232	1
30	110		772	833	565	935	903	885	75	44	194	0
31	96		731		515		884	- 723		1		0
Sum	400	1,873	10,883	26,839	21,045	25,071	30,997	25,523	17,906	7,015	7,205	4,724

Month	Rainfall Average 1941	Rainfall Normal 1924 to 1941	⊕Extreme Second Feet —— 1941 High Day	High	Low Day	Low	Average Second Feet 1941	Acre Feet Total 1941	Period 1938-1941 Average	Maximum	Minimum
Jan.	.52	.38	30	110	‡ 8	0	12.9	793	264	793	0
Feb.	.65	.29	18	148	‡ 5	0	66.9	3,720	8,673	12,200	3,720
Mar.	1.72	.34	30	772	14	121	351	21,600	29,933	34,200	21,600
Apr.	.92	.30	14	1,134	27	564	895	53,200	51,267	53,200	49,400
May	1.39	.47	12	944	26	316	679	41,700	43,200	45,000	41,700
June	.75	.44	21	1,139	1	525	836	49,700	50,400	52,400	49,100
July	1.34	1.49	23	1,199	4	367	1,000	61,500	55,125	61,500	44,200
Aug.	2.76	1.67	5	973	14	636	823	50,600	54,150	57,100	50,600
Sept.	3.62	1.32	9	1,016	28	11	597	35,500	34,500	40,700	22,500
Oct.	1.37	.85	24	360	31	1	226	13,900	20,250	25,700	13,900
Nov.	.43	.40	14	496	1	125	240	14,300	13,340	17,000	9,960
Dec.	.56	.41	10	331	‡30	0	152	9,370	10,742	11,800	9,370
Yearly	15.99	8.36		1,199		0	492	355,883	371,844	394,300	355,883
Irrigated Acreage								68,310	65,569	68,310	61,751
Mean Acre Feet Per Acre								5.21	# 5.65	# 6.05	# 5.21
Average Rainfall in Inches								15.99	ϕ 8.36	ϕ 15.99	ϕ 3.88

‡ And Other Days. ϕ Period 1924-1941. ⊕ Mean Daily Extreme. # Period 1939-1941.

DIVERSIONS FROM THE RIO GRANDE
INTO THE MAVERICK CANAL EXTENSION BELOW THE POWER PLANT
Near Eagle Pass, Texas, Together With Corresponding
ACREAGE CULTIVATED, WATER DUTY AND RAINFALL

The Maverick Canal diverts water for power and irrigation from the Rio Grande into Texas at a point 17.4 river miles below the international bridge between Del Rio, Texas and Villa Acuña, Coahuila, and 711.0 river miles below the American Dam at El Paso, Texas. The tail water from the power plant returns to the river about 32.2 miles farther downstream.

The Maverick Canal Extension begins at the power plant about 9 miles northward from Eagle Pass, Texas. The water-stage recorder is located on a wooden pile bridge about 1 mile below the headgate. Meter measurements are from bridge. Irrigation first began from this canal extension in June 1938. Records of canal discharge began April 1, 1939, and extend to December 31, 1941.

From this canal extension in 1941 there were 11,351 acres of land irrigated, northward and southward from Eagle Pass, as indicated in the table below. Under the Maverick Canal above the power plant the Maverick County Water Control and Improvement District reported that in 1941 the cultivated area was 6,680 acres, of which 4,753 acres were irrigated.

Small amounts of waste water from this canal extension reach the river below the Eagle Pass gaging station.

The average annual evaporation from natural water surfaces in this region is approximately 65 inches per year. See Water Bulletin No. 5, page 58.

Mean Daily Discharge in Second Feet 1941 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	97.4	16.0	62.2	62.5	54.1	51.8	" 70.1	109	107	111	" 162	174
2	95.7	15.6	62.3	62.1	45.6	51.8	" 67.8	101	64.8	119	" 174	174
3	95.2	43.1	62.3	72.8	26.5	57.9	65.5	93.0	11.3	98.0	" 182	177
4	95.0	55.3	78.0	79.8	26.7	53.0	67.5	92.5	18.4	96.8	183	176
5	100	44.4	90.8	80.1	33.9	51.4	81.6	92.3	88.8	118	182	176
6	96.5	44.4	90.1	81.0	33.7	51.8	93.5	92.2	106	113	182	179
7	95.2	44.4	89.4	76.9	34.6	51.3	95.8	92.5	108	117	182	192
8	96.9	43.1	90.1	74.1	38.9	52.1	105	92.8	106	121	183	176
9	96.0	44.4	91.2	76.1	40.4	51.2	112	92.6	106	131	183	174
10	95.4	44.4	90.1	73.6	47.0	50.7	114	92.6	106	137	181	173
11	95.3	44.4	91.2	74.8	49.8	49.8	105	91.7	105	137	182	173
12	100	45.4	90.1	73.4	50.1	51.0	112	91.5	105	138	173	174
13	96.0	43.6	90.1	76.6	50.0	60.8	115	91.4	105	135	171	173
14	95.4	44.4	85.6	86.5	50.3	62.8	108	91.3	106	136	172	188
15	94.6	44.9	82.6	86.1	50.3	61.7	99.0	91.6	105	129	172	181
16	97.0	45.8	85.5	88.6	50.3	59.9	91.4	91.6	104	133	185	179
17	94.2	49.6	63.2	83.0	50.5	64.0	94.7	92.4	104	130	178	163
18	94.7	53.1	41.8	74.4	52.0	65.1	102	98.8	92.1	129	175	158
19	100	53.1	41.8	77.7	52.6	74.6	101	98.8	88.6	144	165	157
20	96.4	57.4	41.8	80.7	52.5	74.6	101	91.4	71.2	123	163	155
21	94.1	61.7	41.4	76.1	49.2	74.2	101	97.9	55.3	114	165	162
22	93.6	61.8	41.4	70.6	54.2	75.9	99.3	105	72.6	148	176	158
23	95.6	61.5	41.4	79.2	54.8	74.3	98.4	105	99.1	146	187	159
24	94.6	61.5	48.3	79.5	58.2	74.4	97.9	106	99.4	140	163	161
25	94.2	61.8	62.6	79.7	59.0	74.4	97.4	106	98.1	144	159	166
26	99.6	61.6	62.3	89.2	58.4	74.5	101	106	92.3	152	167	162
27	71.8	61.6	62.0	87.3	58.3	75.2	102	106	98.1	146	191	164
28	" 14.9	61.9	62.6	70.3	57.3	75.7	105	106	113	" 148	175	167
29	* 14.9		62.9	60.9	58.0	74.7	109	106	111	" 150	173	164
30	15.2		62.9	56.4	58.8	" 72.4	103	106	111	" 155	194	163
31	16.5		62.3		60.1		111	107		" 158		164
Sum	2,631.9	1,370.2	2,130.3	2,290.0	1,516.1	1,893.	3,026.9	3,037.9	2,758.1	4,096.8	5,280	5,262

Month	Rainfall: Average 1941	Rainfall: Normal 1924 to 1941	Extreme Second Feet — 1941: High Day	High	Low Day	Low	Average Second Feet 1941	Acre Feet: Total 1941	Period 1939-1941: Average	Maximum	Minimum
Jan.	1.99	.87	8	102	29	14.7	84.9	5,220	3,733	5,220	" 2,140
Feb.	1.27	.73	4	62.4	3	12.3	48.9	2,720	2,840	3,680	" 2,120
Mar.	1.90	.94	11	92.3	17	36.6	68.7	4,230	3,487	5,080	" 1,150
Apr.	2.92	1.59	26	100	22	25.6	76.3	4,540	4,140	4,540	3,430
May	2.26	3.21	31	60.5	4	25.6	48.9	3,010	2,960	3,030	2,840
June	1.08	2.46	29	77.6	5	26.0	63.1	3,750	4,407	5,300	3,750
July	2.53	1.97	31	121	3	28.9	97.6	6,000	5,267	6,000	4,510
Aug.	1.18	1.57	1	118	20	87.4	98.0	6,030	4,647	6,030	3,480
Sept.	4.54	2.83	27	116	4	10.4	91.9	5,470	4,973	5,470	4,600
Oct.	2.29	1.62	31	190	15	43.2	132.2	8,130	6,333	8,126	5,130
Nov.	.34	.74	27	199	21	52.3	176	10,470	6,657	10,470	4,170
Dec.	.35	1.26	7	196	1	72.0	170	10,400	6,970	10,400	4,280
Yearly	22.65	19.79		199		10.4	96.6	69,970	56,414	69,970	44,950
Irrigated Acreage								11,351			
Mean Acre Feet Per Acre								6.16			
Average Rainfall in Inches								22.65	ϕ 19.79	ϕ 29.27	ϕ 11.80

ϕ Period 1924-1941. * Partly Estimated. " Estimated.

DIVERSIONS FROM THE RIO GRANDE

ON THE UNITED STATES SIDE BELOW RIO GRANDE CITY STATION

Together With Corresponding

ACREAGE CULTIVATED, WATER DUTY AND RAINFALL

Diversions from the Rio Grande for irrigation are made here almost entirely by pumping. 92.2% of the water diverted was measured at the diversion point. The remainder was estimated. A very small part of the measurements were made by plant efficiency and power input; otherwise measurements were by Venturi Meters, open channel rating stations, and Deflection Meters developed by this Commission. There is some re-use within the area of drainage water from the area. Drainage water from this area does not return to the Rio Grande. During the year 39,034 acre feet of water were diverted and used on the new Willacy County Irrigation District, where 58,329 acres were cultivated, of which 31,924 acres were irrigated. The cultivated area and water diverted to Willacy County are all included in the tables below. During the year 6,316 acres were cultivated in Starr County below Rio Grande City gaging station, of which 1,100 acres were irrigated from the Rio Grande. In the maximum, minimum and normal figures below there have been included estimated amounts representing Starr County, year by year, from 1922 to 1941, inclusive, as well as the actual figures as collected each year for Hidalgo, Cameron and Willacy Counties.

The cultivated areas shown here are all supplied with irrigation facilities. More than one crop per year is often grown on some of the land. The area actually irrigated this year was 56.8% of the cultivated area. The average annual evaporation from natural water surfaces in this vicinity is approximately 55 inches per year. See Water Bulletin No. 5, page 58.

Mean Daily Discharge in Second Feet 1941 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	76	430	90	357	28	7	292	1,822	2,006	807	556	1,392
2	211	642	23	615	84	239	322	1,505	2,398	593	511	1,275
3	158	506	121	150	78	271	321	1,135	2,352	595	1,161	866
4	47	106	555	241	184	277	345	2,184	2,301	227	1,085	1,228
5	34	74	696	140	196	168	423	2,214	2,320	172	775	1,174
6	177	79	401	2	37	273	213	1,269	1,640	517	936	640
7	453	116	295	170	164	126	537	1,145	1,519	832	1,021	494
8	411	118	203	377	240	151	385	1,230	2,427	707	642	715
9	227	18	131	496	204	512	603	711	2,467	625	318	460
10	214	20	555	686	54	570	699	491	898	427	1,061	802
11	133	89	575	735	54	641	802	1,068	363	372	1,012	274
12	65	131	445	183	157	635	420	1,393	485	328	867	412
13	875	27	465	117	311	238	115	1,620	649	821	1,270	182
14	354	94	501	490	244	209	447	1,799	568	999	1,615	191
15	278	118	230	497	211	200	508	1,526	1,517	1,238	1,160	558
16	609	38	58	691	209	590	763	996	1,319	920	309	338
17	591	759	505	1,171	143	1,006	1,160	873	904	453	1,366	502
18	307	678	90	1,223	213	1,318	1,364	1,905	1,300	325	1,685	600
19	224	509	9	730	1,121	728	654	1,933	638	246	1,613	748
20	546	475	14	272	1,247	224	422	1,672	299	576	1,463	217
21	1,128	220	2	956	822	38	1,760	2,033	191	857	1,079	94
22	961	2	2	1,212	99	23	1,724	2,276	591	906	626	279
23	997	2	9	1,111	144	75	1,678	1,273	825	708	505	431
24	1,086	2	202	912	333	150	1,655	972	1,118	616	746	316
25	525	115	213	835	76	259	1,719	1,765	1,223	751	1,102	109
26	186	94	213	309	117	390	1,596	2,259	943	833	1,449	673
27	412	125	114	2	175	359	955	2,470	744	970	622	485
28	37	238	65	2	233	384	2,020	2,131	529	777	1,559	208
29	67		138	22	60	260	2,306	1,936	535	837	1,333	798
30	139		28	78	70	117	2,159	1,194	571	780	595	364
31	160		162		69		1,895	1,089		404		135
Sum	11,688	5,825	7,110	14,782	7,377	10,438	30,262	47,889	35,640	20,219	30,042	16,960

Month	Rainfall: Average 1941	Rainfall: Normal 1922 to 1941	Extreme Second Feet — 1941: High: Day	High	Low: Day	Low	Average Second Feet 1941	Acre Feet: Total 1941	Period 1922—1941: Normal	Maximum	Minimum
Jan.	5.30	1.54	21	1,128	5	34	377	23,200	37,615	71,100	7,700
Feb.	1.53	1.04	17	759	‡22	2	208	11,600	60,536	134,160	6,960
Mar.	3.73	1.39	5	696	‡21	2	229	14,100	77,991	156,180	14,100
Apr.	4.05	1.37	18	1,223	‡ 6	2	493	29,300	65,076	119,150	29,300
May	6.32	3.45	20	1,247	1	28	238	14,600	56,336	135,180	4,510
June	6.34	2.89	18	1,318	1	7	348	20,700	53,466	91,700	1,500
July	.49	2.16	29	2,306	13	115	976	60,000	51,314	103,120	10,010
Aug.	1.68	1.71	27	2,470	10	491	1,540	95,000	68,202	113,000	19,130
Sept.	3.83	4.98	9	2,467	21	191	1,190	70,700	46,530	110,130	8,020
Oct.	2.93	2.13	15	1,238	5	172	652	40,100	55,314	102,000	21,430
Nov.	.55	1.37	18	1,685	16	309	1,000	59,600	47,311	96,840	11,510
Dec.	2.09	2.10	1	1,392	21	94	547	33,600	33,960	103,150	10,410
Yearly	38.84	26.13		2,470		2	653	472,500	653,651	914,600	472,500
Average Acreage Cultivated below Rio Grande City								457,379	342,284	504,910	216,300
Mean Acre Feet Per Acre								1.03	1.91	2.68	1.03
Average Rainfall in Inches								38.84	26.13	38.84	16.68

‡ And Other Days.

DIVERSIONS FROM THE RIO GRANDE INTO THE RETAMAL CANAL

Near Rio Bravo, Tamaulipas

The Retamal Canal was constructed by the Flood Control Works Commission of the Lower Rio Grande Valley of Mexico. During floods this canal is used as a floodway. It empties into Culebrón Lake which serves as a reservoir. The spillway at Culebrón permits flood water to escape to the Gulf of Mexico through Floodway No. 1. In combination with Culebrón Lake the Retamal Canal is used in irrigation.

Retamal Canal has a capacity of about 7,000 second feet. Its intake is 24.0 river miles below the Hidalgo-Reynosa bridge near Hidalgo, Texas and 1,108.8 river miles below the American Dam at El Paso, Texas. About 1,000 feet below its intake there is a canal control gate .9 mile below which are several gages where gage readings are taken as often as required by the variations of flow. These gages were installed Sept. 1, 1939. In July 1940 a water-stage recorder was installed at this point. Measurements are made by current meter during low flows and by floats during floods. The records below are based upon 3 measurements by meter during low flows and the 1940 rating curve. The flow records of this canal began September 1, 1939. The 1941 record is only fair. Because of excessive rainfall in the region, there was no irrigation from this canal in 1941.

Mean Daily Discharge in Second Feet 1941 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	293	23.6	0	0	31.4	103	84.8	0	0	2,090	0	243
2	272	19.3	0	0	19.4	81.6	60.7	0	0	2,040	0	243
3	250	0	0	0	1,490	66.7	36.0	23.7	0	2,100	0	243
4	223	0	0	0	2,020	63.9	0	34.6	0	2,220	473	235
5	217	0	0	0	2,150	63.9	0	11.3	0	2,330	579	235
6	205	0	0	0	1,530	126	0	0	0	2,520	509	235
7	193	0	0	0	802	146	0	0	0	2,670	466	235
8	175	0	0	0	243	114	0	0	0	2,700	445	0
9	170	0	0	0	155	84.8	0	0	0	2,520	424	0
10	160	0	0	0	118	69.9	0	0	0	2,340	424	0
11	151	0	0	0	91.5	53.7	0	0	2,050	2,270	417	0
12	146	0	0	0	81.6	53.7	0	0	2,740	2,330	417	0
13	141	0	0	0	75.6	49.1	0	0	2,840	2,420	424	0
14	99.2	0	0	0	72.7	53.7	0	0	2,690	2,570	424	0
15	126	0	0	0	63.9	72.7	0	0	2,130	2,470	417	0
16	141	0	0	0	60.7	60.7	0	0	1,710	2,470	396	0
17	0	0	0	0	55.8	51.2	0	0	1,430	2,300	396	0
18	0	0	0	0	51.2	51.2	0	0	1,360	1,940	396	0
19	0	0	0	0	49.1	53.7	0	0	1,750	1,110	385	0
20	0	0	0	0	49.1	55.8	0	0	1,940	1,070	378	0
21	0	0	0	0	55.8	63.9	0	0	2,560	1,040	367	0
22	0	0	0	0	78.8	91.5	0	0	2,840	1,010	360	0
23	0	0	0	0	111	111	0	0	2,880	858	367	0
24	0	0	0	0	107	136	0	0	1,760	0	351	207
25	0	0	0	0	95.3	155	0	0	0	0	334	735
26	0	0	0	0	75.6	155	0	0	0	0	293	742
27	18.7	0	0	156	72.7	160	0	0	615	0	279	742
28	91.5	0	0	351	72.7	165	0	0	2,260	0	279	720
29	57.9		0	151	81.6	141	0	0	2,420	0	250	710
30	51.2		0	53.6	87.6	107	0	0	2,260	0	243	696
31	23.3		0		95.3		0	0		0		703
Sum	3,209.8	42.9	0	711.6	10,143.4	2,760.7	181.5	69.6	38,235	47,388	10,493	6,924

Month	Extreme Gage Feet — 1941 High	Extreme Gage Feet — 1941 Low	Extreme Second Feet — 1941 High Day	Extreme Second Feet — 1941 High	Extreme Second Feet — 1941 Low Day	Extreme Second Feet — 1941 Low	Average Second Feet 1941	Acre Feet Total 1941	Acre Feet Period 1939-1941 Average	Acre Feet Period 1939-1941 Maximum	Acre Feet Period 1939-1941 Minimum
Jan.	66.24		1	301	#	0	104	6,370	4,230	6,370	2,090
Feb.	64.11		1	26.8	#	0	1.5	85.1	232	379	85.1
Mar.			#	0	#	0	0	0	10,050	20,100	0
Apr.	66.54		28	378	#	0	23.7	1,410	5,855	10,300	1,410
May	73.39	63.88	6	2,240	2	17.3	327	20,120	22,860	25,600	20,120
June	65.58	64.47	28	170	12	47.0	92.0	5,480	15,640	25,800	5,480
July	65.03		1	95.3	#	0	5.9	360	1,290	2,220	360
Aug.	64.57		4	53.7	#	0	2.2	138	7,769	15,400	138
Sept.	75.30		22	2,900	#	0	1,270	75,840	42,270	75,840	3,970
Oct.	74.80		8	2,730	#	0	1,530	93,990	56,963	93,990	35,000
Nov.	71.46		4	1,630	#	0	350	20,810	17,217	23,300	7,540
Dec.	68.01		26	749	#	0	223	13,730	12,267	20,000	3,070
Yearly	75.30			2,900		0	329	238,333.1	196,643	238,333	227,189

Various Days of the Month.

MUNICIPAL WATER USES

Tabulated below are the yearly and monthly figures showing the amounts of water pumped into the municipal distribution systems of several towns along the Rio Grande on the United States and Mexican sides. The Del Rio water supply comes from San Felipe Springs, the others from the Rio Grande. The municipal and industrial water supply for the El Paso area in Texas and Cd. Juarez in Chihuahua comes from deep wells. (See Outfalls from Deep Wells, page 11 of this bulletin.)

In Acre Feet

On The United States Side

Month	Del Rio				Eagle Pass				Laredo			
	1941	# Period 1931-1941			1941	Period 1932-1941			1941	Period 1931-1941		
		Average	Maximum	Minimum		Normal	Maximum	Minimum		Normal	Maximum	Minimum
January	72.0	67.4	97.5	45.5	49.3	48.3	64.2	37.7	148.1	167.7	192.0	148.0
February	64.5	60.6	77.9	46.0	48.0	49.7	64.3	40.2	188.0	179.9	211.0	159.0
March	89.7	80.1	92.4	53.8	55.4	54.7	66.7	38.6	162.4	203.0	241.0	162.4
April	118.4	102.4	118.4	79.8	62.4	68.1	83.9	60.3	145.5	248.0	304.0	145.5
May	130.8	113.4	148.7	81.4	56.7	63.8	76.3	55.4	194.6	243.8	304.0	194.6
June	163.6	131.7	163.6	92.5	79.2	76.4	92.6	49.4	199.7	275.7	332.0	182.0
July	172.3	139.2	172.3	101.1	92.8	84.1	106.0	61.2	209.1	286.6	327.0	209.1
August	187.1	124.0	187.1	79.8	104.8	89.2	104.8	69.5	285.2	303.0	352.0	225.0
September	126.3	110.2	152.3	65.1	90.5	79.8	98.6	51.2	298.7	264.5	309.0	212.0
October	101.7	94.5	104.2	70.5	92.1	65.8	92.1	34.9	207.5	227.2	290.0	175.0
November	92.0	68.5	92.0	59.3	99.9	59.0	99.9	39.9	213.8	217.4	270.0	174.0
December	88.9	63.5	88.9	51.9	58.8	50.1	69.7	35.1	197.7	176.8	213.0	140.0
Yearly	1,407.3	1,239.7	1,694.0	1,006.0	889.9	789.0	914.0	673.0	2,450.3	2,793.6	3,066.0	2,448.0

Month	Roma				Rio Grande City			
	1941	Period 1931-1941			1941	Period 1931-1941		
		Normal	Maximum	Minimum		Normal	Maximum	Minimum
January	19.9	10.5	19.9	9.5	19.0	17.5	20.9	13.2
February	19.9	9.7	19.9	8.6	16.9	17.5	21.2	12.3
March	19.9	9.9	19.9	2.9	19.9	21.9	27.6	18.6
April	30.4	10.5	30.4	2.8	29.5	24.6	31.7	20.6
May	23.5	14.2	23.5	4.3	30.9	28.1	36.8	23.8
June	22.5	13.7	22.5	4.1	28.6	28.9	39.6	23.2
July	29.9	14.8	29.9	4.3	35.1	30.3	35.1	23.8
August	34.4	15.2	34.4	4.3	47.7	30.3	47.7	21.2
September	25.4	14.0	25.4	4.1	30.9	23.4	30.9	16.3
October	29.8	10.8	29.8	2.9	31.3	22.4	31.3	14.4
November	26.5	10.2	26.5	2.8	23.6	17.9	23.6	14.3
December	22.8	10.1	22.8	2.9	20.3	17.2	23.2	12.8
Yearly	304.9	143.6	304.9	53.6	333.7	280.0	333.7	235.0

Brownsville													
Month	1932	1933	1934	1935	1936	1937	1938	1939	1940	1941	Normal	Maximum	Minimum
Jan.	72.6	70.0	61.0	58.7	65.1	61.2	87.1	60.3	72.3	112.1	72.0	112.1	58.7
Feb.	85.9	61.5	59.3	54.6	62.6	57.3	101.9	62.0	96.1	102.5	74.4	102.5	54.6
Mar.	94.4	79.1	70.0	77.8	76.2	66.2	115.1	96.9	102.6	111.4	89.0	115.1	66.2
Apr.	102.1	87.5	77.1	71.7	75.6	81.5	112.1	95.8	118.9	133.5	95.6	133.5	71.7
May	96.7	100.7	80.3	78.9	73.1	80.4	104.3	84.2	102.7	128.5	93.0	128.5	73.1
June	117.2	92.0	102.2	68.0	87.5	96.6	110.8	95.4	128.8	113.8	101.2	128.8	68.0
July	109.8	92.3	89.8	91.6	78.4	88.7	144.8	121.5	149.5	152.2	111.9	152.2	78.4
Aug.	111.1	80.0	90.7	100.2	89.5	108.6	142.4	101.7	188.0	184.7	119.7	188.0	80.0
Sept.	74.1	44.3	72.0	67.4	68.5	102.3	94.8	84.8	153.0	124.2	88.5	153.0	44.3
Oct.	68.0	67.9	73.2	71.0	66.3	101.5	108.0	90.3	130.0	118.6	89.5	130.0	66.3
Nov.	98.3	61.9	60.3	65.4	62.3	96.6	92.6	86.7	104.4	114.2	84.3	114.2	60.3
Dec.	58.2	66.7	54.9	60.0	60.8	79.2	62.8	91.4	106.2	108.2	74.8	108.2	54.9
Yearly	1,088.4	903.9	890.8	865.3	865.9	1,020.1	1,276.7	1,071.0	1,452.5	1,503.9	1,093.9	1,503.9	865.3

On The Mexican Side

Nuevo Laredo									
Year	1928	1929	1930	1931	1932	1933	1934	1935	1936
Acre Feet	1,418.4	1,449.4	965.3	1,046.2	1,369.4	1,251.2	1,418.8	1,402.8	1,343.1

Year	1937	1938	1939	1940	1941	Average	Maximum	Minimum
Acre Feet	1,543.8	1,702.4	1,543.4	1,563.4	1,571.2	1,399.2	1,702.4	965.3

Some months missing in previous years.

SUSPENDED SILT IN THE RIO GRANDE AND TRIBUTARIES — 1941

The gravimetric percentages of dried silt reported here were determined from numerous water samples taken in small necked bottles. Two methods of sampling were used.

A. By lowering one open bottle into the water at one or more verticals in the stream cross section, being careful to approach but not to strike bottom and thus to secure an integrated sample at all depths.

B. By sampling in three bottles each at the surface of the stream, one bottle at the mid-point and one bottle at each side, one-sixth of the width from the water's edge. Numerous experiments have shown that the mean of three samples so taken gives 0.908 of the mean suspended silt in the stream cross section within reasonable limits of accuracy.*

The gravimetric percentages of dried silt were determined from the samples by two methods:

1. By determining the silt in a single monthly composite which was composed by using from each individual sample an amount proportional to the river flow represented by that sample. (One filtering, drying and weighing each month.)
2. By determining the silt in each sample bottle. (One filtering, drying and weighing for each bottle.)

For visualization and comparison the assumption is indulged here that 1,452 tons of silt would occupy one acre-foot in a reservoir bottom, which is equivalent to saying that one cubic foot of silt thus situated would weigh 66.7 pounds. See Water Bulletin No.7, page 63, for data as to the average density of Rio Grande silt in Elephant Butte reservoir.

Month	SUSPENDED SILT									
	Tons		Number of Samples 1941	Gravimetric Percentages—1941			Acre Feet at 1,452 Tons Per Acre Foot			
	Water 1941	Silt 1941		Maximum Sample	Minimum Sample	Average	1941	Period 1934 to 1941		
								Average	Maximum	Minimum
Rio Grande at San Marcial Station										
Sampled by U.S. Section I.B.C., Method A.								Analyzed by U.S. Section I.B.C., Method 1.		
January	64,622,000	116,320	31			.180	80.1	188.9	374.4	27.8
February	91,036,000	564,423	31			.620	388.7	288.5	1,027.0	23.3
March	124,662,000	943,691	31			.757	649.9	320.6	1,012.0	45.5
April	175,707,000	590,376	36			.336	406.6	752.9	3,780.0	18.6
May	1,350,961,000	8,146,295	54			.603	5,610.4	1,558.4	5,610.4	5.8
June	827,832,000	2,442,104	33			.295	1,681.9	1,253.1	9,322.0	2.4
July	334,801,000	666,254	31			.199	458.9	1,095.3	6,672.0	0
August	104,370,000	922,631	30			.884	635.4	1,917.7	11,710.0	83.4
September	113,911,000	2,881,948	30			2.530	1,984.8	2,659.9	17,470.0	156.4
October	299,956,000	4,769,500	32			1.590	3,284.6	889.5	6,520.0	0
November	232,316,000	878,154	29			.378	604.8	154.5	604.8	7.2
December	129,643,000	220,393	30			.170	151.8	163.1	346.4	30.3
Yearly	3,849,817,000	23,141,889	398			.601	15,937.9	11,242.4	41,317.6	2,459.7
Rio Grande at Eagle Pass Station										
Sampled by Mex. Section I.B.C., Method B.								Analyzed by U.S. Dept. Agr., Method 2.		
January	141,941,000	30,825	24	.266	.002	.022	21.2	24.2	124.0	.1
February	165,944,000	31,152	28	.162	.003	.019	21.5	13.0	32.1	2.6
March	154,725,000	12,234	30	.062	.002	.008	8.4	34.6	187.9	4.7
April	232,127,000	296,666	26	.360	.002	.128	204.3	57.0	204.3	3.0
May	554,279,000	6,124,312	31	1.946	.018	1.105	4,217.8	890.1	4,217.8	31.2
June	489,040,000	1,316,670	27	1.297	.048	.269	906.8	1,358.2	3,821.0	24.5
July	563,719,000	5,082,540	28	2.004	.100	.902	3,500.4	1,595.1	7,835.8	95.2
August	567,198,000	3,095,198	30	1.034	.138	.546	2,131.7	1,093.6	2,131.7	217.8
September	1,103,191,000	5,288,917	30	1.140	.118	.479	3,642.5	3,146.2	6,098.0	60.7
October	2,284,757,000	8,445,746	30	.778	.109	.370	5,816.7	1,397.5	5,816.7	190.0
November	697,272,000	443,568	30	.144	.013	.064	305.5	123.4	305.5	14.3
December	400,418,000	95,812	28	.056	.006	.024	66.0	24.6	84.1	1.1
Yearly	7,354,611,000	30,263,640	342	2.004	.002	.411	20,842.8	9,757.5	20,842.8	1,768.3
Rio Alamo Station										
Sampled by Mex. Section I.B.C., Method B.								Analyzed by Mex. Section I.B.C., Method 2.		
January	4,231,000	25,642	8	.912	0	.606	17.7	5.0	21.8	0
February	768,000	60	7	.079	0	.008	0	.1	.6	0
March	1,946,000	461	8	.071	0	.024	.3	8.6	45.4	0
April	2,932,000	15,622	7	.742	0	.533	10.8	44.2	227.4	0
May	14,432,000	70,537	9	.690	0	.489	48.6	53.8	229.7	7.0
June	29,895,000	175,351	8	1.228	0	.587	120.8	89.8	471.0	0
July	3,811,000	4,435	6	.264	0	.116	3.1	24.3	73.8	0
August	5,380,000	27,388	8	.567	0	.509	18.9	101.6	396.0	0
September	48,034,000	458,718	8	1.475	0	.955	315.9	115.6	362.9	1.5
October	8,562,000	30,932	8	.629	0	.361	21.3	95.6	557.9	0
November	2,147,000	0	6	0	0	0	0	1.5	5.2	0
December	1,798,000	0	7	0	0	0	0	2.7	16.1	0
Yearly	123,936,000	809,146	90	1.475	0	.653	557.4	542.8	1,198.6	154.5
# Rio Grande at Roma Station										
Sampled by Mex. Section I.B.C., Method B.								Analyzed by U.S. Dept. Agr., Method 2.		
January	200,681,000	191,954	31	.397	.001	.096	132.2	44.7	168.7	.4
February	191,862,000	98,796	28	.272	.003	.051	68.0	32.3	121.0	.8
March	168,533,000	13,545	31	.036	.001	.008	9.3	177.1	1,825.3	1.3
April	192,455,000	276,255	30	.444	.007	.143	190.3	285.7	1,345.0	.7
May	960,360,000	7,597,393	31	1.399	.066	.791	5,232.4	1,424.5	5,232.4	88.6
June	827,994,000	4,263,824	30	1.439	.095	.515	2,936.5	1,468.3	7,216.0	52.7
July	558,406,000	2,943,215	17	1.395	.050	.527	2,027.0	1,414.4	9,070.0	19.3
August	612,156,000	4,325,986	31	1.602	.279	.707	2,979.3	1,313.6	3,251.2	113.2
September	1,194,807,000	7,304,098	30	1.572	.287	.611	5,030.4	4,352.9	17,998.0	42.8
October	2,229,010,000	9,158,215	31	.850	.218	.411	6,307.3	2,397.5	9,241.0	133.0
November	806,121,000	957,882	30	.487	.014	.119	659.7	150.8	659.7	4.8
December	427,171,000	124,438	30	.077	.011	.029	85.7	66.2	319.0	1.0
Yearly	8,369,556,000	37,255,601	350	1.602	.001	.445	25,658.1	13,128.0	30,839.0	2,314.0
Rio San Juan Station										
Sampled by Mex. Section I.B.C., Method B.								Analyzed by Mex. Sec. I.B.C., Method 2.		
January	83,127,000	487,266	16	1.135	0	.586	335.6	47.1	335.6	0
February	42,924,000	14,882	12	.128	0	.035	10.2	1.5	10.2	0
March	46,590,000	55	14	.001	0	.0001	T	4.9	36.7	0
April	85,062,000	75,942	16	.473	0	.089	52.3	12.7	52.3	0
May	93,044,000	541,011	19	1.280	0	.581	372.6	319.4	1,062.0	1.6
June	660,985,000	3,474,508	35	.987	.022	.526	2,392.9	591.7	2,392.9	0
July	197,522,000	30,556	14	.043	0	.015	21.0	151.0	857.8	.9
August	43,754,000	0	14	0	0	0	0	1,335.2	8,932.0	0
September	482,086,000	155,949	29	1.180	0	.032	107.4	671.7	2,148.0	3.3
October	117,258,000	446	15	.002	0	.0004	.3	499.7	3,133.1	.3
November	77,000,000	0	12	0	0	0	0	16.2	67.3	0
December	88,038,000	0	14	0	0	0	0	44.0	261.7	0
Yearly	2,017,390,000	4,780,615	210	1.280	0	.237	3,292.3	3,695.1	9,395.5	246.6

* See Tech. Bull. No. 382, 1933 U.S. Dept. of Agr. ● Period 1925-1941. # Period 1929-1941.

CHEMICAL ANALYSES OF WATER SAMPLES FROM RIO GRANDE AND TRIBUTARIES - 1941

The chemical analyses reported here were made by the United States Department of Agriculture at Riverside, California, from composite water samples made up periodically from independent water samples. This compositing and the determination of the specific electrical conductances of the independent water samples was done by the United States Section of the International Boundary Commission.

Water samples from the stations at Eagle Pass, Rio Salado and Rio San Juan were gathered by the Mexican Section of the Commission, the others by the United States Section, except those for Caballo Dam and Leasburg Dam. In these cases the data were furnished by the El Paso, Texas office of the United States Bureau of Reclamation and the Riverside, California laboratory office of the Department of Agriculture. The composite samples were composed by taking from each sample an amount of water proportional to the acre footage of river flow represented by that sample.

To convert "Milligram Equivalents" to parts per million by weight, multiply each ion by its appropriate conversion factor. These factors are: HCO_3, 61; CL, 35.5; SO_4, 48; Ca, 20; Mg, 12.16; Na, 23; NO_3, 62.

Conductance, reported in the tables as ($K \times 10^5$ at 25°C), is a relative measure of the total salt concentration in the water samples. (See Circular No. 232 U. S. Dept. Agr.,July 1932.) It is a definite statement of an important physical property of the solution.

Descriptions of the sampling stations will be found in the forward part of this bulletin where the stream discharges are reported for these same stations.

Month	No. of Samples	Total Tons of: Per Acre Foot	Total Tons of: Dissolved Solids	Mean $K \times 10^5$ @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
Water Samples from Rio Grande at San Marcial Station															
Jan.	31	.87	41,320	95.0	0.20	7.9	49	24	3.64	1.29	4.82	3.24	4.23	2.34	0.02
Feb.	31	.87	58,290	95.5	0.16	7.9	50	19	3.67	1.29	4.88	2.99	4.92	1.86	0.04
Mar.	31	.86	78,860	92.9	0.25	7.8	50	18	3.46	1.24	4.68	2.83	5.00	1.67	0.02
Apr.	36	.68	87,720	74.8	0.19	7.6	46	16	3.09	1.10	3.57	2.68	3.69	1.26	0.02
May	57	.51	506,940	54.4	0.07	7.6	41	12	2.41	0.85	2.22	1.99	2.64	0.61	0.03
June	33	.38	231,420	41.8	0.10	8.0	37	11	1.95	0.66	1.52	1.93	1.70	0.45	0.03
July	31	.50	123,000	53.2	0.10	7.7	39	12	2.48	0.82	2.07	2.41	2.27	0.65	0.02
Aug.	30	.96	73,730	98.6	0.18	7.8	43	15	4.38	1.42	4.36	2.77	6.09	1.51	0.04
Sept.	30	1.08	90,500	112.0	-	7.8	44	15	5.05	1.28	5.06	2.74	6.80	1.70	0.04
Oct.	32	.83	183,430	87.4	0.16	7.8	45	13	3.79	1.23	4.04	2.25	5.52	1.12	0.04
Nov.	29	.48	82,080	54.1	0.07	7.8	40	13	2.36	0.75	2.08	2.25	2.32	0.70	0.02
Dec.	30	.59	56,230	63.5	0.10	7.8	41	18	2.82	0.95	2.67	2.63	2.57	1.11	0.02
Mean @	401	.57	1,613,520 ϕ	61.2		7.8	42	13	2.68	0.90	2.59	2.22	3.03	0.82	0.03
Period Average		.71	728,200	79.3			43	18	3.34	1.15	3.41	2.65	3.89	1.39	
Tons of Constituents, 1941									205,000	42,200	228,000	258,000	558,000	112,000	
Average Tons Period 1933-1941									93,100	19,400	108,900	110,400	259,800	67,900	
Water Samples from Rio Grande at Caballo Dam															
Jan.	31	1.06	103	126	0.24	7.9	59	26	3.65	1.61	7.51	4.95	4.48	3.30	0.01
Feb.	28	.99	7,190	110	0.18	8.0	50	25	3.97	1.44	5.34	2.93	5.45	2.75	T
Mar.	31	.95	46,840	106	-	8.0	49	24	3.96	1.50	5.16	2.93	5.31	2.60	0.02
Apr.	30	.93	106,950	104	0.21	8.0	50	23	3.85	1.22	5.08	2.88	5.39	2.41	0.01
May	31	.92	85,560	104	0.19	7.7	48	22	3.86	1.54	5.04	2.93	5.27	2.32	0.03
June	30	.90	105,300	99.0	0.19	7.8	49	22	3.77	1.34	4.88	2.93	5.04	2.22	0.01
July	31	.72	92,880	83.8	0.19	7.4	49	19	3.25	1.17	4.18	2.68	4.13	1.56	0.02
Aug.	31	.69	75,900	77.3	0.21	7.8	49	18	3.10	1.00	3.89	2.54	3.82	1.41	0.03
Sept.	26	.70	43,680	77.6	0.16	8.0	45	20	3.19	1.13	3.55	2.59	3.74	1.56	0.02
Oct.	11	.57	2,410	63.7	0.10	7.7	44	20	2.68	0.79	2.78	2.21	2.81	1.23	0.02
Nov.	8	.61	3,450	70.7	0.09	7.3	44	19	3.00	0.93	3.12	2.57	3.22	1.36	0.02
Dec.	10	.60	6,360	68.6	0.13	7.9	44	18	2.96	0.96	3.02	2.51	3.22	1.28	0.01
Mean @	298	.82	576,623 ϕ	92.1		7.8	49	21	3.53	1.24	4.50	2.77	4.62	1.96	0.02
Period Average		.78	591,600	84.0			45	18	3.57	1.28	3.91	2.85	4.41	1.58	
Tons of Constituents, 1941									67,100	14,400	98,200	79,900	211,400	66,300	
Average Tons Period 1931-1941									73,900	16,100	92,900	88,400	218,900	57,800	
Water Samples from Rio Grande at Leasburg Dam															
Jan.	31	1.20	1,870	133	0.18	7.9	46	26	5.70	1.77	6.29	3.59	6.65	3.65	0.01
Feb.	24	1.04	5,000	115	0.19	7.8	48	24	4.34	1.62	5.60	3.03	5.76	2.85	0.03
Mar.	31	0.99	41,080	111	0.24	8.0	49	24	4.20	1.51	5.39	3.08	5.58	2.75	0.04
Apr.	30	0.97	102,450	108	0.20	7.8	49	24	4.16	1.38	5.28	2.98	5.51	2.67	0.01
May	31	0.99	82,700	110	0.20	7.8	49	23	4.13	1.58	5.43	3.14	5.57	2.58	0.03
June	30	0.94	99,790	105	0.18	7.9	49	22	3.93	1.45	5.14	3.08	5.24	2.37	0.02
July	31	0.82	101,360	89.2	0.25	7.3	48	20	3.47	1.22	4.31	2.88	4.37	1.82	0.03
Aug.	31	0.72	80,030	83.4	0.18	7.7	46	19	3.41	1.13	3.87	2.73	3.99	1.61	0.03
Sept.	30	0.69	54,880	76.1	0.16	7.9	44	20	3.20	1.06	3.35	2.54	3.49	1.56	0.03
Oct.	31	1.01	9,710	110	0.16	7.8	45	24	4.74	1.29	4.98	3.33	5.23	2.69	0.03
Nov.	30	0.97	7,240	106	0.13	7.9	46	23	4.53	1.39	4.95	3.30	5.07	2.56	0.02
Dec.	31	0.81	9,150	89.4	0.16	7.6	44	21	3.88	1.17	3.94	3.00	4.19	1.94	0.01
Mean @	361	0.87	595,260 ϕ	96.7	0.20	7.7	48	22	3.78	1.31	4.63	2.92	4.77	2.15	0.03
Period Average		0.84	615,500	89.9			45	21	3.85	1.37	4.29	3.00	4.62	1.97	
Tons of Constituents, 1941									70,000	14,900	98,500	82,200	213,000	70,900	
Average Tons Period 1931-1941									77,000	16,700	98,400	90,000	221,000	69,600	

** Percent of Total Cations
*** Percent of Total Anions
@ Weighted Mean
ϕ Total

CHEMICAL ANALYSES OF WATER SAMPLES FROM RIO GRANDE AND TRIBUTARIES – 1941

Month	No. of Samples	Total Tons of: Per Acre Foot	Total Tons of: Dissolved Solids	Mean Kx10⁵ @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
Water Samples from Rio Grande at El Paso Station															
Jan.	31	1.94	16,490	212	0.35	8.1	61	38	6.10	2.36	13.40	4.68	8.97	8.45	0.01
Feb.	41	1.92	13,880	213	0.33	8.2	60	37	6.26	2.36	13.00	4.83	9.17	8.25	0.01
Mar.	31	1.32	34,980	146	0.34	8.1	54	31	5.09	1.86	8.05	3.55	6.86	4.60	0.01
Apr.	30	1.19	73,070	131	0.30	7.9	52	28	4.68	1.79	7.07	3.46	6.28	3.73	0.02
May	31	1.20	70,320	136	0.23	7.9	55	29	4.48	1.83	7.62	3.27	6.52	4.04	0.01
June	29	1.23	75,770	136	0.24	8.0	54	28	4.61	1.74	7.34	3.58	6.41	3.82	0.01
July	31	1.11	82,360	122	0.20	7.6	53	27	4.27	1.65	6.62	3.35	5.74	3.36	0.02
Aug.	31	1.02	84,150	114	0.18	7.8	52	27	3.97	1.44	5.89	3.10	5.18	3.14	0.02
Sept.	30	1.02	73,030	114	0.18	7.8	52	28	4.10	1.38	5.94	3.25	4.96	3.18	0.02
Oct.	31	1.52	39,220	166	0.29	7.8	56	35	5.40	1.98	9.54	3.83	7.25	5.90	0.02
Nov.	30	1.71	28,560	185	0.27	7.9	57	35	6.04	2.14	10.96	4.60	8.02	6.68	0.01
Dec.	31	1.59	26,710	172	0.29	7.9	56	34	5.71	2.03	10.03	4.37	7.34	6.06	0.02
Mean ● ♦	377	1.21	618,540 ♦	134	0.24	7.9	54	29	4.58	1.70	7.34	3.48	6.14	4.02	0.02
Period Average		1.19	619,371	128			53	30	4.77	1.75	7.30	3.68	5.99	4.24	
Tons of Constituents 1941									63,200	14,400	116,400	73,000	204,100	98,700	
Average Tons Period 1931-1941									67,500	15.000	118,400	77,800	202,800	106,000	
Water Samples from Rio Grande at Fort Quitman Station															
Jan.	8	3.46	32,040	383	0.43	7.9	63	58	10.70	4.11	25.02	4.68	12.33	23.52	0.04
Feb.	7	3.65	23,290	403	0.43	8.2	63	59	11.20	4.55	26.33	4.47	12.84	25.40	0.03
Mar.	8	2.57	19,660	287	0.43	7.9	62	56	7.79	3.46	18.18	3.24	9.84	16.61	0.03
Apr.–May	12	2.71	81,570	310	0.36	8.0	61	56	8.70	3.54	19.46	3.86	10.02	17.61	0.03
June	11	2.07	72,240	242	0.28	8.1	62	56	6.48	2.57	14.62	2.67	7.66	13.35	0.03
July	10	2.70	59,400	308	0.30	7.5	62	56	8.46	3.37	19.03	3.61	9.93	17.57	0.02
Aug.	17	1.97	104,610	226	0.23	7.8	59	52	6.54	2.44	13.06	3.18	7.53	11.72	0.02
Sept.	8	1.54	108,720	179	0.22	7.9	60	49	5.25	1.81	10.52	2.95	5.98	8.72	0.07
Oct.	7	2.23	102,130	254	0.27	7.9	61	53	7.11	2.80	15.47	3.42	8.50	13.63	0.02
Nov.	6	3.15	77,180	352	0.36	7.9	62	56	9.55	3.88	22.24	4.19	11.54	20.15	0.03
Dec.	7	2.96	77,550	327	0.35	8.0	61	54	9.50	3.74	20.91	4.59	11.00	18.38	0.04
Mean ● ♦	101	2.29	758,390 ♦	261	0.29	7.9	61	54	7.35	2.85	16.01	3.46	8.60	14.30	0.04
Period Average		2.67	508,688	295			62	58	8.61	3.43	19.59	3.85	9.53	18.14	
Tons of Constituents, 1941									65,600	15,600	164,000	46,800	184,700	226,900	
Average Tons Period 1931-1941									44,300	10,800	115,700	30,100	118,100	165,900	
Water Samples from Rio Grande at La Nutria Station															
Jan.	7	3.08	30,340	348	0.43	7.9	65	58	8.63	3.75	23.32	3.60	11.48	21.12	0.01
Feb.	6	3.21	24,200	359	0.42	8.1	65	59	8.80	3.89	23.33	3.40	11.66	22.03	0.02
Mar.	6	3.02	24,640	334	0.40	7.8	63	58	8.74	3.96	21.83	3.39	11.47	20.15	0.02
Apr.	10	1.73	18,860	206	0.27	8.0	63	53	5.52	1.88	12.64	2.54	6.88	10.64	0.03
May	8	2.48	52,330	288	0.34	7.7	63	57	7.43	3.20	17.97	2.93	9.49	16.19	0.02
June	11	1.61	61,020	186	0.26	8.0	60	51	5.30	1.91	11.04	2.41	6.40	9.31	0.04
July	9	1.57	53,690	183	0.18	7.8	60	52	5.41	1.69	10.70	2.36	6.15	9.34	0.04
Aug.	5	1.94	148,600	224	0.23	7.8	60	51	6.67	2.20	13.04	3.12	7.69	11.35	0.02
Sept.	4	1.10	115,500	129	0.16	7.8	59	45	3.88	1.24	7.35	2.31	4.35	5.59	0.13
Oct.	6	2.30	182,390	260	-	7.7	62	55	7.02	2.81	16.08	2.38	9.42	14.19	0.02
Nov.	12	3.17	87,810	363	0.37	7.9	63	58	9.39	4.12	22.56	3.32	12.15	21.00	0.02
Dec.	13	2.85	63,840	313	0.34	7.9	61	54	9.02	3.73	20.25	4.02	10.97	17.78	0.04
Mean ● ♦	97	1.96	863,220 ♦	224		7.8	61	53	6.27	2.35	13.64	2.73	7.71	11.87	0.05
Period Average		2.27	494,907	260			61	56	7.26	2.85	15.94	2.92	8.66	14.48	
Tons of Constituents 1941									74,600	17,100	186,300	49,300	220,900	251,000	
Average Tons Period 1936-1941									43,180	10,280	108,800	26,000	123,400	152,350	
Water Samples from Rio Grande at Upper Presidio Station															
Jan.	4	3.60	30,060	399	0.48	7.9	63	60	10.64	4.49	26.28	3.55	13.32	25.04	0.01
Feb.	4	3.66	24,998	401	0.49	8.0	64	60	10.55	4.66	26.68	3.29	13.58	25.45	0.02
Mar.	5	4.38	18,177	461		8.2	59	61	14.63	5.75	28.80	3.70	16.12	30.40	0.01
Apr.–May	10	1.80	84,510	211		7.9	59	53	6.38	2.07	12.29	2.59	7.39	11.15	0.04
June	6	2.00	80,000	231	0.27	8.1	60	54	6.80	2.31	13.48	2.59	7.75	12.22	0.04
July	7	1.16	49,532	135	0.16	7.8	60	47	4.07	1.13	7.88	2.26	4.67	6.15	0.04
Aug.	4	1.71	119,358	199		7.6	59	52	5.90	1.97	11.56	2.79	6.50	10.09	0.04
Sept.	6	1.61	123,326	187	0.21	7.8	59	52	5.65	1.81	10.91	2.64	6.21	9.46	0.05
Oct.	4	2.31	242,550	263		7.9	59	55	7.96	2.82	15.42	3.24	8.59	14.47	0.02
Nov.	4	3.43	118,335	385	0.42	7.9	61	58	10.93	4.42	24.03	3.78	12.82	23.01	0.01
Dec.	5	3.08	89,012	337	0.40	7.9	62	57	9.46	4.03	21.94	3.51	11.70	20.00	0.03
Mean ● ♦	59	2.11	979,858 ♦	241		7.9	60	54	7.11	2.53	14.44	2.93	8.06	13.16	0.03
Period Average		2.12	411,389	241			60	54	7.15	2.62	14.38	2.99	8.14	13.02	
Tons of Constituents, 1941									89,000	19,300	207,700	55,700	243,000	293,000	
Average Tons Period 1935-1941									37,450	8,370	86,433	23,700	102,600	121,000	

** Percent of Total Cations
*** Percent of Total Anions
● Weighted Mean
♦ Total

CHEMICAL ANALYSES OF WATER SAMPLES FROM RIO GRANDE AND TRIBUTARIES - 1941

Water Samples from Rio Conchos near Ojinaga, Chihuahua

Month	No. of Samples	Total Tons of: Per Acre Foot	Total Tons of: Dissolved Solids	Mean Kx10⁵ @25°C	Boron p.p.m.	pH	% Na **	% Cl ***	Mean Milligram Equivalents per Liter: Ca	Mg	Na	CO_3 + HCO_3	SO_4	Cl	NO_3
Jan.	5	0.97	30,560	103	0.26	8.2	46	15	4.39	1.37	4.92	3.19	5.93	1.58	0.01
Feb.	4	0.87	44,630	93.9	0.24	8.2	47	14	3.88	1.22	4.48	3.29	5.04	1.31	0.03
Mar.	5	0.74	25,160	81.7	0.17	7.8	43	17	3.57	1.01	3.52	2.83	3.98	1.41	0.01
Apr.-May	10	1.05	196,900	102	0.17	7.8	28	09	7.06	0.94	3.08	2.29	7.77	1.01	0.03
June	4	0.87	43,330	93.4	0.22	8.0	41	18	4.59	1.03	3.95	2.69	5.15	1.73	0.01
July	5	0.56	78,960	58.5	0.08	7.8	33	10	3.46	0.48	1.93	2.39	2.93	0.60	0.07
Aug.	5	0.42	98,280	45.3	0.12	7.6	32	10	2.61	0.45	1.42	2.39	1.76	0.45	0.04
Sept.	3	0.40	176,800	43.2		7.8	30	09	2.56	0.50	1.32	2.08	1.85	0.39	0.04
Oct.	4	0.41	311,200	48.6			37	18	2.49	0.55	1.75	2.35	1.50	0.86	0.02
Nov.	4	0.72	76,320	75.5	0.13	7.9	35	11	4.06	0.93	2.74	3.27	3.64	0.85	0.02
Dec.	5	0.83	55,940	90.2	0.16	7.9	40	12	4.42	1.10	3.68	3.50	4.48	1.11	0.04
Mean ⊕	54 ♦	0.54	1,138,080 ♦	58.7			34	13	3.26	0.64	2.06	2.43	2.74	0.77	0.03
Period Average		0.56	613,734	60.0			38	14	3.16	0.76	2.31	2.51	2.84	0.86	
Tons of Constituents, 1941									186,900	22,300	135,500	208,600	376,500	78,100	
Average Tons Period 1935-1941									95,100	13,900	79,600	113,100	205,200	46,000	

Water Samples from Pecos River Station

Month	No. of Samples	Total Tons of: Per Acre Foot	Total Tons of: Dissolved Solids	Mean Kx10⁵ @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.	15	5.98	104,052	618	0.40	7.6	62	65	13.83	12.21	42.69	2.78	21.63	44.54	0.01
Feb.	18	5.94	93,852	619	0.38	7.9	63	64	13.43	11.45	42.17	2.67	21.43	43.81	0.03
Mar.	12	4.90	93,100	518	0.41	7.7	62	64	11.26	9.94	34.56	2.36	17.67	36.11	0.02
Apr.-May	38	2.53	220,363	297	0.22	7.6	59	61	7.02	5.07	17.65	2.44	9.30	18.06	0.05
June	18	3.75	738,750	363	0.28	7.8	41	40	17.82	5.98	16.21	2.01	22.02	15.74	0.03
July	16	5.68	438,496	569	0.34	7.8	53	52	19.15	10.95	33.53	2.41	27.72	33.18	0.05
Aug.	15	5.32	229,824	555	0.34	7.8	55	55	16.39	10.51	32.47	2.16	24.37	32.83	0.04
Sept.	15	4.53	395,922	452		7.8	47	46	18.25	8.37	23.61	2.08	24.92	23.39	0.03
Oct.	12	3.68	1,788,480	347	0.22	7.8	36	35	19.24	6.02	14.33	2.13	23.69	13.93	0.01
Nov.	15	4.95	1,034,550	472	0.28	7.8	45	45	20.65	8.98	24.06	2.20	27.52	24.27	0.02
Dec.	16	7.23	665,714	740	0.45	7.8	56	56	21.62	14.78	45.60	2.32	33.21	46.21	0.09
Mean ⊕	190♦	4.36	5,801,103 ♦	429		7.8	46	45	18.20	7.81	21.81	2.19	23.96	21.74	0.03
Period Average		3.78	1,762,629	395			52	52	13.14	7.19	22.00	2.82	17.30	22.14	
Tons of Constituents, 1941									654,000	171,500	900,000	119,400	2,072,400	1388,900	
Average Tons Period 1935-1941									165,500	55,300	318,300	54,000	524,900	496,000	

Water Samples from Rio Grande at Eagle Pass Station

Month	No. of Samples	Total Tons of: Per Acre Foot	Total Tons of: Dissolved Solids	Mean Kx10⁵ @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.	8	1.43	149,292	164	0.25	8.0	53	48	4.86	2.73	8.59	2.93	5.57	7.94	0.04
Feb.	7	1.45	176,900	168	0.25	8.0	54	46	5.05	2.74	9.07	2.99	6.15	7.95	0.04
Mar.	8	1.36	154,768	160	0.22	7.8	54	48	4.58	2.82	8.58	2.88	5.43	7.72	0.04
Apr.	6	1.01	172,407	123	0.18	8.2	50	47	4.01	2.18	6.11	2.73	3.44	5.55	0.04
May	9	0.86	350,536	89.8	0.12	7.7	42	32	3.93	1.25	3.76	2.44	3.49	2.77	0.05
June	6	2.12	762,564	219	0.22	8.1	40	36	10.63	3.12	9.24	2.34	12.33	8.38	0.04
July	8	1.86	771,156	205	0.16	7.4	50	45	7.32	2.98	10.48	2.51	8.81	9.44	0.07
Aug.	9	1.13	471,323	126	0.15	7.6	45	38	5.25	1.68	5.69	2.44	5.41	4.79	0.05
Sept.	9	0.94	762,622	107		7.8	43	38	4.60	1.36	4.55	2.46	3.97	3.89	T
Oct.	7	1.46	2,453,238	253	0.17	7.8	37	32	7.78	2.27	5.84	2.35	8.53	5.16	0.04
Nov.	7	2.52	1,292,256	266	0.20	7.8	45	43	10.76	4.45	12.41	2.25	13.61	12.06	0.04
Dec.	6	2.58	759,810	290	0.24	7.8	52	49	9.22	4.86	14.99	2.73	11.98	14.19	0.12
Mean ⊕	♦ 90	1.53	8,276,872 ♦	166		7.8	44	39	7.03	2.50	7.37	2.45	7.83	6.63	0.04
Period Average		1.12	3,821,566	125			44	38	5.11	1.96	5.65	2.57	5.20	4.78	
Tons of Constituents, 1941									1026,500	222,900	1236,300	543,700	2753,700	1721,700	
Average Tons Period 1935-1941									469,800	110,100	596,200	358,400	1150,900	781,800	

Water Samples from Rio Salado Station

Month	No. of Samples	Total Tons of: Per Acre Foot	Total Tons of: Dissolved Solids	Mean Kx10⁵ @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.-Feb.	8	1.69	7,453	177	0.48	7.8	44	35	6.82	3.53	8.23	1.75	10.38	6.46	0.03
Mar.	4	3.43	4,596	329	1.26	7.7	48	38	11.87	7.36	17.76	1.64	21.63	14.04	0.01
Apr.	6	3.08	10,503	311		7.8	49	38	10.72	6.39	16.63	1.76	19.39	12.81	0.02
May	11	0.79	34,839	86.5	0.27	7.9	41	32	3.61	1.35	3.50	1.56	4.13	2.67	0.02
June	15	0.42	45,528	49.3	0.13	8.0	29	21	2.87	0.58	1.40	2.16	1.61	1.00	0.04
July	4	0.47	3,840	54.5	0.12	7.6	32	25	2.86	0.87	1.73	2.44	1.63	1.36	0.07
Aug.	8	0.71	2,925	79.9		7.8	39	30	3.38	1.48	3.06	2.11	3.43	2.36	0.04
Sept.	8	0.43	31,175	49.8		7.8	30	22	2.83	0.57	1.46	2.08	1.65	1.04	0.04
Oct.	6	0.41	3,911	50.6	0.19		27	20	2.84	0.85	1.37	2.50	1.48	1.04	0.07
Nov.	6	0.53	2,571	61.3	0.13	7.8	33	21	2.93	1.04	1.94	2.30	2.26	1.26	0.09
Dec.	6	0.63	2,073	69.6	0.25	7.9	33	25	3.46	1.27	2.36	2.73	2.45	1.72	0.11
Mean ⊕	♦ 82	0.57	149,414 ♦	63.7			35	26	3.21	0.91	2.22	2.05	2.57	1.65	0.04
Period Average		0.98	253,953	101.0			41	28	4.56	1.80	4.39	1.94	5.80	3.06	
Tons of Constituents, 1941									22,900	3,990	18,160	22,200	44,050	20,880	
Average Tons Period 1935-1941									31,800	7,670	35,100	20,600	97,400	37,900	

** Percent of Total Cations
*** Percent of Total Anions
⊕ Weighted Mean
♦ Total

CHEMICAL ANALYSES OF WATER SAMPLES FROM RIO GRANDE AND TRIBUTARIES—1941

Month	No. of Samples	Total Tons of: Per Acre Foot	Total Tons of: Dissolved Solids	Mean Kx10⁵ @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
Water Samples from Rio San Juan Station															
Jan.	5	0.75	45,855	85.7	0.18	7.8	42	25	3.61	1.27	3.54	2.21	4.09	2.14	0.04
Feb.	3	0.76	23,993	82.5	0.14	8.0	32	18	4.02	1.74	2.76	2.57	4.48	1.56	0.04
Mar.	4	1.02	34,955	106	0.24	7.8	35	22	4.90	2.45	3.99	2.78	6.05	2.52	0.03
Apr.	5	0.71	44,418	82.7	-	7.8	45	27	3.47	1.20	3.82	2.20	3.70	2.22	0.04
May	6	0.92	62,956	99.6	0.26	7.4	47	33	3.77	1.48	4.62	2.24	4.33	3.28	0.04
June	8	0.43	209,023	47.5	-	8.0	25	16	2.93	0.66	1.21	2.67	1.26	0.78	0.04
July	5	0.55	87,945	59.1	0.08	7.6	26	13	3.51	1.08	1.58	2.84	2.32	0.83	0.18
Aug.	3	0.83	26,709	89.5	-	7.8	39	24	3.77	1.85	3.53	2.31	4.48	2.11	0.07
Sept.	9	0.48	170,208	54.8	0.12	7.8	34	21	2.86	0.71	1.80	2.21	1.97	1.12	0.07
Oct.	5	0.82	70,717	86.2	0.22	7.9	33	20	4.11	1.81	2.95	2.63	4.31	1.81	0.10
Nov.	4	0.99	56,064	106	0.19	7.9	35	21	4.59	2.49	3.89	2.70	5.86	2.36	0.13
Dec.	5	1.06	68,635	108	0.29	7.8	34	21	4.90	2.68	3.83	2.73	6.21	2.37	0.14
Mean ¢	ϕ62	0.60	ϕ 901,478	65.9		7.8	33	21	3.37	1.11	2.21	2.52	2.71	1.37	0.07
Period Average		0.63	580,604	70.0			35	23	3.35	1.21	2.49	2.30	3.04	1.63	
Tons of Constituents, 1941									137,600	27,500	103,600	154,100	265,200	99,000	
Average Tons, Period 1935-1941									83,600	18,400	71,500	85,900	182,100	72,200	
Water Samples from Rio Grande at Rio Grande City															
Jan.	16	1.07	232,190	126	0.21	7.8	52	44	3.97	1.93	6.35	2.42	4.59	5.45	0.03
Feb.	11	1.09	192,930	127	0.18	7.8	51	43	4.14	2.05	6.42	2.42	4.81	5.53	0.04
Mar.	13	1.33	216,790	152	0.21	7.7	52	44	4.61	2.72	8.00	2.62	6.01	6.77	0.03
Apr.	17	1.06	226,840	125	0.24	8.1	52	47	4.02	1.83	6.43	2.34	4.03	5.65	0.04
May	31	0.73	608,090	80.1	0.18	7.9	48	34	3.13	1.00	3.74	2.15	2.90	2.62	0.05
June	38	0.88	941,600	97.5	0.18	8.0	37	29	4.86	1.27	3.54	2.01	4.79	2.81	0.04
July	21	1.44	819,360	157	0.15	7.8	43	38	6.82	2.23	6.83	2.44	7.44	6.05	0.14
Aug.	13	1.23	587,940	137	0.15	7.5	46	38	5.54	1.80	6.16	2.49	5.88	5.15	0.05
Sept.	31	0.69	862,500	80.0	0.13	7.8	43	33	3.49	0.99	3.37	2.26	2.94	2.57	0.07
Oct.	37	1.27	2,184,400	133	0.18	7.8	38	31	6.63	1.85	5.12	2.27	7.22	4.25	0.06
Nov.	11	2.08	1,287,520	225	0.17	7.7	42	39	9.56	3.60	9.72	2.35	11.64	9.15	0.05
Dec.	13	2.59	986,790	282	0.25	7.8	51	50	8.94	5.16	14.97	2.52	12.07	14.49	0.05
Mean ⊕	252ϕ	1.19	9,146,950 ϕ	130	0.17	7.8	43	37	5.54	1.89	5.68	2.28	6.00	4.85	0.06
Period Average		0.85	4,327,601	96.9			43	35	3.97	1.54	4.10	2.36	3.89	3.30	
Tons of Constituents, 1941									1151,000	240,000	1354,000	719,000	3000,000	1789,000	
Average Tons Period 1935-1941									544,000	129,000	645,000	490,000	1282,000	804,000	
Water Samples from North Floodway Near Sebastian, Texas															
Jan. to June *	14	1.58	91,484	174			49	53	5.90	2.57	8.11	3.34	4.59	8.83	0.02
July to Dec. #	9	2.11	41,616	233			56	50	6.59	3.94	13.14	2.90	8.99	12.01	0.04
Total Mean ⊕	23	1.71	133,100	189			51	52	6.08	2.92	9.39	3.23	5.71	9.64	0.03
Tons of Constituents, 1941									12,900	3,760	22,800	10,200	29,000	36,100	

SALT INFLOW TO THE RIO GRANDE WITH SEWAGE AND INDUSTRIAL WASTE

Near El Paso, Texas and Cd. Juarez, Chihuahua.

The tabulated data below cover a 6-day investigation of an apparently normal condition of inflow of salts to the Rio Grande from sewage and industrial wastes in the 4.8 mile stretch of river channel from the Stanton Street Bridge between El Paso and Juarez to a point 300 feet above the Ascarate Wasteway from the Franklin Canal.

From the figures at the bottom of the table it is seen that an average of 54.1 tons of total dissolved solids per day entered the river with an average total of 12.4 second feet of inflow.

Date 1941	Stanton Street Bridge: Time Collected	Stanton Street Bridge: Total Dissolved Solids Tons Per Acre Foot	500 Ft. above Cd. Juarez Sewage Outfall: Time Collected	500 Ft. above Cd. Juarez Sewage Outfall: Total Dissolved Solids Tons Per Acre Foot	300 Ft. above Ascarate Wasteway: Time Collected	300 Ft. above Ascarate Wasteway: Total Dissolved Solids Tons Per Acre Foot
February 19			7:00 A.M.	1.98	7:45 A.M.	2.01
" 19						
" 19			5:20 P.M.	2.02	4:45 P.M.	2.13
" 20	8:00 A.M.	2.01	8:45 A.M.	2.00	8:30 A.M.	2.00
" 20	12:00 M.	2.02	12:30 P.M.	2.00	1:05 P.M.	2.28
" 20	4:00 P.M.	2.03	5:00 P.M.	2.02	5:25 P.M.	2.12
" 20	8:00 P.M.	2.00				
" 21	8:00 A.M.	2.00	8:10 A.M.	1.99	8:45 A.M.	1.97
" 21	12:00 M.	1.99	11:45 A.M.	1.98	12:10 P.M.	2.04
" 21	4:00 P.M.	2.00	4:45 P.M.	1.97	5:15 P.M.	2.06
" 21	8:00 P.M.	2.00				
" 22	8:10 A.M.	2.01	9:00 A.M.	1.98	9:30 A.M.	1.94
" 22	12:05 P.M.	2.00	12:45 P.M.	1.98	1:00 P.M.	2.11
" 22	4:50 P.M.	2.01	5:15 P.M.	1.99	5:40 P.M.	2.06
" 22	8:00 P.M.	2.00				
" 23	7:50 A.M.	1.99	8:00 A.M.	1.96	8:20 A.M.	1.94
" 23	12:40 P.M.	1.98	12:55 P.M.	1.97	1:10 P.M.	2.07
" 23	4:55 P.M.	1.99	5:05 P.M.	1.97	5:45 P.M.	2.06
" 24	8:00 A.M.	1.99	8:15 A.M.	2.00	8:30 A.M.	1.99
" 24	12:15 P.M.	1.97	11:35 A.M.	2.00	12:00 M.	2.06
" 24	4:35 P.M.	1.98	4:20 P.M.	1.98	4:50 P.M.	2.16
" 24	7:40 P.M.	1.97				
Period Averages	Av. Tons Per Acre Foot 2.00 Av. Discharge in S.F. 24.8 Av. Tons Per Day 98.4		Av. Tons Per Acre Foot 1.99 Av. Discharge in S.F. 24.8 Av. Tons Per Day 97.9		Av. Tons Per Acre Foot 2.06 Av. Discharge in S.F. 37.2 Av. Tons Per Day 152	

⊕ Weighted Mean.
ϕ Total

** Percent of Total Cations.
*** Percent of Total Anions.

* Not less than two samples per month.
# Not less than one sample per month.

ELECTRICAL CONDUCTANCE OF WATER SAMPLES — 1941

San Marcial Station

Date	Kx10^5 @25°C	Date	Kx10^5 @25°C	Date	Kx10^5 @25°C	Date	Kx10^5 @25°C	Date	Kx10^5 @25°C	Date	Kx10^5 @25°C	Date	Kx10^5 @25°C	Date	Kx10^5 @25°C	Date	Kx10^5 @25°C
Jan. 1	96.5	Feb. 12	88.0	Mar. 29	87.4	May 5	81.4	May 29	43.7	July 8	118	Aug. 23	80.5	Oct. 7	128	Nov. 21	51.8
2	92.1	13	88.2	30	83.8	5	81.1	29	43.9	9	49.6	24	82.4	8	87.3	22	53.5
3	89.1	14	86.7	31	80.8	6	82.6	30	40.1	10	46.0	25	87.5	9	78.6	23	57.1
4	89.7	16	81.9	Apr. 1	79.2	6	87.6	31	40.0	11	49.6	26	109	10	86.0	24	53.4
5	101	17	89.6	2	78.9	6	97.5	31	39.7	12	49.4	27	71.6	11	81.5	25	55.0
6	97.1	18	110	3	79.5	6	101	June 1	39.3	13	87.7	28	72.3	12	93.3	26	55.8
7	96.2	19	104	4	76.1	6	103	1	38.6	14	48.9	29	72.5	13	57.0	27	55.5
8	95.5	19	105	5	76.4	7	84.9	2	37.6	15	47.7	30	100	14	56.3	28	57.9
9	94.4	20	102	6	74.9	7	78.7	3	38.3	16	54.0	31	85.4	15	65.4	29	57.1
10	95.7	21	92.3	7	73.5	8	70.2	3	36.7	17	55.7	Sept. 1	90.8	16	66.6	30	59.1
11	93.0	22	101	8	75.1	8	67.0	4	38.8	18	56.2	2	97.8	17	72.6	Dec. 1	62.0
12	93.5	23	98.6	9	75.1	9	62.7	4	38.7	19	51.6	3	90.4	18	70.3	2	62.4
13	94.3	24	101	10	79.2	9	62.5	5	39.3	20	54.7	4	91.6	19	70.1	3	59.0
14	98.7	25	101	11	76.6	10	58.9	6	42.4	21	49.2	5	92.2	20	95.0	4	60.8
15	95.3	26	95.6	12	74.8	11	60.5	7	39.8	22	48.1	6	97.1	21	88.9	5	60.3
16	97.3	27	97.6	13	72.0	12	53.3	8	47.7	23	59.2	7	97.1	22	50.5	6	60.8
17	103	28	93.1	14	72.5	12	56.1	9	39.1	24	64.6	8	93.2	23	49.2	7	68.3
18	105	Mar. 1	95.6	15	73.0	13	52.6	10	47.9	25	61.1	9	93.6	24	49.5	8	57.1
19	101	2	94.8	16	73.5	13	52.0	11	46.1	26	72.8	10	98.0	25	58.3	9	58.4
20	95.8	3	94.4	16	72.7	14	52.4	12	37.7	27	61.3	11	91.2	26	131	10	60.2
21	95.1	4	91.1	17	71.0	15	51.3	13	36.6	28	59.9	12	96.6	27	134	11	59.4
22	92.4	5	91.4	17	71.0	15	49.4	14	36.9	29	58.1	13	93.9	27	135	12	61.8
23	94.3	6	96.3	18	73.7	16	49.5	15	38.4	30	64.8	14	95.1	28	84.2	13	64.5
24	93.8	7	89.5	19	68.7	17	46.7	16	39.5	31	64.0	15	96.2	29	68.2	14	61.3
25	93.1	8	88.4	19	69.0	17	48.4	17	50.1	Aug. 1	77.0	16	115	30	63.8	15	62.7
26	91.4	9	89.4	20	65.9	18	44.6	18	43.1	2	75.9	17	101	31	75.1	16	65.1
27	93.8	10	87.9	21	65.4	18	43.3	19	42.8	3	75.6	18	89.2	Nov. 1	64.7	17	61.7
28	89.9	11	91.4	21	65.6	19	41.7	20	43.2	4	77.0	19	88.2	2	62.7	18	61.3
29	91.4	12	91.2	22	62.4	19	42.2	21	44.4	5	85.4	20	114	3	53.0	19	61.9
30	92.4	13	88.4	22	61.1	20	42.1	22	41.5	6	85.4	21	116	4	49.5	20	61.7
31	101	14	87.1	23	69.9	20	41.8	23	41.7	7	85.4	22	110	5	48.0	21	62.6
Feb. 1	97.5	15	87.0	23	70.3	21	38.7	24	40.2	8	86.4	23	97.5	6	48.3	23	64.4
2	97.0	16	85.9	24	70.8	22	41.1	25	41.0	9	86.4	24	159	7	47.6	24	63.5
3	104	17	88.9	25	73.0	22	43.4	26	38.8	10	85.4	25	150	8	47.0	25	63.9
4	99.5	18	92.3	26	80.1	23	45.4	27	40.0	11	86.1	26	140	9	49.3	26	63.7
5	100	19	111	27	78.0	23	45.1	28	41.1	12	123	27	110	10	48.9	27	64.0
6	96.0	20	115	28	79.5	24	49.5	29	37.2	13	113	28	109	11	50.8	28	63.9
6	96.4	21	103	29	78.9	24	49.7	30	34.5	15	118	29	76.[illegible]	12	54.8	29	65.7
6	94.3	22	90.1	30	77.9	25	49.5	July 1	42.0	16	114	30	98.0	13	51.8	30	66.9
7	88.1	23	91.2	May 1	72.7	25	73.7	2	35.6	17	116	Oct. 1	127	14	56.7	31	65.4
7	85.1	24	93.9	2	74.0	26	59.2	3	36.4	18	121	2	126	15	53.0		
8	84.6	25	95.2	2	76.7	26	47.7	4	38.7	19	62.8	3	90.4	16	55.3		
9	89.0	26	97.8	3	89.6	27	46.0	5	38.8	20	108	4	82.9	17	51.7		
10	91.6	27	92.7	3	90.9	28	48.6	6	40.2	21	84.7	5	82.7	18	50.0		
11	91.9	28	88.4	4	90.9	28	49.2	7	63.8	22	77.0	6	126	20	54.8		

El Paso Station

Jan. 1	204	Feb. 11	221	Mar. 13	204	Apr. 24	129	June 5	141	July 18	120	Aug. 29	123	Oct. 10	194	Nov. 21	197
2	208	12	219	14	209	25	132	6	136	19	122	30	121	11	189	22	201
3	207	12	220	15	149	26	128	7	139	20	122	31	118	12	199	23	204
4	216	13	221	16	135	27	124	8	136	21	120	Sept. 1	114	13	199	24	206
5	212	14	219	17	119	28	126	9	136	22	117	2	115	14	182	25	207
6	205	15	219	18	127	29	133	10	136	23	110	3	110	15	171	26	208
7	216	16	218	19	132	30	131	11	133	24	118	4	115	16	179	27	209
8	216	17	217	20	139	May 1	128	12	137	25	119	5	123	17	166	28	211
9	214	18	218	21	154	2	133	13	135	26	120	6	128	18	175	29	211
10	209	19	217	22	148	3	134	14	136	27	122	7	125	19	174	30	211
11	217	19	219	23	139	4	138	15	137	28	116	8	119	20	181	Dec. 1	209
12	216	19	218	24	137	5	135	16	134	29	108	9	120	21	185	2	209
13	215	20	218	25	140	6	138	17	135	30	123	10	127	22	172	3	208
14	218	20	220	26	137	7	131	18	137	31	124	11	124	23	197	4	211
15	217	20	218	27	134	8	139	19	136	Aug. 1	117	12	129	24	187	5	212
16	219	21	217	28	133	9	143	20	132	2	123	13	127	25	174	6	214
17	217	21	217	29	136	10	139	21	132	3	124	14	127	26	196	7	216
18	219	21	216	30	134	11	145	22	133	4	121	15	126	27	195	8	215
19	212	22	217	31	137	12	138	24	129	5	123	16	130	28	188	9	215
20	219	22	218	Apr. 1	135	13	138	25	127	6	120	17	127	29	202	10	173
21	219	22	217	2	131	14	137	26	128	7	114	18	131	30	197	11	144
22	189	23	216	3	133	15	134	27	127	8	122	19	134	31	197	12	121
23	218	23	216	4	130	16	132	28	132	9	116	20	143	Nov. 1	202	13	119
24	218	23	216	5	130	17	135	29	130	10	124	21	138	2	204	14	122
25	219	24	215	6	134	18	136	30	127	11	113	22	93.4	3	203	15	148
26	219	24	216	7	127	19	135	July 1	130	12	112	23	87.1	4	208	16	165
27	219	25	219	8	123	20	140	2	130	13	75.5	24	112	5	213	17	174
28	221	26	219	9	128	21	137	3	130	14	90.2	25	137	6	210	18	184
29	216	27	184	10	127	22	134	4	131	15	117	26	154	7	210	19	192
30	214	28	197	11	129	23	135	5	136	16	128	27	172	8	209	20	194
31	217	Mar. 1	179	12	133	24	133	6	131	17	117	28	165	9	209	21	195
Feb. 1	217	2	165	13	133	25	132	7	130	18	115	29	99.7	10	206	22	199
2	213	3	157	14	129	26	135	8	125	19	117	30	68.4	11	206	23	201
3	214	4	153	15	134	27	141	9	129	20	117	Oct. 1	87.9	12	208	24	203
4	217	5	157	16	134	28	144	10	131	21	114	2	109	13	203	25	202
5	218	6	171	17	132	29	154	11	129	22	113	3	128	14	148	26	201
6	212	7	181	18	135	30	149	12	127	23	117	4	155	15	137	27	204
7	215	8	192	19	135	31	144	13	122	24	116	5	174	16	135	28	204
8	216	9	196	20	138	June 1	144	14	125	25	112	6	182	17	154	29	201
9	216	10	197	21	133	2	143	15	116	26	117	7	184	18	176	30	198
10	220	11	202	22	132	3	142	16	119	27	120	8	185	19	186	31	200
11	218	12	204	23	129	4	142	17	123	28	119	9	192	20	191		

Alamo Arroyo Highway (U. S. 80) Bridge

June 5	73.5						

Camp Rice Arroyo Highway (U. S. 80) Bridge

		June 5	23.7	July 30	45.9		

Diablo Arroyo Highway (U. S. 80) Bridge

June 5	35.8	July 30	36.2	July 30	31.0	July 30	32.6

Madden Arroyo Highway (U. S. 80) Bridge

July 9	30.4						

Guayuco Arroyo Highway (U. S. 80) Bridge

1940

Aug. 31	50.5						

1941

June 5	58.2	July 9	99.1				

Fort Quitman Station

Jan. 4	392	Feb. 19	427	Apr. 9	383	June 5	87.4	July 9	456	Aug. 13	162	Aug. 27	323	Oct. 15	339	Dec. 10	371
8	399	22	453	16	566	5	119	12	483	13	161	Sept. 3	302	22	345	17	305
11	374	26	470	23	441	5	119	16	301	15	144	10	305	25	170	20	332
15	388	Mar. 5	449	30	348	5	134	23	280	15	143	13	309	29	346	24	316
18	398	8	370	May 3	250	6	151	23	284	15	143	17	274	Nov. 6	366	31	343
22	410	12	433	7	338	11	310	26	359	15	142	22	76.9	8	374		
25	391	18	188	14	347	14	316	30	204	15	140	22	75.0	12	375		
29	399	18	187	22	421	18	416	30	210	15	117	24	133	19	320		
Feb. 1	399	18	187	24	362	25	362	Aug. 6	326	15	99.3	27	214	22	353		
5	406	22	269	28	197	28	355	6	324	20	227	Oct. 1	115	26	361		
8	387	26	402	28	197	July 2	328	9	327	20	228	8	311	Dec. 3	366		
12	414	Apr. 2	586	June 4	365	2	314	13	145	23	215	11	349	6	352		

La Nutria Station

Jan. 4	343	Feb. 20	403	Apr. 19	426	May 24	48.1	June 26	168	July 25	95.8	Oct. 11	320	Nov. 15	385	Dec. 11	353
6	345	25	421	19	424	25	201	28	75.6	29	211	16	345	18	388	13	391
7	384	Mar. 1	429	24	483	26	201	29	181	Aug. 6	218	21	349	20	297	16	234
16	353	5	469	26	207	29	204	30	105	7	253	23	369	22	310	18	208
21	390	16	404	28	128	June 3	201	July 1	105	23	216	25	151	25	335	20	261
23	347	18	432	29	126	4	293	9	421	24	87.8	30	323	27	358	23	324
28	337	20	287	30	149	7	91.8	11	89.7	30	287	Nov. 1	324	29	371	25	341
Feb. 1	397	24	276	May 6	296	10	198	15	364	Sept. 15	296	6	392	Dec. 2	372	27	353
5	302	Apr. 1	435	9	297	14	299	21	135	22	73.9	8	390	4	379	30	355
15	350	2	414	15	371	17	325	22	211	23	64.6	11	390	6	383		
19	411	8	492	20	479	21	308	24	108	24	70.6	13	389	9	384		

ELECTRICAL CONDUCTANCE OF WATER SAMPLES — 1941

Upper Presidio Station

Date	Kx10⁵ @25°C	Date	Kx10⁵ @25°C	Date	Kx10⁵ @25°C	Date	Kx10⁵ @25°C	Date	Kx10⁵ @25°C	Date	Kx10⁵ @25°C	Date	Kx10⁵ @25°C	Date	Kx10⁵ @25°C	Date	Kx10⁵ @25°C
Jan. 2	421	Feb. 27	448	Apr. 10	545	May 26	108	June 30	97.1	July 31	176	Sept. 18	299	Oct. 30	171	Dec. 16	376
20	403	Mar. 12	536	17	596	29	196	July 2	116	Aug. 7	259	25	116	Nov. 6	378	18	241
23	402	17	536	24	604	June 5	329	3	81.6	11	253	27	94.0	13	420	24	331
30	407	20	496	29	346	8	127	10	162	20	185	29	127	20	396		
Feb. 6	403	29	392	May 8	303	12	214	17	181	27	170	Oct. 9	287	27	365		
13	403	31	402	17	71.1	19	326	24	129	Sept. 3	317	16	379	Dec. 4	397		
22	425	Apr. 3	510	22	458	26	425	28	110	10	250	25	361	11	403		

Rio Conchos near Ojinaga, Chihuahua

Jan. 2	109	Feb. 13	96.7	Mar. 27	80.8	Apr. 28	57.8	June 10	99.5	July 16	71.4	Aug. 20	34.5	Oct. 15	32.4	Nov. 24	77.5
9	104	22	70.6	31	89.6	May 8	125	12	105	25	58.9	27	51.0	18	33.3	Dec. 3	87.1
19	104	27	72.6	Apr. 3	96.3	15	111	20	102	31	36.4	Sept. 3	55.0	27	58.0	11	87.8
23	98.9	Mar. 7	80.5	10	105	22	115	26	75.3	Aug. 4	58.0	10	56.2	Nov. 6	67.4	14	90.1
30	101	17	75.3	17	107	27	110	July 3	69.0	7	44.6	18	34.8	14	76.7	18	89.7
Feb. 6	95.6	20	71.8	24	111	29	110	10	84.3	15	46.6	Oct. 9	72.9	20	76.1	29	89.1

Lower Presidio Station

May 8	201	June 29	69.4	Sept. 28	59.9												

Pecos River Station

Jan. 2	637	Feb. 11	628	Mar. 25	638	Apr. 27	346	May 27	473	June 30	505	Aug. 9	502	Oct. 23	341	Dec. 2	958
4	649	15	696	25	674	27	348	29	575	July 1	536	11	507	25	354	4	807
6	637	17	673	26	662	28	376	31	610	4	474	12	516	27	458	6	701
8	641	19	669	29	162	28	317	June 3	954	6	506	14	574	29	530	8	702
10	649	21	677	31	981	29	171	5	238	8	518	16	592	31	450	10	731
12	657	23	677	Apr. 2	895	30	245	7	308	10	550	18	682	Nov. 2	411	12	736
14	661	26	669	4	522	May 1	138	10	307	12	536	20	612	4	489	14	731
16	657	27	869	6	476	2	214	10	305	13	645	22	682	6	452	16	767
18	661	27	869	8	424	2	159	11	306	15	525	24	658	8	429	17	808
20	653	27	869	10	422	3	225	12	198	18	610	26	542	10	403	19	746
22	661	28	677	12	407	9	267	15	302	20	695	28	653	12	397	21	712
24	657	28	677	14	158	10	482	17	337	23	675	30	708	14	406	23	726
26	657	28	677	14	77.8	12	389	18	345	25	682	Sept. 30	454	16	425	25	698
28	649	Mar. 2	670	14	65.1	14	400	19	350	26	821	Oct. 7	379	18	447	27	685
30	657	4	670	16	80.2	16	373	20	351	28	1032	9	352	20	504	29	656
Feb. 1	686	6	662	17	922	18	369	21	356	29	495	10	316	22	603	31	644
3	894	10	674	19	670	18	347	22	357	31	446	14	341	24	565		
5	464	12	658	21	372	21	311	23	351	Aug. 2	412	17	332	26	646		
8	485	16	654	23	316	25	356	24	381	4	490	19	312	28	845		
9	570	19	651	25	334	25	411	26	489	7	526	21	322	30	967		

Eagle Pass Station

Jan. 8	168	Feb. 18	163	Mar. 28	158	May 7	64.3	June 13	228	Aug. 3	131	Sept. 10	164	Oct. 20	146	Dec. 15	322
11	172	22	158	31	290	10	100	18	247	7	132	13	165	25	187	20	317
13	169	24	158	Apr. 4	128	13	169	20	254	9	151	14	166	27	190	24	297
17	174	28	158	8	195	17	153	July 5	132	11	120	20	65.4	Nov. 3	239	27	297
20	187	Mar. 4	155	12	154	19	137	8	188	16	138	25	107	9	252	30	297
24	177	8	163	14	93.7	23	86.6	13	219	18	144	26	107	11	256		
27	93.2	10	172	19	266	26	94.1	15	184	23	117	29	108	14	274		
30	171	15	156	22	269	30	118	19	253	26	120	Oct. 4	65.1	18	277		
Feb. 4	188	17	162	26	151	June 6	165	22	253	30	105	7	116	21	297		
8	195	22	155	28	100	7	151	26	249	Sept. 1	140	10	185	25	301		
14	163	24	157	May 2	62.0	9	169	28	265	6	125	13	192	Dec. 1	200		

Rio Salado Station

Jan. 3	75.8	Mar. 14	364	May 2	137	June 4	52.3	June 20	71.5	Aug. 8	75.6	Sept. 10	40.6	Oct. 31	57.5	Dec. 19	72.2
10	81.2	21	365	3	229	4	31.2	22	74.4	15	61.2	10	39.0	Nov. 1	57.4	26	70.6
17	81.3	28	290	4	144	5	29.0	25	69.3	22	70.0	11	47.5	7	61.4	31	78.4
24	84.3	Apr. 4	267	5	144	5	37.1	24	59.4	29	73.9	12	45.7	14	64.8		
31	181	11	258	12	55.9	6	30.3	27	95.8	29	81.6	30	50.2	21	57.4		
Feb. 7	164	16	254	16	49.2	6	30.5	July 4	50.9	30	91.5	Oct. 1	47.8	28	55.9		
14	290	25	258	21	41.8	7	36.3	11	52.3	31	77.7	3	50.0	30	65.0		
21	288	29	305	22	43.8	13	60.8	18	57.7	Sept. 1	153	10	51.5	Dec. 1	64.6		
28	308	30	309	23	37.9	18	84.0	25	42.2	5	247	17	48.4	5	59.2		
Mar. 7	302	May 1	137	29	31.9	19	82.2	Aug. 1	49.8	10	49.0	24	50.4	12	70.1		

Rio San Juan Station

Feb. 7	52.0	Apr. 2	78.2	May 21	137	June 18	43.9	July 16	51.8	Sept. 10	63.3	Sept. 26	66.9	Nov. 12	117	Dec. 31	112
12	101	9	80.2	27	139	22	41.0	25	59.2	11	55.7	Oct. 2	75.8	19	109		
19	89.9	16	86.3	28	65.7	25	30.1	30	69.7	12	32.4	8	78.0	27	107		
Mar. 5	106	23	117	29	45.6	24	29.9	Aug. 6	77.6	13	39.3	15	98.4	Dec. 3	119		
12	113	28	77.4	June 3	56.2	25	47.0	13	110	18	60.3	22	81.9	10	103		
19	102	May 7	124	6	32.8	July 2	59.7	20	88.6	19	61.4	29	94.5	17	106		
26	101	14	81.5	11	188	9	64.2	Sept. 3	78.4	20	102	Nov. 5	89.6	24	107		

Rio Grande City Station

Jan. 1	144	Mar. 7	149	Apr. 30	74.7	May 28	93.1	June 24	63.9	July 25	175	Sept. 12	47.7	Oct. 14	177	Nov. 7	184
3	147	10	153	May 1	125	29	78.5	25	71.1	25	181	13	48.2	14	155	10	212
6	147	12	153	2	126	31	81.3	25	64.5	29	189	13	50.1	15	169	12	237
8	152	14	165	2	86.6	June 1	71.2	26	82.7	30	212	14	77.5	16	180	14	241
10	155	17	154	2	71.2	2	80.9	26	87.1	Aug. 1	227	15	94.5	17	186	18	237
13	154	19	152	3	97.5	4	118	26	93.4	4	139	17	126	18	188	20	236
15	152	21	159	5	89.8	5	86.1	27	80.0	6	122	18	89.5	19	175	22	236
17	150	24	150	4	70.8	5	91.3	27	80.0	8	108	19	97.2	19	173	24	246
20	177	26	146	4	80.5	5	70.1	28	106	11	127	20	115	20	162	26	248
22	154	28	148	5	69.5	6	55.1	28	115	13	134	21	77.8	20	161	Dec. 1	266
24	154	31	152	5	66.2	6	44.7	29	124	15	143	21	51.0	21	154	3	243
27	160	Apr. 2	150	6	67.4	7	49.2	30	149	18	118	22	59.1	21	194	5	243
29	89.2	4	123	6	61.6	7	55.6	July 1	156	20	126	22	54.1	22	199	8	313
29	63.4	7	189	7	67.4	8	69.2	2	164	22	114	23	53.0	22	195	10	335
29	91.2	9	135	7	65.5	9	115	4	281	25	135	23	47.6	23	130	12	333
31	127	11	150	8	67.3	11	164	5	237	27	131	24	46.8	23	130	15	274
Feb. 3	65.2	14	395	10	53.6	13	140	6	192	29	122	26	83.2	24	131	17	276
5	62.1	15	290	12	65.8	16	135	6	142	Sept. 1	127	28	96.8	24	133	22	285
7	144	16	136	14	64.5	19	166	7	122	3	130	29	78.6	25	140	24	277
10	84.3	17	143	16	55.1	20	136	8	137	5	130	Oct. 1	98.6	26	141	26	310
12	141	17	188	19	98.0	21	139	11	131	8	144	3	88.7	27	159	29	297
14	172	18	171	21	136	21	104	13	109	10	115	5	84.9	27	93.2	31	280
17	174	19	115	22	57.6	22	63.9	14	136	10	73.2	6	77.7	28	85.3		
21	159	21	105	22	57.2	22	159	15	126	11	63.9	7	76.2	28	102		
24	144	23	95.8	23	60.9	23	88.2	16	145	11	56.8	7	69.6	29	154		
26	145	25	87.1	23	78.5	23	79.1	16	157	11	52.6	8	70.5	30	183		
28	150	27	170	24	55.9	23	79.4	17	120	11	54.9	10	113	31	168		
Mar. 3	158	28	78.4	25	84.7	24	61.1	18	171	12	58.2	13	170	Nov. 3	209		
5	152	29	79.1	28	121	24	61.0	21	77.0	12	51.8	13	182	5	191		

North Floodway Near Sebastian, Texas

Jan. 11	352	Feb. 28	359	Apr. 12	238	May 12	73.8	June 6	383	July 31	286	Sept. 11	234	Nov. 14	279		
25	348	Mar. 15	375	28	108	17	135	30	161	Aug. 13	305	29	205	Dec. 4	228		
Feb. 10	279	29	154	May 8	75.8	24	122	July 11	289	30	307	Oct. 16	231				

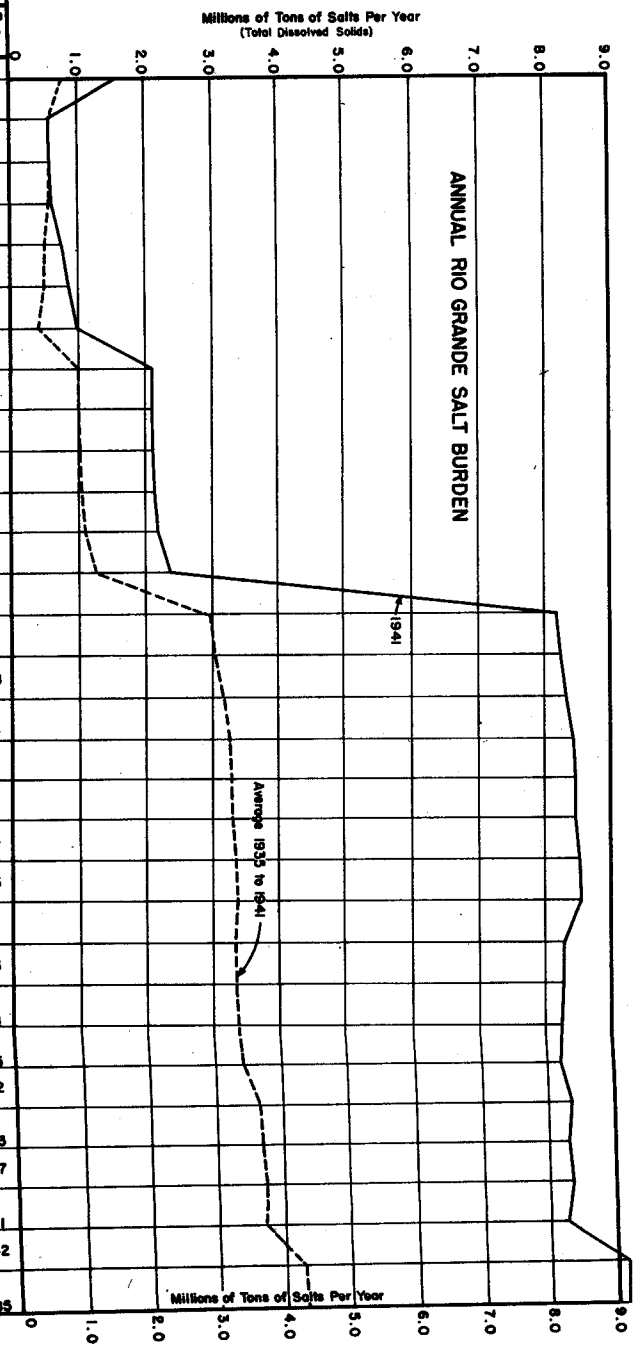
Lower Brownsville Station

Apr. 19	165																

RIO GRANDE SALT BURDEN

The graphical and tabular results below are based upon the chemical analyses shown on the preceding pages as well as upon similar data in previous Water Bulletins. For some tributaries the results are based upon curves showing the relationship between salt concentration and amount of stream flow. For other stations and tributaries the results are arrived at by secondary deductions. For the total stretch of river between Eagle Pass and Rio Grande City a small adjustment (1.8% of Rio Grande City total tons) was necessary to balance. This adjustment was prorated on a river mileage basis from Eagle Pass to Rio Grande City.

	Concentration Tons/Acre Foot	
	1941	Average 1935 to 1941
SAN MARCIAL	.57	.67
UNMEASURED		
CABALLO DAM	.82	.77
UNMEASURED		
LEASBURG DAM	.87	.83
UNMEASURED		
EL PASO	1.21	1.18
UNMEASURED		
FORT QUITMAN	2.29	2.57
UNMEASURED		
LA NUTRIA	1.96	2.26
UNMEASURED		
UPPER PRESIDIO	2.11	2.09
RIO CONCHOS	.54	.55
UNMEASURED		
LOWER PRESIDIO	.82	.78
ALAMITO CREEK	.29	.45
TERLINGUA CREEK	.60	.52
UNMEASURED		
JOHNSON RANCH	.77	.74
UNMEASURED		
LANGTRY	.72	.69
PECOS RIVER	4.36	3.65
GOODENOUGH SPRING	.58	.58
DEVILS RIVER	.34	.28
UNMEASURED		
DEL RIO	1.62	1.07
SAN FELIPE CREEK	.59	.58
PINTO CREEK	.59	.59
RIO SAN DIEGO	.30	.34
RIO SAN RODRIGO	.21	.55
UNMEASURED		
EAGLE PASS	1.53	1.01
RIO ESCONDIDO	.53	.56
UNMEASURED		
EL JARDIN (Estimated)	1.50	.98
UNMEASURED		
LAREDO	1.49	.95
RIO SALADO	.57	.92
UNMEASURED		
ZAPATA	1.41	.93
RIO ALAMO	.40	.37
UNMEASURED		
ROMA	1.34	.91
RIO SAN JUAN	.60	.62
UNMEASURED		
RIO GRANDE CITY	1.19	.85



SANITARY ASPECTS OF WATER QUALITY

Along the Rio Grande, from El Paso, Texas to the Gulf of Mexico.

During 1941 a sanitary water sampling and assay program was carried on jointly by the Texas State Health Department, the Federal Department of Public Health of Mexico, and the American and Mexican Sections of this Commission. Twelve regular sampling stations were established from Lower Brownsville gaging station, 57 river miles above the Gulf of Mexico, to the El Paso gaging station, 1,243.4 river miles above the Gulf. Analyses of the samples from these stations were made in the State Health Department laboratory at Austin, Texas.

Independent of the above, analytical results were also received from the laboratory of the El Paso Sewage Treatment Plant, and the laboratory of the Federal Board of Public Improvements, Nuevo Laredo, Tamaulipas, Mexico.

The 1941 results show the greatest river polution to be in the vicinity of El Paso and Cd. Juarez, but at no place was the river found to be in a septic condition. The 1941 results have, of course, shown conclusively that at all stations and during all seasons of the year coliform organisms are present in the Rio Grande water in such densities as to render the water unfit for human consumption without proper treatment.

The 1941 results and those of previous years show a seasonal variation in density of coliform organisms with the higher densities occurring in the summer.

The average results of the 1941 sampling for fluorides at the Austin laboratory are shown graphically on the following page. Thus, it is seen that fluorides were everywhere below the safe limit for human consumption.

Pending the collection of additional data and the possible further unification of procedures, the 1941 detailed results will be held in unpublished form.

For detailed results showing the 1941 content of boron, chlorides, and pH in the river water at several points along the Rio Grande and its tributaries from El Paso to the Gulf, see "Chemical Analyses" elsewhere in this bulletin. These results show that the monthly average boron content did not exceed 1.26 p.p.m. (Rio Salado), whereas the physiological tolerance point for humans is 30 p.p.m. (*). Likewise it is seen that only at points from El Paso to Upper Presidio, from the Pecos River to Eagle Pass, the Rio Salado and at Rio Grande City, did the average monthly content of chlorides in the river water exceed 250 p.p.m. (***). Similarly the average monthly range of hydrogen-ion concentration was found to vary from pH 7.5 to 8.2, which is within the safe range for fish (**).

BIOCHEMICAL OXYGEN DEMAND AND DISSOLVED OXYGEN IN RIO GRANDE WATER NEAR EL PASO

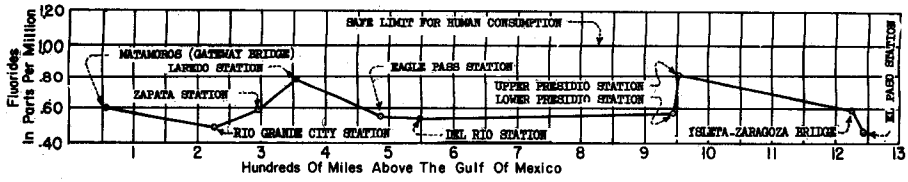
Date 1941	Just Below Leon Street Wasteway Mexican Side				Cordova Island Bridge Center of River				Just above El Paso Sewage Outfall United States Side				Just above El Paso Sewage Outfall Mexican Side				1 Mile below El Paso Sewage Outfall United States Side			
	B. O. D. Parts Per Million	Water Temp. °F	Dissolved Oxygen Parts per Million	Dissolved Oxygen Percent Saturation	B. O. D. Parts Per Million	Water Temp. °F	Dissolved Oxygen Parts per Million	Dissolved Oxygen Percent Saturation	B. O. D. Parts Per Million	Water Temp. °F	Dissolved Oxygen Parts per Million	Dissolved Oxygen Percent Saturation	B. O. D. Parts Per Million	Water Temp. °F	Dissolved Oxygen Parts per Million	Dissolved Oxygen Percent Saturation	B. O. D. Parts Per Million	Water Temp. °F	Dissolved Oxygen Parts per Million	Dissolved Oxygen Percent Saturation
July 2	2.4		6.4		2.8		6.9		3.5		6.9						15.2		3.8	
" 15	1.8	84	6.8	88	2.3	84	6.3	82	2.5	84	6.4	83	2.7	85	6.2	82	9.9	83	4.2	53
" 22	1.6	80	6.9	85	2.8	81	6.7	85	1.9	78	6.4	76	2.1	80	6.7	82	10.4	78	4.7	57
August 5	1.5	82	6.7	84	1.6	84	7.0	90	5.0	85	6.8	87	1.9	84	7.1	91	15.0	85	3.8	49
" 12	1.8	86	7.0	92	5.2	87	8.5	113	5.9	85	6.7	86	3.4	87	7.0	95	12.9	86	4.5	59
" 26	2.5	82	7.3	92	3.9	83	7.1	91	2.5	83	6.9	89	4.3	83	7.2	92	9.5	84	5.0	64
September 2	1.9	84	6.7	86	2.6	84	6.9	88	3.9	85	6.4	84	3.3	84	6.7	86	11.3	85	4.8	63
" 9	2.2	78	7.8	95	2.6	78	7.5	91	6.3	77	7.6	91	3.0	78	7.8	95	12.9	77	5.2	62
" 16	2.8	81	7.3	91	2.1	81	7.3	91	5.1	81	7.0	87	2.0	81	6.8	85	15.8	82	4.0	52
October 7	1.5	75	7.8	92	1.5	75	7.8	92	4.3	75	7.7	91	5.6	75	7.5	88	19.0	76	3.7	44
" 14	2.1	76	7.8	92	4.2	76	7.5	88	6.3	76	7.1	84	4.6	76	7.5	88	17.4	76	4.9	58
" 21	1.6	74	8.6	100	1.7	74	8.3	97	‡ 6.5	71	7.3	82	2.4	74	8.4	98	43.0	74	1.4	16
" 28	1.7	66	9.0	96	1.9	66	8.5	91	6.9	65	8.1	85	5.4	66	8.5	91	42.0	68	2.5	27
November 4	1.7	68	8.0	87	3.8	68	7.4	81	‡ 8.4	68	7.0	76	6.4	68	7.6	83	32.0	68	3.8	41
" 10	0.9	64	8.1	84	1.7	64	8.0	83	20.0	65	7.4	79	4.5	64	8.1	84	54.0	68	2.4	26
" 18	1.6	64	8.5	89	4.8	63	8.2	89	10.0	61	7.8	78	4.9	63	8.1	84	23.0	63	5.4	56
" 25	1.0	57	9.4	90	4.0	57	9.2	88	16.0	55	8.9	83	4.7	56	9.1	86	37.0	59	6.0	59
December 2	0.9	63	9.4	97	‡ 6.7	63	7.5	78	‡39.0	62	5.9	60	10.0	63	7.1	74	111	68	0.0	0
" 9	1.5	55	9.8	88	5.9	54	9.1	84	9.9	54	8.9	82	5.0	54	8.9	82	28.0	57	6.0	58
" 16	1.3	58	9.4	91	7.9	56	9.4	89	19.0	54	8.9	82	8.1	55	8.9	83	32.0	58	4.8	47
" 23	1.5	50	9.6	85	2.0	50	10.0	89	11.1	50	9.7	86	1.7	50	9.9	88	28.0	52	7.5	68
" 30	1.6	55	9.5	89	5.0	54	9.0	85	16.5	54	9.1	84	7.6	55	9.1	85	37.0	57	6.2	60
July Average	1.9		6.7	86	2.6		6.6	82	2.2		6.6	80	2.4		6.4	82	11.8		4.2	55
Aug. "	1.9		7.0	89	3.6		7.5	99	4.5		6.8	87	3.2		7.1	92	12.5		4.4	57
Sept. "	2.1		7.3	91	2.4		7.2	90	5.1		7.0	87	2.8		7.1	89	13.3		4.7	59
Oct. "	1.7		8.3	95	2.3		8.0	92	6.0		7.6	86	4.5		8.0	91	30.4		5.1	56
Nov. "	1.3		8.5	88	4.1		8.2	84	13.6		7.8	79	5.1		8.2	84	36.5		4.4	46
Dec. "	1.3		9.5	90	5.5		9.0	85	19.1		8.5	79	6.5		8.8	82	51.2		4.9	47
1941 Average	1.7		7.9	90	3.4		7.8	89	8.4		7.4	83	4.1		7.6	87	26.0		4.3	50
@ Average 1936-1941												77								51

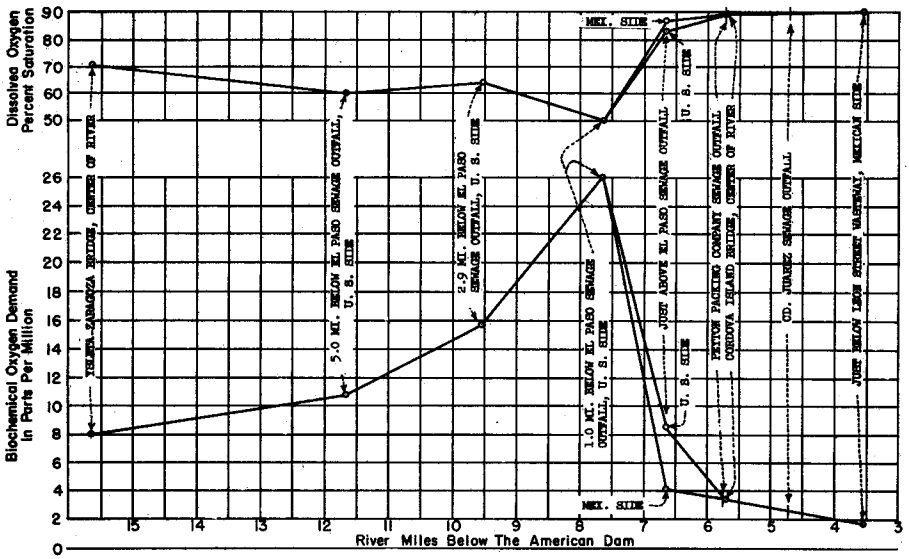
Date 1941	2.9 Miles below El Paso Sewage Outfall United States Side				5.0 Miles below El Paso Sewage Outfall United States Side				Ysleta-Zaragoza Bridge Center of River				From Sewage Outfalls B. O. D. in Parts Per Million			From Asarcaro Wasteway (From Franklin Canal)			
	B. O. D. Parts Per Million	Water Temp. °F	Dissolved Oxygen Parts per Million	Dissolved Oxygen Percent Saturation	B. O. D. Parts Per Million	Water Temp. °F	Dissolved Oxygen Parts per Million	Dissolved Oxygen Percent Saturation	B. O. D. Parts Per Million	Water Temp. °F	Dissolved Oxygen Parts per Million	Dissolved Oxygen Percent Saturation	Cd. Juarez	Peyton Packing Company	El Paso	B. O. D. Parts Per Million	Water Temp. °F	Dissolved Oxygen Parts per Million	Dissolved Oxygen Percent Saturation
July 2					8.1		4.8		7.7		5.3								
" 15					6.7	83	4.1	52	4.3	85	5.5	71	131	900	125				
" 22					7.2	78	4.9	59	7.2	80	5.1	63			118				
August 5					6.7	84	4.8	62	6.4	85	4.9	64	103	800	110				
" 12					6.4	86	5.1	67	6.4	87	5.1	69	180	500					
" 26					5.9	84	5.7	73	9.2	84	5.8	74	185	885	131				
September 2					6.8	85	5.1	67	6.6	86	5.4	71	124	1,715	113				
" 9					7.5	77	6.0	72	6.3	78	6.2	75	81.0	372	76				
" 16					7.2	81	4.9	61	8.6	82	6.2	77	84.0	1,980	127				
October 7					8.6	75	5.3	62	6.8	75	6.3	74							
" 14					10.3	76	4.6	54	11.3	76	5.3	62			132				
" 21	5.2	69	7.0	77	14.6	73	4.4	50	4.1	73	8.0	92			140				
" 28	6.2	62	7.4	75	13.5	65	5.3	56	6.3	62	7.9	84			144	1.4	59	8.8	87
November 4	19.5	68	3.4	37	14.0	67	4.3	46	6.5	66	6.5	70	274	1,000	160				
" 10	23.0	66	4.7	50	9.8	65	6.1	64	6.1	64	6.7	70	219	1,850	162				
" 18	12.0	62	6.6	68	11.0	65	6.2	64	14.0	64	6.2	65	266	1,000	147	1.1	60	8.7	87
" 25	22.0	57	6.2	59	18.0	57	6.8	65	10.0	54	8.0	74	236	750	148				
December 2	36.0	62	3.3	34	18.0	64	3.0	32	11.0	63	4.9	51	332	1,000	150	0.7	56	9.2	87
" 9	24.0	56	6.1	58	18.0	56	6.0	57	8.6	55	7.4	69	335	485	135				
" 16	8.0	52	8.8	80	18.0	55	7.2	67	12.0	56	8.0	76	450	700	131	1.5	50	10.0	89
" 23	22.0	51	8.0	71	19.0	51	7.5	67	15.0	50	8.1	72	288	2,300	150				
" 30	23.0	55	6.4	60	21.0	55	6.2	58	8.1	54	7.3	67	378	900					
July Average					7.3		4.6	56	6.4		5.3	67	131	900	122				
Aug. "					6.3		5.2	67	7.3		5.3	69	155	788	120				
Sept. "					7.1		5.3	67	7.2		5.9	74	96.0	1,125	105				
Oct. "	5.7		7.2	76	11.8		4.9	56	7.1		6.9	78			139	1.4		8.8	87
Nov. "	19.1		5.2	54	13.2		5.8	60	9.2		6.8	70	249	1,150	154	1.1		8.7	87
Dec. "	22.6		6.5	61	18.8		6.0	56	10.9		7.1	67	357	1,077	142	1.1		9.6	88
1941 Average	15.8		6.3	64	10.8		5.3	60	8.0		6.2	71	198	996	150	1.2		9.0	87
@ Average 1936-1941								66				72							

@ Per Sample. * See Water Quality and Treatment - 1941 Manual, Am. W.W. Assn. *** The limit recommended by the U. S. Treasury.
** See Water Pollution in the United States, National Resources Committee, House Doc. 155, 76th Congress, 1st Session. ‡ Greater than.

SANITARY ASPECTS OF WATER QUALITY

Along the Rio Grande, from El Paso, Texas to the Gulf of Mexico.





RESULTS OF EXAMINATION OF WATER SAMPLES FROM THE RIO GRANDE AT NUEVO LAREDO, TAMAULIPAS

The analyses of water shown here were made by the Federal Board of Public Improvements at Nuevo Laredo, Tamaulipas Mexico, from samples of water taken from the Rio Grande by means of the pumps of the city water service, under the supervision of such Board.

Period	Water Analysis — Parts per Million				
	Turbidity	Total Alkalinity	Phenolphthalein Alkalinity	Total Hardness	Magnesia
Maximum 1941					
January	4,980	155	8.0	275	80
February	1,612	160	10.0	455	68
March	170	160	8.0	400	76
April	4,320	150	8.0	620	100
May	23,333	160	10.0	460	48
June	15,750	130	5.0	770	104
July	22,714	155	8.0	750	108
August	21,433	150	8.0	685	80
September	12,500	150	5.0	505	48
October	9,640	140	5.0	715	85
November	3,500	180	8.0	815	108
December	637	165	8.0	815	148
Average 1941					
January	476	145	7.0	393	57
February	238	148	8.0	364	53
March	119	148	7.0	372	55
April	746	130	6.0	339	49
May	6,735	123	4.0	258	25
June	3,918	112	4.0	580	55
July	5,708	123	5.0	521	54
August	8,053	133	5.0	386	32
September	5,986	128	5.0	333	27
October	3,659	127	4.0	485	41
November	733	151	5.0	738	83
December	283	157	5.0	781	119
Total	36,674	1,625	65.0	5,550	650
Average	3,056	135	5.0	463	54
Maximum	8,053	157	8.0	781	119
Minimum	119	112	4.0	258	25

‡ And Other Days.

Period	Water Analysis — Parts per Million				
	Turbidity	Total Alkalinity	Phenolphthalein Alkalinity	Total Hardness	Magnesia
Minimum 1941					
January	51	70	5.0	140	16
February	61	100	5.0	165	24
March	84	140	5.0	335	45
April	65	85	3.0	172	20
May	825	90	0.0	160	8
June	1,171	55	0.0	180	12
July	887	87	3.0	195	20
August	4,100	110	0.0	275	20
September	1,380	95	3.0	170	4
October	1,733	105	3.0	250	8
November	362	135	3.0	590	32
December	152	150	5.0	730	88
Annual Averages					
1932	1,434	132	4.4	340	22.7
1933	644	133	5.0	297	23.4
1934	494	132	5.3	262	25.9
1935	1,298	128	5.7	245	30.0
1936	1,292	135	5.1	275	34.6
1937	1,920	127	5.0	330	40.0
1938	1,435	134	5.7	307	39.0
1939	972	140	5.6	296	36.0
1940	1,899	137	6.0	296	41.0
1941	3,056	135	5.0	463	54.0
1932-1941	1,444	133	5.3	311	34.6

Extremes

Maximum	32,700	241	15	770	148
Dates	Sept. 1937	Aug. 1934	Dec. 1937	June 1941	Dec. 1941
Minimum	19	48	0	80	0.0
Dates	Jan. 1933	Apr. 1935	Nov. 1934‡	May 1935	Sept. 1932‡

RAINFALL ON UNITED STATES SIDE OF RIO GRANDE WATERSHED

INCHES—1941

The rainfall records shown below have not been published elsewhere. The source of each record, and the type of rain gage used, are shown below.

Latitude, longitude and elevation of each rainfall station will be found either at the bottom of the third page following, or in the index to rainfall stations in Water Bulletin No. 10.

American Dam Near El Paso

Recording Gage. — Record by U. S. Section I.B.C.

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total	Average 1938-1941
January		.16									.03	.05																.11				.35	.56
February	.06				.08		.08	.02												.01	T	.08										.33	.15
March						.07	.02					.10		.01	.06	1.92					.02											2.20	.64
April		.05																							.53	.30				.09		.97	.30
May		.02															.17	.01					.56		.03							.79	.30
June																			.03						.75			.18				.96	1.38
July			.19			.04			.02		.05			1.14							.07	.02							.30		.04	1.87	1.48
August						.18	.03					.10	.04			.01							.12						.14	.03	.09	.74	1.04
September							.11	.01			T										1.60	.14					.06	.02				1.94	1.38
October			.02																			.09							.04			.15	.41
November													.07					.05	.06													.18	.41
December										.16	.10																					.26	.16
Yearly																																10.74	8.15

Fort Bliss, Texas

Standard 8 inch rain gage. — Record by U. S. Army

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total	Normal ∮ 1904-1941
January	.21				T						.09	.05												T				.25	T			.58	.39
February	.07				.18	T	.18	.05											T	T		.07	T		T							.55	.35
March		T				T	T				.05	.06	.01	.02	.04	.90	.68				.04			.01								1.79	.55
April	T	.07				T						T	T									.05			.53	.76	.05			.17		1.59	.34
May	T	T	T	T						T							.30	.09			.05		.89	T	.22							1.53	.60
June			.02	T														.02	T	T			.01		.05		.18	.01		T		.28	.55
July			T			.44			.10	T	.06	T		.20		.07		.02	T	T	T	.02				.02	.08				.05	1.04	1.37
August			.21			.13	T	.01		T	T		1.15		T	T		T				.48	.04						.22	.01	T	2.25	1.87
September							.01	.02			T		.25						.01	.08	2.05	.21					.91	.56	.01	.06		4.17	1.40
October			.07								T										T	.33		.19					.10	.97		1.64	.81
November													.01					T	.04		.30	.09										.44	.49
December										.24	.17													T								.41	.80
Yearly																																16.30	8.80

Island Station

Recording Gage. — Record by U. S. Section I.B.C.

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total	Average 1939-1941
January		.26																										.06	.02			.34	.51
February	.08				.19		.19	.02														.11	.08									.67	.31
March											.02	.08				.56	.93					.02		.01								1.62	.58
April		.04																							.38	.08		.02				.52	.22
May	.02	.05								.05							.10						1.10		.27							1.57	.67
June				.14																					.14							.28	.26
July											.09																					.09	.42
August	.20		.05			.54			.08	1.33												.75	.04					.03	.16			3.16	1.42
September							.01				.03		.07				.02				1.65	.26					.06	.03	.18			2.31	1.32
October			.10	.06																			.34	.23					.23	.33		1.29	.81
November																					.43											.43	.57
December										.09	.42																					.51	.30
Yearly																																12.79	7.39

Fabens, Texas

Standard 8 inch rain gage. — Record by U. S. Bureau of Reclamation.

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total	Average 1939-1941
January		.30									T																	.05	.09			.44	.58
February	.09				.06		.10	.05														.26	T	.01								.57	.51
March						T					.05	.02					1.25			T	.07	.12			.01							1.48	.74
April		.04																.06							.57	.20	.08			T		.69	.34
May	.07	.18								.05													.21	.38	.32	.05			T			1.28	.68
June					.29																				.25	.02		.11		.12		.79	.44
July						.02					.34										T	.01				.04	.05		.82		.18	1.44	.80
August			.05		.02				.07	.29	.02		.39	.02							.04	.13							2.53			3.34	1.36
September	.01		.27			T	T	T			.06		.31				.24		T	.07	1.91	.51						.55	.09			4.02	1.95
October			.14					T														T		.12					.31	.65		1.32	1.05
November												.02									.35				.30					.01		.38	.34
December									T	.17	.32													T								.49	.27
Yearly																																16.44	9.86

Fabens - Guadalupe Bridge, Texas

Standard 8 inch rain gage. — Record by U. S. Section I.B.C.

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total	Average 1940-1941
January	.08	.14	.05	T								.05																.10	.26			.66	
February	.05	.13				.29		.15	.01														.37		.05							1.05	
March						T						.11		T			1.08	.02				.89										1.50	
April		.04	T																						.10	.05	.05					.22	.12
May		.25	.02	T													T	T					.14	.44		1.05						1.88	1.25
June				T	.45					.05									.10							.26			.19	.07		1.08	.72
July	.05					.02						.09								T	T	T					.03	.05		.13		.37	.88
August	.14	T	T	T			.05				.07		.50	.13		.08				T	.50		.80						.06	.75		3.46	1.76
September				1.50			.11	.09				.05		.74						.05	.13	2.19	.48					.26	.41	T		5.99	3.02
October				.11																					.45					.54	.27	1.37	1.50
November																						.38										.38	.56
December										.02	.29	.32																				.63	.56
Yearly																																18.21	

County Line Station

Recording Gage. — Record by U. S. Section I.B.C.

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total	Average 1938-1941
January		.22																										.10	.06			.38	.70
February	.31				.10		.07															.20	.26		.06							1.00	.36
March											.02					.45	1.07				.18			.11								1.83	.88
April		.02																							.38	.22		.02		.24		.88	.34
May	.10																						.29	.01			.02	.01	.01			.44	.25
June				.52										.02											.68		.01			.02		1.25	.80
July									.03		.85										.14	.17				.10	.21		.04		.07	1.59	1.36
August			.02		.09	.09		.68	T	.05		.22	.66		.06	.08			.02		.90	.08							.89	T		3.84	1.58
September						.01	.02				.10		.16				.08	T			1.56	.16					T	.05	T	.13		2.27	1.42
October											.02													.46	.01				.30	.41		1.20	.78
November													.38								.24	.05								T		.67	.66
December										.48	.40			T										.03								.91	.34
Yearly																																15.66	9.27

∮ Some months missing.

RAINFALL ON UNITED STATES SIDE OF RIO GRANDE WATERSHED

INCHES — 1941

Fort Hancock Bridge, Texas

Standard 8 inch rain gage. Record by U. S. Section I.B.C.

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total	Average 1940-1941
January	.06	.55										.08																.33	T			.82	
February		.20				.10		.13															.55	.08	.13							1.19	
March												T					.90					.10			T							1.00	
April		.03	.04																			.03			.02	.48	.28	T				.85	.42
May		.01	T								.04											.10		.26	.47	1.00		.14	.03	.20	.05	2.21	1.74
June					3.38	.05									.45					.22		.10				.25	.24	.10	.17			4.94	2.66
July							.05			.07		.20		.14								.14	.05	.08			.05	.18				.96	1.44
August				.11			.08				.05		1.05	.36		.30					.25								T	.17		2.49	1.34
September							.12	.06				.10		.05						.15		1.67	.33					.06	.31			2.69	1.69
October				.18								.09													.85					.86	.40	2.38	1.65
November																						.16										.16	.30
December							.06			.06	.20	.48													.05							.85	.48
Yearly																																20.50	

⊕ Madden Arroyo Highway (U. S. 80) Bridge, Texas

Recording Gage. Record by U. S. Section I.B.C.

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total	
July		Record began September 1, 1941																															
August																																	
September								.30			.16		.13			.05	.04		.02	.16	2.32						.44	.27	.13	.14		4.16	
October			.05					.59		.12			.25										.11	.60					.55	.71		2.78	
November																						.12										.12	
December										.13	.66																					.79	
Yearly																																	

West Small, Texas

Standard 8 inch rain gage. Record by W. L. Sewell

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total	Average 1940-1941
January	.38											.29																.17				.84	
February	.27				.14			.08															.62		.08							1.19	
March												.05					.58				.26	.03			.02							.94	
April		.05																			.37				.37	.34						.74	
May		.10																.05			.08			.75	.41			.19				1.58	.93
June					2.80	.09								.15					.04									.15		.04		3.25	1.87
July		1.01				.12			.13													.57	.09				1.05		.19		1.27	4.41	3.14
August															1.75				.08									.01			.18	2.02	2.68
September						.20					.29		.47				.45				.77	3.00						.29	.20	.78		6.45	3.44
October											.10		.05											1.10						1.20		2.45	1.58
November																					.19											.19	
December												.57																				.57	.25
Yearly																																24.43	

Finlay, Texas

Standard 8 inch rain gage. Record by J. R. McAvoy

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total	Average 1940-1941
January											.37	.05					.18				.03				.07			.21	.05		.11	1.07	
February							.03																.82		.13							.98	
March											.06	.03				.56	.51				.34				.06							1.56	
April																									.58	.11						.69	
May		.06																.07			.02	.58		.03	.98		.08			.10		1.98	1.31
June				2.66	.12				.03												.17				.28		.08	.04	.02			3.40	1.93
July						.15		.88	.51										.10			.12					.73		.15			2.40	2.14
August	.18		.09		.05					.13			.14		.11							.09							.05			.75	1.80
September												.11	.20	.26			.16			.31	4.20	.21			.32		.10	.09	.80	.13		6.89	3.60
October		.09					.06				.08			.04										.70			.98				.96	2.91	2.03
November							.98															.22				.04						1.24	1.04
December							.06												.75				.15									.96	1.08
Yearly																																24.77	

⊕ Guayuco Arroyo Highway (U. S. 80) Bridge, Texas

Standard 8 inch rain gage. Record by U. S. Section I.B.C.

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total	Average 1940-1941
May 1940								.07	Record began May 1, 1940						.07						.10	.13										.37	
June 1940				.10																		.24						.11				.45	
July 1940					.15												.27										.59			.64	.35	2.00	
Aug. 1940	.07			.18				.08			.26	.22												.30	.77	.11					.02	2.01	
Sept. 1940	.69													.05																		.74	
Oct. 1940			.06							T	.11	.25								Record ended October 31, 1940												.27	
July 1941			Record began September 1, 1941																														
Aug. 1941																																	
Sept. 1941				.04		.05	.18				.18		.15			.10		.05			2.55	1.31						.20	.40			5.21	2.98
Oct. 1941				.03							.14													1.65					.35	.88		3.05	1.81
Nov. 1941																					.07	.12										.19	
Dec. 1941							.04			.06	.26																					.36	
Yearly																																	

Fort Quitman Station

Recording Gage. Record by U. S. Section I.B.C.

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total	Average# 1937-1941
January	.05	.40						.02			.10	T																.23		.30		1.10	.73
February	.22	.01			.13		.06	.03														.08	.42		.09							1.04	.35
March											.02					.49	.42				.24	.05										1.22	.40
April		.06																							.47	.22	.04	.04				.85	.48
May	.02	.03																					.92	.01	.07		.01	.12	.30	.02		1.50	.53
June			.02		.20										.06				.02	.05	.24				.06		.32	.79	.36	.20		2.32	.77
July						.02																	1.66				.19				.04	1.91	1.67
August			.27		.30	.42		.10					.58				.58				.05	.04	.03	.09			.90	.19				2.95	1.77
September			.09			.14	.70	.02			.18		.24			.20					1.67	1.26						.09	.09			4.68	1.89
October											.12													.81					.42	.60		1.95	.93
November																					.09	.09										.18	.40
December							.04			.07	.35																					.46	.25
Yearly																																20.14	10.17

⊕ Neely Ranch, Texas

Standard 8 inch rain gage. Record by Mrs. Tom Neely.

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total	
August						.64							.74				.22		.41			.47			Record began August 1, 1941							2.48	
September	.51		.74			.07	.66				.52					.07					1.50	.27						.10				4.44	
October											.19													1.61					T	.66	.38	2.84	
November										.32	.24											T										T	
December																								.04								.60	
Yearly																																	

⊕ Schroder Ranch, Texas

Standard 8 inch rain gage. Record by O. H. Schroder.

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total	
August						?.60							?.70				.50			.09		.35					.20			.25		2.69	
September	.50		1.60				.40				.52										1.75	.47						.10			.38	5.72	
October											.25		Record began August 1, 1941											.85					.63	.45		2.18	
November													Estimate record August 1 to 15									.09										.09	
December											.35		? Estimated from surrounding stations																			.35	
Yearly																																	

⊕ See footnote at bottom of page 71. # Some months missing.

RAINFALL ON UNITED STATES SIDE OF RIO GRANDE WATERSHED

INCHES.—1941

Fort D. A. Russell, Texas

Standard 8 inch rain gage. Record by U. S. Army.

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total	Normal 1908-1941
January		.54		.02								.67																T	T		.23	1.26	.57
February	.42				.04		.16	.02												T	T	T	.04		T							.68	.58
March		T					.04								.23		T	T				.02			.45			T				.72	.23
April		T				T																	T		1.10	1.35	.02	.35		.02		2.84	.76
May	.25	.30									.33				.03		.60	.01			.52		.57	.06			T	.30			.02	2.99	1.10
June	.02		T	T		.20								.01						.03					.21	.06	.01			.13		.67	1.39
July		T	.21				.05	.01	T			T	.61			.36		T		T		1.49	.51	T	.01	T	.82				.14	4.01	2.49
August			T		.39			T	.02	.01	T	.01	T	T					1.19		T		.16	.10		.46	.96	.66			.02	3.98	3.08
September	T	T	.28		.08		.46	.01		.21	.78		.03			T	.14	.33			.54	.08								1.41		4.15	2.24
October									.33	.10	.24										.98	.11	.71	1.70	.27					.06		4.50	1.32
November														.07								.02			.03							.12	.54
December							.15			.12		.54												T								.79	.46
Yearly																																26.71	14.96

Crosson Ranch, Texas

Standard 8 inch rain gage. Record by B. H. Davis

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total	Average 1933-1941
January		.45	.12								.30	.49																			.15	1.51	.54
February	.66						.52																									.98	.33
March																.12					.05											.17	.22
April																										2.40		.20				2.60	.52
May												.12						.96						.74								1.82	1.45
June	.20													1.00	.55										.20			1.56				3.51	2.11
July	.33	.46				.56		.32															1.12	.85	.80							4.42	2.91
August				.20													.20									1.05	.29	1.04			.60	3.38	2.35
September		.15	1.20				.31				1.30						.95					.30								.70		4.91	2.42
October									.30												.40			1.40								2.10	.88
November														.20																		.20	.61
December							.38				.60																					.98	.50
Yearly																																26.38	15.04

Johnson Ranch, Texas

Standard 8 inch rain gage. Record by U. S Section I.B.C.

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total	Average 1933-1941
January		.25		.06								.25																		.12	.20	.88	.56
February					.19		.06	.12																								.37	.22
March																.02						.05										.07	.19
April																									.05	2.03	.38	.12				2.58	.64
May		.03														.03	.28	.25						.54	.06						.88	1.87	1.27
June	.19		.25											.06	.38								.03		2.12			.03				3.06	1.25
July	.44										.12				.06								.06			.03	.06					.77	1.40
August							.08				.06													.06		.25					.02	.47	.84
September							.06	.19		.12		.69					.16						.06	.78								2.06	1.27
October	.37								.06																.06							.49	.83
November																									.25							.25	.27
December							.12			.03																						.15	.49
Yearly																																13.02	9.03

Big Bend State Park

Standard 8 inch rain gage. Record by Park Custodian.

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total	Average 1936-1941
January		.52		.05																												.57	.69
February	.28				.16		.20																									.64	.51
March																.05																.09	.18
April											.15				.30	.11	.11	.03					1.55	T .08		.08 .39	1.05	1.02				2.15 .47	.55 1.97
May	.55	.20												.48								.12			1.98			.08		.10		3.57	2.91
June	.77				.04																												
July	.34	.52		.65						.09		.16		1.05	T	.04							1.08	1.30	.03						.11	5.37	3.84
August		.16	.11	.11		.70			1.50	.05												.11	.14		1.90	.01	1.91		.03			6.73	3.25
September								.60			.50	.69											.75							1.60		4.10	2.86
October	1.60		.35												.80	T																2.75	1.80
November								.33		.25	.25															.38						.38	.88
December																																.83	1.46
Yearly																																30.61	20.92

Sanderson, Texas

Standard 8 inch rain gage. Record by U. S. Weather Bureau.

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total	Average 1939-1941
January												.78																.06				.84	.54
February					.27		.31												.20	.02	.03	.02	.04	.06	.06							1.01	.98
March																	.44				.09	.11	.28		.11	.28		1.01	.82			0	.55
April																	.50	.52			.22		1.33	.74		.80						3.14	1.76
May	.01	.82																					.14			.74			.72			4.74	3.42
June			.30	.65			.40							.25												T						2.46	1.53
July	.98										.09			.47																		2.30	1.09
August						.10					.33	.11	.74 .38			.03	.19	1.25				.02	.44		.64	.12	.04	.07				1.41	2.09
September								.13	.57 .76	.16					.18						.26	.04								.28		2.99	1.22
October	.59		.97																									.03	.02			3.24	2.21
November										.51	.61	.06																				.09	1.86
December	.52						.32																									1.82	.83
Yearly																															Incomplete		17.48

0 No Record

Sanderson, Texas

Standard 8 inch rain gage. Record by U. S. Army.

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total	Average 1940-1941
January		.24		.08	T	T	T	T	T			.85					.02										.04	.03		.04		1.30	
February	.06		.02		.19		.25	.10									T		.20	.02	.04	.12	.08		.08	.02						1.16	
March					T									.04			.33		T		.12	.34			.11							1.14	
April		T												.02	T										.18	.94						2.86	
May		.91		T						.02		.02				.01		.83		.19			1.28	1.05		.74						5.05	
June		T	.89	T	.02		.43	T	T					.22								T		T	.13	T		.73		.56		2.98	
July	.50								.01		.13		.46	T	T					.03				.45	.29	.07						1.94	
August		.01			.15			.14	.58	.01	.42	.01	.81 .41	.02						.01	.02		.04	.59	.01	T	.10	T	T			1.59	
September		T	.98				T		.77	.12	.02				T .26	.14	1.24	.10	T		T .23					T .04				.07 .28		3.15	3.11
October	.60													.10					T		.01	.01	T						.02	.01 T		3.27 .18	.74
November										.92		.06		T	T					.02												1.84	.99
December	.52						.32																										
Yearly																																25.80	

Pecos River Station

Standard 8 inch rain gage. Record by U. S. Section I.B.C.

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total	Average 1938-1941
January		T		.10					.05				.10															.10		.20	.10	.65	1.23
February	.74				.25			T														.10 .06	.66	.01 .06								1.76	1.05
March						.40								.10 .50	.08	.18		1.30	.10		.08					1.30 1.00	.06 .74			.08		3.74	1.16
April		T	.12																					.59	.25 T				1.92			4.79	1.98
May	.10	1.40	T	.06	.05													08	.29	.05						.10	.09					2.40	2.56
June			.35							.30					.10																	.94	2.25
July	1.90								.10	.10			.09				.21															2.40	2.19
August				.10	.04			.02						.15									.04	.03				.40				.78	1.87
September								.01		.65 .61	.61				1.45 .25	.36	2.50	.35					T	.57					.09 T			6.08	1.60
October		1.11																	.05			.07						T		T	.25	2.77 .07	1.39 .85
November										.11											T											.16	.65
December																																	
Yearly																																26.30	18.36

RAINFALL ON UNITED STATES SIDE OF RIO GRANDE WATERSHED

INCHES —1941

Comstock, Texas

Standard 8 inch rain gage. Record by U. S. Section I.B.C.

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total	Average 1939-1941
January		T										.09															.19		.11	.11	.95	1.45	.82
February	.05				.18		.29														T	.15										.67	.80
March					.11											.57	.73				.09	.05			.57	.07						2.17	1.40
April		.03										T	1.55	.62											1.18	.46	.05	.17		.02		4.08	3.56
May		1.10																.52							.09							1.71	2.57
June			.44					1.22							.97											.10						2.73	2.12
July	.27		.20							1.10				.51																		1.88	.88
August						.10		.40					.57														.46					1.53	2.93
September										.81	.86	.06		.02		.98	1.80	.26											.05		.14	4.98	1.82
October	.19	.04		.53						1.70					1.17								.15	.02							.43	4.23	2.21
November																													.15	T		.15	.91
December							.11				.02	.02								.18												.33	.84
Yearly																																23.91	20.66

Devils Lake, Texas

Standard 8 inch rain gage. Record by U. S. Section I.B.C.

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total	Average 1939-1941
January																														.44		.44	.37
February	.65	.01			.20														.02	.02	.03	.06	.01									.98	.96
March																	1.11	.09				.04	.04			.50						1.63	1.25
April													1.32												.19	1.07	.85					3.43	2.84
May		.87																							.84							1.71	1.63
June			.03							.07					1.15										.50	.80						2.55	2.55
July	.55	.01							.46	.71	.14																					1.87	.95
August					.39	.02	.01						.25																			.67	2.37
September										.03	1.67	.04				.83	1.15	.03														3.75	1.53
October										.51					.52								1.12	.04	.01							2.20	1.50
November																					.01							.26				.27	.82
December							.02								.01	.01				.03												.07	.78
Yearly																																19.37	17.55

Fort Clark, Texas

Standard 8 inch rain gage. Record by U. S. Army.

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total	Average 1871-1941
January	T	T		T		T	.01						T																.05		.24	.16	.46	.90
February	.69	.14			T	.27		.28	T							.01					T	.03	.21	T	T	T						1.63	1.15
March						.05								T				1.75	T		.04	T			.12	.49						2.45	1.59
April	T													T	T	T						T	.15		.05	1.16	1.21	.06	.32	T		2.95	1.87
May	.04	1.10		T						.02					T			.29		.03		.01	.01		T			T	.05			1.55	3.00
June			.05				T			.06	.01	T			.35									.14	.01	.01						.63	2.69
July	T	T			T				T		2.87			2.68			T															5.55	2.22
August					T	.30	.05																			.26	T					.61	1.94
September								T	T	1.71	1.32	.47	.01				.04	.92		T			T	.12		T	.09	T	T		4.68	2.95
October	T		T			.05		T		T	.09	T				.22		T			.01	T	.02	.34						.12	.16	1.01	2.05
November			.01																		T	.06	T							T		.25	1.47
December	T	T						.05			.01	.06	.01		T	.01	T	.01		T	.04		.02			.12	.03	.03	T	T	.01	.22	1.36
Yearly																																21.95	23.15

* Quemado, Texas

Standard 8 inch rain gage. Record by U. S. Section I.B.C.

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total	
July																																	
August																																	
September																																	
October																																	
November																																	
December											.06		.07							.10						.17						.17	
																																.25	
Yearly																																	

* El Indio, Texas

Standard 8 inch rain gage. Record by U. S. Section I.B.C.

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total	
January																																	
February																																	
March																																	
April																																	
May																																	
June		T		1.07								T									.30	T		.31								1.68	
July				T	T						.62	.85	.65																			2.12	
August					1.05		.35																			T						1.40	
September									2.35							.70			1.40													4.45	
October																.55															.01	.56	
November																						.68										.73	
December		.12					T	T	T	T	T	.35	T	T	T	T	T	T	T	.12	T					.05						.59	
Yearly																																	

Gage Installed May 7, 1941

* Roma, Texas

Standard 8 inch rain gage. Record by U. S Section I.B.C.

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total	
January				.04													T										3.01	.01		.02		3.08	
February	.21				.40		.02														.06	.57				T						1.26	
March							.30										.64	.15				.07	.06	.34								1.56	
April															.16	.01									.39	.17	1.13					1.86	
May		.37		2.06																	.50	.02							.77			3.72	
June				.22							.57						.67			.41	2.14	1.08	.25	.25	3.72	.32						9.65	
July											1.50	.50																				2.00	
August					.20	.17																										.37	
September									2.95	.26	.10					.04	.16		.26							.15			.16			4.08	
October															.74														.30			1.04	
November																					.25											.25	
December		.01						.42													.45											.88	
Yearly																																29.75	

Rio Grande City, Texas

Recording Gage. Record by U. S. Section I.B.C.

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total	Average 1939-1941
January	T				.05	T				T							.03										1.78	.40			.04	2.28	1.20
February	.06	.05			.30	.06															.20	.29	.06		.02	.04						1.08	.58
March		.02			.02	.11								.02	.01		.24	.05	.06		.02	.04	.14	.73	.06							1.50	2.27
April											T			.10								.08			.12	2.21	1.08					3.59	1.80
May		.04			1.83																.27		.19						.01			2.34	1.90
June				.08						.13						2.22				.03	.02	2.36	.84	.36	1.51	.07						7.55	5.54
July					.75						.02																					.77	.60
August					.66																											.66	1.35
September									1.21	3.16	.06						.10	.07	.36							.08	.65	.01	1.95			7.61	3.07
October								.43			.13				.05	.26												1.25			.06	2.18	1.69
November					.01															.12	.42											.75	.75
December		.27						.36		.50	.01	.03			.08		.01	.01	.10	.06	.08								.05	.15	.03	1.72	1.89
Yearly																																32.23	22.24

* Medden Arroyo Highway (U.S. 80) Bridge, Texas - Lat. 31° 13' - Long. 105° 46' - Elev. 3,500'.
* Cienegue Arroyo Highway (U.S. 80) Bridge, Texas - Lat. 31° 10' - Long. 105° 40' - Elev. 3,600'.
* Rocky Ranch, Texas - Lat. 30° 59' - Long. 105° 28' - Elev. 3,350'.
* Sabinoso Ranch, Texas - Lat. 30° 56' - Long. 105° 29' - Elev. 3,300'.
* Quemado, Texas - Lat. 28° 56' - Long. 100° 57' - Elev. 769'.
* El Indio, Texas - Lat. 28° 51' - Long. 100° 19' - Elev. 725'.
* Roma, Texas - Lat. 26° 24' - Long. 99° 01' - Elev. 230'.

RAINFALL ON MEXICAN SIDE OF RIO GRANDE WATERSHED

INCHES — 1941

The 1941 rainfall records shown below have not been published elsewhere. The source of each record and the type of rain gage used are shown below. The normals and averages for monthly and annual records are based on all available records published and corrected in these Water Bulletins.

Latitude, longitude and elevation of each rainfall station will be found either at the bottom of page 79, or in the index to rainfall stations in Water Bulletin No.10.

Juárez, Chih.

Standard 8 inch rain gage. Record by National Irrigation Commission.

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total	Normal ‡ 1905-1941
January	.12	.13			T						.12																.04	.08	T			.49	.34
February	.12			T	.22	T	.14													T		.08		T								.56	.38
March						.04					.12	.02	T	.04		1.42	.06	.02			.01											1.75	.39
April	.06																							.06	.82	.67				.08		1.69	.45
May	.01																.22				.04	1.34	.25		.02							1.88	.50
June			T	T														.07	T	T					.14			.02	T			.25	.69
July			T			.10			.31	T	.12		.25									.01				.02					.22	1.25	1.19
August			T		T	T	.02		T	T		2.48	.10			T	T					T	.02					.02	.05	.31	.04	3.24	1.31
September							.14	.15			T		.10							.67	1.48	.12					.79	.87		.16		4.48	1.39
October			.18																			.31		.16				.02	.20	.99		1.86	.97
November												T	T					.08			.40											.48	.65
December										.26	.31													.04								.61	.45
Yearly																																18.48	8.89

• Rancho Vidrio, Chih.

Standard 8-inch rain gage. Record by Mexican Section, I. B. C.

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total	
January																																	
February																																	
March																																	
April																																	
May																																	
June																																	
July																																	
August			.20		.02			.02			.08		1.54			.31						.12	.03					.02	.05	.26		2.65	
September							.02	.08					.01							.39	1.58	.22					1.16		.85	.02		4.35	
October	.10										T											.27	.31					.02	.28	.81		1.79	
November													.02								.44											.46	
December									.53																							.53	
Yearly																																	

Guerrero, Chih.

Standard 8-inch rain gage. Record by Meteorological Service of Mexico

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total	‡ Normal 1905-1941
January	.04	.02								.43	.08															.71					.06	1.34	.49
February				.55	.31	T	.04																									.90	.42
March											.16			.59							T											.75	.25
April																									T		T					T	.21
May									T						T	.06	.26							T		.12						.44	.28
June																				T	.04		.02	.04		.31	.43	T	.16	.12		1.12	1.62
July	T	T			.47	T	.26	.07				.63			.77	.24		.20	.30		.28	.33	T	T			T	.31	.51		.33	4.70	4.27
August	.14	T	.14	.06	.16	.08	.47	T			.31	.51	1.50	.07		.22	.08	.16			.79	.35	.08	.24	.53	.75	.04	.22	.04	.16	.12	7.22	4.92
September		.10	2.99	.02	.10	T	.81		T	.12	.20	T	T		.31	.06	.08	.71	1.04	.28	.31						.22	2.95		.18		10.48	3.48
October		.77							.18	.28		.18											T						T			1.41	1.11
November												T												.51	T							0.51	.70
December						.31	.16	T		.06		T												T								0.53	.85
Yearly																																29.40	18.58

La Junta, Chih.

Standard 8-inch rain gage. Record by Meteorological Service of Mexico.

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total	‡ Normal 1905-1941
January	.14										.37																T				T	.51	.75
February				.61	.12		.20															.58										1.51	.44
March											.41			1.04																		1.45	.26
April																										T						T	.06
May	.10	T															.10							T								.20	.58
June																		T	.06	T	T	T	.07		.46					.08		.67	1.79
July		T	.31	.22	.85	.26	.80	.36	.12	.15	.39	.04	.02	.20	.16	.02	.10			.06	.02	.04	.06				.19	.10	.08	.06	.24	4.85	5.05
August	1.38	T	.29	.01	.05	.64	.07				.10	.27	.44	.11	.32	.41	.58	.59	.12	.07	.06	.05	.01	.02	.07	.37		.28	.04	.52	.17	6.84	4.92
September		.02	.26	.17	.08		.16	T	.14				.05		.09			.06		.22	.53						.51					2.29	2.04
October	.37								.73	.05																			.26			1.41	1.24
November																					.12			.16								.28	.39
December						.53	.01	.06	.37	.05	.13													.06								1.21	.74
Yearly																																21.22	18.06

La Boquilla, Chih.

Standard 8-inch rain gage. Record by Rio Conchos Hydro-electric Company.

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total	‡ Normal 1910-1941
January	.04										.03																			.01	.10	.18	.31
February					.55																											.55	.20
March																																.00	.22
April																									.09			.01				.10	.19
May													.01									.78	.04		.28							1.11	.74
June												.15	.10				.19		.18					.06					.17			.85	1.59
July		1.89					.03	1.28		.08				.90	.07							.65			.41	.70			.73		.09	6.83	2.91
August	.05	.90		.09	.02	.04		.47		.14	.49										.57			.48		.34	.03					3.42	3.04
September	.32		.34	.28			.24							.62	2.10	.07		.28			.38	.04								.08		4.75	3.13
October	.49								1.75	1.03													.20	.06								3.53	1.04
November															.11									.05	.11			.01				.26	.48
December							.90			.01																						.91	.44
Yearly																																22.49	14.89

Parral, Chih.

Standard 8-inch rain gage. Record by Meteorological Service of Mexico.

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total	‡ Normal 1905-1941
January			T																												.16	.16	.17
February				.39	.20																											.59	.28
March																																0	.17
April																									.32	.08						.40	.08
May												.04				.18								.04	.35							.61	.39
June													.12	T		.63			.10		.04		.79		.30				.06	.06		2.10	1.85
July	.65	.37					.12	.18	1.28	.04	.31				.28	.30	.38	.04			.10	.33	.79	.08	.59	.33	.16		.79		T	7.14	4.51
August	T	.49	.26	.16	.49			1.75		T	.77	.14	.22		.28						.61	.06	.12	T		1.36	.73	1.75				9.19	4.19
September	T		.08	.04			.33	.06	.73	1.16	.14	T	.04	.51	.39	.33				1.22	.04	.16						T	.04	.04		5.31	3.98
October	.65								2.89	.35	T												.28	.51								4.66	1.47
November												.10												.18	.16	T						.44	.84
December							.89	.14	.04		.04																					1.11	.65
Yearly																																31.72	18.56

‡ Some months missing.

• See footnote at bottom of page 79.

RAINFALL ON MEXICAN SIDE OF RIO GRANDE WATERSHED

INCHES —1941

Villalba, Chih. — 1940

Standard 8 inch rain gauge. Record by National Irrigation Commission.

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total
January																																
February																																
March																																
April																																
May	Record began September 24, 1940																															
June																																
July																																
August																																
September																																
October																																
November			.08	.05			.01	.19			.38	.02		.38	.06						.14		.01									.59
December						T			T	.02	.07								T											T	.07	.40
Yearly																																.09

Villalba, Chih.—1941

Standard 8 inch rain gauge. Record by National Irrigation Commission.

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total	Average 1940-1941
January	.02	T	.02								.23																T			.04	.39	.70	
February				.47	.22		T																									.69	
March													T																		T		
April																									.20							.24	
May											T		T	.38	.01	.13	.12	T				T	T		.02		T		T			.66	
June											.01		.02				.18			T	.30	T			.04	.08		.01	T	.39		1.05	
July		1.47				.02	.07	.62		.45	T		.12	.33	.03	T			.01	.14	T	.30	.05	.08	.73	.12	.15	.10	.12		.50	5.77	
August	T	.63	.10	.18		T		.77	T	T	.01		.04	.26	.09	T					.12	.13	.91	.09	T	.33	.76	.04	T		.02	4.50	
September	.26		.02				.28			.07	T	.45			.35	.01	.23			.02	.45	.26	T						.05	.01		2.42	
October	.94						T		1.44	1.79	.07		T			T								T						T		4.24	2.62
November												.20		T	.18									T	.02	T		T	T			.40	.40
December						.14	.58	T	T	T	T		T							T												.72	.40
Yearly																																21.37	

Delicias, Chih.

Standard 8 inch rain gauge. Record by National Irrigation Commission.

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total	Average 1933-1941
January	.04										.20																			.02	.57	.83	.42
February				.50	.21																											.51	.21
March																																0	.17
April																										.14						.18	.24
May													.06	.02	.14	.15	.19	T				.01	T	.07	.01		.07	.01				.73	.32
June												.07				T	.07		.02		.33	T	.02	T	.07				T	.54		1.12	1.60
July	T	.04					.22	.03	.02					.07		.01		.02				.04	.22	T	.01	.19	.09	.29	.01	.01	.11	1.38	2.94
August		.71		.06		.35	T			.04	.08		.33			.20							.15	.44		.28	.04		.20		.02	2.90	2.41
September	.79						.35	.06		.08	.04	.03			.37	.41					.33	.35							T	.06		2.94	2.18
October	.15									1.12	2.06	.06												.13								3.52	.98
November												.07			.03										T	.10	T					.20	.48
December						.17	.41		T	T																						.58	.39
Yearly																																14.89	11.94

Chihuahua, Chih.

Standard 8 inch rain gauge. Record by Meteorological Service of Mexico.

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total	Normal 1900-1941
January	.06		.09								.06																.04	T				.27	.27
February	T				.39	T																										.39	.26
March						T								T											T							T	.27
April																									.04	.08		T				.12	.19
May											T		T		T	.09		.16					T	.50	.63	.04	.14	T	.50	T		1.86	.38
June													.18	.06			.94	.02		.01	.02								.24	1.33		2.80	1.60
July		T				T	.31	1.91		T	T		.16		.08	.50			T	T	.28	1.58	T	T	.04	T	T	.02	.08	T	T	4.36	3.66
August	T	T	.14	.56		T	T		T	T	.14	T	1.22	T	T	.22		.14			.02	T	.31	T	T	T	1.26	T	T	.40	.37	4.58	3.60
September	T		.16		T	.02	T			T	.67	.39	.01		T	.02				T	.06	.01	T						.44	.16		1.94	3.22
October	.37						.06	.08		1.80	.71												T									3.04	.90
November												.09	.01											T	.22							.32	.55
December							.18	.04	T	.01	T	.02																				.25	.40
Yearly																																19.95	15.30

Ojinaga, Chih.

Standard 8 inch rain gauge. Record by Meteorological Service of Mexico.

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total	Normal 1906-1941
January	T									.37	.24	T																		T		.61	.14
February			.06	T		.33																										.41	.26
March					T						T	.04	T								T									.04		.04	.27
April				T																		T	.47	1.44	.12	.08		T		.04		2.15	.27
May	.12							T						1.02	1.10	.12	.16					2.58	.39	.06	T	T				.18		5.45	.62
June												.24	.49								T		T			.31	1.02	T	1.77			3.81	.72
July	.08	.35						T		T		.08		.08							.12		.26	.12	.22	.06	T					1.37	1.12
August		.10		.20		T		T		T		.31			T	T						.47	.16	T			.31	.04				1.59	1.40
September		T				.08	T		T	.67		.45		T	T	T			T	.08	.31	.33					T		T	1.34		3.82	1.37
October	.20							T	.24	.24	.51		T							T	.83		.51	.08					T			2.61	1.11
November												T									T				T							T	.45
December						T			.39	T									T													.39	.40
Yearly																																22.27	8.13

El Mulato, Chih.

Standard 8 inch rain gauge. Record by Meteorological Service of Mexico.

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total	Normal 1926-1941
January	.13	T	.03	.01	T				T		T	.09	.01	T																		.27	.33
February				.09	.20	T		.32	T																							.61	.31
March														.12	T						.08	T	*									.20	.13
April																									.24	.40	T	.56	T	.48		1.68	.38
May	.29	T									.13				.20	.47	T	.39	T				.79	.33	.15	.05	T				.20	2.58	.89
June								.03	.48	T																	.90	T	.83			2.24	1.28
July	T				T				.14	T												.08	.12	.10	.23	.44	T	.15	.05	T	.18	1.49	1.06
August		.04	T							.09	.05	.21	.15	T		T	T	.11	T		T	.13	T	.24	.18	.39	.05	T				1.64	1.44
September							.25	T		.84	.15		.39	T			T	.55	.05		T	.72	T							.84		2.97	1.37
October								.26	.16	.15	.41	.05	T							T		.08	.22	.44	T					.01		1.78	1.04
November																									.08	T						.08	.39
December						T	.20	T	T	T	.25	.05	T																			.50	.60
Yearly																																16.44	9.02

* Villa Acuña, Coah.

Standard 8 inch rain gauge. Record by Meteorological Service of Mexico.

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total
January																																
February																																
March																																
April																																
May																																
June																																
July																																
August																																
September																																
October									.10	.41	.06				.65	T	T						3.94									5.16
November										T						T									.24		.13	.04				.41
December							.08		T	T	.10		T		T		T	T	T	.28		T										.46
Yearly																																

\# Some months missing. * See footnote at bottom of page 79.

RAINFALL ON MEXICAN SIDE OF RIO GRANDE WATERSHED

INCHES —1941

Palestina, Coah.

Standard 8-inch rain gage. Record by National Irrigation Commission.

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total	Normal 1931-1941
January					.02	T						.08						T		T	T	.08	.04	T		.04	.63	.04	.12	.86	.94	2.19	1.05
February					.39	T	.20		.16							T	.83	T		T	T	.16	T	.20	.18		T					.87	.75
March																.71							.06		.104	.71	.23	.83	T	T		2.08	1.17
April		.08																.16		.12		T		.16	.51	T	T					2.85	1.21
May	T	1.26													.10									.12	.16							2.21	2.79
June			1.65								.12																					2.35	2.41
July									T	.75	.08		1.77						T													2.60	2.34
August									.51	.28	.12		.06		.28	6.14									.22	.49	.18	.26				1.21	2.01
September									.04	.28					.28				T			T	.43	T					T	.06		7.19	3.88
October		.04														T								.12	T	.18	T		.06	T		1.13	1.01
November																T	T	T	.04	.16												.30	.70
December													.02	T																		.22	1.41
Yearly																																24.94	20.73

Nuevo Laredo, Tamps.

Standard 8-inch rain gage. Record by Meteorological Service of Mexico.

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total	Normal 1909-1941
January		.02																								.03	1.53	.01		.06	.10	1.57	.81
February	.09				.45	.54	.02														T	.64	.02		.06	T						1.28	.78
March													.04				.54	.01	.02	.02	.05	T	.07	.14	.16	T						1.57	.89
April																		.11		T	.05	T			T	.72	1.03	T	.53			2.28	1.02
May		.49	T		T				T		.56	T									.92	3.46	.15	.15	.32					.19	.02	.86	1.48
June	T																															5.56	1.78
July				.66							T	T																				.66	1.08
August										T		T																.55				.55	1.02
September									1.97	.79						T		.83			T					.50			.26			4.35	2.85
October										.30						T								T					T			.30	1.23
November																		T		.19	.06				.06							.31	.86
December							.17			.18	T			.13	T					.12	.12	.01										.73	1.19
Yearly																																20.02	15.96

Muzquiz, Coah.

Standard 8 inch rain gage. Record by Meteorological Service of Mexico.

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total	Normal 1923-1941
January								T										T	.39								.55	.23	.20	.12	.75	2.24	.99
February	T			.16	.20	T	.16										.08	T		.08	.04	.08	T	T	T	.16						.96	.41
March				.24	T	T										.16	.20	T		T	T		T	.24	.08	T						.92	1.23
April										T					T									.12	.75							1.85	1.11
May	.12	.55																.51		.65	T	.47	.12	1.57	T	.99	T	.51	T	.08		3.77	3.53
June		.18	3.31	T	T							T			T	.67					1.06	2.24	.51	1.30	.55							9.56	3.50
July				T						T	.24			.24																		.48	2.16
August	T						.20	.39																		T	.43	.31	T			1.35	2.66
September								T	.24	.91	.39					.31	1.14	.79	.16		.12				.24	T		T				4.30	5.50
October	.12	T					T	.31	.16					.12	T				T	.08		.39	T						.12			1.30	2.45
November										.08	.08										T		T	T	.20		.08	.12	T			.56	1.32
December		T					.20	.12	T	.12			T						T													.44	1.30
Yearly																																27.71	26.12

Nueva Rosita, Coah.

Standard 8-inch rain gage. Record by Meteorological Service of Mexico.

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total	Normal 1923-1941
January																									.20	T	.25	.12	.16	.08	.41	1.20	.95
February	.35		T	.55	.23	T	.20										T	T														1.33	.47
March				T			T																									T	.51
April								T				.51						1.14		1.69	T	.30	T	1.65	.31	.28	.20	.59		T		1.89	1.37
May	.71	T										T	.35			.12						.26	.28	.53	.08	T						.96	3.23
June			2.30								.14																					3.59	2.24
July										.89																						.89	1.90
August																									T							T	1.47
September								.16	.79	.75						1.97	1.57	.20						.35	.20	.16						6.15	1.97
October							.65	T																								.65	1.47
November																					.16			T					T			.16	.74
December	.16	T				.14	T	.98	T																		T					1.28	.95
Yearly																																23.08	17.25

Sabinas, Coah.

Standard 8 inch rain gage. Record by National Irrigation Commission.

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total	# Average 1922-1941
January																											.39	.12	.14	.18	1.18	2.56	1.19
February													.35																			2.22	
March					.02											.02	.50				.10			.14								.58	1.51
April															.22									.16	.27	.12	.08	1.22				2.07	1.78
May		.53		.79														1.97		.18		.18	.39	3.58		.06	T		T			7.42	4.13
June			1.34	.04							.28										1.16	.45	.06	.45	.04							3.82	2.71
July				T							.57			T			T		.06													.63	1.38
August				T	T																					2.64	.08					2.72	1.39
September								T	.37	.26	1.32					T		.39			.10				.06	.18						2.68	4.84
October		T					T			.10					.16										.06			.28		.04		.64	.80
November																				T	.37	T		.01	T		.12	.20	T			.70	.92
December							T	.14	T	T	.12	T			.02					.06												.54	.76
Yearly																																25.63	

Sierra Mojada, Coah.

Standard 8 inch rain gage. Record by Meteorological Service of Mexico.

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total	Normal 1927-1941
January	T	T																									T			.16	.98	1.14	.55
February				.51	.47		T	T																								.98	.32
March																T											.22					.22	.37
April																								T	1.26	.18						1.44	.32
May												.12				T	.20	.04					.23	.20	.79		T	T		.04	.04	1.66	1.01
June												.04	.16	.31	.04			T		T	.08	.87		1.30	T				.43	T		3.25	2.29
July		.04				T	T	T	.20					T	.23	.12		T		.12	T	.08		T	.71	T	T	T				1.50	2.97
August	T	T			.02	.01	.20	.08	1.38	2.56	T		.31		T						.91	T		.51			.71		.71	.08		7.48	2.97
September			T						.23	1.18	.79		1.26	.31	.39						T											4.16	2.68
October															2.44						.28			.20								2.92	1.39
November																T					T			T	.08	T	T					.08	.57
December						T	.87	T		.20	.16																					1.23	.68
Yearly																																26.04	16.12

San Buenaventura, Coah.

Standard 8-inch rain gage. Record by Meteorological Service of Mexico.

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total	Normal 1926-1941
January							T		.09			.20															.16	.22	T	.31	.52	1.50	.75
February	.13		.33	.24	.31	.21	T										T	.13	T	.12	.06				.08							1.48	.53
March																				T				T		.21	.21					.42	.29
April			T		.13					T			T		T											.18	T	.16				.34	.42
May					T					.62								.56		T	.25	T	.33	T	.08	T						.57	1.49
June														.20										.46								1.84	1.56
July									T	.16	T				T					.57					.13		.65				.59	1.90	1.62
August				.23				.35																.66								1.24	1.62
September							.57		.80				1.26		1.20		T															5.83	2.13
October		T									.21				T			T			T		T									T	1.23
November											T						T	T								T	.24	T				.78	.58
December						T	.18	T	.23	.27	T			T						T												.68	.90
Yearly																																14.71	13.12

Some months missing.

RAINFALL ON MEXICAN SIDE OF RIO GRANDE WATERSHED

INCHES.—1941

Monclova, Coah.

Standard 8 inch rain gage. Record by Meteorological Service of Mexico.

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total	Normal 1927-1941
January		T						T	T	T		.12								T	T	T			T	T	.69	.16	T	.20	.31	1.44	.92
February	.20			.86	.59		.12	T												T	T	T		T	T	.10	T					1.13	.48
March																	T	T		T	T	T				.06	.14	.07	T			.10	.38
April													T	T											.23	.16						.50	.65
May	.05			T	T													.49		T				T								.70	1.54
June								.15						.23	.16	T						.12	.23	1.18	T	T						2.07	1.33
July											T	1.08													T							1.08	1.73
August	.05						T	T																.16		.20	.08					.49	1.37
September								.98	1.08	.98	.08				.39	.98		.06	T			T									4.55	3.16
October		T								.05					.08							T			.49							.66	1.23
November											T										T		.20	T	T		.86	.30		.04		.78	.37
December						.10	.47	.08	.12	.16				T						T												.93	.74
Yearly																																14.43	13.90

Don Martin, Coah.

Standard 8 inch rain gage. Record by National Irrigation Commission.

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total	Normal 1927-1941
January								.20				.02																					
February	.05			.01	.49		.16									T				.02	.03	.10				.25	1.19	.06	.18	.07	.54	2.39	.95
March			T		.05											.02	.50	.06		.01	.22	.02	T	T	.07		T					.93	.59
April																T					T			.31								.97	.76
May		T		.27																.02				.06	.17	.05	.06	1.16	.24			1.72	1.34
June			.57								T	T		.08				1.55			.01	2.63	1.72	.02	T		T					6.00	2.58
July											.16	.75					T		T	T	.43	.50	.12									1.66	2.20
August					T																											.91	1.42
September								.02	.80	.34	.11						.28	.13	.41							.56	.01					.37	1.72
October										.98					.57											.08						2.37	2.75
November																		T	.18	.01	.01				.03			.01	.04			1.43	1.76
December							.33	.15	.06	.07			.01	.02	.02		.02	T	.02	.01	.01			.10	.04	T	.09					.45	.71
Yearly																																.72	1.08
																																19.90	17.66

Lag. de Salinillas, N. L.

Standard 8-inch rain gage. Record by National Irrigation Commission.

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total	Average 1940-1941
January							T	T																T	T	.71	1.18	.08	.10	.12	.24	2.43	1.26
February	.04			.02	.47		.16	.04								.01	T		T	.02	.10	.12	T	T	.02		T					1.00	.60
March					.08											T	.47	.16		T	.02	.12		.10								.95	1.94
April															.12							T		.02	.24	.01	.39	.69	.65			2.10	1.06
May		.51	T	.12														2.36		.69		.01	.98	.26			T			.08		4.97	4.15
June			4.13								.04			.06							.53	.22	.45	.31								5.74	3.98
July		T		T	.04							.01		T																		.05	.02
August					.02																					.94						.96	2.05
September								2.91	.47	.39		T		T	T		T	.01	.10	T	.02							.06	.03			3.59	2.18
October									.10					T	.41	.01								.06	.02			.02	.01			.63	1.30
November		T												T	T	T			.01	.04	.06				.04		.03					.18	.56
December							.30	.10	.04	.16	.02	.01	.01	.01	.01	.01	.01	T	.08	.01										T		.71	1.10
Yearly																																23.71	20.14

Anahuac, N. L.

Standard 8-inch rain gage. Record by National Irrigation Commission.

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total	Average 1933-1941
January								.03	.01				.02													.18	1.36	.18	.16	.04	.20	2.18	.99
February	.06			.06	.43		.09														.07	.16										.87	.43
March																.02	.33	.02	.02	.01	.10	.04	T	.10						T		.64	.89
April													T			.46								.08	.65	.07	.57	.03	1.78	T		3.62	1.21
May		.87	T	1.08														.05		2.15	.07	.06	.93			.12					T	3.35	3.13
June			4.69								T		T	.04			.23			1.20	.63	.82	.85	.26								8.12	1.65
July																															T	T	1.09
August	T				T	T																				.26						.26	1.77
September	T							T	1.06	.37	2.66	T				.06	.02	T	.30	T					.07	.26		.26				5.06	2.91
October										.65					.55	.02							T	T				.01	T			1.18	1.21
November																		T		.21	.12				.01		.04					.38	.53
December							.26	.13	.03	.14	.01	T	T	.04	T	T	T	T	.16	T	T									T		.77	1.32
Yearly																																28.42	17.13

Guerrero, Tampe.

Standard 8 inch rain gage. Record by Meteorological Service of Mexico.

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total	Average 1936-1941
January		T		.22										T													1.14	.08		T	T	1.44	.88
February	.12	T			.47								T	T	T		T		T	.06	.31	.26	T		.06	T						1.28	.55
March			T		T	T								T	T	.04	.79	T	T		.07	T	T	.24	T	T						1.14	1.02
April					T								T	T		.04								T	.50	.28	.43		.83			1.88	.68
May		.79		.71	.12																2.40	T	.24		.04							4.30	3.10
June			T		T							.98				.79	T			.55	.59	.67	.08	T	T	T						3.66	1.72
July				T																T									T		T	T	1.16
August					1.22																											1.22	2.54
September									1.57	1.58	.55					.08			.16	.08						.04				T		3.86	2.57
October	.22							T		.04	T				.14	.02																.42	1.44
November																				1.38	.12											1.50	.60
December							.31	.04		.33	.02	T		.16	T	.02			T	.22												1.10	1.97
Yearly																																21.80	18.23

Rayones, N. L.

Standard 8 inch rain gage. Record by National Irrigation Commission.

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total	# Average 1906-1941
January																											T					T	.59
February					.26												.08				.59											.73	.61
March															.04		T	.41	.20					.03			.59					1.07	.41
April														.98	.12					.17				.05		.04						1.36	.34
May	.18																	.30			.49		.43				.10			.61	T	2.11	1.50
June						.24					.10					.12	.10				1.84	.67	.44	.08								3.59	2.55
July											T																		T		T	T	1.20
August	.12				.68																											.80	2.99
September								.04	.61	.51	.20						.24	.28	.28						.08	.24						2.48	3.07
October		.08								.09							.09															.26	1.98
November													.05																			.05	.65
December										.98																						.98	.93
Yearly																																13.43	16.57

San Pedro, N. L.

Recording gage. Record by National Irrigation Commission.

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total	Average 1939-1941
January			T	T	T	T	T	*	*	*	*						.12	T		.16	.08	T		T	*	T	*	T	T	T		1.27	.76
February	.16	T	.16	.12	.08		.39						.20	.04			.23	.20				.12	T	.08		1.26	.23	T				2.40	
March				.04										.55		T		T	T	T		T	T	T	.23	.11	T	T				.89	.56
April																	T	T	T	T	.63	.08	2.83	.87	.20		1.06	.26	.39	.35		6.69	4.31
May			.47	.47	T		T		.05	T	.71	2.37		T	T	.10	T	.71	T	.23	3.31	3.80	.81	.70	2.85							16.54	11.50
June																																	
July						T	.04	.23			1.10	.87																T	.71			2.95	3.01
August												.08										.04				.12						.36	6.12
September	.12	.04							2.09	3.54	1.57	.04				T	1.18	.61	.33	T	.31	.08	.16		.08	.67		.20				10.86	9.40
October						T				.16					.12	.08						.08	.30				.57		.08	T		1.35	2.40
November							.08				1.61	T		T					.08	.31	.65		.12			.04	.08	.10				3.09	1.73
December		.12					.39	.16		.39		T		.08						.04									.08	T		1.26	.92
Yearly	* Rain fell on these days. Amount not known.																																

Some months missing.

RAINFALL ON MEXICAN SIDE OF RIO GRANDE WATERSHED

INCHES — 1941

Allende, N. L.

Recording gage. Record by National Irrigation Commission.

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total	Average 1938-1941
January							.02	.03	.01																		1.04	.02				1.12	1.02
February	.52		.41	.37	.17		.24													.39	.26	.07			.20		.19	.04				2.86	.95
March				T		T							.26	.35			.23	.26	.20	.04	.04				.87	.67						2.92	2.33
April																									.67	.79	1.06					2.52	2.94
May																					1.42	1.22	1.56	1.50			.43	.09			.31	6.53	4.44
June				3.70							1.34	.98				1.46	.35			.43	1.50	2.99	1.54	1.06	1.02							16.37	8.77
July											.04	1.46																				1.50	2.98
August	.07				T	T						.11																				.18	3.59
September									1.56	3.23	T	T						1.46	.19	T	T				.12	.26						6.82	3.11
October	.18									T					1.76	.22					.29			.16			.99	T	.09	T	.07	3.76	3.33
November											1.31		T	T	T					.41	.82	T	.12				.18	T				2.84	1.61
December		1.04					.32	.10		.68			T	.24						T								.17		T		2.55	1.89
Yearly																																49.97	38.90

Montemorelos, N. L.

Standard 8-inch rain gage. Record by National Irrigation Commission.

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total	∮ Normal 1904-1941
January							.16	.22	.18																		1.38	.20				2.14	.85
February	.15	.03		.20	.24		.02									T				1.37	.42				.15	.08		.08				2.74	.90
March						.41							.14				.29	.15	.21			.14		.22		.31	.72					2.79	1.31
April										.04			.06	.36						.07				.04	.08	.40	.30	.18	T	.16		1.69	2.22
May	.04		T		.23													.35			.59		1.89	.16	.55	T	1.46	T	.08			5.35	2.87
June		T		1.50						.04	.35	2.52	T			T		1.38	.24	2.24	1.18	1.02	1.69	.28	3.39							15.83	4.10
July											.04	.31																				.35	2.39
August	T																					.08										.08	3.49
September							T		3.15	4.80	1.57						T	1.57	.66		.07				.31	T						12.13	4.42
October		T							.11						1.22	.21								.39			.98	.06	.06	.06		3.09	2.26
November	T	T	T								1.16		.04	.12				.02	T	T	.31	.04	.08	.04		.07	.31	T				2.19	2.01
December	T	.56					.39	.18	.04	.62	T		T	.20	.12													.05	T			2.16	1.29
Yearly																																50.54	28.09

Villa de Santiago, N. L.

Standard 8 inch rain gage. Record by National Irrigation Commission.

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total	∮ Normal 1925-1941
January							.10	.10	.39	.05																	1.19	.11	.04	.04	.04	2.06	1.02
February	.30	.04	.22	.08	.14		.14										.16			.16	.20	.04		T		T	.08					1.56	1.07
March				.04	T								.35			T	.49	.40	.11		.04	T	.10	.16		1.02	.63					3.34	1.27
April													.02	.43		T				.06				.04	.28	.35	.13	.04				1.35	1.58
May																	T			T	1.36	.03	2.24	.51	.31	.02	.20	.54	.16			5.37	3.62
June			.56	.89				T			.69	1.14		T		.04	T	1.65		.20	1.89	3.94	2.28	2.01	2.28							17.57	5.90
July							.14		.69	T	.54	.94																	.85			3.16	3.46
August								T			T															.10	.28					.38	3.07
September									2.20	2.93	1.40	.04					.20	.55	.23	.08	.38	.06	.07			.30	.10		.07	T		8.61	9.31
October	.05	.03		T				T		.51					.31	.14				T			T	.26			.29	.03	T	.31		1.93	4.60
November							.08				1.65			.02				.04	.04	.20	.22		.09			.04	.16	.08	.01			2.63	1.78
December			.18			.41	.22	.02	.33			.01	.06							.10								.07	T			1.40	1.34
Yearly																																49.36	40.02

Cadereyta, N. L.

Recording Gage. Record by National Irrigation Commission.

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total	∮ Normal 1904-1941
January																																	.86
February																																	1.04
March															.13		.42	.31	.13	.09	.06		.13	.07	.02	.39	.42					2.17	1.54
April										T			.05	.63		.01								.03	.30	.20	.68	.03		.03		1.96	1.99
May	.02			.07	.03																.22	.01	.16	.03	.14	.02	1.09		1.00			2.79	2.56
June			3.21	.58						.03	.13	.03				.31		1.02		1.43	.17	3.75	2.11	.74	.16							13.67	4.51
July											.87	.30								.01									.06			1.24	2.94
August	.10	.06				.02	.01																								.05	.24	2.84
September									2.87	5.51	.01							2.32			1.12		T			.46						12.29	4.61
October	.08	T			.02		.16			.16					.18	.04	.02											.06	.06	.04		.82	2.63
November											.51		.02	.10					.05	.16	.08	.01				.16	.57	.04				1.70	1.68
December		.20					.37	.04		.24		T	.02	.20	T	T				T								.14	.10			1.31	.97
Yearly																																	28.17

• Las Comitas, N. L. — 1940

Standard 8 inch rain gage. Record by National Irrigation Commission.

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total	
January																				.18		.03									.01	.22	
February				.06		.02							.02																			.10	
March																						.02		.37	.01	.04						.44	
April											.01																					.01	
May									.31						.01				.08		T	.04						.28				.72	
June						.02					.31		.01	.59		.07								3.61	.90	.04	.11		.12			5.78	
July			.31	.20	.03									.10	.06							.22							.28		.30	1.50	
August						.22	.43		.69				.09	.01	.20			1.28	1.44	.24	.01										.55	5.16	
September		.01	.19		.39	.80	4.72	.75												.06												6.92	
October						.17						.03	.02	.88	.17	.01								.06								1.34	
November		.04						.03	.02				.01														.33	.02				.45	
December	T						T			.05				.05					T	1.74	.49											2.33	
Yearly																																24.97	

• Las Comitas, N. L. — 1941

Standard 8 inch rain gage. Record by National Irrigation Commission.

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total	Average 1940-1941
January																											.71			.01	.01	.73	.48
February	.28	.01	.05	.07	.17		.03														.06											.67	.38
March																		.25	.19					.18								.62	.53
April													.11	.15	T	.01	.02					.01			.19	1.34	.06					1.89	.95
May					.12																.11		.18		.02	.33	.06	.13	.03	.10		1.08	.90
June			.06		.05						.91	T						.51			.88	2.09	.69	.03			.04					5.26	3.52
July								.06		.07	.82	.33							.05													1.33	1.42
August	.13	T				T																.03	T									.16	2.66
September								.14	1.32	.70	.22			.01	.17		.04	.50	.69				.30		.01	.02						4.12	3.52
October		.02	.01							.02				.62		.04									.01							.72	1.03
November											.19					.06				.13	.11											.49	.47
December							.26	.06		.50	.06																					.88	1.60
Yearly																																17.95	21.46

Las Enramadas, N. L.

Standard 8-inch rain gage. Record by Meteorological Service of Mexico.

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total	∮ Normal 1926-1941
January		T					.39	.37	.11																		1.87	.12	.10			2.96	1.22
February	.08		.09	T	.31															.16	.39	.08		T	.06	T	T	T				1.37	.65
March						.41								T			.20	.23	.12	T	.12	.05	T	.16			.33					1.62	.74
April														.30	T	.05	T	T		T	.08	T					.94					1.37	1.18
May					T																.15			.29		.18	.31		.05	.10	.13	1.21	3.43
June			T	2.24							.10	.10				1.20	.67	.79	.21			.54	.73	.31	1.95							8.84	3.82
July											.89	.50																		.23		1.62	3.24
August	T				.37	.26			.07						.16											.54						1.40	3.38
September								.67	3.32	.16					.07		T	1.13	.11							.27	.25	T	T	T		6.11	5.40
October		T				.16	.26	T						T		.26							T				.15	.28				1.18	1.94
November											.09									.26						.15	.12					.62	.84
December		.30		T			.24	.07		.47				.19	T	T	T												.05			1.32	1.11
Yearly																																29.62	26.95

∮ Some months missing.

• See footnote at bottom of page 79.

RAINFALL ON MEXICAN SIDE OF RIO GRANDE WATERSHED

INCHES—1941

El Cuchillo, N. L.

Recording Gage. Record by National Irrigation Commission.

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total	Average 1938-1941
January				.02			.14	.07	.03											.10	.31	.06		T	.04	T	1.96	.04	.07			2.53	1.82
February	.04		.08	.17	.35		.05													T	.04	.08	.02	.06								1.80	.42
March						.07							T	.03		T	.16	.10	.08		T	T		T	.16	.47	.03					.67	.66
April													T	.22		.02					.24	T	.05	.04			.75	T			T	1.60	1.17
May		T		.11	T															1.14	.79	.12	.44	.85	1.21		.09					.23	2.31
June				.46						.20	.26						.26															3.15	3.89
July										.57	.71	.06																	.08			1.02	1.82
August					.63	.06			8.38	.51	T				.40	T	.69	.07	.15				.02		.09	.20	.13					.69	1.75
September																											.13	.02		T		10.64	4.45
October	.02	T				T	T	.05						.16	T		T	T	.16	.05						T						.96	1.89
November									T	.02																			.05	T		.85	.93
December	.04	T					.28	.02	T	.45	.02	.01		.27	T	.02			.06													1.22	1.14
Yearly																																25.84	19.76

Los Ramones, N. L.

Recording gage. Record by National Irrigation Commission.

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total	Average 1939-1941
January							T	.24	.08											.04	.47	T		.08	.08	T	.98	.20	.12	.04		1.66	
February	.04		.08	T	.26		.04					.04	.08				.39	.04	.16	.04	.12	.08	T	.12	.	.28	T					1.09	
March						.12							.08	1.97											T	T	.16					1.65	
April					T																.39	.55	.71	.75			.31					2.96	
May			2.72	.16								.47					.20			.31	T	.85	.51	.04	.67		.08					2.72	
June										.39	.75																				.92	5.91	
July					.04	.87			T							T		.04	.12	T	T		T		.09	.64		T	.08			1.54	
August	.04							1.65	4.73	1.03	T				T	T				.08	.08		.12			.57	.11					1.69	
September						.16	.09								T	T				.18	.18							.18	T			8.32	5.00
October											.08															.09	.04					.71	
November											T								T										.08			.37	.52
December			.08				.28	T	T	.42				.24	T																	1.10	.63
Yearly																																29.50	

Gral. Bravo, N. L.

Standard 8 inch rain gage. Record by Meteorological Service of Mexico.

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total	Normal 1906-1941
January		T	T					T	T											.06	.02	T	T	T	T		2.99	.55				3.34	.79
February	T	T	T	.08		.03										T	T				.12	.31	.12			T						.19	.36
March											T	.47	.31	T	T	T	.24	.20	.20	.20	.12											1.97	.62
April											T	T	T	.23							.16			T	.12	1.26	T	T				1.77	1.16
May				T															1.42	1.14		.55	1.02	.23		1.26	T	.71				1.97	3.03
June			T						.12		.87					T																5.35	3.23
July											4.09																					4.09	2.74
August				.75																												.75	2.53
September								8.51	T	.94							T		T							.39	T					9.84	3.75
October														1.22	T	T											T					1.22	1.22
November										2.36									T	T												2.36	.95
December							.75		.16	T			T	.23															T			1.14	1.09
Yearly																																33.99	21.29

Gral Cepeda, Coah.

Standard 8 inch rain gage. Record by Meteorological Service of Mexico.

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total	Normal 1906-1941
January								T			.10	.22	T							T						T	.21	.22	.41	.61	.60	2.57	.60
February	.41	.22	.18	.13	.43	.21	T							T	T						T											1.58	.55
March		T									T			.10				.14			T	.22	.47	T			.06	T				.99	.29
April														T	.33	.14	.09	T		.13	T	T			T	.14	.09	T				.92	.24
May					T	.08		T		T	.23		.12			T	.10	T	T		T		T	.10	.25							.88	.92
June		T	.21	T				T			.12			.22					T	.10	.14	1.06	.41	1.06	.24	.39	.08					4.03	2.61
July	.10	.13	.20	T				T		.22	T	.65	.12	.37								T		.14					T	T	.14	2.07	4.42
August	.41	.21	.81	.12	T						T			.14	1.99	.10	T						T	.13	.22	1.30	.22	T	.14			5.79	3.17
September			T	.14	.33				.26	.10	.16	.06	T		.37	T						T				T	.21	T				1.63	3.08
October		1.77			T		.21		.08		T	T			T		T					T										2.20	1.34
November				T												.12				.41	.59	.21	T									1.33	.62
December					T			T	.55	.81	T	.14	.02	T		T	.08	.13	.08	T	T											1.85	.85
Yearly																																25.64	18.67

Saltillo, Coah. 1886–1899

Standard 8 inch rain gage. Record by Meteorological Service of Mexico.

Year	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
1886	.39	0	.26	.06	1.22	5.46	4.33	1.41	1.11	.64	0	.04	19.72
1887	0	T	.44	.04	.42	7.35	2.56	1.91	5.02	3.58	3.16	1.49	25.98
1888	1.50	.39	.58	1.50	.86	4.19	2.70	5.07	4.89	1.42	.75	1.58	25.43
1889	4.24	.	3.56	.78	.09	.89	3.83	1.27	7.29	0	0	T	
1890	T	.12	.39	.14	1.65	6.27	2.13	2.90	5.00	2.05	1.57	.71	22.93
1891	0	.25	0	.51	1.56	.60	1.65	1.97	1.50	.30	-	.37	
1892	2.82	4.14	.68	.65	.82	.02	1.41	10.71	5.51	2.74	.25	1.05	30.78
1893	.06	.01	0	0	4.26	.52	3.06	2.17	1.42	.52	.10	0	12.12
1894	0	0	.26	.41	1.02	6.09	-	-	-	1.08	T	0	
1895	T	2.36	.44	.28	2.03	3.47	2.95	6.47	2.48	T	2.95	0	23.43
1896	.12	2.25	T	3.04	1.95	.87	2.72	3.97	2.29	8.50	2.41	0	28.10
1897	3.66	.04	0	.40	1.89	1.61	1.06	4.07	.48	.24	.08	T	13.53
1898	0	.67	.35	2.15	1.19	.82	3.71	5.18	T	1.35	1.89	.66	15.95
1899	.47	0	T	1.05	1.21	6.49	2.37	1.01	4.26	5.78	.65	1.04	24.21

Saltillo, Coah.

Standard 8 inch rain gage. Record by National Irrigation Commission.

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total	Normal 1886-1941
January				.02					.15			.06															.41	.06		.07	.09	.82	.66
February	.37	.06	.06	.10	.29			T									.05	.11	.18		.03			.24								.91	.51
March																											.06	T				.64	.42
April					.04									.26	.44	T		T								.35	.12					1.21	.77
May																			.23		.55	.18				.27		.02	.12			.94	1.03
June	.02	.11					.03		.12							T						.66	1.17	.04	T	1.38	.80					4.36	2.11
July	.31		.38	.05					.14	.14	.10		T		.18					.26						.46		.02	.04	.85	2.93	2.83
August	.47						.72		.78		.11	.18			.11								.07	.06	.16	.04	T	.06	T	.15		2.80	2.58
September				T				.05	.65	.10	.09	T	T		.04	T		.20		T											T	2.29	2.60
October		.21	T		.04	T		.06	1.16	T		T			T	.04				.04	T				T		-T	T		T		.44	1.30
November											.03					.09		.05		.21	.85		.08	T				T				1.24	1.04
December								.16	.15		.87	T	T	T		.02																1.18	.66
Yearly																																19.80	16.51

Ramos Arizpe, Coah.

Standard 8 inch rain gage. Record by Meteorological Service of Mexico.

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total	Normal 1907-1941
January				T					.02	T		.08								T	T						.59	.12	.02	.06	.08	.97	.54
February	.16	T	.02	.20	.23												.01	.08	.23					.04								.61	.38
March													T	.30	T	T										.02	.02					.35	.35
April																		T			.10	T										.65	.45
May															.04	.12						T	.47	.59		.59	.31					.49	.82
June	T	T							T	T																.20	.31	.16				1.89	1.24
July										.31	T	T		.02						.16						.71			.02	.10	.20	1.52	1.64
August	.39	T					.85					T			T											T	T	.12		T		1.34	1.51
September								.06	.35	T	.26							.02					.01									1.39	1.70
October		.02	.06	.30					.20	.67						T					T											.58	.61
November								.20	.06		.71	.01								.02	.31	.04										.37	.49
December																			T													.98	.66
Yearly																																11.17	10.39

Some months missing.

RAINFALL ON MEXICAN SIDE OF RIO GRANDE WATERSHED

INCHES—1941

Cuesta de los Fierros, N. L.

Recording Gage. Record by National Irrigation Commission.

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total	Average 1939-1941
January		T				T	.10	T			T														T		.41	.14	.04	.09	.07	.85	.44
February	.23	.08	.02	.12	.37		.01													T	T			T								.83	.60
March												T									T				.18	T	T					.18	.40
April														.26	T									.04	.11	.49						.86	.34
May					.05													T			.28			T				.14	.25			.79	.80
June						T			.26			T				T					.04	1.06	.45		.30	.06			.02			2.19	2.57
July										.94	.16	.10	.02															.02	.08	.59	.07	1.98	1.05
August	.03	T				.45					T			T									.15		.02		.06		.26			.97	2.37
September							.23	2.54		.10	.14							.04														3.05	3.85
October	T	.19	.10	T			T									.10												.02				.41	1.02
November											.01	T					T		T	.33	.04						T					.38	.48
December						T	.06			.67	.04		T	.02																		.79	1.12
Yearly																																13.19	15.24

* Laguna de Sanchez, N. L.

Recording gage. Record by National Irrigation Commission.

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total	
January																																	
February																																	
March																																	
April													T	.98		.12				.61					.56	1.83						4.10	
May																		.14			.88		.67			.41	.10	.29			.21	2.70	
June						.22		.10			1.24	.27			.39	T	T	1.33		.12	.42	1.65	.70	.49	.55							6.48	
July				T	T					.24	1.52	.20																.49			.10	2.55	
August						.21	.16																			T					.14	.51	
September	T			.20				.17	1.18	1.30	.24	.88					T	.33	.53	T		T			.10	.81						5.74	
October	T	.18	.12							T						.20				T				T								.50	
November											.14									.12	.59											.85	
December						.52	.21	.12	.77					T																		1.62	
Yearly																																23.05	

Monterrey, N. L.

Recording gage. Record by National Irrigation Commission.

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total	Normal 1896-1941
January			T	T		T	T	T	T	T							T				T			T		T	T	T	T			T	.70
February	.05		T	T	.20												.33	T		T	T	T	T	.08	T	1.08	.22					.83	.64
March				T		T						T				T			T		T		.02		.16	.47	.07	.08		T		1.71	.80
April					.33								.10		T	.18					.06	.43	.60	.07	.12		1.54	.08	.10			1.08	1.17
May			.71	.14						.07	T	.24				.55		.23		.02	.44	3.67	1.37	.22	.04							3.33	1.65
June																																7.70	2.85
July											1.07	2.85																				3.92	2.45
August	.02					T		.02				.04													T			.08				.16	2.96
September								.07	1.97	2.37	.25						T	1.42	.03		.05		.14		T	.06	.01				6.57	5.84
October		.05				T	T	.02		.72					.25	.02							.03	.06			.05	.05	.02			1.26	3.16
November									.07		.97			.03		.09			T	.39	.14		.01			.04	.16	.18	T		T	2.01	1.47
December		.08					.22	.06		.34	.01			.06		T				.02							.01	T				.80	.84
Yearly																																28.57	24.51

Topo Chico, N. L.

Recording gage. Record by National Irrigation Commission.

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total	Average 1939-1941
January								T	T																		T	T			T	T	.08
February	T	T	T		.16																.08	T			T							.24	.20
March												.08	T		T	.31	.08	T	T	T	T	T	.20	T	.65	.24	T					1.54	1.34
April											T	T	.12		.04				T	T		.07	T	.16	.31	.08	.08	T				.86	.33
May	T			T	.05												T		T	T	.04	.04	.20	.08	.16	T	.24	T	.04			.85	.68
June	1.42					.04		.47			.04	T			.31		T		.04	.12	2.52	1.85	.39	.39								7.59	5.02
July									T	.39		1.69																				2.08	1.34
August																															.01	.01	1.67
September								.02	1.59	2.29								1.91				.04	.08			.17						6.10	4.41
October	.63				T				1.20							.02											T	T				1.85	2.16
November											.49		T	T				T		.39	.08	T				.12	.41	.26				1.75	1.22
December						.20		T		.39	T	T	T						T							T	T	T				.59	1.22
Yearly																																23.46	19.87

Cienaga de Flores, N. L.

Recording gage. Record by National Irrigation Commission.

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total	Average 1938-1941
January						T	.61	1.97	1.97															T		T	2.12	.65	.22	.22	.18	7.94	3.40
February	.01		T	.01													T			.43	T			T	T	T						.45	.80
March				T	T	T						T	T			T	T	T		T	T	T	T		.02	.69	.12					.85	.99
April										T		T	.19	.22	T	T						T	T	.05	.55	.43	.01	.09	.02	.06		1.60	.94
May				T	.49													.06	.05		.41	.21	.41	.08	T	4.55	.52	.13	.04	.40		7.35	3.56
June			3.05						.10	T	T	.37			.39		.62	T	.37	.05	.28	1.32	1.83	.22	T			T				8.56	2.96
July										T	.62	.09							T	.31								T				1.02	1.71
August	T				.05	T																										.05	2.97
September								T	2.11	3.24	.09					.53		.63	.14	T	.65				T	1.79		.04	T			9.22	4.35
October	.30	T	T	T	.55					.08							T	T	T	T	T	T		T				T	T	T		.91	1.94
November										.12		.06	.13	.15		.07	T	T	T	.49	.14	T	.07			.25	.73	.06	.02			2.27	.72
December			.06			.25	.07			.36	.04			.10				T	.06									.08	.09	T		1.14	1.06
Yearly																																41.36	24.80

Santa Catarina, N. L.

Recording gage. Record by National Irrigation Commission.

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total	Average 1937-1941
January						.08	1.38	1.85	T																	T	.21	.18	3.58	2.28	1.50	11.06	3.14
February	.08	.71	1.02	.63													.08		T					T	T	T						2.51	.84
March												T	T				.10	.25	.15	.02			T	.13		T	.03					.66	.37
April													.09	.22				.03				.03			.06	.39	.07	T		T		.86	.85
May					.46																.06					.08		.20				.85	.96
June				.03					.64		.08	.28				.11	.20			.38	.27	1.57	.80	1.60	.82	.22			T			6.94	3.54
July										.16	.97																					1.13	1.42
August	.22					.26				.38							.61		.25		.19		.11									.59	4.08
September							.13	2.07	.75	.29													.22		.11	.14						4.74	3.75
October	T	.10	T						.38						.10	.02								.02								.56	1.16
November									.04							.02		T	T	.22	.20											.48	.45
December		.06				.25	.02		.53	.03																						.87	1.75
Yearly																																31.25	22.31

Higueras, N. L.

Standard 8-inch rain gage. Record by Meteorological Service of Mexico.

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total	Normal 1906-1941
January						.30	.13																				1.14	.37		.08		2.02	.91
February	.30			.15																												.89	.57
March													.12			.11	.15	.10	.08		.34	.10				.18	.10					1.61	.66
April													.18	.22									.33	.46	.57	.14	.04	.14				1.09	1.25
May					.20													.14				.46	.20	T		2.05	.67		.44	.38		4.74	1.77
June			.30					.14	.35	.11		.12						.20		.08	.34	1.18	1.38	.23								4.43	2.88
July				T	T		T				1.02	.69								1.04									.08	T		2.83	2.54
August	.88	T			.09			.01	T			.01														.16		.01				1.16	3.16
September									.59	2.58	.08					.75	.14	.99	.69	.08	1.18				.79	.19			.04			8.10	4.45
October	.09				.12	.01	.10			.04						.04						.03	.01	.01				.06	.04	.01		.56	1.76
November											.02			T	T	T				.35	.16		.01	.01		.12	.18	.04	T			.89	1.05
December						.28	.02	T	.23	.04	T	T	.08															T	.06	T		.71	.90
Yearly																																29.05	21.88

* Some months missing.

* See footnote at bottom of page 79.

RAINFALL ON MEXICAN SIDE OF RIO GRANDE WATERSHED

INCHES — 1941

Cerralvo, N. L.

Recording Gage. Record by National Irrigation Commission.

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total	*Average 1938-1941
January				.02		T	.29	.25	T																		.61	.09	.30	.04	.01	1.59	1.42
February	.17		T	T	.12														.01	.06	.10	T		.18	.10							.74	.38
March				.01		.13							T	.01		.05	.30				.15	.09	.07	.57	.02	.47	.13					1.96	1.06
April	.03												.05	.20		T						T		.03	.78	.15	.56	.10				1.88	1.34
May		.41		.16	.26																.16	.10	.89	.57		.33	4.97		.28		.08	8.21	6.70
June			3.76								1.87	.41				T		T		.14	.78	.69	.68	.36	.06							8.75	4.85
July											.01	.45								.19	T								.14	.39		1.18	2.16
August	.04				.31																					.02		.05				.42	1.00
September								.26	5.02	.19	.19					1.81	.03	.08	.57	.11	.05				T	1.09		T		.13		9.53	6.50
October	T						.11	.01		.30			T		.22	T							.65					.04				1.33	2.48
November										.11	.30									.34			.09			.02	.01			T		.87	.45
December							.35	.05	.44					.55	.05	T	T	T	.05										.04			1.49	.74
Yearly	* 1940 Missing.																															37.95	28.06

La Tableta, N. L.

Recording gage. Record by National Irrigation Commission.

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total	Average 1939-1941
January							.15	.13																			1.65	.03	.14	.05		2.15	1.20
February	.13			.03	.01	.31	.05													.12	.36	.04		.04	.07							1.16	.64
March						.03								.02		.04	.20	.05	.19	.04	.05	.06	.06	.50		.20	.03					1.47	1.18
April													.04	.28								.01		T	.52	.04	1.01		.02			1.92	1.02
May		.01		.04	.07																.11		.64	.26		T	1.67				1.12	3.92	3.94
June			.98	.05								.81					.72			2.28	.19	.51	.51	.04	.39	.01						6.49	5.72
July											T	1.15	.67																	T		1.82	1.04
August					.06	.29			.03																	.02		.04				.44	1.04
September								.01	5.79	1.31	.92						.30		.22	.09					.25	.04	.10					9.01	5.23
October	.04	.20				T		.26							.09													.25		.02		.86	2.77
November										.14	.37									.12	.10					.01	.05					.79	.46
December		.07					.34	.05	T	.48		.01	.01	.17	T																	1.13	1.35
Yearly																																31.16	25.59

Campamento Comales, Tamps.

Recording gage. Record by National Irrigation Commission.

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total	#Average 1938-1941
January	T	.03		.03		T	T	.02	T	T			T												T		2.65	.03		.02		2.78	1.38
February	.10	T	.01		.36	T	.07													.04	.28	.19			.06	.01						1.12	.44
March						T						.05		.04		.03	.42	.05	.05	.02	.07	.15	.07	.63		.01	T					1.59	1.49
April											T		T	.19		.03						.14		.14	.28	2.01	1.52	.02	T			4.33	2.02
May		.20	2.19	.08																	.79	.02	.85	.03	.02		.01					4.19	2.80
June				.13						1.26							T			.33	2.04	.29	.53	.22	.73	.04						5.57	3.38
July										.30	.57	.14	.04																			1.09	1.28
August					.46	.02																						.06				.54	3.16
September									3.87	.07	T						.09	T	.14							1.04	.24	.06	.26			5.77	2.64
October	.24				.06			.06			.07				2.75	.01											.88		.04	T		4.11	2.14
November					.02															.26	.02									T		.30	.31
December		.39					.39	T		.56	T	.01	T	.04	.04	.02	.02	T	.06		.12								.06	.02		1.73	1.91
Yearly																																33.08	22.95

Linares, N. L.

Recording gage. Record by National Irrigation Commission.

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total	#Normal 1900-1941
January						.01	.04	.26	.23																		1.58	.22	.04			2.38	1.08
February		.02	.03	.17	.17		.22										.05			.24	.61	.08	.06	.02	.10		.01					1.78	.92
March					.01	.02						.07	.09	.04			.26	.39	.31	.02	.07	.09		.27			.46	.01				2.11	1.13
April													.02	.33	.09								.71	.16	.03	.11	.95	.12	.11	.20		2.83	2.52
May				.27	.02													.11			1.13		.25	.10		.22	.03		.04	2.51		4.68	3.52
June				.07						.20	.22	.80				1.52	.50	.01	.09	1.15	.93	1.64	1.30	2.77	4.88	.05						16.11	4.42
July							.05				.57	.87																		.04		1.53	3.55
August						.19			.04																		.13	.01				.37	2.67
September									1.84	2.61	.01							.29	1.99		.04		.04			.72	.01					7.55	6.27
October	.03				.11					.06					1.01	.25		.02						.04			4.59	.24	.02	.07	.02	6.44	2.81
November										.04				.01	T					.20	.04	.01	.01			.04	.35	.09		T		.79	1.49
December		.17					.20	.06	.02	.74			.02	.15	.02																	1.38	1.23
Yearly																																47.95	31.61

Villagrán, Tamps.

Recording gage. Record by National Irrigation Commission.

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total	#Average 1939-1941
January																																	
February													.09									1.14	.55				.09					1.87	
March					.32		.30												.83	.71	.12				.12							2.40	
April													.67		.20			.20					.20	.16		.71	.28	.16	.16	.28		3.02	
May	.20																.04		.08		.79	.75	2.95	1.06	1.57	.79		.28	.85			9.34	
June				.94						.56	.10	.06					2.28	.39	.24	.39	.31	.85	1.61	1.18	.08	.20						9.17	
July											.16	.67																				.83	
August						.65	.71																									1.36	
September									.71	.94							.20	.24	.02		.98	.24	.08	.16	1.57	1.10	.08					6.32	5.36
October	1.26						.94								.08												1.26	.31				3.85	4.72
November		.16								.08					.08											.04	.59	.28				1.23	.62
December			.43	.04			.16																									.63	.36
Yearly																																	

Mendez, Tamps.

Standard 8 inch rain gage. Record by National Irrigation Commission.

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total	Average 1939-1941
January							T	T	.18																		4.41	.25				4.84	
February					.27		.12														.57	.12	T		.10	T						1.18	
March											.82	T	T					1.22							1.04							3.08	
April														.20	T	.24						T			T	.37	T					.81	
May				T																	1.58	T	.58	1.22				.11	.22	1.07		4.78	
June											T	T					T	.55	T	T	.19	1.23	1.28	.09								3.34	
July											2.26	T																				2.26	
August							T																									T	
September									1.13	T	.72						.55	1.56	.31						.52	.54	T	.53				5.86	3.88
October								T							T	T											1.07	T				1.07	1.41
November							T				T									T						.17	T					.17	.18
December		1.56					T	T		.29				T	.11				T	T	T											1.96	1.15
Yearly																																29.35	

Reynosa, Tamps.

Standard 8 inch rain gage. Record by Meteorological Service of Mexico.

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total	
January		.12		.07								T					.01									.03	4.90	.12	T		.02	5.27	
February	.11	.02	.01	.05	.40		.02											T		T		.53	T									1.14	
March						.10								.07	T	T	.37	.28	.39	.10	.01	.54		.39								2.25	
April																																	
May																																	
June																																	
July																																	
August																																	
September																																	
October																																	
November					.11												T	T		.08												.19	
December	.91						.16		T	.41	T	T		.04	.13	T			.11	.12										.04		1.92	
Yearly																																	

Some months missing.
● Rancho Vidrio, Chih. - Lat. 31° 42' - Long. 106° 24' - Elev. 3,610'.
● Villa Acuña, Coah. - Lat. 29° 19' - Long. 100° 54' - Elev. 1,000'.
● Las Comitas, N. L. - 25° 26' - Long. 99° 07' - Elev. 1,670'.
● Laguna de Sanchez, N. L. - Lat. 25° 21' - Long. 100° 16'.
● Reynosa, Tamps. - Lat. 26° 06' - Long. 98° 17' - Elev. 150'.

EVAPORATION FROM FREE WATER SURFACES IN THE RIO GRANDE BASIN

Four types of pans are used for determining evaporation in the Rio Grande basin below San Marcial, New Mexico. The results reported below are inches evaporation from each pans.

1. Circular land pan 4 feet in diameter and 10 inches deep, made of 22 gage galvanized iron, set on wooden platform on top of ground. Water in pan kept at about 7 to 8 inches depth. Measurements by micrometer hook gage. This type of pan was used in Elephant Butte, State College, Alamogordo Dam, Red Bluff Dam, Balmorhea (Weather Bureau), Grand Falls, Fort Stockton, Dilley and all Mexican stations. This is the standard Weather Bureau pan.

2. Circular land pan 6 feet in diameter and 2 feet deep, made of 20 gage galvanized iron, set with top of pan 4 inches above ground. Water in pan kept at about 16 to 18 inches deep. Measurements by micrometer hook gage. This type of pan was used at Balmorhea (A. & M. College) and Weslaco.

3. Circular land pan 10 feet in diameter and 22 inches deep, set with the top edge of the pan about 1.5 inches above ground. Water in the pan is kept about 17 inches deep. Measurements by micrometer hook gage. This type of pan is used at Winterhaven.

4. Thirty-six inch square floating pan 18 inches deep kept filled to about 15 inches deep. Made of 20 gage galvanized iron with metal floats of the same material at each end. The top of the pan is kept about 3 inches above the water outside the pan. The pan floats in a metal water tank 5 feet deep and about 4½ feet in diameter which is kept full within a few inches of the top. Measurements by fixed point gage in center of pan and a dipper of known volume for refilling the pan up to the gage point. This type of pan was used at Jornada, New Mexico.

An evaporometer developed by the United States Section of the International Boundary Commission and calibrated against a standard Weather Bureau pan, was used at Valeta, County Line, Presidio, Johnson Ranch, Devils River, Eagle Pass, and Rio Grande City, Texas.

The United States Weather Bureau furnished the records for Elephant Butte, Jornada, State College, New Mexico, Alamogordo Dam, Red Bluff Dam, Balmorhea, Grand Falls, Fort Stockton. From Texas A. & M. College come records of Balmorhea, Winterhaven and Weslaco. The Mexican records are from the Meteorological Service of Mexico and the National Irrigation Commission.

In The United States

Month	Elephant Butte Dam, N. M.		Jornada, N. M.		State College, N. M.		Valeta, Texas T. & C.		County Line Sta.	Presidio, Texas	Johnson Ranch, Texas		Alamogordo Dam, N. M.		Red Bluff Dam, Texas		Balmorhea, Texas A. & M. College	
	1941	Normal 1924–1941	1941	Normal 1925–1941	1941	Normal 1924–1941	1941	Average 1928–1941	1941	1941	1941	Average 1940–1941	1941	Average 1929–1941	1941	Average 1929–1941	1941	Normal 1926–1941
Jan.	2.72	2.85	2.31	2.84	2.79	2.98	2.97	3.38			4.13		2.50	2.66	3.02	2.72	1.56	2.46
Feb.	3.91	4.39	3.37	4.08	3.60	4.39	3.74	4.28	4.80		5.31		3.46	3.89	4.35	3.08	2.07	3.97
Mar.	6.98	7.76	5.48	7.35	5.84	7.53	6.86	7.76	6.15	8.53	14.09	11.76	5.76	7.51	6.36	8.17	3.74	5.22
Apr.	10.86	10.43	8.46	9.86	8.76	9.61	10.12	11.15	11.39	12.83	13.12	14.22	9.48	10.00	9.88	10.88	5.04	6.57
May	14.38	12.81	10.64	12.33	11.09	11.36	12.57	12.75	13.18	13.04	14.42	14.86	9.45	11.22	8.86	10.98	5.35	7.35
June	15.37	14.65	12.31	13.35	12.64	12.54	11.51	13.15	17.47	13.08	16.96	16.92	10.49	12.97	10.44	11.60	5.52	7.86
July	15.10	12.65	11.49	11.82	10.56	11.44	11.84	12.50	11.06	11.24	16.90	19.10	9.99	12.81	11.64	13.36	6.89	7.61
Aug.	12.31	11.17	9.57	10.32	9.18	9.59	7.80	9.81	6.57	9.77	18.00	17.88	10.02	11.33	11.34	11.36	6.15	6.82
Sept.	9.65	8.77	7.80	8.61	7.61	8.04	6.92	8.40	5.87	7.93	12.74	13.04	8.42	9.67	8.19	10.10	4.14	5.38
Oct.	7.16	6.96	5.31	6.40	5.29	6.00	5.52	5.85	4.97	4.77	10.81	10.68	5.06	7.17	5.69	6.70	3.80	4.20
Nov.	4.00	4.23	2.78	3.79	3.12	3.75	2.39	2.78	2.88	3.29	6.45	5.44	3.70	3.78	3.68	3.59	2.21	2.85
Dec.	3.54	2.74	2.52	2.49	2.87	2.65	2.05	2.41	3.19	2.84	5.17	4.20	3.30	3.22	3.27	3.50	2.02	2.05
Total	103.98	99.37	82.04	93.24	83.35	90.28	83.69	94.20			138.30		81.63	96.23	86.90	97.98	47.27	61.35

Month	Balmorhea, Texas Weather Bureau		Grand Falls, Texas		Fort Stockton, Texas		Devils River Bridge, Texas		Eagle Pass, Texas	Winterhaven, Texas		Dilley, Texas		Rio Grande City, Texas		Weslaco, Texas	
	1941	Average 1940–1941	1941	Average 1940–1941	1941	Average 1940–1941	1941	Average 1940–1941	1941	1941	Normal 1931–1941	1941	Normal 1928–1941	1941	Average 1929–1941	1941	Normal 1932–1941
Jan.	2.10	1.73	3.36	2.88	3.07		4.82			1.82	1.80	2.71	2.62	3.15	3.96	2.11	2.40
Feb.	2.97	3.62	3.63	4.15	3.68		4.13		2.24	1.86	2.62	2.32	3.42	4.12	7.69	2.29	2.97
Mar.	5.04	6.14	6.59	7.18	6.16		7.34	9.99	3.93	2.83	4.59	3.69	5.77	4.12	7.40	2.43	4.20
Apr.	6.93	7.89	10.44	11.93	9.52		12.49	11.93	6.83	4.18	5.93	5.80	7.11	9.45	8.99	4.86	5.88
May	7.13	7.88	9.77	10.58	8.47	9.93	12.25	14.02	6.13	4.71	6.24	6.49	7.94	8.82	10.78	4.67	5.87
June	7.56	7.88	11.36	11.00	11.08	10.40	15.33	15.44	8.18	5.34	7.64	7.05	9.19	8.71	10.35	4.68	5.95
July	8.20	8.71	11.04	11.96	10.91	11.32	19.07	20.81	11.96	7.55	8.32	9.40	10.34	13.33	13.68	6.98	6.78
Aug.	7.69	7.59	11.12	11.26	9.58	9.46	23.36	20.06	14.07	7.65	8.17	10.40	10.43	15.94	16.11	6.83	6.91
Sept.	4.96	6.40	8.09	9.16	7.70	8.70	15.09	14.48	9.28	5.56	6.35	7.85	7.57	11.10	11.90	5.07	4.66
Oct.	3.64	4.72	6.09	7.26	4.92	6.10	8.17	9.72	7.50	4.25	4.65	6.10	5.95	7.06	8.30	4.18	4.61
Nov.	2.57	2.60	3.64	3.86	3.34	3.82	4.32	4.64	4.46	2.65	2.94	3.98	3.51	4.40	4.27	2.98	3.33
Dec.	2.42	2.30	3.15	3.18	4.38	4.02	3.64	4.54	3.06	1.84	1.86	2.54	2.54	2.89	4.69	2.06	2.37
Total	61.28	67.46	88.08	94.14	83.15		129.01			50.22	60.59	68.33	76.39	93.11	109.12	48.88	55.95

In Mexico

Month	La Junta, Chih.		Villalba, Chih.		Cd. Delicias, Chih.		Palestina, Coah.		Presa De Guadalupe, Coah.				Sabinas, Coah.	San Buenaventura, Chih.	
	1941	Average 1936–1941	1941	Average 1940–1941	1941	Average 1940–1941	1941	Normal 1931–1941	1939	1940	1941	Average 1939–1941	1941	1941	Normal 1939–1941
Jan.	3.23	3.11	5.52		3.56		5.54	5.43	4.57		3.67	4.12		3.03	3.68
Feb.	3.99	3.88	6.56		4.69		4.81	4.85	6.79		5.10	5.94	2.81	4.17	4.67
Mar.	6.40	6.44	10.22		7.53		4.97	7.43	9.32		7.23	8.28	5.04	5.99	7.17
Apr.	9.39	9.24	14.08		10.83		6.14	8.82	10.26		11.39	11.28	9.08	8.56	9.07
May	9.96	10.48	14.02		11.84		7.44	10.02	12.57		12.52	12.54	8.81	9.91	10.63
June	10.80	10.16	13.78		12.00	11.26	8.22	11.06	12.13		11.92	11.82	8.09	10.87	11.02
July	5.76	7.09	9.33		9.89	10.12	10.30	12.09	12.33		11.15	11.74	11.59	7.96	8.91
Aug.	4.62	6.14	7.64		8.60	8.23	11.69	12.30	10.11		9.24	9.68	12.13	6.69	7.48
Sept.	3.84	5.03	6.44		6.56	7.29		9.37	8.96		7.52	8.24	8.51	4.73	6.76
Oct.	4.55	4.90	6.69	7.99	6.41	6.52	9.64	8.71	5.32	6.30	7.05	6.22	7.30	4.98	5.89
Nov.	3.20	3.34	4.56	3.57	3.72	4.06	7.16	7.24	3.38	3.54	4.49	3.80	3.09	2.99	3.99
Dec.	2.22	2.57	3.98	5.00	3.59	3.56	5.70	5.73	2.69	2.98	3.34	3.00	2.46	3.19	3.02
Total	67.36	72.38	102.82		89.24			105.05	99.13		94.44	96.66		72.87	82.88

Month	Don Martin, Coah.		Lag. De Salinillas, N. L.		Cd. Anahuac, N. L.		Montemorelos, N. L.	El Cachillo, N. L.		Cienaga De Flores, N. L.	La Tablete, N. L.	Comales, Tamps.		
	1941	Normal 1927–1941	1941	Average 1940–1941	1941	Average 1933–1941	1941	1941	Average 1940–1941	1941	1941	1939	1941	Average 1939–1941
Jan.	2.58	3.58	4.16	3.80	2.39	2.54		3.81	3.62			5.81	3.87	4.33
Feb.	2.16	4.59	3.46	4.77	2.15	3.53		3.19	5.06			3.88	3.36	5.30
Mar.	3.95	7.81	3.20	6.21	3.88	6.09		4.32	6.38			8.52	4.71	7.16
Apr.	7.21	9.58	8.99	10.01	7.84	7.85	5.05	8.46	9.38	6.60		10.45	9.06	9.88
May	8.35	10.93	9.99	10.34	7.86	8.82	6.34	10.42	10.84	8.14	6.61	11.81	10.65	11.43
June	8.00	12.59	7.84	9.66	6.44	10.36	4.96	8.59	9.88	7.65	4.38	12.39	9.09	11.08
July	9.93	13.04	9.77	11.32	9.00	11.14	8.21	13.13	13.67	9.26	7.72	13.37	13.13	13.46
Aug.	11.28	12.64	9.44	10.58	11.56	11.00	8.16	13.12	14.52	10.46	9.41	11.45	14.56	13.23
Sept.	7.44	9.04	7.43	8.32	7.17	7.51	5.60	9.28	9.72	7.20	5.84	9.41	10.68	9.99
Oct.	5.41	6.77	7.18	7.23	5.80	5.67	4.06	6.88	7.22	4.31	4.37	8.85	7.29	7.99
Nov.	2.83	4.32	3.66	5.00	3.23	3.41	2.06	3.79	4.37	3.51	2.18	7.34	4.16	5.53
Dec.	2.09	3.42	1.57	2.88	2.03	2.34	1.77	2.98	3.73	2.70		5.79	3.30	4.32
Total	71.23	98.31	76.69	90.14	69.48	80.26		90.17	98.59			111.07	95.86	104.82

DRAINAGE BASIN AND IRRIGATED AREAS

Along the Rio Grande and Tributaries—1941

The drainage basin areas tabulated below are taken from the best available sources, including topographic maps. The total area within the outer rim of the Rio Grande Basin is about 335,500 square miles. But, in many places, and particularly along the southwestern side of the basin large areas yield no run-off to the Rio Grande. Such non-yielding areas constitute about 48.8% of the total area encompassed by the outer rim of the basin leaving 171,643 square miles of productive watershed. Only the productive watershed areas are listed below.

The irrigated acreages listed below include only areas below San Marcial gaging station on the Rio Grande and below Girvin gaging station on the Pecos River. These figures are from the most reliable sources and are the best figures available. On the United States side below Rio Grande City the figures are for cultivated acreages all of which have irrigation facilities, but a small part of which is farmed without irrigation in favorable seasons. (See page 55 hereof.)

For drainage basin and irrigated areas in previous years see the heading of each gaging station in Water Bulletins Nos. 1 to 8, and see table in Water Bulletins No. 9, page 90, and No. 10, page 102.

DESIGNATIONS OF AREAS AND GAGING STATIONS	Drainage Basin—Square Miles			Irrigated Areas—Acres			
	In		Total	In			Total
	United States	Mexico		United States	Mexico Primary	Mexico Secondary	
Above San Marcial Station	24,717	0	24,717				
San Marcial to Elephant Butte Dam	1,747	0	1,747				
Above Elephant Butte Dam	26,464	0	26,464				
Elephant Butte Dam to Caballo Dam	1,290	0	1,290	114	0	0	114
Above Caballo Dam	27,754	0	27,754	114	0	0	114
Caballo Dam to El Paso	1,513	0	1,513	94,728	0	0	94,728
Above El Paso Station	29,267	0	29,267	94,842	0	0	94,842
El Paso to American Dam	4	0	4	0	0	0	0
Above American Dam	29,271	0	29,271	94,842	0	0	94,842
American Dam to Juarez	41	47	88				
Above Juarez Station	29,312	47	29,359				
Juarez to Island	146	472	618				
Above Island Station	29,458	519	29,977				
Island to County Line	485	186	671				
Above County Line Station	29,943	705	30,648				
Guayuco Arroyo, above U. S. 80 Highway Bridge	162	0	162				
County Line to Ft. Quitman, excluding Guayuco Arroyo	501	679	1,180				
County Line to Ft. Quitman, including Guayuco Arroyo	663	679	1,342				
El Paso Station to Ft. Quitman Station, total	1,339	1,384	2,723	68,310	50,084	0	118,394
Above Ft. Quitman Station	30,606	1,384	31,990	163,152	50,084	0	213,236
Quitman Arroyo (I.B.C. name) above measuring point near its mouth	36	0	36				
Quitman Arroyo (I.B.C. name) above rocky canyon	18	0	18				
Red Light Arroyo (I.B.C. name) (Quitman Arroyo on U.S.G.S.Maps) above measuring point near its mouth	260	0	260				
Van Horn Creek, above measuring point near its mouth	117	0	117				
Ft. Quitman to La Nutria, excluding Quitman Arroyo, Red Light Arroyo, and Van Horn Creek	628	886	1,514				
Ft. Quitman to La Nutria, total	1,041	886	1,927	‡ 1,748	6,425	0	8,173
Above La Nutria Station	31,647	2,270	33,917	164,900	56,509	0	221,409
Capote Creek, above measuring point near its mouth	93	0	93				
La Nutria to Upper Presidio, total	580	503	1,083	† 3,626	6,919	0	10,545
Above Upper Presidio Station	32,227	2,773	35,000	168,526	63,428	0	231,954
Rio Conchos, above Boquilla Dam	0	7,322	7,322				
Rio Conchos, below Boquilla Dam, excluding area above Boquilla Dam	0	17,419	17,419				
Rio Conchos, total	0	24,741	24,741	0	155,926	12,108	168,034
Upper to Lower Presidio, excluding Rio Conchos	21	5	26	† 1,729	0	0	1,729
Upper Presidio to Lower Presidio, total	21	24,746	24,767	1,729	155,926	12,108	169,763
Above Lower Presidio Station	32,248	27,519	59,767	170,255	219,354	12,108	401,717
Alamito Creek, above gaging station	1,504	0	1,504	† 829	0	0	829
Terlingua Creek, above gaging station	1,070	0	1,070	† 297	0	0	297
Lower Presidio to Johnson Ranch, excluding Alamito and Terlingua	1,439	2,671	4,110	† 3,624	1,730	0	5,354
Lower Presidio to Johnson Ranch, total	4,013	2,671	6,684	4,750	1,730	0	6,480
Above Johnson Ranch Station	36,261	30,190	66,451	175,005	221,084	12,108	408,197
Johnson Ranch to Boquillas	471	3,735	4,206	† 299	0	0	299
Above Boquillas Station	36,732	33,925	70,657	175,304	221,084	12,108	408,496
Maravillas Creek, above proposed gaging station	2,192	0	2,192	0	0	0	0
Lozier Creek, above gaging station	1,728	0	1,728	0	0	0	0
Boquillas to Langtry, excluding Maravillas and Lozier	2,125	2,595	4,720	0	0	0	0
Boquillas to Langtry, total	6,045	2,595	8,640	0	0	0	0
Johnson Ranch to Langtry, excluding Maravillas and Lozier	2,596	6,330	8,926				
Johnson Ranch to Langtry, total	6,516	6,330	12,846	† 299	0	0	299
Above Langtry Station	42,777	36,520	79,297	175,304	221,084	12,108	408,496

† Estimated 3% increase over 1940 acreage, same increase as shown in acreage in Rio Grande Valley between Caballo Dam and Fort Quitman. ‡ Partly Estimated.

DRAINAGE BASIN AND IRRIGATED AREAS

Along the Rio Grande and Tributaries—1941

DESIGNATIONS OF AREAS AND GAGING STATIONS	Drainage Basin—Square Miles			Irrigated Areas—Acres			
	In		Total	In			Total
	United States	Mexico		United States	Mexico		
					Primary	Secondary	
Pecos River, above Girvin	29,562	0	29,562				
Pecos River, Girvin to I.B.C. gaging station	5,681	0	5,681	‡ 419	0	0	419
Pecos River, above I.B.C. gaging station	35,243	0	35,243	‡ 419	0	0	419
Goodenough Spring, above gaging station	1	0	1	0	0	0	0
Devils River, above Juno gaging station	2,733	0	2,733	0	0	0	0
Devils River, below gaging station near Juno to I.B.C. gaging station	1,327	0	1,327	‡ 8	0	0	8
Devils River, above I.B.C. gaging station	4,060	0	4,060	‡ 8	0	0	8
Cienagas Creek, above gaging station	18	0	18	354	0	0	354
Langtry to Del Rio, excluding above tributaries	398	2,495	2,893	10	0	0	10
Langtry to Del Rio, total	39,720	2,495	42,215	791	0	0	791
Above Del Rio Station	82,497	39,015	121,512	176,095	221,084	12,108	409,287
Las Vacas Arroyo, above gaging station	0	146	146	0	1,483	494	1,977
San Felipe Creek, above gaging station	62	0	62	924	0	0	924
Sycamore Creek, above gaging station	524	0	524	0	0	0	0
Pinto Creek, above gaging station	229	0	229	100	0	0	100
Rio San Diego, above gaging station	0	931	931	0	21,004	0	21,004
Las Moras Creek, above gaging station	162	0	162	712	0	0	712
Rio San Rodrigo, above gaging station	0	586	586	0	3,212	3,212	6,424
Del Rio to Eagle Pass, excluding above tributaries	527	581	1,108	16,835	7,661	0	24,496
Del Rio to Eagle Pass, total	1,504	2,244	3,748	18,571	33,360	3,706	55,637
Above Eagle Pass Station	84,001	41,259	125,260	194,666	254,444	15,814	464,924
Rio Escondido, above gaging station	0	1,130	1,130	0	6,178	8,649	14,827
Arroyo Amole, total	0	482	482	0	0	0	0
Eagle Pass to El Jardin, excluding above tributaries	736	1,191	1,927	1,696	247	0	1,943
Eagle Pass to El Jardin, total	736	2,803	3,539	1,696	6,425	8,649	16,770
Above El Jardin Dam Site	84,737	44,062	128,799	196,362	260,869	24,463	481,694
Santa Isabella Arroyo, above river road	350	0	350	0	0	0	0
El Jardin to Laredo, excluding Santa Isabella	387	1,079	1,466	ϕ 4,186	1,236	0	5,422
El Jardin to Laredo, total	737	1,079	1,816	ϕ 4,186	1,236	0	5,422
Eagle Pass to Laredo, excluding above tributaries	1,123	2,270	3,393	5,882	1,483	0	7,365
Eagle Pass to Laredo, total	1,473	3,882	5,355	5,882	7,661	8,649	22,192
Above Laredo Station	85,474	45,141	130,615	200,548	262,105	24,463	487,116
Dolores Creek, above gaging station	606	0	606	0	0	0	0
Rio Salado, above Don Martin Dam	0	13,819	13,819	0	54,364	8,896	63,260
Rio Salado, below Don Martin Dam	0	7,709	7,709	0	17,051	10,132	27,183
Rio Salado, above gaging station	0	21,528	21,528	0	71,415	19,028	90,443
Laredo to Zapata, excluding above tributaries	491	942	1,433	ϕ 6,008	1,236	0	7,244
Laredo to Zapata, including Dolores and excluding Salado	1,097	942	2,039	ϕ 6,008	1,236	0	7,244
Laredo to Zapata, total	1,097	22,470	23,567	ϕ 6,008	72,651	19,028	97,687
Above Zapata Station	86,571	67,611	154,182	206,556	334,756	43,491	584,803
El Tigre Arroyo, above gaging station	261	0	261	0	0	0	0
Rio Alamo, above gaging station	0	1,675	1,675	0	4,942	5,436	10,378
Zapata to Roma, excluding above tributaries	771	315	1,086	ϕ 1,102	0	0	1,102
Zapata to Roma, including El Tigre and excluding Alamo	1,032	315	1,347	ϕ 1,102	0	0	1,102
Zapata to Roma, total	1,032	1,990	3,022	ϕ 1,102	4,942	5,436	11,480
Above Roma Station	87,603	69,601	157,204	207,658	339,698	48,927	596,283
Rio San Juan, above gaging station at Santa Rosalia	0	12,013	12,013	0	102,551	67,214	169,765
Los Olmos Creek, above gaging station	535	0	535	0	0	0	0
Roma to Rio Grande City, excluding above tributaries	143	847	990	ϕ 114	0	0	114
Roma to Rio Grande City, including Los Olmos and excluding San Juan	678	847	1,525	ϕ 114		0	114
Roma to Rio Grande City, total	678	12,860	13,538	ϕ 114	102,551	67,214	169,879
Above Rio Grande City Station	88,281	82,461	170,742	207,772	442,249	116,141	766,162
Rio Grande City to Hidalgo	415	430	845				
Above Hidalgo Station	88,696	82,891	171,587				
Hidalgo to Mercedes Bridge Station	15	15	30				
Above Mercedes Bridge Station	88,711	82,906	171,617				
Mercedes Bridge to Matamoros Station	11	11	22				
Above Matamoros Station	88,722	82,917	171,639				
Matamoros to Lower Brownsville Station	2	2	4				
Rio Grande City to Lower Brownsville Station	443	458	901	*457,379	# 0	# 0	457,379
Above Lower Brownsville Station	88,724	82,919	171,643	665,151	442,249	116,141	1,223,541

* Cultivated acres, see heading on preceding page. ‡ Estimated.
ϕ Estimated same as 1940. # No irrigation in 1941 due to excessive rainfall.

AUTHENTICATED DISCHARGE RECORDS

The tabulation below shows the publications in which may be found discharge records that have been authenticated by this Commission for gaging stations on the Rio Grande from San Marcial, New Mexico, to the Gulf of Mexico, and on tributaries near their confluence with the Rio Grande below San Marcial, as well as on floodways leading from the Rio Grande. The table covers all of the years of record for San Marcial and El Paso gaging stations. For stations below El Paso the table covers only the years of record within the two periods 1900 to 1913 and 1924 to 1941.

AUTHENTICATED DISCHARGE RECORDS

Name of Gaging Station	Records Within The Period	Where Published
San Marcial	1895 - 1923	W.B. 7; W.S.P. 358, 388, 408, 438, 458, 478, 508, 528, 628
	1924 - 1930	W.B. 6; W.S.P. 628, 688, 703, 718
	1931,1932* - 1941	W.B. 1 - 6* - 11
Below Elephant Butte Dam	1915 and 1916	W. B. 10
	1938 - 1941	W. B. 8 - 11
Below Caballo Dam	1938 - 1941	W. B. 8 - 11
El Paso	1889 - 1923	W.B. 7; W.S.P. 358, 388, 408, 568, 588
	1924-1928* - 1930	W.B. 6*; W.S.P. 588, 608, 628, 648, 668♦ 688, 703, 718
	1931 - 1941	W. B. 1 - 11
Below American Dam	June 1938 - 1941	W. B. 8 - 11
El Paso Sewage Outfall	1936 - 1941	W. B. 8 - 11
Cd. Juarez	Apr. 1938 - 1941	W. B. 8 - 11
Island	Aug. 1938 - 1941	W. B. 8 - 11
Tornillo Bridge	1924 - 1930	W. B. 5, 6; W.S.P. 668, 688, 703, 718
	1931 - 1937	W. B. 1 - 7
County Line	1938 - 1941	W. B. 8 - 11
Ft. Quitman	1924 - 1930	W.B. 6; W.S.P. 588, 608, 628, 648, 668, 688, 703, 718
	1931 - 1941	W. B. 1 - 11
La Nutria	June 1935 - 1941	W. B. 5 - 11
Upper Presidio	1900 * 1913	W. B. 7*
	1924 - 1926*-1930	W. B. 3, 4*, 6; W.S.P.588,608,628
	1927* and 1932*	W. B. 9*
	1931 - 1933*	W. B. 1 - 4*
	1934-1937*- 1939*	W. B. 4 - 10*
	1940 - 1941	W. B. 10 - 11
Rio Conchos	1900 - 1913	W. B. 7
	1924 * 1932	W. B. 6, 7*
	1933 - 1941	W. B. 5 - 11
Lower Presidio	1900 * 1913	W. B. 7*
	1924 * 1932	W. B. 6*, 7*
	1933 - 1937	W. B. 3 - 7
	1938*,1939*-1941	W. B. 8,9,10*,11
Alamito Creek	1932 - 1941	W. B. 2 - 11
Terlingua Creek	1932 - 1936	W. B. 2 - 6
	1937*	W. B. 7, 8*
	1938*,1939*-1941	W. B. 8, 9, 10*, 11
Johnson Ranch	Apr. 1936 - 1941	W. B. 6 - 11
Boquillas	1924 - 1928	W. B. 5, 6
	1929 - 1930	W. B. 6; W.S.P. 688, 703, 718
	1931 - Apr. 1936	W. B. 1 - 6
Lozier Creek	1932 - 1935	W. B. 2 - 6
Langtry	1900 * 1913	W. B. 7*
	1904* and 1906*	W. B. 9
	1924* - 1927	W. B. 4*, 6
	1928 - 1930	W. B. 6; W.S.P. 668, 688, 703, 718
	1931 - 1941	W. B. 1 - 11
Pecos River	1900 - 1913	W. B. 7
	1924 - 1930	W. B. 6; W.S.P. 588, 608, 628, 648, 668, 688, 703, 718
	1931 - 1941	W. B. 1 - 11
Goodenough Spring	1924 - 1929	W. B. 5, 6
	Feb. 1929 - 1930	W. B. 6; W.S.P. 688, 703, 718
	1931 - 1941	W. B. 1 - 11
Devils River	1900-1902* - 1913	W. B. 7, 11*
	1924 - 1930	W. B. 6; W.S.P. 588, 608, 628, 648, 668, 688, 703, 718
	1931 - 1932*	W. B. 1, 2, 5*, 6
	1933* - 1934*	W. B. 3, 4, 5*, 6
	1935-1936* - 1941	W. B. 5 - 10*, 11

W.S.P. - Water Supply Paper of the U. S. Geological Survey.
W. B. - Water Bulletins of this Commission. * Partly revised in Water Bulletin marked thus *.
♦ - The monthly totals for the year 1928 are slightly revised on page 46, Water Bulletin No. 6.

AUTHENTICATED DISCHARGE RECORDS

AUTHENTICATED DISCHARGE RECORDS

Name of Gaging Station	Records Within The Period	Where Published
Cienegas Creek	Sept. 1931 - June 1935	W. B. 1 - 6
Del Rio	1900 * 1913	W. B. 7*
	1924*	W. B. 4*, 6; W.S.P. 588, 608
	1925 - 1930	W.B. 6; W.S.P. 608, 628, 648, 668, 688, 703, 718
	1931 - 1941	W. B. 1 - 11
Arroyo Las Vacas	Partial Records June 1935 - Mar. 1938	W. B. 6, 7, 8
	Apr. 1938 - Dec. 1941	W. B. 8 - 11
San Felipe	Sept. 1931-1935* - 1941	W. B. 1 - 10*, 11
Sycamore Creek	1932 - May 1935	W. B. 2 - 6
Pinto Creek	Nov. 1928 - 1930	W. B. 6; W.S.P. 688, 703, 718
	1931 - 1941	W. B. 1 - 11
Rio San Diego	Oct. 1932 - 1941	W. B. 2 - 11
Las Moras Creek	1932 - 1934*	W. B. 2 - 5*, 6
	1935	W. B. 5, 6
Rio San Rodrigo	1932 - 1941	W. B. 2 - 11
Eagle Pass	1900 * 1913	W. B. 7*
	1924* - 1926	W. B. 4*, 6
	1927 - 1930	W. B. 6; W.S.P. 648, 668, 688, 703, 718
	1931 - 1941	W. B. 1 - 11
Rio Escondido	1932 - 1941	W. B. 2 - 11
Laredo	1900 * 1913	W. B. 7*
	1924 - 1925*	W. B. 4*, 6
	1926*	W. B. 4, 5*, 6
	1927 - 1928	W. B. 4, 6
	1929 - 1930	W. B. 3, 6
	Sept. 1934*	W. B. 9*
	1931 - 1941	W. B. 1 - 11
Dolores Creek	1932 - May 1936	W. B. 2 - 6
Rio Salado	1900 - 1913	W. B. 7
	1924 - 1928	W. B. 5, 6
	1929 - 1930	W. B. 3, 6
	1931 - 1941	W. B. 1 - 11
Zapata	1932 -1938* -1941	W. B. 2 - 10*, 11
El Tigre Creek	1932 - Apr. 1936	W. B. 2 - 6
Rio Alamo	1924 - 1928	W. B. 5, 6
	1929 - 1930	W. B. 3, 6
	1931 - 1941	W. B. 1 - 11
Roma	1900 * 1913	W. B. 7*
	1924 - 1929	W. B. 5, 6
	Mar. 1929 - 1930	W.B. 6; W.S.P. 688, 703, 718
	1931	W. B. 1, 6
	1932*	W. B. 2, 3*, 6
	1933 - 1941	W. B. 3 - 11
Rio San Juan	Oct. 1900 - 1913	W. B. 7
	1924 - 1928	W. B. 5, 6
	1929 - 1930	W. B. 3, 6
	1931, 1932* - 1941	W. B. 1 - 8*, 9, 10, 11
Los Olmos Creek	1932 - Mar. 1936	W. B. 2 - 6
Rio Grande City	1924 - 1931	W.B. 5, 6
	1932* - 1941	W.B. 2-8*,9,10*,11
	1937*,1938*,1939*	W.B. 11*
N. Floodway	1926 - 1941	W. B. 2 - 11
S. Floodway	1926 - 1941	W. B. 2 - 11
Hidalgo	July 1928 - 1930	W.B. 6; W.S.P. 668, 688, 703, 718
	1931	W. B. 1, 6
	Partial Records 1932 - 1936	W. B. 2 - 6
	May 1938 - Nov. 1939	W. B. 8, 9
	Partial Records 1940 and 1941	W. B. 10, 11
Retamal ®	1939 - 1941	W. B. 9 - 11
Mercedes Bridge	Sept. 1932 - Oct. 1932	W. B. 2
	Partial Records 1935 - 1936	W. B. 5, 6
	Nov. 1937 - Dec. 1937	W. B. 7
	Partial Records 1938 - 1941	W. B. 8 - 11
Rancho Viejo Floodway	1935 - 1941	W. B. 5 - 11
Matamoros	1900 - 1913	W. B. 7
	1924 - Sept. 1926	W.B. 6; W.S.P. 588, 608, 628
	Oct. 1926 - 1928	W. B. 5, 6
	1929 - 1930	W. B. 3, 6
	1931 - 1941	W. B. 1 - 11
Lower Brownsville	1934 - 1941	W. B. 4 - 11

W. B. - Water Bulletins of this Commission.
W.S.P. -Water Supply Papers of the U. S. Geological Survey.
* Partly revised in Water Bulletins marked thus*. ® Retamal Canal is sometimes used as a floodway.