UNITED STATES DEPARTMENT OF THE INTERIOR
RAY LYMAN WILBUR, Secretary
GEOLOGICAL SURVEY
GEORGE OTIS SMITH, Director

Water-Supply Paper 646

SURFACE WATER SUPPLY *of the* UNITED STATES

1927

PART VI
MISSOURI RIVER BASIN

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Prepared in cooperation with the States of
MONTANA, WYOMING, COLORADO
MISSOURI, and KANSAS

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SURFACE WATER SUPPLY OF MISSOURI RIVER BASIN, 1927

AUTHORIZATION AND SCOPE OF WORK

This volume is one of a series of 14 reports presenting results of measurements of flow made on streams in the United States during the years ending September 30, 1927.

The data presented in these reports were collected by the United States Geological Survey under the following authority contained in the organic law (20 Stat. L., p. 394):

Provided, That this officer [the Director] shall have the direction of the Geological Survey and the classification of public lands and examination of the geological structure, mineral resources, and products of the national domain.

The work was begun in 1888 in connection with special studies relating to irrigation in the West. Since the fiscal year ending June 30, 1895, successive appropriation bills passed by Congress have carried the following items:

For gaging the streams and determining the water supply of the United States, and for the investigation of underground currents and artesian wells, and for the preparation of reports upon the best methods of utilizing the water resources.

Annual appropriations for the fiscal years ending June 30, 1895–1928

1895	$12, 500. 00	1918	$175, 000. 00
1896	24, 500. 00	1919	148, 244. 10
1897–1899	50, 000. 00	1920	175, 000. 00
1900	70, 000. 00	1921–1923	180, 000. 00
1901–1902	100, 000. 00	1924 and 1925	170, 000. 00
1903–1906	200, 000. 00	1926	165, 000. 00
1907	150, 000. 00	1927	151, 000. 00
1908–1910	100, 000. 00	1928	147, 000. 00
1911–1917	150, 000. 00		

In the execution of the work many private and State organizations have cooperated either by furnishing data or by assisting in collecting data. Acknowledgments for cooperation of the first kind are made in connection with the description of each station affected; cooperation of the second kind is acknowledged on page 10.

Measurements of stream flow have been made at about 5,330 points in the United States and also at many points in Alaska and the Hawaiian Islands. In July, 1927, 1,750 gaging stations were being maintained by the Geological Survey and the cooperating

organizations. Many miscellaneous discharge measurements are made at other points. In connection with this work data were also collected in regard to precipitation, evaporation, storage reservoirs, river profiles, and water power in many sections of the country and will be made available in water-supply papers from time to time.

DEFINITION OF TERMS

The volume of water flowing in a stream—the "run-off" or "discharge"—is expressed in various terms, each of which has become associated with a certain class of work. These terms may be divided into two groups—(1) those that represent a rate of flow, as second-feet, gallons per minute, miner's inches, and discharge in second-feet per square mile, and (2) those that represent the actual quantity of water, as run-off in inches, acre-feet, and millions of cubic feet. The principal terms used in this series of reports are second-feet, second-feet per square mile, run-off in inches, and acre-feet. They may be defined as follows:

"Second-feet" is an abbreviation for "cubic feet per second." A second-foot is the rate of discharge of water flowing in a channel of rectangular cross section 1 foot wide and 1 foot deep at an average velocity of 1 foot per second. It is generally used as a fundamental unit from which others are computed.

"Second-feet per square mile" is the average number of cubic feet of water flowing per second from each square mile of area drained, on the assumption that the run-off is distributed uniformly both as regards time and area.

"Run-off in inches" is the depth to which an area would be covered if all the water flowing from it in a given period were uniformly distributed on the surface. It is used for comparing run-off with rainfall, which is usually expressed in depth in inches.

An "acre-foot," equivalent to 43,560 cubic feet, is the quantity required to cover an acre to the depth of 1 foot. The term is commonly used in connection with storage for irrigation.

The following terms not in common use are here defined:

"Stage-discharge relation," an abbreviation for the term "relation of gage height to discharge."

"Control," a term used to designate the section or sections of the stream below the gage which determine the stage-discharge relation at the gage. It should be noted that the control may not be the same section or sections at all stages.

The "point of zero flow" for a gaging station is that point on the gage—the gage height—at which water ceases to flow over the control.

EXPLANATION OF DATA

The data presented in this report cover the year beginning October 1, 1926, and ending September 30, 1927. At the beginning of January in most parts of the United States much of the precipitation in the preceding three months is stored in the form of snow or ice, or in ponds, lakes, and swamps, or as ground water, and this stored water passes off in the streams during the spring break-up. At the end of September, on the other hand, the only stored water available for run-off is possibly a small quantity in the ground; therefore the run-off for the year beginning October 1 is practically all derived from precipitation within that year.

The base data collected at gaging stations consist of records of stage, measurements of discharge, and general information used to supplement the gage heights and discharge measurements in deter-

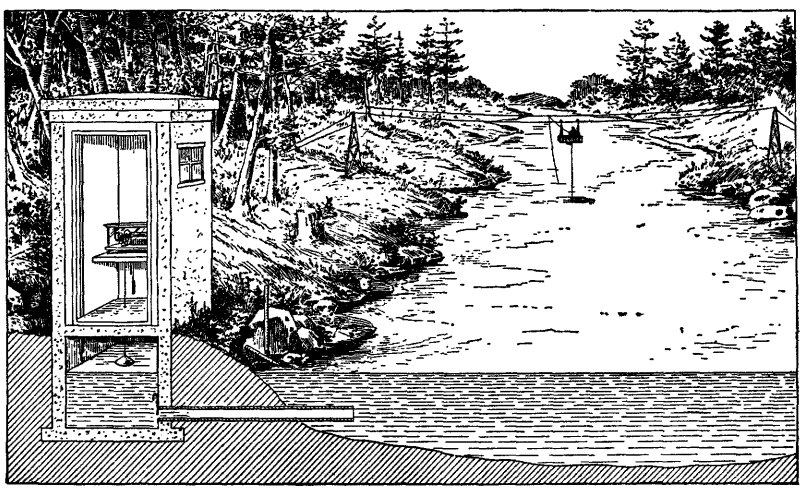

FIGURE 1.—Typical gaging station

mining the daily flow. The records of stage are obtained either from direct readings on a staff or chain gage or from a water-stage recorder that gives a continuous record of the fluctuations. Measurements of discharge are made with a current meter by the general methods outlined in standard textbooks on the measurement of river discharge. A typical gaging station, equipped with water-stage recorder and measuring cable and car, is shown in Figure 1.

From the discharge measurements rating tables are prepared that give the discharge for any stage. The application of the daily gage heights to these rating tables gives the daily discharge from which the monthly and yearly mean discharge is determined.

The data presented for each gaging station in the area covered by this report comprise a description of the station, a table giving

results of discharge measurements, a table showing the daily discharge of the stream, and a table of monthly and yearly discharge and run-off.

If the base data are insufficient to determine the daily discharge, tables giving daily gage heights and results of discharge measurements are published.

The description of the station gives, in addition to statements regarding location and equipment, information in regard to any condition that may affect the permanence of the stage-discharge relation, covering such subjects as the occurrence of ice, the use of the stream for log driving, shifting of control, and the cause and effect of backwater. It gives also information as to diversions that decrease the flow at the gage, artificial regulation, maximum and minimum recorded stages, and the accuracy of the records.

The table of daily discharge gives, in general, the discharge in second-feet corresponding to the mean of the gage heights read each day. At stations on streams subject to sudden or rapid diurnal fluctuation the discharge obtained from the rating table and the mean daily gage height may not be the true mean discharge for the day. If such stations are equipped with water-stage recorders the mean daily discharge may be obtained by averaging discharge at regular intervals during the day or by use of the discharge integrator, an instrument operating on the principle of the planimeter and containing as an essential element the rating curve of the station.

In the table of monthly discharge the column headed "Maximum" gives the mean flow for the day when the mean gage height was highest. As the gage height is the mean for the day it does not indicate correctly the stage when the water surface was at crest height and the corresponding discharge was consequently larger than given in the maximum column. Likewise, in the column headed "Minimum" the quantity given is the mean flow for the day when the mean gage height was lowest. The column headed "Mean" is the average flow in cubic feet per second during the month. On this average flow are based computations recorded in the remaining columns, which are defined on page 2.

ACCURACY OF FIELD DATA AND COMPUTED RESULTS.

The accuracy of stream-flow data depends primarily (1) on the permanence of the stage-discharge relation and (2) on the accuracy of observation of stage, measurements of flow, and interpretation of records.

A paragraph in the description of the station gives information regarding the (1) permanence of the stage-discharge relation, (2) precision with which the discharge rating curve is defined, (3) refinement

of gage readings, (4) frequency of gage readings, and (5) methods of applying daily gage height to the rating table to obtain the daily discharge.

For the rating tables "well defined" indicates, in general that the rating is probably accurate within 5 per cent; "fairly well defined," within 10 per cent; "poorly defined," within 15 to 25 per cent. Those notes are very general and are based on the plotting of the individual measurements with reference to the mean rating curve.

The monthly means for any station may represent with high accuracy the quantity of water flowing past the gage, but the figures showing discharge per square mile and depth in inches may be subject to gross errors caused by the inclusion of large noncontributing districts in the measured drainage area, by lack of information concerning water diverted for irrigation or other use, or by inability to interpret the effect of artificial regulation of the flow of the river above the station. "Second-feet per square mile" and "run-off in inches" are therefore not computed if such errors appear probable. The computations are also omitted for stations on streams draining areas in which the annual rainfall is less than 20 inches. All figures representing "second-feet per square mile" and "run-off in inches" published by the Geological Survey in earlier reports should be used with caution because of possible inherent but unknown sources of error.

Many gaging stations on streams in the irrigated areas of the United States are situated above most of the diversions from those streams, and the discharge recorded does not show the water supply available for further development, as prior appropriations below the stations must be satisfied first. To give an idea of the amount of prior appropriations a paragraph on diversions is presented in each station description. The figures given can not be considered exact but represent the best information available.

The table of monthly discharge gives only a general idea of the flow at the station and should not be used for other than preliminary estimates; the tables of daily discharge allow more detailed studies of the variation in flow. It should be borne in mind, however, that the observations in each succeeding year may be expected to throw new light on data previously published.

PUBLICATIONS

Investigation of water resources by the United States Geological Survey has consisted in large part of measurements of the volume of flow of streams and studies of the conditions affecting that flow, but it has comprised also investigation of such closely allied subjects as irrigation, water storage, water powers, underground waters, and quality of waters. Most of the results of these investigations have

been published in the series of water-supply papers, but some have appeared in the bulletins, professional papers, monographs, and annual reports.

The results of stream-flow measurements are now published annually in 12 parts, each part covering an area whose boundaries coincide with natural drainage features as indicated below.

PART I. North Atlantic slope basins (St. John River to York River).
II. South Atlantic slope and eastern Gulf of Mexico basins (James River to the Mississippi).
III. Ohio River Basin.
IV. St Lawrence River Basin.
V. Upper Mississippi River and Hudson Bay Basins.
VI. Missouri River Basin.
VII. Lower Mississippi River Basin.
VIII. Western Gulf of Mexico basins.
IX. Colorado River Basin.
X. The Great Basin.
XI. Pacific slope basins in California.
XII. North Pacific slope basins, in three parts:
A, Pacific slope basins in Washington and upper Columbia River Basin.
B, Snake River Basin.
C, Pacific slope basins in Oregon and lower Columbia River Basin.

Water-supply papers and other publications of the United States Geological Survey containing data in regard to the water resources of the United States may be obtained or consulted as indicated below.

1. Copies may be purchased at nominal cost from the Superintendent of Documents, Government Printing Office, Washington, D. C., who will, on application, furnish lists giving prices.

2. Sets of the reports may be consulted in the libraries of the principal cities in the United States.

3. Sets are available for consultation in the local offices of the water-resources branch of the Geological Survey as follows:

Augusta, Me., Statehouse.
Boston, Mass., 2500 Customhouse.
Hartford, Conn., 64 State Capitol.
Albany, N. Y., 506 Broadway-Arcade Building.
Trenton, N. J., 423 Statehouse Annex.
Charlottesville, Va., Brooks Museum, University of Virginia.
South Charleston, W. Va., Naval Ordnance Plant.
Asheville, N. C., 608 City Hall.
Chattanooga, Tenn., 630 Power Building.
Tuscaloosa, Ala., Post Office Building.
Columbus, Ohio, Engineering Experiment Station, Ohio State University.
Chicago, Ill., 1510 Consumers Building.
Madison, Wis., 337N State Capitol.
St. Paul, Minn., 202 Old State Capitol.
Topeka, Kans., 23 Federal Building.

Rolla, Mo., Rolla Building, School of Mines and Metallurgy.
Fort Smith, Ark., Post Office Building.
Austin, Tex., State Capitol.
Tucson, Ariz., 104 Agricultural Building, University of Arizona.
Denver, Colo., 403 Post Office Building.
Salt Lake City, Utah, 313 Federal Building.
Idaho Falls, Idaho, 228 Federal Building.
Boise, Idaho, Federal Building.
Helena, Mont., 415 Power Building.
Tacoma, Wash., 406 Federal Building.
Portland, Oreg., 606 Post Office Building.
San Francisco, Calif., 303 Customhouse.
Los Angeles, Calif., 751 Figueroa Street.
Honolulu, Hawaii, Territorial Office Building.

A list of the Geological Survey's publications may be obtained by applying to the director of the United States Geological Survey, Washington, D. C.

Stream-flow records have been obtained at about 5,330 points in the United States, and the data obtained have been published in the reports tabulated on pages 7 and 9.

Stream-flow data in reports of the United States Geological Survey

A=Annual Report; B=Bulletin; W=Water-Supply Paper

Report	Character of data	Year
10th A, pt. 2	Descriptive information only	
11th A, pt. 2	Monthly discharge and descriptive information	1884 to September, 1890.
12th A, pt. 2	do	1884 to June 30, 1891.
13th A, pt. 3	Mean discharge in second-feet	1884 to Dec. 31, 1892.
14th A, pt. 2	Monthly discharge (long-time records, 1871 to 1893)	1888 to Dec. 31, 1893.
B 131	Descriptions, measurements, gage heights, and ratings	1893 and 1894.
16th A, pt. 2	Descriptive information only	1895.
B 140	Descriptions, measurements, gage heights, ratings, and monthly discharge (also many data covering earlier years).	
W 11	Gage heights (also gage heights for earlier years)	1896.
18th A, pt. 4	Descriptions, measurements, ratings, and monthly discharge (also similar data for some earlier years).	1895 and 1896.
W 15	Descriptions, measurements, and gage heights, eastern United States, eastern Mississippi River, and Missouri River above junction with Kansas.	1897.
W 16	Descriptions, measurements, and gage heights, western Mississippi River below junction of Missouri and Platte, and western United States.	1897.
19th A, pt. 4	Descriptions, measurements, ratings, and monthly discharge (also some long-time records).	1897.
W 27	Measurements, ratings, and gage heights, eastern United States, eastern Mississippi River, and Missouri River.	1898.
W 28	Measurements, ratings, and gage heights, Arkansas River and western United States.	1898.
20th A, pt. 4	Monthly discharge (also for many earlier years)	1898.
W 35 to 39	Descriptions, measurements, gage heights, and ratings	1899.
21st A, pt. 4	Monthly discharge	1899.
W 47 to 52	Descriptions, measurements, gage heights, and ratings	1900.
22d A, pt. 4	Monthly discharge	1900.
W 65, 66	Descriptions, measurements, gage heights, and ratings	1901.
W 75	Monthly discharge	1901.
W 82 to 85	Complete data	1902.
W 97 to 100	do	1903.
W 124 to 135	do	1904.
W 165 to 178	do	1905.
W 201 to 214	do	1906.
W 241 to 252	do	1907–8.
W 261 to 272	do	1909.
W 281 to 292	do	1910.

Stream-flow data in reports of the United States Geological Survey—Continued

Report	Character of data	Year
W 301 to 312	Complete data	1911.
W 321 to 332	do	1912.
W 351 to 362	do	1913.
W 381 to 394	do	1914.
W 401 to 414	do	1915.
W 431 to 444	do	1916.
W 451 to 464	do	1917.
W 471 to 484	do	1918.
W 501 to 514	do	1919–20.
W 521 to 534	do	1921.
W 541 to 554	do	1922.
W 561 to 574	do	1923.
W 581 to 594	do	1924.
W 601 to 614	do	1925.
W 621 to 634	do	1926.
W 641 to 654	do	1927.

NOTE.—No data regarding stream flow are given in the Fifteenth and Seventeenth Annual Reports.

The records at most of the stations discussed in these reports extend over a series of years, and miscellaneous measurements at many points other than regular gaging stations have been made each year. An index of the reports containing records obtained prior to 1904 has been published in Water-Supply Paper 119.

The following table gives, by years and drainage basins, the numbers of the papers on surface-water supply published from 1899 to 1927. The data for any particular station will be found in the reports covering the years during which the station was maintained. For example, data for Machias River at Whitneyville, Me., 1903 to 1921, are published in Water-Supply Papers 97, 124, 165, 201, 241, 261, 281, 301, 321, 351, 381, 401, 431, 451, 471, 501, and 521, which contain records for the New England streams from 1903 to 1921. Results of miscellaneous measurements are published by drainage basins.

Numbers of water-supply papers containing results of stream measurements, 1899–1927

[For basins included see p. 6]

Year	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII-A	XII-B	XII-C
1899 [a]	35	[b] 35, 36	36	36	36	[c] 36, 37	37	37	[d] 37, 38	38, [e] 39	38, [f] 39	38	38	38
1900 [g]	47, [h] 48	48	48, [i] 49	49	49	49, [j] 50	50	50	50	51	51	51	51	51
1901	65, 75	65, 75	65, 75	65, 75	[k] 65, 66, 75	66, 75	[k] 65, 66, 75	66, 75	66, 75	66, 75	66, 75	66, 75	66, 75	66, 75
1902	82	[b] 82, 83	83	[l] 82, 83	[k] 83, 85	84	[k] 83, 84	84	85	85	85	85	85	85
1903	97	[b] 97, 98	98	[e] 97	[k] 98, 99, [m] 100	99	[k] 98, 99	99	100	100	100	100	100	100
1904	[n] 124, [o] 125, [p] 126	[p] 126, 127	128	129	[k] 128, 130	130, [q] 131	[k] 128, 131	132	133	133, [r] 134	134	135	135	135
1905	[n] 165, [o] 166, [p] 167	[p] 167, 168	169	170	171	172	[k] 169, 173	174	175, [s] 177	176, [r] 177	177	178	178	[t] 177, 178
1906	[n] 201, [o] 202, [p] 203	[p] 203, 204	205	206	207	208	[k] 205, 209	210	211	212, [r] 213	213	214	214	214
1907–8	241	242	243	244	245	246	247	248	249	250, [r] 251	251	252	252	252
1909	261	262	263	264	265	266	267	268	269	270, [r] 271	271	272	272	272
1910	281	282	283	284	285	286	287	288	289	290	291	292	292	292
1911	301	302	303	304	305	306	307	308	309	310	311	312	312	312
1912	321	322	323	324	325	326	327	328	329	330	331	332-A	332-B	332-C
1913	351	352	353	354	355	356	357	358	359	360	361	362-A	362-B	362-C
1914	381	382	383	384	385	386	387	388	389	390	391	392	393	394
1915	401	402	403	404	405	406	407	408	409	410	411	412	413	414
1916	431	432	433	434	435	436	437	438	439	440	441	442	443	444
1917	451	452	453	454	455	456	457	458	459	460	461	462	463	464
1918	471	472	473	474	475	476	477	478	479	480	481	482	483	484
1919–20	501	502	503	504	505	506	507	508	509	510	511	512	513	514
1921	521	522	523	524	525	526	527	528	529	530	531	532	533	534
1922	541	542	543	544	545	546	547	548	549	550	551	552	553	554
1923	561	562	563	564	565	566	567	568	569	570	571	572	573	574
1924	581	582	583	584	585	586	587	588	589	590	591	592	593	594
1925	601	602	603	604	605	606	607	608	609	610	611	612	613	614
1926	621	622	623	624	625	626	627	628	629	630	631	632	633	634
1927	641	642	643	644	645	646	647	648	649	650	651	652	653	654

[a] Rating tables and index to Water-Supply Papers 35–39 contained in Water-Supply Paper 39. Tables for monthly discharge for 1899 in Twenty-first Annual Report, Part IV.
[b] James River only.
[c] Gallatin River.
[d] Green and Gunnison Rivers and Grand River above junction with Gunnison.
[e] Mohave River only.
[f] Kings and Kern Rivers and south Pacific slope basins.
[g] Rating tables and index to Water-Supply Papers 47–52 and data on precipitation wells, and irrigation in California and Utah contained in Water-Supply Paper 52. Tables for monthly discharge for 1900 in Twenty-second Annual Report, Part IV.
[h] Wissahickon and Schuylkill Rivers to James River.
[i] Scioto River.
[j] Loup and Platte Rivers near Columbus, Nebr., and all tributaries below junction with Platte.
[k] Tributaries of Mississippi from east.
[l] Lake Ontario and tributaries to St. Lawrence River proper.
[m] Hudson Bay only.
[n] New England rivers only.
[o] Hudson River to Delaware River, inclusive.
[p] Susquehanna River to Yadkin River, inclusive.
[q] Platte and Kansas Rivers.
[r] Great Basin in California, except Truckee and Carson River Basins.
[s] Below junction with Gila.
[t] Rogue, Umpqua, and Siletz Rivers only.

COOPERATION

In Montana, until March, 1927, part of the work has been carried on under cooperative agreement with the United States Bureau of Reclamation, the work being done by the Geological Survey and the expense borne by the Bureau of Reclamation. After March, 1927, the expense was borne by the Department of State. The legislature of Montana made an appropriation for stream-gaging work, which was expended in accordance with paragraph 3, section 2244, of the Revised Codes of 1907 of the State of Montana, which reads as follows:

> The State engineer shall become conversant with the waterways of the State and the needs of the State as to irrigation matters, shall make, or cause to be made, measurements and calculations of the ordinary and flood discharge of streams, cooperating in this work as much as possible with the United States Geological Survey and the Montana Experiment Station; such measurements to be made on streams in the order of their importance, provided that measurements already made, if deemed reliable, may be adopted.

This fund was expended largely on work in connection with several Carey Act projects and irrigation districts in Montana. Financial assistance was also rendered by the Mineral Range Power Co.; the South Bench Irrigation District, Three Forks, Mont.; and the Liberty-Montana Mines Co.

Officials of the Yellowstone National Park furnished observers for gaging stations in the park and have paid for a part of the expense of the work.

In Wyoming the work was carried on in cooperation with the State through John A. Whiting, State engineer. Financial assistance was also rendered by the United States Bureau of Reclamation, the United States Indian Service, the Douglas Reservoirs Water Users' Association, and Mr. Fred Firnekas, water commissioner.

In Colorado the work was carried on in cooperation with the State engineer, Mr. M. C. Hinderlider. Financial assistance was also rendered by the city of Denver, the city of Loveland, the city engineer of Boulder, the Farmers Reservoir & Irrigation Co., and Mr. Barton M. Jones.

In South Dakota the work was carried on in cooperation with the United States Bureau of Reclamation.

In Kansas the work was done in cooperation with the Kansas Water Commission, which was succeeded on February 11 by the Division of Water Resources, State Board of Agriculture, George S. Knapp, chief engineer.

The work in Missouri and at the station on the Missouri River at Leavenworth, Kans., was carried on in cooperation with the Missouri Bureau of Geology and Mines, through H. A. Buehler, State geologist.

Financial assistance was also rendered by the United States Weather Bureau, United States Army Engineers, Chicago Great Western Railroad, Missouri Hydro-Electric Power Co., Central Missouri Power & Water Co., and Springfield City Water Co.

DIVISION OF WORK

Data for stations in the upper Missouri and Yellowstone River Basins in Montana were collected and prepared for publication under the direction of W. A. Lamb, district engineer, assisted by A. H. Tuttle, C. S. Heidel, and Mrs. G. Thompson.

Data for stations in Yellowstone National Park were collected and prepared for publication under the direction of C. G. Paulsen, district engineer, assisted by Berkeley Johnson, F. M. Veatch, and Miss E. H. Haugse.

Data for stations in Colorado and Wyoming were collected and prepared for publication under the direction of Robert Follansbee, district engineer, assisted by P. V. Hodges and Miss N. L. Esterly.

Data for stations in Kansas were collected and prepared for publication by J. B. Spiegel, district engineer, assisted by R. H. Husted.

Data for stations in Missouri and for the station on the Missouri River at Leavenworth, Kans., were collected and prepared for publication under the direction of H. C. Beckman, district engineer, assisted by V. L. Austin, A. L. Hill, and C. H. Jennings.

The records were reviewed and the manuscript assembled by Warren Withee.

GAGING-STATION RECORDS

MISSOURI RIVER PROPER

RED ROCK RIVER AT METZEL FORD, NEAR MONIDA, MONT.

LOCATION.—Near center of north line of sec. 34, T. 13 S., R. 3 W., at private bridge at Schultz ranch, 1 mile below Metzel Ford, and 20 miles east of Monida, Beaverhead County.

DRAINAGE AREA.—Not measured.

RECORDS AVAILABLE.—April 30, 1925, to September 30, 1927.

EQUIPMENT.—A continuous water-stage recorder on left bank. Discharge measurements made from bridge or by wading.

CHANNEL AND CONTROL.—Channel composed of clay. Banks subject to overflow at high stage. Control poorly defined. Considerable moss in creek during summer.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 4.20 feet at 1.45 p. m. May 17 (discharge, 586 second-feet); minimum, 1.50 feet at 7.30 a. m. October 1 (discharge, 7.2 second-feet).

1925–1927: Maximum stage recorded, that of May 17, 1927; minimum, 1.36 feet at 2 p. m. September 23, 1926 (discharge, 2.7 second-feet).

DIVERSIONS AND REGULATIONS.—No diversion. Natural storage in Red Rock Lakes.

ACCURACY.—Stage-discharge relation not permanent; affected by growth of moss in channel and by ice. Two rating curves used during year; both fairly well defined. Three discharge measurements, covering a range from 80 to 360 second-feet, were made during the year and check the respective curves closely. Operation of water-stage recorder not satisfactory. Daily discharge ascertained by applying mean daily gage height to rating table, using shifting-control method October 1–4 and July 1–16, except as indicated in footnote to table of daily discharge. Records fair.

Daily discharge, in second-feet, of Red Rock River at Metzel Ford, near Monida, Mont., for the year ending September 30, 1927

Day	Oct.	Nov.	May	July	Aug.	Sept.	Day	Oct.	Nov.	May	July	Aug.	Sept.
1	10	63	------	356	126	140	16		------	504	149	129	------
2	14	61	------	350	126	136	17		------	416	143	130	------
3	15	65	------	336	127	140	18	45	------	433	140	127	------
4	12	67	------	319	126	142	19		------	501	137	129	------
5		------	------	303	125	143	20	76	------	518	132	129	------
6		------	------	283	122	146	21	71	------	521	129	134	------
7		------	------	264	123	150	22	67	------	511	126	137	------
8		------	------	244	125	148	23	68	------	440	122	143	------
9		------	------	237	127	145	24	69	------	413	121	143	------
10	45	------	------	213	127	145	25	69	------	450	120	139	------
11		------	------	198	127	------	26	69	------	436	120	136	------
12		------	------	185	130	------	27	63	------	440	118	133	------
13		------	------	172	129	------	28	54	------	470	117	133	------
14		------	511	166	133	------	29	54	------	501	120	143	------
15		------	508	156	133	------	30	67	------	------	123	143	------
							31	74	------	------	122	139	------

NOTE.—Recorder not operating Oct. 5–19; mean discharge estimated. No record Nov. 6 to May 13, May 30 to June 30, and Sept. 11–30.

Monthly discharge of Red Rock River at Metzel Ford, near Monida, Mont., for the year ending September 30, 1927

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	76	10	49.3	3,030
November 1–4	67	61	64.0	508
May 14–29	521	413	473	15,100
July	356	117	188	11,600
August	143	122	131	8,060
September 1–10	150	136	144	2,860

RED ROCK RIVER BELOW RED ROCK RESERVOIR, NEAR MONIDA, MONT.

LOCATION.—In SW. ¼ sec. 32, T. 13 S., R. 6 W., just below Red Rock Reservoir, 8 miles northwest of Monida, Beaverhead County, and 15 miles east of Lima.

RECORDS AVAILABLE.—July 22, 1911, to September 30, 1918; May 1, 1925, to September 30, 1927.

EQUIPMENT.—Stage determined by measuring with graduated rod the depth on a peg set in concrete well with its top at elevation of crest of weir. Gage heights indicate head on 40-foot weir 150 yards below dam. Discharge measurements made from footbridge 50 feet above weir or by wading.

CHANNEL AND CONTROL.—Channel composed of coarse gravel and boulders. Banks high. Current very swift at high stages, causing considerable velocity of approach at weir. Control is concrete weir; subject to shift owing to débris washed in above.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 2.50 feet at 6 p. m. June 5 (discharge, 752 second-feet); minimum, 0.18 foot at 7 a. m. October 1 (discharge, 18 second-feet).

1911–1918, 1925–1927: Maximum stage recorded, 3.2 feet April 28, 1914 (discharge, 1,220 second-feet); minimum discharge, 5 second-feet January 1 to April 10, 1913 (gage height, 0.10 foot).

DIVERSIONS AND REGULATION.—No diversions. Flood water stored in reservoir and released as required during irrigation season.

ACCURACY.—Stage-discharge relation permanent during year; not affected by ice. Rating curve well defined between 50 and 500 second-feet. Three discharge measurements, covering a range from 45 to 405 second-feet, made during the year check the curve. Gage read to hundredths twice daily. Daily discharge ascertained by applying mean daily gage height to rating table. Records good.

COOPERATION.—Gage-height record furnished by Red Rock Reservoir & Irrigation Co.

Daily discharge, in second-feet, of Red Rock River below Red Rock Reservoir, near Monida, Mont., for the year ending September 30, 1927

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	19	47	44	31	31	22	22	138	683	397	365	172
2	20	47	45	31	31	22	22	166	701	377	349	166
3	20	47	45	31	31	22	22	214	701	361	288	166
4	20	47	45	31	26	24	22	246	701	349	246	161
5	19	48	45	31	22	22	22	263	724	326	243	166
6	19	47	45	31	22	22	22	263	738	310	240	166
7	20	47	45	32	22	22	22	288	738	310	233	161
8	21	45	45	32	22	22	22	326	734	353	227	159
9	21	45	45	31	22	22	22	337	734	431	221	151
10	20	45	45	31	22	22	24	337	738	435	217	147
11	20	45	45	31	22	22	24	361	729	439	214	147
12	21	45	45	31	22	22	24	385	729	444	211	149
13	20	45	45	31	22	22	24	389	734	422	214	144
14	20	45	45	31	22	22	24	401	743	397	214	140
15	21	45	45	32	22	22	24	410	743	377	211	142
16	32	44	45	31	22	22	38	410	743	418	214	138
17	45	44	41	32	22	22	55	393	738	488	205	135
18	44	45	37	31	22	22	55	318	734	497	199	133
19	42	45	37	31	22	22	68	310	734	492	196	133
20	42	44	37	31	22	22	81	326	729	497	199	131
21	42	44	35	31	22	23	81	365	720	483	196	129
22	42	44	34	31	22	23	81	406	711	475	196	127
23	42	44	32	31	22	23	81	439	697	448	194	123
24	44	45	31	31	22	23	81	448	605	422	194	119
25	44	45	31	31	22	23	81	414	519	414	185	113
26	45	45	31	31	22	23	81	377	470	410	182	109
27	45	45	31	30	22	22	108	373	410	406	185	106
28	47	45	31	31	22	23	138	393	393	397	175	99
29	48	45	31	31	-------	23	138	492	389	397	175	92
30	48	45	31	30	-------	23	138	577	393	381	179	88
31	48	-------	31	30	-------	22	-------	637	-------	373	174	------

Monthly discharge of Red Rock River below Red Rock Reservoir, near Monida, Mont. for the year ending September 30, 1927

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	48	19	32.3	1,990
November	48	44	45.3	2,700
December	45	31	39.4	2,420
January	32	30	31.0	1,910
February	31	22	23.1	1,280
March	24	22	22.4	1,380
April	138	22	54.9	3,270
May	637	138	361	22,200
June	743	389	662	39,400
July	497	310	411	25,300
August	365	174	217	13,300
September	172	88	137	8,150
The year	743	19	170	123,000

BEAVERHEAD RIVER AT BARRATTS, MONT.

LOCATION.—In SW. ¼ sec. 20, T. 8 S., R. 9 W., at highway bridge at point where highway crosses railroad, 1 mile above Barratts, Beaverhead County, 2 miles below mouth of Grasshopper Creek, and 10 miles southwest of Dillon.

DRAINAGE AREA.—2,850 square miles (measured on county map).

RECORDS AVAILABLE.—August 12, 1907, to September 30, 1927.

EQUIPMENT.—Chain gage on downstream side of bridge. Discharge measurements made from downstream side of bridge.

CHANNEL AND CONTROL.—Banks high and not subject to overflow. Stream bed clean and rocky. Two chamnels at low and medium stages.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 3.30 feet June 12 (discharge, 1,550 second-feet); minimum, 0.59 foot October 1–5 (discharge 165 second-feet).

1907–1927: Maximum stage recorded, 6.0 feet June 19 and 20, 1908 (discharge, 3,640 second-feet); minimum discharge, 106 second-feet July 28, 29, August 19–31, September 1 and 10–17, 1919 (gage height, 0.50 foot).

DIVERSIONS AND REGULATION.—Numerous diversions above station. Storage and release of flood waters of Red Rock River near Monida have some effect on flow at this station.

ACCURACY.—Stage-discharge relation permanent during year; seriously affected by ice, observations discontinued during winter. Rating curve well defined by 12 discharge measurements well distributed along curve, between 150 and 1,400 second-feet. Four of the measurements, covering a range from 190 to 610 second-feet, were made during the year and check the curve. Gage read to hundredths twice daily. Daily discharge ascertained by applying mean daily gage height to rating table. Records good.

Daily discharge, in second-feet, of Beaverhead River at Barratts, Mont., for the year ending September 30, 1927

Day	Oct.	Nov.	Dec.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	165	195	358		319	358	836	494	379	264
2	165	195	358		319	358	780	470	379	264
3	165	195	358		282	319	780	470	470	264
4	165	195	358		264	379	836	470	421	264
5	165	195	358		264	300	836	470	379	264
6	168	201	358		282	300	836	423	379	264
7	171	201	358		282	300	836	379	379	264
8	180	201	358		282	300	952	338	338	264
9	189	201	358		282	319	1,070	319	338	264
10	189	201	358		282	319	1,370	247	338	264
11	189	201	358		282	282	1,430	247	319	264
12	189	201	358		282	282	1,550	247	319	264
13	189	201	358		282	264	1,430	230	319	264
14	189	227	358		282	264	1,490	230	319	282
15	189	247	358		282	282	1,490	247	319	319
16	189	247	358		319	319	1,310	230	319	358
17	189	247	358		338	338	1,250	214	319	379
18	189	300	358		319	358	1,190	204	300	358
19	198	300	358		300	358	1,070	186	300	338
20	201	319	358	282	300	358	1,070	180	300	338
21	201	319	319	282	300	401	1,010	186	300	338
22	201	319	300	282	300	646	836	198	300	338
23	195	358	282	319	282	646	780	198	300	338
24	195	358	358	319	319	518	699	198	282	338
25	195	358	247	319	379	494	672	198	282	558
26	195	358	247	319	401	494	699	198	264	379
27	195	358	247	338	401	494	699	198	264	379
28	195	358	247	319	401	836	699	198	264	379
29	195	358	247	338	401	894	646	237	264	379
30	195	358	247	319	379	894	568	247	264	379
31	195		247	319		780		247	264	

Monthly discharge of Beaverhead River at Barratts, Mont., for the year ending September 30, 1927

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	201	165	187	11,500
November	358	195	266	15,800
December	358	247	327	20,100
March 20-31	338	282	313	7,450
April	401	264	314	18,700
May	894	264	434	26,700
June	1,550	568	991	59,000
July	494	180	277	17,000
August	470	264	322	19,800
September	379	264	314	18,700

JEFFERSON RIVER NEAR SILVERSTAR, MONT.

LOCATION.—In SE. ¼ sec. 23, T. 2 S., R. 6 W., at highway bridge 5 miles southwest of Silverstar, Madison County, on road between Silverstar and Iron Rod, and 5 miles below junction of Beaverhead and Big Hole Rivers.

DRAINAGE AREA.—7,840 square miles (measured on General Land Office map).

RECORDS AVAILABLE.—August 11, 1910, to September 30, 1916; July 22, 1920, to September 30, 1927.

EQUIPMENT.—Chain gage attached to bridge. Discharge measurements made from downstream side of highway bridge.

CHANNEL AND CONTROL.—Bed composed of gravel; fairly permanent. Left bank high and clean. Right bank covered with brush and subject to overflow during extreme floods. No definite control.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 9.85 feet at 1 p. m. June 15 (discharge, 19,800 second-feet); minimum 2.29 feet at 6 p. m. August 13 (discharge, 750 second-feet).

1910–1916; 1920–1927: Maximum stage recorded, that of June 15, 1927; minimum, 1.36 feet August 30–31, 1924 (discharge, 129 second-feet).

DIVERSIONS AND REGULATION.—Numerous irrigation ditches divert water above and below station. Flow partly regulated by two dams; one on Red Rock River near Monida stores water for irrigation and one on Big Hole River near Divide is used for development of power.

ACCURACY.—Stage-discharge relation permanent during year; seriously affected by ice; observations discontinued during winter. Rating curve well defined between 200 and 15,000 second-feet by 16 discharge measurements well distributed along curve. Five measurements, covering a range from 786 to 13,500 second-feet, made during the year indicate that the curve is correct. Gage read to hundredths once daily. Daily discharge ascertained by applying daily gage height to rating table. Records good.

Daily discharge, in second-feet, of Jefferson River near Silverstar, Mont., for the year ending September 30, 1927

Day	Oct.	Nov.	Dec.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	810	860	1,540		1,400	1,200	5,720	7,260	5,240	860	1,200
2	810	915	1,540		1,400	1,200	5,240	7,260	4,320	970	1,260
3	915	915	1,540		1,260	1,140	4,320	6,730	3,860	1,020	1,200
4	915	860	1,620		1,200	1,020	3,420	6,220	3,640	1,020	1,260
5	915	860	1,620		1,140	1,020	3,000	5,720	3,860	1,020	1,260
6	915	860	1,540		1,140	970	2,800	5,970	3,420	1,020	1,260
7	915	915	1,400		1,080	970	2,600	6,220	3,210	970	1,200
8	915	970	1,400		1,080	970	2,410	7,260	3,000	915	1,200
9	915	970	1,400		1,080	1,020	2,240	8,890	2,600	860	1,200
10	970	970	1,400		1,080	1,140	2,240	10,600	2,600	760	1,260
11	970	970	1,470		1,140	1,140	2,410	12,300	2,240	760	1,330
12	970	1,020	1,620		1,140	1,140	2,600	13,500	2,000	810	1,620
13	970	1,080	1,470		1,140	1,080	2,600	14,100	1,770	760	1,700
14	860	1,080	1,540		1,140	1,140	2,800	14,100	1,700	810	1,700
15	860	1,080	1,400		1,200	1,200	3,000	18,400	1,770	970	1,770
16	860	1,080			1,140	1,260	3,420	14,100	1,770	1,140	1,770
17	860	1,080			1,080	1,330	4,550	12,900	1,700	1,140	1,700
18	860	1,080			1,080	1,260	5,720	12,000	1,620	1,140	1,700
19	860	1,140			1,020	1,200	6,220	11,400	1,470	1,020	1,620
20	810	1,140			1,080	1,140	6,220	11,200	1,400	1,020	1,540
21	860	1,140			1,080	1,140	5,970	10,000	1,260	1,140	1,470
22	860	1,140			1,080	1,140	5,720	9,450	1,080	1,080	1,400
23	860	1,330			1,080	1,140	5,480	8,890	1,020	1,020	1,400
24	860	1,400			1,080	1,200	5,240	8,890	1,020	970	1,330
25	860	1,540			1,140	2,240	4,780	7,800	1,080	915	1,330
26	860	1,540			1,140	2,240	4,780	7,260	1,020	915	1,330
27	860	1,540			1,140	3,420	5,240	7,530	1,020	860	1,400
28	860	1,540		1,400	1,140	4,320	5,970	7,530	915	860	1,400
29	860	1,540			1,140	4,780	6,470	7,260	915	915	1,400
30	860	1,540			1,140	5,720	7,260	6,730	810	1,140	1,400
31	860				1,140		7,260		810	1,200	

Monthly discharge of Jefferson River near Silverstar, Mont., for the year ending September 30, 1927

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	970	810	882	54,200
November	1,540	860	1,140	67,800
December 1-15	1,620	1,400	1,500	44,600
March	1,400	1,020	1,140	70,100
April	5,720	970	1,660	98,800
May	7,260	2,240	4,440	273,000
June	18,400	5,720	9,580	570,000
July	5,240	810	2,070	127,000
August	1,200	760	968	59,500
September	1,770	1,200	1,420	84,500

MISSOURI RIVER BELOW HAUSER LAKE DAM, NEAR HELENA, MONT.

LOCATION.—In SW. ¼ sec. 29, T. 12 N., R. 2 W., at Hauser Lake power plant, 15 miles northeast of Helena, Lewis and Clark County.

DRAINAGE AREA.—Not measured.

RECORDS AVAILABLE.—December 27, 1922, to September 30, 1927.

EQUIPMENT.—Stevens continuous water-stage recorder installed on operating platform of power plant and connected to a float in exciter tailrace. Elevation of zero of gage, 3,563.00 feet above mean sea level. Discharge measurements made from cable three-fourths mile below dam.

CHANNEL AND CONTROL.—Channel composed of heavy boulders and gravel. Control is heavy gravel bar 1,200 feet below power house; not subject to shift.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 78.80 feet June 14, 15, and 18 (discharge, 33,300 second-feet); minimum, 65.55 feet at 3.40 p. m. February 20 (discharge, 570 second-feet).

1922–1927: Maximum stage recorded, that of June 14, 15, and 18, 1927; minimum, 65.40 feet at 7 p. m. September 14, 1924 (discharge, 500 second-feet).

DIVERSIONS AND REGULATION.—Numerous diversions from river and tributaries above gage and two pumping plants located on Hauser Lake. Operation of power plants above station controls low-water flow and partly regulates flow at higher stages. Storage in Hebgen Reservoir controls flow of Madison River.

ACCURACY.—Stage-discharge relation permanent during year; not affected by ice. Rating curve well defined below 20,000 second-feet and fairly well defined above. One discharge measurement, at 33,200 second-feet, made during the year checks the curve. Operation of water-stage recorder satisfactory. Daily discharge ascertained by averaging discharge for intervals of a day and checked by discharge integrator. Records excellent.

COOPERATION.—Complete records furnished by Montana Power Co. Data reduced to three significant figures for publication.

Daily discharge, in second-feet, of Missouri River below Hauser Lake Dam, near Helena, Mont., for the year ending September 30, 1927

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	2,910	4,140	4,560	2,670	4,310	4,080	5,200	13,000	16,600	17,600	2,840	3,990
2	2,310	3,640	4,900	3,610	4,420	3,890	5,460	10,200	16,400	15,100	3,600	4,310
3	1,640	3,870	5,230	3,880	4,060	3,010	5,020	10,600	16,400	12,700	3,950	4,520
4	2,240	3,750	5,370	4,240	3,860	3,000	4,630	10,800	16,600	9,650	3,410	4,670
5	2,150	3,380	5,350	4,020	3,920	2,830	4,550	8,640	16,500	10,400	3,360	4,300
6	3,790	4,000	4,840	4,540	3,680	3,680	4,530	8,340	16,000	10,200	3,620	5,400
7	4,440	2,680	4,700	4,370	4,500	4,680	4,520	8,300	16,100	6,820	3,440	5,400
8	4,560	3,220	4,470	3,580	4,500	4,120	4,530	7,870	17,700	5,070	3,760	4,960
9	4,650	3,760	4,280	1,680	4,200	3,430	4,530	7,530	21,100	4,890	3,690	4,380
10	3,640	4,020	4,360	4,160	4,320	4,440	4,500	7,570	25,500	4,070	3,220	4,090
11	3,350	4,200	4,500	4,220	4,120	4,150	4,040	7,170	27,400	3,880	3,060	3,320
12	4,140	3,430	3,580	4,420	4,320	4,040	4,280	5,740	29,800	4,260	2,940	4,640
13	4,020	3,220	4,650	4,620	3,380	4,580	5,040	6,020	31,000	4,320	3,190	4,660
14	4,020	2,100	4,700	4,620	4,360	4,380	6,180	6,320	32,600	4,920	3,520	5,100
15	3,810	2,990	4,420	4,600	4,120	4,650	5,740	6,080	33,300	5,450	3,060	5,080
16	3,660	4,060	3,280	2,440	4,180	4,610	4,820	6,140	33,100	5,460	3,420	4,610
17	2,310	3,450	3,640	3,230	4,500	4,650	4,120	7,740	32,900	4,400	4,280	4,950
18	3,750	3,080	3,870	4,220	4,480	4,650	3,430	9,000	33,300	4,840	4,320	4,740
19	3,460	4,580	1,500	4,620	4,000	4,650	4,340	11,600	29,800	5,460	3,840	5,460
20	3,040	3,780	3,030	4,580	1,960	4,630	4,200	12,600	25,900	5,260	4,090	4,980
21	3,440	2,270	3,080	4,600	2,760	4,450	3,730	12,500	25,500	4,420	3,600	4,860
22	3,540	3,630	3,550	4,560	3,500	4,280	3,960	12,200	23,400	3,940	4,240	4,700
23	3,630	4,560	4,600	4,340	3,450	4,260	4,020	12,200	22,800	3,200	3,880	4,800
24	1,650	4,020	4,600	4,530	3,380	4,260	3,480	11,300	21,100	2,580	3,420	4,430
25	3,460	2,460	3,110	4,500	3,650	4,190	4,310	10,900	21,400	3,620	4,160	4,100
26	3,970	3,300	3,870	4,500	3,640	4,100	4,340	10,200	21,500	4,090	4,310	4,120
27	4,520	3,610	4,600	4,100	3,400	3,970	3,880	10,400	21,200	4,070	4,090	4,220
28	4,240	2,870	4,260	3,680	3,660	4,090	7,160	12,700	21,000	3,620	3,950	4,290
29	4,230	3,350	4,150	3,980	-------	4,660	12,900	15,000	500	3,440	3,820	4,360
30	3,980	4,680	3,670	3,350	-------	5,240	14,200	17,100	19,800	3,440	4,140	5,000
31	2,400	-------	3,710	3,720	-------	4,500	--------	17,100	--------	3,240	3,260	-------

Monthly discharge of Missouri River below Hauser Lake Dam, near Helena, Mont., for the year ending September 30, 1927

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	4,650	1,640	3,450	212,000
November	4,680	2,100	3,540	211,000
December	5,370	1,500	4,140	255,000
January	4,620	1,680	4,010	247,000
February	4,500	1,960	3,880	215,000
March	5,240	2,830	4,200	258,000
April	14,200	3,430	5,190	309,000
May	17,100	5,740	10,100	621,000
June	33,300	16,000	23,500	1,400,000
July	17,600	2,580	5,950	366,000
August	4,320	2,840	3,660	225,000
September	5,460	3,320	4,610	274,000
The year	33,300	1,500	6,340	4,590,000

MISSOURI RIVER AT FORT BENTON, MONT.

LOCATION.—In NE. ¼ sec. 26, T. 24 N., R. 8 E., at highway bridge at Fort Benton, Chouteau County.

DRAINAGE AREA.—24,600 square miles.

RECORDS AVAILABLE.—June 16, 1881, to November 14, 1891; July 1, 1902, to September 30, 1927.

EQUIPMENT.—Stevens continuous water-stage recorder on left bank just below bridge abutment. Discharge measurements made from highway bridge.

CHANNEL AND CONTROL.—Channel composed of coarse gravel and sand. Control is rock ledge covered with heavy boulders, 1,000 feet below gage; practically permanent.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 10.30 feet at 10 a. m. June 13 (discharge, 52,900 second-feet); minimum discharge, 2,710 second-feet December 13, 1926.

1881–1891; 1902–1927: Maximum stage recorded, 16.3 feet June 7, 1908 (discharge, 107,000 second-feet); minimum discharge, 1,420 second-feet August 17, 1919.

Prior to 1918 open-season records only; discharge may have been lower during winter.

DIVERSIONS AND REGULATION.—Numerous diversions from river and tributaries above station. Flow partly regulated by operation of storage reservoirs and power plants of Montana Power Co. above station.

ACCURACY.—Stage-discharge relation permanent except as affected by ice. Rating curve well defined. Three discharge measurements, covering a range from 25,900 to 51,900 second-feet, made during the year check the curve. Operation of water-stage recorder satisfactory except as indicated in footnote to table of daily discharge. Daily discharge ascertained by applying mean daily gage height to rating table or, for days of considerable fluctuation while recorder was in operation, by use of the discharge integrator, except for period of ice effect or of no record as indicated in footnote to table of daily discharge. Records good.

Daily discharge, in second-feet, of Missouri River at Fort Benton, Mont., for the year ending September 30, 1927

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	4,920	5,040	4,490	4,880	4,690	4,750	5,860	15,400	49,800	30,800	5,760	6,830
2	5,080	5,290	4,490	4,340	4,700	4,800	5,860	18,200	50,100	27,700	5,650	6,860
3	5,290	5,620	4,490	4,330	4,780	5,140	6,760	18,800	47,500	27,100	5,340	6,590
4	5,410	4,980	4,250	4,500	5,230	5,120	7,100	17,400	46,800	24,100	5,170	6,590
5	4,920	5,510	3,890	4,880	5,390	5,340	6,520	16,400	46,400	22,100	5,340	6,690
6	4,170	5,400	4,680	4,680	4,270	5,000	6,350	15,600	43,800	20,800	5,020	6,420
7	3,790	5,290	4,910	4,910	4,120	4,960	6,150	14,600	43,400	19,400	6,620	5,820
8	4,730	5,100	6,220	5,430	4,240	4,970	5,760	13,900	43,400	20,800	4,940	6,860
9	4,440	5,250	5,540	4,930	4,860	5,070	5,980	13,400	44,900	17,200	5,190	8,900
10	4,420	5,500	4,570	4,050	4,600	4,600	5,600	13,000	47,100	16,600	5,040	9,360
11	4,370	5,330	5,500	3,650	4,870	4,810	5,000	13,000	49,000	9,660	4,810	7,890
12	4,770	5,560	4,210	4,310	4,720	4,990	5,760	12,600	50,500	9,600	5,070	7,100
13	5,260	5,460	2,710	3,750	4,540	4,820	5,920	12,800	52,900	9,240	6,160	7,030
14	5,240	5,030	3,340	4,400	4,360	6,410	5,200	13,200	52,500	8,180	6,330	7,350
15	5,410	5,600	5,540	4,200	4,660	7,100	5,440	44,400	52,100	8,070	6,600	7,000
16	5,330	5,520	5,880	5,600	4,400	6,830	5,600	15,600	52,100	8,370	6,980	6,860
17	5,350	4,820	4,900	6,160	3,940	7,030	7,280	17,200	52,100	8,780	7,750	6,450
18	5,180	4,610	4,400	4,900	4,560	7,050	7,890	19,100	51,300	7,480	7,890	6,660
19	5,000	4,330	4,930	4,100	4,870	6,720	8,110	20,200	50,500	7,320	7,350	7,030
20	5,400	4,220	5,000	3,630	4,740	7,170	7,170	19,600	49,800	8,560	7,680	6,930
21	5,250	4,790	5,090	4,480	5,070	6,760	6,400	20,500	48,200	8,520	7,390	7,170
22	5,220	4,730	5,280	4,870	5,040	6,550	5,420	22,000	44,900	8,480	7,170	6,930
23	5,280	3,930	4,600	4,890	5,410	6,800	5,720	25,900	43,800	8,040	6,900	7,240
24	5,190	4,310	4,310	4,660	5,190	6,410	5,550	27,400	41,600	7,050	6,760	7,390
25	5,150	4,730	3,600	4,710	4,830	6,570	6,500	28,000	40,900	6,220	7,000	6,520
26	5,200	4,800	3,960	4,990	4,090	6,560	7,100	29,800	37,400	6,240	6,760	7,420
27	5,240	4,530	3,830	4,690	4,490	6,470	7,820	31,100	36,000	6,280	6,490	7,280
28	5,080	4,220	4,430	5,080	4,670	6,280	10,500	33,100	35,400	6,370	6,760	6,690
29	5,210	4,760	4,750	5,070	-------	6,420	13,400	37,400	34,300	5,920	7,170	6,490
30	5,420	4,370	5,050	4,460	-------	6,490	14,100	46,000	32,800	5,820	6,590	5,950
31	5,050	-------	5,080	4,540	-------	5,950	--------	49,800	--------	5,860	6,250	------

NOTE.—No gage-height record because of ice effect or failure of recorder to operate Nov. 17 to Mar. 9, Mar. 11–14, 18–28, and July 12–30; daily discharge for these periods obtained from flow at Volta power plant, near Great Falls.

Monthly discharge of Missouri River at Fort Benton, Mont., for the year ending September 30, 1927

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	5,420	3,790	5,020	309,000
November	5,620	3,930	4,950	295,000
December	6,220	2,710	4,640	285,000
January	6,160	3,630	4,650	286,000
February	5,410	3,940	4,690	260,000
March	7,170	4,600	5,930	365,000
April	14,100	5,000	6,930	412,000
May	49,800	12,600	21,500	1,320,000
June	52,900	32,800	45,700	2,720,000
July	30,800	5,820	12,500	769,000
August	7,890	4,810	6,320	389,000
September	9,360	5,820	7,010	417,000
The year	52,900	2,710	10,800	7,830,000

MISSOURI RIVER AT LEAVENWORTH, KANS.

LOCATION.—In NE. ¼ sec. 36, T. 8 S., R. 22 E., at Chicago Great Western Railroad bridge in Leavenworth, Leavenworth County, 6 miles above Platte River.

DRAINAGE AREA.—428,000 square miles.

RECORDS AVAILABLE.—April 1, 1922, to September 30, 1927. The United States Army engineers obtained records of stage from 1873 to 1899, and the Chicago Great Western Railroad from 1917 to 1922.

EQUIPMENT.—Chain gage on upstream handrail of bridge. Zero of gage is 300 feet above St. Louis city datum and 713.53 feet above mean sea level. Discharge measurements made from downstream side of bridge.

CHANNEL AND CONTROL.—Bed composed of silt and sand; shifting. Right bank high. Left bank is overflowed at stage of 52 feet. No well-defined control.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 49.3 feet May 17, 18, and June 29, 30 (discharge, 213,000 second-feet); minimum discharge, 9,200 second-feet December 21 and 22, when river was frozen.

1922–1927: Maximum discharge recorded, 241,000 second-feet July 7 and 8, 1923; minimum, 3,450 second-feet (measured with current meter) December 22, 1924

The Army engineers report a maximum stage of 53.0 feet April 29 and 30, 1881, and a low-water stage of 29.2 feet December 9 and 10, 1873, and January 6, 1874; these records corrected to datum of present gage.

DIVERSIONS AND REGULATION.—None.

ACCURACY.—Stage-discharge relation not permanent during year; seriously affected by ice during winter. Rating curve fairly well defined above 15,000 second-feet by eight discharge measurements, three of which were made during the year. Gage read to tenths once daily. Daily discharge ascertained by shifting-control method until November 30 and by applying daily gage height to rating table after that date. Records fair except those for periods of ice effect, which are poor.

Daily discharge, in second-feet, of Missouri River at Leavenworth, Kans., for the year ending September 30, 1927

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	63,800	28,300	20,000	16,700	29,100	43,500	56,500	85,000	146,000	208,000	61,300	53,200
2	57,700	27,500	23,100	17,200	33,900	41,500	56,500	72,200	141,000	208,000	60,100	45,500
3	54,300	27,500	21,800	17,200	38,500	36,500	57,700	75,400	137,000	205,000	65,100	42,500
4	48,800	26,700	20,600	22,400	47,700	36,500	61,300	75,400	154,000	202,000	62,500	40,500
5	46,600	25,900	20,600	23,100	29,900	34,700	60,100	70,600	146,000	197,000	60,100	39,500
6	45,500	25,900	21,800	32,300	35,500	33,100	56,500	63,800	146,000	188,000	56,500	35,500
7	43,500	24,500	21,800	23,100	33,900	35,500	57,700	61,300	144,000	185,000	63,800	41,500
8	37,500	25,200	17,700	23,800	33,100	42,500	61,300	58,900	159,000	188,000	61,300	37,500
9	36,500	25,900	17,200	22,400	32,300	41,500	70,600	56,500	164,000	191,000	52,100	44,500
10	42,500	25,900	16,200	21,200	32,300	40,500	63,800	54,300	169,000	191,000	48,800	44,500
11	46,600	25,900	16,200	20,000	33,100	43,500	80,200	56,500	169,000	183,000	49,900	42,500
12	38,500	25,200	15,200	18,800	33,100	47,700	111,000	69,000	174,000	174,000	51,000	37,500
13	34,700	25,200	14,700	17,700	33,900	43,500	108,000	132,000	174,000	161,000	70,600	36,500
14	34,700	25,200	14,700	17,200	33,100	39,500	102,000	159,000	164,000	144,000	78,600	3,4700
15	31,500	25,200	14,200	16,700	33,100	47,700	108,000	183,000	156,000	134,000	61,300	33,900
16	22,400	25,200	13,000	16,200	33,100	44,500	132,000	197,000	154,000	127,000	55,400	32,300
17	27,500	29,100	11,800	15,700	31,500	42,500	134,000	213,000	154,000	144,000	60,100	33,100
18	27,500	29,100	11,000	15,200	28,300	41,500	149,000	213,000	156,000	122,000	62,500	35,500
19	24,500	28,300	10,200	14,700	24,500	40,500	180,000	156,000	167,000	111,000	63,800	35,400
20	25,900	26,700	9,500	14,700	21,800	42,500	185,000	134,000	177,000	104,000	69,000	33,100
21	27,500	23,100	9,200	13,800	25,200	56,500	183,000	125,000	185,000	104,000	60,100	32,300
22	26,700	15,700	9,200	13,800	26,700	57,700	161,000	122,000	191,000	98,000	49,900	30,700
23	26,700	15,200	10,200	13,800	33,900	51,000	132,000	120,000	199,000	100,000	51,000	29,900
24	26,700	15,200	13,000	13,800	35,500	47,700	113,000	111,000	208,000	98,000	58,900	29,100
25	27,500	14,200	13,000	13,800	38,500	45,500	120,000	98,000	211,000	86,800	47,700	29,900
26	28,300	14,200	14,200	14,700	37,500	43,500	117,000	96,000	211,000	81,800	42,500	30,700
27	28,300	18,200	14,700	15,200	51,000	47,700	102,000	92,200	211,000	73,800	43,500	31,500
28	29,100	16,200	15,200	16,700	48,800	48,800	88,600	96,000	211,000	75,400	41,500	31,500
29	29,100	17,200	15,200	19,400	-------	47,700	85,000	137,000	213,000	73,800	42,500	32,300
30	28,300	17,700	15,700	21,200	-------	53,200	102,000	159,000	213,000	70,600	45,500	44,500
31	27,500	-------	16,700	25,200	-------	56,500	-------	164,000	-------	62,500	56,500	-------

NOTE.—Stage-discharge relation seriously affected by ice Dec. 14–22 and Jan. 8 to Feb. 2; daily discharge estimated from gage heights, observer's notes, weather records, and comparison with flow at other stations.

Monthly discharge of Missouri River at Leavenworth, Kans., for the year ending September 30, 1927

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	63,800	22,400	35,400	2,180,000
November	29,100	14,200	23,200	2,380,000
December	23,100	9,200	15,400	947,000
January	32,300	13,800	18,300	1,130,000
February	51,000	21,800	33,900	1,880,000
March	57,700	33,100	44,400	2,730,000
April	185,000	56,500	103,000	6,130,000
May	213,000	54,300	113,000	6,950,000
June	213,000	137,000	173,000	10,300,000
July	208,000	62,500	138,000	8,480,000
August	78,600	41,500	56,600	3,480,000
September	53,200	29,100	36,700	2,180,000
The year	213,000	9,200	66,100	47,800,000

MISSOURI RIVER AT BOONVILLE, MO.

LOCATION.—In sec. 35, T. 49 N., R. 17 W., at bridge on State highway No. 40 at Boonville, Cooper County.

DRAINAGE AREA.—508,000 square miles.

RECORDS AVAILABLE.—October 1, 1925, to September 30, 1927. The United States Weather Bureau has obtained records of stage at Missouri, Kansas & Texas Railway bridge one-fourth mile upstream since 1873.

EQUIPMENT.—Chain gage on bridge. Zero of gage is 562.71 feet above mean sea level. Discharge measurements made from downstream side of bridge.

CHANNEL AND CONTROL.—Bed composed of sand and mud; shifting. Right bank high; left bank overflowed at stage of 24 feet. No well-defined control.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 26.87 feet at 9 a. m. April 23 (discharge, 381,000 second-feet); minimum discharge, 19,000 second-feet December 21 and 22 when river was frozen.

1926–1927: Maximum stage recorded, that of April 23, 1927; minimum discharge, that of December 21 and 22, 1926.

On June 21, 1844, the river reached a stage of 35.9 feet, and on June 5, 1903, a stage of 33.3 feet; stages determined from chiseled marks on stone monument near right end of bridge.

DIVERSIONS AND REGULATION.—None.

ACCURACY.—Stage-discharge relation not permanent during year; seriously affected by ice during winter. Rating curve fairly well defined above 25,000 second-feet by 13 discharge measurements, 3 of which were made during the year. Gage read to hundredths once daily. Daily discharge ascertained by applying daily gage height to rating table December 5 to June 15; shifting-control method based upon two discharge measurements used remainder of year. Records fair except those for periods of ice effect, which are poor.

Daily discharge, in second-feet, of Missouri River at Boonville, Mo., for the year ending September 30, 1927

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	84,000	33,400	30,700	25,400	51,600	61,800	122,000	169,000	193,000	219,000	74,400	72,600
2	84,000	32,800	29,200	26,200	63,600	58,200	181,000	169,000	188,000	216,000	69,000	74,400
3	92,000	32,200	29,200	25,800	58,200	50,100	196,000	150,000	183,000	214,000	63,600	67,200
4	120,000	31,700	29,700	26,200	45,600	44,400	179,000	145,000	198,000	209,000	65,400	58,200
5	135,000	31,700	31,200	26,200	42,000	42,000	164,000	135,000	214,000	206,000	69,000	54,600
6	162,000	31,200	31,200	29,200	56,400	42,000	155,000	135,000	227,009	203,000	67,200	50,100
7	157,000	31,700	32,200	31,700	58,200	42,000	140,000	135,000	229,000	198,000	63,600	51,600
8	150,000	31,700	38,800	36,400	58,200	48,600	122,000	198,000	235,000	193,000	65,400	51,600
9	135,000	31,700	48,600	35,800	56,400	54,600	122,000	219,000	229,000	191,000	61,800	60,000
10	155,000	34,000	44,400	34,000	48,600	61,800	143,000	179,000	209,000	191,000	58,200	69,000
11	159,000	34,600	38,800	31,700	47,100	58,200	183,000	138,000	196,000	191,000	69,000	88,000
12	155,000	34,000	35,200	28,400	43,200	61,800	179,000	120,000	206,000	191,000	70,800	72,600
13	135,000	34,000	34,000	26,200	42,000	72,600	227,000	104,000	224,000	186,000	86,000	61,800
14	118,000	36,400	31,200	24,200	40,400	76,200	242,000	157,000	229,000	167,000	104,000	54,600
15	100,000	42,000	30,700	23,200	41,200	76,200	240,000	201,000	235,000	162,000	120,000	50,100
16	80,000	47,100	26,200	21,800	43,200	69,000	253,000	216,000	237,000	138,000	131,000	45,600
17	60,000	51,600	22,200	20,800	43,200	65,400	279,000	216,000	224,000	133,000	113,000	45,600
18	48,600	51,600	20,500	20,200	42,000	65,400	281,000	222,000	211,000	138,000	102,000	40,400
19	43,200	50,100	19,600	19,900	47,100	80,000	287,000	224,000	209,000	140,000	102,000	39,600
20	43,200	48,600	19,300	19,600	47,100	98,000	314,000	219,000	216,000	124,000	92,000	41,200
21	50,100	42,000	19,000	19,600	41,200	113,000	343,000	193,000	227,000	111,000	94,000	40,400
22	47,100	39,600	19,000	19,600	34,600	109,000	370,000	169,000	232,000	111,000	92,000	38,800
23	38,000	36,400	19,300	19,600	32,800	111,000	381,000	157,000	235,000	109,000	86,000	38,000
24	36,400	32,200	19,900	19,600	35,800	100,000	361,000	167,000	232,000	104,000	70,800	37,200
25	35,200	30,200	24,600	19,900	36,400	86,000	312,000	181,000	227,000	109,000	78,000	36,400
26	34,600	30,200	23,900	21,800	38,800	72,600	274,000	171,000	227,000	102,000	84,000	36,400
27	34,600	30,700	24,200	23,200	45,600	63,600	253,000	150,000	227,000	90,000	74,400	37,200
28	34,600	31,700	24,200	25,000	45,600	61,800	216,000	135,000	224,000	84,000	72,600	38,800
29	34,000	32,800	24,200	27,000	-------	63,600	188,000	131,000	222,000	82,000	67,200	39,600
30	33,400	32,200	24,200	35,800	-------	69,000	169,000	157,000	222,000	78,000	61,800	43,200
31	33,400	-------	25,000	36,400	-------	78,000	-------	183,000	-------	82,000	63,600	-------

NOTE.—Stage-discharge relation seriously affected by ice Dec. 16-24 and Jan. 11-29; daily discharge estimated from daily gage heights, observer's notes, weather records, and comparison with flow at other stations.

Monthly discharge of Missouri River at Boonville, Mo., for the year ending September 30, 1927

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	162,000	33,400	84,800	5,210,000
November	51,600	30,200	36,300	2,160,000
December	48,600	19,000	28,100	1,730,000
January	36,400	19,600	25,800	1,590,000
February	58,200	32,800	45,900	2,550,000
March	113,000	42,000	69,500	4,270,000
April	381,000	122,000	229,000	13,600,000
May	224,000	104,000	169,000	10,400,000
June	237,000	183,000	219,000	13,000,000
July	219,000	78,000	151,000	9,280,000
August	131,000	58,200	80,400	4,940,000
September	88,000	36,400	51,200	3,050,000
The year	381,000	19,000	99,200	71,800,000

GRASSHOPPER CREEK BASIN

GRASSHOPPER CREEK NEAR DILLON, MONT.

LOCATION.—In NW. ¼ sec. 26, T. 8 S., R. 10 W., 5 miles above Barratts and 14 miles above Dillon, Beaverhead County.

DRAINAGE AREA.—360 square miles (measured on Forest Service map of Beaverhead National Forest).

RECORDS AVAILABLE.—March, 10 1921, to September 30, 1927.

EQUIPMENT.—Chain gage on left bank; installed June 30, 1927, Prior to that date gage was vertical staff with enamel face at same location and datum. Discharge measurements made by wading at gage or from bridge one-eighth mile above.

CHANNEL AND CONTROL.—Banks high and covered with brush. Stream bed composed of boulders and coarse gravel; subject to occasional shift.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 6.20 feet at 10 a. m. June 12 (discharge, 355 second-feet); minimum, 4.55 feet April 19, 21, and July 22–24 (discharge, 19 second-feet).

1921–1927: Maximum discharge recorded, 557 second-feet June 5, 1925 (gage height, 6.52 feet); minimum stage, 3.85 feet August 28 to September, 3, 1924 (discharge, 0.5 second-foot).

DIVERSIONS AND REGULATION.—Considerable water diverted for irrigation above gage. No regulation.

ACCURACY.—Stage-discharge relation permanent during year; seriously affected by ice, observations discontinued during winter. Rating curve well defined between 5 and 150 second-feet by five measurements well distributed along curve. Three of the measurements, covering a range from 27 to 116 second-feet, were made during the year and check the curve. Gage read to half-tenths or hundredths once daily. Daily discharge ascertained by applying daily gage height to rating table. Records for medium and low stages good; those for high stages fair.

Daily discharge, in second-feet, of Grasshopper Creek near Dillon, Mont., for the year ending September 30, 1927

Day	Oct.	Nov.	Dec.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	21	31	26	-------	44	65	-------	106	34	52
2	21	31	26	-------	44	65	-------	99	38	52
3	21	31	26	-------	44	57	-------	106	43	52
4	21	31	26	-------	23	57	-------	106	56	44
5	21	31	26	-------	28	57	-------	101	50	40
6	21	36	26	-------	33	57	-------	95	38	37
7	21	36	26	-------	44	57	-------	73	73	33
8	21	36	26	-------	44	50	-------	67	38	33
9	21	36	26	-------	38	50	275	60	38	33
10	21	36	26	-------	28	44	301	40	38	57
11	26	36	26	-------	28	38	327	37	38	57
12	26	36	-------	-------	28	33	355	37	43	57
13	26	36	-------	23	28	28	301	35	48	52
14	26	36	-------	28	23	33	275	33	50	52
15	26	31	-------	28	44	38	301	33	53	77
16	26	31	-------	28	57	44	275	23	50	70
17	26	26	-------	23	50	82	250	26	48	65
18	26	26	-------	23	65	82	250	26	45	54
19	26	31	-------	23	19	57	250	24	43	44
20	26	31	-------	23	28	65	250	22	43	42
21	26	31	-------	28	19	82	225	21	38	40
22	26	31	-------	50	44	82	200	19	36	40
23	26	31	-------	44	50	91	152	19	34	40
24	26	26	-------	44	65	91	130	19	32	42
25	26	26	-------	50	100	57	120	22	32	42
26	26	26	-------	38	91	57	120	24	32	44
27	26	31	-------	38	73	130	120	28	32	42
28	31	31	-------	33	65	250	141	28	41	42
29	26	31	-------	73	44	-------	130	26	45	42
30	31	31	-------	65	44	-------	110	24	50	52
31	31	-------	-------	57	-------	-------	-------	28	56	-------

NOTE.—No record because of missing gage heights May 29 to June 8.

Monthly discharge of Grasshopper Creek near Dillon, Mont., for the year ending September 30, 1927

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	31	21	24.9	1,530
November	36	26	31.7	1,890
December 1–11	26	26	26.0	567
March 12–31	73	23	37.8	1,420
April	100	19	44.5	2,650
May 1–28	250	28	67.8	3,770
June 9–30	355	110	22.1	9,640
July	106	19	45.4	2,790
August	56	32	41.9	2,580
September	77	33	47.6	2,830

BIG HOLE RIVER BASIN

BIG HOLE RIVER NEAR MELROSE, MONT.

LOCATION.—In SE. ¼ sec. 27, T. 3 S., R. 9 W., at highway bridge at Browns siding on Oregon Short Line Railroad, 8 miles south of Melrose, Silver Bow County.

DRAINAGE AREA.—Not measured.

RECORDS AVAILABLE.—March 16, 1924, to September 30, 1927.

EQUIPMENT.—Chain gage on bridge; installed July 17, 1927. Gage used prior to June 10, 1927, was Stevens continuous water-stage recorder in wooden shelter on left bank; lost during flood. Both gages set to same datum. Discharge measurements made from highway bridge or by wading.

CHANNEL AND CONTROL.—Channel composed of heavy gravel and sand between large boulders. Control is riffle of same material 400 feet below gage; subject to change owing to movement of sand and gravel between boulders.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, determined by levels from high-water mark, 14.0 feet June 10 (discharge not determined); minimum, 1.55 feet at 4 p. m. November 17 (discharge, 326 second-feet).

1924–1927: Maximum stage recorded, that of June 10, 1927; minimum, 1.02 feet at 11.30 p. m. September 3, 1924 (discharge, 228 second-feet).

DIVERSIONS AND REGULATION.—Several small diversions for irrigation above station. Operation of power plant above station causes some fluctuation in stage.

ACCURACY.—Stage-discharge relation changed by flood of June 10. Two rating curves used during year; one applicable prior to November 23 is well defined between 300 and 5,000 second-feet by 13 discharge measurements well distributed along curve; the other, used since July 17, is well defined by five measurements between 750 and 8,000 second-feet. Five measurements, covering a range from 475 to 7,640 second-feet were made during the current year and check the curve closely. Operation of water-stage recorder not satisfactory. Chain gage read to hundredths or half-tenths once daily after July 17. Daily discharge ascertained by applying daily or mean daily gage height to rating table. Records good but very fragmentary.

Daily discharge, in second-feet, of Big Hole River near Melrose, Mont., for the year ending September 30, 1927

Day	Oct.	Nov.	May	June	July	Aug.	Sept.
1		438				808	
2		434				808	
3		434	3,380			924	
4		420				955	
5		417				894	
6		427				680	
7		459				636	
8		471					
9		444					
10		459					
11		452					
12		471					
13		487					
14		495					991
15		475					1,020
16		434		7,680			1,010
17		396			1,240		931
18		363			1,240		836
19		398			1,160		814
20		434			1,090		770
21		430			1,020		738
22		434			1,020		718
23		475			894		699
24					865		690
25					865		680
26					894		671
27	475				924		690
28	491				865		690
29	487				836		709
30	467				865		709
31	441				780		

NOTE.—No records because of missing gage height Oct. 1–26, Nov. 24 to May 2, May 4 to June 15, June 17 to July 16, and Aug. 8 to Sept. 13.

Monthly discharge of Big Hole River near Melrose, Mont., for the year ending September 30, 1927

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October 27-31	491	441	472	4,680
November 1-23	495	363	441	20,100
July 17-31	1,240	780	971	28,900
August 1-7	955	636	815	11,300
September 14-30	1,020	671	787	26,500

SOUTH BOULDER CREEK BASIN

SOUTH BOULDER CREEK NEAR JEFFERSON ISLAND, MONT.

LOCATION.—In sec. 18, T. 2 S., R. 3 W., 200 feet above dam at headworks of power pipe line of Liberty-Montana Mines Co. and 16 miles southwest of Jefferson Island, Madison County.

DRAINAGE AREA.—Not measured.

RECORDS AVAILABLE.—May 15, 1926, to September 30, 1927.

EQUIPMENT.—Stevens 8-day water-stage recorder in wooden shelter on right bank. Discharge measurements made by wading at gage or from bridge at power house three-fourths mile below.

CHANNEL AND CONTROL.—Bed composed of large boulders. Banks high, clean, and not subject to overflow. Control is channel for some distance below gage; may shift.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 3.08 feet at 10 p. m. June 26 (discharge, 359 second-feet); minimum, 1.11 feet at 7 a. m. November 8 (discharge, 12.6 second-feet).

1926–1927: Maximum and minimum stages recorded, same as given above.

DIVERSIONS AND REGULATION.—None.

ACCURACY.—Stage-discharge relation not permanent; seriously affected by ice, observations discontinued during winter. Rating curve used prior to July 18 well defined below 50 second-feet and fairly well defined above by five discharge measurements covering a range from 14 to 222 second-feet. Rating curve used after July 18 well defined by three discharge measurements covering a range from 14 to 71 second-feet. Five of the measurements were made during the year and check the curve closely. Operation of water-stage recorder satisfactory. Daily discharge ascertained by applying mean daily gage height to rating table, using shifting-control method June 30 to July 18, except for periods of ice effect as indicated in footnote to table of daily discharge. Records fair above 50 second-feet prior to July 18; other records good.

Daily discharge, in second-feet, of South Boulder Creek near Jefferson Island, Mont., for the year ending September 30, 1927

Day	Oct.	Nov.	Dec.	Apr.	May	June	July	Aug.	Sept.
1	22	22			35	64	177	40	26
2	22	22			34	64	177	54	26
3	22	22			31	66	177	45	24
4	22	20			31	68	203	42	27
5	22	20			29	78	195	38	26
6	23	20			28	98	155	38	23
7	27	18			27	152	152	35	23
8	25	17			26	241	150	34	23
9	24	19	14.4		26	235	147	33	23
10	24	19			25	284	130	32	21
11	24	17			27	313	113	31	21
12	23	18			28	292	103	31	21
13	24	18			30	266	97	33	21
14	24	17			33	278	94	32	20
15	24	17	15.4		40	278	94	32	19
16	24	18			53	266	82	28	18
17	25				76	278	76	28	18
18	25				82	295	76	30	18
19	24				84	301	74	28	18
20	25				76	292	74	27	17
21	24				67	266	71	26	17
22	24				60	278	69	26	16
23	24				53	313	67	25	16
24	23	15			52	301	63	24	17
25	24				57	292	63	24	17
26	26				82	330	65	23	16
27	28			22	88	292	59	23	16
28	25			26	81	243	55	22	18
29	23			30	72	221	54	25	17
30	23			33	68	200	47	29	17
31	25				64		49	28	

NOTE.—Mean discharge estimated because of ice Nov. 17–30. Discharge for Dec. 9 and 15 represents actual discharge measurements. Gage height missing May 8; discharge interpolated.

Monthly discharge of South Boulder Creek near Jefferson Island, Mont., for the year ending September 30, 1927

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	28	22	24.0	1,480
November	22	15	17.1	1,020
December			[a] 15	922
April 27–30	33	22	27.8	220
May	88	25	50.5	3,110
June	330	64	232	13,800
July	203	47	103	6,330
August	54	22	31.5	1,940
September	27	16	20.0	1,190

[a] Estimated from discharge measurements of Dec. 9 and 15.

WILLOW CREEK BASIN

WILLOW CREEK NEAR WILLOW CREEK, MONT.

LOCATION.—In sec. 18, T. 1 S., R. 1 E., at highway bridge at Harwood ranch, 7 miles south of Willow Creek, Gallatin County.

DRAINAGE AREA.—164 square miles (measured on topographic maps).

RECORDS AVAILABLE.—September 5, 1919, to September 30, 1927.

EQUIPMENT.—Weight and cable gage on upper handrail of bridge. Discharge measurements made from bridge or by wading.

CHANNEL AND CONTROL.—Bed composed of sand and gravel; shifting. Banks low and covered with brush.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 3.32 feet at 7 p. m. June 13 (discharge, 330 second-feet); minimum, 1.40 feet November 27 (discharge, 3 second-feet).

1919–1927: Maximum stage recorded 3.40 feet June 21 and 22, 1922 (discharge, 456 second-feet); minimum discharge, that of November 27, 1926.

DIVERSIONS AND REGULATION.—Numerous diversions for irrigation both above and below gage. No regulation.

ACCURACY.—Stage-discharge relation not permanent; affected by ice and by shifting control. Rating curve fairly well defined by four discharge measurements made during the year between 25 and 250 second-feet; extended beyond these limits. Gage read to hundredths once daily. Daily discharge ascertained by applying daily gage height to rating table, using shifting-control method October 1 to December 7. Records fair prior to December 7; thereafter good.

Daily discharge, in second-feet, of Willow Creek near Willow Creek, Mont., for the year ending September 30, 1927

Day	Oct.	Nov.	Dec.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	26	34	23	-------	25	103	227	161	38	83
2	25	32	30	-------	25	88	163	200	41	80
3	25	31	28	-------	16	76	169	172	41	87
4	26	31	28	-------	12	78	157	144	51	83
5	28	30	25	-------	11	56	144	132	48	80
6	30	30	26	83	10	57	161	97	43	69
7	31	31	23	112	11	66	178	69	41	73
8	31	32	-------	97	16	74	209	51	43	66
9	31	32	-------	51	19	83	265	34	43	66
10	32	35	-------	48	31	87	280	27	46	69
11	31	34	-------	43	25	83	315	16	51	73
12	32	32	-------	36	16	87	325	13	69	66
13	32	32	-------	31	18	97	330	11	73	76
14	35	28	-------	27	21	101	320	7	83	80
15	34	26	-------	24	31	120	300	8	43	80
16	32	21	-------	27	36	124	290	11	36	83
17	34	16	-------	36	36	157	251	11	34	87
18	32	18	-------	46	41	136	246	13	41	87
19	32	17	-------	83	29	136	232	15	41	83
20	35	20	-------	66	36	132	222	41	43	85
21	35	21	-------	51	34	157	232	41	41	83
22	36	23	-------	48	31	161	237	51	36	90
23	36	21	-------	46	36	136	246	66	34	94
24	35	11	-------	29	36	105	275	43	34	101
25	32	13	-------	27	54	97	265	41	38	112
26	32	10	-------	22	71	140	290	48	46	116
27	32	3	-------	24	87	191	251	46	43	105
28	34	13	-------	25	97	220	249	46	69	90
29	35	14	-------	24	94	265	237	41	73	80
30	34	18	-------	22	103	265	204	43	73	69
31	32	-------	-------	25	-------	169	-------	34	80	-------

NOTE.—Stage-discharge relation affected by ice Dec. 8 to Mar. 5; discharge not computed.

Monthly discharge of Willow Creek near Willow Creek, Mont., for the year ending September 30, 1927

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	36	25	31.8	1,960
November	35	3	23.6	1,400
December 1-7	30	23	26.1	362
March 6-31	112	22	44.3	2,280
April	103	10	36.9	2,200
May	265	56	124	7,620
June	330	144	242	14,400
July	200	7	55.9	3,440
August	83	34	48.9	3,010
September	116	66	83.2	4,950

MADISON RIVER BASIN

MADISON RIVER NEAR WEST YELLOWSTONE, MONT.

LOCATION.—250 feet upstream from old footbridge at ford on old Gallatin trail, just north of highway to West Yellowstone, and 4 miles east of West Yellowstone and west boundary of Yellowstone National Park. Gibbon and Firehole Rivers unite to form Madison River 9 miles upstream.

DRAINAGE AREA.—410 square miles (measured on topographic maps).

RECORDS AVAILABLE.—June 16, 1913, to September 30, 1927.

EQUIPMENT.—Friez water-stage recorder on left bank. Gage datum for recorder raised 2.50 feet June 29,1926, but records were not based on present datum until October 1, 1926. During winter periods, because of unfavorable conditions caused by severe ice and snow at recorder site, a vertical staff at different datum on left bank 500 feet below was used. Discharge measurements made from cable two-thirds mile below gage or by wading.

CHANNEL AND CONTROL.—Bed composed of gravel and boulders; somewhat rough. One channel at all stages. Aquatic growth is present during greater part of year and at times causes backwater. Control practically permanent.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, from water-stage recorder, 2.36 feet at 8 a. m. June 9 (discharge, 1,770 second-feet); minimum estimated discharge, 325 second-feet December 12–15.

1913–1927: Maximum stage recorded, 2.64 feet (old vertical staff) at 6 p. m. June 10, 1917 (discharge, 1,950 second-feet); minimum, 1.1 feet (vertical staff) February 2, 1924 (discharge, 284 second-feet).

DIVERSIONS AND REGULATION.—None.

ACCURACY.—Stage-discharge relation changed within well-defined limits by moss growth during summer; affected slightly by ice for short periods in December and January. Rating curve for staff gage used December 11 to May 7 is well defined and was closely checked by discharge measurements in 1927; rating curves for recorder site used during remainder of the year are based on standard rating and six measurements ranging from 489 to 1,620 second-feet made during June to September, 1927. Operation of water-stage recorder satisfactory October 1 to December 8 and May 14 to September 30; during intervening period staff gage at lower site was read to hundredths about once a week. Daily discharge ascertained by applying daily gage height to rating table except as indicated in footnote to table of daily discharge. For periods when water-stage recorder was operated, mean daily gage height was determined by inspection of recorder graph. Records good October to December 8 and after June 10; others fair.

Daily discharge, in second-feet, of Madison River near West Yellowstone, Mont., for the year ending September 30, 1927

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	452	386	462	368			375		944	851	480	452
2	452	386	452		350	380	376	800	908	794	480	480
3	480	386	462						944	772	480	452
4	462	378	490						1,030	761	471	462
5	424	378	442	375	339	384		650	1,080	761	471	462
6	424	386	424				380	650	1,220	717	452	462
7	442	395	414					660	1,380	706	452	452
8	510	386	414	376					1,630	684	462	452
9	452	378	375		340	380	384		1,670	684	462	490
10	433	378		375				600	1,580	653	452	805
11	462	378	339						1,630	632	452	632
12	452	386			339	376	390		1,630	611	452	530
13	424	386	325						1,550	600	480	510
14	414	378						750	1,510	600	510	540
15	404	378		384				886	1,470	570	510	500
16	404	386			340	370						
17	414	370					392	1,020	1,470	580	520	490
18	414	370		370				1,190	1,500	560	480	490
19	395	395	400		346	368		1,320	1,410	550	471	480
20	386	433					400	1,220	1,330	540	471	471
21	386	452						1,180	1,360	530	471	471
22	386	500		330	360	375		1,060	1,230	520	462	462
23	386	510					416	1,040	1,160	520	462	452
24	386	490						1,000	1,160	540	452	462
25	386	520					600	932	1,200	510	452	510
26	386	462	350		376	376	853	908	1,200	519	442	480
27	395	462		350	380			980	1,130	510	442	471
28	395	452					950	1,050	1,220	490	442	462
29	378	452		339	-------	375		1,120	1,060	480	433	520
30	378	480		340	-------		1,020	1,050	968	490	442	560
31	386	-------		-------	-------	-------	-------	968	908	500	462	530
								908	-------	490	480	------

NOTE.—Discharge estimated on account of ice and missing gage heights Dec. 9, 10, 12–31, Jan. 2–7, 9–14, 16–28, 30, 31, Feb. 1–4, 6–11, 13–18, 20–25, 27, 28, Mar. 1–4, 6–11, 13–18, 20–25, 27–31, Apr. 1, 3–8, 10–15, 17–22, 24, 25, 27–29, May 1–4, 6, 8–13; based on weather records and flow of other Park streams. Braced figures show mean discharge for periods included.

Monthly discharge of Madison River near West Yellowstone, Mont., for the year ending September 30, 1927

[Drainage area, 410 square miles]

Month	Discharge in second-feet				Run-off	
	Maximum	Minimum	Mean	Per square mile	Inches	Acre-feet
October	510	378	418	1.02	1.18	25,700
November	520	370	416	1.01	1.13	24,800
December	490	----------	382	.932	1.07	23,500
January	----------	----------	360	.878	1.01	22,100
February	----------	----------	350	.854	.89	19,400
March	----------	----------	376	.917	1.06	23,100
April	1,020	----------	496	1.21	1.35	29,500
May	1,320	----------	882	2.15	2.48	54,200
June	1,670	908	1,280	3.12	3.48	76,200
July	851	480	604	1.47	1.70	37,100
August	520	433	466	1.14	1.31	28,700
September	805	452	499	1.22	1.36	29,700
The year	1,670	----------	544	1.33	18.02	394,000

CROW CREEK BASIN

CROW CREEK NEAR RADERSBURG, MONT.

LOCATION.—In NE. ¼ sec. 23, T. 6 N., R. 1 W., at Glendale ranger station in Jefferson National Forest, 1 mile above mouth of Slim Sam Creek and 6 miles northwest of Radersburg, Broadwater County.

DRAINAGE AREA.—Not measured.

RECORDS AVAILABLE.—April 17, 1924, to September 30, 1927. May 26, 1919, to September 30, 1922, at old location 600 feet below mouth of Slim Sam Creek. Records comparable except during short periods in spring, when discharge of Slim Sam Creek may be an appreciable percentage of flow in Crow Creek.

EQUIPMENT.—Stevens continuous water-stage recorder in wooden shelter on left bank. Discharge measurements made from bridge below Slim Sam Creek or by wading.

CHANNEL AND CONTROL.—Channel composed of gravel and heavy boulders. No well-defined control. Banks high, covered with brush, and not subject to overflow; may shift.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 4.12 feet at 7 a. m. June 11 (discharge, 772 second-feet); minimum, 0.98 foot at 4.30 a. m. April 14 (discharge, 8.4 second-feet).

1919–1922, 1924–1927: Maximum discharge recorded, 817 second-feet at 6 a. m. June 8, 1920; minimum stage, 0.73 foot at 6.45 p. m. December 13, 1924 (discharge, 2.1 second-feet).

DIVERSIONS AND REGULATION.—No diversions above station, but all of normal flow is used below. No regulation.

ACCURACY.—Stage-discharge relation not permanent; seriously affected by ice, observations discontinued during winter. Two rating curves used during year, both fairly well defined below 500 second-feet; one applicable prior to June 10 and the other since that date. Two low-water discharge measurements made during the year check the respective curves. Operation of water-stage recorder satisfactory. Daily discharge ascertained by applying mean daily gage height to rating table, except for period of ice effect and days of missing gage height, as indicated in footnote to table of daily discharge.

Daily discharge, in second-feet, of Crow Creek near Radersburg, Mont., for the year ending September 30, 1927

Day	Oct.	Nov.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	23	20	-------	12	134	185	107	43	34
2	25	19	-------	12	112	198	100	46	31
3	25	19	-------	11	96	176	92	44	29
4	23	18	-------	11	81	238	95	41	28
5	23	19	-------	11	66	286	113	38	31
6	23	19	-------	12	62	373	91	36	28
7	22	19	-------	14	57	469	84	34	31
8	23	17	-------	14	49	607	79	33	31
9	23	18	-------	13	46	644	74	34	31
10	22	18	-------	12	44	541	68	30	29
11	22	19	-------	13	47	469	66	30	27
12	22	19	-------	14	52	476	64	30	26
13	22	18	22	12	57	417	61	42	28
14	22	19	14	11	72	417	61	41	29
15	22	17	11	13	104	400	65	63	30
16	22	16	10	16	166	376	58	53	32
17	22	22	10	16	289	343	54	44	27
18	22	27	11	15	221	317	51	39	25
19	22	30	11	11	227	301	50	37	24
20	22	-------	11	14	190	271	46	37	23

Daily discharge, in second-feet, of Crow Creek near Radersburg, Mont., for the year ending September 30, 1927—Continued

Day	Oct.	Nov.	Mar.	Apr.	May	June	July	Aug.	Sept.
21	22	-------	11	16	155	238	44	38	22
22	22	-------	11	15	136	221	43	35	22
23	22	-------	11	14	117	219	42	33	22
24	21	-------	11	18	115	204	43	32	22
25	21	-------	11	31	123	177	43	31	23
26	20	-------	11	48	193	170	43	30	23
27	22	-------	11	69	243	181	43	30	22
28	22	-------	11	99	230	149	44	28	25
29	21	-------	11	104	211	134	44	29	25
30	21	-------	12	119	185	118	44	38	24
31	20	-------	12	-------	183	-------	44	47	-------

NOTE.—Recorder not operating Oct. 30, 31, Nov. 2, 3, Mar. 21, 22, and July 25–30; discharge interpolated.

Monthly discharge of Crow Creek near Radersburg, Mont., for the year ending September 30, 1927

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	25	20	22.1	1,360
November 1–19	30	16	19.6	739
March 13–31	22	10	11.7	441
April	119	11	26.3	1,560
May	289	44	131	8,060
June	644	118	310	18,400
July	113	42	63.1	3,880
August	63	28	37.6	2,310
September	34	22	26.8	1,590

PRICKLY PEAR CREEK BASIN

PRICKLY PEAR CREEK NEAR CLANCY, MONT.

LOCATION.—In S. ½ sec. 34, T. 9 N., R. 3 W., at private bridge on Haab ranch, one-fourth mile below mouth of Lump Gulch Creek and 1¼ miles north of Clancy, Jefferson County.

DRAINAGE AREA.—178 square miles (Measured on topographic maps).

RECORDS AVAILABLE.—July 12, 1910, to September 30, 1916, and July 28, 1921, to September 30, 1927, at present site. July 15, 1908, to June 30, 1909, at old site 1 mile below.

EQUIPMENT.—Vertical staff gage on downstream side of right abutment of bridge. Discharge measurements made by wading or from bridge.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 3.80 feet at 8 a. m. June 3 (discharge, 492 second-feet); minimum, 1.00 foot at 8 a. m. April 21 (discharge, 19 second-feet).

1909–1916, 1921–1927: Maximum discharge recorded, that of June 3, 1927; minimum stage, 0.71 foot September 9, 1924 (discharge, 9.3 second-feet).

DIVERSIONS AND REGULATION.—Several small diversions from main stream and tributaries above gage; practically all water is appropriated and used for irrigation below station. No regulation.

ACCURACY.—Stage-discharge relation permanent; seriously affected by ice, observations discontinued during winter. Rating curve well defined between 20 and 500 second-feet by 11 discharge measurements, 6 of which were made during the year. Gage read twice daily to hundredths. Daily discharge ascertained by applying mean daily gage height to rating table. Records good.

Daily discharge, in second-feet, of Prickly Pear Creek near Clancy, Mont., for the year ending September 30, 1927

Day	Oct.	Nov.	Dec.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	36	27	38		32	100	343	146	55	49
2	38	27	38		30	100	343	138	53	53
3	45	28	38		31	80	492	130	52	54
4	45	27	38		29	74		130	53	53
5	46	29	38		26	74		195	52	54
6	43	29	38		29	72		162	51	52
7	43	29			31	70		130	50	54
8	40	29			34	70		122	51	52
9	38	29			30	64		115	48	48
10	38	29			35	71		100	47	46
11	37	29			31	74		97	44	46
12	33	28			31	84		92	44	46
13	34	27			31	74		93	43	46
14	37	27			34	93		108	44	45
15	36	28			34	78		90	86	44
16	38	29			34	130	442	74	64	46
17	37	30			38	213	392	75	59	45
18	37	30			34	195	343	72	60	44
19	37	29			37	162	296	60	65	45
20	35	29			34	162	296	59	74	45
21	33	34			30	170	284	62	63	44
22	37	40			34	162	251	59	55	41
23	39	41			34	162	241	58	53	41
24	35	39			37	162	231	55	52	43
25	39	38			66	178	213	54	52	44
26	37	38			80	262	195	53	53	44
27	32	38		31	108	319	186	52	48	44
28	29	38		26	115	296	178	52	56	44
29	29	38		26	108	343	162	52	62	44
30	27	38		26	108	284	154	53	56	44
31	27			32		296		53	51	

NOTE.—Water over top of gage June 4–15; discharge not computed. Gage height missing June 17; discharge interpolated.

Monthly discharge of Prickly Pear Creek near Clancy, Mont., for the year ending September 30, 1927

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	46	27	36.7	2,260
November	41	27	31.7	1,890
December 1–6	38	38	38.0	452
March 27–31	32	26	28.2	280
April	115	26	45.5	2,710
May	343	64	151	9,280
July	195	52	90.0	5,530
August	86	43	54.7	3,360
September	54	41	46.7	2,780

TENMILE CREEK NEAR RIMINI, MONT.

LOCATION.—In NE. ¼ sec. 20, T. 9 N., R. 5 W., opposite Moose Creek ranger station, 500 feet above mouth of Moose Creek and 3 miles north of Rimini, Lewis and Clark County.

DRAINAGE AREA.—34 square miles (measured on topographic maps).

RECORDS AVAILABLE.—March 13, 1915, to September 30, 1927.

EQUIPMENT.—Stevens continuous water-stage recorder on left bank opposite ranger station; installed April 24, 1927. Friez water-stage recorder at same location used prior to that date. Discharge measurements made from footbridge 75 feet above gage or by wading.

CHANNEL AND CONTROL.—Channel composed of boulders and gravel. Left bank high and steep; composed of loose material; not subject to overflow. Right bank sloping and subject to overflow. Control is shifting.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 3.36 feet at 5.30 a. m. June 11 (discharge, 642 second-feet); minimum, 0.53 foot August 11 (discharge, 1.6 second-feet).

1915–1927: Maximum stage recorded, 4.87 feet May 15, 1917 (discharge, 948 second-feet); minimum, 0.10 foot March 28, 1925 (discharge, 0.4 second-foot).

DIVERSIONS AND REGULATION.—Some water is diverted above station for part of the water supply of Helena. Small reservoir above station for water-supply system of Helena has slight effect on the flow.

ACCURACY.—Stage-discharge relation not permanent; seriously affected by ice, observations discontinued during winter. Two rating curves used during year; one, used October 1 to November 30, is well defined between 3 and 200 second-feet; the other, used April 16 to September 30, is well defined between 5 and 400 second-feet. Ten discharge measurements, covering a range from 2 to 367 second-feet, were made during the year. Operation of water-stage recorders satisfactory. Daily discharge ascertained by applying mean daily gage height to rating table, using shifting-control method October 1 to November 30 and April 16 to June 7. Records after June 8 good; others fair.

Daily discharge, in second-feet, of Tenmile Creek near Rimini, Mont., for the year ending September 30, 1927

Day	Oct.	Nov.	Apr.	May	June	July	Aug.	Sept.
1	7.8	3.6	------	120	137	48	3.5	4.7
2	7.4	4.0	------	103	165	42	4.7	4.5
3	3.6	3.4	------	86	215	39	4.3	4.1
4	3.4	3.4	------	76	238	42	4.1	3.5
5	4.5	3.8	------	71	328	43	2.5	3.5
6	4.9	3.8	------	62	462	30	2.4	2.7
7	4.3	4.3	------	56	527	26	2.1	3.3
8	6.6	3.6	------	50	561	22	2.1	3.9
9	9.0	4.3	------	49	539	16	2.2	3.9
10	8.6	4.6	------	49	487	11	1.9	4.1
11	8.6	4.3	------	55	567	9.8	1.7	4.1
12	8.2	4.3	------	62	446	8.8	2.2	3.5
13	8.2	4.3	------	86	387	8.0	4.1	3.3
14	7.8		------	114	394	7.5	10	3.5
15	7.4		------	142	360	11	16	3.5
16	7.4		11	192	304	8.4	8.4	3.5
17	7.8		10	240	298	7.5	5.8	3.1
18	7.4	4.3	10	187	243	6.7	5.0	2.9
19	7.0		10	163	212	6.9	4.7	2.7
20	6.7		10	155	182	6.4	4.5	2.5
21	6.4		10	150	163	5.5	4.1	2.4
22	6.7		11	132	132	4.5	4.1	2.2
23	7.0	4.3	11	130	109	4.3	3.9	2.1
24	5.8	4.3	30	140	96	3.7	3.5	2.2
25	5.8	4.9	50	147	96	3.7	3.7	2.4
26	5.8	5.2	60	168	90	3.9	4.1	2.4
27	5.8	5.2	90	179	86	4.5	4.7	2.4
28	5.5	5.0	107	168	72	4.5	3.7	2.5
29	4.6	5.0	109	152	63	4.5	3.7	2.7
30	4.3	5.0	111	147	54	3.5	4.7	2.7
31	4.3	------	------	125	------	3.5	6.9	------

NOTE.—Gage-height record missing Nov. 14–22, 28–30, and Apr. 24; discharge interpolated.

Monthly discharge of Tenmile Creek near Rimini, Mont., for the year ending September 30, 1927

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	9.0	3.4	6.41	394
November	5.2	3.4	4.31	256
April 16-30	111	10	42.7	1,270
May	240	49	121	7,440
June	567	54	267	15,900
July	48	3.5	14.4	885
August	16	1.7	4.49	276
September	4.7	2.1	3.16	188

TENMILE CREEK NEAR HELENA, MONT.

LOCATION.—In SE. ¼ sec. 22, T. 10 N., R. 4 W., opposite Broadwater Hotel, near Helena, Lewis and Clark County.

DRAINAGE AREA.—103 square miles (measured on topographic maps).

RECORDS AVAILABLE.—July 8, 1908, to September 30, 1927.

EQUIPMENT.—Stevens continuous water-stage recorder in wooden shelter on right bank. From April 25 to August 16 a Friez water-stage recorder was used. Discharge measurements made by wading or from highway bridge 500 feet below gage.

CHANNEL AND CONTROL.—Bed of stream coarse gravel and boulders; shifts occasionally. Banks not liable to be overflowed.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 6.58 feet (determined by levels from high-water marks) June 11 (discharge, 865 second-feet); minimum, 1.93 feet at 10 a. m. November 19 (discharge, 3.1 second-feet).

1908–1927: Maximum discharge recorded, that of June 11, 1927; minimum discharge, no flow in afternoon of July 10, 1918, June 26 to September 30, 1919, and July 31 to September 16, 1921.

DIVERSIONS AND REGULATION.—Part of water supply for city of Helena is taken from Tenmile Creek above station. Two irrigation ditches also take water from the creek above gage. No regulation.

ACCURACY.—Stage-dicharge relation not permanent; seriously affected by ice; observations discontinued during winter. Rating curve used prior to May 16 well defined below 350 second-feet and checked by three discharge measurements made between April 26 and May 16, covering a range from 80 to 334 second-feet; rating curve used after May 17 fairly well defined below 500 second-feet by three discharge measurements made June 14 to July 26, covering a range from 11 to 502 second-feet. Operation of water-stage recorder satisfactory except as noted in footnote to table of daily discharge. Daily discharge ascertained by applying mean daily gage height to rating table, using shifting-control method February 25 to April 25 and May 17 to June 13, except as indicated in footnote to table of daily discharge. Records good except those for periods of shifting control, which are fair.

Daily discharge, in second-feet, of Tenmile Creek near Helena, Mont., for the year ending September 30, 1927

Day	Oct.	Nov.	Dec.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	13.0	10	14	------	8.7	16	197	472	80	8.4	29
2	14	9.9	21	------	9.1	15	163	502	73	10	20
3	14	9.9	21	------	11	18	127	529	67	10	20
4	14	9.1	18	------	13	15	117	598	69	9.2	19
5	9.1	9.1	14	------	13	14	101	613	76	10	20
6	12	9.1	15	------	10	14	94	634	62	12	16
7	17	11	12	------	9.1	17	85	680	54	13	16
8	19	9.9	14	------	9.9	22	81	726	49	14	14
9	18	9.5	11	------	8.7	19	80	772	38	17	14
10	16	9.5	14	------	9.5	18	90	818	36	17	16
11	16	9.1	15	------	7.9	16	100	865	35	17	17
12	16	9.5	------	------	7.9	15	122	749	32	18	16
13	10	8.7	------	------	16	15	169	633	31	18	16
14	10	8.3	------	------	24	16	226	517	28	22	15
15	12	7.2	------	------	16	21	309	467	34	37	14
16	12	7.2	------	------	12	26	383	421	14	31	14
17	15	6.3	------	------	11	22	568	373	26	23	14
18	14	7.2	------	------	9.9	19	496	351	22	20	13
19	12	3.7	------	------	13	15	423	306	22	19	12
20	12	4.8	------	------	9.1	19	338	262	19	18	12
21	13	6.3	------	------	14	17	324	217	18	16	12
22	14	9.9	------	------	16	19	287	195	16	17	11
23	14	13	------	------	13	21	299	174	15	19	11
24	14	14	------	------	14	36	338	153	14	18	12
25	14	13	------	9.5	12	70	351	132	12	16	12
26	13	14	------	9.5	12	101	481	121	12	16	12
27	13	13	------	9.9	10	141	470	118	11	20	12
28	12	12	------	9.1	11	185	484	103	8.8	22	12
29	11	13	------	------	11	189	529	92	9.6	20	12
30	11	17	------	------	14	180	490	86	8.4	19	12
31	10	------	------	------	17	------	478	------	8.8	22	------

NOTE.—Gage-height record missing Oct. 24 to Nov. 1, June 7–10, 12, 13, 19, 20, 22–24, July 23, 24, Aug. 5, 6, and Sept. 26–30; discharge estimated or interpolated.

Monthly discharge of Tenmile Creek near Helena, Mont., for the year ending September 30, 1927

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	19	9.1	13.4	824
November	17	3.7	9.81	584
December 1–11	21	11	15.4	336
February 25–28	9.9	9.1	9.50	75.4
March	24	8.7	12.0	738
April	189	14	43.7	2,600
May	568	80	284	17,500
June	865	86	423	25,200
July	80	8.4	32.3	1,990
August	37	8.4	17.7	1,090
September	29	11	14.8	881

LITTLE PRICKLY PEAR CREEK BASIN

LITTLE PRICKLY PEAR CREEK NEAR MARYSVILLE, MONT.

LOCATION.—In SW. ¼ sec. 18, T. 12 N., R. 6 W., at highway bridge on ranch of Casper Traufer, one-fourth mile below mouth of Deadman Creek and 6 miles northwest of Marysville, Lewis and Clark County.

DRAINAGE AREA.—69 square miles (measured on topographic map).

RECORDS AVAILABLE.—May 24, 1913, to September 30, 1927, at present site; April 12 to May 23, 1913, about one-fourth mile above present site; May 18, 1909, to December 31, 1911, at station above mouth of Deadman Creek.

EQUIPMENT.—Vertical staff gage spiked to upstream side of left abutment of highway bridge. Discharge measurements made from bridge or by wading.

CHANNEL AND CONTROL.—Bed composed of sand and gravel; shifts slightly.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 2.30 feet at 6 p. m. June 8 (discharge, 303 second-feet); minimum, 0.80 foot November 14–28 (discharge, 12 second-feet).

1909–1911, 1913–1927: Maximum stage recorded, 3.8 feet May 25 and 26, 1917 (discharge, 454 second-feet); minimum discharge, 1.2 second-feet March 7–13, 1911.

DIVERSIONS AND REGULATION.—Two or three small ditches divert water from the stream above station. No regulation.

ACCURACY.—Stage-discharge relation not permanent; seriously affected by ice, observations discontinued during winter. Two rating curves used during year; one, applicable October 1 to December 11, is well defined by 15 discharge measurements between 10 and 250 second-feet; the other, applicable March 20 to September 30, is well defined by five measurements between 14 and 250 second-feet. Three measurements, covering a range from 12 to 203 second-feet, were made during the year. Gage read to hundredths once daily except during period April 25 to July 2, when it was read twice daily. Daily discharge ascertained by applying daily or mean daily gage height to rating table. Records good.

Daily discharge, in second-feet, of Little Prickly Pear Creek near Marysville, Mont., for the year ending September 30, 1927

Day	Oct.	Nov.	Dec.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	14	13	14		28	157	181	70	29	21
2	14	13	15		28	149	188	65	29	20
3	14	13	18		28	138	209	62	29	20
4	14	13	16		27	123	212	61	29	20
5	14	13	16		28	111	212	56	29	20
6	14	13	14		28	99	234	54	28	19
7	14	13	14		30	95	272	50	27	19
8	14	13	14		30	90	295	48	27	18
9	14	13	14		30	79	287	46	27	18
10	14	13	14		30	81	267	46	27	18
11	14	13	14		29	81	261	43	26	18
12	14	13			29	86	246	42	26	18
13	14	13			28	99	216	41	25	18
14	14	12			29	130	200	40	25	18
15	14	12			30	159	197	40	28	18
16	13	12			31	202	193	38	26	18
17	13	12			32	238	179	38	25	18
18	13	12			32	197	170	37	24	18
19	13	12			32	170	161	37	24	17
20	13	12		23	32	142	149	35	24	17
21	13	12		26	33	132	140	35	23	17
22	13	12		30	33	115	136	34	23	17
23	13	12		25	33	111	130	33	23	17
24	13	12		25	37	126	119	33	22	17
25	13	12		24	48	159	111	32	22	17
26	13	12		24	84	195	101	32	22	17
27	13	12		26	134	200	97	32	22	17
28	13	12		26	161	190	90	32	22	17
29	13	14		27	164	193	81	32	22	17
30	13	14		27	157	195	77	30	22	17
31	13			27		188		29	21	

Monthly discharge of Little Prickly Pear Creek near Marysville, Mont., for the year ending September 30, 1927

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	14	13	13.5	830
November	14	12	12.6	750
December 1–11	18	14	14.8	323
March 20–31	30	23	25.8	614
April	164	27	49.2	2,930
May	238	79	143	8,790
June	295	77	180	10,700
July	70	29	42.0	2,580
August	29	21	25.1	1,540
September	21	17	18.0	1,070

SMITH RIVER BASIN

SMITH RIVER NEAR WHITE SULPHUR SPRINGS, MONT.

LOCATION.—In SE. ¼ SW. ¼ sec. 33, T. 11 N., R. 8 E., at Meachen ranch, 14 miles northeast of White Sulphur Springs, Meagher County, and 32 miles northwest of Martinsdale.

DRAINAGE AREA.—Not measured.

RECORDS AVAILABLE.—September 30, 1922, to September 30, 1927.

EQUIPMENT.—Chain gage on right bank 650 feet west of ranch house; installed June 27. Prior to that date a vertical staff gage 150 feet downstream was used. Both gages at same datum but do not read the same. Discharge measurements made by wading or from bridge.

CHANNEL AND CONTROL.—Channel composed of coarse gravel. Banks low and subject to overflow at high stages. Control is a gravel bar 30 feet below gage; shifts occasionally.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 3.20 feet at 7 p. m. May 27 (discharge, 186 second-feet); minimum, 0.60 foot October 30 (discharge, 9.6 second-feet).

1922–1927: Maximum stage recorded, 3.05 feet June 21, 1923 (discharge, 224 second-feet); minimum discharge, 3.1 second-feet from discharge measurement of March 8, 1923.

DIVERSIONS AND REGULATION.—One or two small diversions for irrigation above this station. No regulation.

ACCURACY.—Stage-discharge relation not permanent; seriously affected by ice, observations discontinued during winter. Two rating curves used during year, one applicable for open channel October 1 to May 27 and the other June 27 to September 30. Three discharge measurements, ranging from 25 to 145 second-feet, made during the year after June 27, check the latter curve closely. Gage read to hundredths twice daily. Daily discharge ascertained by applying mean daily gage height to rating table. Records good.

Daily discharge, in second-feet, of Smith River near White Sulphur Springs, Mont., for the year ending September 30, 1927

Day	Oct.	Nov.	Dec.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	13	12	12	------	12	44	------	145	33	21
2	13	11	12	------	11	30	------	130	30	20
3	14	11	14	------	15	32	------	110	27	18
4	14	11	13	------	15	32	------	115	25	20
5	13	11	13	------	16	27	------	108	25	18
6	12	12	13	------	16	33	------	92	25	18
7	12	12	13	------	16	52	------	85	26	18
8	11	11	13	------	17	35	------	85	25	23
9	11	11	15	------	19	39	------	80	25	24
10	11	11	12	------	18	36	------	76	24	21
11	11	11	12	------	15	34	------	63	24	19
12	10	11	}	------	20	32	------	54	24	20
13	11	10	}	------	13	30	------	44	24	19
14	11	10	}	------	12	28	------	33	24	18
15	10	11	}	------	30	30	------	40	25	18
16	11	12	}	------	38	34	------	54	25	18
17	11	15	} 12	------	20	42	------	48	26	18
18	11	15	}	------	17	56	------	39	25	18
19	11	16	}	------	16	68	------	38	25	18
20	11	16	}	}	18	64	------	38	24	18
21	11	16	}	}	17	64	------	71	24	17
22	11	15	}	} 10	19	74	------	90	25	16
23	11	14	} 13	}	13	78	------	85	24	16
24	11	13	} 13	}	73	116	------	32	22	15
25	10	12	}	}	33	93	------	26	22	14
26	11	12	}	11	57	154	------	38	21	14
27	11	11	}	8.9	65	174	146	46	21	14
28	11	12	} 12	8.9	51	------	------	39	22	15
29	10	11	}	14	53	------	------	36	24	15
30	10	12	}	15	44	------	------	28	23	15
31	11	------	}	12	------	------	------	33	24	------

NOTE.—Gage washed out May 27; no record May 28 to June 30, except June 27, which represents actual measurement. Braced figures represent mean discharge for periods indicated.

Monthly discharge of Smith River near White Sulphur Springs, Mont., for the year ending September 30, 1927

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	14	10	11.3	695
November	16	10	12.3	732
December	15	12	12.4	762
March 20–31	15	8.9	10.8	257
April	73	11	26.0	1,550
May 1–27	174	27	56.7	3,040
July	145	26	64.5	3,970
August	33	21	24.6	1,510
September	24	14	17.9	1,070

SUN RIVER BASIN

NORTH FORK OF SUN RIVER NEAR AUGUSTA, MONT.

LOCATION.—In unsurveyed tract at Sun River diversion dam, 18 miles northwest of Augusta, Lewis and Clark County.

DRAINAGE AREA.—596 square miles (measured by United States Bureau of Reclamation).

RECORDS AVAILABLE.—January 1, 1916, to September 30, 1927, at present site. August 5, 1889, to December 31, 1890, and October 31, 1903, to December 31, 1915, at station in sec. 33, T. 22 N., R. 7 W., at Henningson ranch, 8 miles downstream from present site. The flow of the stream is practically the same at both points, as there are no diversions or large tributaries.

EQUIPMENT.—Sloping staff gage on right abutment of Sun River diversion dam. Discharge measurements made from highway bridge half a mile below gage or by wading.

CHANNEL AND CONTROL.—Control is crest of Sun River diversion dam, which is a concrete structure with an arch section 153.3 feet in length and a gravity section 59.2 feet in length, separated by a pier.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 5.95 feet June 9 (discharge, 11,400 second-feet); minimum, 0.40 foot March 26 to April 13 (discharge, 150 second-feet).

1889–1927: Maximum stage recorded, 11.4 feet June 21, 1916 (discharge, 32,300 second-feet); minimum, 0.0 foot April 7 and 8, 1915 (discharge, 15 second-feet).

DIVERSIONS AND REGULATION.—Intake of Pishkun Canal of United States Bureau of Reclamation is at right end of diversion dam. No regulation.

ACCURACY.—Stage-discharge relation permanent during year. Rating curve well defined and is based upon the formula $Q=3.1\ LH^{1.6}$ which was closely checked by seven discharge measurements. Gage read to half-tenths once daily; to hundredths occasionally. Daily discharge ascertained by applying daily gage height to rating table and adding flow in canal. Records good.

COOPERATION.—Records furnished by United States Bureau of Reclamation.

Combined daily discharge, in second-feet, of North Fork of Sun River and Pishkun Canal near Augusta, Mont., for the year ending September 30, 1927

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	288	288	288	215	215	215	150	2,200	3,000	3,100	460	460
2	288	288	288	215	215	215	150	1,670	3,450	2,540	655	460
3	288	288	288	215	215	215	150	1,600	3,450	2,780	655	460
4	288	288	288	215	215	215	150	1,450	3,600	2,780	655	460
5	328	288	288	215	215	215	150	1,200	4,010	2,780	555	460
6	328	288	288	215	215	215	150	1,080	5,600	2,280	555	505
7	328	288	288	215	215	215	150	1,130	7,050	2,280	555	555
8	328	288	288	215	215	215	150	880	8,700	2,280	555	505
9	328	288	288	215	215	215	150	880	11,400	2,280	460	505
10	328	288	288	215	215	215	150	880	8,900	2,200	460	505
11	328	288	288	215	215	215	150	1,120	9,800	1,770	460	555
12	328	288	288	215	215	215	150	1,470	8,700	1,670	460	555
13	370	288	288	215	215	215	150	1,840	6,800	1,600	555	555
14	370	288	288	215	215	215	182	3,140	6,800	1,480	655	555
15	370	288	288	215	215	215	215	3,880	8,100	1,480	765	555
16	328	288	215	215	215	215	215	4,980	6,800	1,250	765	555
17	328	288	215	215	215	215	290	6,160	6,300	1,140	655	505
18	328	288	215	215	215	182	290	5,860	6,100	1,140	605	505
19	328	288	215	215	215	182	215	4,120	6,520	1,140	460	460
20	328	288	215	215	290	182	215	3,360	5,800	1,040	460	460
21	288	288	215	215	290	150	215	2,820	4,900	1,040	460	412
22	288	288	215	215	290	182	220	2,460	5,600	1,010	460	412
23	288	288	215	215	290	215	330	2,160	5,600	920	412	412
24	288	288	215	215	215	215	370	3,140	5,320	880	412	370
25	288	288	215	215	215	182	663	3,570	5,350	840	370	370
26	288	250	215	215	215	150	1,430	3,710	5,100	840	370	330
27	288	250	215	215	215	150	2,030	3,550	5,100	765	370	330
28	288	250	215	215	215	150	3,050	3,300	4,650	615	370	290
29	288	250	215	215	-------	150	2,850	3,300	3,800	555	370	290
30	288	250	215	215	-------	150	2,500	2,850	3,800	405	370	370
31	288	-------	215	215	-------	150	-------	3,000	-------	405	370	-------

Daily discharge, in second-feet, of Pishkun Canal near Augusta, Mont., for the year ending September 30, 1927

Day	Apr.	May	July	Day	Apr.	May	July	Day	Apr.	May	July
1		200	100	11		0	370	21		165	485
2		200	235	12		0	420	22		165	550
3		200	275	13		0	475	23		165	550
4		200	275	14		140	485	24	0	140	550
5		200	275	15		275	485	25	108	120	550
6		200	275	16		275	485	26	178	110	550
7		130	275	17		60	485	27	190	100	550
8		0	275	18		60	485	28	200	100	325
9		0	275	19		115	485	29	200	100	185
10		0	275	20		165	485	30	200		35
								31			35

Combined monthly discharge of North Fork of Sun River and Pishkun Canal near Augusta, Mont., for the year ending September 30, 1927

[Drainage area, 596 square miles]

Month	Discharge in second-feet				Run-off	
	Maximum	Minimum	Mean	Per square mile	Inches	Acre-feet
October	370	288	313	0.525	0.61	19,200
November	288	250	282	.473	.53	16,800
December	288	215	250	.419	.48	15,400
January	215	215	215	.361	.42	13,200
February	290	215	226	.379	.39	12,600
March	215	150	195	.327	.38	12,000
April	3,050	150	574	.963	1.07	34,200
May	6,100	880	2,670	4.48	5.16	164,000
June	11,400	3,000	6,000	10.1	11.27	357,000
July	3,100	405	1,530	2.57	2.96	94,100
August	765	370	508	.852	.98	31,200
September	555	290	457	.767	.86	27,200
The year	11,400	150	1,100	1.85	25.11	797,000

SUN RIVER AT FORT SHAW, MONT.

LOCATION.—In SW. ¼ sec. 1, T. 20 N., R. 2 W., at highway bridge at Fort Shaw, Cascade County.

DRAINAGE AREA.—1,475 square miles (measured by United States Bureau of Reclamation).

RECORDS AVAILABLE.—May 16, 1912, to September 30, 1927. A station on Sun River at Sun River, maintained July 31, 1905, to October 5, 1912, gave results for practically the same drainage area.

EQUIPMENT.—Stevens continuous water-stage recorder in shelter on left bank under highway bridge and chain gage on bridge. Discharge measurements made from cable 500 feet below gage or by wading.

CHANNEL AND CONTROL.—Bed of stream composed of gravel and rocks; shifts occasionally.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 10.42 feet at 6 p. m. June 9 (discharge, 10,400 second-feet); minimum, 3.91 feet at 11 a. m. April 21 (discharge, 219 second-feet).

1905–1927: Maximum stage recorded, 13.4 feet June 7, 1928 (discharge, 18,400 second-feet); minimum, 3.04 feet August 27, 1926 (discharge, 38 second-feet).

DIVERSIONS AND REGULATION.—Willow Creek Reservoir has a capacity of 16,640 acre-feet. There are adjudicated rights for diverting 248 second-feet from Sun River direct and 664 second-feet from tributaries above this station. In addition there are the Fort Shaw and Pishkun Canals of the United States Bureau of Reclamation and a few small ditches constructed since the adjudication.

ACCURACY.—Stage-discharge relation not permanent; affected by ice. Rating curve well defined between 35 and 400 second-feet and fairly well defined between 400 and 7,000 second-feet. Operation of water-stage recorder satisfactory except as indicated in footnote to table of daily discharge. Chain gage read to half-tenths at irregular intervals during periods when recorder was not operating. Five discharge measurements, covering a range from 656 to 7,120 second-feet, were made during the current year. Daily discharge ascertained by applying mean daily gage height to rating table, using shifting-control method June 14 to August 21, except as noted in footnote to table of daily discharge. Records for medium and low stages good, others fair; winter records poor.

COOPERATION.—United States Bureau of Reclamation furnished some gage readings.

Daily discharge, in second-feet, of Sun River at Fort Shaw, Mont., for the year ending September 30, 1927

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	477	458	483				288	2,410	4,370	4,100	666	606
2	477	465	496				288	2,100	4,110	4,040	635	650
3	477	477	477				280	1,810	4,280	3,970	613	666
4	477	483	477				292	1,520	4,370	2,960	591	635
5	477	465	471				280	1,220	4,280	3,010	562	606
6	477	446	471			250	276	932	4,920	2,740	515	591
7	477	471	471				272	1,000	6,160	2,440	502	620
8	477	489	465				264	1,070	7,560	2,180	471	768
9	477	471	458				268	1,140	9,360	2,060	446	744
10	576	452	446			292	268	1,210	8,530	1,900	429	712
11	628	435	458			276	260	1,280	8,760	1,710	401	705
12	620	418	435			297	264	1,950	8,760	1,490	385	728
13	606	401	429			380	252	2,620	7,160	1,240	446	728
14	569	396				446	248	3,300	6,700	1,180	465	728
15	576	374			250	369	292	3,970	7,240	1,100	752	728
16	556	369		300		354	369	4,640	6,880	1,030	1,020	689
17	542	348				354	306	5,580	6,720	898	1,210	650
18	650	306				348	297	6,360	6,560	792	966	628
19	673	276				348	297	4,640	6,400	673	833	613
20	613	272				354	280	4,200	5,850	650	760	598
21	562	280				348	245	3,770	5,650	643	720	583
22	528	276	350			348	284	3,640	5,450	575	705	576
23	496	369				338	329	3,520	5,410	506	736	569
24	471	429				324	320	3,360	5,540	438	666	576
25	440	435				324	407	4,110	5,480	369	606	535
26	435	452				324	958	4,110	5,300	301	591	515
27	429	452				324	1,960	4,200	5,390	361	576	489
28	465	465				320	2,500	4,110	4,710	422	549	471
29	477	465			-------	301	3,040	4,730	4,230	483	562	465
30	465	471			-------	284	2,730	5,480	4,160	544	643	483
31	458	-------			-------	276	-------	4,730	-------	605	628	------

NOTE.—Stage-discharge relation seriously affected by ice Dec. 14 to Mar. 9; discharge estimated. *Braced figures represent mean discharge for periods indicated. Gage-height record missing Oct. 4, 5, 7, 8, Apr. 28, 30, May 1, 3–5, 7–10, 12–15, 20, 22, June 21, 30, July 1, 2, 22–25, and 27–31; discharge interpolated.

Monthly discharge of Sun River at Fort Shaw, Mont., for the year ending September 30, 1927

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	673	429	520	32,000
November	489	272	412	24,500
December	496	350	398	24,500
January			300	18,400
February			250	13,900
March	446	250	309	19,000
April	3,040	245	614	36,500
May	6,360	932	3,180	196,000
June	9,360	4,110	6,010	358,000
July	4,100	301	1,460	89,800
August	1,210	385	634	39,000
September	768	465	622	37,000
The year	9,360	245	1,230	889,000

MARIAS RIVER BASIN

MARIAS RIVER NEAR SHELBY, MONT.

LOCATION.—In sec. 20, T. 31 N., R. 2 W., at highway bridge 7 miles south of Shelby, Toole County.

DRAINAGE AREA.—2,610 square miles.

RECORDS AVAILABLE.—April 4, 1902, to January 12, 1908; April 23, 1911, to September 30 1922; March 26, 1923, to September 30, 1927.

EQUIPMENT.—Stevens water-stage recorder on downstream side of pier on left bank. Discharge measurements made from downstream side of highway bridge or by wading.

CHANNEL AND CONTROL.—Bed composed of gravel and boulders; control shifts occasionally. Left bank steep and high; not subject to overflow. Right bank gently sloping; will be overflowed at extremely high stages.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 9.50 feet at 6 p. m. June 9 (discharge, 12,000 second-feet); minimum, 3.02 feet April 14 (discharge, 506 second-feet).

1902–1907, 1911–1927: Maximum stage recorded, 14.9 feet June 24, 1907 (discharge, 29,500 second-feet); minimum, 1.5 feet August 20, 1919 (discharge, 10 second-feet).

DIVERSIONS AND REGULATION.—The Valier-Montana Land & Water Co.'s Carey Act project, the Blackfeet project of the United States Bureau of Reclamation, and a number of smaller private diversions take water from the principal tributaries above this station. Water is stored in reservoirs on tributaries above the station; the principal ones are Two Medicine Lake, Four Horns, Swift Dam, and Lake Francis.

ACCURACY.—Stage-discharge relation permanent; seriously affected by ice, observations discontinued during winter. Rating curve well defined by 16, discharge measurements made during 1926–27, well distributed along curve. Operation of water-stage recorder not satisfactory. Daily discharge ascertained by applying mean daily gage height to rating table. Records good but very fragmentary.

Daily discharge, in second-feet, of Marias River near Shelby, Mont., for the year ending September 30, 1927

Day	Oct.	Nov.	Apr.	May	June	July	Aug.	Sept.
1		755		4,390		4,390		961
2		734		3,930		3,930		898
3		706		3,390		3,660		937
4		672		2,880		4,300		1,080
5		652		2,510		4,200		1,100
6		626		2,370		3,660	785	1,040
7		607		2,180		3,220	762	985
8	830			2,040		2,960	755	1,030
9	1,000			1,980	10,000	2,720	755	1,230
10	1,080			1,860		2,370	748	1,280
11	1,060			1,860		2,110	713	1,250
12	1,000			2,110			755	1,270
13	969			2,370			822	1,280
14	985		506	3,220			1,140	1,680
15	937		513	2,300			1,500	3,660
16	882		672	4,780			1,740	2,880
17	868		1,500	6,030			2,180	2,370
18	1,180		1,390	6,240			1,860	2,040
19	1,740		1,080	5,610			1,620	1,800
20	1,620		905	5,400			1,680	1,680
21	1,440		755	7,320			1,560	1,560
22	1,340		734	9,130	6,240		1,440	1,440
23	1,230		741		6,450		1,340	1,340
24	1,100		830		6,240		1,250	1,240
25	1,020		1,930		6,450		1,100	1,190
26	945		3,750		6,030		1,050	1,440
27	868		5,080		5,610		969	1,390
28	860		5,820		4,780		945	1,280
29	838		5,820		4,480		961	1,120
30	808		4,880		4,480		977	1,010
31	770						985	

NOTE.—No record because of failure of recorder to operate Oct. 1–7, May 23 to June 8, June 10–21, and July 12 to Aug. 5.

Monthly discharge of Marias River near Shelby, Mont., for the year ending September 30, 1927

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October 8–31	1,740	770	1,060	50,500
November 1–7	755	607	679	9,430
April 14–30	5,820	506	2,170	73,200
May 1–22	9,130	1,860	3,810	166,000
July 1–11	4,390	2,110	3,410	74,400
August 6–31	2,180	713	1,170	60,300
September	3,660	898	1,450	86,300

MARIAS RIVER NEAR BRINKMAN, MONT.

LOCATION.—In NW. ¼ sec. 21, T. 29 N., R. 8 E., at Brinkman ranch, 21 miles south of Inverness, on Great Northern Railway, and 4 miles from Brinkman post office, Hill County.

DRAINAGE AREA.—Not measured.

RECORDS AVAILABLE.—October 6, 1921, to September 30, 1927.

EQUIPMENT.—Overhanging chain gage on right bank 500 feet downstream from ranch house. Discharge measurements made from cable a quarter of a mile above gage or by wading.

CHANNEL AND CONTROL.—Bed composed of gravel and small boulders. Left bank high and clean. Right bank clean and is overflowed only at extremely high stages.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 9.2 feet at 7.30 a. m. June 1 (discharge, 14,300 second-feet); minimum, 1.34 feet November 24–26 (discharge, 376 second-feet).

1921–1927: Maximum stage recorded, that of June 1, 1927; minimum, 0.68 foot August 26–29, 1926 (discharge, 106 second-feet).

A stage of 18.0 feet was reached during flood of 1908, according to levels to high-water marks (discharge not determined).

DIVERSIONS AND REGULATION.—Numerous diversions are made for irrigation from tributaries above this station; the principal ones are those for the Blackfeet project and the Valier Carey Act project. The principal storage reservoirs are Two Medicine Reservoir on Two Medicine River, Four Horns Reservoir on Badger Creek, Swift Reservoir on Birch Creek, and Lake Francis Reservoir on Dupuyer Creek.

ACCURACY.—Stage-discharge relation permanent during year; seriously affected by ice, observations discontinued during winter. Rating curve will defined below 6,000 second-feet by 12 discharge measurements; extended above 6,000 second-feet. Two measurements, at 957 and 4,030 second-feet, made during the year check the curve. Gage read twice daily to hundredths. Daily discharge ascertained by applying mean daily gage height to rating table. Records good below 6,000 second-feet and fair above.

Daily discharge, in second-feet, of Marias River near Brinkman, Mont., for the year ending September 30, 1927

Day	Oct.	Nov.	Dec.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	522	785	446	-------	1,060	4,860	14,300	4,680	1,260	875
2	530	785	431	-------	1,010	4,500	12,100	4,680	1,210	875
3	538	740	423	-------	920	4,150	9,400	4,150	1,160	875
4	562	655	460	-------	920	3,500	8,340	3,980	1,110	920
5	570	655	490	-------	785	2,890	7,940	4,680	1,010	920
6	612	612	506	-------	875	2,590	6,950	4,500	920	965
7	655	546	522	-------	740	2,310	7,340	3,980	875	965
8	655	522	538	-------	785	2,310	8,540	3,660	875	965
9	698	522	538	-------	785	2,030	9,840	3,190	830	1,060
10	785	522	530	-------	785	2,030	10,900	3,190	785	1,260
11	830	522	522	-------	698	1,900	11,600	2,740	785	1,160
12	920	514	522	-------	655	2,030	11,600	2,740	740	1,160
13	965	498	546	-------	562	2,170	13,000	2,590	740	1,160
14	920	468	554	-------	570	2,450	10,900	2,590	740	1,540
15	920	453	554	-------	612	2,310	9,620	3,190	920	3,040
16	875	468	514	-------	655	3,980	9,180	2,890	965	2,590
17	920	468	530	-------	785	4,500	9,180	2,450	1,320	2,170
18	920	453	538	-------	1,380	5,240	8,740	2,030	1,380	2,170
19	1,010	431	530	-------	1,650	5,810	8,540	1,900	1,770	2,170
20	1,430	460	522	1,200	1,210	5,810	8,140	1,770	1,900	1,900
21	1,430	446	506	1,200	1,010	6,000	7,740	1,650	1,600	1,540
22	1,320	423	490	1,260	875	8,340	7,140	1,540	1,480	1,380
23	1,480	390	468	1,060	830	11,800	6,760	1,480	1,380	1,210
24	1,320	376	460	920	785	9,400	6,570	1,430	1,260	1,160
25	1,160	376	446	785	830	8,140	6,190	1,770	1,260	1,210
26	965	376	431	785	1,010	8,960	6,570	1,540	1,210	1,210
27	965	383	416	1,010	3,660	10,900	6,000	1,540	1,110	1,260
28	920	396	416	1,060	4,860	9,620	5,810	1,480	1,010	1,210
29	875	409	416	1,160	5,240	7,340	5,430	1,430	920	1,110
30	830	423	400	1,060	5,050	7,940	5,050	1,380	920	1,010
31	785	-------	400	1,110	-------	10,500	-------	1,320	875	-------

NOTE.—Discharge estimated or interpolated Dec. 25, 30, 31, Mar. 20 and 21.

Monthly discharge of Marias River near Brinkman, Mont., for the year ending September 30, 1927

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	1,480	522	900	55,300
November	785	376	503	29,900
December	554	400	486	29,900
March 19–31	1,260	785	1,050	25,000
April	5,240	562	1,390	82,700
May	11,800	1,900	5,360	330,000
June	14,300	5,050	8,650	515,000
July	4,680	1,320	2,650	163,000
August	1,900	740	1,110	68,200
September	3,040	875	1,370	81,500

DRY FORK OF MARIAS RIVER AT FOWLER, MONT.

LOCATION.—Near center of sec. 31, T. 30 N., R. 1 W., at highway bridge one-fourth mile northeast of railway depot at Fowler, Pondera County.

DRAINAGE AREA.—Not measured.

RECORDS AVAILABLE.—March 25 to August 14, 1920 (fragmentary), and March 2, 1921, to September 30, 1927.

EQUIPMENT.—Cable gage on downstream guard rail of new highway bridge. Discharge measurements made from bridge or by wading.

CHANNEL AND CONTROL.—Bed composed of gravel. No definite control; shifts occasionally.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 4.44 feet at 7 p. m. May 31 (discharge, 887 second-feet); no flow several days in December.

1920–1927: Maximum stage recorded, 6.20 feet at 8 a. m. April 14, 1920 (discharge, 1,220 second-feet); no flow during periods in 1920, 1922, 1924, 1925, and 1926.

DIVERSIONS AND REGULATION.—Practically entire normal flow diverted for irrigation. Water passing this station is largely seepage and waste from Valier-Montana Land & Water Co.'s irrigation project.

ACCURACY.—Stage-discharge relation not permanent; seriously affected by ice, observations discontinued during winter. Two rating curves used during year, one, applicable October 1 to May 21, well defined between 3 and 30 second-feet and fairly well defined between 30 and 120 second-feet; the other, applicable May 22 to September 30, fairly well defined between 18 and 400 second-feet. Gage read to even hundredths twice daily. Daily discharge ascertained by applying mean daily gage height to rating table, using shifting-control method May 21 to June 3. Records fair.

Daily discharge, in second-feet, of Dry Fork of Marias River at Fowler, Mont., for the year ending September 30, 1927

Day	Oct.	Nov.	Dec.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	5.4	3.1	0.6	-------	34	16	736	236	138	23
2	5.6	2.9	.4	-------	27	13	440	258	102	24
3	5.7	3.1	0	-------	27	16	392	250	81	20
4	6.7	3.3	0	-------	22	15	386	305	62	19
5	5.4	2.6	0	-------	21	12	288	326	52	17
6	6.1	2.9	0	-------	22	11	224	275	52	16
7	9.1	3.1	0	-------	22	20	205	248	52	17
8	8.1	2.4	0	-------	18	38	200	238	44	19
9	6.7	2.9	0	-------	8.1	68	326	194	40	25
10	7.1	3.1	6	-------	2.3	82	234	111	40	25
11	7.8	3.3	0	-------	11	108	255	57	39	31
12	6.1	3.1	0	-------	14	114	375	54	31	27
13	6.7	2.9	0	108	18	73	272	39	37	24
14	8.1	3.6	0	125	32	51	214	30	71	23
15	8.6	3.8	0	112	29	35	219	62	161	25
16	10	3.1	0	27	71	26	318	42	226	16
17	7.1	2.0	0	37	116	20	315	29	205	12
18	4.7	1.1	0	44	89	22	285	30	167	14
19	3.8	1.0	0	66	56	24	295	29	144	12
20	4.2	.5	0	73	14	55	285	27	89	13
21	4.7	.5	0	76	38	241	272	28	62	12
22	4.0	.6	0	86	33	456	260	29	54	9.0
23	3.6	.5	0	112	38	504	272	214	71	7.2
24	3.8	.7	0	65	38	496	268	214	63	7.2
25	3.1	.5	0	55	59	518	265	198	49	7.2
26	3.3	.6	0	71	61	339	260	180	40	7.6
27	3.6	.8	0	61	39	280	250	144	33	7.2
28	3.1	.6	0	38	28	272	253	114	29	7.2
29	3.1	.8	0	38	22	386	248	118	27	8.3
30	3.1	.6	0	36	18	853	246	120	23	9.4
31	2.9	-------	0	39	-------	803	-------	136	23	-------

Monthly discharge of Dry Fork of Marias River at Fowler, Mont., for the year ending September 30, 1927

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	10	2.9	5.53	340
November	3.8	.5	2.00	119
December	.6	.0	.05	3.1
March 12-31	125	27	66.8	2,520
April	116	2.3	34.2	2,040
May	853	11	192	11,800
June	736	214	295	17,600
July	326	27	140	8,610
August	226	23	74.4	4,570
September	31	7.2	16.1	958

JUDITH RIVER BASIN

JUDITH RIVER NEAR UTICA, MONT.

LOCATION.—In NW. ¼ sec. 17, T. 13 N., R. 12 E., at site of private wagon bridge on Noel ranch, 10 miles above Utica, Judith Basin County, and 20 miles from Hobson, nearest railway station.

DRAINAGE AREA.—326 square miles (measured on topographic maps).

RECORDS AVAILABLE.—October 1, 1919, to September 30, 1927.

EQUIPMENT.—Wire gage on left bank at bridge site, replacing wire gage on bridge used prior to June 8, 1927; datum unchanged. Discharge measurements made from highway bridge 1 mile above gage or by wading.

CHANNEL AND CONTROL.—Gravel bar forms low-water control; shifting. One channel at all stages. Banks are low, wooded, and subject to overflow.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 5.70 feet at 7.30 p. m. June 11 (discharge, 1,070 second-feet); minimum, 1.10 feet September 23 and 24 (discharge, 5.0 second-feet).

1919–1927: Maximum stage recorded, that of June 11, 1927; minimum, 1.00 foot November 16 to December 1, 1919, and March 31 to April 20, 1922 (discharge, 0.5 second-foot).

DIVERSIONS AND REGULATION.—Several ditches divert water above station for irrigation. No regulation.

ACCURACY.—Stage-discharge relation not permanent; seriously affected by ice, observations discontinued during winter. Two rating curves used during year—one, well defined below 450 second-feet, applicable October 1 to December 31; the other, applicable March 20 to September 30, is well defined by five discharge measurements between 9 and 650 second-feet. Two measurements were made during the year. Gage read to hundredths twice daily. Daily discharge ascertained by applying mean daily gage height to rating table. Records good below 650 second-feet and fair above.

Daily discharge, in second-feet, of Judith River near Utica, Mont., for the year ending September 30, 1927

Day	Oct.	Nov.	Dec.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	40	42	26		8.4	197	780	316	82	42
2	38	42	26		11.1	193	871	310	78	42
3	38	42	26		9.9	197	884	288	72	42
4	38	42	26		10.8	184	871	304	72	42
5	38	42	26		10.8	168	845	327	68	42
6	38	42	27		10.8	164	928	327	65	41
7	40	41	27		9.3	153	910	327	65	38
8	38	40	26		9.9	141	910	321	79	40
9	38	36	27		10.5	154	952	304	76	38
10	37	35	26		10.5	131	998	282	65	36
11	36	33	26		10.5	134	1,040	282	65	33
12	36	33	26		11.1	138	1,030	282	65	35
13	35	30	26		12.0	164	962	282	66	33
14	35	32	26		12.3	223	910	310	72	32
15	35	32	26		12.9	266	884	349	65	33
16	35	32	26		12.6	338	858	443	65	33
17	35	32	26		12.0	524	806	510	65	32
18	36	31	26		11.7	574	774	504	65	24
19	39	30	25		10.8	562	748	475	65	18
20	39	29	25	7.5	10.8	533	718	380	65	14.2
21	40	29	25	7.5	10.8	504	733	206	65	11.1
22	39	27	24	7.5	11.7	496	688	158	65	7.0
23	40	27	24	8.1	12.0	438	643	110	65	5.0
24	40	28	24	8.4	10.8	429	592	94	65	5.0
25	40	27	24	7.8	9.6	496	554	104	65	7.0
26	40	27	23	8.1	63	613	562	127	63	12.0
27	41	27	23	7.2	96	861	533	94	53	14.2
28	42	27	23	8.4	127	812	475	94	51	18
29	42	27	23	6.2	141	877	417	91	44	19
30	42	26	23	10.5	172	851	400	86	42	22
31	42		23	12.3		845		86	42	

Monthly discharge of Judith River near Utica, Mont., for the year ending September 30, 1927

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	42	35	38.5	2,370
November	42	26	33.0	1,960
December	27	23	25.2	1,550
March 20–31	12.3	6.2	8.29	197
April	172	8.4	29.1	1,730
May	877	131	399	24,500
June	1,040	400	776	46,200
July	510	86	264	16,200
August	82	42	64.5	3,970
September	42	5.0	27.0	1,610

MUSSELSHELL RIVER BASIN

NORTH FORK OF MUSSELSHELL RIVER AT DELPINE, MONT.

LOCATION.—Near south quarter corner of sec. 35, T. 10 N., R. 9 E., at Delpine, Meagher County.

DRAINAGE AREA.—48 square miles (measured on topographic map).

RECORDS AVAILABLE.—May 1, 1909, to October 30, 1911, and March 22, 1922, to September 30, 1927.

EQUIPMENT.—Chain gage; installed August 9, 1927. Prior to that date a vertical staff 500 feet downstream was used. New gage set to independent datum. Discharge measurements made by wading.

CHANNEL AND CONTROL.—Channel composed of gravel and small boulders. Control is a riffle of same material; shifting. Banks are low at gage and covered with overhanging brush; subject to overflow.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 4.82 feet June 1 (discharge, 125 second-feet); minimum, 1.58 feet December 26–30 (discharge, 4.2 second-feet).

1909–1911, 1922–1927: Maximum discharge from extension of rating curve, 545 second-feet July 21, 1923; 2.2 second-feet December 15–17, 1922.

DIVERSIONS AND REGULATION.—No data on diversions. No regulation.

ACCURACY.—Stage-discharge relation not permanent; affected by ice, observations discontinued during winter. Four rating curves used during the year, all fairly well defined for low water but poorly defined for higher stages. Four discharge measurements, covering a range from 13 to 59 second-feet, were made during the year. Gage read to hundredths once daily. Daily discharge ascertained by applying gage heights to rating table, using shifting-control method April 22–28, May 27 to June 5, and August 5–8. Records prior to August 9 are poor; thereafter fair.

Daily discharge, in second-feet, of North Fork of Musselshell River at Delpine, Mont., for the year ending September 30, 1927

Day	Oct.	Nov.	Dec.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	9.8	6.4	8.2	-------	19	15	125	54	22	15
2	9.4	6.4	7.4	-------	12	15	75	52	19	16
3	9.4	6.7	7.4	-------	23	16	77	52	22	17
4	9.8	7.1	7.4	-------	15	15	75	52	21	17
5	9.4	7.1	6.4	-------	10	15	75	56	20	15
6	9.0	7.1	6.4	-------	14	17	68	51	22	15
7	8.6	7.1	6.4	-------	23	17	66	47	22	13
8	9.0	7.1	6.0	-------	15	15	66	47	22	19
9	9.0	7.1	6.0	-------	10	16	70	43	23	19
10	7.4	7.1	5.7	-------	9.4	16	68	39	25	19
11	7.8	7.1	5.7	-------	9.0	15	74	37	22	18
12	7.8	7.1	7.1	-------	8.2	14	72	37	20	18
13	7.4	6.7	6.7	-------	7.4	13	72	35	25	17
14	7.4	6.7	7.1	-------	8.2	13	70	35	25	16
15	7.8	7.4	6.4	-------	12	12	68	39	25	15
16	7.8	7.8	5.7	-------	9.0	14	68	35	23	12
17	7.4	8.2	5.4	-------	8.2	20	66	32	23	12
18	7.8	8.6	5.4	-------	9.0	19	66	30	22	12
19	7.8	9.0	5.4	-------	8.2	25	64	28	20	12
20	7.4	9.4	5.4	6.4	8.6	28	66	25	17	12
21	7.4	9.0	4.8	6.0	8.2	37	62	23	17	12
22	7.1	9.0	5.1	5.7	9.8	35	62	28	22	12
23	7.1	9.4	5.1	5.4	34	40	62	25	20	12
24	7.1	9.8	4.8	5.4	67	44	60	20	25	12
25	7.1	10.2	4.5	5.1	24	40	58	22	23	12
26	7.1	10.2	4.2	4.8	20	70	58	23	20	12
27	7.1	9.8	4.2	5.1	15	88	58	22	18	12
28	7.1	9.8	4.2	4.8	17	76	56	22	18	12
29	7.1	9.4	4.2	8.2	15	85	54	19	17	11
30	7.1	9.0	4.2	23	17	67	54	19	17	11
31	6.7	-------	4.5	46	-------	67	-------	21	16	-------

Monthly discharge of North Fork of Musselshell River at Delpine, Mont., for the year ending September 30, 1927

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	9.8	6.7	7.89	485
November	10.2	6.4	8.09	481
December	8.2	4.2	5.72	352
March 20–31	46	4.8	10.5	250
April	67	7.4	15.5	922
May	88	12	31.6	1,940
June	125	54	67.8	4,030
July	56	19	34.5	2,120
August	25	16	21.1	1,300
September	19	11	14.2	845

MUSSELSHELL RIVER AT HARLOWTON, MONT.

LOCATION.—In sec. 26, T. 8 N., R. 15 E., at highway bridge 1 mile south of Harlowton, Wheatland County.

DRAINAGE AREA.—1,130 square miles (measured on topographic map).

RECORDS AVAILABLE.—July 11, 1907, to September 30, 1927.

EQUIPMENT.—Chain gage on upstream side of highway bridge. Discharge measurements made from bridge or by wading.

CHANNEL AND CONTROL.—Bed composed of sand and gravel; bar or ridge crosses channel 75 feet below gage; shifts. Banks subject to overflow at high stage. Water confined to one channel under bridge.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 6.32 feet at 1.30 p. m. June 13 (discharge, 2,420 second-feet); minimum, 3.02 feet at 1.30 p. m. March 25 (discharge, 52 second-feet).

1907–1927: Maximum discharge recorded, 4,020 second-feet May 27, 1917; stream dry August 4–11, 1910, and September 11–15, 1919.

DIVERSIONS AND REGULATION.—Numerous ditches divert from tributaries and from Musselshell River above station. No regulation.

ACCURACY.—Stage-discharge relation not permanent; affected by ice, observations discontinued during winter. Standard rating curve fairly well defined. Three discharge measurements, covering a range from 124 to 794 second-feet, were made during the year. Gage read to hundredths twice daily. Daily discharge ascertained by applying mean daily gage height to rating table, using shifting-control method. Records fair.

Daily discharge, in second-feet, of Musselshell River at Harlowton, Mont., for the year ending September 30, 1927

Day	Oct.	Nov.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	75	77	-------	99	556	1,560	453	113	154
2	78	77	-------	96	518	1,640	347	150	125
3	81	73	-------	90	462	1,830	338	132	113
4	75	73	-------	86	399	1,640	356	125	116
5	81	75	-------	73	356	1,580	390	113	113
6	81	75	-------	83	338	1,570	408	108	111
7	83	73	-------	92	338	1,560	356	104	108
8	83	77	-------	104	381	1,650	262	108	116
9	84	81	-------	130	321	1,780	210	113	140
10	83	77	-------	94	280	2,000	192	108	167
11	77	75	-------	88	256	2,140	183	108	167
12	79	73	-------	84	256	2,240	171	113	147
13	81	73	-------	75	256	2,220	158	104	132
14	79	73	-------	69	292	1,940	158	136	132
15	77	90	-------	79	364	1,860	244	167	118

Daily discharge, in second-feet, of Musselshell River at Harlowton, Mont., for the year ending September 30, 1927—Continued

Day	Oct.	Nov.	Mar.	Apr.	May	June	July	Aug.	Sept.
16	77	73	-------	94	462	1,700	268	167	116
17	77	81	-------	106	594	1,600	234	150	113
18	77	-------	-------	94	891	1,450	196	154	106
19	77	-------	-------	94	927	1,400	192	143	106
20	79	-------	-------	69	779	1,370	179	125	101
21	75	-------	-------	72	855	1,310	158	113	104
22	92	-------	-------	72	873	1,200	147	188	101
23	84	-------	-------	83	818	1,090	230	234	101
24	83	-------	-------	86	613	999	196	206	101
25	81	-------	57	143	742	891	167	175	116
26	81	-------	58	268	909	817	150	154	118
27	79	-------	55	426	981	963	129	150	116
28	81	-------	54	462	1,330	828	125	129	111
29	81	-------	57	528	1,600	651	104	129	111
30	81	-------	75	462	1,570	508	106	129	111
31	81	-------	101	-------	1,450	-------	111	167	-------

Monthly discharge of Musselshell River at Harlowton, Mont., for the year ending September 30, 1927

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	92	75	80.1	4,930
November 1–17	90	73	76.2	2,570
March 25–31	101	54	65.3	907
April	528	69	147	8,750
May	1,600	256	670	41,200
June	2,240	508	1,470	87,500
July	453	104	223	13,700
August	234	104	139	8,550
September	167	101	120	7,140

CHECKERBOARD CREEK AT DELPINE, MONT.

LOCATION.—In NE. ¼ sec. 2, T. 9 N., R. 9 E., at highway bridge one-fourth mile southeast of Delpine, Meagher County, half a mile above its confluence with North Fork of Musselshell River and 15 miles northwest of Martinsdale.

DRAINAGE AREA.—24.3 square miles (measured on topographic map).

RECORDS AVAILABLE.—March 22, 1922, to September 30, 1927. May 26, 1909, to December 31, 1911, and May 21, 1913, to December 31, 1914, at ranch formerly owned by J. A. Porter 2 miles above present station, where drainage area is 21.3 square miles.

EQUIPMENT.—Vertical staff gage on right bank 500 feet below bridge; installed August 9, 1927. Prior to that date a staff gage at highway bridge was used. New gage set to independent datum. Discharge measurements made from bridge or by wading.

CHANNEL AND CONTROL.—Channel composed of fine sand and gravel. Control composed of same material; subject to shift. Banks low and covered with overhanging brush; may be overflowed at high stage.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 2.66 feet at 8 a. m. June 1 (discharge, 73 second-feet); minimum, 0.60 foot March 24–26 (discharge, 3.5 second-feet).

1909–1911, 1913–14, 1922–1927: Maximum stage recorded, 3.1 feet at 5.30 p. m. July 16, 1923 (discharge, 167 second-feet); minimum, 0.38 foot September 10, 1924 (discharge, 0.7 second-foot).

DIVERSIONS AND REGULATION.—Small ditch diverts some water above gage. No regulation.

ACCURACY.—Stage-discharge relation not permanent; affected by ice, observations discontinued during winter. Three rating curves used during year; the first, applicable October 1 to December 31 and March 20 to July 26, is well defined between 3.5 and 48 second-feet by four discharge measurements made in 1926; the second, applicable July 27 to August 8, is well defined between 5 and 15 second-feet by two measurements made in 1927; the third, used August 9 to September 30, is well defined between 4 and 20 second-feet by five measurements and fairly well to 100 second-feet by one high-water measurement. Gage read to even hundredths once daily. Daily discharge ascertained by applying daily gage height to rating table, using shifting-control method April 13 to July 26 and August 9 to September 30. Records fair.

Daily discharge, in second-feet, of Checkerboard Creek at Delpine, Mont., for the year ending September 30, 1927

Day	Oct.	Nov.	Dec.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	4.4	7.2	6.9	-------	4.8	16	73	11	19	11
2	4.2	7.4	6.9	-------	4.8	12	53	11	12	11
3	3.9	7.4	6.9	-------	5.7	12	54	11	12	11
4	3.7	7.4	6.8	-------	5.3	11	47	12	11	11
5	3.9	7.2	6.7	-------	4.6	10	46	13	11	10
6	3.9	7.2	6.4	-------	5.5	11	47	12	11	9.8
7	3.9	6.9	6.2	-------	6.2	11	49	12	11	9.4
8	3.7	6.9	5.9	-------	5.3	9.9	47	12	11	11
9	3.9	6.9	5.9	-------	4.8	8.5	50	11	11	12
10	3.9	6.9	5.9	-------	4.6	9.0	50	11	14	11
11	3.7	6.9	5.9	-------	4.6	9.6	72	11	13	10
12	3.9	6.9	5.9	-------	5.0	11	70	12	13	10
13	3.9	6.9	5.7	-------	4.4	11	61	12	17	10
14	3.7	6.7	5.7	-------	4.5	11	37	12	17	9.8
15	3.9	7.2	5.9	-------	5.3	13	29	14	16	9.8
16	3.9	7.4	5.9	-------	4.6	15	28	12	15	9.4
17	7.7	7.4	5.9	-------	5.0	22	25	13	14	9.4
18	7.7	7.4	5.9	-------	5.3	17	19	13	14	9.4
19	7.4	8.2	5.7	-------	4.4	20	17	13	13	9.4
20	7.4	8.5	5.7	3.9	5.0	15	17	12	13	9.1
21	7.6	8.2	5.7	3.9	5.3	15	17	11	12	8.8
22	7.7	7.7	5.9	3.7	4.6	14	15	26	15	8.8
23	7.7	7.9	5.7	3.7	6.2	13	14	15	14	8.8
24	7.7	7.9	5.5	3.5	28	19	14	13	15	8.8
25	7.4	7.9	5.5	3.5	15	18	12	14	13	8.8
26	7.4	7.7	5.3	3.5	18	28	12	14	12	8.5
27	7.4	7.9	5.0	3.7	20	61	14	15	12	8.5
28	7.4	7.7	5.0	3.5	18	52	13	14	12	8.5
29	7.4	7.4	4.8	4.4	14	65	11	14	12	8.5
30	7.4	7.2	4.8	6.9	17	33	10	13	13	8.5
31	7.4	-------	4.8	5.0	-------	32	-------	20	11	-------

Monthly discharge of Checkerboard Creek at Delpine, Mont., for the year ending September 30, 1927

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	7.7	3.7	5.65	347
November	8.5	6.7	7.41	441
December	6.9	4.8	5.83	358
March 20-31	6.9	3.5	4.10	98
April	28	4.4	8.19	487
May	65	8.5	19.5	1,200
June	73	10	34.1	2,030
July	26	11	13.2	812
August	19	11	13.2	812
September	12	8.5	9.67	575

AMERICAN FORK NEAR HARLOWTON, MONT.

LOCATION.—In SW. ¼ sec. 12, T. 7 N., R. 15 E., on George Glennie ranch, half a mile above junction of American Fork and Lebo Creek and 5 miles southeast of Harlowton, Wheatland County.

DRAINAGE AREA.—Not measured.

RECORDS AVAILABLE.—July 28, 1907, to December 31, 1911; May 19 to December 31, 1913; and May 3, 1924, to September 30, 1927.

EQUIPMENT.—Chain gage on downstream side of private bridge one-fourth mile from observer's house. Discharge measurements made by wading or from bridge.

CHANNEL AND CONTROL.—Stream bed of gravel and clay; subject to shift. Banks high and not subject to overflow.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 3.78 feet at 8.30 a. m. June 12 and 13 (discharge, 509 second-feet); minimum, 0.80 foot March 27 (discharge, 2. 3 second-feet).

1907–1911, 1913, 1924–1927: Maximum stage recorded, 4.40 feet June 1, 1908 (discharge, 870 second-feet); creek dry at various times.

DIVERSIONS AND REGULATION.—Some diversions for irrigation above gage. No regulation.

ACCURACY.—Stage-discharge relation practically permanent; seriously affected by ice, observations discontinued during winter. Rating curve well defined below 300 second-feet by nine discharge measurements made since 1924. Three of the measurements, covering a range from 5 to 237 second-feet, were made during the year and check the curve. Gage read to even hundreths once daily. Daily discharge ascertained by applying daily gage height to rating table, except as indicated in footnote to table of daily discharge. Records good.

Daily discharge, in second-feet, of American Fork near Harlowton, Mont., for the year ending September 30, 1927

Day	Oct.	Nov.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	6.0	5.1		3.5	40	233	73.0	7.5	4.3
2	7.0	5.1		3.5	49	220	75	6.5	4.3
3	6.0	5.1		3.5	33	220	73	5.1	4.3
4	6.0	5.1		3.5	33	220	71	5.1	4.3
5	6.0	5.1		3.5	33	220	71	5.1	3.9
6	5.5	5.1		3.5	37	205	65	4.3	3.9
7	5.5	5.1		3.5	39	220	65	4.3	7.5
8	6.0	5.1		3.5	33	374	42	5.5	7.5
9	5.5	4.7		4.3	33	374	42	5.1	7.5
10	5.5	4.7		3.2	40	374	36	4.7	7.0
11	5.5	4.7		3.9	40	439	36	4.7	6.5
12	5.5	4.7		4.3	37	509	36	5.1	6.0
13	5.5	4.7		4.3	40	509	23	5.5	6.0
14	5.5	4.7		3.5	69	374	23	6.5	6.0
15	5.5	4.7		4.3	49	374	16	6.5	6.0
16	6.0	4.7		5.5	155	326	37	5.5	4.7
17	5.1			6.5	117	310	36	5.5	4.7
18	5.1			15	117	310	36	5.5	4.7
19	5.1			6.5	117	310	18	5.5	4.3
20	5.1		3.5	6.5	117	310	7.5	5.5	4.7
21	5.1		4.3	7.0	180	342	7.5	6.0	4.7
22	5.1		4.3	7.0	208	250	7.5	6.5	4.7
23	5.1		3.9	7.0	155	244	7.5	7.0	4.7
24	5.1		3.5	7.0	117	220	7.5	7.5	7.0
25	5.1		3.2	7.0	155	220	5.1	7.5	7.0
26	5.1		2.9	7.0	208	220	5.5	6.0	7.0
27	5.1		2.3	7.0	286	220	5.1	6.0	6.5
28	5.1		3.2	7.0	286	220	5.5	4.7	6.5
29	5.1		2.9	5.5	272	220	4.3	4.7	6.0
30	5.1		3.2	33	259	220	4.3	4.7	6.0
31	5.1		3.2		246		7.5	4.7	

NOTE.—Gage-height record missing May 29 to June 2; discharge interpolated.

Monthly discharge of American Fork near Harlowton, Mont., for the year ending September 30, 1927

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	7.0	5.1	5.45	335
November 1–16	5.1	4.7	4.90	156
March 20–31	4.3	2.3	3.37	80
April	33	3.2	6.34	377
May	286	33	116	7,130
June	509	205	294	17,500
July	75	4.3	30.6	1,880
August	7.5	4.3	5.62	346
September	7.5	3.9	5.61	334

LEBO CREEK NEAR HARLOWTON, MONT.

LOCATION.—In SW. ¼ sec. 12, T. 7 N., R. 15 E., at farm bridge on Glennie ranch, half a mile above junction with American Fork and 5 miles southeast of Harlowton, Wheatland County.

DRAINAGE AREA.—48 square miles.

RECORDS AVAILABLE.—July 28, 1907, to December 31, 1911; May 19 to November 22, 1913; May 3, 1924, to September 30, 1927.

EQUIPMENT.—Vertical staff gage on right bank at farm bridge. Present datum 0.71 foot lower than gage used during 1907–1913. Discharge measurements made from bridge or by wading.

CHANNEL AND CONTROL.—Channel composed of clay with gravel and sand. Control is gravel bar 100 feet below gage.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 3.65 feet at 10 a. m. June 2 (discharge, 115 second-feet); minimum, 1.40 feet July 4 (discharge, 1.5 second-feet).

1907–1911, 1913, 1924–1927: Maximum stage recorded, 5.30 feet (old datum) May 31, 1908 (discharge, from extension of rating curve, 270 second-feet); minimum, 0.43 foot (old datum) July 23-25, 1910 (discharge, 0.4 second-foot).

DIVERSIONS AND REGULATION.—Numerous ditches divert water for irrigation above gage. Operation of small storage reservoir at headwaters of creek affects flow.

ACCURACY.—Stage-discharge relation not permanent; seriously affected by ice, observations discontinued during winter. Two rating curves used during year; one, applicable October 1 to July 4, is well defined by five discharge measurements between 2 and 40 second-feet; the other, used July 9 to September 30, is well defined by six measurements between 2 and 30 second-feet. Three measurements were made during the year. Gage read to half-tenths once daily. Daily discharge ascertained by applying daily gage height to rating table, using shifting-control method July 9–26. Records good.

Daily discharge, in second-feet, of Lebo Creek near Harlowton, Mont., for the year ending September 30, 1927

Day	Oct.	Nov.	Apr.	May	June	July	Aug.	Sept.
1	30	20	15	20	62	2.7	18.0	18
2	30	20	20	20	115	2.1	8.0	18
3	27	20	20	20	62	2.1	9.6	22
4	27	20	20	20	102	1.5	9.6	22
5	27	24	15	20	102	3.3	9.6	18
6	24	24	15	20	102	5.1	13	18
7	24	24	13	24	94	7.0	13	22
8	24	24	13	24	102	8.9	11	28
9	20	24	13	30	102	10.8	11	28
10	20	24	13	30	68	10.8	11	28
11	20	24	15	24	86	4.5	13	28
12	22	24	15	24	86	3.7	13	28
13	22	24	15	24	56	3.7	22	28
14	20	24	15	15	50	3.5	22	28
15	20	24	24	24	53	14.2	22	28
16	20	24	30	24	50	14.2	22	28
17	20	24	30	20	44	10.5	9.6	22
18	20	------	24	20	44	5.2	9.6	22
19	20	------	30	20	44	5.1	9.6	22
20	20	------	24	20	44	5.1	9.6	22
21	20	------	20	20	47	2.1	9.6	22
22	20	------	20	27	34	2.1	9.6	25
23	20	------	20	30	34	9.9	13	25
24	20	------	20	24	34	9.9	13	25
25	20	------	20	30	34	9.9	13	28
26	20	------	20	37	32	9.9	18	28
27	20	------	20	37	30	8.0	18	28
28	20	------	20	40	30	9.6	9.6	28
29	20	------	20	62	30	9.6	9.6	28
30	20	------	20	62	30	9.6	9.6	28
31	20	------	------	40	------	9.6	13	------

NOTE.—Gage-height record July 5–8 doubtful; discharge interpolated.

Monthly discharge of Lebo Creek near Harlowton, Mont., for the year ending September 30, 1927

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	30	20	21.8	1,340
November 1–17	24	20	23.1	779
April	30	13	19.3	1,150
May	62	15	27.5	1,690
June	115	30	60.1	3,580
July	14.2	1.5	6.91	425
August	22	9.6	13	799
September	28	18	24.8	1,480

FLATWILLOW CREEK NEAR FLATWILLOW, MONT.

LOCATION.—In NE. ¼ sec. 19, T. 12 N., R. 25 E., at private wagon bridge on Flatwillow Land & Livestock Co.'s ranch, 12 miles above Flatwillow, Petroleum County, and 30 miles north of Roundup.

DRAINAGE AREA.—About 195 square miles (measured on 1916 map of Fergus County).

RECORDS AVAILABLE.—April 17, 1918, to September 30, 1927. May 1, 1911, to April 17, 1918, records were kept at station 4 miles downstream, below headworks of canal of Flatwillow-Carey Act project.

EQUIPMENT.—Overhanging chain gage on left bank 300 feet above bridge. Discharge measurements made from bridge or by wading.

CHANNEL AND CONTROL.—Banks fairly high and covered with willows. Bed composed of adobe and gravel. Low-water control is a gravel riffle; shifts occasionally.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 5.9 feet May 29 to June 4 (discharge, 410 second-feet); minimum, 0.94 foot October 31 and November 1 (discharge, 4.5 second-feet).

1911–1927: Maximum stage recorded, 9.0 feet, estimated by observer at old location, June 4–10, 1917 (discharge, 454 second-feet in creek and 500 second-feet additional in canal); no flow at various times in 1925 and 1926.

DIVERSIONS AND REGULATION.—Several small diversions above station which may occasionally divert all the water at low stage. No regulation.

ACCURACY.—Stage-discharge relation not permanent; seriously affected by ice, observations discontinued during winter. Two rating curves used during year; one applicable October 1 to December 31, is well defined by four discharge measurements between 2 and 55 second-feet; the other, applicable March 7 to September 30, is fairly well defined by two measurements between 20 and 160 second-feet. Gage read to half-tenths or hundredths once or twice daily. Daily discharge ascertained by applying daily or mean daily gage height to rating table. Records for October and November good; others fair.

Daily discharge, in second-feet, of Flatwillow Creek near Flatwillow, Mont., for the year ending September 30, 1927

Day	Oct.	Nov.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	12	4.5	-------	30	82	400	111	20	24
2	17	5.5	-------	30	78	400	111	20	22
3	18	5.5	-------	32	75	400	89	18	24
4	14	7.5	-------	30	75	400	86	18	24
5	12	8.5	-------	30	72	380	82	16	22
6	12	7.5	89	33	75	370	78	16	20
7	12	8.5	78	32	75	340	78	16	18
8	12	9.0	86	30	78	320	75	17	18
9	10	8.5	78	32	78	320	64	16	18
10	10	8.5	82	33	78	340	61	16	22
11	10	8.0	86	34	78	340	52	16	24
12	9.5	9.5	89	35	78	350	49	15	24
13	10	10.0	96	33	75	350	46	16	24
14	9.5	9.5	127	32	72	340	46	39	22
15	10	9.0	151	30	72	330	41	34	22
16	10	8.5	187	32	75	310	43	32	22
17	10	8.5	187	28	78	290	41	27	24
18	10	9.5	135	26	82	270	41	24	22
19	9.5	9.5	103	22	86	260	39	22	22
20	9.5	12	41	20	103	223	39	20	21
21	9.0	14	42	16	103	196	38	20	20
22	9.5	17	40	29	111	178	36	20	22
23	8.5	-------	39	33	119	160	36	20	20
24	8.5	-------	42	52	178	160	35	27	18
25	8.0	-------	41	55	196	160	35	26	18
26	8.5	-------	40	187	232	151	34	26	20
27	7.5	-------	41	330	300	143	33	24	18
28	6.5	-------	38	232	360	135	22	24	18
29	5.5	-------	35	143	390	127	24	24	18
30	5.5	-------	33	96	400	119	22	24	20
31	4.5	-------	34	-------	400	-------	22	24	-------

Monthly discharge of Flatwillow Creek near Flatwillow, Mont., for the year ending September 30, 1927

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	18	4.5	9.95	612
November 1–22	17	4.5	9.02	393
March 6–31	187	33	78.5	4,050
April	330	16	59.2	3,520
May	400	72	140	8,610
June	400	119	275	16,400
July	111	22	51.9	3,190
August	39	15	21.8	1,340
September	24	18	21.0	1,250

FLATWILLOW CREEK AT PETROLIA, MONT.

LOCATION.—In NE. ¼ sec. 25, T. 14 N., R. 28 E., 2 miles above junction with Box Elder Creek, 1 mile south of Petrolia, Petroleum County, and 16 miles southeast of Winnett, the nearest railway point.

DRAINAGE AREA.—650 square miles (measured on county map).

RECORDS AVAILABLE.—June 11, 1921, to September 30, 1927.

EQUIPMENT.—Chain gage on left bank. Discharge measurements made by wading or from highway bridge 1 mile below.

CHANNEL AND CONTROL.—One channel at all stages, straight for 200 feet above but curved sharply to right just below gage. Left bank high; right bank low and covered with brush and trees. Control is gravel riffle; shifts occasionally.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 8.56 feet at 8 a. m. May 28 (discharge, estimated 2,170 second-feet); no flow at various times during October and November.

1921–1927: Maximum stage recorded, 12.94 feet July 5, 1923 (discharge, estimated 3,700 second-feet); no flow at various times.

DIVERSIONS AND REGULATION.—Numerous ditches divert water above station for irrigation. No regulation.

ACCURACY.—Stage-discharge relation not permanent; seriously affected by ice, observations discontinued during winter. Standard rating curve is well defined between 5 and 350 second-feet by seven discharge measurements; extended above 350 second-feet. Two measurements were made during the year. Gage read to hundredths once or twice daily. Daily discharge ascertained by applying daily or mean daily gage height to rating table, using shifting-control method after July 2. Records for medium and low stages good; others fair.

Daily discharge, in second-feet, of Flatwillow Creek near Petrolia, Mont., for the year ending September 30, 1927

Day	Oct.	Nov.	Dec.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	856	0	8		6	99	736	176	12	18
2	88	0	8		6	81	814	176	12	18
3	16	0	8		8	72	650	175	12	18
4	2	0			10	67	597	159	10	18
5	2	0			8	67	597	145	12	110
6	0	0			6	65	501	137	14	46
7	0	0			10	70	513	135	16	23
8	0	0			8	74	453	124	14	18
9	0	0			4	150	441	103	10	18
10	0	0			2	233	407	101	5.5	18

Daily discharge, in second-feet, of Flatwillow Creek near Petrolia, Mont., for the year ending September 30, 1927—Continued

Day	Oct.	Nov.	Dec.	Mar.	Apr.	May	June	July	Aug.	Sept.
11	0	0			6	118	525	95	4.5	18
12	0	0			10	81	525	88	3.8	18
13	0	0			12	72	489	74	1.8	20
14	0	0			14	81	465	70	.5	23
15	0	0			26	76	429	67	29	21
16	0	0			43	73	388	66	55	25
17	0	0			53	75	377	66	53	21
18	0	0			126	75	344	62	35	18
19	0	0			57	80	388	60	27	18
20	0	0		117	33	90	312	57	27	18
21	0	0		126	23	534	263	47	25	18
22	0	0		123	17	1,640	273	37	25	18
23	0	0		151	17	1,930	263	35	24	17
24	0	0		90	15	594	245	33	24	17
25	0	0		43	12	534	260	28	24	19
26	0	0		28	37	269	377	24	23	19
27	0	0		16	47	361	227	19	20	27
28	0	10		12	147	2,170	220	18	20	21
29	0	10		12	213	1,710	202	18	19	23
30	0	8		7	114	1,390	188	19	16	23
31	0			7		940		17	17	

Monthly discharge of Flatwillow Creek at Petrolia, Mont., for the year ending September 30, 1927

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	856	0.0	31.0	1,910
November	10	.0	.9	54
March 20–31	151	7	61.0	1,450
April	213	2	36.3	2,160
May	2,170	65	447	27,500
June	814	188	416	24,800
July	176	17	78.4	4,820
August	55	.5	19.1	1,170
September	110	17	23.6	1,400

MILK RIVER BASIN

SOUTH FORK OF MILK RIVER NEAR INTERNATIONAL BOUNDARY

LOCATION.—In NW. ¼ sec. 29, T. 37 N., R. 9 W., at Richard Croff ranch, just above Kennedy Coulee, Glacier County, 5 miles south of international boundary, and 30 miles northeast of Browning.

DRAINAGE AREA.—288 square miles (measured on topographic map).

RECORDS AVAILABLE.—April 28, 1905, to September 30, 1927.

EQUIPMENT.—Stevens continuous water-stage recorder on left bank. Discharge measurements made from cable 300 feet above gage or by wading.

CHANNEL AND CONTROL.—Bed composed of clay and small boulders. Banks high and not subject to overflow except during extreme floods.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 7.60 feet (determined from high-water marks) sometime during April (discharge, 3,290 second-feet); minimum, 1.54 feet October 15 (discharge, 13.8 second-feet).

1905–1927: Maximum stage recorded, 15.4 feet June 6, 1908, determined from high-water marks; flood width, 850 feet; flood cross section, about 2,600 square feet (discharge not computed); no flow August 1–8 and August 18 to September 2, 1919.

DIVERSIONS AND REGULATION.—None.

ACCURACY.—Stage-discharge relation not permanent; affected by ice, observations discontinued during winter. Two rating curves used during year; one, applicable during October, is well defined; the other, applicable May 2 to September 30, is well defined between 10 and 1,200 second-feet, and extended above. Seventeen discharge measurements, covering a range from 14 to 1,130 second-feet, were made during the year. Daily discharge ascertained by applying mean daily gage height to rating table, using shifting-control method October 1–5 and 18–31, except as indicated in footnote to table of daily discharge. Records good except for estimated periods, for which they are fair.

COOPERATION.—Station maintained jointly with the Dominion Water Power and Reclamation Service, Department of the Interior, Canada.

Daily discharge, in second-feet, of South Fork of Milk River near international boundary for the year ending September 30, 1927

Day	Oct.	May	June	July	Aug.	Sept.	Day	Oct.	May	June	July	Aug.	Sept.
1	19.9	350	1,670	238	251	69	16	14.5	290	472	181	150	241
2	20.0	270	898	220	184	69	17	14.5	300	430	135	179	194
3	20.2	236	753	246	152	68	18	17.0	310	397	110	233	166
4	20.4	215	634	297	120	66	19	22.6	500	361	97	159	142
5	20.6	197	530	340	104	63	20	20.7	700	334	91	124	124
6	20.7	205	491	257	95	64	21	17.0	800	314	86	159	110
7	19.7	176	495	210	89	98	22	17.9	1,000	288	145	192	102
8	20.7	157	491	186	81	164	23	19.7	900	280	128	142	98
9	18.7	181	612	166	79	122	24	18.7	868	267	98	150	110
10	19.7	238	676	140	78	116	25	18.7	1,340	254	83	142	120
11	16.2	321	648	130	78	169	26	18.7	940	244	79	106	115
12	15.3	270	799	124	73	152	27	18.7	621	233	75	91	110
13	14.5	257	671	120	76	483	28	17.0	487	215	78	79	105
14	14.5	280	574	138	98	1,290	29	17.0	1,220	199	106	76	100
15	13.8	280	510	197	157	526	30	15.3	1,680	215	116	78	100
							31	14.5	1,390	------	169	76	------

NOTE.—Daily discharge interpolated or estimated because of missing gage heights May 1, 14–23, Sept. 15–18, and 24–30.

Monthly discharge of South Fork of Milk River near international boundary for the year ending September 30, 1927

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	22.6	13.8	18.0	1,110
May	1,680	157	548	33,700
June	1,670	199	498	29,600
July	340	75	154	9,470
August	251	73	124	7,620
September	1,290	63	182	10,800

MILK RIVER AT MILK RIVER, ALBERTA

LOCATION.—In NE. ¼ sec. 21, T. 2 N., R. 16 W. fourth meridian, at Milk River, Alberta.

DRAINAGE AREA.—1,104 square miles (measured by engineers of Department of Interior, Canada).

RECORDS AVAILABLE.—During open-water season July 1, 1909, to December 31, 1911; complete records January 1, 1912, to September 30, 1927. Prior to October 1, 1920, maintained by Department of Interior, Canada.

EQUIPMENT.—Stevens continuous water-stage recorder on left bank. A chain gage on railroad bridge 1,000 feet upstream, set at an independent datum, is read during winter when water-stage recorder is not in operation. Discharge measurements made from traffic bridge above gage or by wading.

CHANNEL AND CONTROL.—Bed of stream composed of sand and gravel. Right bank high, clean, and subject to overflow at extreme stages. Left bank low. Control shifting.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 11.41 feet May 22 (discharge, estimated 7,460 second-feet); no flow at various times during January and February.

1909–1927: Maximum stage recorded, that of May 22, 1927; no flow at various times during 1922, 1923 and 1927.

DIVERSIONS AND REGULATION.—No diversions of importance. Flow increased by water from St. Mary Canal during irrigation season.

ACCURACY.—Stage-discharge relation not permanent; affected by ice. Rating curves well defined except for high stages. Fifteen discharge measurements, covering a range from 35 to 1,500 second-feet, were made during the year. Operation of water-stage recorder satisfactory except during winter. Chain gage read to hundredths once daily November 5 to April 23. Daily discharge ascertained by applying daily or mean daily gage height to rating table, using shifting-control method May 7–22 and June 18 to September 30, except as noted in footnote to table of daily discharge. Records good except those for high stages and for period of ice effect, which are fair.

COOPERATION.—Station maintained jointly with the Dominion Water Power and Reclamation Service, Department of the Interior, Canada.

Daily discharge, in second-feet, of Milk River at Milk River, Alberta, for the year ending September 30, 1927

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	46.5	29.9	7.0	8.8	1.6	21.7	352	510	2,490	369	724	316
2	46.5	32.6	7.0	7.6	2.0	23.1	394	439	2,210	405	844	266
3	44.9	32.6	6.4	6.4	2.0	24.4	369	387	1,610	474	760	229
4	43.4	32.6	6.4	5.8	1.8	61	386	360	1,410	887	713	194
5	43.4	29.9	6.4	5.2	1.8	48	510	329	1,170	844	672	155
6	41.8	29.9	6.4	4.6	1.6	48	352	303	979	808	661	146
7	38.8	31.2	5.8	4.0	1.6	53	465	338	923	655	661	155
8	37.2	31.2	5.8	3.6	1.6	53	311	316	850	638	638	190
9	35.7	29.9	5.8	3.2	1.6	55	273	291	1,390	649	626	237
10	34.1	31.2	5.8	2.8	1.4	48	256	282	1,880	632	609	229
11	32.6	32.6	5.2	2.4	1.0	48	238	320	1,250	649	604	233
12	34.1	31.2	4.0	2.0	.8	55	190	453	1,170	661	604	237
13	37.2	41.8	3.6	1.6	.6	62	187	382	1,180	684	609	258
14	35.7	27.2	3.2	1.6	.4	72	193	334	992	707	638	1,080
15	34.1	11.8	3.0	1.6	.2	140	412	356	844	832	766	1,460
16	32.6	21.7	2.8	1.4	0	356	1,040	356	736	961	766	689
17	32.6	19.0	3.6	1.4	0	245	2,500	338	666	893	760	419
18	28.5	19.0	4.0	1.4	0	288	1,390	382	604	766	772	320
19	28.5	19.0	10.0	1.4	.6	277	1,060	396	548	760	844	282
20	28.5	18.1	10.0	1.4	1.2	213	237	638	521	730	772	270
21	29.9	18.1	8.8	1.4	1.4	204	282	1,790	505	701	760	249
22	32.6	11.8	6.4	1.4	1.6	219	364	4,250	474	695	742	233
23	32.6	10.9	5.8	1.0	2.0	210	695	1,760	448	701	802	222
24	34.1	10.9	5.2	0	2.4	426	748	1,590	439	724	736	222
25	29.9	10.0	4.6	0	3.4	495	1,720	1,540	415	684	689	320
26	28.5	9.4	4.0	0	8.2	500	2,320	1,750	396	649	661	364
27	27.2	8.8	5.2	0	5.2	348	1,860	1,380	382	621	576	303
28	25.8	8.2	6.4	0	10.9	307	1,280	1,040	364	604	521	254
29	25.8	7.6	7.6	0	-------	266	992	1,340	396	604	505	222
30	25.8	7.0	8.8	.8	-------	270	672	3,330	338	626	429	211
31	27.2	-------	10.0	2.0	-------	300	-------	3,140	-------	655	364	------

NOTE.—Stage-discharge relation affected by ice Nov. 15 to Apr. 23; discharge estimated from a study of gage heights, seven discharge measurements, weather records, and observer's notes concerning ice.

Monthly discharge of Milk River at Milk River, Alberta, for the year ending September 30, 1927

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	46.5	25.8	34.1	2,100
November	41.8	7.0	21.8	1,300
December	10.0	2.8	5.97	367
January	8.8	0	2.41	148
February	10.9	0	2.03	113
March	500	21.7	185	11,400
April	2,500	187	735	43,700
May	4,250	282	981	60,300
June	2,490	338	918	54,600
July	961	369	686	42,200
August	844	364	672	41,300
September	1,460	146	332	19,800
The year	4,250	0	383	277,000

MILK RIVER AT EASTERN CROSSING OF INTERNATIONAL BOUNDARY

LOCATION.—In NE. ¼ sec. 6, T. 37 N., R. 9 E., at eastern crossing of international boundary, 30 miles north of Rudyard, Hill County, Mont., and 37 miles south of Many Berries, Alberta.

DRAINAGE AREA.—2,514 square miles (measured by engineers of Irrigation Branch, Department of the Interior, Canada).

RECORDS AVAILABLE.—April 1, 1913, to September 30, 1927. From August 7, 1909, to 1912, maintained by Irrigation Branch, Department of the Interior, Canada.

EQUIPMENT.—Au water-stage recorder on left bank; installed October 13, 1926. Prior to that date a Stevens continuous water-stage recorder at same site was used. Elevation of zero of both gages, 2,698.92 feet above sea level. Discharge measurements made from cable or by wading.

CHANNEL AND CONTROL.—A bar composed of heavy boulders, gravel, and sand makes a decided riffle at medium and low stages; shifts frequently.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 10.16 feet at 4.40 p. m. May 23 (discharge, roughly 12,000 second-feet); minimum, 0.58 foot November 5 (discharge, 25.9 second-feet).

1909–1927: Maximum stage recorded, that of May 23, 1927; no flow August 3–17, 22, 23, 1914, February 1 to March 13, 1922, and March 1–5, 1923.

DIVERSIONS AND REGULATION.—No diversions. Natural flow increased by approximately 53,200 acre-feet of water from St. Mary Canal during irrigation season of 1927.

ACCURACY.—Stage-discharge relation not permanent; seriously affected by ice, observations discontinued during winter. Two standard rating curves used during year; the first, used during October, is well defined between 25 and 750 second-feet; the other, used April 1 to September 30, is well defined between 20 and 2,000 second-feet, and extended above. Nineteen discharge measurements, covering a range from 26 to 2,440 second-feet, were made during the year. Operation of water-stage recorder fairly satisfactory. Daily discharge ascertained by applying mean daily gage height to rating table, using shifting-control method October 1–31, April 1 to May 10, June 9 to July 5, July 14 to August 10, and September 10–30, except as noted in footnote to table of daily discharge. Records good below 2,000 second-feet and fair above.

COOPERATION.—Station maintained jointly with the Dominion Water Power and Reclamation Service, Department of the Interior, Canada.

Daily discharge, in second-feet, of Milk River at eastern crossing of international boundary for the year ending September 30, 1927

Day	Oct.	Apr.	May	June	July	Aug.	Sept.
1	56.0	483	1,160	7,300	396	698	424
2	54.0	401	743	4,500	392	712	387
3	51.0	453	806	4,980	429	698	352
4	48.2	463	514	2,660	660	798	310
5		473	473	2,380	891	705	272
6		448	480	1,930	882	675	198
7		660	488	1,370	815	660	164
8		593	468	1,230	767	626	154
9	45.0	513	498	1,250	612	626	138
10		453	463	1,500	593	652	208
11		473	406	3,060	606	682	276
12		415	356	2,000	580	668	352
13	42.4	326	343	1,580	563	668	338
14	43.8	302	401	1,520	612	1,760	334
15	45.2	415	409	1,310	1,080	4,370	880
16	43.8	535	478	1,080	952	1,360	1,430
17	45.2	1,870	798	988	832	1,100	1,020
18	45.2	2,670	736	900	840	882	569
19	43.8	1,740	563	782	840	815	468
20	43.8	1,170	1,790	668	815	832	434
21	42.4	638	3,480	645	743	952	334
22	42.4	392	7,190	593	705	798	310
23	41.0	439	10,700	593	675	736	294
24	41.0	541	7,060	509	668	751	264
25	39.6	1,140	3,310	498	660	767	237
26	39.6	2,400	3,020	478	645	690	223
27	38.2	4,130	2,730	458	652	632	226
28	38.2	3,190	2,450	453	652	595	352
29	38.2	1,760	3,460	415	652	558	334
30	34.0	1,370	7,000	406	652	473	294
31	34.0	-------	9,190	-------	652	514	-------

NOTE.—Gage-height record missing Oct. 1-3, 5-12, Apr. 4, 9, May 6, 26, July 4, Aug. 28, Sept. 11, and 15; discharge interpolated or estimated.

Monthly discharge of Milk River at eastern crossing of international boundary for the year ending September 30, 1927

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	56	34	43.6	2,680
April	4,130	302	1,030	61,300
May	10,700	343	2,320	143,000
June	7,300	406	1,600	95,200
July	1,080	392	694	42,700
August	4,370	473	886	54,500
September	1,430	138	386	23,000

NORTH FORK OF MILK RIVER ABOVE ST. MARY CANAL, NEAR BROWNING, MONT.

LOCATION.—In SW. ¼ sec. 16, T. 37 N., R. 11 W., on Blackfeet Indian Reservation, 1¼ miles above outlet of canal, 3 miles south of international boundary, and 30 miles north of Browning, Glacier County.

DRAINAGE AREA.—60 square miles (measured on topographic maps).

RECORDS AVAILABLE.—June 20, 1921, to September 30, 1927. Records obtained at this station only during period when St. Mary Canal is in operation.

EQUIPMENT.—Stevens continuous water-stage recorder installed in box shelter on left bank. Discharge measurements made by wading near gage.

CHANNEL AND CONTROL.—One channel at all stages. Banks high; not subject to overflow. Control is gravel bar; subject to shift.

EXTREMES OF DISCHARGE.—Maximum discharge recorded during year, 4.93 feet at 2 p. m. May 29 (discharge, 363 second-feet); minimum, 0.87 foot at 2 p. m. May 14 (discharge, 22.5 second-feet).

1921–1927: Maximum stage recorded, that of May 29, 1927; minimum, 0.59 foot September 22, 1922 (discharge, 7.3 second-feet).

DIVERSIONS AND REGULATION.—None.

ACCURACY.—Stage-discharge relation not permanent. Standard rating curve well defined between 25 and 150 second-feet by six discharge measurements. Nine measurements, covering a range from 32 to 131 second-feet, were made during the year. Operation of water-stage recorder satisfactory. Daily discharge ascertained by applying mean daily gage height to rating table, using shifting-control method June 5 to July 28 and August 12 to September 8. Records good.

COOPERATION.—Station maintained jointly with the Dominion Water Power and Reclamation Service, Department of the Interior, Canada.

Daily discharge, in second-feet, of North Fork of Milk River above St. Mary Canal, near Browning, Mont., for the year ending September 30, 1927

Day	May	June	July	Aug.	Sept.	Day	May	June	July	Aug.	Sept.
1	------	199	61	49.3	46.6	16	33.9	81	55	49.3	------
2	------	164	59	44.6	44.6	17	34.4	74	47.9	57	------
3	------	193	68	42.0	45.3	18	36.9	72	45.3	47.3	------
4	------	156	72	40.7	44.0	19	42.0	74	46.0	44.6	------
5	------	160	60	42.0	43.3	20	58	66	45.3	44.0	------
6	------	174	53	40.7	44.0	21	63	67	45.3	51	------
7	------	134	49.9	40.7	42.7	22	71	68	52	47.9	------
8	------	115	47.9	38.8	47.3	23	100	70	45.3	46.6	------
9	------	125	46.6	39.4	------	24	128	68	44.6	44.0	------
10	------	104	46.6	39.4	------	25	135	63	44.6	44.0	------
11	------	124	47.3	40.1	------	26	110	63	44.0	44.0	------
12	------	104	47.3	38.2	------	27	86	61	44.0	43.3	------
13	------	104	46.0	40.7	------	28	98	57	44.6	42.0	------
14	32.7	93	48.6	63	------	29	288	58	44.0	46.0	------
15	32.7	84	80	51	------	30	187	71	45.3	47.9	------
						31	220	------	68	46.6	------

Monthly discharge of North Fork of Milk River above St. Mary Canal, near Browning, Mont., for the year ending September 30, 1927

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
May 14-31	288	32.7	97.6	3,480
June	199	57	102	6,076
July	80	44	51.4	3,160
August	63	38.8	45.0	2,770
September 1-8	46.6	42.7	44.7	709

NORTH FORK OF MILK RIVER NEAR INTERNATIONAL BOUNDARY

LOCATION.—In NE. ¼ sec. 11, T. 1, R. 23 W. fourth meridian, 300 yards above highway bridge at Peters ranch, 18 miles east of Kimball, Alberta, and 2 miles north of international boundary.

DRAINAGE AREA.—101 square miles (measured on topographic maps).

RECORDS AVAILABLE.—January 1, 1913, to September 30, 1927. July 21, 1909, to December 31, 1912, station was maintained by Irrigation Branch of the Department of the Interior, Canada, in NE. ¼ sec. 13, T. 1, R. 23 W. fourth meridian, about 2 miles downstream; May 6, 1911, to December 31, 1912, station was maintained at Alexander Dubray ranch, 2 miles south of international boundary.

EQUIPMENT.—Water-stage recorder on left bank. Chain gage read for periods when recorder was not in operation. Discharge measurements made by wading, from cable, or from highway bridge.

CHANNEL AND CONTROL.—Bed of stream at gage and principal control composed of clay and small boulders; shifting.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 3.44 feet at 6 p. m. May 29 (discharge, 771 second-feet); minimum, 1.01 feet March 1 (discharge, 3.2 second-feet; ice present).

1909–1927: Maximum stage recorded, 4.14 feet May 8, 1920 (discharge, 1,070 second-feet); minimum discharge, that of March 1, 1927.

DIVERSIONS AND REGULATION.—No diversions. Discharge partly regulated by flow of St. Mary Canal during the irrigation season.

ACCURACY.—Stage-discharge relation not permanent; seriously affected by ice, observations discontinued during winter. Rating curves for recording gage and for chain gage are well defined. Fifteen discharge measurements, covering a range from 11 to 519 second-feet, were made during the year. Operation of water-stage recorder satisfactory except for period March 1 to May 1, when chain gage was read to hundredths once daily. Daily discharge ascertained by applying daily or mean daily gage height to rating table, except as indicated in footnote to table of daily discharge. Records good except those for periods of ice effect and missing gage height, which are fair.

COOPERATION.—Station maintained jointly with the Dominion Water Power and Reclamation Service, Department of the Interior, Canada.

Daily discharge, in second-feet, of North Fork of Milk River near international boundary for the year ending September 30, 1927

Day	Oct.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	14.5	3.2	77	55	488	82	520	140
2	14.1	10.1	88	32.3	345	221	499	84
3	13.8	30.6	99	28.0	324	290	499	62
4	13.8	24.6	110	28.0	257	305	499	57
5	13.4	19.8	122	31.0	228	301	504	55
6	13.0	16.2	61	31.0	247	286	515	57
7	12.7	12.7	49.8	31.0	200	328	504	97
8	13.0	14.8	40.4	33.6	169	366	504	72
9	12.7	12.7	29.7	42.7	206	389	504	62
10	12.0	12.7	14.8	63	159	412	499	70
11	12.0	10.2	9.8	68	177	432	499	77
12	11.4	23.8	9.8	57	169	462	499	55
13	11.6	132	12.0	48.8	145	473	499	221
14	11.4	61	33.3	37.5	136	478	559	221
15	11.4	47.0	77	34.9	125	554	542	110
16	11.2	36.0	281	34.9	120	483	520	84
17	11.0	27.0	239	33.6	112	452	520	77
18	11.0	19.0	124	42.7	101	499	520	74
19	11.0	61	60	58	99	499	512	68
20	11.0	77	72	145	95	504	510	65
21	11.0	84	97	154	91	515	522	58
22	11.1	81	103	185	86	520	522	54
23	11.1	71	246	250	91	510	520	54
24	11.1	47.0	300	234	86	504	494	63
25	11.0	27.0	105	250	79	504	437	67
26	10.8	28.8	70	240	79	499	412	62
27	10.6	23.8	63	185	77	494	380	55
28	10.6	25.4	56	159	74	488	353	52
29	10.6	36.0	54	526	72	494	275	48.8
30	10.6	57	54	576	90	499	240	50
31	10.6	69	-------	515	-------	537	180	-------

NOTE.—Stage-discharge relation affected by ice Mar. 1 to Apr. 16; discharge estimated from a study of gage heights, four discharge measurements, weather records, and observer's notes concerning ice. Gage-height record missing Oct. 21, 23, 25, 26, 28, 30, Apr. 13, and Aug. 18–22; discharge interpolated or estimated.

Monthly discharge of North Fork of Milk River near international boundary for the year ending September 30, 1927

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	14.5	10.6	11.8	726
March	132	3.2	38.8	2,390
April	300	9.8	91.9	5,470
May	576	28.0	136	8,360
June	488	72	158	9,400
July	554	82	432	26,600
August	559	180	470	28,900
September	221	48.8	79.1	4,710

LODGE CREEK AT INTERNATIONAL BOUNDARY

LOCATION.—In SE. ¼ sec. 12, T. 1, R. 29 W. third meridian, at Willow Creek Royal Northwest Mounted Police barracks, 1 mile north of international boundary, in Saskatchewan, Canada, and 30 miles northwest of Havre, Mont.

DRAINAGE AREA.—806 square miles (measured by engineers of Irrigation Branch, Department of the Interior, Canada).

RECORDS AVAILABLE.—April 1, 1917, to September 30, 1927. April 25, 1910, to October 31, 1916, maintained by Irrigation Branch, Department of the Interior, Canada.

EQUIPMENT.—Stevens continuous water-stage recorder on right bank; elevation of zero, 2,721.06 feet above sea level. Discharge measurements made from cable or by wading. Some low-water measurements made with weir.

CHANNEL AND CONTROL.—Composed of heavy boulders, gravel, and sand; shifting.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 12.41 feet at 7.30 p. m. May 23 (discharge, 3,680 second-feet); no flow at various times during year.

1917–1927: Maximum stage recorded, that of May 23, 1927; creek dry at various times.

DIVERSIONS AND REGULATION.—Several small ditches divert water for irrigation above station. No regulation.

ACCURACY.—Stage-discharge relation permanent during year except as affected by ice. Rating curve below 2,000 second-feet well defined by 15 discharge measurements made during the year; extended above that point. Operation of water-stage recorder satisfactory. Daily discharge ascertained by applying mean daily gage height to rating table, except for days of considerable fluctuation, for which it was ascertained by averaging hourly discharges, and except as indicated in footnote to table of daily discharge. Records good.

COOPERATION.—Station maintained jointly with the Dominion Water Power and Reclamation Service, Department of the Interior, Canada.

Daily discharge, in second-feet, of Lodge Creek at international boundary for the year ending September 30, 1927

Day	Mar.	Apr.	May	June	July	Aug.	Day	Mar.	Apr.	May	June	July	Aug.
1		637	335	465	5.6	0.5	16		560	50	41.0	7.0	1.4
2		363	226	252	4.4	.4	17		752	50	92	6.3	1.4
3		367	164	158	3.8	.4	18		734	131	109	9.4	1.2
4		478	136	114	3.8	.4	19		657	215	68	21.3	1.1
5		614	117	83	210	.4	20		368	107	52	11.0	.9
6		703	95	70	172	.4	21		274	485	46	7.0	.5
7		664	102	57	55	1.7	22	0.3	221	2,090	35.2	4.4	.4
8		749	128	47	74	2.9	23	.6	188	2,980	30.6	2.3	.4
9		653	210	42	41	2.4	24	1.6	233	2,820	21.3	1.9	.3
10		329	172	40	27.1	2.3	25	4.2	516	1,090	15.7	1.6	.2
11		170	123	36	18.3	2.1	26	144	1,000	450	11.8	1.4	.2
12		83	82	32	12.3	1.9	27	556	1,640	257	11.0	1.2	.1
13		55	62	57	10.5	1.6	28	906	1,390	572	9.2	1.1	------
14		63	55	39.2	8.1	1.5	29	1,260	822	1,580	7.4	1.1	------
15		109	54	43.0	8.8	1.4	30	1,150	575	1,450	7.0	.9	------
							31	1,300	-------	863	-------	.6	------

NOTE.—Stage-discharge relation affected by ice Mar. 1–25; discharge estimated on basis of one discharge measurement and study of gage-height record and temperature records. No flow during October and on days between Mar. 1 and Sept. 30 for which no discharge is given.

Monthly discharge of Lodge Creek near international boundary for the year ending September 30, 1927

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
March	1,300	0.0	172	10,600
April	1,640	55	532	31,700
May	2,980	50	556	34,200
June	465	7.0	69.7	4,150
July	210	.6	23.7	1,460
August	2.9	.0	.92	56.6

NOTE.—No flow during October and September.

McRAE COULEE AT INTERNATIONAL BOUNDARY

LOCATION.—In NW. ¼ sec. 5, T. 1, R. 28 W., one-fourth mile above mouth, three-fourths mile north of international boundary, in Saskatchewan, Canada, and 1½ miles east of Willow Creek Royal Northwest Mounted Police barracks.

DRAINAGE AREA.—53 square miles (measured by engineers of Irrigation Branch, Department of the Interior, Canada).

RECORDS AVAILABLE.—March 1 to September 30, 1927.

EQUIPMENT.—A water-stage recorder in wooden shelter on right bank; installed September 28, 1927. Overhanging wire gage at same datum and location used prior to this date. Discharge measurements made from cable or by wading.

CHANNEL AND CONTROL.—Channel composed of gravel and clay. Banks high; not subject to overflow. Control composed of gravel and clay; shifting.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 5.74 feet May 23 (discharge, 486 second-feet); no flow at various times.

DIVERSIONS AND REGULATION.—None.

ACCURACY.—Stage-discharge relation permanent except as affected by ice. Rating curve well defined below 20 second-feet and fairly well defined from 20 to 300 second-feet by seven discharge measurements. Gage read to hundredths once daily. Daily discharge ascertained by applying daily gage height to rating table except as indicated in footnote to table of daily discharge. Records good except those for high stages and for period of ice effect, which are fair.

COOPERATION.—Station maintained jointly with the Dominion Water Power and Reclamation Service, Department of the Interior, Canada.

Daily discharge, in second-feet, of McRae Coulee at international boundary for the year ending September 30, 1927

Day	Mar.	Apr.	May	June	July	Day	Mar.	Apr.	May	June	July
1	------	29.4	0.03	10.7	------	16	------	26.7	--------	0.1	------
2	------	35.4	.02	9.0	------	17	------	67	0.02	5.2	0.04
3	------	72	.01	5.9	------	18	------	16.8	.01	4.3	.01
4	------	91	.01	4.1	0.01	19	------	23.2	.02	3.4	------
5	------	36.8	.01	3.0	1.1	20	------	11.6	.1	1.6	------
6	------	12.8	.01	1.1	13.6	21	------	2.7	13.9	.4	------
7	------	7.6	.01	.8	.02	22	------	3.2	189	.2	------
8	------	3	.02	.4	.01	23	------	5.0	486	.1	------
9	------	2.1	.01	.5	------	24	1.1	5.9	129	.02	------
10	------	4.3	.01	.8	------	25	.8	14.6	57	.01	------
11	------	.3	--------	.5	------	26	.5	6.8	11.9	--------	------
12	------	.9	--------	.4	------	27	2.3	3.6	10.7	--------	------
13	------	.2	--------	.2	------	28	50	1.6	65	--------	------
14	------	.2	--------	.2	------	29	390	.4	192	--------	------
15	------	9.8	--------	.1	------	30	307	.1	107	--------	------
						31	120	-------	61	--------	------

NOTE.—Stage-discharge relation affected by ice Mar. 24 to Apr. 18; discharge estimated from study of discharge measurements and gage-height records. No flow on days between Mar. 1 and Sept. 30, for which no discharge is given.

Monthly discharge of McRae Coulee at international boundary for the year ending September 30, 1927

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
March	390	0.0	28.1	1,730
April	91	.1	16.5	982
May	486	.0	42.7	2,630
June	10.7	.0	1.77	105
July	13.6	.0	.477	29.3
The period	----------	----------	----------	5,480

NOTE.—Coulee dry during August and September.

BATTLE CREEK AT INTERNATIONAL BOUNDARY

LOCATION.—In SE. ¼ sec. 4, T. 1, R. 26 W. third meridian, in Saskatchewan, Canada, one-fourth mile above point where creek crosses international boundary and 35 miles north of Chinook, Mont.

DRAINAGE AREA.—726 square miles (revised; measured by engineers of Irrigation Branch, Department of the Interior, Canada).

RECORDS AVAILABLE.—April 17, 1917, to September 30, 1927.

EQUIPMENT.—Stevens continuous water-stage recorder. Discharge measurements made from cable 45 feet below gage or by wading.

CHANNEL AND CONTROL.—Composed of heavy boulders, sand, and gravel; shifting.

EXTREMES OF DISCHARGE.—Maximum stage during year, from water-stage recorder, 7.02 feet from 10 to 11 p. m. April 4 (discharge, 2,010 second-feet); no flow October 1–6 and March 1–21.

1917–1927: Maximum stage recorded, 8.50 feet April 13, 1917 (discharge, 3,200 second-feet); no flow at various times.

DIVERSIONS AND REGULATION.—Several small ditches divert water for irrigation above station. No regulation.

ACCURACY.—Stage-discharge relation not permanent; seriously affected by ice, observations discontinued during winter. Standard rating curve well defined between 20 and 1,500 second-feet and extended above. Fourteen discharge measurements, covering a range from 20 to 1,300 second-feet, were made during the year. Operations of water-stage recorder satisfactory except March 22 to April 3, July 23 to 31, and September 20–30, when staff gage was read to hundredths once daily. Daily discharge ascertained by applying daily or mean daily gage height to rating table, using shifting-control method April 29 to September 30, except as indicated in footnote to table of daily discharge. Records good except those for periods of ice effect, which are fair.

COOPERATION.—Station maintained jointly with the Dominion Water Power and Reclamation Service, Department of the Interior, Canada.

Daily discharge, in second-feet, of Battle Creek at international boundary for the year ending September 30, 1927

Day	Oct.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0	0	134	1,380	1,080	81	22.8	16.4
2	0	0	126	618	1,050	81	23.8	15.6
3	0	0	950	354	518	78	24.8	16.4
4	0	0	1,700	308	373	76	26.0	18.1
5	0	0	1,480	264	290	151	23.8	17.3
6	0	0	1,170	234	267	244	22.8	17.3
7	1.0	0	871	228	236	98	21.8	15.6
8	2.3	0	725	219	207	80	22.8	15.6
9	2.1	0	262	226	189	98	20.8	14.9
10	2.3	0	78	241	184	83	22.8	14.9
11	2.3	0	65	198	175	71	20.8	15.6
12	2.3	0	50	166	171	63	20.8	15.6
13	2.3	0	60	157	182	58	20.8	19.0
14	2.3	0	48.0	182	168	56	29.4	19.0
15	1.5	0	216	168	238	66	24.8	21.8
16	1.5	0	764	155	365	71	23.8	27.1
17	1.2	0	1,090	145	365	60	23.8	28.3
18	1.0	0	860	136	256	57	22.8	27.1
19	1.1	0	670	142	203	51	23.8	26.0
20	1.2	0	496	184	191	49.5	39.2	22.8
21	1.2	0	490	373	162	45.0	37.8	20.8
22	1.2	.2	452	968	140	42.1	34.9	20.8
23	1.2	.4	394	840	130	38.0	30.6	19.8
24	1.2	.2	442	1,690	118	33.5	26.0	19.8
25	1.1	.4	457	1,370	112	30.6	22.8	22.8
26	1.1	5.2	646	968	105	29.4	20.8	22.8
27	1.1	29.4	1,020	646	96	20.8	19.0	22.8
28	1.0	2.5	1,340	781	90	20.8	19.8	22.8
29	1.0	2.5	1,460	1,160	89	29.4	18.1	21.8
30	1.1	3.2	1,620	1,150	87	29.4	18.1	22.8
31	1.1	411	--------	1,030	--------	30.6	16.4	--------

NOTE.—Stage-discharge relation affected by ice Mar. 1–28 and Apr. 9–14; discharge estimated from a study of gage heights, three discharge measurements, weather records, and observer's notes concerning ice. Gage-height record missing Oct. 7, Apr. 3, 19, 27, and July 23; discharge estimated or interpolated.

Monthly discharge of Battle Creek at international boundary for the year ending September 30, 1927

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	2.3	0	1.18	73
March	411	0	14.7	904
April	1,700	48.0	671	39,900
May	1,690	136	538	33,100
June	1,080	87	261	15,500
July	244	20.8	65.2	4,010
August	39.2	16.4	24.1	1,480
September	28.3	14.9	20.0	1,190

WOODPILE COULEE NEAR INTERNATIONAL BOUNDARY

LOCATION.—In NE. ¼ sec. 22, T. 37 N., R. 17 E., at Turner ranch, 4 miles south of international boundary and 2 miles east of Phipps post office, Blaine County, Mont.

DRAINAGE AREA.—76 square miles.

RECORDS AVAILABLE.—March 1 to September 30, 1927.

EQUIPMENT.—Chain gage on right bank. Discharge measurements made by wading or with weir.

CHANNEL AND CONTROL.—Bed composed of gravel and clay. Banks covered with small brush. Control is gravel bar; shifting. Considerable trouble with tumble weeds in summer.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 16.69 feet at 7 a. m. April 4 (discharge, 423 second-feet); no flow at various times.

DIVERSIONS AND REGULATION.—No information.

ACCURACY.—Stage-discharge relation not permanent; affected by ice. Standard rating curve well defined below 250 second-feet and extended above. Ten discharge measurements, covering a range from 0.4 to 250 second-feet, were made during the year. Gage read to hundredths twice daily. Daily discharge ascertained by applying mean daily gage height to rating table, using shifting-control method April 22 to July 10, except as indicated in footnote to table of daily discharge. Records fair.

COOPERATION.—Station maintained jointly with the Dominion Water Power and Reclamation Service, Department of the Interior, Canada.

Daily discharge, in second-feet, of Woodpile Coulee near international boundary for the year ending September 30, 1927

Day	Mar.	Apr.	May	June	July	Aug.	Day	Mar.	Apr.	May	June	July	Aug.
1	------	218	2.8	2.0	0.1	0.02	16	------	220	0.4	0.6	12.8	------
2	------	166	1.8	2.0	.1	.02	17	------	204	.5	.6	4.1	------
3	------	205	2.0	1.0	.1	.02	18	------	108	.8	.9	1.2	------
4	------	330	1.5	1.0	5.4	------	19	------	37.4	.6	1.3	.5	------
5	------	289	1.1	1.0	229	------	20	------	23.8	11.3	1.3	.5	------
6	------	139	1.0	.8	20.5	------	21	------	22.1	171	1.1	.4	------
7	------	82	1.8	.8	6.6	------	22	------	7.9	307	.8	.3	------
8	------	41.9	3.0	.8	2.8	------	23	------	12.0	397	.7	.2	------
9	------	17.1	2.2	.8	2.1	------	24	------	41.2	75	.5	.1	------
10	------	20.5	1.2	.8	1.2	------	25	------	60	10.0	.5	.1	------
11	------	11.6	.6	.8	.9	------	26	------	41.9	5.0	.4	.1	------
12	------	6.6	.5	.8	.5	------	27	------	22.1	3.0	.3	.1	------
13	------	2.7	.3	.6	.5	------	28	------	14.0	20.0	.3	.1	------
14	------	3.7	.4	.6	.6	------	29	------	6.9	75	.2	.1	------
15	------	41.9	.3	.6	22.1	------	30	240	4.4	20.0	.2	.1	------
							31	367	------	2.0	------	.1	------

NOTE.—No flow on days between Mar. 1 and Sept. 30 for which no discharge is given. Stage-discharge relation affected by ice Apr. 11–19; discharge estimated on basis of one discharge measurement and a study of weather records. Gage washed out May 24 to June 9; discharge estimated by comparison with records for adjacent streams.

Monthly discharge of Woodpile Coulee near international boundary for the year ending September 30, 1927

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
March	367	0.0	19.6	1,210
April	330	2.7	80.0	4,760
May	397	.3	36.1	2,220
June	2.0	.2	.80	47.6
July	229	.1	10.1	621
August	.02	.0	.002	.0
The period				8,860

NOTE.—No flow during September.

EAST FORK OF BATTLE CREEK NEAR INTERNATIONAL BOUNDARY

LOCATION.—In NW. ¼ sec. 17, T. 37 N., R. 20 E., at Stuckle ranch, 2 miles south of international boundary and 7 miles east of Norheim, Blaine County, Mont.

DRAINAGE AREA.—98 square miles.

RECORDS AVAILABLE.—March 1 to September 30, 1927.

EQUIPMENT.—Au water-stage recorder on right bank; installed September 3, 1927. Prior to that date a wire gage 300 feet upstream, was used. New gage is at independent datum. Discharge measurement made from cable, by wading, or with weir.

CHANNEL AND CONTROL.—Bed composed of gravel and clay. Control is at end of pool 80 feet below gage; fairly permanent.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 13.93 feet at 7 a. m. May 23 (discharge, from extension of rating curve, 325 second-feet); no flow at various times.

DIVERSIONS AND REGULATION.—No information.

ACCURACY.—Stage-discharge relation permanent except as affected by ice. Rating curve well defined below 100 second-feet by seven discharge measurements well distributed along the curve; extended above 100 second-feet. Gage read to hundredths twice daily. Daily discharge ascertained by applying mean daily gage height to rating table except as indicated in footnote to table of daily discharge. Records good except those for high stages and for periods of ice effect, which are fair.

COOPERATION.—Station maintained jointly with the Dominion Water Power and Reclamation Service, Department of the Interior, Canada.

Daily discharge, in second-feet, of East Fork of Battle Creek near international boundary for the year ending September 30, 1927

Day	Mar.	Apr.	May	June	July	Aug.	Day	Mar.	Apr.	May	June	July	Aug.
1		88	7.4	6.6			16		52	3.5	1.4	0.2	1.1
2		67	7.6	5.6			17		89	3.9	2.1	.2	.6
3		105	7.0	4.5			18		107	4.6	1.4	.5	.6
4		134	6.5	3.4	0.2		19		26.1	7.6	.8	.8	.3
5		123	6.0	3.0	9.7		20		19.0	6.4	.6	1.3	.2
6		69	5.6	2.5	4.3		21		16.2	164	.5	1.4	.1
7		61	6.0	2.2	1.7		22		10.8	242	.3	.5	
8		31.7	7.8	1.8	.9		23		12.5	278	.2	.3	
9		14.0	13.2	1.6	.6		24		51	111	.2	.1	
10		15.1	8.7	1.4	.3		25		83	29.8	.1		
11		23.1	6.5	.9	.2		26		8.9	9.0	.1		
12		20.9	5.4	.8	.1		27		8.1	5.4	.1		
13		11.0	4.5	.6	.1		28	40	8.0	199	.1		
14		6.2	4.3	.4	.1	1.3	29	60	9.7	117			
15		11.9	3.8	.8	.2	2.5	30	180	8.7	26.9			
							31	100		9.7			

NOTE.—No flow on days between Mar. 1 and Sept. 30, for which no discharge is given. Stage-discharge relation affected by ice Mar. 28–31 and Apr. 9–20; discharge estimated on basis of one discharge measurement and study of gage-height records and temperature records.

Monthly discharge of East Fork of Battle Creek near international boundary for the year ending September 30, 1927

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
March	180	0.0	12.3	756
April	134	6.2	43.0	2,560
May	278	3.5	42.5	2,610
June	6.6	.0	1.47	87.5
July	9.7	.0	.77	47.3
August	2.5	.0	.22	13.5
The period				6,070

NOTE.—No flow during September.

LYONS COULEE NEAR INTERNATIONAL BOUNDARY

LOCATION.—In NE. ¼ sec. 4, T. 37 N., R. 19 E., half a mile south of international boundary and 1 mile east of Norheim, Blaine County, Mont.

DRAINAGE AREA.—47 square miles.

RECORDS AVAILABLE.—March 1 to September 30, 1927.

EQUIPMENT.—Overhanging chain gage, supplemented by a vertical staff for high stages, attached to tree on right bank 300 feet below ford near ranch house; installed March 27, 1927. Discharge measurements made by wading at ordinary stages and from bridge half a mile downstream during high water.

CHANNEL AND CONTROL.—Stream bed and banks composed of clay and gravel. Banks wooded; not subject to overflow. Control probably permanent, but stage-discharge relation may be affected by tumble weeds lodging in channel below gage.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 7.65 feet at 7 p. m. April 3 (discharge, 668 second-feet); no flow at various times.

DIVERSIONS AND REGULATION.—No information.

ACCURACY.—Stage-discharge relation changed during year; affected by ice Standard rating curve fairly well defined below 350 second-feet and extende above. Eight discharge measurements, covering a range from 1 to 33 second-feet, were made during the year. Gage read to hundredths or hal. tenths twice daily. Daily discharge ascertained by applying mean dail gage height to rating table, using shifting-control method April 29 to Augus 22, except as indicated in footnote to table of daily discharge. Records fair

COOPERATION.—Station maintained jointly with the Dominion Water Powe and Reclamation Service, Department of the Interior, Canada.

Daily discharge, in second-feet, of Lyons Coulee near international boundary for the year ending September 30, 1927

Day	Mar.	Apr.	May	June	July	Aug.	Day	Mar.	Apr.	May	June	July	Aug.
1		222	6.0	6.2		0.1	16		115	0.8	1.6	20.2	1.0
2		274	4.8	3.6		.1	17		179	.9	1.4	7.8	.7
3		414	4.1	2.8			18		226	.9	1.6	4.1	.6
4		374	3.7	2.6	19.9		19		25.8	1.1	1.3	2.6	.4
5		314	3.1	2.0	240		20		24.1	1.6	1.2	2.0	.4
6		127	2.5	1.8	14.0		21		12.3	282	.9	1.7	.2
7		84	5.7	1.4	6.7		22		9.3	402	.8	1.5	.1
8		34.6	31.8	1.6	3.3		23		11.8	506	.7	1.3	
9		5.2	21.8	1.4	1.9		24		38.0	88	.6	1.1	
10		4.5	7.1	1.5	1.2		25		40.3	14.2	.4	.9	
11		3.2	3.3	1.5	1.1		26		25.4	7.1	.2	.7	
12		4.5	2.1	1.4	.9		27		16.5	4.4	.04	.6	
13		5.1	1.4	1.2	.9	5.4	28	32.9	12.3	63		.5	
14		7.4	.9	1.1	.7	10.5	29	37.1	9.5	86		.4	
15		10.3	.9	3.6	12.0	2.0	30	172	7.4	28.0		.3	
							31	268		9.7		.3	

NOTE.—No flow on days between Mar. 1 and Sept. 30 for which no discharge is given. Stage-discharge relation affected by ice Apr. 9-19; discharge estimated on basis of one discharge measurement, weather records, and observer's notes concerning ice.

Monthly discharge of Lyons Coulee near international boundary for the year ending September 30, 1927

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
March	268	0.0	16.5	1,010
April	414	3.2	87.9	5,230
May	506	.8	51.4	3,160
June	6.2	.0	1.48	88.1
July	240	.0	11.2	689
August	10.5	.0	.69	42.4
The period				10,200

NOTE.—No flow during September.

WHITEWATER CREEK NEAR INTERNATIONAL BOUNDARY

LOCATION.—In NW. ¼ sec. 24, T. 37 N., R. 29 E., just below mouth of North Fork of Whitewater Creek, 3½ miles south of international boundary, 5 miles northeast of Lowrane post office, Phillips County, Mont., 18 miles south of Roche Plain, Saskatchewan, and 50 miles north of Malta, Mont.

DRAINAGE AREA.—Not measured.

RECORDS AVAILABLE.—March 1 to September 30, 1927.

EQUIPMENT.—Au water-stage recorder in wooden shelter on left bank; installed July 31, 1927. Gage used prior to that date was vertical staff at same location. Discharge measurements made from cable 20 feet above gage or by wading.

CHANNEL AND CONTROL.—Bed composed of heavy clay, gravel, and large boulders. Banks fairly high, clean, and not subject to overflow except at extremely high stages. Control composed of heavy boulders and gravel 300 feet below gage; probably permanent.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 4.71 feet at 11.50 a.m. April 5 (discharge, 1,140 second-feet); no flow at various times in March.

DIVERSIONS AND REGULATION.—None.

ACCURACY.—Stage-discharge relation permanent except as affected by ice. Rating curve well defined below 120 second-feet by 11 measurements and fairly well above by one measurement, at 1,110 second-feet. Gage read to hundredths once daily prior to July 31; operation of water-stage recorder satisfactory since that date. Daily discharge ascertained by applying mean daily gage height to rating table except as indicated in footnote to table of daily discharge. Records good except those for periods of ice effect, which are fair.

COOPERATION.—Station maintained jointly with the Dominion Water Power and Reclamation Service, Department of the Interior, Canada.

Daily discharge, in second-feet, of Whitewater Creek near international boundary for the year ending September 30, 1927

Day	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0	753	1.4	21.0	0.1	0.1	0.1
2	0	140	1.1	7.9	.1	.1	.1
3	0	426	1.0	4.8	.1	.1	.1
4	0	828	1.1	2.6	.1	.1	.1
5	0	923	1.4	2.2	.2	.1	.1
6	0	366	1.6	1.8	.3	.1	.1
7	0	270	2.5	1.3	.1	.2	.1
8	0	105	4.8	1.0	.1	.1	.1
9	0	189	2.6	.7	.1	.1	.1
10	0	115	1.3	1.1	.1	.1	.1
11	1.0	82	1.0	1.0	.1	.1	.1
12	0	63	.7	.9	.2	.1	.1
13	0	53	1.0	.7	.2	.1	.2
14	0	40.4	.7	.6	.2	.1	.2
15	0	51	.5	1.0	.3	.1	.1
16	0	61	.3	1.0	.5	.1	.1
17	0	43.7	1.0	.7	.2	.1	.1
18	0	35.3	.7	.5	.2	.1	.1
19	0	26.1	.7	.3	.1	.1	.1
20	0	12.2	3.4	.3	.3	.1	.1
21	0	10.2	49.6	.3	.1	.1	.2
22	0	36.2	78	.2	.3	.1	.2
23	.9	14.4	37	.2	.1	.1	.2
24	1.0	10.6	20.2	.2	.1	.1	.2
25	1.0	6.8	13	.2	.1	.1	.2
26	6.3	4.8	9.4	.1	.1	.1	.1
27	16.5	3.9	5.9	.1	.1	.1	.1
28	86	2.6	17.2	.1	.1	.1	.1
29	516	1.9	43.7	.1	.1	.1	.1
30	786	1.6	50	.1	.1	.1	.1
31	550	-------	37	-------	.1	.1	-------

NOTE.—Stage-discharge relation affected by ice Mar. 1 to Apr. 4 and Apr. 18–21; discharge estimated on basis of four discharge measurements and a study of gage-height and temperature records.

Monthly discharge of Whitewater Creek near international boundary for the year ending September 30, 1927

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
March	786	0.0	63.4	3,900
April	923	1.6	156	9,280
May	78	.3	12.6	775
June	21	.1	1.77	105
July	.5	.1	.16	9.8
August	.2	.1	.10	6.1
September	.2	.1	.12	7.1
The period				14,100

FRENCHMAN RIVER AT INTERNATIONAL BOUNDARY

LOCATION.—In SW. ¼ sec. 4, T. 1, R. 10 W. third meridian, at Hall ranch, in Saskatchewan, Canada, just across international boundary from east side of lot 3, sec. 6, T. 37. N, 34 E.

DRAINAGE AREA.—1,875 square miles (measured by engineers of the Department of the Interior, Canada).

RECORDS AVAILABLE.—April 1, 1917, to September 30, 1927.

EQUIPMENT.—Stevens water-stage recorder. Discharge measurements made from cable 20 feet above gage or by wading.

CHANNEL AND CONTROL.—A bar composed of boulders and gravel forms the principal control at low and medium stages. At high stages this bar is drowned out.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 11.43 feet at 11 a. m. April 10 (discharge, 3,370 second-feet); no flow March 1–11 (ice).

1917–1927: Maximum stage recorded, 13.12 feet at 2 p. m. March 29, 1925 (discharge, 5,440 second-feet); no flow at various times.

DIVERSIONS AND REGULATION.—Several ditches divert water for irrigation 60 miles above station in Saskatchewan. No regulation.

ACCURACY.—Stage-discharge relation permanent during year except as affected by ice, observations discontinued during winter. Rating curve well defined. Twenty discharge measurements, covering a range from 28 to 3,100 second-feet, were made during the year. Operation of water-stage recorder satisfactory except during October. Daily discharge ascertained by applying mean daily gage height to rating table except as indicated in footnote to table of daily discharge. Records good except those for periods of ice effect and missing gage height, which are fair.

COOPERATION.—Station maintained jointly with the Dominion Water Power and Reclamation Service, Department of the Interior, Canada.

Daily discharge, in second-feet, of Frenchman River at international boundary for the year ending September 30, 1927

Day	Oct.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	21.6	0.0	977	1,170	1,460	144	50.0	35.4
2	45.2	.0	1,340	1,380	1,280	135	48.4	34.3
3	20.6	.0	1,480	1,810	1,120	125	45.2	30.3
4	10.0	.0	1,820	2,260	1,030	118	43.6	27.5
5	7.0	.0	2,680	2,100	960	112	42.0	26.8
6	5.8	.0	2,830	1,640	793	112	43.6	26.8
7	6.2	.0	2,960	1,230	635	115	42.0	26.8
8	6.9	.0	2,770	977	541	187	40.9	28.9
9	7.2	.0	3,000	922	474	248	38.7	29.6
10	7.5	.0	3,260	835	460	221	38.7	29.6
11	7.7	.0	2,930	687	465	202	39.8	30.3
12	8.0	2.0	2,180	590	408	215	38.7	33.2
13	8.3	34.6	1,770	465	369	190	38.7	33.2
14	8.0	11.9	1,470	522	326	154	46.8	36.5
15	8.0	50.0	1,220	460	296	138	52	35.4
16	8.0	40.0	9 0	429	285	133	43.6	34.3
17	8.0	95	708	413	282	105	42.0	33.2
18	8.5	75	708	421	275	91	40.9	30.3
19	9.0	53	713	421	285	79	40.9	30.3
20	9.7	50.0	687	479	285	86	36.5	29.6
21	9.8	40.0	703	916	278	81	36.5	28.9
22	9.9	30.0	703	1,040	268	70	37.6	28.2
23	10.0	24.7	798	1,260	268	63	37.6	27.5
24	11.0	20.0	814	1,200	265	63	37.6	26.8
25	12.0	19.6	729	1,150	244	63	37.6	26.1
26	13.0	75	651	1,190	225	65	38.7	26.1
27	14.1	150	610	1,050	209	60	37.6	25.4
28	14.0	293	656	1,170	187	56	39.8	24.7
29	13.8	500	777	1,340	172	55	37.6	24.7
30	10.2	796	936	1,430	157	52	37.6	24.7
31	10.0	890	-------	1,520	-------	52	40.9	-------

NOTE.—Recorder not operating during October; discharge based on observer's irregular readings of staff gage, estimated or interpolated for days of no reading. Stage-discharge relation affected by ice Mar. 1 to Apr. 4; discharge estimated on basis of seven discharge measurements and a study of gage-height and temperature records.

Monthly discharge of Frenchman River at international boundary for the year ending September 30, 1927

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	45.2	5.8	11.3	695
March	890	.0	105	6,460
April	3,260	610	1,460	86,900
May	2,260	413	1,050	64,600
June	1,460	157	477	28,400
July	248	52	116	7,130
August	52	36.5	41.0	2,520
September	36.5	24.7	29.5	1,760

ROCK CREEK AT INTERNATIONAL BOUNDARY

LOCATION.—In SE. ¼ sec. 1, T. 37 N., R. 37 E., at Bowrey ranch, three-quarters of a mile south of international boundary, 2 miles above mouth of Horse Creek, and 5 miles west of Barnard post office, Valley County, Mont.

DRAINAGE AREA.—Not measured.

RECORDS AVAILABLE.—March 1 to September 30, 1927.

EQUIPMENT.—Staff gage in three sections; installed March 18, 1927. Discharge measurement made from cable 30 feet above gage, by wading, or with weir.

CHANNEL AND CONTROL.—Bed of stream composed of gravel and clay. Banks fairly high and covered with brush. Control is gravel and sand riffle 300 feet below gage at trail crossing; subject to shift.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 10.51 feet at 9 a. m. April 6 (discharge, 982 second-feet); no flow March 1–17.

DIVERSIONS AND REGULATION.—One small ditch diverts water a quarter of a mile above gage.

ACCURACY.—Stage-discharge relation permanent during year except as affected by ice. Rating curve well defined below 100 second-feet by seven discharge measurements and fairly well defined above by one computed measurement at 938 second-feet. Gage read to hundredths once daily. Daily discharge ascertained by applying daily gage height to rating table, using shifting-control method September 16–30, except as noted in footnote to table of daily discharge. Records for open channel good; others fair.

COOPERATION.—Station maintained jointly with the Dominion Water Power and Reclamation Service, Department of the Interior, Canada.

Daily discharge, in second-feet, of Rock Creek at international boundary for the year ending September 30, 1927

Day	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0	541	25.2	48.0	6.3	3.0	5.3
2	0	354	27.2	47.0	5.8	3.0	8.7
3	0	734	30.4	40.1	5.8	2.7	5.1
4	0	666	31.3	33.4	5.8	4.0	3.2
5	0	800	31.3	34.8	6.3	2.9	2.9
6	0	982	28.8	30.7	7.1	2.0	2.5
7	0	469	28.8	34.0	6.5	2.0	2.3
8	0	487	61	26.9	6.0	1.8	2.1
9	0	924	49.3	23.8	5.8	2.1	2.1
10	0	723	36.2	27.2	6.3	1.4	2.3
11	0	328	31.9	32.5	4.4	1.8	2.3
12	0	124	24.8	32.2	4.0	1.5	2.5
13	0	85	21.8	26.2	3.8	3.0	2.7
14	0	85	18.8	22.6	3.8	2.3	2.9
15	0	91	16.0	22.2	3.8	2.1	3.2

Daily discharge, in second-feet, of Rock Creek at international boundary for the year ending September 30, 1927

Day	Mar.	Apr.	May	June	July	Aug.	Sept.
16	0	92	15.1	19.2	4.9	1.8	3.2
17	0	61	13.5	57	7.3	1.8	4.0
18	10.0	47.0	17.4	30.0	6.8	3.2	3.0
19	1.8	42.0	27.8	16.9	6.3	1.6	2.7
20	.8	31.9	40.4	13.9	6.2	1.8	2.5
21	1.8	31.9	48.3	13.1	6.1	1.8	2.5
22	1.8	31.3	100	11.5	6.0	2.1	3.0
23	2.7	30.7	61	10.8	5.9	2.1	3.6
24	1.8	29.4	63	9.6	5.8	1.6	2.9
25	2.7	28.5	63	8.7	5.6	2.0	3.0
26	3.6	33.1	40.4	8.4	5.5	1.8	3.6
27	8.4	34.8	33.4	8.1	5.4	1.8	4.2
28	42.0	32.8	33.4	6.8	5.3	1.4	4.8
29	68	28.5	250	6.5	5.2	1.6	5.5
30	72	25.8	86	6.0	5.1	1.6	5.5
31	172	-------	57	-------	4.0	2.3	-------

NOTE.—Stage-discharge relation affected by ice Mar. 1 to Apr. 5; discharge estimated on basis of one discharge measurement and a study of a gage height and temperature records. Gage-height record missing July 20-29; Sept. 12-14, and 26-28; discharge interpolated.

Monthly discharge of Rock Creek at international boundary for the year ending September 30, 1927

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
March	172	0.0	12.6	775
April	982	25.8	266	15,800
May	250	13.5	45.6	2,800
June	57	6.0	23.6	1,400
July	7.3	3.8	5.58	343
August	4.0	1.4	2.13	131
September	8.7	2.1	3.47	206
The period	----------	----------	----------	21,700

HORSE CREEK AT INTERNATIONAL BOUNDARY

LOCATION.—In SE. ¼ sec. 3, T. 37 N., R. 37 E., at Hunter ranch, three-quarters of a mile south of international boundary, 8 miles west of Barnard post office, and 11 miles northeast of Thoeny, Valley County, Mont.

DRAINAGE AREA.—71 square miles.

RECORDS AVAILABLE.—March 1 to September 30, 1927.

EQUIPMENT.—Vertical staff gage on right bank; installed March 17, 1927. Discharge measurements made from cable or by wading.

CHANNEL AND CONTROL.—Bed composed of gravel and clay. Banks high. Gravel and clay bar 60 feet below gage forms control; probably shifting.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 9.80 feet April 9 (discharge, 691 second-feet); no flow at various times during March.

DIVERSIONS AND REGULATION.—None.

ACCURACY.—Stage-discharge relation not permanent; affected by ice. Standard rating curve well defined by six discharge measurements below 35 second-feet and fairly well defined above by one computed measurement at 605 second-feet. Gage read to hundredths once daily, but there are numerous gaps in the record. Daily discharge ascertained by applying daily gage height to rating table, using shifting-control method April 24 to July 19, except as indicated in footnote to table of daily discharge. Records fair.

COOPERATION.—Station maintained jointly with the Dominion Water Power and Reclamation Service, Department of the Interior, Canada.

Daily discharge, in second-feet, of Horse Creek at international boundary for the year ending September 30, 1927

Day	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0	150	3.7	8.3	0.7	0.2	3.5
2	0	300	3.4	5.6	.6	.2	3.0
3	0	275	3.1	4.7	.6	.2	2.5
4	0	500	3.0	4.4	.6	.2	1.8
5	0	620	3.2	4.0	.5	.2	1.0
6	0	617	3.1	3.5	.5	.2	1.0
7	0	400	3.8	8.5	.4	.2	.9
8	0	464	11.1	3.1	.5	.2	.9
9	0	691	8.0	3.5	.5	.2	.8
10	0	84	6.2	3.8	.5	.2	.7
11	0	59	4.2	7.8	.5	.2	.6
12	0	52	3.7	6.8	.5	.2	.6
13	0	12.4	3.3	5.8	.5	.2	.5
14	0	14.7	3.0	4.8	.4	.2	.4
15	0	55	2.3	3.8	.4	.2	.4
16	0	25.8	2.1	2.8	.4	.2	.3
17	0	15.0	2.0	5.5	.4	.2	.4
18	0	8.2	4.4	4.0	.4	.2	.3
19	0	7.1	3.5	2.5	.3	.2	.2
20	1.0	6.5	2.6	1.6	.3	.2	.2
21	.4	5.6	38.4	1.6	1.0	.2	.2
22	0	4.4	60	1.6	1.0	.3	.2
23	0	4.0	38.4	1.6	.4	.2	.2
24	0	4.1	30.0	1.2	.4	.1	.2
25	0	4.3	19.4	1.0	.3	.1	.2
26	0	4.4	6.5	1.0	.3	.1	.2
27	0	4.9	6.5	.9	.3	.1	.3
28	0	4.6	6.2	.8	.3	.1	.2
29	0	4.3	150	.8	.3	.1	.2
30	11.9	4.0	24.8	.7	.3	.1	.2
31	32.4	-------	11.1	-------	.3	.2	-------

NOTE.—Stage-discharge relation affected by ice Mar. 1 to Apr. 5; discharge estimated on basis of one discharge measurement and a study of gage height and weather records. Gage-height record missing for several days each month, the readings becoming more infrequent toward the end of the year; discharge estimated or interpolated.

Monthly discharge of Horse Creek at international boundary for the year ending September 30, 1927

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
March	32.4	0.0	1.47	90.4
April	691	4.0	147	8,750
May	150	2.0	15.2	935
June	8.5	.7	3.53	210
July	1.0	.3	.46	28.3
August	.3	.1	.18	11.1
September	3.5	.2	.74	44.0
The period	----------	----------	----------	10,100

McEACHERN CREEK AT INTERNATIONAL BOUNDARY

LOCATION.—In SE. ¼ sec. 1, T. 37 N., R. 36 E., half a mile south of international boundary at Dolson ranch and 7 miles north of Thoeny, Valley County, Mont.

DRAINAGE AREA.—160 square miles.

RECORDS AVAILABLE.—March 1 to September 30, 1927. March, 1924, to October, 1926, station maintained by Department of Interior, Canada.

EQUIPMENT.—Staff gage on right bank. Discharge measurements made from cable 800 feet downstream from gage or by wading.

CHANNEL AND CONTROL.—Bed of stream composed of gravel and clay. Control of same material 150 feet below gage; probably permanent.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 10.42 feet at 3 p. m. April 9 (discharge, 1,850 second-feet); no flow at various times.

DIVERSIONS AND REGULATION.—No information.

ACCURACY.—Stage-discharge relation permanent except as affected by ice. Rating curve well defined below 1,200 second-feet by 11 discharge measurements. Six measurements, covering a range from 1 to 42 second-feet, made during the year check the curve closely. Gage read to hundredths or half-tenths once daily. Daily discharge ascertained by applying daily gage height to rating table except as indicated in footnote to table of daily discharge. Records good except those for extreme high stages, which are fair.

COOPERATION.—Station maintained jointly with the Dominion Water Power and Reclamation Service, Department of the Interior, Canada.

Daily discharge, in second-feet, of McEachern Creek near international boundary for the year ending September 30, 1927

Day	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0	698	5.9	25.3	1.2	0.4	0.01
2	0	683	5.2	21.1	1.2	.04	01
3	0	1,090	4.4	17.4	.7	.04	01
4	0	1,230	4.4	17.4	.7	.04	.01
5	0	1,080	5.2	17.4	.4	.04	.01
6	0	673	3.6	17.4	.4	.04	0
7	0	606	3.5	14.4	.4	0	0
8	0	663	30.7	14.2	.04	0	0
9	0	1,380	35.9	14.2	.04	0	0
10	0	463	35.9	34.3	.04	0	0
11	0	53	26.2	214	.04	0	0
12	0	25.3	14.9	88	.04	0	0
13	0	14.9	4.2	67	.04	0	0
14	0	14.9	4.2	29.4	.04	0	0
15	0	50.0	4.2	14.2	0	0	.01
16	0	65	4.2	5.3	0	0	.01
17	0	35.4	4.2	4.6	0	0	.01
18	0	19.9	4.1	4.6	0	0	.01
19	0	13.9	4.1	3.8	0	0	0
20	0	5.2	4.1	3.8	0	0	0
21	0	5.3	46.3	3.8	66	.01	0
22	0	7.0	530	3.0	34.3	.01	0
23	0	7.1	108	3.0	14.2	.01	0
24	0	8.7	69	2.4	14.2	.01	0
25	0	10.4	69	2.4	1.2	.01	0
26	0	10.6	69	2.4	1.2	.01	0
27	0	11.6	53	1.7	1.2	.01	0
28	0	10.6	34.8	1.7	1.2	.01	0
29	0	9.0	458	1.7	.4	.01	0
30	3.5	7.4	391	1.7	.4	.01	0
31	88	-------	68	-------	.4	.01	-------

NOTE.—Stage-discharge relation affected by ice Mar. 1–31; discharge estimated on basis of two discharge measurements and a study of gage height and weather records.

Monthly discharge of McEachern Creek near international boundary for the year ending September 30, 1927

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
March	88	0	2.95	181
April	1,380	5.2	298	17,700
May	530	3.5	67.9	4,180
June	214	1.7	21.7	1,290
July	66	0	4.52	278
August	.4	0	.023	1.4
September	.01	0	.003	.2
The period				23,600

YELLOWSTONE RIVER BASIN

YELLOWSTONE LAKE AT LAKE HOTEL, YELLOWSTONE NATIONAL PARK

LOCATION.—At boat landing directly in front of Lake Hotel, 1½ miles southwest of outlet of Yellowstone Lake.

DRAINAGE AREA.—1,010 square miles (measured on topographic maps).

RECORDS AVAILABLE.—October 7, 1921, to September 30, 1927.

EQUIPMENT.—Vertical staff gage on pile at wharf. Gage datum is 7,729.51 feet above mean sea level.

EXTREMES OF STAGE.—Maximum stage recorded during year, 6.12 feet afternoon of June 30; minimum, 0.58 foot December 3–5 and 7–9. Slightly lower stage may have occurred during winter.

1921–1927: Maximum stage recorded, that of June 30, 1927; minimum, 0.36 foot December 17, 1921. Lower stage probably occurred during period of no record.

DIVERSIONS AND REGULATION.—None.

ACCURACY.—Gage read to hundredths once daily October 1 to June 10; thereafter to half-tenths. Observations discontinued during winter on account of severe ice formation at gage. Ice in lake broke up May 17. Records good.

COOPERATION.—Records furnished by officials of Yellowstone Park.

Daily gage height, in feet, of Yellowstone Lake at Lake Hotel, Yellowstone National Park, for the year ending September 30, 1927

Day	Oct.	Nov.	Dec.	May	June	July	Aug.	Sept.
1			0.60		2.14	6.08	4.16	2.60
2			.60		2.18	6.02	4.11	2.55
3			.58		2.22	5.92	4.11	2.50
4	1.02		.58		2.28	6.02	4.01	2.50
5	1.02		.58		2.32	5.97	3.96	2.50
6	1.01		.60		2.40	5.92	3.91	2.45
7	.98		.58		2.46	5.87	3.86	2.40
8	.98		.58		2.50	5.82	3.81	2.40
9	.96		.58		2.84	5.82	3.81	2.40
10					3.00	5.72	3.76	2.40
11					3.22	5.67	3.76	2.35
12					3.42	5.62	3.71	2.35
13					3.67	5.57	3.61	2.35
14		0.62			3.82	5.52	3.56	2.35
15		.60			4.07	5.47	3.51	2.30
16		.60			4.27	5.32	3.46	2.27
17		.60			4.42	5.27	3.41	2.25
18		.60			4.62	5.22	3.41	2.20
19		.60			4.82	5.17	3.31	2.20
20					4.97	5.12	3.26	2.15
21		.60			5.02	5.07	3.21	2.10
22		.60			5.12	5.02	3.20	2.10
23		.60			5.22	4.92	3.10	2.10
24	.78				5.32	4.82	3.05	2.05
25	.76			1.91	5.42	4.72	3.05	2.00
26	.74	.60		1.90	5.52	4.67	3.00	2.00
27	.74			1.92	5.62	4.51	2.85	1.98
28	.72			1.98	5.77	4.41	2.80	1.96
29	.72			2.04	5.87	4.36	2.80	1.95
30	.72			2.07	6.09	4.26	2.70	1.90
31				2.12		4.21	2.70	

YELLOWSTONE RIVER AT YELLOWSTONE LAKE OUTLET, YELLOWSTONE NATIONAL PARK

LOCATION.—At Fishing Bridge, a quarter of a mile below outlet of Yellowstone Lake and 1½ miles northeast of Lake Hotel.

DRAINAGE AREA.—1,010 square miles (measured on topographic maps).

RECORDS AVAILABLE.—December 3, 1922, to September 30, 1927. Gage-height records only prior to October 1, 1925.

EQUIPMENT.—Vertical staff near left bank attached to pile on upstream side of Fishing Bridge. Gage datum is 7,728.90 feet above mean sea level. Discharge measurements made from boat a short distance above gage.

CHANNEL AND CONTROL.—Bed composed of gravel. Right bank subject to overflow above gage, but below gage the flow is well confined at all stages. A small island divides river into two channels for a short distance below gage. Control is formed by a gravel and rock riffle below lower end of this island.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 6.3 feet June 29, 30, and July 1 (discharge, 7,420 second-feet); minimum, 0.94 foot January 9 and 10 (discharge, 560 second-feet).

1922–1927: Maximum and minimum stages were recorded in 1927.

DIVERSIONS AND REGULATION.—None.

ACCURACY.—Stage-discharge relation permanent except for slight ice effect for short periods. Rating curve fairly well defined between 1,000 and 8,000 second-feet; based on three discharge measurements made during 1928 at this station and by 23 measurements made during 1923 to 1927 at Canyon station, 13 miles below, after deducting estimated intervening inflow. Gage read to hundredths October 1 to June 8 and to half-tenths June 9 to September 30. After June 6 the gage was read daily; prior thereto, particularly during winter, when stages were fairly constant, there were periods when gage was not read regularly. Daily discharge determined by applying daily gage height to rating table except as noted in footnote to table of daily discharge. Records good except those for extremely high stages and for estimated periods, which are fair.

COOPERATION.—Gage-height record furnished by officials of Yellowstone Park.

Daily gage height, in feet, of Yellowstone River at Yellowstone Lake outlet, Yellowstone National Park, for the year ending September 30, 1927

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Apr.	May	June	July	Aug.	Sept.
1	1.55		1.00		1.14				6.30	4.55	3.10
2	1.55		1.00	1.04					6.20	4.50	3.05
3			1.00	1.08					6.15	4.47	3.05
4	1.54		1.00	1.00	1.14		1.28	2.58	6.20	4.40	2.95
5	1.54		1.00	1.00					6.15	4.30	2.95
6	1.50		1.00	.96	1.16	1.08			6.10	4.30	2.90
7	1.50		1.00	1.00			1.34	2.98	6.05	4.20	2.85
8	1.48		1.00	1.00	1.16	1.09		3.08	6.02	4.10	2.85
9	1.46		1.04	.94		1.09	1.39	3.20	6.00	4.10	2.85
10			1.08	.94	1.16			3.35	5.95	4.00	2.85
11	1.46		1.02	1.02		1.10		3.55	5.90	3.95	2.80
12			1.02	1.00	1.16		1.42	3.65	5.85	3.90	2.80
13				.98				3.95	5.80	3.90	2.80
14	1.44	1.08		.98	1.14	1.09	1.47	4.25	5.75	3.85	2.80
15		1.06	1.00				1.49	4.35	5.70	3.80	2.80
16	1.42	1.04	1.00	1.04	1.14	1.10		4.50	5.65	3.75	2.72
17		1.04	1.04	1.04				4.65	5.60	3.75	2.70
18		1.04	1.08	1.00		1.11	1.54	4.85	5.55	3.70	2.65
19		1.04	1.08	1.02	1.16			5.15	5.50	3.65	2.65
20	1.38		1.04	1.00	1.16			5.25	5.45	3.60	2.60
21		1.04	1.02	.98		1.12	1.80	5.35	5.30	3.55	2.55
22		1.04	1.02	.98				5.45	5.20	3.50	2.55
23	1.36	1.02	1.00	1.00	1.14	1.12		5.55	5.15	3.50	2.55
24	1.34	1.00	1.00	1.02			2.28	5.60	5.15	3.40	2.50
25	1.34			1.00	1.14	1.13		5.70	5.00	3.30	2.45
26	1.32	1.00	1.00	1.00	1.16			5.90	4.95	3.30	2.45
27	1.30		1.00	1.02	1.16	1.14		6.05	4.85	3.25	2.43
28	1.30		1.00		1.16		2.35	6.15	4.80	3.20	2.40
29	1.28		1.00					6.30	4.70	3.20	2.40
30	1.28		1.02			1.16	2.54	6.28	4.65	3.15	2.37
31	1.28		1.02						4.60	3.15	

NOTE.—The gage-height record shows approximate stages in Yellowstone Lake, but owing to a small amount of fall between the main body of lake and gage, daily elevations derived from the gage below the outlet are slightly less than those obtained from the gage in Yellowstone Lake at the Lake Hotel. Gage heights for period July 10–20 were corrected on basis of graphic comparison with readings obtained at Lake Hotel, because original readings by observer were in error.

Daily discharge, in second-feet, of Yellowstone River at Yellowstone Lake outlet, Yellowstone National Park, for the year ending September 30, 1927

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	795		575		628			642	1,480	7,420	4,180	2,040
2	795		575	575	628			656	1,490	7,220	4,090	1,980
3	795		575		628		610	671	1,500	7,220	4,010	1,980
4	795		575	575	628			685	1,510	7,220	3,920	1,860
5	795		575	575	628			692	1,650	7,220	3,760	1,860
6	770		575	560	628		610	698	1,780	7,020	3,760	1,810
7	770	650	575	575	628		610	705	1,920	6,820	3,600	1,760
8	770		575	575	628		610	715	2,040	6,820	3,440	1,760
9	748		575	560	628		610	725	2,160	6,820	3,440	1,760
10	748		575	560	628		610	725	2,340	6,820	3,280	1,760
11	748		575	575	628		610	725	2,620	6,620	3,210	1,700
12	748		575	575	628		610	725	2,760	6,430	3,130	1,700
13	748		575	575	629		610	736	3,210	6,430	3,130	1,700
14	748	610	575	575	628		610	748	3,680	6,430	3,060	1,700
15	736	592	575	584	628		610	770	3,840	6,240	2,980	1,700
16	725	592	575	592	628	620	610	778	4,090	6,050	2,900	1,600
17	725	592	592	592	628		610	786	4,260	6,050	2,900	1,600
18	725	592		575	628		610	795	4,600	6,050	2,830	1,560
19	725	592	592	575	628		610	838	5,310	5,860	2,760	1,560
20	725	592	592	575	628		610	882	5,310	5,680	2,680	1,510
21	718	592	575	575	628		610	925	5,680	5,490	2,620	1,460
22	712	592	575	575	628		610	1,040	5,680	5,310	2,540	1,460
23	705	575	575	575	628		610	1,150	6,050	5,310	2,540	1,460
24	705	575	575	575	628		619	1,260	6,050	5,310	2,410	1,420
25	705	575	575	575	628		628	1,270	6,240	4,950	2,280	1,380
26	685	575	575	575	628		628	1,280	6,620	4,950	2,280	1,380
27	685	575	575	575	628		628	1,290	6,820	4,600	2,220	1,380
28	685	575	575	586	628		628	1,300	7,220	4,600	2,160	1,340
29	685	575	575	596	-------		628	1,380	7,420	4,430	2,160	1,340
30	685	575	575	607	-------		628	1,460	7,420	4,260	2,100	1,300
31	685	-------	575	617	-------		-------	1,470	-------	4,260	2,100	-------

NOTE.—Discharge estimated on account of slight ice effect Dec. 9–10, 18–19, and Jan. 2, 3, because of missing gage heights, Nov. 1–13, Mar. 1–31, and Apr. 1–5; discharge interpolated during other short periods of missing gage heights.

Monthly discharge of Yellowstone River at Yellowstone Lake outlet, Yellowstone National Park, for the year ending September 30, 1927

[Drainage area, 1,010 square miles]

Month	Discharge in second-feet				Run-off	
	Maximum	Minimum	Mean	Per square mile	Inches	Acre-feet
October	795	685	735	0.728	0.84	45,200
November	----------	575	613	.607	.68	36,500
December	----------	----------	577	.571	.66	35,500
January	617	560	578	.572	.66	35,500
February	628	628	628	.622	.65	34,900
March	----------	----------	620	.614	.71	38,100
April	628	----------	614	.608	.68	36,500
May	1,470	642	920	.911	1.05	56,600
June	7,420	1,480	4,090	4.05	4.52	243,000
July	7,420	4,260	6,000	5.94	6.85	369,000
August	4,180	2,100	2,980	2.95	3.40	183,000
September	2,040	1,300	1,630	1.61	1.80	97,000
The year	7,420	560	1,670	1.65	22.50	1,210,000

YELLOWSTONE RIVER NEAR CANYON HOTEL, YELLOWSTONE NATIONAL PARK

LOCATION.—Half a mile upstream from Upper Falls and Canyon ranger station, 1¼ miles south of Canyon Hotel, and 13 miles below outlet of Lake Yellowstone.

DRAINAGE AREA.—1,280 square miles (measured on topographic maps).

RECORDS AVAILABLE.—June 21, 1913, to September 30, 1927.

EQUIPMENT.—Stevens continuous water-stage recorder on left bank, 450 feet above Chittenden Bridge. Discharge measurements made from cable one-fifth mile above gage.

CHANNEL AND CONTROL.—Bed composed of gravel and boulders. One channel at all stages. Control formed by upper part of Upper Yellowstone Falls; permanent for long periods.

EXTREMES OF DISCHARGE.—Maximum stage during year, from water-stage recorder, 4.23 feet from 7 to 10 p. m. June 30 (discharge, 7,890 second-feet); minimum, 0.83 foot October 13 and 14 (discharge, 758 second-feet). Lower stage and discharge occurred during winter, when observations were discontinued.

1913–1927: Maximum stage recorded, 4.50 feet June 27, 1918 (discharge, 8,550 second-feet); minimum, 0.72 foot September 6, 1919 (discharge, 664 second-feet). Not actual minimum.

DIVERSIONS AND REGULATION.—None.

ACCURACY.—Stage-discharge relation permanent; observations discontinued during winter. Rating curve well defined between 1,000 and 8,000 second-feet on basis of 17 discharge measurements made during 1925 to 1927, of which six measurements, ranging from 1,770 to 7,850 second-feet, were made during the year. Operation of water-stage recorder satisfactory except for two short periods. Daily discharge ascertained by applying to rating table mean daily gage height obtained by inspection of recorder graph, except as noted in footnote to table of daily discharge. Records excellent.

Daily discharge, in second-feet, of Yellowstone River near Canyon Hotel, Yellowstone National Park, for the year ending September 30, 1927

Day	Oct.	May	June	July	Aug.	Sept.	Day	Oct.	May	June	July	Aug.	Sept.
1	818	-------	1,840	7,710	4,430	2,280	16	------	-------	4,740	6,250	3,300	1,750
2	810	-------	1,930	7,710	4,360	2,220	17	------	-------	4,970	6,110	3,200	1,730
3	818	-------	1,980	7,710	4,280	2,140	18	------	-------	5,090	5,980	3,090	1,700
4	802	-------	2,080	7,530	4,280	2,080	19	------	-------	5,330	5,840	3,090	1,650
5	795	-------	2,080	7,530	4,170	2,040	20	------	-------	5,580	5,580	2,980	1,600
6	795	-------	2,400	7,530	4,060	2,000	21	------	-------	5,710	5,580	2,980	1,570
7	802	-------	2,440	7,350	3,950	1,960	22	------	-------	5,840	5,460	2,880	1,560
8	810	-------	2,780	7,180	3,840	1,910	23	------	-------	5,980	5,400	2,880	1,540
9	780	-------	2,880	7,180	3,730	1,890	24	------	-------	6,250	5,330	2,780	1,570
10	772	-------	3,090	7,010	3,620	2,040	25	------	-------	6,390	5,210	2,670	1,500
11	788	-------	3,410	7,010	3,520	1,990	26	------	-------	6,690	5,100	2,630	1,470
12	772	-------	3,620	6,850	3,520	1,940	27	------	-------	7,010	4,980	2,550	1,430
13	758	-------	3,950	6,690	3,410	1,900	28	------	-------	7,350	4,860	2,490	1,430
14	758	-------	4,170	6,540	3,410	1,850	29	------	-------	7,530	4,740	2,420	1,410
15	------	-------	4,400	6,390	3,300	1,800	30	------	-------	7,710	4,630	2,400	1,390
							31	------	1,890	-------	4,510	2,360	------

NOTE.—Discharge interpolated on account of missing gage heights July 23, 25–30, Aug. 1, 2, and Sept. 11–14.

Monthly discharge of Yellowstone River near Canyon Hotel, Yellowstone National Park, for the year ending September 30, 1927

[Drainage area, 1,280 square miles]

Month	Discharge in second-feet				Run-off	
	Maximum	Minimum	Mean	Per square mile	Inches	Acre-feet
October 1–14	818	758	791	0.618	0.322	22,000
June	7,710	1,840	4,510	3.52	3.93	268,000
July	7,710	4,510	6,240	4.88	5.63	384,000
August	4,430	2,360	3,310	2.59	2.99	204,000
September	2,280	1,390	1,780	1.39	1.55	106,000

YELLOWSTONE RIVER AT CORWIN SPRINGS, MONT.

LOCATION.—In NE. ¼ sec. 30, T. 8 S., R. 8 E., at highway bridge in canyon at Corwin Springs, Park County, 8 miles north of Gardiner.

DRAINAGE AREA.—2,630 square miles.

RECORDS AVAILABLE.—September 2, 1910, to September 30, 1927.

EQUIPMENT.—Chain gage fastened to floor of highway bridge on downstream side near right bank. Discharge measurements made from downstream side of bridge.

CHANNEL AND CONTROL.—Bed of stream composed of small rocks. Current swift at all stages; no definite control, but there has been no shift since station was established. Banks high and not subject to overflow.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 10.0 feet at 9 a. m. June 27 (discharge, 21,500 second-feet); minimum, 0.75 foot December 13 and 14 (discharge, 890 second-feet).

1910–1927: Maximum stage recorded, 11.5 feet June 14 and 15, 1918 (discharge, from extension of rating curve, 26,500 second-feet); minimum discharge, estimated, 720 second-feet January 8–10, 1920.

DIVERSIONS AND REGULATION.—No water diverted from Yellowstone River above station. Yellowstone Lake furnishes a natural but uncontrolled regulation.

ACCURACY.—Stage-discharge relation permanent during year except as affected by ice. Rating curve well defined between 1,000 and 18,300 second-feet; extended beyond these limits. No discharge measurements were made during the year. Gage read to hundredths once daily. Daily discharge ascertained by applying daily gage height to rating table except as indicated in footnote to table of daily discharge. Records good except those for estimated periods, which are fair.

Daily discharge, in second-feet, of Yellowstone River at Corwin Springs, Mont., for the year ending September 30, 1927

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1,450	1,200	1,180	985	985	1,070	1,100	5,380	5,380	14,600	5,590	3,190
2	1,450	1,180	1,180	985	985	1,070	1,100	4,600	4,980	13,400	5,590	3,190
3	1,450	1,180	1,180	985	985	1,100	1,140	3,610	5,800	13,400	5,380	3,060
4	1,450	1,180	1,180	985	985	1,100	1,140	3,060	5,800	13,400	5,380	3,000
5	1,400	1,140	1,140	985	1,010	1,100	1,140	2,860	6,490	12,800	5,180	2,930
6	1,400	1,140	1,140	985	1,010	1,100	1,140	2,620	8,230	12,200	4,790	2,800
7	1,400	1,100	1,140	1,010	1,010	1,100	1,140	2,620	11,000	12,200	4,790	2,800
8	1,400	1,070	1,140	1,010	1,010	1,070	1,180	2,620	14,000	12,200	4,600	2,800
9	1,400	1,070	1,070	985	960	1,070	1,180	2,400	15,500	11,600	4,600	2,800
10	1,400	1,070	1,100	985	960	1,070	1,100	2,280	14,000	11,000	4,420	3,330
11	1,450	1,100	1,100	985	960	1,100	1,100	2,280	18,300	10,400	4,240	3,330
12	1,450	1,100	985	985	970	1,100	1,100	2,400	18,900	9,870	4,240	3,000
13	1,400	1,140	890	985	970	1,100	1,100	2,400	18,300	9,870	4,240	2,800
14	1,400	1,100	890	985	985	1,100	1,070	3,330	19,600	9,310	4,420	2,740
15	1,400	1,100	900	985	985	1,100	1,100	4,790	19,600	9,310	4,420	2,740
16	1,400	1,100	1,000	985	985	1,070	1,100	7,220	19,600	8,760	4,240	2,740
17	1,360	1,100	1,000	985	1,010	1,070	1,100	9,870	18,900	8,230	4,240	2,680
18	1,360	1,100	1,000	985	1,040	1,070	1,100	10,200	18,300	8,230	4,070	2,560
19	1,360	1,100	1,140	985	1,040	1,070	1,140	7,970	19,300	7,970	3,900	2,500
20	1,360	1,100	1,100	985	1,040	1,010	1,140	6,730	19,300	7,720	3,900	2,450
21	1,310	1,100	1,100	935	1,040	1,040	1,140	5,800	17,100	7,470	3,900	2,450
22	1,310	1,180	1,040	935	1,040	1,070	1,220	5,800	17,100	7,220	3,750	2,450
23	1,310	1,220	985	935	1,040	1,070	1,140	4,980	18,300	7,220	3,610	2,450
24	1,260	1,220	985		1,040	1,070	1,260	4,600	19,600	6,970	3,610	2,500
25	1,260	1,220			1,040	1,070	1,600	4,790	19,600	6,730	3,610	2,500
26	1,260	1,220			1,040	1,070	2,060	5,800	20,200	6,490	3,330	2,400
27	1,260	1,180	1,000	1,000	1,070	1,070	3,000	6,490	21,500	6,250	3,330	2,280
28	1,360	1,180			1,070	1,100	3,900	6,490	18,900	6,020	3,330	2,280
29	1,220	1,180			-------	1,070	4,420	5,800	17,400	6,250	3,330	2,280
30	1,180	1,180			-------	1,070	4,790	5,380	15,800	6,020	3,330	2,340
31	1,220	-------	1,100	1,040	-------	1,100	-------	5,180	--------	5,800	3,330	------

NOTE.—Discharge estimated because of ice Dec. 12–18, 25–30, Jan. 13, 24–30, and Feb. 12 and 13.

Monthly discharge of Yellowstone River at Corwin Springs, Mont., for the year ending September 30, 1927

[Drainage area, 2,630 square miles]

Month	Discharge in second-feet				Run-off	
	Maximum	Minimum	Mean	Per square mile	Inches	Acre-feet
October	1,450	1,180	1,360	0.517	0.60	83,600
November	1,220	1,070	1,140	.434	.48	67,800
December	1,180	890	1,050	.399	.46	64,600
January	1,040	935	987	.375	.43	60,700
February	1,070	960	1,010	.384	.40	56,100
March	1,100	1,040	1,080	.411	.47	66,400
April	4,790	1,070	1,560	.593	.66	92,800
May	10,200	2,280	4,850	1.84	2.12	298,000
June	21,500	4,980	15,600	5.93	6.62	928,000
July	14,600	5,800	9,320	3.54	4.08	573,000
August	5,590	3,330	4,220	1.60	1.84	259,000
September	3,330	2,280	2,710	1.03	1.15	161,000
The year	21,500	890	3,740	1.42	19.31	2,710,000

YELLOWSTONE RIVER AT INTAKE, MONT.

LOCATION.—In NW. ¼ sec. 36, T. 18 N., R. 56 E., at Lower Yellowstone diversion dam at Intake, Dawson County, 18 miles below Glendive.

DRAINAGE AREA.—66,800 square miles (measured on base maps of Montana and Wyoming).

RECORDS AVAILABLE.—January 1, 1911, to September 30, 1927. At Glendive, 18 miles above, by War Department and Department of Agriculture, 1893 to 1903, and by Geological Survey August 1, 1903, to December 31, 1910.

EQUIPMENT.—Chain gage on left abutment of dam. Gage readings represent depth of water on crest of dam. Discharge measurements made from bridge at Glendive or from ferryboat 100 feet below dam.

CHANNEL AND CONTROL.—Dam forming the principal control is a rock-filled timber-crib structure on pile foundation 700 feet long, crosses the stream at right angles to current, and raises low-water level about 4 feet; specially designed to resist the destructive effects of ice by approach on a slope of 3 to 1; downstream face is ogee-shaped and protected by a heavy rock apron.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 9.4 feet July 1 (discharge, 101,000 second-feet); minimum, 0.70 foot December 21 and 22 (discharge, 3,010 second-feet).

1903–1927: Maximum stage recorded, 12.6 feet June 21, 1921 (discharge, 159,000 second-feet); minimum, 0.2 foot December 6–8, 1922, and January 6 and 7, 1923 (discharge, estimated because of ice, 1,200 second-feet).

DIVERSIONS AND REGULATION.—The Lower Yellowstone Canal, which diverts water to irrigate 66,000 acres, heads at left abutment of dam. Of the several diversions from the main streams above station the United States Bureau of Reclamation Huntley project and the Billings Carey Act project are the largest. There are also numerous diversions from the tributaries. Yellowstone Lake and Shoshone Reservoir form the only important regulation and control only a small part of the flood flow.

ACCURACY.—Stage-discharge relation probably permanent; slightly affected by ice. Rating curve well defined below 80,000 second-feet and fairly well above by fourteen discharge measurements made prior to 1927. No measurements made during the year. Gage read to half-tenths twice daily. Daily discharge ascertained by applying mean daily gage height to rating table. Records good.

Daily discharge, in second-feet, of Yellowstone River at Intake, Mont., for the year ending September 30, 1927

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	9,550	8,090	1,100	8,370	6,250	11,500	8,370	15,800	37,200	101,000	19,000	15,100
2	9,550	8,090	11,500	8,090	7,270	9,860	8,370	18,200	31,600	89,700	20,600	15,100
3	9,550	7,810	12,800	8,090	7,810	8,660	8,370	19,800	29,600	75,300	23,200	15,100
4	12,200	7,270	11,500	7,810	7,810	8,370	7,810	19,800	33,800	67,600	22,300	12,800
5	11,100	7,270	10,200	7,810	7,810	8,950	7,810	19,200	32,700	59,800	21,500	12,200
6	9,550	7,540	8,370	7,810	7,810	12,200	7,810	20,200	30,600	53,800	20,600	11,500
7	9,250	7,810	7,540	8,370	7,810	19,800	7,810	18,600	29,600	50,800	19,800	11,500
8	8,950	7,810	6,750	8,370	7,810	22,300	7,810	18,600	31,600	47,900	19,000	10,800
9	8,370	7,810	7,270	8,370	8,370	19,800	7,270	19,800	41,000	42,200	18,600	10,200
10	8,950	8,370	9,550	7,810	8,660	14,700	7,270	20,600	50,800	41,000	18,600	10,200
11	8,950	8,370	10,800	7,810	8,660	11,800	6,750	20,700	59,800	38,400	18,200	10,500
12	8,950	7,810	9,550	8,090	7,810	11,500	6,750	33,800	70,600	37,200	17,400	10,800
13	8,640	7,810	9,250	7,810	7,810	11,100	6,750	32,700	75,300	36,000	17,000	18,200
14	8,950	7,810	8,950	7,540	7,270	11,500	7,270	26,700	76,800	33,800	17,800	19,000
15	8,370	7,810	8,370	7,540	7,270	12,800	7,810	23,600	81,600	32,700	22,300	18,600
16	8,370	7,270	7,810	7,270	6,750	19,000	8,370	20,600	84,800	33,800	24,900	17,400
17	8,370	7,270	6,250	6,750	6,500	13,200	8,950	20,600	83,200	32,700	26,700	15,400
18	8,370	7,270	5,280	6,250	6,750	10,800	10,200	21,500	84,800	32,700	25,800	13,600
19	8,370	7,270	4,350	5,280	6,250	10,200	12,500	25,800	84,800	30,600	23,200	13,600
20	8,370	7,270	4,120	5,280	6,250	9,550	11,800	33,800	84,800	27,600	20,200	13,600
21	9,090	7,270	3,010	5,280	6,500	9,550	12,200	42,200	83,200	25,800	17,800	13,600
22	8,090	7,270	3,010	5,280	7,010	9,550	11,500	43,600	83,200	24,900	16,600	12,500
23	8,090	5,760	3,900	5,280	7,810	9,550	10,200	41,000	86,400	24,900	16,600	11,500
24	8,370	3,900	8,950	5,040	11,500	9,550	9,550	39,600	83,200	23,200	17,400	11,100
25	8,950	6,000	10,800	5,760	15,100	9,950	8,370	42,200	75,300	24,000	18,200	11,100
26	8,950	5,280	10,200	4,350	18,200	9,950	8,370	36,000	73,800	23,200	18,200	10,800
27	8,370	6,750	9,550	4,350	17,400	8,950	8,950	30,600	78,400	22,300	17,400	10,500
28	8,090	7,810	8,370	4,350	15,100	8,950	10,200	28,600	81,600	20,600	16,600	10,800
29	8,090	8,370	8,370	4,810	-------	8,950	11,800	36,000	84,800	19,800	16,600	11,500
30	8,090	9,550	8,370	5,280	-------	8,950	13,600	45,000	91,400	19,800	15,800	12,800
31	8,090	-------	7,810	5,760	-------	8,950	-------	42,600	-------	19,800	15,100	-------

NOTE.—Stage-discharge relation slightly affected by ice on dam Nov. 18–20 and Mar. 26–30; discharge interpolated.

Monthly discharge of Yellowstone River at Intake, Mont., for the year ending September 30, 1927

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	12,200	8,090	8,840	544,000
November	9,550	3,900	7,390	440,000
December	12,800	3,010	8,180	503,000
January	8,370	4,350	6,650	409,000
February	18,200	6,250	8,830	490,000
March	22,300	8,370	11,600	713,000
April	13,600	6,750	9,020	537,000
May	45,000	15,800	28,300	1,740,000
June	91,400	29,600	65,200	3,880,000
July	101,000	19,800	39,100	2,400,000
August	26,700	15,100	19,500	1,200,000
September	19,000	10,200	13,000	774,000
The year	101,000	3,010	18,800	13,600,000

TOWER CREEK AT TOWER FALLS, YELLOWSTONE NATIONAL PARK

LOCATION.—A short distance above Tower Falls and bridge on highway leading to Camp Roosevelt, a quarter of a mile above junction of Tower Creek with Yellowstone River, and 2 miles southeast of Camp Roosevelt.

DRAINAGE AREA.—51 square miles (measured on topographic maps).

RECORDS AVAILABLE.—September 2, 1922, to September 30, 1927.

EQUIPMENT.—Vertical staff on right bank. Discharge measurements made from footbridge three-eighths mile above gage or by wading.

CHANNEL AND CONTROL.—Bed composed of lava rock, boulders, and gravel. One channel at all stages. Control formed by rock riffle 30 feet below gage; well defined and fairly permanent.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 6.1 feet June 22, 25, and 26 (discharge, 583 second-feet); minimum discharge, 17 second-feet March 26–31. Probably not actual minimum.

1922–1927: Maximum stage recorded, 6.16 feet May 30, 1925 (discharge, 642 second-feet); minimum, 3.38 feet May 6, 1924 (discharge, 13 second-feet).

DIVERSIONS AND REGULATION.—None.

ACCURACY.—Stage-discharge relation changed June 9 and 10; not affected by ice because of springs and snow cover. Rating curve used October 1 to June 8 is well defined between 25 and 100 second-feet by thirteen discharge measurements made in 1925 and 1926; curve used after June 10 is well defined between 35 and 450 second-feet by eight measurements ranging from 35 to 443 second-feet made during the year. Gage read to hundredths about once daily June 11 to September 10; at other times less frequently. Daily discharge determined by applying daily gage height to rating table except as indicated in footnote to table of daily discharge. Records after June 10 good; others fair.

Daily discharge, in second-feet, of Tower Creek at Tower Falls, Yellowstone National Park, for the year ending September 30, 1927

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1		25	23			20			110	327	65	38
2		25				20		100	89	298	64	37
3	27		25	20					92	269	60	36
4					19		18	51	96	269	56	36
5		22	28			20			98	242	55	36
6	27			19					100	229	52	36
7					19				105	204	52	36
8		20		20			18		110	192	52	35
9						21		40	225	181	50	48
10					19				340	170	48	61
11				23			18		455	160	46	50
12		20							472	149	49	39
13									526	139	62	38
14			25	23	19			54	526	130	75	37
15	26						18	96	545	120	55	36
16								138	564	110	49	36
17		37				19		180	564	101	47	36
18				23	20			222	554	98	45	36
19		35							545	95	45	36
20							25		526	86	45	35
21		28		20				125	564	86	43	35
22			23						583	80	44	34
23		30			20				564	78	42	32
24				20				87	564	74	41	33
25	25						46	104	583	76	40	34
26			22	20		17	51	122	583	72	40	35
27				19		17	56		545	69	39	35
28	25	25				17		120	490	64	38	35
29						17	80		422	65	44	35
30						17		106	373	68	42	35
31		-------	21	18	-------		-------	108	-------	66	39	------

NOTE.—Discharge estimated or interpolated Nov. 1, Mar. 1, 27, 28, Apr. 26, May 15–17, 25, 31, June 3, 5, 7, 9, 10, 15, 18, July 11, 26, 31, Aug. 3, 10, 13, 17, Sept. 4, 9, 11, 13, 14, 16, 18–20, 22, 24, 25, and 27–30. Estimate based on weather records and flow of other streams in the park.

Monthly discharge of Tower Creek at Tower Falls, Yellowstone National Park, for the year ending September 30, 1927

[Drainage area, 51 square miles]

Month	Discharge in second-feet				Run-off	
	Maximum	Minimum	Mean	Per square mile	Inches	Acre-feet
October			26.0	0.510	0.59	1,600
November			25.2	.494	.55	1,500
December			24.1	.473	.55	1,480
January			20.5	.402	.46	1,260
February			19.5	.382	.40	1,080
March			18.9	.371	.43	1,160
April			29.6	.580	.65	1,760
May	222		94.0	1.84	2.12	5,780
June	583	89	397	7.78	8.68	23,600
July	327	64	141	2.76	3.18	8,670
August	75	38	49.2	.965	1.11	3,030
September	61	32	37.4	.733	.82	2,230
The year	583		73.4	1.44	19.54	53,200

LAMAR RIVER NEAR TOWER FALLS RANGER STATION, YELLOWSTONE NATIONAL PARK

LOCATION.—Half a mile north of Cooke City road, three-fourths mile above junction with Yellowstone River, and 2 miles northeast of Tower Falls ranger station.

DRAINAGE AREA.—640 square miles (measured on topographic maps).

RECORDS AVAILABLE.—September 2, 1922, to September 30, 1927.

EQUIPMENT.—Au continuous water-stage recorder on left bank. Gage datum lowered 1.00 foot on July 29, 1927. Discharge measurements made from cable 50 feet below gage or by wading.

CHANNEL AND CONTROL.—Bed composed of lava rock, boulders, gravel, and sand. One channel at all stages. Control is formed by gravel and boulder riffle 200 feet below gage; well defined and practically permanent.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, from high-water marks on gage, 8.62 feet May 17 (discharge, 13,100 second-feet); minimum discharge, estimated 125 second-feet December 12–15, during extremely cold period. Probably not actual minimum.

1922–1927: Maximum stage recorded, that of May 17, 1927; minimum, −0.08 foot April 20, 1924 (discharge, 104 second-feet). Lower stage and discharge have occurred during periods of no record.

DIVERSIONS AND REGULATION.—None.

ACCURACY.—Stage-discharge relation permanent except as affected by ice during winter. Owing to difference in gage readings at certain stages between the outside and inside staff gages, two rating curves were used; the first, referred to outside staff, used January 6 to April 30, May 1–15, 21–25, 28–31, and June 1–4, is well defined between 150 and 9,000 second-feet; the second, referred to inside staff, was used during remainder of year and is well defined between 150 and 11,000 second-feet, based on nine discharge measurements made during 1925 to 1927, of which four measurements ranging from 558 to 10,200 second-feet were made during the year. Operation of water-stage recorder satisfactory October 1 to December 31 and after June 5; staff gage read at irregular intervals during intervening period. Daily discharge ascertained by applying daily and mean daily gage height to rating table except as indicated in footnote to table of daily discharge. Records October 1 to December 5 and June 6 to September 30 excellent; others fair except those for estimated periods, which are poor.

Daily discharge, in second-feet, of Lamar River near Tower Falls ranger station, Yellowstone National Park, for the year ending September 30, 1927

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	226	180	175						1,750	4,700	744	321
2	247	168	172						1,740	4,100	820	374
3	235	188	175		170			1,300	1,950	3,940	730	325
4	247	172	185						2,160	4,020	685	293
5	229	160	175					920	3,170	3,620	601	289
6	254	180	160						4,180	3,240	560	274
7	271	178							5,920	3,100	543	264
8	282	165						750	8,010	2,960	521	271
9	250	158	150						8,670	2,750	526	321
10	247	158		175					8,010	2,680	505	388
11	241	170						654	10,700	2,360	500	435
12	250	168					180		11,200	2,180	460	341
13	235	165	125		150			1,000	10,300	1,900	495	313
14		158							11,000	1,740	583	325
15		138						1,640	11,200	1,640	577	317
16		142				175		3,100	10,700	1,540	532	293
17		188						9,570	1,390	455	278	
18		305	170					10,000	9,110	1,300	425	264
19		325							10,000	1,260	420	254
20	200	333						5,000	9,800	1,170	420	250
21		357						2,260	7,790	1,120	425	247
22		325		130					8,010	1,090	470	244
23		281						2,000	9,110	1,040	480	247
24		237							10,000	989	392	337
25		193			160		400	2,160	9,340	898	365	297
26	190	241	150				545	2,520	9,800	890	345	260
27	211	250					1,220	2,880	10,300	806	337	244
28	229	250					1,890	2,500	8,670	771	321	238
29	182	225		160			2,160	2,210	7,150	764	317	268
30	155	200					2,260	1,980	5,720	724	333	268
31	185	-------					-------	1,740	--------	698	383	------

NOTE.—Discharge estimated because of ice and missing gage heights Oct. 14–25, Nov. 23, 24, 29, 30, Dec. 7 to Mar. 31, Apr. 1–25, 27, May 1–4, 6–10, 12–14, 17–20, 22–24, 26, 28, 30, June 1, 3, and 5, on basis of weather records and flow of other streams in the park.

Monthly discharge of Lamar River near Tower Falls ranger station, Yellowstone National Park, for the year ending September 30, 1927

[Drainage area, 640 square miles]

Month	Discharge in second-feet				Run-off	
	Maximum	Minimum	Mean	Per square mile	Inches	Acre-feet
October	282	155	218	0.341	0.39	13,400
November	357	138	212	.331	.37	12,600
December	----------	----------	155	.242	.28	9,530
January	----------	----------	163	.255	.29	10,000
Feburary	----------	----------	156	.244	.25	8,660
March	----------	----------	175	.273	.31	10,800
April	2,260	----------	434	.678	.76	25,800
May	----------	----------	2,340	3.66	4.22	144,000
June	11,200	1,740	7,830	12.2	13.61	466,000
July	4,700	698	1,980	3.09	3.56	122,000
August	820	317	493	.770	.89	30,300
September	435	238	295	.461	.51	17,600
The year	----------	----------	1,200	1.88	25.44	871,000

GARDINER RIVER AT MAMMOTH HOTEL, YELLOWSTONE NATIONAL PARK

LOCATION.—A quarter of a mile downstream from footbridge on trail crossing leading to Mount Everts, three-eighths mile below inflow from Mammoth Hot Springs, nine-tenths mile northeast of Mammoth Hotel, and 5 miles above junction with Yellowstone River.

DRAINAGE AREA.—201 square miles (measured on topographic map).

RECORDS AVAILABLE.—September 3, 1922, to September 30, 1927.

EQUIPMENT.—Au water-stage recorder on left bank; installed July 30, 1927. From June 10 to July 29, 1927, a vertical staff gage at present site and datum was used. Prior to June 10, 1927, gage was a vertical staff a quarter of a mile upstream at different datum from present gage. Discharge measurements made from footbridge a quarter of a mile upstream from present gage or by wading.

CHANNEL AND CONTROL.—Bed composed of gravel and boulders. One channel at all stages. Control formed by stretch of the stream bed below gage.

EXTREMES OF DISCHARGE.—Maximum discharge recorded during year, 1,540 second-feet during early morning of June 12; minimum discharge, 62 second-feet November 17 and April 11.

1922–1927: Maximum and minimum discharges recorded, same as for 1927. Lower flow may have occurred during extremely cold period December 17–26, 1924, when gage was not read.

DIVERSIONS AND REGULATION.—None.

ACCURACY.—Stage-discharge relation changed May 1 and 17, below old gage site; permanent after June 9, at new gage site; not affected by ice, owing to warm springs above. Rating curves for old gage not well defined; rating curve for new gage, used after June 10, well defined between 100 and 1,800 second-feet. Seven discharge measurements, covering a range from 162 to 1,470 second-feet, were made during the year. Staff gage read to hundredths once daily October 1 to July 29, except during winter, when readings were not made regularly; thereafter operation of water-stage recorder was satisfactory. Daily discharge ascertained by applying daily or mean daily gage height to rating table, except as noted in footnote to table of daily discharge. Records fair prior to July 29; excellent thereafter.

Daily discharge, in second-feet, of Gardiner River at Mammoth Hotel, Yellowstone National Park, for the year ending September 30, 1927

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	105	82	86	77			69	419	416	800	236	145
2	110	82	90	77			73	371	433	744	243	147
3	105	82	100	73			69	285	433	674	226	142
4	100	77	105	82			69	265	488	660	216	139
5	95	82	105	73			66	285	506	640	207	139
6	95	86	116	73		80	73	246	657	601	200	136
7	95	82	86	69			73	211	891	563	200	134
8	95	82	77	73			77	195	1,090	524	200	142
9	95	86	69	77			66	180	1,090	486	200	147
10	95	86	69	77			73	188	1,070	480	194	268
11	100	86	77	82	75	77	62	195	1,350	455	191	188
12	95	86	77	77		77	66	203	1,500	430	185	164
13	95	86	69	77		80	69	228	1,300	403	197	159
14	95	86	69	77		82	66	246	1,320	385	207	159
15	95	77	73	82			66	285	1,350	376	194	147
16	95	69	86	82			69	635	1,350	351	188	142
17	95	62	95	82			66	1,010	1,300	326	179	139
18	95	95	95	82		70	69	852	1,220	318	173	136
19	95	77	86	82			82	469	1,260	310	170	134
20	95	86	82	77			90	619	1,260	302	170	132
21	95	90	77	73	77		100	657	1,160	298	167	126
22	95	100	77	69	73	69	69	469	1,190	279	182	129
23	95	100	82	73	69	76	73	381	1,260	279	170	129
24	95	95	77	77	73	82	110	348	1,300	272	161	132
25	95	90	77	77	77	69	133	381	1,260	264	153	134
26	90	86	77	77		69	146	364	1,350	260	153	129
27	86	90	77		75	69	159	381	1,300	243	150	126
28	96	90	77			69	166	381	1,160	243	147	136
29	86	86	77	80	-------	73	166	398	1,010	236	150	142
30	82	86	82		-------	72	173	381	891	240	161	142
31	82	-------	77		-------	70	-------	398	-------	236	159	-------

NOTE.—Gage-height record missing Jan. 23, 25, Jan. 27 to Feb. 20, Feb. 22, 24, Feb. 26 to Mar. 10, Mar. 13, 15–21, 23, 26, 27, 30, 31, June 14, July 6, 7; discharge interpolated or estimated.

Monthly discharge of Gardiner River at Mammoth Hotel, Yellowstone National Park, for the year ending September 30, 1927

[Drainage area, 201 square miles]

Month	Discharge in second-feet				Run-off	
	Maximum	Minimum	Mean	Per square mile	Inches	Acre-feet
October	110	82	94.6	0.471	0.54	5,820
November	100	62	85.0	.423	.47	5,060
December	116	69	82.9	.412	.48	5,100
January	----------	69	77.3	.385	.44	4,750
February	----------	----------	74.8	.372	.39	4,150
March	----------	----------	75.0	.373	.43	4,610
April	173	62	90.3	.449	.50	5,370
May	1,010	180	385	1.92	2.21	23,700
June	1,500	416	1,070	5.32	5.94	63,700
July	800	236	409	2.03	2.34	25,100
August	243	147	185	.920	1.06	11,400
September	268	126	145	.721	.80	8,630
The year	1,500	62	231	1.15	15.60	167,000

STILLWATER RIVER NEAR NYE, MONT.

LOCATION.—In SE. ¼ sec. 32, T. 5 S., R. 15 E., in Beartooth National Forest, 1,000 feet above mouth of Woodbine Creek and 8 miles southwest of Nye, Stillwater County.

DRAINAGE AREA.—Not measured.

RECORDS AVAILABLE.—May 12, 1924, to September 30, 1927, when station was discontinued.

EQUIPMENT.—Stevens 8-day water-stage recorder in wooden shelter on left bank. Chain gage below mouth of Woodbine Creek read during winter. Discharge measurements made from cable below mouth of Woodbine Creek. Flow of Woodbine Creek is subtracted to obtain discharge at gage.

CHANNEL AND CONTROL.—Channel composed of heavy boulders and cobblestones. Gradient of channel is steep. Control poorly defined.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 6.75 feet at 1 a. m. June 27 (discharge, 6,520 second-feet); minimum discharge, 25 second-feet March 26 and April 21.

1924–1927: Maximum stage recorded, that of June 27, 1927; minimum discharge, 20 second-feet February 28, 1926.

DIVERSIONS AND REGULATION.—None.

ACCURACY.—Stage-discharge relation not permanent; affected by ice. Rating curves used October 1 to November 17 and November 18 to April 27 well defined below 1,300 second-feet; curve used after April 28 well defined between 100 and 4,500 second-feet. Six discharge measurements, covering a range from 62 to 4,440 second-feet, were made during the year. Operation of water-stage recorder satisfactory October 1 to November 17 and April 28 to September 9. Chain gage read to half-tenths twice daily November 18 to April 27. Daily discharge ascertained by applying mean daily gage height to rating table, subtracting daily flow of Woodbine Creek from records for period of chain gage readings, except as indicated in footnote to table of daily discharge. Low and medium stage records good for periods when recorder was in operation; other records poor.

Daily discharge, in second-feet, of Stillwater River near Nye, Mont., for the year ending September 30, 1927

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	126	124	120		65	60	57	436	383	2,140	520	242
2	124	121	115		65	55	55	347	376	1,880	621	235
3	123	123	115		65	57	55	292	414	1,820	507	231
4	124	116	124		71	57	55	255	429	-------	455	229
5	119	118	100		57	57	55	229	515	-------	418	229
6	119	121	82	80	55	57	60	209	881	-------	407	229
7	126	123	100		51	57	64	199	1,640	-------	404	233
8	140	118	90		55	57	57	183	2,430	-------	383	233
9	130	119	90		68	57	57	172	3,060	-------	376	233
10	124	119	90		65	64	57	172	-------	-------	360	233
11	130	121	90		65	45	57	176	-------	-------	340	233
12	131	119	127		64	45	51	176	-------	-------	325	------
13	128	119	92		55	57	47	180	-------	-------	344	------
14	131	118	92		57	57	55	218	-------	-------	369	------
15	128	109	92		55	47	57	305	-------	-------	393	------
16	130	103	92	75	55	55	50	610	-------	-------	340	------
17	137	90	136		55	57	50	1,100	-------	-------	305	------
18	140	78	136		55	57	50	1,150	-------	-------	305	------
19	137	66	127		51	60	40	916	-------	-------	292	------
20	135	66	120		55	57	30	683	-------	-------	284	------
21	131	66	144		68	51	25	503	-------	-------	292	------
22	131	70	120		57	51	30	474	-------	860	347	------
23	135	80			60	40	54	407	-------	790	328	------
24	133	90			51	35	61	369	-------	725	305	------
25	130	100			51	30	91	383	-------	689	287	------
26	131	125		65	55	25	146	533	5,140	707	272	------
27	144	142	80		57	40	180	738	5,410	665	260	------
28	146	125			60	51	328	758	4,420	616	257	------
29	139	102			-------	57	366	595	3,560	570	260	------
30	119	113			-------	55	400	494	2,820	551	262	------
31	137	-------			-------	55	-------	429	-------	533	251	------

NOTE.—No record June 10-25, July 4-21, and Sept. 12-30.

Monthly discharge of Stillwater River near Nye, Mont., for the year ending September 30, 1927

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	146	119	131	8,060
November	142	66	107	6,370
December	144	----------	100	6,150
January	----------	----------	73.1	4,490
February	71	51	58.7	3,260
March	64	25	51.8	3,190
April	400	25	91.3	5,430
May	1,150	172	442	27,200
August	621	251	351	21,600
September 1-11	242	229	233	5,080

WOODBINE CREEK NEAR NYE, MONT.

LOCATION.—In SW. ¼ sec. 33, T. 5 S., R. 15 E., in Beartooth National Forest, a quarter of a mile above mouth and 8 miles southwest of Nye, Stillwater County.

DRAINAGE AREA.—Not measured.

RECORDS AVAILABLE.—May 12, 1924, to September 30, 1927, when station was discontinued.

EQUIPMENT.—Stevens 8-day water-stage recorder in wooden shelter on right bank. Discharge measurements made from footbridge 10 feet below gage or by wading.

CHANNEL AND CONTROL.—Channel composed of heavy boulders and cobblestones. Control is rock outcrop 15 feet below gage. Current is swift at all stages.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 3.80 feet at 2 a. m. June 27 (discharge, 318 second-feet); minimum discharge, 4.7 second-feet March 26 (discharge measurement; ice present).

1924–1927: Maximum stage recorded, 4.57 feet at 1 a. m. July 9, 1926 (discharge, 327 second-feet); minimum discharge, that of March 26, 1927.

DIVERSIONS AND REGULATION.—None.

ACCURACY.—Stage-discharge relation not permanent; affected by ice. Rating curves well defined. Six discharge measurements, covering a range from 5 to 272 second-feet, made during the year check the curves. Operation of water-stage recorder fairly satisfactory; not in operation during winter, when staff gage was read about once a week. Daily discharge ascertained by applying mean daily gage height to rating table, except as indicated in footnote to table of daily discharge. Records for open channel good; others fair.

Daily discharge, in second-feet, of Woodbine Creek near Nye, Mont., for the year ending September 30, 1927

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	22	15						22	40	110	56	33
2	21	15						21	33	100	61	31
3	21	15						19	35	94	54	30
4	20	15						18	37	94	50	29
5	21	15						17	60	94	48	28
6	21	15						16	80	94	47	28
7	21	14						15	160	94	47	29
8	23	14					5	15	220	94	46	29
9	20	14						14	270	100	43	29
10	20	14						15	-------	99	42	29
11	19	14						15	-------	88	42	------
12	20	14						15	-------	79	40	------
13	19	14						15	-------	72	42	------
14	19	13						16	-------	66	46	------
15	18	12						20	-------	69	44	------
16	19	12	8	6	5	5	10	30	-------	63	38	------
17	20	12					10	54	-------	62	35	------
18	19						10	63	-------	64	34	------
19	18						10	54	-------	65	33	------
20	19						11	43	-------	63	32	------
21	18						11	36	-------	62	40	------
22	18						11	34	-------	62	49	------
23	17						11	32	-------	64	47	------
24	17						12	28	-------	59	44	------
25	17	10					14	27	-------	57	41	------
26	17						15	41	294	60	38	------
27	17						15	56	258	56	36	------
28	16						18	71	217	54	35	------
29	16						19	64	195	54	36	------
30	15						20	56	148	53	37	------
31	16				-------		-------	48	-------	53	34	------

NOTE.—Stage-discharge relation affected by ice Nov. 18 to Apr. 15; discharge estimated on basis of one discharge measurement and a study of gage height and temperature records and observer's notes concerning ice. Discharge estimated or interpolated because of missing gage height Apr. 17–22, 24, 25, May 4, 5, 22–24, 26, 27, 29, 31, June 1, 3–8, July 4–6, and Aug. 21. No record June 10–25 and Sept. 11–30.

Monthly discharge of Woodbine Creek near Nye, Mont., for the year ending September 30, 1927

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	23	15	18.8	1,160
November	15		12.2	726
December			8	492
January			6	369
February			5	278
March			5	307
April	20		9.1	542
May	71	14	31.9	1,960
July	110	53	74.1	4,560
August	61	32	42.5	2,610
September 1–10	33	28	29.5	585

CLARK FORK AT CHANCE, MONT.

LOCATION.—In NW. ¼ NW. ¼ sec. 32, T. 9 S., R. 22 E., at highway bridge at former post office of Chance, Carbon County, just above mouth of Sand Coulee, half a mile north of the Wyoming boundary, and 10 miles south of Belfry.

DRAINAGE AREA.—Not measured.

RECORDS AVAILABLE.—July 28, 1921, to September 30, 1927.

EQUIPMENT.—Vertical staff gage nailed to face of left abutment. Discharge measurements made from highway bridge.

CHANNEL AND CONTROL.—Clean boulders and gravel. Banks high and clean but subject to overflow at extremely high stages.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 6.2 feet at 8 a. m. June 27 (discharge, 10,000 second-feet); minimum, 0.50 foot at 8 a. m. March 19 (discharge, 72 second-feet).

1921–1927: Maximum and minimum stages recorded, same as for 1927.

DIVERSIONS AND REGULATION.—Numerous irrigation ditches divert water above and below station. No regulation.

ACCURACY.—Stage-discharge relation permanent; seriously affected by ice, observations discontinued during winter. Rating curve well defined between 300 and 10,000 second-feet by ten discharge measurements, three of which were made during the year. Gage read to hundredths twice daily. Daily discharge ascertained by applying mean daily gage height to rating table. Records good.

Daily discharge, in second-feet, of Clark Fork at Chance, Mont., for the year ending September 30, 1927

Day	Oct.	Nov.	Dec.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	443	364	480		155	2,500	1,940	5,620	1,730	920
2	443	318	430		138	2,170	1,800	5,120	1,800	870
3	443	318	430		149	1,730	2,020	5,120	2,020	920
4	416	318	430		144	1,590	2,170	5,120	1,870	822
5	416	318	443		119	1,400	2,500	4,620	1,660	870
6	416	298	347		123	1,200	2,870	4,380	1,590	775
7	443	298	416		126	1,140	3,930	4,380	1,520	775
8	443	298	347		160	1,080	5,370	4,380	1,520	775
9	443	268	234		166	920	6,650	4,620	1,460	1,080
10	416	330	239		155	870	5,870	4,620	1,460	870
11	416	341	335		152	870	7,730	4,150	1,460	1,140
12	416	313	169		141	870	8,290	3,930	1,460	920
13	430	298	95	184	138	822	7,730	3,710	1,260	870
14	423	298	86	160	131	1,260	8,290	3,490	1,590	822
15	416	268	99	208	121	2,020	8,860	3,280	1,590	775

Daily discharge, in second-feet, of Clark Fork at Chance, Mont., for the year ending September 30, 1927—Continued

Day	Oct.	Nov.	Dec.	Mar.	Apr.	May	June	July	Aug.	Sept.
16	430	298	128	123	138	3,280	8,570	2,870	1,460	822
17	443	264	-------	109	141	4,150	7,730	2,680	1,400	685
18	518	215	-------	131	187	4,620	7,190	2,680	1,260	642
19	443	247	-------	80	160	3,930	8,290	2,870	1,260	600
20	416	178	-------	136	141	3,280	8,290	2,870	1,200	518
21	416	166	-------	146	157	2,680	7,190	2,870	1,200	518
22	416	330	-------	131	166	2,870	6,920	2,680	1,260	480
23	416	518	-------	114	194	2,170	8,010	2,870	1,590	480
24	416	518	-------	119	396	1,940	8,860	2,500	1,400	480
25	376	518	-------	119	642	1,870	9,440	2,330	1,200	600
26	376	436	-------	109	1,520	2,330	8,860	2,170	1,200	559
27	376	416	-------	109	1,870	2,680	10,000	2,170	1,140	518
28	443	443	-------	114	2,170	2,680	8,860	2,170	1,020	480
29	389	396	-------	133	2,330	2,500	8,010	2,170	970	480
30	353	443	-------	144	2,170	2,170	6,650	2,330	920	518
31	330	-------	-------	141	-------	1,940	-------	1,940	920	-------

Monthly discharge of Clark Fork at Chance, Mont., for the year ending September 30, 1927

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	518	330	419	25,800
November	518	166	334	19,900
December 1–16	480	86	294	9,330
March 13–31	208	80	132	4,980
April	2,330	119	483	28,700
May	4,620	822	2,110	130,000
June	10,000	1,800	6,630	395,000
July	5,620	1,940	3,440	212,000
August	2,020	920	1,400	86,100
September	1,140	480	723	43,000

CLARK FORK AT EGDAR, MONT.

LOCATION.—In SW. ¼ sec. 24, T. 4 S., R. 23 N., on highway bridge half a mile east of Edgar, Carbon County.

DRAINAGE AREA.—Not measured.

RECORDS AVAILABLE.—July 29, 1921, to September 30, 1927.

EQUIPMENT.—Chain gage fastened to guardrail on downstream side of bridge. Discharge measurements made from highway bridge.

CHANNEL AND CONTROL.—Channel composed of sand and gravel. Control poorly defined.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 8.1 feet at 5.30 p. m. June 27 (discharge, 10,200 second-feet); minimum, 2.15 feet at 7.30 a. m. March 20 (discharge, 208 second-feet).

1921–1927: Maximum and minimum stages recorded, same as for 1927.

DIVERSIONS AND REGULATION.—Numerous ditches divert water for irrigation above station. No regulation.

ACCURACY.—Stage-discharge relation permanent; seriously affected by ice, observations discontinued during winter. Rating curve well defined between 400 and 10,000 second-feet by 15 measurements well distributed along curve, 4 of which were made during 1927. Gage read twice daily to hundredths at medium and low stages and to half-tenths at high stages. Daily discharge ascertained by applying mean daily gage height to rating table. Records good.

Daily discharge, in second-feet, of Clark Fork at Edgar, Mont., for the year ending September 30, 1927

Day	Oct.	Nov.	Dec.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1,230	605	605		278	2,570	1,970	6,280	1,700	945
2	605	605	605		278	2,260	1,830	5,410	1,700	855
3	566	566	527		278	1,830	1,700	4,790	1,830	770
4	566	605	566		268	1,460	1,830	4,990	1,830	770
5	566	605	605		240	1,340	1,970	4,990	1,700	770
6	566	605	605		240	1,180	2,410	4,390	1,580	728
7	527	566	566		249	1,180	3,610	3,990	1,580	770
8	527	566	491		230	1,230	4,990	4,190	1,340	770
9	566	566	527		230	1,130	7,160	4,190	1,280	770
10	566	566	455		230	1,080	6,500	4,190	1,230	990
11	527	566	390		259	1,040	8,540	4,190	1,230	945
12	566	605	491		289	1,040	8,770	3,990	1,230	945
13	566	566	491		294	1,040	8,310	3,610	1,230	945
14	566	605	491		299	945	8,540	3,070	1,230	900
15	566	566	422		278	1,700	9,000	2,900	1,460	812
16	566	605			320	2,730	9,000	2,730	1,460	770
17	605	605			278	3,610	8,540	2,260	1,230	770
18	566	566			455	5,200	7,850	2,410	1,180	770
19	645	491			378	4,190	8,310	2,410	1,230	685
20	645	900		240	378	3,430	8,540	2,410	1,130	645
21	645	855		221	294	2,900	7,620	2,410	1,230	645
22	645	685		259	337	3,800	7,160	2,410	1,460	566
23	645	812		235	384	3,070	7,620	2,570	1,460	566
24	605	812		230	422	2,110	9,000	2,260	1,460	566
25	605	812		230	527	1,830	9,470	2,110	1,230	566
26	605	900		230	1,080	1,970	9,230	2,110	1,230	685
27	645	812		230	1,580	2,410	9,710	1,970	1,230	685
28	685	566		230	1,830	2,570	9,710	1,830	1,230	605
29	685	566		230	1,970	2,730	8,770	1,700	1,230	566
30	645	605		230	2,110	2,110	7,620	1,830	1,180	527
31	605			278		1,970		2,110	1,040	

Monthly discharge of Clark Fork at Edgar, Mont., for the year ending September 30, 1927

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	1,230	527	617	37,900
November	900	491	645	38,400
December 1-15	605	390	522	15,500
March 20-31	278	221	237	5,640
April	2,110	230	543	32,300
May	5,200	945	2,180	134,000
June	9,710	1,700	6,840	407,000
July	6,280	1,700	3,250	200,000
August	1,830	1,040	1,370	84,200
September	990	527	743	44,200

WIND RIVER AT RIVERTON, WYO.

LOCATION.—In sec. 2, T. 1 S., R. 4 E., at highway bridge three-quarters of a mile east of Riverton, Fremont County. Popo Agie River unites with Wind River to form Big Horn River three-quarters of a mile below.

DRAINAGE AREA.—2,320 square miles (measured on base map of Wyoming).

RECORDS AVAILABLE.—May 15, 1911, to September 30, 1927. From May 14, 1906, to November 1, 1908, station maintained at Walker's Ferry, 1 mile above present station. No streams enter between; records directly comparable.

EQUIPMENT.—Chain gage on downstream side of first pier bent from left bank. Prior to June 13, 1927, a Friez water-stage recorder at same location and datum was used during open-water periods. Discharge measurements made from cable just above bridge.

CHANNEL AND CONTROL.—Bed composed of sand and gravel. Control at gravel bar just below gage; slightly shifting. Right bank subject to overflow during extremely high water.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 11 feet June 29 (discharge, 9,400 second-feet); minimum discharge, 170 second-feet December 16.

1906–1908, 1911–12, 1915–1927: Maximum discharge recorded, 12,300 second-feet June 14, 1906; minimum, that of December 16, 1926.

DIVERSIONS AND REGULATION.—Water is diverted from Wind River and its tributaries for irrigation of 35,000 acres. No regulation.

ACCURACY.—Stage-discharge relation slightly shifting; seriously affected by ice. Rating curve used October 1 to June 19 well defined below 3,000 second-feet; curve used June 20 to September 30 well defined between 500 and 6,500 second-feet. Six discharge measurements, covering a range from 333 to 6,370 second-feet, made during the year check the curves. Operation of water-stage recorder satisfactory during open water until June 13. Chain gage read once weekly November 20 to March 27 and once or twice daily June 13 to September 30. Daily discharge ascertained by applying mean daily gage height to rating tables, using shifting-control method July 29 to September 30, except as explained in footnote to table of daily discharge. Records good except during winter period and during August and September, for which they are fair.

Daily discharge, in second-feet, of Wind River at Riverton, Wyo., for the year ending September 30, 1927

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	757	420	420				344	1,450	1,480	6,430	3,000	1,150
2	689	474	440				348	1,480	1,530	5,900	3,040	1,060
3	663	464	440				330	1,260	1,650	5,120	3,280	1,000
4	632	480	436				318	1,050	1,980	5,250	2,890	888
5	596	500	420	335	305	345	298	964	2,200	5,330	2,630	850
6	568	502					280	892	2,880	5,000	2,440	808
7	579	498					286	845	3,930	4,500	2,300	829
8	596	491					306	908	5,280	4,250	2,330	888
9	602	464					330	852	6,140	4,110	2,220	2,580
10	579	425					326	722	5,760	4,230	2,160	4,870
[redacted]			340									
11	562	469					344	656	6,030	4,230	2,010	4,080
12	552	491					344	602	6,630	4,080	1,950	3,840
13	540	480					326	579	7,440	4,250	1,840	3,250
14	530	447					322	722	7,700	4,080	2,270	3,040
15	540	405					322	1,430	7,840	3,780	2,000	2,460
[redacted]				316	310	340						
16	557	405					318	2,340	7,440	3,410	1,800	2,220
17	557	385					375	3,740	6,630	3,190	1,680	1,940
18	552	370	245				380	4,830	6,630	2,960	1,470	1,640
19	614	370					370	4,380	6,760	2,890	1,360	1,480
20	502	370					339	3,380	6,840	2,790	1,300	1,360
21	486	380				340	306	2,700	6,560	2,760	1,440	1,260
22	530	400				345	298	2,220	6,030	2,850	1,440	1,190
23	524	460				355	310	1,940	6,030	2,700	1,490	1,120
24	498	460				352	344	1,630	6,430	2,850	1,620	1,080
25	486	442			340	330	442	1,400	6,700	2,830	1,740	1,640
26	474	430	305	300		300	670	1,530	6,840	2,600	1,470	1,750
27	480	420				290	980	2,140	7,380	2,430	1,420	1,530
28	502	400				295	1,280	2,340	8,460	2,350	1,320	1,380
29	557	380			-------	310	1,510	2,130	9,400	5,900	1,260	1,340
30	513	400			-------	330	1,480	1,820	8,050	3,520	1,180	1,300
31	436	-------			-------	344	-------	1,570	-------	3,210	1,150	-------

NOTE.—Stage-discharge relation affected by ice Nov. 18–24, 26, 27, Nov. 29 to Dec. 3, Dec. 5 to Mar. 23; discharge determined from temperature record, one current-meter measurement, weekly gage heights, and comparison with flow of Big Horn River at Thermopolis.

Monthly discharge of Wind River at Riverton, Wyo., for the year ending September 30, 1927

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	757	436	557	34,200
November	502	370	436	25,900
December	----------	----------	327	20,100
January	----------	----------	316	19,400
February	----------	----------	317	17,600
March	----------	----------	337	20,700
April	1,510	280	474	28,200
May	4,830	579	1,760	108,000
June	9,400	1,480	5,820	346,000
July	6,430	2,350	3,860	237,000
August	3,280	1,150	1,920	118,000
September	4,870	808	1,790	107,000
The year	9,400	----------	1,500	1,080,000

BIG HORN RIVER AT THERMOPOLIS, WYO.

LOCATION.—In sec. 36, T. 43 N., R. 95 W., at highway bridge between Thermopolis and Hot Springs, Hot Springs County. Nearest tributary, Thermopolis Hot Springs, discharges 9 second-feet into Big Horn River a short distance downstream.

DRAINAGE AREA.—8,080 square miles (measured on base map of Wyoming).

RECORDS AVAILABLE.—May 28, 1900, to December 31, 1905; June 30, 1910, to September 30, 1927.

EQUIPMENT.—Chain gage on downstream handrail of concrete bridge. Discharge measurements made from 2-span highway bridge a third of a mile upstream.

CHANNEL AND CONTROL.—Bed composed of coarse gravel and small boulders. Control for low and medium stages a short distance below; shifts at intervals. High-water control is formed by vertical walls of canyon entrance half a mile downstream. Banks high and not subject to overflow except during extreme flood stage.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 9.7 feet at 5.30 p. m. June 30 (discharge, 14,800 second-feet); minimum, 0.26 foot December 16 and 17 (discharge, 415 second-feet).

1900–1905, 1910–1927: Maximum stage, from high-water mark, 16.2 feet at 11 p. m. July 24, 1923 (discharge, 29,800 second-feet); [1] minimum, 0.2 foot at 5 p. m. April 5, 1904 (discharge, 180 second-feet).

DIVERSIONS AND REGULATION.—Water diverted for irrigation of 1,100 acres from Big Horn River above station. For diversions from Wind River see Wind River at Riverton. No regulation.

ACCURACY.—Stage-discharge relation slightly shifting; not affected by ice. Rating curve well defined by 16 measurements between 600 and 12,000 second-feet; extended beyond those limits. Nine measurements were made during the year. Gage read to quarter-tenths twice daily. Daily discharge ascertained by applying mean daily gage height to rating table, using shifting-control method August 25 to September 9. Records good.

[1] For description of flood see Water-Supply Paper 520, p. 108, 1925.

Daily discharge, in second-feet, of Big Horn River at Thermopolis, Wyo., for the year ending September 30, 1927

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1,030	858	864	530	562	695	980	2,690	2,830	13,200	3,710	1,490
2	1,240	845	878	578	554	648	910	2,550	2,550	10,100	3,550	1,490
3	1,210	931	878	594	562	653	845	2,690	2,410	7,340	3,710	1,490
4	1,170	897	890	640	578	666	785	2,410	2,690	6,980	3,550	1,290
5	1,120	884	839	648	582	725	768	1,990	3,870	6,790	3,250	1,240
6	1,070	904	845	644	586	780	725	1,990	3,870	7,160	2,830	1,200
7	1,040	904	746	662	608	845	690	1,730	4,580	6,600	2,690	1,100
8	1,060	878	720	648	590	845	690	1,730	5,680	5,860	2,830	1,100
9	1,060	834	630	644	586	845	720	2,130	7,340	5,500	2,690	1,150
10	1,070	839	578	612	594	878	815	1,860	8,640	5,120	2,550	3,870
11	1,000	833	550	594	582	815	815	1,610	8,270	5,310	3,250	4,400
12	1,010	884	574	582	554	715	845	1,500	8,820	5,120	2,280	3,550
13	966	910	586	590	554	705	845	1,400	9,750	5,120	3,110	3,250
14	945	890	526	574	554	815	780	1,400	10,900	5,680	4,760	2,830
15	945	845	582	578	574	980	785	1,560	12,100	4,760	4,040	2,690
16	952	815	470	558	562	1,050	815	1,730	12,400	4,580	2,970	2,550
17	924	715	462	566	562	815	780	3,250	11,600	4,040	2,150	2,280
18	917	635	526	582	590	785	845	5,860	10,500	3,710	2,150	2,150
19	931	578	671	590	594	758	980	7,160	9,750	3,710	1,800	1,910
20	917	566	644	590	604	746	1,050	6,600	9,750	3,550	1,800	1,800
21	852	676	644	566	622	720	945	5,680	10,100	3,550	1,800	1,800
22	871	780	648	554	644	815	780	4,220	10,100	3,400	1,910	1,590
23	858	884	626	570	662	785	730	3,870	9,010	3,550	1,800	1,590
24	878	1,050	582	604	676	945	758	3,250	8,640	3,870	1,800	1,590
25	864	987	599	468	671	878	815	2,690	9,010	3,870	1,910	1,800
26	858	952	612	465	662	845	910	2,410	9,380	3,400	1,910	2,970
27	858	897	626	522	658	815	1,260	2,690	9,380	2,970	1,910	2,410
28	878	871	522	550	666	746	1,990	3,550	10,500	2,970	1,910	2,030
29	917	791	506	574	-------	741	2,410	3,400	12,800	4,580	1,690	1,910
30	1,010	809	482	554	-------	815	2,690	3,400	14,700	6,050	1,590	1,800
31	938	-------	518	653	-------	980	-------	2,830	--------	3,870	1,490	------

Monthly discharge of Big Horn River at Thermopolis, Wyo., for the year ending September 30, 1927

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	1,240	852	979	60,200
November	1,050	566	839	49,900
December	890	462	639	39,300
January	662	465	583	35,800
February	676	554	600	33,300
March	1,050	648	802	49,300
April	2,690	690	992	59,000
May	7,160	1,400	2,960	182,000
June	14,700	2,410	8,400	500,000
July	13,200	2,970	5,240	322,000
August	4,760	1,490	2,560	157,000
September	4,400	1,100	2,070	123,000
The year	14,700	462	2,220	1,610,000

DINWOODY CREEK NEAR BURRIS, WYO.

LOCATION.—In sec. 10, T. 5 N., R. 5 W., at highway bridge on road from Riverton to Dubois, 6 miles northwest of Burris, Fremont County, on Wind River Diminished Reservation. No tributary between station and mouth, a quarter of a mile below.

DRAINAGE AREA.—114 square miles (measured on base map of Wyoming).

RECORDS AVAILABLE.—May 15,1918, to September 30, 1927. Station maintained at same site from January 16 to October 31, 1909.

EQUIPMENT.—Gurley 7-day water-stage recorder at left bridge abutment. Discharge measurements made from single-span bridge or by wading.

CHANNEL AND CONTROL.—Bed composed of boulders. Control at large boulders 25 feet downstream; fairly permanent. Banks not subject to overflow.

EXTREMES OF DISCHARGE.—Maximum stage during year, from water-stage recorder, 3.47 feet at 8 a. m. June 29 (discharge, 1,070 second-feet); minimum, 0.62 foot March 5 and 9 (discharge, 11 second-feet).

1918–1927: Maximum stage recorded, 3.75 feet at 9 a. m. July 25, 1923 (discharge, 1,710 second-feet); minimum discharge, 8 second-feet April 17, 1922.

DIVERSIONS AND REGULATION.—Practically no diversion. Natural regulation to small extent by Dinwoody Lake and numerous other small lakes on headwaters.

ACCURACY.—Stage-discharge relation practically permanent; slightly affected by ice. Rating curve well defined between 15 and 1,000 second-feet and checked by a measurement May 30 at discharge of 162 second-feet. Operation of water-stage recorder satisfactory during open water except as explained in footnote to table of daily discharge. Chain gage read to hundredths three times a week November 21 to April 30. Daily discharge ascertained by applying to rating table mean daily gage height obtained by inspection of recorder graph, except as explained in footnote to table of daily discharge. Records good except those for estimated periods, which are fair.

Daily discharge, in second-feet, of Dinwoody Creek near Burris, Wyo., for the year ending September 30, 1927

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	68	33	30	16	17	14	15	60	124	723	532	229
2	65	33	30	18	18	16	15	68	112	586	530	195
3	65	32	30	20	19	15	15	86	110	542	536	192
4	64	30	30	19	18	14	15	91	122	525	503	212
5	58	29	29	18	17	11	15	92	150	530	464	225
6	60	27	29	17	18	12	16	86	200	500	459	229
7	58	28	30	17	19	14	17	86	250	500	454	247
8	53	29	30	17	20	12	19	81	300	500	442	295
9	54	27	30	17	18	11	20	73	260	503	432	591
10	56	27	30	17	17	12	18	65	420	500	400	569
11	54	27	31	16	17	12	17	59	464	510	370	558
12	53	26	25	16	17	19	16	49	470	550	359	508
13	53	27	20	15	16	26	20	45	470	600	336	393
14	53	27	14	17	16	24	18	45	503	580	312	331
15	50	27	19	20	16	22	16	49	503	560	288	291
16	50	26	23	19	16	20	13	79	558	550	251	259
17	48	25	27	18	16	19	16	205	547	542	218	218
18	46	25	26	17	16	18	20	388	486	547	240	201
19	45	25	24	15	16	17	21	360	525	569	260	198
20	39	24	23	14	16	20	22	278	596	596	274	189
21	39	25	25	13	16	23	23	212	564	624	287	180
22	40	27	27	12	17	29	24	174	520	630	331	165
23	40	27	23	13	16	28	23	133	514	635	346	152
24	33	28	19	13	16	26	22	107	569	613	326	133
25	36	29	15	14	16	23	20	94	635	586	312	129
26	34	26	15	15	15	20	19	84	635	591	304	127
27	33	24	15	16	14	18	21	94	690	602	270	120
28	33	26	15	17	12	17	23	140	899	618	259	120
29	34	29	15	19	-------	16	38	174	1,040	542	262	122
30	32	29	15	18	-------	16	53	163	872	536	266	112
31	34	-------	15	16	-------	16	-------	142	-------	534	251	-------

NOTE.—Stage-discharge relation affected by ice Nov. 14–21, Dec. 7–29, Jan. 11–14, 16–28, and Mar. 14–18; discharge determined from temperature and gage-height records, observer's notes, and comparison with Bull Lake Creek. Discharge interpolated on days of missing gage height from Nov. 21 to Apr. 30. Recorder not operating June 5–10, July 5–8, 10–16, 31, Aug. 1, 10–12, 18, 19; discharge estimated or interpolated.

Monthly discharge of Dinwoody Creek near Burris, Wyo., for the year ending September 30, 1927

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	68	32	47.7	2,930
November	33	24	27.5	1,640
December	31	14	23.5	1,440
January	20	12	16.4	1,010
February	20	12	16.6	922
March	29	11	18.1	1,110
April	53	13	20.3	1,210
May	388	45	125	7,690
June	1,040	110	474	28,200
July	723	500	565	34,700
August	536	218	350	21,500
September	591	112	250	14,900
The year	1,040	11	162	117,000

DRY CREEK NEAR BURRIS, WYO.

LOCATION.—In SW. ¼ sec. 12, T. 4 N., R. 5 W., above head of Dry Creek ditch and 2 miles south of Burris, Fremont County, on Wind River Diminished Reservation. Little Dry Creek enters 2 miles below.

DRAINAGE AREA.—73 square miles (measured on base map of Wyoming).

RECORDS AVAILABLE.—May 19, 1921, to September 30, 1927.

EQUIPMENT.—Gurley 7-day water-stage recorder at left bank, half a mile above head of Dry Creek ditch. Discharge measurements made from cable 100 feet above gage or by wading.

CHANNEL AND CONTROL.—Bed composed of boulders; fairly permanent. No well-defined control. Banks not subject to overflow.

EXTREMES OF DISCHARGE.—Maximum stage during year, from water-stage recorder, 2.49 feet at noon June 28 (discharge, 465 second-feet); minimum discharge occurred during winter.

1921–1927: Maximum stage, from high-water mark, 3.9 feet about June 12, 1921 (discharge, 1,100 second-feet); minimum discharge recorded, 2 second-feet February 23, 1921.

DIVERSIONS AND REGULATION.—One small ditch diverts water above station. Diurnal fluctuation during spring from alternate melting and freezing of mountain snow.

ACCURACY.—Stage-discharge relation practically permanent; seriously affected by ice, observations discontinued during winter. Rating curve well defined between 10 and 600 second-feet and checked by measurement of May 30 at discharge of 74 second-feet. Operation of water-stage recorder satisfactory. Daily discharge ascertained by applying to rating table mean daily gage height obtained by inspection of recorder graph, using shifting-control method May 16 to June 10, except as indicated in footnote to table of daily discharge. Records good except those for periods of missing gage heights, which are fair.

Daily discharge, in second-feet, of Dry Creek near Burris, Wyo., for the year ending September 30, 1927

Day	Oct.	Nov.	May	June	July	Aug.	Sept.
1	30	18	30	73	170	95	45
2	30	17	35	80	147	107	43
3	30	19	40	101	151	96	41
4	29	19	44	125	167	85	40
5	28	19	45	141	174	76	39
6	27	13	42	178	135	73	36
7	26	------	42	216	132	72	37
8	26	------	37	269	143	70	44
9	25	------	32	232	147	67	86
10	25	------	28	237	150	65	182
11	24	------	27	262	150	65	155
12	23	------	33	275	153	61	121
13	22	------	40	295	155	65	113
14	21	------	60	282	150	67	97
15	20	------	100	251	130	64	81
16	19	------	182	219	116	61	71
17	19	------	282	209	108	53	63
18	20	------	234	209	108	50	57
19	21	------	147	237	110	50	52
20	20	------	115	240	111	62	47
21	19	------	87	212	111	61	44
22	19	------	81	197	108	64	43
23	17	------	70	202	110	65	41
24	16	------	62	237	107	67	42
25	16	------	70	224	101	64	53
26	16	------	99	240	96	59	53
27	16	------	132	321	95	56	53
28	17	------	116	427	100	52	54
29	17	------	87	364	107	49	52
30	17	------	74	232	100	48	53
31	18	------	74	------	93	49	------

NOTE.—Gage-height record missing Oct. 4–15, May 1–6, and July 10–15; discharge estimated on basis of records for Dinwoody Creek.

Monthly discharge of Dry Creek near Burris, Wyo., for the year ending September 30, 1927

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	30	16	21.7	1,330
November 1–6	19	13	17.5	208
May	282	27	82.2	5,050
June	427	73	226	13,400
July	174	93	127	7,810
August	107	48	65.7	4,040
September	182	36	64.6	3,840

WILLOW CREEK NEAR CROWHEART, WYO.

LOCATION.—In SW. ¼ sec. 20, T. 3 N., R. 4 W., above Willow Creek ditch, 2 miles upstream from bridge on main road from Fort Washakie to Dubois and 2 miles southwest of Crowheart, Fremont County, on Wind River Diminished Reservation. No tributary between station and mouth, 12 miles downstream.

DRAINAGE AREA.—Not measured.

RECORDS AVAILABLE.—May 15 to October 31, 1909; May 16, 1921, to June 30 1923; April 25, 1925, to September 30, 1927.

EQUIPMENT.—Gurley 7-day water-stage recorder at left bank 500 feet above diversion dam for Willow Creek ditch. Discharge measurements made from cable above gage or by wading.

CHANNEL AND CONTROL.—Bed composed of gravel and small boulders. Control at rapids 10 feet downstream; shifts slightly during high water. Left bank subject to overflow at stage of 3.5 feet.

EXTREMES OF DISCHARGE.—Maximum stage during year, from water-stage recorder, 4.13 feet at 2.30 p. m. July 28 (discharge, 356 second-feet); minimum discharge during winter.

1921–1923, 1925–1927: Maximum stage from high-water mark, 4.50 feet (old datum) July 26, 1923 (discharge, 750 second-feet); minimum discharge recorded, 7 second-feet January 14, 1921.

DIVERSIONS AND REGULATION.—No diversions above station. Diurnal fluctuation during spring from alternate melting and freezing of mountain snow.

ACCURACY.—Stage-discharge relation practically permanent; affected by ice, observations discontinued during winter. Rating curve well defined between 10 and 100 second-feet by six discharge measurements and checked by two measurements during year. Operation of water-stage recorder satisfactory. Daily discharge ascertained by applying to rating table mean daily gage height obtained by inspection of recorder graph. Records good.

Daily discharge, in second-feet, of Willow Creek near Crowheart, Wyo., for the year ending September 30, 1927

Day	Oct.	Nov.	Apr.	May	June	July	Aug.	Sept.
1	15	14	-------	11	39	52	17	11
2	15	14	-------	11	43	48	14	11
3	15	14	-------	11	58	52	13	11
4	14	14	-------	12	64	53	13	11
5	14	14	-------	11	71	50	13	11
6	14	14	-------	12	88	40	13	11
7	14	14	-------	12	103	41	13	11
8	14	14	-------	12	128	40	13	11
9	14	14	-------	12	110	38	13	12
10	14	14	-------	12	109	34	13	13
11	14	14	-------	12	115	35	13	12
12	14	13	-------	12	125	35	13	11
13	14	13	-------	12	117	32	17	11
14	14	13	-------	12	105	31	13	12
15	14	13	-------	12	96	27	12	12
16	14	13	-------	42	87	27	13	12
17	14	12	-------	89	91	23	12	11
18	14	13	-------	76	90	22	13	11
19	14	13	-------	52	104	22	12	11
20	14	13	-------	39	91	21	12	11
21	14		-------	33	72	20	12	11
22	14		-------	30	68	19	12	11
23	14		10	27	78	20	12	11
24	14		11	25	91	20	12	18
25	14		12	34	78	18	12	14
26	14	13	12	60	84	17	12	12
27	14		12	70	97	17	11	11
28	14		12	59	106	63	11	11
29	14		11	46	82	25	11	11
30	14		11	40	62	21	11	12
31	14		-------	41	-------	16	11	-------

NOTE.—Gage-height record missing Nov. 21–30; mean discharge estimated.

Monthly discharge of Willow Creek near Crowheart, Wyo., for the year ending September 30, 1927

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	15	14	14.1	867
November	14	12	13.3	791
April 23-30	12	10	11.4	181
May	89	11	30.3	1,860
June	128	39	88.4	5,260
July	63	16	31.6	1,940
August	17	11	12.6	775
September	18	11	11.6	690

BULL LAKE CREEK NEAR LENORE, WYO.

LOCATION.—Near north line of sec. 17, T. 3 N., R. 2 W., at highway bridge 14 miles southeast of Lenore, Fremont County, on Wind River Diminished Reservation. No tributary between station and mouth, a quarter of a mile below.

DRAINAGE AREA.—132 square miles (measured on base map of Wyoming).

RECORDS AVAILABLE.—May 18, 1918, to September 30, 1927.

EQUIPMENT.—Stevens 7-day water-stage recorder at left bank just below bridge. Discharge measurements made from bridge or by wading.

CHANNEL AND CONTROL.—Bed composed of large boulders; permanent. Control at small rapids just below gage; slightly shifting at long intervals. Banks not subject to overflow.

EXTREMES OF DISCHARGE.—Maximum stage during year, from water-stage recorder, 7.23 feet at 8 a. m. June 29 (discharge, 3,340 second-feet); minimum discharge during winter.

1918–1927: Maximum discharge recorded, 3,990 second-feet at 2 p. m. June 16, 1918; minimum discharge, from current-meter measurement, 17.8 second-feet February 1, 1919.

DIVERSIONS AND REGULATION.—Two ditches divert water above station for irrigation of 200 acres. Flow naturally regulated by Bull Lake, which has an area of 4 square miles.

ACCURACY.—Stage-discharge relation slightly shifting; affected by ice. Rating curve used October 1 to February 28 is well defined by eight discharge measurements; curve used March 7 to September 30 is defined by two discharge measurements between 50 and 2,000 second-feet and extended beyond those limits. Operation of water-stage recorder satisfactory during open water; staff gage read once a week December 1 to March 31. Daily discharge ascertained by applying to rating table mean daily gage height obtained by inspection of recorder graph, except as indicated in footnote to table of daily discharge. Records good except those for estimated periods, which are fair.

Daily discharge, in second-feet, of Bull Lake Creek near Lenore, Wyo., for the year ending September 30, 1927

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	130	90	80			50	48	197	352	1,990	772	326
2	132	92	85			50	45	250	339	1,530	750	310
3	132	94	85	40		50	44	266	348	1,300	743	290
4	130	92	85			54	45	262	395	1,230	722	274
5	130	90	85			57	44	246	486	1,360	659	250
6	130	87	90		46	60	46	243	575	1,400	610	258
7	124	90	85			62	48	243	802	1,200	589	254
8	122	79	80			60	53	258	1,090	1,110	575	254
9	119	81	75			55	55	250	1,290	1,180	575	282
10	117	81	70			45	60	232	1,330	1,140	534	480
11	114	81		38		45	63	218	1,380	1,170	504	849
12	112	79				46	66	204	1,520	1,230	480	905
13	110	77	50		44	47	68	204	1,740	1,280	480	772
14	110	77				48	68	225	1,940	1,240	498	666
15	107	75				48	68	302	2,010	1,150	480	547
16	105	74			50	48	62	452	1,850	1,060	464	500
17	102	74			51	48	70	694	1,690	977	430	450
18	100	74	60		52	48	70	905	1,580	929	400	400
19	98	72			53	50	70	929	1,610	929	370	357
20	100	74			54	50	68	795	1,800	937	348	334
21	98	72		35	54	52	65	652	1,820	969	348	310
22	96	72			54	52	63	547	1,690	994	357	290
23	94	72	50		54	50	63	464	1,610	1,000	385	278
24	96	74			54	50	63	395	1,730	1,020	410	278
25	92	77			54	48	63	352	1,940	1,020	425	314
26	90	79			52	46	63	362	1,970	985	415	306
27	87	79			52	44	73	415	2,110	953	400	302
28	87	79			50	44	94	486	2,850	945	380	310
29	90	79	40	40	------	44	126	480	3,300	937	366	298
30	90	79			------	45	158	410	2,730	881	339	326
31	87	------			------	46	------	375	------	833	339	------

NOTE.—Stage-discharge relation affected by ice Dec. 1 to Feb. 28; discharge estimated on basis of weekly staff gage readings, temperature records, observer's notes concerning ice, and comparison with records of flow of Dinwoody Creek. Discharge interpolated or estimated because of missing gage heights Nov. 30, Mar. 1–6, 8–13, 15–20, 22–27, 29, 30, Apr. 6–10, and Sept. 16–18.

Monthly discharge of Bull Lake Creek near Lenore, Wyo., for the year ending September 30, 1927

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	132	87	107	6,580
November	94	72	79.8	4,750
December	------	------	60.0	3,690
January	------	------	37.7	2,320
February	------	------	48.7	2,700
March	62	44	49.7	3,060
April	158	44	66.6	3,960
May	929	197	397	24,400
June	3,300	339	1,530	91,000
July	1,990	833	1,130	69,500
August	772	339	489	30,100
September	905	250	392	23,300
The year	3,300	------	366	265,000

LITTLE WIND RIVER NEAR FORT WASHAKIE, WYO.

LOCATION.—In SE. ¼ sec. 1, T. 1 S., R. 2 W., above Ray ditch, 2½ miles above junction with North Fork at Fort Washakie, Fremont County, on Wind River Diminished Reservation.

DRAINAGE AREA.—134 square miles (measured on base map of Wyoming).

RECORDS AVAILABLE.—May 11, 1921, to September 30, 1927.

EQUIPMENT.—Gurley 7-day water-stage recorder on right bank 500 feet above head gate of Ray ditch. Discharge measurements made from cable 300 feet below gage.

CHANNEL AND CONTROL.—Bed composed of gravel and small boulders; shifting. Control poorly defined. Banks not subject to overflow.

EXTREMES OF DISCHARGE.—Maximum stage during year, from water-stage recorder, 5.5 feet at noon June 28 (discharge, 1,670 second-feet); minimum stage during winter.

1921–1927: Maximum stage recorded, 7.59 feet at 2 p. m. July 9, 1926 (discharge, estimated from slope and cross section, 5,220 second-feet); minimum discharge, 14 second-feet February 22, 1921.

DIVERSIONS AND REGULATION.—A few small ditches divert water above station. Diurnal fluctuation during spring from alternate melting and freezing of mountain snow.

ACCURACY.—Stage-discharge relation practically permanent; affected by ice, records discontinued during winter. Rating curve fairly well defined between 50 and 800 second-feet by four discharge measurements made during current year; extended beyond those limits. Operation of water-stage recorder fairly satisfactory. Daily discharge ascertained by applying to rating table mean daily gage height obtained by inspection of recorder graph, except as indicated in footnote to table of daily discharge. Records good.

Daily discharge, in second-feet, of Little Wind River near Fort Washakie, Wyo., for the year ending September 30, 1927

Day	Oct.	Nov.	Dec.	Apr.	May	June	July	Aug.	Sept.
1	72	44	48	24	165	160	735	213	86
2	68	41	48	24	130	173	448	211	80
3	65	44	47	24	100	187	436	204	76
4	61	37	46	23	100	230	583	185	75
5	59	44	44	24	95	273	660	171	74
6	59	40	44	24	90	379	472	162	72
7	59	38	45	26	103	508	424	162	70
8	57	37	44	26	108	675	432	154	77
9	54	37	38	26	106	614	424	148	96
10	54	38	46	26	82	642	420	141	202
11	51	40	44	26	81	665	420	137	187
12	50	37	------	26	88	827	432	135	164
13	48	34	------	26	116	816	400	135	187
14	47	32	------	26	173	888	368	132	185
15	46	31	------	26	249	805	344	126	167
16	44	34	------	25	340	750	318	123	152
17	44	26	------	26	452	765	297	121	135
18	44	37	------	27	440	628	276	120	128
19	44	43	------	26	324	785	276	116	118
20	44	40	------	24	246	882	276	110	112
21	43	42	------	24	215	770	282	104	104
22	43	42	------	25	197	675	282	100	102
23	43	40	------	25	173	720	276	103	96
24	41	40	------	29	150	876	273	114	137
25	40	40	------	40	158	849	258	109	143
26	40	41	------	59	230	816	240	103	143
27	40	46	------	99	276	1,140	232	103	135
28	43	44	------	139	280	1,500	228	99	132
29	43	45	------	148	220	1,350	232	92	133
30	40	47	------	164	175	1,180	220	89	135
31	42	------	------	------	154	------	211	89	------

NOTE.—Gage-height record missing Apr. 9–12, May 1–6, 28–30; discharge interpolated or estimated.

Monthly discharge of Little Wind River near Fort Washakie, Wyo., for the year ending September 30, 1927

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	72	40	49.3	3,030
November	47	26	39.4	2,340
December 1–11	48	38	44.9	980
April	164	23	41.9	2,490
May	452	81	188	11,600
June	1,500	160	718	42,700
July	735	211	360	22,100
August	213	89	133	8,180
September	202	70	123	7,320

NORTH FORK OF LITTLE WIND RIVER AT FORT WASHAKIE, WYO.

LOCATION.—In SW. ¼ sec. 33, T. 1 N., R. 1 W., at Fort Washakie, Fremont County, on Wind River Diminished Reservation. North Fork enters Little Wind River a quarter of a mile below.

DRAINAGE AREA.—138 square miles (measured on base map of Wyoming).

RECORDS AVAILABLE.—May 13, 1921, to September 30, 1927.

EQUIPMENT.—Gurley 7-day water-stage recorder on left bank a quarter of a mile above highway bridge at Fort Washakie. Discharge measurements made from cable at gage.

CHANNEL AND CONTROL.—Bed composed of gravel and small boulders. Control at small rapids just below gage; shifting. Left bank subject to overflow at stage of 3 feet.

EXTREMES OF DISCHARGE.—Maximum stage during year, from water-stage recorder, 3.68 feet at 8 p. m. June 28 (discharge, 1,630 second-feet); minimum stage during winter.

1921–1927: Maximum stage recorded, 4.85 feet at noon July 9, 1926 (discharge, 2,640 second-feet); minimum discharge, from current-meter measurement, 16 second-feet January 19, 1922.

DIVERSIONS AND REGULATION.—Several small ditches divert water above station. Diurnal fluctuation during spring from alternate melting and freezing of mountain snow.

ACCURACY.—Stage-discharge relation slightly shifting; affected by ice, observations discontinued during winter. Rating curves fairly well defined below 800 second-feet and extended above. Three discharge measurements, covering a range from 170 to 641 second-feet, were made during the year. Operation of water-stage recorder satisfactory. Daily discharge ascertained by applying to rating tables mean daily gage height obtained by inspection of recorder graph, except as indicated in footnote to table of daily discharge. Records good above 50 second-feet, except for estimated periods; others fair.

Daily discharge, in second-feet, of North Fork of Little Wind River at Fort Washakie, Wyo., for the year ending September 30, 1927

Day	Oct.	Nov.	Dec.	Apr.	May	June	July	Aug.	Sept.
1	56	40	45		150	170	636	200	82
2	53	39	45		129	175	498	211	80
3	55	41	45		100	184	449	205	78
4	53	41	43		100	225	440	197	72
5	52	41	40		96	270	516	184	71
				50					
6	52	38	47		88	342	498	170	70
7	52	35	46		100	494	436	170	68
8	51	33	42		107	691	404	165	72
9	51	33	44		90	685	388	158	82
10	50	35	40		77	668	380	148	124
11	48	35	40	54	78	703	372	138	124
12	47	34	------	54	86	884	372	131	140
13	46	34	------	54	92	926	372	131	158
14	44	35	------	54	122	975	364	131	165
15	43	36	------	54	158	954	342	131	162
16	43	37	------	53	240	799	318	131	160
17	42	38	------	56	372	721	294	129	155
18	40	38	------	68	444	652	270	122	150
19	40	36	------	58	396	715	253	120	140
20	40	36	------	51	332	787	237	118	131
21	38	38	------	47	276	721	234	118	124
22	38	43	------	42	231	674	237	115	118
23	38	39	------	40	194	620	231	111	115
24	38	38	------	40	165	703	237	113	118
25	37	39	------	53	162	721	237	107	170
26	37	39	------	115	200	703	225	102	158
27	37	41	------	138	225	799	211	102	150
28	38	44	------	140	234	1,210	205	96	150
29	39	48	------	138	208	1,250	208	94	148
30	38	48	------	140	186	884	205	90	158
31	39	------	------	------	178	------	200	88	------

NOTE.—Gage-height record missing Nov. 30 to Dec. 3 and Apr. 1–15; discharge estimated on basis of records for Little Wind River.

Monthly discharge of North Fork of Little Wind River at Fort Washakie, Wyo., for the year ending September 30, 1927

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	56	37	44.4	2,730
November	48	33	38.4	2,280
December 1–11	47	40	43.4	947
April	140	40	65.0	3,870
May	444	77	181	11,100
June	1,250	170	677	40,300
July	636	200	331	20,400
August	211	88	136	8,360
September	170	68	123	7,320

NOWOOD CREEK AT BONANZA, WYO.

LOCATION.—In sec. 13, T. 49 N., R. 91 W., at Bonanza, Big Horn County. Nearest tributary, Paintrock Creek, enters some distance above.

DRAINAGE AREA.—1,790 square miles (measured on base map of Wyoming).

RECORDS AVAILABLE.—July 29, 1910, to September 30, 1927.

EQUIPMENT.—Chain gage on left bank 1,000 feet below store at Bonanza. Discharge made from highway bridge or by wading.

CHANNEL AND CONTROL.—Bed composed of gravel. Control is small rapids 100 feet downstream; shifting between narrow limits.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 7.46 feet at 5 p. m. June 28 (discharge, 4,260 second-feet); minimum discharge probably occurred during winter.

1910–1927: Maximum stage recorded, 8.09 feet at 9 a. m. June 15, 1924 (discharge, 5,160 second-feet); minimum, 1.55 feet July 27–31, 1919 (discharge, 1.5 second-feet).

DIVERSIONS AND REGULATION.—Adjudicated diversions for irrigation of 5,700 acres from Nowood Creek above station and 3,400 acres below. No regulation.

ACCURACY.—Stage-discharge relation practically permanent; affected by ice, observations discontinued during winter. Rating curve well defined by 12 discharge measurements and checked by measurement on May 28 at discharge of 1,780 second-feet. Gage read to hundredths twice daily. Daily discharge ascertained by applying mean daily gage height to rating table, except as indicated in footnote to table of daily discharge. Records good except those for periods when affected by ice, which are fair.

Daily discharge, in second-feet, of Nowood Creek at Bonanza, Wyo., for the year ending September 30, 1927

Day	Oct.	Nov.	Dec.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	271	311	251		416	1,480	986	1,590	500	271
2	402	308	248		372	2,010	930	1,200	466	271
3	323	293	244		311	1,580	1,000	1,240	452	257
4	323	278	244		330	1,070	1,000	1,460	434	238
5	308	264	------		293	944	1,070	1,490	389	234
6	304	271	------	190	254	853	1,220	1,140	346	231
7	300	271	------		238	757	1,540	1,000	323	212
8	308	271	------		251	958	2,110	1,000	315	219
9	351	264	------		304	958	2,950	944	300	238
10	330	257	------		380	680	2,550	944	278	275
11	327	261	------	200	355	658	3,250	937	261	261
12	330	264	------	206	315	757	3,530	865	238	261
13	315	264	------	228	300	917	3,310	787	228	257
14	315	278	------	323	286	1,240	2,450	658	515	251
15	308	278	------	434	296	1,630	2,220	608	570	251
16	300	271	------	597	334	2,070	2,000	586	630	248
17	300	264	------	296	475	2,890	1,990	526	564	231
18	304	244	------	264	597	3,580	2,250	480	452	228
19	311	235	------	231	721	3,000	2,650	461	434	228
20	315	230	------	212	466	2,030	2,700	443	443	231
21	311	230	------	219	338	1,840	1,750	412	470	225
22	304	234	------	219	286	1,950	1,310	685	438	219
23	300	293	------	212	264	1,910	1,540	641	542	231
24	372	286	------	219	293	1,530	2,610	480	510	244
25	346	271	------	209	308	1,270	2,790	608	443	323
26	315	264	------	212	398	1,540	2,540	505	394	330
27	308	257	------	206	703	1,650	3,490	407	363	323
28	323	251	------	209	958	1,760	3,870	363	342	315
29	407	251	------	238	1,220	1,460	2,680	372	319	351
30	346	244	------	308	1,260	1,170	2,130	500	300	338
31	311	------	------	363	------	1,000	------	461	278	------

NOTE.—Stage-discharge relation affected by ice Nov. 19–21 and Mar. 1–11; discharge based on temperature record and comparison with records of flow of Big Horn River at Thermopolis.

Monthly discharge of Nowood Creek at Bonanza, Wyo., for the year ending September 30, 1927

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	407	271	322	19,800
November	311	230	265	15,800
March	597		242	14,900
April	1,260	238	444	26,400
May	3,580	658	1,520	93,500
June	3,870	930	2,210	132,000
July	1,590	363	768	47,200
August	630	228	404	24,800
September	351	212	260	15,500

PAINTROCK CREEK NEAR HYATTVILLE, WYO.

LOCATION.—In sec. 25, T. 50 N., R. 89 W., at mouth of canyon, 6 miles above Hyattville, Big Horn County. Nearest tributary, Luman Creek, enters three-quarters of a mile downstream.

DRAINAGE AREA.—164 square miles (measured on topographic map).

RECORDS AVAILABLE.—August 8, 1920, to January 10, 1927, when station was discontinued.

EQUIPMENT.—Gurley water-stage recorder 1,000 feet upstream from bridge at State Fish Hatchery. Discharge measurements made from cable 300 feet below gage or by wading.

CHANNEL AND CONTROL.—Bed composed of boulders. Control at large boulders 25 feet downstream; shifts occasionally. Banks not subject to overflow.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 1.69 feet at 5 p. m. October 27 (discharge, 117 second-feet); minimum stage probably occurred during winter.

1920–1927: Maximum stage recorded, 7.2 feet at 1 a. m. July 24, 1923 (discharge, 4,960 second-feet); minimum, 0.29 foot from 10 a. m. to 1 p. m. February 17, 1921 (discharge, 14 second-feet).

DIVERSIONS AND REGULATION.—Station is above all diversions except that for Rhinehart ditch, which diverts water for irrigation of 12 acres. Below station are adjudicated diversions for irrigation of 4,700 acres.

ACCURACY.—Stage-discharge relation permanent during year; affected by ice. Rating curve fairly well defined by nine discharge measurements, one of which was made August 8, 1926, at a discharge of 115 second-feet, and another January 10, 1927, at a discharge of 33 second-feet. Operation of water-stage recorder fairly satisfactory October 1 to November 14; gage read once a week November 15 to January 10. Daily discharge ascertained by applying to rating table mean daily gage height obtained by inspection of recorder graph October 1 to November 14. Records good except during estimated periods, for which they are poor.

Daily discharge, in second-feet, of Paintrock Creek near Hyattville, Wyo., for the year ending September 30, 1927

Day	Oct.	Nov.	Dec.	Jan.	Day	Oct.	Nov.	Dec.	Jan.
1	71	94		40	16	85			
2	75	90		40	17	90		40	
3	76	78	40	42	18	84			
4	86	78		44	19	84		48	
5	88	71	38	46	20	82			
6	95	64		44	21	79	45		
7	102	57		42	22	76			
8	106	48		40	23	78			
9	105	53	38	37	24	67			
10	106	60		34	25	80		40	
11	116	55			26	99			
12	113	54	37		27	117			
13	106	52			28	108	48		
14	102	50	30		29	96			
15	98	45			30	86			
					31	100			

NOTE.—Gage-height record missing Oct. 25 and Nov. 5 and 6; discharge interpolated. Stage-discharge relation affected by ice Nov. 15 to Jan. 10; discharge estimated on basis of weekly staff gage readings, one discharge measurement, and temperature records.

Monthly discharge of Paintrock Creek near Hyattville, Wyo., for the year ending September 30, 1927

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	117	67	92.1	5,660
November			54.6	3,250
December			38.7	2,380
January 1–10	46	34	40.9	811

GREYBULL RIVER AT MEETEETSE, WYO.

LOCATION.—In sec. 4, T. 48 N., R. 100 W., at Meeteetse, Park County. Nearest tributary, Meeteetse Creek, enters 3 miles downstream.

DRAINAGE AREA.—690 square miles (measured on topographic map).

RECORDS AVAILABLE.—June 11 to September 30, 1897; April 24 to October 31, 1903; July 18, 1920, to September 30, 1927.

EQUIPMENT.—Gurley 7-day water-stage recorder on right bank in intake for Meeteetse water supply. Discharge measurements made from cable 200 feet upstream from gage.

CHANNEL AND CONTROL.—Bed composed of boulders and coarse gravel. Control is 35 feet downstream; shifting.

EXTREMES OF DISCHARGE.—Maximum stage during year, from water-stage recorder, 5.48 feet at 1 a. m. June 27 (discharge, 2,010 second-feet); minimum stage during winter.

1921–1927: Maximum stage recorded, from high-water mark, 8.35 feet at about 6 a. m. July 9, 1926 (discharge, estimated, 6,350 second-feet); minimum discharge, 63 second-feet March 4, 1922.

DIVERSIONS AND REGULATION.—Adjudicated diversions for irrigation of 7,100 acres from Greybull River above station and 10,000 acres from tributaries entering above. No regulation.

ACCURACY.—Stage-discharge relation not permanent; affected by ice; observations discontinued during winter. Standard rating curve fairly well defined. Four discharge measurements, covering a range from 300 to 1,330 second-feet, were made during the year. Operation of water-stage recorder satisfactory. Daily discharge ascertained by applying to rating table mean daily gage height obtained by inspection of recorder graph, using shifting-control method June 26 to September 30, except as indicated in footnote to table of daily discharge. Records fair.

Daily discharge, in second-feet, of Greybull River at Meeteetse, Wyo., for the year ending September 30, 1927

Day	Oct.	Nov.	Apr.	May	June	July	Aug.	Sept.
1	242	193	-------	306	470	880	641	342
2	242	182	-------	224	440	848	704	324
3	247	190	-------	166	520	896	710	314
4	229	176	-------	160	505	904	623	296
5	224	182	-------	147	594	832	578	301
6	229	182	-------	142	758	744	556	296
7	224	182	-------	156	987	779	556	288
8	224	166	-------	150	1,270	779	556	364
9	212	169	-------	118	1,160	808	525	578
10	220	176	-------	126	1,060	816	500	647
11	216	186	-------	145	1,200	737	505	556
12	205	182	-------	150	1,320	704	560	500
13	209	169	-------	163	1,430	691	605	475
14	205	160	-------	238	1,580	653	578	440
15	201	150	-------	386	1,620	617	572	410
16	205	156	-------	698	1,470	545	530	391
17	209	152	-------	1,030	1,380	550	500	378
18	216	152	-------	952	1,430	561	535	364
19	205	150	-------	717	1,480	556	594	350
20	201	150	-------	578	1,480	540	698	342
21	201	156	-------	510	1,330	525	594	332
22	201		-------	530	1,330	525	572	324
23	205		-------	455	1,380	530	556	324
24	197		-------	410	1,520	490	525	337
25	193		274	465	1,350	490	485	373
26	193	150	332	611	1,530	495	465	364
27	209		386	635	1,580	515	450	332
28	216		391	566	1,550	561	425	314
29	193		350	490	1,240	611	410	314
30	169		319	455	1,050	583	396	337
31	193	-------	-------	425	-------	594	382	-------

NOTE.—Gage-height record missing Nov. 17–20 and 22–30; discharge estimated on basis of temperature record.

Monthly discharge of Greybull River at Meeteetse, Wyo., for the year ending September 30, 1927

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	252	169	211	13,000
November	193	150	164	9,760
April 25–30	391	274	342	4,070
May	1,030	118	397	24,400
June	1,620	440	1,200	71,400
July	904	490	657	40,400
August	710	382	545	33,500
September	647	288	377	22,400

SHOSHONE RIVER BELOW SHOSHONE RESERVOIR, WYO.

LOCATION.—In lot 76, T. 52 N., R. 102 W., 3½ miles below Shoshone Dam and 4½ miles west of Cody, Park County. Nearest tributary, Sulphur Creek, enters a short distance downstream.

DRAINAGE AREA.—1,470 square miles (measured on base map of Wyoming).

RECORDS AVAILABLE.—January 1, 1921, to September 30, 1927.

EQUIPMENT.—Stevens water-stage recorder.

CHANNEL AND CONTROL.—Bed composed of boulders and sand. Control shifts slightly at intervals, owing to sand scouring out and filling in. Banks not subject to overflow.

EXTREMES OF DISCHARGE.—Flow is so thoroughly controlled by Shoshone Reservoir that extremes of are little value.

ICE.—Stage-discharge relation rarely affected by ice..

DIVERSIONS AND REGULATION.—No diversions between station and Shoshone Dam, 3½ miles above. Shoshone Reservoir, with capacity of 456,000 acre-feet, regulates flow.

COOPERATION.—Complete records furnished by Bureau of Reclamation.

Daily discharge, in second-feet, of Shoshone River below Shoshone Reservoir, Wyo., for the years ending September 30, 1921–1927

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1921												
1				583	617	605	857	1,060	1,190	3,960	1,140	900
2				583	617	605	940	872	1,780	3,740	1,180	866
3				583	617	577	855	1,040	1,720	3,220	1,160	864
4				583	617	577	713	1,040	1,650	2,710	1,160	856
5				583	617	577	608	1,040	1,570	2,850	1,160	816
6				583	617	577	604	786	1,830	2,300	1,160	816
7				583	617	583	602	1,050	2,760	2,320	1,150	815
8				582	617	1,140	521	852	1,690	2,370	1,150	742
9				583	617	1,930	553	1,080	1,560	2,380	1,110	679
10				583	572	1,930	501	1,190	3,040	2,390	962	677
11				583	528	1,930	652	1,190	5,820	2,390	855	676
12				583	531	1,930	678	1,190	9,000	3,370	855	674
13				583	552	1,930	790	752	11,100	3,370	855	581
14				583	566	1,930	693	1,190	10,700	2,350	855	555
15				583	578	1,540	548	1,190	9,380	2,210	855	484
16				583	583	1,980	591	1,200	9,190	2,100	855	472
17				1,170	583	2,080	592	1,230	8,540	1,960	855	473
18				1,990	574	1,780	788	874	7,000	1,840	855	473
19				1,990	535	2,140	1,010	1,240	5,780	1,740	806	414
20				1,990	535	2,150	1,060	933	1,300	1,650	687	472
21				1,990	606	2,150	1,070	1,250	4,050	1,540	687	471
22				1,470	652	2,150	1,060	1,250	4,050	1,480	687	470
23				598	675	1,110	1,050	1,320	4,760	1,310	687	470
24				605	666	892	1,060	1,390	5,320	1,450	687	470
25				605	640	752	981	1,400	5,460	1,460	687	470
26				605	610	729	937	1,480	5,100	1,630	687	470
27				605	605	729	1,070	1,160	4,820	1,520	808	470
28				605	605	738	1,070	1,460	4,580	1,410	922	470
29				605	------	702	1,070	1,460	4,370	1,360	989	470
30				605	------	748	1,070	1,120	4,250	1,200	958	470
31				605	------	748	------	1,480	------	1,100	926	------
1921-22												
1	450	382	303	303	275	217	227	287	3,270	4,580	1,510	982
2	333	274	215	303	271	214	227	320	3,280	4,170	1,470	969
3	423	307	303	303	267	214	231	368	3,630	3,910	1,470	948
4	423	307	303	303	256	210	231	386	4,660	3,800	1,510	928
5	426	269	303	303	256	210	234	405	5,470	3,610	1,530	928
6	426	243	303	303	256	207	241	434	6,140	3,410	1,500	948
7	423	282	303	303	256	207	245	459	6,920	3,250	1,500	948
8	423	307	303	303	256	207	249	496	7,380	3,100	1,480	935
9	421	307	303	303	252	207	249	528	7,670	2,870	1,450	941
10	303	307	303	303	252	203	256	544	7,840	2,680	1,420	895

Daily discharge, in second-feet, of Shoshone River below Shoshone Reservoir, Wyo., for the years ending September 30, 1921–1927—Continued

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1921–22—Con.												
11	532	307	303	303	252	203	260	555	7,220	2,520	1,380	881
12	579	307	249	303	245	203	264	566	6,720	2,400	1,340	868
13	669	256	235	311	241	200	245	566	6,630	2,270	1,300	855
14	667	350	298	307	241	200	245	572	6,630	2,220	1,280	1,330
15	410	256	298	303	241	197	245	561	6,850	2,300	1,260	2,210
16	262	290	298	303	238	194	252	539	6,870	2,290	1,230	2,140
17	259	303	248	299	238	194	260	566	6,850	2,270	1,190	2,060
18	272	308	295	299	238	194	267	623	7,400	2,180	1,160	2,460
19	352	303	295	295	238	194	252	729	7,860	2,100	1,130	2,800
20	415	303	295	295	231	200	256	849	7,960	2,090	1,110	2,710
21	415	303	297	291	231	207	275	1,010	7,960	2,120	1,080	2,650
22	363	303	299	287	231	210	320	1,300	8,010	2,070	1,070	410
23	336	303	299	287	231	214	328	1,390	7,790	1,960	1,070	1,440
24	372	303	299	283	231	214	337	1,560	6,920	1,870	1,050	2,980
25	345	303	299	283	227	217	350	2,230	6,270	1,790	1,030	2,910
26	304	303	299	283	227	220	363	3,270	5,890	1,730	1,000	2,860
27	382	303	299	279	227	227	382	3,680	5,680	1,690	982	2,830
28	382	303	299	279	217	231	405	3,510	5,440	1,660	962	2,610
29	325	303	299	279	------	231	420	3,440	5,130	1,620	955	1,970
30	301	303	264	279	------	231	400	3,400	4,890	1,570	969	2,770
31	302	------	265	275	------	231	------	3,360	--------	1,540	989	------
1922–23												
1	2,740	197	350	270	197	270	320	429	2,820	6,350	1,720	769
2	2,450	234	350	281	200	274	328	429	2,890	6,440	1,810	752
3	506	271	350	294	200	280	328	429	2,890	6,600	1,960	716
4	506	271	350	317	206	280	324	378	2,900	6,700	1,850	731
5	501	267	350	305	218	274	382	298	2,970	6,250	1,760	731
6	506	271	332	284	218	270	415	287	3,090	6,000	1,670	716
7	496	311	345	250	209	286	415	411	3,200	5,600	1,580	710
8	485	350	354	237	203	309	407	842	3,340	5,440	1,550	710
9	454	350	359	283	200	331	411	936	3,460	5,100	1,510	710
10	429	350	337	312	197	328	411	1,170	3,620	5,840	1,440	689
11	506	350	350	309	197	335	415	1,260	3,780	4,640	1,410	689
12	459	350	350	260	200	328	415	1,320	3,950	4,410	1,360	689
13	429	350	350	260	200	331	415	1,320	4,100	4,200	1,330	679
14	420	350	350	270	203	328	415	1,370	4,360	3,980	1,300	674
15	420	350	350	243	200	324	313	1,320	4,840	3,800	1,260	663
16	420	350	350	224	200	324	243	1,330	5,560	3,640	1,240	653
17	420	350	350	227	206	324	243	1,320	6,300	3,460	1,190	648
18	420	350	350	224	212	331	246	1,350	6,000	3,280	1,150	648
19	415	350	303	227	218	328	250	1,410	5,520	3,010	1,120	648
20	420	350	303	218	230	324	250	1,450	4,610	2,770	1,100	648
21	420	350	303	203	239	324	250	1,510	3,210	2,660	1,080	648
22	410	350	320	215	246	324	287	1,570	3,280	2,640	1,060	648
23	415	350	299	209	263	309	253	1,840	3,720	3,450	934	390
24	420	350	279	206	253	324	263	2,070	3,690	3,510	836	377
25	434	350	295	203	253	313	298	2,350	3,690	3,460	825	377
26	439	350	320	200	250	324	331	2,710	3,690	3,150	813	377
27	415	350	311	200	263	324	343	2,880	4,880	2,820	808	394
28	415	350	350	200	270	324	399	2,790	6,100	2,490	813	428
29	415	350	275	203	------	331	467	2,660	6,130	2,210	791	476
30	400	350	275	200	------	331	423	2,560	6,220	2,020	780	493
31	197	------	279	200	------	328	------	2,560	--------	1,770	774	------
1923–24												
1	547	753	493	454	240	305	250	441	2,560	5,440	1,480	780
2	580	747	484	449	246	284	253	489	2,480	5,360	1,620	786
3	599	742	484	449	246	280	250	538	2,830	5,160	1,550	780
4	614	737	480	449	246	362	253	561	3,780	4,960	1,520	753
5	628	737	380	424	270	351	260	643	4,910	4,990	1,480	726
6	643	732	476	343	263	339	253	679	5,440	5,210	1,440	710
7	653	727	476	294	263	253	298	699	5,380	5,180	1,380	674
8	658	721	471	335	263	250	324	747	4,750	4,910	1,340	694
9	663	710	462	335	270	215	302	752	4,060	4,320	1,300	538
10	663	628	493	343	277	212	335	791	3,530	3,850	1,250	432
11	653	538	511	347	287	218	329	830	3,190	3,540	1,220	358
12	653	524	506	324	291	221	339	930	3,250	3,230	1,200	316
13	648	511	498	324	291	221	480	1,080	3,950	3,210	1,160	316
14	653	511	498	291	291	200	390	1,280	5,410	3,010	1,130	298
15	648	515	489	263	287	233	362	1,680	6,970	2,790	1,100	305

Daily discharge, in second-feet, of Shoshone River below Shoshone Reservoir, Wyo., for the years ending September 30, 1921–1927—Continued

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1923–24—Con.												
16	653	515	484	263	313	212	366	2,900	7,650	2,570	1,080	313
17	653	511	484	274	309	209	362	4,380	7,720	2,380	1,040	313
18	653	502	480	270	309	212	415	5,220	7,660	2,210	1,030	313
19	653	502	476	309	309	212	437	5,730	6,640	2,080	1,040	316
20	694	502	476	339	260	215	351	5,860	5,460	1,980	1,020	324
21	775	502	471	277	260	215	355	5,720	4,520	1,960	1,010	316
22	802	498	467	253	260	215	358	5,730	4,230	1,810	1,000	324
23	796	502	454	233	260	212	366	5,380	4,760	1,660	985	331
24	791	506	462	227	256	215	362	4,700	5,190	1,570	967	335
25	735	502	449	230	260	215	366	4,380	5,320	1,500	961	331
26	780	502	458	237	260	215	370	4,720	5,770	1,450	942	331
27	775	502	454	256	302	212	358	4,410	6,130	1,410	747	331
28	769	498	445	256	305	215	366	3,980	6,030	1,380	819	320
29	758	498	449	256	407	215	378	3,510	5,700	1,190	825	324
30	753	493	449	256	-------	212	394	3,250	5,480	1,180	813	328
31	753	-------	449	246	-------	215	-------	2,840	--------	1,170	791	------
1924–25												
1	328	498	436	349	305	265	288	859	8,270	10,700	1,940	1,010
2	328	493	436	349	305	265	295	889	6,970	9,930	1,850	988
3	331	502	436	345	280	260	302	932	5,970	9,340	1,810	962
4	331	507	436	345	280	260	313	984	5,160	8,500	1,810	942
5	320	507	432	345	280	255	324	1,050	4,640	8,100	1,770	930
6	331	502	427	345	280	255	350	1,110	4,460	7,760	1,700	916
7	343	502	419	345	280	255	357	1,190	4,190	7,520	1,620	904
8	347	498	415	338	275	255	365	1,240	3,930	7,460	1,540	897
9	347	489	445	338	275	255	377	1,260	3,720	6,970	1,510	891
10	351	489	476	338	275	255	392	1,260	3,880	6,540	1,490	878
11	358	489	476	330	275	255	420	1,310	4,050	6,200	1,470	860
12	347	484	480	330	275	255	458	1,440	3,860	5,920	1,450	841
13	351	480	480	330	270	255	493	1,610	3,660	5,890	1,440	829
14	362	476	480	330	270	255	525	2,030	3,480	5,560	1,450	810
15	366	471	484	324	270	255	562	2,640	3,490	5,400	1,450	804
16	370	471	484	324	270	255	615	2,790	4,020	5,210	1,400	798
17	374	471	484	320	270	255	697	3,050	4,240	5,160	1,370	786
18	390	476	480	314	270	257	768	3,240	4,610	4,940	1,340	804
19	407	467	476	314	270	257	801	3,780	5,990	4,580	1,320	762
20	428	467	476	314	270	250	824	4,880	8,040	4,290	1,290	745
21	445	467	471	314	275	250	835	6,490	9,980	3,880	1,270	745
22	449	462	462	310	275	250	847	7,000	10,800	3,470	1,240	739
23	458	458	462	310	275	257	859	6,500	11,700	3,240	1,210	739
24	467	458	415	310	275	264	859	6,100	11,700	3,010	1,180	733
25	476	454	374	310	270	264	853	6,030	11,400	2,770	1,150	727
26	484	449	355	310	270	264	847	6,100	11,600	2,570	1,120	716
27	489	437	355	310	270	264	841	6,200	11,400	2,390	1,100	704
28	498	441	355	310	270	267	835	6,420	10,900	2,290	1,080	698
29	498	437	349	305	-------	267	830	7,050	11,000	2,190	1,070	693
30	502	432	349	305	-------	285	830	8,180	11,200	2,170	1,050	693
31	498	-------	349	305	-------	288	-------	8,830	--------	2,070	1,040	------
1925–26												
1	687	562	506	428	320	249	643	2,580	2,730	3,180	1,160	754
2	687	557	496	423	316	239	631	2,320	2,840	3,110	1,140	742
3	681	562	491	418	316	239	614	1,800	2,960	2,940	1,110	736
4	681	562	487	418	312	239	574	1,710	3,150	2,800	1,090	730
5	670	562	487	413	307	264	574	1,580	3,710	2,650	1,060	724
6	664	557	487	400	307	268	530	1,790	4,550	2,520	1,030	718
7	659	557	487	395	307	264	569	1,790	5,320	2,420	1,010	713
8	653	552	482	395	303	264	660	1,790	4,970	2,420	990	707
9	648	552	477	395	303	295	784	1,790	5,020	2,740	978	701
10	648	547	472	386	299	287	844	1,790	5,400	2,620	972	695

Daily discharge, in second-feet, of Shoshone River below Shoshone Reservoir, Wyo., for the years ending September 30, 1921–1927—Continued

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1925–26—Con.												
11	642	547	472	386	299	264	838	1,790	5,290	2,400	972	689
12	745	547	472	386	299	268	844	1,790	4,940	2,240	966	683
13	1,020	552	472	381	295	260	1,310	1,790	4,560	2,110	972	672
14	1,000	547	472	381	291	260	1,310	1,790	4,240	1,980	966	666
15	982	542	467	377	291	260	1,300	1,790	3,800	1,900	953	654
16	757	536	462	377	287	260	1,310	1,790	3,460	1,800	935	643
17	573	536	462	368	287	264	1,610	1,790	3,060	1,730	923	631
18	562	531	462	368	283	268	2,570	1,800	2,800	1,690	911	620
19	562	526	467	363	283	268	3,030	1,810	2,680	1,660	911	608
20	562	521	462	359	279	268	3,020	1,850	2,570	1,620	905	597
21	562	516	457	354	276	264	3,020	1,920	2,380	1,590	898	591
22	562	511	462	350	272	268	3,010	2,000	2,200	1,550	892	563
23	562	511	472	346	276	287	3,010	2,100	2,070	1,500	880	552
24	567	506	467	341	272	372	3,000	2,110	2,050	1,460	862	541
25	567	506	462	337	268	433	3,000	1,970	2,130	1,420	850	530
26	562	506	462	337	264	585	2,920	2,080	2,300	1,380	838	519
27	562	506	457	332	264	701	2,580	2,170	2,470	1,340	820	509
28	562	506	452	324	264	695	2,580	2,280	2,850	1,300	802	498
29	557	506	448	324	-------	677	2,580	2,400	2,990	1,260	790	488
30	562	501	443	324	-------	672	2,580	2,520	3,070	1,230	790	477
31	557	-------	434	320	-------	660	-------	2,630	--------	1,190	772	-------
1926–27												
1	467	404	404	616	527	283	317	551	1,840	7,350	2,400	1,280
2	467	404	404	611	507	283	317	606	1,850	6,250	2,360	1,250
3	467	404	404	606	459	283	317	637	1,910	5,940	2,360	1,220
4	467	404	413	596	459	283	313	669	2,010	6,080	2,290	1,200
5	467	404	409	674	454	294	313	690	2,180	5,590	2,160	1,170
6	467	404	409	815	445	328	305	787	2,640	4,840	2,060	1,150
7	467	395	409	810	413	332	305	804	3,560	4,630	2,000	1,130
8	467	395	413	804	357	332	305	804	5,180	4,610	1,940	1,110
9	648	395	409	804	357	332	305	810	6,520	4,590	1,860	1,130
10	820	395	400	799	357	320	305	810	7,000	4,740	1,800	1,160
11	637	395	400	787	361	313	305	810	7,980	4,910	1,730	1,180
12	457	395	395	782	361	313	305	810	8,750	5,780	1,700	1,180
13	452	395	395	776	328	313	305	815	9,050	5,420	1,670	1,170
14	452	404	386	771	357	313	305	833	9,360	5,080	1,660	1,170
15	447	395	372	765	328	309	305	885	9,700	4,670	1,650	1,150
16	447	395	359	765	305	313	305	1,000	9,660	4,230	1,640	1,130
17	443	390	254	765	305	309	305	1,210	9,230	3,880	1,620	1,110
18	443	386	341	760	305	313	348	1,440	9,050	3,750	1,590	1,080
19	447	386	268	754	305	309	348	1,600	9,740	3,710	1,560	1,060
20	868	386	381	754	305	313	301	1,570	10,200	3,410	1,560	1,040
21	1,700	381	447	754	305	313	298	1,590	9,300	3,550	1,550	1,020
22	923	386	530	754	305	313	298	1,640	8,830	3,540	1,540	999
23	377	395	643	754	305	309	283	1,730	9,170	3,430	1,530	975
24	377	400	666	754	305	313	268	1,570	10,600	3,260	1,520	962
25	372	404	648	760	290	317	265	1,480	11,300	3,060	1,490	956
26	377	400	637	760	279	317	313	1,530	11,300	2,900	1,460	944
27	381	400	625	760	283	320	324	1,620	12,000	2,780	1,420	932
28	390	400	614	760	283	320	395	1,710	12,300	2,660	1,400	920
29	400	400	602	760	-------	317	454	1,800	11,400	2,750	1,370	903
30	404	400	591	754	-------	320	493	1,810	9,280	2,670	1,340	903
31	400	-------	585	616	-------	317	-------	1,820	-------	2,510	1,310	------

NOTE.—Discharge estimated Jan. 1 to Mar. 18, 1925, from fluctuation of water surface in reservoir.

Monthly discharge of Shoshone River below Shoshone Reservoir, Wyo., for the years ending September 30, 1921–1927

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
1921				
January	1,990	583	818	50,300
February	675	528	598	33,200
March	2,150	577	1,290	79,300
April	1,070	501	820	48,800
May	1,480	752	1,150	70,700
June	11,100	1,190	4,780	284,000
July	3,960	1,100	2,150	132,000
August	1,180	687	916	56,300
September	900	414	600	35,700
The period	11,100	414	1,460	790,000
1921–22				
October	669	259	397	24,400
November	382	243	300	17,900
December	303	215	289	17,800
January	311	275	295	18,100
February	275	217	244	13,600
March	231	194	210	12,900
April	420	227	284	16,900
May	3,680	287	1,240	76,200
June	8,010	3,270	6,370	379,000
July	4,580	1,540	2,500	154,000
August	1,530	955	1,240	76,200
September	2,980	410	1,700	101,000
The year	8,010	194	1,260	908,000
1922–23				
October	2,740	197	574	35,300
November	350	197	329	19,600
December	359	275	329	20,200
January	317	200	243	14,900
February	270	197	220	12,200
March	335	270	314	19,300
April	467	243	342	20,400
May	2,880	287	1,440	88,500
June	6,300	2,820	4,160	248,000
July	6,700	1,770	4,120	253,000
August	1,960	774	1,250	76,900
September	769	377	616	36,700
The year	6,700	197	1,170	845,000
1923–24				
October	802	547	689	42,400
November	753	493	579	34,500
December	511	445	474	29,100
January	454	227	310	19,100
February	407	240	279	16,000
March	362	200	237	14,600
April	480	250	343	20,400
May	5,860	441	2,740	168,000
June	7,720	2,480	5,020	299,000
July	5,440	1,170	2,990	184,000
August	1,620	747	1,140	70,100
September	786	298	444	26,400
The year	7,720	200	1,270	924,000
1924–25				
October	502	320	399	24,500
November	507	432	474	28,200
December	484	349	434	26,700
January	349	305	325	20,000
February	305	270	276	15,300
March	288	250	260	16,000
April	859	288	599	35,600
May	8,830	859	3,630	223,000
June	11,700	3,480	6,940	413,000
July	10,700	2,070	5,360	330,000
August	1,940	1,040	1,400	86,100
September	1,010	693	818	48,700
The year	11,700	250	1,750	1,270,000

Monthly discharge of Shoshone River below Shoshone Reservoir, Wyo., for the years ending September 30, 1921–1927—Continued

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
1925–26				
October	1,020	557	654	40,200
November	562	501	534	31,800
December	506	434	470	28,900
January	428	320	371	22,800
February	320	264	291	16,200
March	701	239	350	21,500
April	3,030	530	1,730	103,000
May	2,630	1,580	1,970	121,000
June	5,400	2,050	3,420	204,000
July	3,180	1,190	1,990	122,000
August	1,160	772	940	57,800
September	754	477	632	37,600
The year	5,400	239	1,110	807,000
1926–27				
October	1,700	372	529	32,500
November	404	381	397	23,600
December	666	268	462	28,400
January	815	596	742	45,600
February	527	279	355	19,700
March	332	283	312	19,200
April	493	265	321	19,100
May	1,820	551	1,180	72,600
June	12,300	1,840	7,760	462,000
July	7,350	2,510	4,280	263,000
August	2,400	1,310	1,730	106,000
September	1,280	903	1,090	64,900
The year	12,300	265	1,600	1,160,000

TONGUE RIVER NEAR DAYTON, WYO.

LOCATION.—In SE. ¼ sec. 2, T. 56 N., R. 87 W., above Highline ditch, at mouth of canyon, 3½ miles southwest of Dayton, Sheridan County. Nearest tributary, Amsden Creek, enters 1½ miles downstream.

DRAINAGE AREA.—204 square miles (measured on topographic map).

RECORDS AVAILABLE.—October 24, 1911, to May 25, 1912 (fragmentary gage-height record); November 18, 1918, to September 30, 1927. From May 1 to October 31, 1903, at Dayton.

EQUIPMENT.—Stevens 7-day water-stage recorder on left bank, 1,000 feet below head gate of Highline Canal. Discharge measurements made from cable 100 feet downstream or by wading.

CHANNEL AND CONTROL.—Bed composed of boulders and coarse gravel, well compacted. Control 200 feet downstream; shifts slightly at long intervals.

EXTREMES OF DISCHARGE.—Maximum stage during year, from water-stage recorder, 5.07 feet at 8.30 p. m. May 17 (discharge, 2,030 second-feet); minimum, 1.39 feet December 14 (discharge, 35 second-feet).

1918–1927: Maximum stage recorded, 5.57 feet at 1 a. m. June 15, 1924 (discharge, 2,460 second-feet); minimum, 1.00 foot at 9 p. m. November 29, 1919 (discharge, 15 second-feet).

DIVERSIONS AND REGULATION.—Only diversion above station is Highline Canal, which diverts about 3,500 acre-feet annually. Alternate melting and freezing of mountain snow during spring cause diurnal fluctuation.

ACCURACY.—Stage-discharge relation practically permanent; not affected by ice. Rating curve well defined between 60 and 1,300 second-feet and checked by a measurement made May 24 at a discharge of 637 second-feet. Operation of water-stage recorder satisfactory. Daily discharge ascertained by applying to rating table mean daily gage height obtained by inspection of recorder graph. Records excellent.

Daily discharge, in second-feet, of Tongue River near Dayton, Wyo., for the year ending September 30, 1927

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	122	110	94	79	70	63	64	543	772	772	304	183
2	132	110	99	79	70	68	68	543	718	711	321	183
3	130	88	99	79	72	69	70	390	821	691	310	177
4	132	90	94	77	74	68	72	346	738	638	297	171
5	127	108	69	77	74	68	69	310	745	626	253	171
6	134	103	83	77	69	66	64	283	905	560	240	177
7	127	103	94	77	72	62	70	283	1,100	532	249	168
8	130	69	94	74	63	68	77	283	1,320	506	249	171
9	122	90	68	69	57	68	77	157	1,460	495	243	177
10	127	105	86	68	70	60	72	204	1,240	446	230	177
11	124	99	90	74	76	58	77	273	1,500	428	223	162
12	117	103	69	70	72	60	76	283	1,420	407	220	157
13	114	90	50	63	69	72	72	331	1,280	394	223	154
14	120	97	38	68	68	74	72	415	1,260	411	256	152
15	112	76	56	88	64	74	72	566	1,190	394	236	150
16	112	94	99	79	66	62	74	926	1,120	379	287	147
17	112	69	99	69	69	60	72	1,380	1,120	353	246	142
18	114	81	97	68	69	60	69	1,360	1,120	331	220	144
19	108	90	90	74	68	53	66	1,060	1,130	324	226	142
20	103	88	86	74	69	52	68	856	1,370	314	236	142
21	110	92	86	69	69	66	58	772	1,260	310	243	140
22	105	101	83	83	68	68	68	884	1,080	314	310	137
23	105	101	79	90	66	62	76	745	1,060	321	276	137
24	99	97	77	85	68	64	79	677	1,100	300	236	142
25	122	92	79	81	63	62	112	766	1,070	290	217	168
26	108	88	77	79	68	63	171	982	1,030	280	204	154
27	114	88	76	74	69	66	243	1,060	1,050	270	208	142
28	101	88	76	68	66	66	304	1,080	1,220	270	204	144
29	108	88	77	68	-------	68	324	905	947	249	204	154
30	69	97	79	69	-------	69	379	800	870	300	198	157
31	124	-------	79	68	-------	72	-------	711	-------	310	189	-------

Monthly discharge of Tongue River near Dayton, Wyo., for the year ending September 30, 1927

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	134	69	116	7,130
November	110	69	93.2	5,550
December	99	38	81.4	5,010
January	90	63	74.7	4,590
February	76	57	68.5	3,800
March	74	52	64.9	3,990
April	379	58	108	6,430
May	1,380	157	651	40,000
June	1,500	718	1,100	65,500
July	772	249	417	25,600
August	321	189	244	15,000
September	183	137	157	9,340
The year	1,500	38	265	192,000

POWDER RIVER AT ARVADA, WYO.

LOCATION.—In sec. 16, T. 54 N., R. 77 W., at highway bridge at Arvada, Sheridan County. Nearest tributary, Wildhorse Creek, an intermittent stream, enters a quarter of a mile downstream.

DRAINAGE AREA.—6,050 square miles (measured on topographic maps and base map of Wyoming.

RECORDS AVAILABLE.—May 4, 1919, to September 30, 1927. From July 22, 1915, to April 29, 1919, station maintained just above mouth of Clear Creek, 16 miles downstream. Discharge at two points fairly comparable, except for run-off following infrequent heavy rains.

EQUIPMENT.—Chain gage on downstream side of bridge. Discharge measurements made from highway bridge or by wading.

CHANNEL AND CONTROL.—Bed composed of sand and gravel. Control 200 feet downstream at small rapids composed of sand and rock; subject to shifts. Right bank subject to overflow at stage of 7 feet.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 6.5 feet at 6 p. m. August 15 (discharge, 7,750 second-feet); minimum discharge during winter.

1919–1927: Maximum stage, from high-water mark, 23.7 feet about 8 p. m. September 29, 1923 (discharge estimated from slope measurement, 95,000 second-feet [2]); river dry during part of summers of 1919, 1921, 1922, and 1923.

DIVERSIONS AND REGULATION.—Practically no diversions from Powder River in Wyoming, but adjudicated diversions for irrigation of 90,000 acres from tributaries entering above. No regulation.

ACCURACY.—Stage-discharge relation slightly shifting; affected by ice, observations discontinued during winter. Rating curve well defined by ten discharge measurements between 50 and 3,000 second-feet; extended beyond those limits. Three of the measurements, covering a range from 200 to 2,500 second-feet, were made during the year and check the curve closely. Gage read to quarter-tenths twice daily. Daily discharge ascertained by applying mean daily gage height to rating table. Records good.

Daily discharge, in second-feet, of Powder River at Arvada, Wyo., for the year ending September 30, 1927

Day	Oct.	Nov.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	176	308		530	2,460	1,440	949	1,630	260
2	182	260		690	2,350	2,220	1,760	1,890	215
3	204	265	350	613	2,990	1,690	1,020	914	188
4	232	237		539	2,790	1,220	869	781	171
5	243	249		445	1,790	1,510	972	575	215
6	232	237		421	1,470	1,260	651	469	176
7	243	204		369	1,260	1,090	575	1,200	166
8	254	249	500	308	1,140	949	503	720	171
9	249	243		347	2,180	847	557	972	176
10	249	237		362	1,800	880	333	1,030	2,980
11	283	232	600	405	1,300	858	296	548	4,020
12	271	198	800	521	2,990	1,990	277	391	2,080
13	283	204	1,000	521	3,180	1,090	413	469	2,180
14	277	215	2,040	485	2,230	1,020	1,890	521	803
15	265	226	1,480	450	2,070	1,180	1,960	4,000	413
16	249	237	1,640	421	2,260	1,340	1,160	3,550	277
17	254	237	1,740	421	2,560	1,190	670	2,430	221
18	254	249	1,040	521	2,820	892	347	995	215
19	249	142	1,930	858	3,200	836	260	604	204
20	243	140	2,920	1,930	3,430	1,260	243	369	198
21	243	140	1,100	1,260	2,330	1,220	398	283	182
22	243	200	926	949	2,080	1,600	880	265	193
23	260	300	566	730	2,190	995	781	584	215
24	260	347	503	1,380	2,100	750	792	461	215
25	260	437	461	1,300	1,800	575	477	557	193
26	302	347	405	1,600	1,680	530	340	429	260
27	314	271	376	1,970	1,560	445	237	308	254
28	314	296	461	1,970	1,650	4,570	290	249	249
29	327	308	469	2,150	1,420	1,690	296	232	302
30	376	321	485	2,570	1,440	1,440	660	249	960
31	314	-------	584	-------	1,240	-------	1,140	283	-------

NOTE.—Stage-discharge affected by ice Nov. 20–23 and Mar. 1–13; discharge estimated on basis of temperature record and observer's notes concerning ice.

[2] For description of flood, see Water-Supply Paper 520, p. 117, 1925.

Monthly discharge of Powder River at Arvada, Wyo., for the year ending September 30, 1927

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	376	176	261	16,000
November	437	140	251	14,900
March	2,920	----------	831	51,100
April	2,570	308	901	53,600
May	3,430	1,140	2,120	130,000
June	4,570	445	1,290	76,800
July	1,960	237	710	43,700
August	4,000	232	902	55,500
September	4,020	166	612	36,400

CLEAR CREEK NEAR BUFFALO, WYO.

LOCATION.—In sec. 6, T. 50 N., R. 82 W., just above power house of Buffalo Northwest Electric Co., 4 miles west of Buffalo, Johnson County.

DRAINAGE AREA.—120 square miles (measured on topographic map).

RECORDS AVAILABLE.—June 16, 1917, to October 31, 1927, when station was discontinued. From June 1 to September 30, 1894, and from May 2, 1896, to February 28, 1900, station maintained at measuring flume 1 mile upstream. Flow at two points comparable.

EQUIPMENT.—Chain gage on left bank 300 feet above power house. Discharge measurements made from cable 50 feet upstream from gage or by wading.

CHANNEL AND CONTROL.—Bed composed of large boulders. Control at large boulders 10 feet downstream; shifts slightly at intervals. Banks not subject to overflow.

EXTREMES OF DISCHARGE.—Maximum stage recorded during period, 4.78 feet at 9.30 a. m. June 28 (discharge, 1,380 second-feet); minimum stage during winter.

1917–1927: Maximum stage recorded, that of June 28, 1927; minimum, 0.66 foot at 7 a. m. March 26, 1922 (discharge, 2 second-feet exclusive of flow through pipe line, which was 4 second-feet).

DIVERSIONS AND REGULATION.—Pipe line of Buffalo Northwest Electric Co. diverts water from Clear Creek 1½ miles upstream; a separate record of flow through pipe line is kept. Four Lakes, French Creek Canal, and North Fork divert water from Clear Creek above station. During 1927, 10,200 acre-feet was diverted between June 10 and August 31. Alternate melting and freezing of mountain snow during spring of year cause diurnal fluctuation in flow.

ACCURACY.—Stage-discharge relation practically permanent; affected by ice, observations discontinued during winter. Rating curve well defined by 11 discharge measurements between 25 and 700 second-feet and checked by discharge measurement on May 22 at a discharge of 421 second-feet; extended beyond these limits. Gage read to quarter-tenths twice daily. Daily discharge ascertained by applying mean daily gage height to rating table. Records good.

Daily discharge, in second-feet, of Clear Creek near Buffalo, Wyo., for the period October 1, 1926, to October 31, 1927

Day	Oct.	Nov.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.
1	53	37		16	626	315	463	216	80	60
2	52	37		17	312	304	357	227	80	59
3	49	18		22	144	282	349	213	76	59
4	51	18		19	136	297	380	174	73	60
5	46	41		16	120	297	376	147	69	60
6	46	38		18	91	330	315	110	66	57
7	44	29		34	128	368	278	120	63	56
8	44	22		36	147	569	271	120	65	56
9	44	19		29	93	647	282	108	70	56
10	42	29		20	86	544	267	95	76	55
11	41	32		20	128	751	278	86	72	50
12	43	31		18	242	789	271	82	66	46
13	39	26		18	395	751	260	88	63	49
14	39	19		20	376	602	260	231	60	51
15	36	19		20	427	577	252	267	57	50
16	37	19		21	561	431	224	206	54	49
17	36	20		21	569	415	170	164	52	50
18	37	28		23	548	463	164	147	51	48
19	44	35		22	419	499	164	139	50	46
20	43	31	14	20	326	540	153	184	50	45
21	43	29	13	22	345	376	167	157	50	44
22	43	31	13	20	443	330	256	177	49	44
23	43	33	13	23	384	345	260	224	47	42
24	39	32	13	21	289	512	181	167	48	41
25	45	28	16	39	297	503	263	139	64	42
26	39	25	13	170	357	516	297	125	63	42
27	43	23	13	508	384	755	242	108	65	44
28	45	23	14	491	423	1,130	216	97	62	42
29	43	23	18	391	326	643	227	90	65	40
30	37	23	19	376	274	585	202	90	66	40
31	37		20		260		227	82		43

Monthly discharge of Clear Creek near Buffalo, Wyo., for the period October 1, 1926, to October 31, 1927

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	53	36	42.7	2,630
November	41	18	27.3	1,620
March 20–31	20	13	14.9	355
April	508	16	83.0	4,940
May	626	86	312	19,200
June	1,130	282	516	30,700
July	463	153	260	16,000
August	267	82	148	9,100
September	80	47	62.4	3,710
October	60	40	49.2	3,030

Combined monthly discharge of Clear Creek and pipe line near Buffalo, Wyo., for the period October 1, 1926, to October 31, 1927

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	61	44	51	3,140
November	48	25	34.3	2,040
March 20–31	26	19	20.9	498
April	514	22	89	5,300
May	633	93	319	19,600
June	1,140	289	523	31,100
July	471	161	268	16,500
August	276	91	157	9,650
September	88	55	70	4,170
October			*56.2	3,460

* Discharge of pipe line estimated at second-feet.

CHEYENNE RIVER BASIN

BELLE FOURCHE RIVER NEAR MOORCROFT, WYO.

LOCATION.—In sec. 36, T. 50 N., R. 68 W., at highway bridge 1½ miles west of Moorcroft, Crook County. Nearest perennial tributary, Donkey Creek, enters 1 mile downstream.

DRAINAGE AREA.—1,380 square miles (measured on base map of Wyoming).

RECORDS AVAILABLE.—September 1, 1923, to September 30, 1927.

EQUIPMENT.—Chain gage on upstream side of highway bridge. Discharge measurements made from downstream side of bridge or by wading.

CHANNEL AND CONTROL.—Bed composed of silt and sand; shifts during high water. No well-defined control. Banks subject to slight overflow during extreme high water.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 8.85 feet at 10 p. m. August 14 (discharge, 6,420 second-feet); minimum, 0.10 foot November 4–7 (discharge, 1.2 second-feet).

1923–1927: Maximum stage recorded, 12.6 feet April 7, 1924 (discharge, from extension of rating curve, 12,500 second-feet); minimum discharge, 0.3 second-foot September 6–30, 1924.

DIVERSIONS AND REGULATION.—Practically no diversion for irrigation above station. Chicago, Burlington & Quincy Railroad pumps 30,000 gallons daily from river just above station. No regulation.

ACCURACY.—Stage-discharge relation not permanent; affected by ice, observations discontinued during winter. Rating curve used October 1 to April 18 fairly well defined by three measurements made during 1926 between 1 and 25 second-feet; curve used April 19 to September 30 fairly well defined between 15 and 1,500 second-feet by three measurements made during year. Gage read to hundredths twice daily. Daily discharge ascertained by applying mean daily gage height to rating table, using shifting-control method May 14–21 and June 24 to August 13. Records fair.

Daily discharge, in second-feet, of Belle Fourche River at Moorcroft, Wyo., for the year ending September 30, 1927

Day	Oct.	Nov.	Apr.	May	June	July	Aug.	Sept.
1	1.5	1.8	9	22	356	18	119	26
2	1.5	1.8	10	19	339	16	140	18
3	1.5	1.7	12	18	96	16	48	18
4	1.5	1.2	9	17	58	15	24	17
5	1.5	1.2	9	15	46	13	49	17
6	1.7	1.2	8	15	48	12	76	16
7	2.2	1.2	7	18	36	9	39	14
8	1.8	1.5	7	381	28	9	38	14
9	1.8	1.5	7	299	24	59	24	13
10	1.8	1.5	7	81	24	35	20	13
11	1.8	1.5	8	422	21	19	14	12
12	1.8	1.8	9	368	148	14	12	12
13	1.8	1.8	10	186	120	11	10	149
14	1.8	2.2	10	117	55	9	2,260	142
15	1.8	2.2	13	101	48	10	1,560	45
16	1.8	2.2	14	80	38	108	545	27
17	1.8	-------	14	57	222	45	242	21
18	1.8	-------	24	47	102	23	123	18
19	1.8	-------	228	37	51	17	100	16
20	1.8	-------	121	34	44	12	81	14
21	1.8	-------	52	149	72	10	71	12
22	1.8	-------	43	715	206	9	68	11
23	1.8	-------	111	182	64	8	309	10
24	1.8	-------	282	78	46	7	81	10
25	1.8	-------	252	55	35	7	52	10
26	1.8	-------	226	42	22	6	42	10
27	1.8	-------	82	36	20	6	40	9
28	1.8	-------	49	33	21	7	46	9
29	1.8	-------	38	31	20	6	43	9
30	1.8	-------	28	51	19	6	41	90
31	1.8	-------	-------	34	-------	6	34	-------

Monthly discharge of Belle Fourche River near Moorcroft, Wyo., for the year ending September 30, 1927

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	2.2	1.5	1.76	108
November 1–16	2.2	1.2	1.64	52
April	282	7	56.6	3,370
May	715	15	121	7,440
June	356	19	81.0	4,820
July	108	6	17.7	1,090
August	2,260	10	205	12,600
September	149	9	26.7	1,590

BELLE FOURCHE RIVER NEAR BELLE FOURCHE, S. DAK.

LOCATION.—In sec. 2, T. 8 N., R. 2 E., at diversion dam of Belle Fourche irrigation project, 1½ miles below Belle Fourche, Butte County.

DRAINAGE AREA.—4,310 square miles.

RECORDS AVAILABLE.—May 10 to November 30, 1906; January 1, 1912, to September 30, 1927.

EQUIPMENT.—Inclined staff gage 100 feet above crest of diversion dam and a gage in canal. Records of daily discharge represent the entire flow of the river at the diversion dam and have been corrected for water diverted through inlet canal and passed through the sluice gates.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 3.12 feet at 7 a. m. May 13 (discharge, 8,250 second-feet); minimum, 0.07 foot at 7 a. m. September 9 (discharge, 94 second-feet).

1912–1927; Maximum stage recorded, 7.8 feet at 4 p. m. April 9, 1924 (discharge, 22,400 second-feet); river dry for several days during 1914 and 1919.

DIVERSIONS AND REGULATION.—In Wyoming portion of drainage basin adjudicated diversions for irrigation of 980 acres from Belle Fourche River and 18,000 acres from tributaries. In South Dakota practically no diversion from Belle Fourche River but extensive diversions from Redwater River.

ACCURACY.—The Bureau of Reclamation considers the records fair.

COOPERATION.—Complete records furnished by United States Bureau of Reclamation.

Daily discharge, in second-feet, of Belle Fourche River near Belle Fourche, S. Dak., for the year ending September 30, 1927

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	170	156	210	190	172	182	250	751	1,540	611	353	475
2	156	159	207	185	183	186	274	632	2,740	524	487	346
3	158	159	209	186	207	245	322	632	3,880	511	457	282
4	177	161	183	172	205	252	357	584	2,500	476	531	270
5	175	162	188	152	213	296	351	584	1,550	411	734	244
6	175	165	204	162	214	305	291	584	1,150	411	622	231
7	175	200	181	156	212	295	272	887	942	392	453	179
8	173	241	177	173	161	266	271	1,870	1,020	363	440	196
9	163	207	183	179	185	276	406	1,390	862	332	752	99
10	170	208	183	162	191	246	346	2,270	787	280	439	108
11	170	191	192	233	177	281	312	4,210	952	276	399	115
12	170	199	185	157	182	244	520	3,840	853	256	328	115
13	168	188	101	152	179	296	512	8,140	930	290	302	115
14	170	201	95	118	179	352	497	3,650	930	346	311	115
15	164	189	88	151	176	357	475	2,780	930	392	379	135

Daily discharge, in second-feet, of Belle Fourche River near Belle Fourche, S. Dak., for the year ending September 30, 1927—Continued

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
16	170	167	152	248	164	366	475	2,190	1,000	1,490	2,870	116
17	171	156	169	161	161	318	1,140	1,830	834	650	1,940	112
18	161	130	172	118	170	327	3,320	1,560	773	403	1,320	265
19	170	148	178	233	185	433	1,830	1,250	672	314	1,050	172
20	170	157	178	131	173	345	1,900	1,140	834	541	704	177
21	170	145	180	94	186	345	1,490	1,420	924	631	609	179
22	170	225	180	143	183	254	1,290	1,410	924	396	704	198
23	168	234	150	144	205	313	1,000	1,040	773	750	571	221
24	168	197	135	155	185	300	904	1,430	922	1,220	395	217
25	167	197	236	157	189	283	812	1,660	1,070	553	400	217
26	147	188	169	151	177	280	700	1,160	773	425	823	234
27	158	216	164	157	188	270	1,170	876	622	552	691	254
28	156	187	173	204	172	259	1,170	910	1,530	457	552	250
29	156	187	178	202	-------	245	1,050	989	1,460	437	445	419
30	150	197	178	189	-------	245	982	822	834	325	419	324
31	151	-------	183	165	-------	245	-------	747	-------	310	379	------

Monthly discharge of Belle Fourche River near Belle Fourche, S. Dak., for the year ending September 30, 1927

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	177	147	166	10,200
November	241	130	184	10,900
December	236	88	173	10,600
January	248	94	167	10,300
February	214	161	185	10,300
March	433	182	287	17,600
April	3,326	250	823	49,000
May	8,140	584	1,720	106,000
June	3,880	622	1,180	70,200
July	1,490	256	494	30,400
August	2,870	302	673	41,400
September	475	99	213	12,700
The year	8,140	88	524	380,000

PLATTE RIVER BASIN

GRIZZLY CREEK NEAR WALDEN, COLO.

LOCATION.—In sec. 29, T. 8 N., R. 80 W., at highway bridge 10 miles south of Walden, Jackson County. Nearest tributary, Little Grizzly Creek, enters half a mile downstream.

DRAINAGE AREA.—234 square miles (measured on geologic map).

RECORDS AVAILABLE.—May 13, 1904, to October 31, 1905; May 3 to September 30, 1923; October 1, 1926, to September 30, 1927.

EQUIPMENT.—Bristol float-type water-stage recorder just below left bridge abutment. Discharge measurements made from single-span bridge or by wading.

CHANNEL AND CONTROL.—Bed composed of sand and gravel. Control is at small rapids 100 feet downstream; practically permanent. Banks not subject to overflow.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 3.85 feet at 3 a. m. May 23 (discharge, 554 second-feet); minimum discharge probably occurred during winter.

1904–5, 1923, 1926–27: Maximum stage recorded, 4.8 feet at 7 a. m. June 10, 1923 (discharge, 1,340 second-feet); minimum discharge, 1 second-foot August 24–28, 1905.

DIVERSIONS AND REGULATION.—Water diverted for irrigation from Grizzly Creek and tributaries above station. Diurnal fluctuation during spring from alternate melting and freezing of mountain snow.

ACCURACY.—Stage-discharge relation practically permanent; affected by ice, observations discontinued during winter. Rating curve well defined between 10 and 500 second-feet by four measurements made during year. Operation of water-stage recorder satisfactory. Daily discharge ascertained by applying to rating table mean daily gage height obtained by inspection of recorder graph. Records good.

Daily discharge, in second-feet, of Grizzly Creek near Walden, Colo., for the year ending September 30, 1927

Day	Oct.	May	June	July	Aug.	Sept.	Day	Oct.	May	June	July	Aug.	Sept.
1	14	------	219	160	48	20	16	17	------	309	18	30	17
2	18	------	226	121	42	18	17	14	------	239	16	32	18
3	21	------	231	95	45	17	18	13	------	250	14	30	16
4	27	------	237	85	48	15	19	13	------	282	12	28	14
5	30	------	252	86	48	14	20	13	------	274	12	26	13
6	30	------	258	81	47	18	21	13	------	246	12	23	11
7	30	------	272	58	43	21	22	13	532	224	20	23	10
8	30	------	286	39	47	21	23	14	518	186	26	23	12
9	29	------	309	36	54	19	24	13	454	159	28	27	14
10	28	------	328	63	60	20	25	12	374	137	31	26	19
11	23	------	320	51	47	18	26	12	356	120	26	27	27
12	20	------	284	38	40	16	27	13	363	116	27	29	32
13	19	------	296	30	38	16	28	13	300	104	39	30	30
14	17	------	282	26	34	17	29	16	270	134	45	28	28
15	17	------	280	22	30	18	30	17	241	156	51	22	24
							31	17	220	------	55	22	------

NOTE.—No gage-height record Oct. 1–3, 5–9, 31; discharge interpolated.

Monthly discharge of Grizzly Creek near Walden, Colo., for the year ending September 30, 1927

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	30	12	18.6	1,140
May 22–31	532	220	363	7,200
June	328	104	234	13,900
July	160	12	45.9	2,820
August	60	22	35.4	2,180
September	32	10	18.3	1,090

NORTH PLATTE RIVER NEAR WALDEN, COLO.

LOCATION.—In sec. 5, T. 8 N., R. 80 W., at highway bridge 8 miles southwest of Walden, Jackson County. Nearest tributary, Roaring Fork, enters 2½ miles above.

DRAINAGE AREA.—446 square miles (measured on topographic map and geologic map in Bulletin 596).

RECORDS AVAILABLE.—May 13, 1904, to October 31, 1905; October 1, 1923, to September 30, 1927.

EQUIPMENT.—Bristol float-type water-stage recorder on downstream side of left pier of bridge. Discharge measurements made from single-span bridge or by wading.

CHANNEL AND CONTROL.—Bed composed of gravel and medium-sized boulders. Control about 200 feet below gage; slightly shifting. Banks subject to slight overflow during extreme high water.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 4.9 feet May 18 (discharge, 1,640 second-feet); minimum discharge occurred during winter. 1904–5, 1923–1927: Maximum stage recorded, 5.0 feet at 8 a. m. June 15, 1924 (discharge, 1,760 second-feet); minimum discharge, 15 second-feet September 13–18, 1905.

DIVERSIONS AND REGULATION.—See North Platte River near Northgate, Colo., for diversions. Diurnal fluctuation during spring caused by alternate melting and freezing of mountain snow.

ACCURACY.—Stage-discharge relation practically permanent; seriously affected by ice, observations discontinued during winter. Rating curve well defined by 10 discharge measurements between 40 and 1,600 second-feet and checked by 3 measurements during year. Operation of water-stage recorder not satisfactory. Daily discharge ascertained by applying to rating table mean daily gage height obtained by inspection of recorder graph, except as indicated in footnote to table of daily discharge. Records good except those for periods of missing gage heights, which are fair.

Daily discharge, in second-feet, of North Platte River near Walden, Colo., for the year ending September 30, 1927

Day	Oct.	Nov.	Apr.	May	June	July	Aug.	Sept.
1	45	56	--------	1,200	589	860	196	88
2	51	59	--------	1,300	643	576	182	80
3	54	61	--------	1,310	702	562	204	80
4	60	59	--------	1,270	697	548	207	75
5	66	--------	--------	1,210	740	408	179	75
6	64	--------	--------	1,150	815	328	174	78
7	62	--------	--------	1,130	895	270	194	79
8	60	--------	--------	1,420	1,050	200	179	78
9	61	--------	--------	1,450	1,250	350	177	79
10	71	--------	1,540	1,300	1,330	300	165	85
11	78	--------	1,500	1,100	1,310	254	168	80
12	78	--------	1,450	1,150	1,230	252	156	74
13	72	--------	1,100	1,050	1,200	252	144	79
14	64	--------	650	1,090	1,180	223	134	82
15	58	--------	500	1,110	1,240	194	124	82
16	56	--------	359	1,230	1,270	159	114	83
17	55	--------	350	1,430	1,060	142	106	84
18	51	--------	345	1,590	1,160	124	102	85
19	47	--------	340	1,560	1,450	106	96	82
20	47	--------	350	1,330	1,360	108	101	82
21	47	--------	390	1,230	1,200	128	102	82
22	46	--------	440	1,230	1,010	154	96	79
23	48	--------	510	1,240	860	174	96	84
24	50	--------	580	1,080	900	218	101	96
25	50	--------	785	584	1,010	177	97	126
26	51	--------	980	760	980	159	102	142
27	52	--------	1,030	790	1,000	161	98	134
28	52	--------	995	745	1,020	177	94	122
29	55	--------	1,000	706	1,010	210	104	111
30	60	--------	1,100	625	1,040	238	94	113
31	58	--------	--------	557	--------	223	94	-------

NOTE.—Stage-discharge relation affected by ice Apr. 10–15 and gage-height record missing Apr. 17–23, 30, May 10–13, July 3, 8–11, 18, Aug. 12–16, 27, Sept. 16 and 17; discharge based on comparison with records of flow of North Platte River at Saratoga and of Roaring Fork and Grizzly Creek near Walden.

Monthly discharge of North Platte River near Walden, Colo., for the year ending September 30, 1927

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	78	45	57.1	3,510
November 1-4	61	56	58.8	466
April 10-30	1,540	340	776	32,300
May	1,590	557	1,130	69,500
June	1,450	589	1,040	61,900
July	860	106	266	16,400
August	207	94	135	8,300
September	142	74	90.0	5,360

NORTH PLATTE RIVER NEAR NORTHGATE, COLO.

LOCATION.—In sec. 11, T. 11 N., R. 80 W., at bridge on Interstate Highway 6 miles south of Colorado-Wyoming line and 6 miles northwest of Northgate, Jackson County. Three small tributaries, Camp, Threemile, and Sixmile Creeks, enter North Platte River between station and State line. These streams have very little flow except spring run-off.

DRAINAGE AREA.—1,440 square miles (measured on Colorado topographic map).

RECORDS AVAILABLE.—May 23, 1915, to September 30, 1927.

EQUIPMENT.—Gurley 7-day water-stage recorder. Discharge measurements made from 2-span bridge or by wading.

CHANNEL AND CONTROL.—Bed composed of sand, gravel, and small boulders. Principal control 200 feet downstream at small rapids; shifting at intervals. Banks are not subject to overflow.

EXTREMES OF DISCHARGE.—Maximum stage during year, from water-stage recorder, 4.13 feet at 10 a. m. May 19 (discharge, 2,760 second-feet); minimum stage probably occurred during winter.

1915–1927: Maximum stage recorded, 6.24 feet at 3 a. m. June 11, 1923 (discharge, 6,720 second-feet); minimum discharge, 67 second-feet October 7 and 20, 1922.

DIVERSIONS AND REGULATION.—Water diverted for irrigation of 100,000 acres from North Platte River and tributaries above station. No regulation.

ACCURACY.—Stage-discharge relation practically permanent; seriously affected by ice, observations discontinued during winter. Rating curve well defined by 10 discharge measurements between 100 and 4,000 second-feet and checked by 3 measurements during year. Operation of water-stage recorder fairly satisfactory. Daily discharge ascertained by applying to rating table mean daily gage height obtained by inspection of recorder graph, except as indicated in footnote to table of daily discharge. Records good except those for periods of missing gage heights, which are fair.

Daily discharge, in second-feet, of North Platte River near Northgate, Colo., for the year ending September 30, 1927

Day	Oct.	Nov.	Apr.	May	June	July	Aug.	Sept.
1	116	129	------	2,250	1,020	2,030	534	235
2	129	------	------	2,320	998	1,310	474	228
3	140	------	------	2,430	1,030	1,040	486	222
4	164	------	------	2,280	1,070	1,030	515	215
5	183	------	------	2,040	1,170	1,230	521	208
6	186	------	------	1,850	1,280	1,150	491	202
7	183	------	------	1,730	1,310	865	497	196
8	173	------	------	2,100	1,420	712	486	196
9	179	------	------	2,000	1,670	624	446	196
10	190	------	------	1,800	1,990	829	402	200
11	190	------	------	1,840	2,160	704	375	200
12	183	------	------	1,940	2,380	584	355	198
13	173	------	------	2,040	2,350	540	330	198
14	164	------	------	1,960	2,300	497	335	200
15	157	------	------	2,000	2,350	429	325	217
16	154	------	------	2,010	2,250	385	320	210
17	148	------	------	2,180	2,300	360	310	196
18	145	------	------	2,480	2,400	350	295	179
19	145	------	------	2,710	2,480	350	273	167
20	142	------	------	2,540	2,640	360	269	151
21	142	------	------	2,350	2,250	375	269	151
22	140	------	------	2,360	1,970	400	257	154
23	137	------	736	2,430	1,630	425	253	170
24	134	------	874	2,380	1,440	450	238	214
25	132	------	1,270	1,930	1,520	491	234	249
26	132	------	1,760	1,600	1,610	474	253	380
27	129	------	2,070	1,540	1,620	468	261	412
28	126	------	2,220	1,450	1,760	474	261	340
29	127	------	2,270	1,360	2,010	591	254	305
30	128	------	2,120	1,210	2,250	631	248	285
31	128	------	------	1,090	------	578	242	------

NOTE.—No gage-height record Oct. 29–31, May 9, June 14–18, July 17–24, and Aug. 29 to Sept. 6; discharge based on comparison with records of flow of North Platte River near Walden.

Monthly discharge of North Platte River near Northgate, Colo., for the year ending September 30, 1927

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	190	116	152	9,350
April 23–30	2,270	736	1,660	26,300
May	2,710	1,090	2,010	124,000
June	2,640	998	1,820	108,000
July	2,030	350	669	41,100
August	534	234	349	21,500
September	412	151	222	13,200

NORTH PLATTE RIVER AT SARATOGA, WYO.

LOCATION.—At highway bridge at Saratoga, Carbon County. Nearest tributary, Spring Creek, enters 2 miles above.

DRAINAGE AREA.—2,880 square miles (measured on base map of Wyoming).

RECORDS AVAILABLE.—June 9, 1903, to October 31, 1906; April 1 to December 17, 1909; April 27, 1911, to September 30, 1927.

EQUIPMENT.—Chain gage on upstream side of bridge. Discharge measurements made from 2-span highway bridge or by wading.

CHANNEL AND CONTROL.—Bed composed of coarse gravel and small boulders. Control at rapids 500 feet downstream; fairly permanent. Banks not subject to overflow.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 8.05 feet June 15 (discharge, 8,460 second-feet); minimum discharge, estimated, 160 second-feet November 20.

1903–1906, 1909, 1911–1927: Maximum stage recorded, 11.06 feet (present datum) from high-water mark on June 8, 1909 (discharge, from extension of rating curve, 18,000 second-feet); minimum, 3.3 feet at 6 p. m. September 7, 1924 (discharge, 87 second-feet).

DIVERSIONS AND REGULATION.—Adjudicated diversions for irrigation of 5,800 acres from North Platte River between Saratoga and State line. No regulation.

ACCURACY.—Stage-discharge relation shifts slightly at intervals; affected by ice. Rating curve used October 1 to November 18 well defined by nine measurements; curve used November 19 to September 30 well defined by nine measurements between 200 and 9,000 second-feet and checked by four measurements made during year. Gage read to hundredths twice daily. Daily discharge ascertained by applying mean daily gage height to rating tables, except as indicated in footnote to table of daily discharge. Records good except those for estimated periods, which are fair.

Daily discharge, in second-feet of North Platte River at Saratoga, Wyo., for the year ending September 30, 1927

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	209	290		234	271	300	890	4,710	4,560	4,070	944	435
2	217	295		243	280	320	880	4,680	4,610	3,930	922	435
3	221	310		234	285	340	870	4,510	4,760	3,520	944	435
4	209	310		252	309	319	860	4,560	4,760	3,170	922	408
5	209	310		271	290	309	840	4,610	4,960	2,800	860	385
6	209	320	250	252	280	324	900	4,740	5,160	2,240	860	350
7	201	325		276	309	367	1,320	4,660	5,220	2,120	860	362
8	201	335		265	290	350	2,120	4,510	5,320	1,750	860	350
9	201	330		255	252	396	2,440	4,460	6,030	1,480	900	356
10	217	320		250	243	547	2,440	4,460	6,770	1,450	880	345
11	230	320				511	2,290	4,510	7,450	1,440	800	330
12	345	325				448	2,150	4,610	7,010	1,280	676	319
13	400	320				373	1,960	4,660	6,420	1,140	650	309
14	388	315				408	1,750	4,910	6,420	1,050	617	309
15	370	300				475	1,370	5,060	8,460	860	570	309
16	360	285	185	240	260	448	1,140	5,430	6,950	668	547	290
17	355	185				356	1,100	5,920	6,650	642	555	304
18	340	181				330	1,050	7,320	6,360	642	602	319
19	350	165				319	1,030	7,260	6,560	563	511	309
20	330	160				290	1,030	7,580	6,950	563	511	299
21	330				319	271	1,090	7,970	6,140	555	489	290
22	325				304	299	1,010	7,770	5,110	547	482	299
23	315				290	319	988	7,710	4,660	518	482	290
24	305				257	330	1,080	7,450	4,680	800	475	299
25	300				248	350	1,320	5,920	4,560	746	455	746
26	295	220	205	240	234	373	1,850	5,750	4,260	650	435	746
27	300				226	402	2,330	5,750	4,260	840	449	820
28	300				270	563	3,780	5,860	4,260	944	462	737
29	310				-------	728	4,170	4,980	4,510	1,030	462	710
30	305				-------	840	4,310	4,840	4,760	1,220	455	693
31	290	-------			-------	860	-------	4,640	-------	1,140	448	------

NOTE.—Stage-discharge relation affected by ice Nov. 19 to Jan. 1, Jan. 7 to Feb. 2, Feb. 9–20, Mar. 1, 2; discharge estimated on basis of temperature and gage-height record, one current-meter measurement, and observer's notes.

Monthly discharge of North Platte River at Saratoga, Wyo., for the year ending September 30 1927

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	400	201	288	17,700
November	335	160	263	15,600
December	----------	----------	213	13,100
January	----------	----------	244	15,000
February	----------	----------	270	15,000
March	860	271	415	25,500
April	4,310	840	1,680	100,000
May	7,970	4,460	5,540	341,000
June	8,460	4,260	5,620	334,000
July	4,070	518	1,430	87,900
August	944	435	648	39,800
September	820	290	420	25,000
The year	8,460	----------	1,420	1,030,000

NORTH PLATTE RIVER BELOW PATHFINDER RESERVOIR, WYO.

LOCATION.—In sec. 24, T. 29 N., R. 84 W., a quarter of a mile below Pathfinder Dam, Natrona County. Nearest tributary, Canyon Creek, enters 2 miles above in the reservoir.

DRAINAGE AREA.—10,700 square miles (measured on base map of Wyoming).

RECORDS AVAILABLE.—May 9, 1905, to September 30, 1927.

EQUIPMENT.—Chain gage on left bank a quarter of a mile below Pathfinder Dam. Discharge measurements made from cable 50 feet above gage.

CHANNEL AND CONTROL.—Bed composed of gravel; control practically permanent. Banks not subject to overflow.

EXTREMES OF DISCHARGE.—Since completion of reservoir: Maximum discharge, 18,900 second-feet June 25–27, 1917; leakage through gate during winter may be as low as 5 second-feet.

DIVERSIONS AND REGULATION.—Adjudicated diversions for irrigation of 7,000 acres from North Platte River between Saratoga and Pathfinder Reservoir and 147,000 acre-feet from tributaries. Pathfinder Dam forms reservoir having a capacity of 1,070,000 acre-feet, which materially changes natural run-off of river. Winter flow may be practically cut off in some years by storage in reservoir.

COOPERATION.—Complete records furnished by United States Bureau of Reclamation.

Daily discharge, in second-feet, of North Platte River below Pathfinder Reservoir, Wyo., for the year ending September 30, 1927

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	50	50	315	500	300	620	55	50	3,000	5,600	6,150	4,430
2	50	50	315	500	300	620	55	50	3,000	5,700	5,870	4,430
3	50	50	315	500	300	630	55	50	3,000	5,610	5,230	4,430
4	50	50	315	500	300	140	55	50	3,010	5,450	5,090	4,420
5	50	50	315	500	300	65	55	50	3,010	5,520	5,140	4,400
6	50	50	300	500	300	60	55	50	3,010	5,490	5,130	4,400
7	50	50	300	500	300	60	55	50	3,050	5,690	5,170	4,430
8	50	50	300	500	300	60	55	50	3,050	5,470	5,160	4,420
9	50	50	300	500	300	60	55	50	4,900	5,570	5,150	4,400
10	50	50	300	500	300	60	55	50	5,170	5,540	5,120	4,450
11	50	50	300	500	300	60	55	50	5,060	5,620	5,100	4,420
12	50	50	300	500	300	60	55	50	5,250	5,550	5,080	4,420
13	50	50	300	500	300	60	55	50	5,190	5,810	4,560	4,410
14	50	50	420	500	300	60	55	50	5,220	6,060	4,520	4,040
15	50	50	500	500	300	60	55	50	5,180	6,060	4,540	3,910

Daily discharge, in second-feet, of North Platte River below Pathfinder Reservoir, Wyo., for the year ending September 30, 1927—Continued

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
16	50	50	500	500	150	60	55	50	5,220	6,060	4,600	3,890
17	50	50	500	500	50	60	50	50	6,130	6,050	3,950	1,430
18	50	250	500	500	50	60	50	100	6,840	6,040	3,490	540
19	50	315	500	500	50	60	50	100	7,220	6,100	3,430	540
20	50	315	500	500	50	145	50	100	7,420	6,110	3,430	2,180
21	50	315	500	500	50	95	50	100	7,480	6,140	3,400	2,530
22	50	315	500	500	50	95	50	100	7,500	6,130	3,390	2,530
23	50	315	500	500	50	95	50	100	7,400	6,110	3,380	2,520
24	50	315	500	500	50	95	50	100	7,120	6,140	4,400	3,400
25	50	315	500	500	50	95	50	100	6,690	6,130	4,460	4,650
26	50	315	500	500	50	95	50	100	6,270	6,110	4,450	4,950
27	50	315	500	500	300	95	50	930	5,970	6,150	4,450	3,490
28	50	315	500	500	600	95	50	2,020	5,740	6,150	4,440	3,040
29	50	315	500	410	-------	95	50	3,060	5,610	6,140	4,430	540
30	50	315	500	310	-------	95	50	3,010	5,710	6,120	4,420	100
31	50	-------	500	310	-------	95	-------	3,040	-------	6,110	4,400	-------

Monthly discharge of North Platte River below Pathfinder Reservoir, Wyo., for the year ending September 30, 1927

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	50	50	50	3,070
November	315	50	163	9,700
December	500	300	416	25,600
January	500	310	485	29,800
February	600	50	216	12,000
March	630	60	132	8,120
April	55	50	53	3,150
May	3,060	50	445	27,400
June	7,500	3,000	5,280	314,000
July	6,150	5,450	5,890	362,000
August	6,150	3,390	4,580	282,000
September	4,950	100	3,390	202,000
The year	7,500	50	1,770	1,280,000

NORTH PLATTE RIVER ABOVE AND BELOW WHALEN, WYO.

LOCATION.—In sec. 11, T. 26 N., R. 65 W., at diversion dam at Whalen, Goshen County. Nearest large tributary, Cottonwood Canyon Creek, an intermittent stream, which enters 1½ miles below.

DRAINAGE AREA.—16,300 square miles (measured on base map of Wyoming).

RECORDS AVAILABLE.—May 1, 1909, to September 30, 1927. Records above Whalen represent discharge above dam, and those below Whalen quantity passing over dam. Difference between two records represents amount diverted by Interstate and Fort Laramie Canals.

EQUIPMENT.—To determine flow over weir vertical staff is used, its zero being weir crest. The discharge is then computed by a weir formula. There are also four sluice gates in dam, through which discharge is computed. Discharge through headgates of Interstate and Fort Laramie Canals is computed from gate openings.

DIVERSIONS AND REGULATION.—Adjudicated diversions for irrigation of 38,000 acres from North Platte River between Pathfinder and Whalen gaging station, exclusive of the diversions by the Bureau of Reclamation. Discharge represents chiefly effect of Pathfinder and Guernsey Reservoirs, which store water for use in Interstate and Fort Laramie Canals.

COOPERATION.—Complete records furnished by United States Bureau of Reclamation.

Daily discharge, in second-feet, of North Platte River above Whalen, Wyo., for the year ending September 30, 1927

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	2,740	391	665	622	715	135	350	3,270	3,180	5,060	6,050	4,030
2	1,650	349	647	676	679	175	400	3,320	3,480	5,600	6,340	4,050
3	1,110	323	641	748	595	87	400	3,400	3,350	5,710	6,730	4,140
4	913	317	619	796	541	25	821	3,300	3,100	5,770	6,650	4,430
5	835	311	619	864	701	25	850	2,930	3,010	5,710	6,090	4,030
6	688	305	659	840	631	25	928	2,510	3,210	5,270	5,710	4,140
7	576	300	659	864	625	25	749	2,250	3,210	5,010	4,970	4,250
8	493	299	670	858	577	525	759	2,310	3,150	5,040	4,570	4,330
9	462	293	594	871	517	540	761	2,660	2,850	5,390	4,430	4,280
10	397	293	541	853	457	540	713	2,620	3,250	4,490	4,600	4,260
11	325	293	637	805	439	540	908	2,620	4,750	5,250	4,730	4,230
12	325	299	336	775	449	500	930	3,430	4,390	5,380	4,700	4,270
13	351	305	76	751	351	500	1,010	4,090	4,860	5,450	4,750	4,120
14	321	305	92	739	361	450	992	4,980	4,230	5,460	4,790	3,970
15	303	329	79	709	451	450	904	5,180	4,710	5,490	5,650	4,120
16	303	335	138	571	499	400	892	5,370	5,840	5,530	6,310	4,130
17	300	281	205	541	493	400	744	5,550	6,620	5,610	5,750	4,090
18	260	196	205	595	467	400	822	5,570	6,110	5,630	4,060	3,690
19	250	136	260	679	629	450	1,080	5,400	6,420	5,670	3,850	3,360
20	276	163	310	703	597	400	1,470	4,880	7,090	5,600	3,130	2,810
21	269	170	364	553	631	300	1,270	4,600	8,310	5,590	3,130	2,430
22	269	192	448	451	565	350	1,100	4,320	7,720	5,680	3,170	2,460
23	293	294	586	379	529	400	993	3,310	8,380	6,090	3,420	2,520
24	300	714	676	313	583	450	994	2,770	7,850	6,140	3,590	2,650
25	311	1,120	610	289	463	450	1,060	2,290	7,260	6,020	4,130	2,600
26	317	786	628	355	485	400	1,070	1,910	6,930	5,920	4,040	2,960
27	305	738	574	505	441	400	1,400	1,710	6,400	5,880	4,130	4,000
28	369	725	472	661	0	350	2,190	1,500	6,220	5,970	4,040	4,630
29	402	677	478	727	-------	350	2,870	1,270	6,250	6,020	4,000	4,370
30	404	671	556	727	-------	350	3,090	1,500	4,800	6,180	4,110	2,420
31	400	-------	586	727	-------	350	-------	2,060	-------	6,270	4,050	------

NOTE.—No flow Feb. 28 because diversion tunnel at Guernsey Dam was closed and some time was required to fill reservoir up to power intake gate, through which it could be diverted and returned to river below.

Daily discharge, in second-feet, of North Platte River below Whalen, Wyo., for the year ending September 30, 1927

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	2,480	290	554	393	501	135	350	2,530	1,460	2,440	3,210	1,120
2	1,450	248	536	447	465	150	400	2,290	1,720	3,120	3,540	1,060
3	912	212	530	519	381	75	400	2,150	1,640	3,230	4,250	1,190
4	714	206	578	567	327	25	266	2,120	1,380	3,260	4,430	1,450
5	636	200	619	675	579	25	247	1,690	1,290	3,140	3,850	950
6	413	259	548	663	417	25	325	1,460	1,500	2,660	3,330	1,060
7	336	300	548	687	411	25	175	1,200	1,400	2,240	2,640	1,150
8	240	188	560	681	363	525	181	1,820	1,270	2,090	2,390	1,210
9	240	182	476	717	303	540	198	1,960	859	2,170	2,320	1,180
10	144	182	344	699	243	540	535	1,970	1,080	1,220	2,540	1,390
11	72	182	637	651	225	540	730	1,630	2,470	1,870	2,650	1,470
12	72	188	260	624	327	500	752	2,390	2,020	1,900	2,560	1,610
13	98	259	32	597	183	500	830	2,980	2,330	1,920	2,620	1,520
14	68	305	15	585	147	450	814	3,780	1,700	1,880	2,660	1,410
15	50	218	15	555	237	450	726	3,980	2,210	1,920	3,340	1,740
16	103	224	15	417	285	400	714	4,170	3,350	2,060	3,960	1,800
17	100	170	15	387	279	400	589	4,380	4,110	2,120	3,290	1,750
18	60	104	15	441	253	400	667	4,380	3,590	2,130	1,520	1,350
19	50	50	39	525	507	450	787	4,180	3,900	2,170	1,220	944
20	175	67	81	549	429	400	1,020	3,670	4,560	2,100	505	392
21	168	69	135	399	417	300	817	3,360	5,780	2,090	552	110
22	168	81	219	297	351	350	643	3,050	5,140	2,130	375	145
23	192	183	357	225	315	400	583	2,030	5,770	2,510	500	157
24	300	603	447	159	369	450	571	1,450	5,190	2,580	710	423
25	210	1,010	381	135	249	450	637	957	4,450	2,450	1,170	469
26	216	675	399	201	363	400	493	501	4,020	2,430	1,010	1,140
27	204	697	345	351	273	400	745	309	3,300	2,390	1,170	2,450
28	268	725	243	507	0	350	1,500	85	2,960	2,550	1,120	3,080
29	301	566	249	573	-------	350	2,170	85	3,650	2,700	1,030	3,450
30	362	560	327	573	-------	350	2,390	103	2,330	2,840	1,150	1,720
31	400	-------	357	513	-------	350	-------	427	-------	3,000	1,120	------

NOTE.—No flow Feb. 28 because diversion tunnel at Guernsey Dam was closed and some time was required to fill reservoir up to power intake gate, through which it could be diverted and returned to river below.

Monthly discharge of North Platte River above Whalen, Wyo., for the year ending September 30, 1927

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	2,740	250	533	32,800
November	1,120	136	397	23,600
December	676	76	472	29,000
January	871	289	663	40,800
February	715	0	517	28,700
March	540	25	347	21,300
April	3,090	350	1,080	64,300
May	5,570	1,270	3,320	204,000
June	8,380	2,850	5,230	311,000
July	6,270	4,490	5,610	345,000
August	6,730	3,130	4,700	289,000
September	4,630	2,420	3,730	222,000
The year	8,380	0	2,230	1,610,000

Monthly discharge of North Platte River below Whalen, Wyo., for the year ending September 30, 1927

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	2,480	50	361	22,200
November	1,010	50	307	18,300
December	637	15	319	19,600
January	717	135	494	30,400
February	507	0	329	18,300
March	540	25	345	21,200
April	2,390	175	708	42,100
May	4,380	85	2,160	133,000
June	5,780	852	2,880	171,000
July	3,260	1,220	2,360	145,000
August	4,430	375	2,150	132,000
September	3,450	110	1,300	77,400
The year	5,780	0	1,150	830,000

NORTH FORK OF NORTH PLATTE RIVER NEAR WALDEN, COLO.

LOCATION.—In sec. 29, T. 9 N., R. 80 W., at Norrell ranch, one-fourth mile above mouth and 7 miles west of Walden, Jackson County.

DRAINAGE AREA.—168 square miles (measured on topographic map and special map in Bulletin 596).

RECORDS AVAILABLE.—October 1, 1923, to September 30, 1927.

EQUIPMENT.—Bristol float-type water-stage recorder on left bank opposite ranch house. Datum lowered 0.34 foot October 1, 1926. Discharge measurements made from cable just above recorder or by wading.

CHANNEL AND CONTROL.—Bed composed of gravel and sand. Control at gravel bar 150 feet below; shifts at infrequent intervals. Banks subject to overflow during high water.

EXTREMES OF DISCHARGE.—Maximum stage during year, from water-stage recorder, 2.17 feet at 7 a. m. June 30 (discharge, 520 second-feet); minimum discharge probably occurred during winter.

1924–1927: Maximum stage recorded, 2.63 feet at 9 a. m. April 19, 1926 (discharge, 694 second-feet); minimum discharge, 19 second-feet September 16, 1924, and September 29 and 30, 1926.

DIVERSIONS AND REGULATION.—Water diverted for irrigation of several hundred acres. Diurnal fluctuation during spring from alternate melting and freezing of mountain snow.

ACCURACY.—Stage-discharge relation permanent during year; seriously affected by ice, observations discontinued during winter. Rating curve fairly well defined between 60 and 400 second-feet by three measurements made during year; extended parallel to previous curve beyond those limits. Operation of water-stage recorder satisfactory. Daily discharge ascertained by applying to rating table mean daily gage height obtained by inspection of recorder graph, using shifting-control method October 1 to November 13, except as indicated in footnote to table of daily discharge. Records good except those for estimated periods, which are fair.

Daily discharge, in second-feet, of North Fork of North Platte River near Walden, Colo., for the year ending September 30, 1927

Day	Oct.	Nov.	Apr.	May	June	July	Aug.	Sept.
1	25	26	441	262	57	346	170	66
2	33	27	454	262	67	223	175	66
3	35	28	474	245	82	204	187	69
4	36	23	464	225	92	262	184	64
5	37	37	497	200	113	365	172	67
6	37	41	467	190	120	288	170	64
7	33	40	441	215	134	223	166	62
8	29	34	414	230	166	199	155	59
9	31	32	398	220	199	207	138	64
10	30	36	350	220	225	333	118	66
11	27	34	320	210	270	254	109	62
12	26	36	275	202	294	199	113	58
13	26	37	235	202	243	180	111	62
14	25	-------	190	236	262	182	104	61
15	26	-------	150	225	281	161	104	58
16	27	-------	144	246	300	140	107	55
17	27	-------	148	254	257	126	97	57
18	26	-------	130	249	303	117	92	55
19	26	-------	120	168	375	113	97	53
20	27	-------	130	155	375	130	106	52
21	25	-------	132	182	324	194	95	50
22	26	-------	128	189	273	228	89	53
23	26	-------	117	163	246	130	92	69
24	27	-------	125	117	257	246	92	74
25	26	-------	145	86	327	184	83	95
26	26	-------	170	90	346	163	88	102
27	26	-------	190	76	375	184	100	88
28	26	-------	207	74	451	194	88	71
29	27	-------	238	77	494	257	78	70
30	28	-------	294	70	494	236	77	76
31	25	-------	-------	61	-------	197	71	-------

NOTE.—Stage-discharge relation affected by ice Apr. 10–15, 24–27, and May 2–11; discharge estimated on basis of temperature record and comparison with records for Roaring Fork.

Monthly discharge of North Fork of North Platte River near Walden, Colo., for the year ending September 30, 1927

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	37	25	28.3	1,740
November 1–13	41	23	33.2	856
April	497	117	266	15,800
May	262	61	181	11,100
June	494	57	260	15,500
July	365	113	212	13,000
August	187	71	117	7,190
September	102	50	65.6	3,900

ROARING FORK NEAR WALDEN, COLO.

LOCATION.—In sec. 10, T. 8 N., R. 81 W., at highway bridge 1½ miles above mouth and 11 miles southwest of Walden, Jackson County. Nearest tributary, Beaver Creek, enters 1 mile above.

DRAINAGE AREA.—84 square miles (measured on topographic map and on geologic map in Bulletin 596).

RECORDS AVAILABLE.—May 14, 1904, to October 31, 1905; October 1, 1923, to September 30, 1927.

EQUIPMENT.—Bristol float-type water-stage recorder at left abutment of bridge. Discharge measurements made from bridge or by wading.

CHANNEL AND CONTROL.—Bed composed of gravel. Control 50 feet below gage; shifts at intervals. Banks not subject to overflow.

EXTREMES OF DISCHARGE.—Maximum stage during year, from water-stage recorder, 3.52 feet at 9 a. m. June 19 (discharge, 628 second-feet); minimum discharge probably occurred during winter.

1904–5, 1923–1927: Maximum stage recorded, 3.73 feet at 6 a. m. June 15, 1924 (discharge, 790 second-feet); minimum, 1.02 feet (old datum) August 15, 1904 (discharge, 2 second-feet).

DIVERSIONS AND REGULATION.—Water diverted for irrigation of several hundred acres. Diurnal fluctuation during spring from alternate melting and freezing of mountain snow.

ACCURACY.—Stage-discharge relation not permanent; affected by ice, observations discontinued during winter. Rating curve used October 1 to June 19 well defined by thirteen measurements and checked during year by measurement on May 25 at discharge of 137 second-feet. Curve used June 20 to September 30 fairly well defined between 40 and 600 second-feet by two measurements made during year. Operation of water-stage recorder satisfactory. Daily discharge ascertained by applying to rating tables mean daily gage height obtained by inspection of recorder graph, using shifting-control method May 16–31 and June 12–19, except as indicated in footnote to table of daily discharge. Records fair.

Daily discharge, in second-feet, of Roaring Fork near Walden, Colo., for the year ending September 30, 1927

Day	Oct.	Nov.	Dec.	Apr.	May	June	July	Aug.	Sept.
1	20	20	32		332	126	335	94	41
2	22	20	30		346	153	233	109	40
3	22	23	27	80	270	167	213	116	40
4	22	19	28		262	161	244	105	37
5	25	19	25		242	182	376	90	37
6	23	20	------		224	201	271	88	38
7	20	19	------		244	251	189	99	40
8	22	18	------	50	284	376	162	87	37
9	25	19	------		222	475	215	80	38
10	29	23	------	159	193	486	274	69	40
11	30	25	------	142	182	498	175	66	39
12	27	25	------	106	178	427	148	68	38
13	26	23	------	88	165	362	136	64	40
14	25	21	------	87	182	353	126	56	40
15	25	18	------	77	207	420	110	51	40
16	29	18	------	64	277	364	97	54	40
17	25	24	------	76	366	321	90	51	36
18	25	22	------	88	410	510	78	44	33
19	23	22	------	108	308	588	66	45	30
20	23		------	96	257	496	60	51	32
21	22		------	94	251	449	69	48	33
22	22	20	------	110	264	352	85	47	33
23	23		------	124	255	321	101	48	40
24	23		------	157	205	402	105	56	45
25	22	23	------	214	146	430	78	57	60
26	21	25	------	273	161	455	77	60	60
27	20	24	------	321	161	490	81	68	57
28	19	24	------	337	172	523	83	60	56
29	20	32	------	319	161	449	96	48	54
30	20	32	------	317	126	502	120	48	57
31	22	------	------	------	116	------	107	47	------

NOTE.—Stage-discharge relation affected by ice Nov. 20–24, 27, 28, and Apr. 1–9; no gage-height record June 25, Sept. 11, 14, 15, 17; discharge estimated on basis of temperature record and comparison with records of flow of North Fork of North Platte River.

Monthly discharge of Roaring Fork near Walden, Colo., for the year ending September 30, 1927

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	30	19	23.3	1,430
November	32	18	21.9	1,300
December 1–5	32	25	28.4	282
April	337	64	145	8,630
May	410	116	231	14,200
June	588	126	376	22,400
July	376	60	148	9,100
August	116	44	66.9	4,110
September	60	30	41.7	2,480

MICHIGAN CREEK AT WALDEN, COLO.

LOCATION.—In NW. ¼ sec. 21, T. 9 N., R. 79 W., at highway bridge half a mile north of Walden, Jackson County. Nearest tributary, Illinois Creek, enters 1½ miles downstream.

DRAINAGE AREA.—185 square miles (measured chiefly on topographic maps).

RECORDS AVAILABLE.—May 9, 1904, to October 31, 1905; May 1, 1923, to September 30, 1927.

EQUIPMENT.—Gurley 7-day water-stage recorder at right abutment of bridge. Discharge measurements made from single-span bridge or by wading.

CHANNEL AND CONTROL.—Bed composed of sand and gravel. Control at small rapids 50 feet downstream; practically permanent. Banks not subject to overflow except during ice gorging in spring.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 2.45 feet at 3 a. m. May 24 (discharge, 532 second-feet); minimum, 0.78 foot November 1 and 2 (discharge, 15 second-feet).

1904–5; 1923–1927: Maximum stage recorded, 3.3 feet at 9 a. m. June 10, 1923 (discharge, 1,070 second-feet); minimum discharge, 4 second-feet August 28–31, 1924.

DIVERSIONS AND REGULATION.—Water diverted from Michigan Creek and tributaries above station for irrigation of several thousand acres. During 1927, 5,330 acre-feet diverted from Michigan Creek above station to Cache la Poudre Basin. Diurnal fluctuation during spring from alternate melting and freezing of mountain snow.

ACCURACY.—Stage-discharge relation practically permanent; seriously affected by ice, observations discontinued during winter. Two rating curves used, both well defined between 20 and 600 second-feet. Three discharge measurements, covering a range from 30 to 450 second-feet, made during the year check the curves. Operation of water-stage recorder fairly satisfactory. Daily discharge ascertained by applying to rating tables mean daily gage height obtained by inspection of recorder graph, except as indicated in footnote to table of daily discharge. Records good.

Daily discharge, in second-feet, of Michigan Creek at Walden, Colo., for the year ending September 30, 1927

Day	Oct.	Nov.	Apr.	May	June	July	Aug.	Sept.
1	22	15	------	326	214	262	58	27
2	23	15	------	390	197	180	57	26
3	26	------	------	425	190	148	58	25
4	32	------	------	381	230	142	60	24
5	35	------	------	312	220	136	66	25
6	34	------	------	281	218	116	58	25
7	34	------	------	281	258	50	62	25
8	36	------	------	334	326	40	64	26
9	41	------	------	262	371	30	68	28
10	41	------	------	222	395	40	60	27
11	40	------	------	292	386	60	50	26
12	39	------	------	317	371	60	45	26
13	36	------	------	317	400	58	42	27
14	35	------	------	312	415	58	39	28
15	31	------	------	312	456	55	38	27
16	31	------	------	334	352	48	39	26
17	30	------	------	352	300	43	42	23
18	30	------	------	381	352	40	38	21
19	29	------	------	445	343	35	34	20
20	29	------	42	435	304	38	40	19
21	30	------	42	435	304	42	42	18
22	29	------	42	478	211	45	40	20
23	28	------	43	522	200	46	38	27
24	28	------	53	488	200	48	38	29
25	24	------	81	381	214	48	36	42
26	28	------	133	360	218	40	39	64
27	26	------	211	343	258	35	43	58
28	26	------	239	330	296	46	39	50
29	23	------	239	317	300	62	34	46
30	22	------	269	285	330	66	29	43
31	18	------	------	239	------	68	29	------

NOTE—No gage-height record May 26, June 4, 5, July 7–12, and Aug. 18–23; discharge estimated on basis of comparison with records of flow of Illinois Creek.

Monthly discharge of Michigan Creek at Walden, Colo., for the year ending September 30, 1927

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	41	18	30.2	1,860
April 20-30	269	42	127	2,770
May	522	222	351	21,600
June	456	190	294	17,500
July	262	30	70.5	4,330
August	68	29	46.0	2,830
September	64	18	29.9	1,780

ILLINOIS CREEK AT WALDEN, COLO.

LOCATION.—In NW. ¼ sec. 29, T. 9 N., R. 79 W., at highway bridge half a mile southwest of Walden, Jackson County. Illinois Creek enters Michigan Creek 1½ miles downstream.

DRAINAGE AREA.—254 square miles (measured on geologic map).

RECORDS AVAILABLE.—May 1, 1923, to September 30, 1927.

EQUIPMENT.—Vertical staff attached to upstream end of bridge abutment. Discharge measurements made from single-span bridge or by wading.

CHANNEL AND CONTROL.—Bed composed of sand and gravel. Control at small rapids 75 feet downstream; slightly shifting. Banks not subject to overflow except during ice gorging in spring.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 2.42 feet at 8.30 a. m. April 28 (discharge, 450 second-feet); minimum discharge during winter.

1923–1927: Maximum stage recorded, 6.4 feet from high-water mark May 28, 1926 (discharge, 2,520 second-feet); minimum, 0.42 foot September 7 and 8, 1924 (discharge, 0.3 second-foot).

DIVERSIONS AND REGULATION.—Water diverted for irrigation of several thousand acres from Illinois Creek and tributaries above station. Diurnal fluctuation during spring from alternate melting and freezing of mountain snow.

ACCURACY.—Stage-discharge relation slightly shifting; seriously affected by ice; observations discontinued during winter. Rating curve well defined by 14 discharge measurements, 3 of which were made during year. Gage read to quarter-tenths twice daily. Daily discharge ascertained by applying mean daily gage height to rating table, using shifting-control method June 15–25, except as indicated in footnote to table of daily discharge. Records good.

Daily discharge, in second-feet, of Illinois Creek at Walden, Colo., for the year ending September 30, 1927

Day	Oct.	Apr.	May	June	July	Aug.	Sept.
1	10		261	133	169	31	13
2	11		238	128	161	27	12
3	14	180	247	120	128	24	9
4	14		229	123	120	33	10
5	14		218	163	110	30	10
6	22	198	212	144	44	25	9
7	20	232	189	139	25	20	12
8	18	256	195	106	21	25	10
9	23	316	206	136	16	33	9
10	25	316	282	161	9	27	10
11	21	285	297	203	38	24	9
12	23	279	329	250	35	21	9
13	18	279	364	273	32	18	12
14	20	144	322	261	30	16	8
15	16	133	261	273	23	15	5

Daily discharge, in second-feet, of Illinois Creek at Walden, Colo., for the year ending September 30, 1927—Continued

Day	Oct.	Apr.	May	June	July	Aug.	Sept.
16	15	120	232	258	21	16	5
17	16	108	238	250	20	18	4
18	15	108	273	261	16	16	3
19	18	106	319	241	9	13	9
20	15	98	364	203	9	15	10
21	12	70	383	175	13	16	9
22	13	78	364	175	16	12	3
23	12	87	379	161	15	10	10
24	15	136	390	118	12	9	17
25	13	232	379	82	13	12	26
26	12	364	285	77	21	13	40
27	13	405	232	72	19	15	42
28	12	446	218	77	14	15	31
29	15	394	200	120	31	16	30
30	15	285	152	163	30	14	30
31	14	-------	144	-------	36	15	-------

NOTE.—No gage height record Apr. 1-5; mean discharge based on temperature record.

Monthly discharge of Illinois Creek at Walden, Colo., for the year ending September 30, 1927

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	25	10	15.9	978
April	446	70	213	12,700
May	390	144	271	16,700
June	273	72	168	10,000
July	169	9	40.5	2,490
August	33	9	19.2	1,180
September	42	3	13.9	827

LA PRELE CREEK NEAR DOUGLAS, WYO.

LOCATION.—In sec. 6, T. 31 N., R. 73 W., just above high-water line of La Prele Reservoir, 16 miles southwest of Douglas, Converse County.

DRAINAGE AREA.—146 square miles (measured on map in Bulletin 626).

RECORDS AVAILABLE.—August 25, 1919, to September 30, 1927.

EQUIPMENT.—Gurley 7-day water-stage recorder on right bank. Discharge measurements made from private bridge 1 mile upstream or by wading.

CHANNEL AND CONTROL.—Bed composed of well-compacted sand and gravel. Control 150 feet downstream at rapids; practically permanent. Banks subject to overflow at stage of 6 feet.

EXTREMES OF DISCHARGE.—Maximum stage during year, from water-stage recorder, 9.9 feet at 10 p. m. May 15 (discharge, 898 second-feet); minimum, 3.43 feet at 9 p. m. July 17 (discharge, 4.4 second-feet).

1919–1927: Maximum stage, from high-water mark of May 11, 1920, 11.4 feet (discharge, 1,220 second-feet); minimum discharge recorded, 0.4 second-foot October 2, 1919.

DIVERSIONS AND REGULATION.—Adjudicated diversions for irrigation of 10,300 acres from La Prele Creek and tributaries. No regulation.

ACCURACY.—Stage-discharge relation practically permanent; affected by ice. Rating curve well defined between 8 and 900 second-feet by 10 discharge

measurements, 5 of which were made during year. Operation of water-stage recorder fairly satisfactory. Daily discharge ascertained by applying to rating table mean daily gage height obtained by inspection of recorder graph, except as indicated in footnote to table of daily discharge. Records good except those for estimated periods, which are fair.

COOPERATION.—Field data furnished by Douglas Reservoirs Water Users Association.

Daily discharge, in second-feet, of La Prele Creek near Douglas, Wyo., for the year ending September 30, 1927

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	8	11	15			10	70	374	112	33	38	5.4
2	8	11	13			10	91	375	108	26	27	5.5
3	8	10	13			10	116	317	104	23	44	5.5
4	10	10	13			10	109	282	98	22	30	5.4
5	10	10	12			10	56	262	95	20	23	5.5
6	10	10	14	12	12	10	60	242	87	17	26	5.7
7	10	10	13			10	65	273	77	15	32	5.9
8	10	10	12			10	70	366	70	16	26	6.5
9	10	10	14			12	81	340	60	15	23	6.9
10	10	10	16			11	75	430	50	13	20	7.5
11	10	9	12			11	70	425	43	12	18	7.1
12	10	9				11	60	615	50	12	16	7.3
13	10	9				14	65	770	45	10	17	7.5
14	9	9				16	70	806	44	10	18	7.3
15	9	9				15	75	814	260	10	20	7.3
16	9	10	11	11	11	14	80	830	232	8.8	15	7.1
17	9	11				14	85	810	108	7.1	13	7.1
18	9	11				13	90	716	39	4.9	14	7.1
19	9	11				13	100	570	24	5.2	13	7.3
20	9	12				15	90	483	18	5.5	11	7.1
21	9	15				16	80	469	53	6.7	9.8	7.5
22	9	13				12	70	422	40	9.8	9.0	7.8
23	10	14				10	76	368	40	46	10	8.2
24	10	14				12	81	307	47	19	11	8.2
25	10	17			12	10	100	269	48	12	9.8	8.8
26	10	13	12	12		7.8	200	241	48	11	8.0	9.0
27	10	14				7.5	366	216	48	32	8.0	9.2
28	10	16				9	375	197	48	57	7.5	9.0
29	11	15			-------	19	339	170	50	23	7.1	9.0
30	12	16			-------	25	343	146	40	21	6.1	9.0
31	12	-------			-------	40	-------	124	-------	35	5.9	------

NOTE.—No gage-height record Oct. 1, 10, 22, 24–29, 31, Nov. 1–5, 7–12, 14–19, Mar. 13–18, 24, 25, 30, 31, Apr. 1, 6–8, 10–22, 25, 26, June 2, 3, 9, 10, 22, 23, 25–30; stage-discharge relation affected by ice Dec. 12 to Mar. 3; discharge interpolated or estimated on basis of discharge measurements and climatic data. Discharge May 9–10, June 15, July 23, 27, 28 computed from hourly discharge.

Monthly discharge of La Prele Creek near Douglas, Wyo., for the year ending September 30, 1927

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	12	8	9.68	595
November	17	9	11.6	690
December	16	-------	12.2	750
January	-------	-------	11.7	719
February	-------	-------	11.6	644
March	40	7.5	13.1	806
April	375	56	120	7,140
May	830	124	420	25,800
June	260	18	72.9	4,340
July	57	4.9	18.0	1,110
August	44	5.9	17.3	1,060
September	9.2	5.4	7.26	432
The year	830	4.9	61.0	44,100

LARAMIE RIVER NEAR GLENDEVEY, COLO.

LOCATION.—In SW. ¼ sec. 25, T. 10 N., R. 76 W., near highway bridge 3 miles east of Glendevey, Larimer County. Nearest tributary, Nunn Creek, enters just above station.

DRAINAGE AREA.—101 square miles (measured on topographic map).

RECORDS AVAILABLE.—June 24, 1904, to October 31, 1905; August 18, 1910, to September 30, 1927.

EQUIPMENT.—Bristol float-type water-stage recorder at right bank 40 feet below bridge. Discharge measurements made from four-span bridge or by wading.

CHANNEL AND CONTROL.—Bed composed of boulders and sand. Control is boulder riffle 50 feet below bridge; practically permanent. Banks not subject to overflow.

EXTREMES OF DISCHARGE.—Maximum stage during year, from water-stage recorder, 2.62 feet at 9 p. m. May 21 (discharge, 570 second-feet); minimum discharge during winter.

1904–5, 1910–1927: Maximum stage recorded, 4.55 feet (old datum) at 7 p. m. June 9, 1923 (discharge, 2,240 second-feet); minimum, 1.5 feet February 14–15, 1911 (discharge, 5 second-feet).

DIVERSIONS AND REGULATION.—Water diverted for irrigation of 200 acres from Laramie River above station. In addition a total of 29,300 acre-feet was diverted during 1927 from Laramie River Basin to that of the Cache la Poudre. No regulation.

ACCURACY.—Stage-discharge relation practically permanent; affected by ice, observations discontinued during winter. Rating curve well defined by six discharge measurements, one of which was made on June 22 at a discharge of 188 second-feet. Operation of water-stage recorder satisfactory. Daily discharge ascertained by applying to rating table mean daily gage height obtained by inspection of recorder graph, except as indicated in footnote to table of daily discharge. Records excellent.

Daily discharge, in second-feet, of Laramie River near Glendevey, Colo., for the year ending September 30, 1927

Day	Oct.	Nov.	Apr.	May	June	July	Aug.	Sept.
1	33	30		77	214	150	67	40
2	34	25		97	206	142	69	39
3	36	30		100	214	136	77	40
4	38	31		95	214	140	65	44
5	32	31		89	245	153	66	54
6	41	30	25	88	232	127	66	51
7	40	30		133	265	109	74	46
8	41	31		136	315	102	77	40
9	45	26		86	340	109	84	38
10	53	27		99	315	123	64	38
11	46	30	28	99	327	107	59	37
12	40	30	28	97	327	91	62	37
13	36	30	32	102	282	85	65	42
14	35	26	34	140	278	81	67	49
15	35	30	34	161	378	75	82	42
16	34	28	37	232	271	73	66	38
17	34	31	36	383	245	70	51	37
18	33	33	34	392	312	67	46	35
19	33	34	32	315	304	67	48	32
20	32	32	32	357	278	68	55	30
21	33	18	26	406	254	84	56	29
22	31	22	26	430	212	76	56	30
23	32	26	28	340	203	74	61	40
24	30		30	271	242	70	53	40
25	31		38	265	265	66	50	59
26	30		51	300	271	66	61	59
27	30	22	63	282	296	85	59	53
28	30		69	285	293	109	53	47
29	31		67	271	239	102	49	43
30	26		68	223	212	99	47	42
31	26	-------	-------	217	-------	77	45	-------

NOTE.—No gage-height record Nov. 24-30 and Apr. 1-10; discharge based on temperature record and comparison with Laramie River near Jelm.

Monthly discharge of Laramie River near Glendevey, Colo., for the year ending September 30, 1927

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	53	26	34.9	2,150
November	34	18	27.2	1,620
April	69	----------	34.8	2,070
May	430	77	212	13,000
June	378	203	268	15,900
July	153	66	96.2	5,920
August	84	45	61.3	3,770
September	59	29	41.7	2,480

LARAMIE RIVER NEAR JELM, WYO.

LOCATION.—In sec. 15, T. 12 N., R. 77 W., near highway bridge at Boswell ranch, a quarter of a mile below Colorado-Wyoming line and 4 miles south of old Jelm, Albany County. Stuck Creek enters 1 mile upstream.

DRAINAGE AREA.—297 square miles (measured on topographic maps).

RECORDS AVAILABLE.—May 7, 1911, to September 30, 1927. From June 22, 1904, to October 31, 1905, station maintained at Decker ranch, half a mile south of State line. Records at two stations comparable, as there are no tributaries or large diversions between them.

EQUIPMENT.—Bristol float-type water-stage recorder on right bank 30 feet downstream from bridge. Discharge measurements made from 2-span bridge or by wading.

CHANNEL AND CONTROL.—Bed composed of gravel. Control a short distance downstream; slightly shifting at long intervals. Left bank subject to overflow at stage of 3.0 feet; flow passes through three well-defined high-water channels.

EXTREMES OF DISCHARGE.—Maximum stage during year, from water-stage recorder, 3.04 feet at 5 a. m. May 22 (discharge, 1,190 second-feet); minimum discharge during winter.

1904–5, 1911–1927: Maximum stage recorded, 4.15 feet at 8 p. m. June 9, 1923 (discharge, 4,200 second-feet); minimum, 1.8 feet September 22–24, October 4–8, 18–23, 28–31, 1905 (discharge, 22 second-feet).

DIVERSIONS AND REGULATION.—Water diverted for irrigation of 3,000 acres between Jelm and Glendevey stations. Diurnal fluctuation during spring caused by alternate melting and freezing of mountain snow.

ACCURACY.—Stage-discharge relation shifts slightly at intervals; affected by ice, observations discontinued during winter. Rating curves used October 1 to November 17 and April 8 to September 30 are both well defined between 30 and 2,000 second-feet by ten discharge measurements, of which one was made June 22 at discharge of 517 second-feet. Operation of water-stage recorder satisfactory. Daily discharge ascertained by applying to rating tables mean daily gage height obtained by inspection of recorder graph, except as indicated in footnote to table of daily discharge. Records good.

Daily discharge, in second-feet, of Laramie River near Jelm, Wyo., for the year ending September 30, 1927

Day	Oct.	Nov.	Apr.	May	June	July	Aug.	Sept.
1	65	63	50	167	586	366	146	54
2	68	54	50	208	586	318	134	53
3	72	61	50	219	599	300	140	56
4	72	63	50	215	580	300	126	58
5	70	84	50	212	627	322	126	59
6	76	58	60	200	661	270	121	59
7	78	58	70	258	706	234	128	54
8	76	51	82	346	796	223	126	50
9	82	50	69	262	867	236	151	52
10	95	84	69	250	840	313	121	54
11	84	61	69	258	858	242	116	49
12	74	54	65	270	912	200	114	41
13	63	53	59	283	752	183	116	44
14	61	54	56	360	698	173	106	54
15	63	56	53	427	970	160	111	50
16	61	51	54	566	737	151	118	42
17	58	40	55	822	661	143	95	40
18	58	40	56	990	737	131	84	38
19	56	38	58	805	737	128	80	38
20	56	35	60	849	683	134	88	40
21	60		61	921	627	180	95	40
22	58		62	1,010	547	193	84	42
23	56		69	858	476	170	106	76
24	58		67	661	495	170	93	74
25	51		78	627	521	140	71	116
26	53	40	104	675	482	134	76	134
27	53		131	668	502	163	88	108
28	56		154	706	514	262	74	104
29	58		148	706	508	270	71	88
30	51		154	606	476	234	64	84
31	74			593		176	59	

NOTE.—Stage-discharge relation affected by ice Nov. 18–30; no gage-height record Apr. 1–7, 16–21; discharge based on temperature record.

Monthly discharge of Laramie River near Jelm, Wyo., for the year ending September 30, 1927

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	95	51	65.0	4,000
November	84	35	50.3	2,990
April	154	50	73.8	4,390
May	1,010	167	516	31,700
June	970	476	658	39,200
July	366	128	214	13,200
August	151	59	104	6,400
September	134	38	61.7	3,670

LARAMIE RIVER AND PIONEER CANAL NEAR WOODS, WYO.

LOCATION.—In sec. 36, T. 14 N., R. 77 W., at diversion dam for Pioneer Canal 2 miles from Woods post office, Albany County. Nearest important tributary, Fox Creek, enters 3 miles above.

DRAINAGE AREA.—418 square miles (measured on topographic maps).

RECORDS AVAILABLE.—April 16, 1912, to September 30, 1924; April 19 to September 30, 1927.

EQUIPMENT.—Bristol float-type water-stage recorder, datum of which is crest of dam. Bristol float-type recorder in Pioneer Canal at Johnson Bridge, 1½ miles below intake. Discharge measurements made from cable 2,000 feet above dam. Measurements of Pioneer Canal made at Johnson Bridge, and this quantity is subtracted from flow at cable to determine flow at diversion dam.

CHANNEL AND CONTROL.—Channel at gage is pool formed by concrete diversion dam 2 feet high. Control is dam itself and is practically permanent. Banks are not subject to overflow. Bed of canal composed of shale, which changes somewhat; principal control at concrete drop 1 mile downstream.

EXTREMES OF DISCHARGE.—Laramie River: Maximum stage during year, from water-stage recorder, 2.46 feet at 5 a. m. May 18 and 9 a. m. May 22 (discharge, 1,510 second-feet); minimum discharge during winter. Pioneer Canal: Maximum stage during year, 3.05 feet June 30 to July 7 (discharge, 262 second-feet); minimum discharge, practically zero during winter. Combined maximum discharge, 1,560 second-feet May 22; minimum discharge during winter.

1912–1924, 1927: Combined maximum discharge, 5,060 second-feet June 10, 1923; minimum discharge during winter.

DIVERSIONS AND REGULATION.—Water diverted for irrigation of 700 acres from Laramie River between Jelm and Woods stations, exclusive of diversion by Pioneer Canal. No regulation, as pond above dam is too small to have any appreciable effect on flow. When canal head gates are closed, the discharge over dam increases.

ACCURACY.—Laramie River: Stage-discharge relation practically permanent. Rating curve well defined by many measurements and checked during current year by a measurement May 3 at discharge of 385 second-feet. Operation of water-stage recorder fairly satisfactory. Daily discharge ascertained by applying to rating table mean daily gage height obtained by inspection of recorder graph, except as indicated in footnote to table of daily discharge. Records good. Pioneer Canal: Stage-discharge relation shifts at intervals. Rating curve fairly well defined by seven discharge measurements, two of which were made during year. Water-stage recorder operated nine days in June; for remainder of period staff gage read at infrequent intervals. Daily discharge ascertained by applying mean gage height to rating table and interpolating for days of missing gage heights. Gage-height record so fragmentary that records are considered poor.

Daily discharge, in second-feet, of Laramie River near Woods, Wyo., for the year ending September 30, 1927

Day	Apr.	May	June	July	Aug.	Sept.	Day	Apr.	May	June	July	Aug.	Sept.
1	------	323	636	318	96	32	16	------	876	844	55	58	50
2	------	399	628	226	86	30	17	------	1,130	676	41	48	45
3	------	412	612	182	79	28	18	------	1,340	772	30	39	40
4	------	418	588	178	79	27	19	88	1,140	788	32	34	40
5	------	393	620	199	79	27	20	88	1,110	676	45	41	40
6	------	369	652	163	76	39	21	90	1,210	596	76	48	50
7	------	464	700	133	82	34	22	90	1,280	519	125	39	65
8	------	572	820	111	79	34	23	93	1,160	424	93	55	80
9	------	381	900	107	100	37	24	82	916	418	79	58	90
10	------	369	900	167	79	39	25	96	836	457	96	41	100
11	------	393	890	114	52	37	26	136	982	405	174	41	110
12	------	438	884	100	52	28	27	182	900	405	270	76	86
13	------	491	748	89	58	32	28	217	876	323	194	61	93
14	------	636	900	82	50	45	29	226	804	255	140	43	82
15	------	708	1,150	76	41	58	30	255	668	245	100	39	73
							31	------	652	-------	86	37	------

NOTE.—No gage-height record Apr. 19–22, June 11, 14, and Sept. 16–26; discharge based on comparison with records of flow of Laramie River near Jelm.

Monthly discharge of Laramie River near Woods, Wyo., for the year ending September 30, 1927

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
April 19–30	255	82	137	3,260
May	1,340	323	731	44,900
June	1,150	245	648	38,600
July	318	30	125	7,690
August	100	34	59.5	3,660
September	110	27	52.4	3,120
The period				101,000

Daily discharge, in second-feet, of Pioneer Canal near Woods, Wyo., for the year ending September 30, 1927

Day	Apr.	May	June	July	Aug.	Sept.	Day	Apr.	May	June	July	Aug.	Sept.
1	------	20	100	262	18	18	16	------	18	105	112	18	18
2	------	20	100	262	18	18	17	------	18	104	112	18	18
3	------	20	100	262	18	18	18	------	18	104	112	18	18
4	------	20	100	262	18	18	19	39	18	104	112	18	18
5	------	20	99	262	18	18	20	39	55	104	112	18	18
6	------	23	99	262	18	18	21	35	55	105	112	18	18
7	------	26	100	262	18	18	22	35	55	106	112	18	18
8	------	28	100	112	18	18	23	35	55	107	112	18	18
9	------	30	100	112	18	18	24	35	55	108	112	18	18
10	------	32	100	112	18	18	25	35	55	109	112	18	18
11	------	34	104	112	18	18	26	30	55	110	18	18	18
12	------	36	104	112	18	18	27	30	55	134	18	18	18
13	------	18	104	112	18	18	28	25	100	225	18	18	18
14	------	18	105	112	18	18	29	25	100	251	18	18	18
15	------	18	105	112	18	18	30	25	100	262	18	18	18
							31	------	100	------	18	18	------

Monthly discharge of Pioneer Canal near Woods, Wyo., for the year ending September 30, 1927

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
April 19–30	39	25	32.3	769
May	100	18	41.1	2,530
June	262	99	119	7,080
July	262	18	128	7,870
August	18	18	18	1,110
September	18	18	18	1,070
The period				20,400

Combined monthly discharge of Laramie River and Pioneer Canal near Woods, Wyo., for the year ending September 30, 1927

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
April 19–30	280	117	169	4,020
May	1,360	343	772	47,500
June	1,260	506	766	45,600
July	580	104	253	15,600
August	118	52	77.5	4,770
September	128	45	70.4	4,190
The period				122,000

LARAMIE RIVER AT TWO RIVERS, WYO.

LOCATION.—In sec. 5, T. 17 N., R. 74 W., near site of old highway bridge at Two Rivers, Albany County. Nearest tributary, Little Laramie River, enters a quarter of a mile below.

DRAINAGE AREA.—1,290 square miles (measured on base map of Wyoming).

RECORDS AVAILABLE.—May 1, 1911, to October 15, 1927, when station was discontinued.

EQUIPMENT.—Au fuzee water-stage recorder on left bank 45 feet downstream from old bridge site. Discharge measurements made from cable 100 feet downstream from gage or by wading.

CHANNEL AND CONTROL.—Bed composed of sand and gravel; shifting at intervals. No well-defined control. Banks not subject to overflow.

EXTREMES OF DISCHARGE.—Maximum stage during period October 1, 1926, to October 15, 1927, from water-stage recorder, 3.78 feet at noon May 24 (discharge, 780 second-feet); minimum discharge, 11 second-feet October 17.

1911–1927: Maximum stage recorded, 7.48 feet at 3 a. m. June 13, 1923 (discharge, 3,930 second-feet); no flow September 22–25, 1911.

DIVERSIONS AND REGULATION.—Adjudicated diversions for irrigation of 29,700 acres from Laramie River between Two Rivers and Jelm stations. No regulation.

ACCURACY.—Stage-discharge relation shifts at intervals; affected by ice, observations discontinued during winter. Rating curve used October 1 to November 30 well defined by eight discharge measurements; curve used May 3 to October 15 well defined between 20 and 750 second-feet by eight measurements, four of which were made during year. Operation of water-stage recorder satisfactory. Daily discharge ascertained by applying to rating table mean daily gage height obtained by inspection of recorder graph, using shifting-control method May 3 to June 6, except as indicated in footnote to table of daily discharge. Records good.

Daily discharge, in second-feet, of Laramie River at Two Rivers, Wyo., for the period October 1, 1926, to October 15, 1927

Day	Oct.	Nov.	May	June	July	Aug.	Sept.	Oct.
1	27	15	200	425	265	165	43	75
2	27	22	190	412	260	149	40	73
3	29	24	180	412	238	134	38	75
4	33	33	200	400	220	123	33	78
5	34	33	212	412	200	107	33	78
6	35	21	210	400	185	115	33	81
7	37	16	193	412	168	99	33	90
8	37	20	212	400	151	99	33	99
9	37	25	332	400	126	101	32	99
10	37	35	350	440	111	109	32	90
11	37	37	350	490	101	105	31	85
12	37	35	325	508	92	97	32	81
13	32	37	288	542	90	87	30	69
14	19	40	282	542	84	76	30	64
15	18	40	300	508	79	72	29	62
16	13	45	332	542	73	68	29	-------
17	11	50	375	660	71	62	30	-------
18	15	61	455	560	68	61	31	-------
19	22	60	580	542	73	61	30	-------
20	20	55	700	580	71	60	28	-------
21	16	55	660	542	65	56	27	-------
22	15	55	640	472	64	52	26	-------
23	15	58	720	425	69	49	26	-------
24	15	58	760	362	87	53	28	-------
25	22	60	720	320	87	53	29	-------
26	26	64	580	290	75	52	35	-------
27	26	66	525	280	78	49	46	-------
28	24	66	542	270	76	46	61	-------
29	26	70	508	298	85	45	71	-------
30	21	74	490	288	105	49	75	-------
31	18	-------	455	-------	174	49	-------	-------

NOTE.—Stage-discharge relation affected by ice Nov. 8–10, 14–17, 19–24, 28–29; discharge based on temperature record. Stage-discharge relation affected by snow May 10–11; discharge estimated.

Monthly discharge of Laramie River at Two Rivers, Wyo., for the period October 1, 1926, to October 15, 1927

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
1926				
October	37	11	25.2	1,550
November	74	15	44.3	2,640
1927				
May	760	180	415	25,500
June	660	270	438	26,100
July	265	64	119	7,320
August	165	45	80.7	4,960
September	75	26	35.8	2,130
October 1-15	99	62	79.9	2,380

LARAMIE RIVER AT FORT LARAMIE, WYO.

LOCATION.—In sec. 25, T. 26 N., R. 65 W., at siphon crossing of Fort Laramie Canal, 3 miles west of Fort Laramie, Goshen County.

DRAINAGE AREA.—4,580 square miles (measured on base map of Wyoming).

RECORDS AVAILABLE.—April 4, 1915, to September 30, 1927.

EQUIPMENT.—Vertical staff gage. Discharge measurements made from highway bridge at Fort Laramie.

CHANNEL AND CONTROL.—No information.

EXTREMES OF DISCHARGE.—Data not available.

DIVERSIONS AND REGULATION.—Water diverted for irrigation of 68,000 acres from Laramie River between Two Rivers and Fort Laramie. Flow regulated by Wheatland Reservoir, 70 miles upstream in main channel of river, having a capacity of 110,000 acre-feet. Stored water from reservoir diverted from river a few miles below reservoir.

COOPERATION.—Complete records furnished by United States Bureau of Reclamation.

Daily discharge, in second-feet, of Laramie River at Fort Laramie, Wyo., for the year ending September 30, 1927

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	130	148	152	190	310	152	645	725	265	310	465	157
2	130	145	167	190	310	136	559	725	265	310	310	157
3	130	145	162	206	285	152	393	725	265	265	265	157
4	157	144	166	206	310	160	725	660	360	310	310	143
5	144	142	166	206	310	164	660	660	310	265	310	143
6	144	142	170	310	385	188	410	595	360	242	265	143
7	157	140	177	225	265	192	360	562	310	225	285	130
8	144	140	180	285	265	192	310	562	285	225	465	130
9	144	140	181	190	225	196	265	595	242	190	265	130
10	157	142	164	190	143	196	332	595	225	157	242	143
11	144	142	160	190	190	190	360	530	206	206	225	157
12	144	144	172	170	190	188	375	660	157	190	225	190
13	144	144	35	170	157	184	360	790	265	130	225	190
14	144	148	80	190	190	188	360	725	225	130	206	190
15	144	144	150	190	190	188	360	725	170	82	1,180	157
16	144	146	150	170	265	188	360	725	242	82	435	157
17	130	150	150	190	360	184	360	725	492	82	385	130
18	147	150	104	170	310	176	465	660	385	115	310	130
19	154	155	150	170	285	165	435	660	332	130	310	130
20	135	150	150	130	285	144	410	625	385	225	310	130
21	137	150	150	143	190	180	410	595	310	157	265	130
22	138	150	150	130	206	180	410	595	285	130	242	130
23	141	180	150	115	190	200	310	530	265	242	242	130
24	136	168	150	130	190	192	410	410	265	265	225	130
25	140	160	150	170	190	192	410	360	242	310	225	130
26	135	156	150	170	190	192	530	360	190	225	225	157
27	135	152	150	190	206	207	725	332	242	206	225	170
28	136	155	150	225	188	208	725	360	157	190	242	206
29	148	155	150	245	-------	216	725	310	157	206	225	206
30	152	150	150	285	-------	216	725	310	242	225	206	204
31	152	-------	150	360	-------	475	-------	310	-------	265	170	------

Monthly discharge of Laramie River at Fort Laramie, Wyo., for the year ending September 30, 1927

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	157	130	142	8,730
November	180	140	149	8,870
December	181	35	150	9,220
January	360	115	197	12,100
February	385	143	242	13,400
March	475	136	193	11,900
April	725	265	463	27,600
May	790	310	571	35,100
June	492	157	270	16,100
July	310	82	203	12,500
August	1,180	170	306	18,800
September	206	130	153	9,100
The year	1,180	35	253	183,000

LITTLE LARAMIE RIVER AT TWO RIVERS, WYO.

LOCATION.—On line between secs. 5 and 6, T. 17 N., R. 74 W., at highway bridge half a mile south of Two Rivers, Albany County. No tributary between station and mouth, half a mile below.

DRAINAGE AREA.—310 square miles (measured on base map of Wyoming).

RECORDS AVAILABLE.—May 6, 1911, to October 15, 1927, when station was discontinued.

EQUIPMENT.—Stevens continuous water-stage recorder just below bridge. Discharge measurements made from cable 100 feet above gage or by wading.

CHANNEL AND CONTROL.—Bed composed of sand and gravel; shifting at long intervals. No well-defined control. Banks not subject to overflow, except during extremely high water.

EXTREMES OF DISCHARGE.—Maximum stage during period October 1, 1926, to October 15, 1927, from water-stage recorder, 4.26 feet at 4 p. m. June 16 (discharge, 481 second-feet); minimum, 1.82 feet September 5 (discharge, 1 second-foot).

1911–1927: Maximum discharge recorded, 1,790 second-feet at 11 a. m. May 29, 1926; river frequently becomes dry in summer owing to irrigation above.

DIVERSIONS AND REGULATION.—Water diverted for irrigation of 29,000 acres from Little Laramie River between Fillmore and Two Rivers stations. No regulation.

ACCURACY.—Stage-discharge relation shifts at intervals; affected by ice, observations discontinued during winter. Rating curve used October 1 to November 30 well defined by ten discharge measurements; curve used May 3 to October 15 well defined between 2 and 500 second-feet by four discharge measurements made during year. Operation of water-stage recorder satisfactory. Daily discharge ascertained by applying to rating table mean daily gage height obtained by inspection of recorder graph, using shifting-control method May 3–31, except as indicated in footnote to table of daily discharge. Records good except those for estimated periods, which are fair.

Daily discharge, in second-feet, of Little Laramie River at Two Rivers, Wyo., for the period October 1, 1926, to October 15, 1927

Day	Oct.	Nov.	May	June	July	Aug.	Sept.	Oct.
1	7	29	60	142	120	61	7	31
2	8	28	56	138	98	54	5	40
3	13	30	54	140	77	66	3	45
4	19	28	49	140	70	70	2	45
5	21	28	43	160	65	57	1	51
6	21	29	42	178	60	45	1	57
7	21	27	41	217	56	42	2	49
8	21		53	255	46	62	4	43
9	21		79	262	45	63	4	37
10	20		73	339	45	53	4	28
11	20	30	81	421	41	41	6	20
12	19		110	438	39	31	7	19
13	19		104	424	37	29	6	19
14	18		76	364	41	37	6	18
15	18		70	364	37	34	8	18
16	17		67	456	29	30	7	-------
17	16		49	364	23	24	6	-------
18	15		49	278	19	21	4	-------
19	14		74	321	15	17	3	-------
20	14		84	434	13	15	3	-------
21	14		74	424	12	19	2	-------
22	15	35	90	324	15	19	2	-------
23	16		118	228	22	19	2	-------
24	17		153	154	34	20	8	-------
25	17		144	112	34	22	13	-------
26	16		126	94	31	22	19	-------
27	16		125	87	34	20	31	-------
28	16		156	88	38	17	39	-------
29	17		168	130	57	14	37	-------
30	20	38	172	135	73	14	30	-------
31	23	-------	153	-------	73	9	-------	-------

NOTE.—No gage-height record Nov. 8–29, May 1, 2; discharge based on comparison with flow of Laramie River at Two Rivers. Stage-discharge relation affected by snow May 12; discharge estimated.

Monthly discharge of Little Laramie River at Two Rivers, Wyo., for the period October 1, 1926, to October 15, 1927

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
1926				
October	23	7	17.1	1,050
November	38	27	32.2	1,920
1927				
May	172	41	90.1	5,540
June	456	87	254	15,100
July	120	12	45.1	2,770
August	70	9	33.8	2,080
September	39	1	9.1	541
October 1–15	57	18	34.7	1,030

SOUTH PLATTE RIVER AT SOUTH PLATTE, COLO.

LOCATION.—In sec. 25, T. 7 S., R. 70 W., below point where North Fork of South Platte River enters at South Platte, Jefferson County.

DRAINAGE AREA.—2,550 square miles (measured on base map of Colorado).

RECORDS AVAILABLE.—March 28, 1902, to September 30, 1927. Records at Platte Canyon and at Deansbury, a few miles below, extend back to 1887, with the exception of 1893 and 1894. Earlier records, 1887–1892, were obtained by State engineer, and records from 1895 to 1896 were collected under direction of Denver Power & Irrigation Co.

EQUIPMENT.—Stevens 7-day water-stage recorder on right bank 375 feet below mouth of North Fork. Discharge measurements made from cable near gage or by wading.

CHANNEL AND CONTROL.—Bed composed of coarse sand and fine gravel. Control 35 feet downstream at well-defined rapids; shifting. Banks not subject to overflow.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 3.55 feet at noon July 2 (discharge, 1,160 second-feet); minimum discharge during winter.

1888–1892, 1895–1900, 1902–1927: Maximum gage height during period, 8.95 feet from 5 to 9 p. m. June 7, 1921 (discharge, 6,320 second-feet); minimum discharge recorded, 21 second-feet August 4, 1902.

DIVERSIONS AND REGULATION.—Water diverted from tributaries of South Platte River above station for irrigation of 46,000 acres. Flow regulated chiefly by Cheesman Reservoir, 20 miles above station, having a capacity of 79,000 acre-feet.

ACCURACY.—Stage-discharge relation not permanent; affected by ice, observations discontinued during winter. Standard rating curve well defined between 150 and 1,200 second-feet by 20 measurements, 9 of which were made during year. Operation of water-stage recorder satisfactory. Daily discharge ascertained by shifting-control method except during September, when mean daily gage height was applied to rating table. Records good except during winter, when the monthly means are only fair.

Daily discharge, in second-feet, of South Platte River at South Platte, Colo., for the year ending September 30, 1927

Day	Oct.	Nov.	Dec.	Apr.	May	June	July	Aug.	Sept.
1	164	202	142		400	715	1,120	590	342
2	152	181	126		416	715	1,000	558	348
3	152	200	126	160	366	750	670	536	345
4	154	191	126		356	805	655	590	595
5	162	202	121		348	710	518	600	600
6	171	218	120	164	420	610	456	464	590
7	159	215	127	161	452	610	476	436	527
8	166	193	120	177	509	563	825	518	400
9	164	179	114	175	440	496	972	770	232
10	166	193	112	175	432	476	994	554	223
11	159	215	112	187	472	496	962	532	215
12	154	210	110	185	468	563	1,010	514	215
13	154	210	------	170	484	630	1,010	563	247
14	152	226	------	162	518	840	860	527	244
15	152	200	------	232	527	740	572	492	277
16	152	215	------	238	576	901	563	317	241
17	150	145	------	259	600	595	370	301	226
18	148	143	------	277	650	600	298	286	229
19	157	170	------	301	610	600	277	345	226
20	205	185	------	304	610	586	259	352	215
21	187	175	------	301	610	615	262	352	179
22	183	212	------	317	581	620	317	456	171
23	183	226	------	314	550	550	404	472	179
24	183	205	------	314	527	514	680	370	244
25	183	208	------	334	563	500	810	359	301
26	173	178	------	362	572	504	645	362	345
27	171	200	------	396	558	476	536	342	338
28	173	195	------	400	554	576	660	328	338
29	175	179	------	554	550	785	785	342	317
30	175	210	------	496	522	890	765	331	301
31	185	------	------	------	720	------	586	317	------

NOTE.—Stage-discharge relation affected by ice Apr. 1–5; mean discharge estimated.

Monthly discharge of South Platte River at South Platte, Colo., for the year ending September 30, 1927

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	205	148	167	10,300
November	226	143	196	11,700
December	----------	----------	94	5,780
January	----------	----------	95	5,840
February	----------	----------	118	6,550
March	----------	----------	146	8,980
April	554	160	258	15,400
May	720	348	515	31,700
June	901	476	634	37,700
July	1,120	259	655	40,300
August	770	286	448	27,500
September	600	171	308	18,300
The year	1,120	----------	304	220,000

NOTE.—Mean discharge for December, January, February, and March based on State record at Watertown reduced by 3 per cent on account of difference in drainage area.

NORTH FORK OF SOUTH PLATTE RIVER AT SOUTH PLATTE, COLO.

LOCATION.—In sec. 25, T. 7 S., R. 70 W., one-third of a mile above railroad station at South Platte, Jefferson County. No tributary between station and mouth at South Platte.

DRAINAGE AREA.—484 square miles (measured on base map of Colorado).

RECORDS AVAILABLE.—June 4, 1909, to September 30, 1910; April 1, 1913, to September 30, 1927.

EQUIPMENT.—Stevens 7-day water-stage recorder on left bank. Discharge measurements made from cable 300 feet above gage or by wading.

CHANNEL AND CONTROL.—Bed composed of gravel and sand. Principal control a short distance below gage; shifting. Banks not subject to serious overflow.

EXTREMES OF DISCHARGE.—Maximum stage during year, from water-stage recorder, 3.14 feet at 8 a. m. May 18 (discharge, 459 second-feet); minimum stage probably occurred during winter.

1909–10, 1913–1927: Maximum stage recorded, 5.9 feet at 4 a. m. June 8, 1921 (discharge, 1,910 second-feet); minimum, 1.50 feet December 18, 1922 (discharge, 12 second-feet).

DIVERSIONS AND REGULATION.—Water diverted for irrigation of several hundred acres above station. Diurnal fluctuation during spring, caused by alternate melting and freezing of mountain snow.

ACCURACY.—Stage-discharge relation shifts at intervals; seriously affected by ice, observations discontinued during winter. Standard rating curve well defined between 50 and 500 second-feet by nine discharge measurements made during year. Operation of water-stage recorder satisfactory. Daily discharge ascertained by shifting-control method from October 1 to November 12, and by applying to rating table mean daily gage height obtained by inspection of recorder graph from April 1 to September 30. Records good.

Daily discharge, in second-feet, of North Fork of South Platte River at South Platte, Colo., for the year ending September 30, 1927

Day	Oct.	Nov.	Dec.	Apr.	May	June	July	Aug.	Sept.
1	79	77	57	80	219	303	297	176	152
2	74	66	62	89	239	308	272	181	161
3	77	73	57	100	242	323	264	209	156
4	79	65	59	97	244	303	256	181	159
5	79	63	58	90	234	288	249	163	161
6	80	72	58	87	229	288	239	154	165
7	78	71	63	93	254	291	232	156	127
8	80	63	59	96	297	314	229	185	116
9	84	56	45	89	236	306	219	314	116
10	83	59	51	88	222	308	249	224	111
11	79	72	50	96	244	320	224	190	110
12	77	69	50	90	234	367	209	174	107
13	76	66	-------	83	239	358	209	172	111
14	74	60	-------	80	269	355	207	172	114
15	73	49	-------	79	278	398	202	167	140
16	73	56	-------	82	320	388	185	163	144
17	72	50	-------	90	355	352	178	159	150
18	73	66	-------	97	404	352	174	146	156
19	72	82	-------	108	391	346	174	142	154
20	72	85	-------	107	385	332	174	146	144
21	70	71	-------	94	388	320	176	148	110
22	70	66	-------	100	394	303	224	140	101
23	69	66	-------	100	370	291	214	138	104
24	69	61	-------	107	329	294	216	142	105
25	66	62	-------	119	317	297	200	138	117
26	68	41	-------	154	326	346	172	144	146
27	70	59	-------	185	317	326	185	146	138
28	69	57	-------	202	323	323	190	150	129
29	71	47	-------	190	311	358	234	156	121
30	69	66	-------	209	308	334	209	144	121
31	61	-------	-------	-------	288	-------	188	136	-------

Monthly discharge of North Fork of South Platte River at South Platte, Colo., for the year ending September 30, 1927

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	84	61	73.7	4,530
November	85	41	63.9	3,800
December 1–12	63	45	55.8	1,330
April	209	79	109	6,490
May	404	219	297	18,300
June	398	288	326	19,400
July	297	172	215	13,200
August	314	136	166	10,200
September	165	101	132	7,860

CLEAR CREEK NEAR GOLDEN, COLO.

LOCATION.—In sec. 32, T. 3 S., R. 70 W., in canyon 1½ miles above Golden, Jefferson County. Only important tributary between station and mouth, Ralston Creek, enters 12 miles below.

DRAINAGE AREA.—392 square miles (measured on topographic map).

RECORDS AVAILABLE.—May 4, 1919, to September 30, 1927. From December 4, 1908, to December 31, 1909; June 8, 1911, to May 3, 1919, records available for station half a mile upstream where flow is practically the same.

EQUIPMENT.—Bristol float-type water-stage recorder on left bank 200 feet upstream from Colorado & Southern Railway section house. Discharge measurements made from cable near gage or by wading.

CHANNEL AND CONTROL.—Bed composed of coarse gravel and sand. Low-water control at small rapids 100 feet downstream; shifting. Banks not subject to overflow.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 4.13 feet at 3 a. m. June 29 (discharge, 1,080 second-feet); minimum discharge during winter.

1909, 1911–1927: Maximum discharge recorded, 4,420 second-feet July 31, 1921; minimum, 18 second-feet January 11, 1918, from current-meter measurement.

DIVERSIONS AND REGULATION.—Only diversion above station is Golden ditch, which diverted 4,560 acre-feet during 1927. Alternate melting and freezing of mountain snow causes diurnal fluctuation during spring.

ACCURACY.—Stage-discharge relation slightly shifting; seriously affected by ice, records discontinued during winter. Rating curves used October 1 to November 18 and March 28 to September 30 are both well defined between 50 and 900 second-feet by eight discharge measurements, of which five were made during year. Operation of water-stage recorder satisfactory. Daily discharge ascertained by applying to rating table mean daily gage height obtained by inspection of recorder graph. Records good.

Daily discharge, in second-feet, of Clear Creek near Golden, Colo., for the year ending September 30, 1927

Day	Oct.	Nov.	Dec.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	107	100				64	258	552	650	374	184
2	102	92				64	289	546	600	419	165
3	112	102				78	313	520	572	441	142
4	124	82				81	358	465	552	391	142
5	116	88				74	348	476	593	348	145
6	107	98				71	327	506	558	374	178
7	92	96				71	332	593	506	396	184
8	92	86				72	407	680	513	441	184
9	107	79				70	327	672	552	539	178
10	119	96				83	308	758	650	413	178
11	119	77				90	294	807	572	385	181
12	112	77		58		88	275	841	546	396	168
13	112	90				90	275	742	546	402	181
14	102	90				72	322	734	500	424	175
15	98	102				72	353	790	441	369	159
16	98	112				78	407	702	424	358	145
17	92	76				81	494	695	407	327	139
18	92	52				85	579	816	369	303	134
19	95	50				116	565	841	353	298	122
20	100	45				116	600	734	385	303	122
21	102	50	49			85	865	710	402	275	122
22	100	50				90	710	695	532	249	114
23	98	50				110	695	665	494	258	129
24	109	50				114	635	742	488	244	136
25	96	50				112	579	798	407	213	154
26	98	52				142	621	926	374	209	156
27	98	55				168	593	926	385	217	126
28	96	55			71	184	650	934	453	228	116
29	90	55			74	184	635	943	488	228	94
30	88	55			78	217	565	807	470	209	110
31	92				74		579		413	205	

NOTE.—Stage-discharge relation affected by ice Nov. 19–30; discharge based on temperature record.

Monthly discharge of Clear Creek near Golden, Colo., for the year ending September 30, 1927

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	124	88	102	6,270
November	112	45	73.7	4,390
April	217	64	101	6,010
May	865	258	470	28,900
June	943	465	721	42,900
July	650	353	490	30,100
August	539	205	330	20,300
September	184	94	149	8,870

NORTH ST. VRAIN CREEK NEAR ALLENS PARK, COLO.

LOCATION.—In SW. ¼ sec. 14, T. 3 N., R. 73 W., a short distance above bridge on main road from Allens Park to Estes Park and 2½ miles north of Allens Park, Boulder County. Copeland Lake outlet enters a few hundred yards upstream.

DRAINAGE AREA.—33 square miles (measured on topographic map).

RECORDS AVAILABLE.—October 23, 1925, to September 30, 1927.

EQUIPMENT.—Bristol float-type water-stage recorder on left bank a short distance below bridge. Discharge measurements made from single-span bridge or by wading; during winter discharge measured by weir placed in creek near by.

CHANNEL AND CONTROL.—Bed composed of gravel. Control 50 feet downstream; slightly shifting. Banks not subject to overflow.

EXTREMES OF DISCHARGE.—Maximum stage during year, from water-stage recorder, 2.7 feet at 1 a. m. June 28 (discharge, 407 second-feet); minimum discharge recorded, 6.0 second-feet March 22.

1925–1927: Maximum stage recorded, 3.05 feet from 8 to 10 p. m. June 8, 1926 (discharge, 488 second-feet); minimum discharge, that of March 22, 1927.

DIVERSIONS AND REGULATION.—Practically no diversions above station. Diurnal fluctuation caused by alternate melting and freezing of mountain snow during spring.

ACCURACY.—Stage-discharge relation slightly shifting; weir used during winter kept free from ice. Standard rating curve used October 1 to November 15 and April 17 to September 30 is well defined between 15 and 400 second-feet by 17 discharge measurements, 9 of which were made during year. Rating table used January 10 to April 16 was computed from weir table and is only fairly accurate because of leakage. Operation of water-stage recorder satisfactory during periods of open water. Height of water over weir measured to tenths of an inch twice daily during winter. Daily discharge ascertained by applying mean daily gage height to rating table except for periods October 1 to November 15 and April 17 to July 31, when shifting-control method was used, and except as indicated in footnote to table of daily discharge. Records good except those for periods of missing gage heights, which are fair.

Daily discharge, in second-feet, of North St. Vrain Creek near Allens Park, Colo., for the year ending September 30, 1927

Day	Oct.	Nov.	Jan.	Feb.	Mar.	Apr.	May	June.	July	Aug.	Sept.
1	13	11	7.0	6.4	6.7	9.8	45	103	210	130	54
2	15	18	7.5	6.4	6.9	9.6	50	132	210	149	50
3	18	19	7.5	6.2	6.7	8.9	49	143	220	138	51
4	17	25	7.5	6.4	6.9	9.6	49	122	222	117	50
5	15	14	8.0	6.7	7.5	10	45	136	227	105	46
6	17	13	7.8	7.3	7.8	10	41	158	208	113	45
7	14	13	7.8	7.8	7.3	10	60	220	187	134	45
8	13	14	7.8	7.1	6.9	10	59	256	175	140	40
9	18	14	7.6	6.7	7.1	12	42	254	180	148	41
10	15	25	7.8	8.9	6.9	12	40	254	189	122	45
11	13	16	7.5	7.8	7.8	12	37	246	180	113	42
12	13	15	7.0	6.7	7.1	11	37	274	173	101	38
13	13	14	6.5	6.2	7.8	12	41	284	180	95	42
14	12	14	6.7	7.3	8.2	10	52	222	164	91	42
15	11	13	6.4	6.2	7.8	10	66	246	147	85	36
16	11		6.9	6.2	6.7	11	109	220	145	78	34
17	10		6.9	6.4	6.9	12	153	269	138	71	34
18	10	14	7.1	6.9	6.4	12	166	329	134	64	32
19	9		6.9	7.3	6.7	11	126	314	130	58	30
20	10		6.4	10	8.4	10	130	306	126	64	29
21	9		6.7	6.7	7.1	10	155	284	124	60	28
22	8		6.4	6.4	6.0	11	201	246	153	59	28
23	9	15	6.9	6.7	6.7	14	162	259	155	56	29
24	8		6.7	7.5	7.1	17	124	299	169	55	30
25	8		6.9	7.1	6.2	25	120	299	143	59	33
26	8		6.7	6.9	6.2	31	149	329	132	68	34
27	8		7.1	7.1	7.5	42	140	363	128	70	34
28	8	13	7.3	8.0	8.2	42	149	379	155	76	33
29	7		7.1	-------	13	38	147	350	171	70	30
30	7		6.7	-------	10	39	109	289	153	66	32
31	10	-------	8.9	-------	7.8	-------	101	-------	140	62	-------

NOTE.—No gage-height record Nov. 16–30, Jan. 1–9, 12–13; discharge based on temperature record.

Monthly discharge of North St. Vrain Creek near Allens Park, Colo., for the year ending September 30, 1927

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	18	7	11.5	707
November	25	11	14.9	887
December			8.0	492
January	8.9	6.4	7.16	440
February	10.0	6.2	7.05	392
March	13.0	6.0	7.43	457
April	42.0	8.9	16.1	958
May	201	37	95.3	5,860
June	379	163	251	14,900
July	227	124	167	10,300
August	149	55	90.7	5,580
September	54	28	37.9	2,260
The year	379	----------	59.7	43,200

NOTE.—No gage-height record during December; mean discharge estimated.

SOUTH ST. VRAIN CREEK NEAR WARD, COLO.

LOCATION.—On line between secs. 35 and 36, T. 2 N., R. 73 W., at footbridge on trail to Stapp Lake, 2 miles northwest of Ward, Boulder County.

DRAINAGE AREA.—15 square miles (measured on topographic map).

RECORDS AVAILABLE.—May 29, 1926, to September 30, 1927.

EQUIPMENT.—Bristol float-type water-stage recorder on right bank 10 feet below footbridge. Discharge measurements made from single-span bridge or by wading.

CHANNEL AND CONTROL.—Bed composed of coarse gravel and small boulders; control at gravel bar a short distance downstream, somewhat shifting during high water.

EXTREMES OF DISCHARGE.—Maximum stage during year, from water-stage recorder, 2.02 feet at 2 a. m. June 29 (discharge, 225 second-feet); minimum discharge occurred during winter.

1926–1927: Maximum stage recorded, 2.48 feet from midnight to 4 a. m. June 7, 1926 (discharge, 313 second-feet); minimum discharge during winter.

DIVERSIONS AND REGULATION.—No diversions above station. Several small lakes afford natural regulation.

ACCURACY.—Stage-discharge relation shifting during high water; affected by ice, observations discontinued during winter. Rating curves used October 1 to 20 and May 21 to September 30 are both well defined between 10 and 200 second-feet by seven discharge measurements made during 1926 and 1927. Operation of water-stage recorder fairly satisfactory. Daily discharge ascertained by applying to rating table mean daily gage height obtained by inspection of recorder graph, except as indicated in footnote to table of daily discharge. Records fair.

Daily discharge, in second-feet, of South St. Vrain Creek near Ward, Colo., for the year ending September 30, 1927

Day	Oct.	May	June	July	Aug.	Sept.	Day	Oct.	May	June	July	Aug.	Sept.
1	14	------	59	148	80	33	16	10	------	116	81	44	24
2	15	------	74	101	79	33	17	10	------	138	75	46	23
3	14	------	77	115	79	29	18	11	------	152	75	50	23
4	13	------	67	116	81	28	19	10	------	152	77	48	22
5	12	------	79	125	80	28	20	10	------	144	84	47	22
6	12	------	91	150	79	26	21		84	144	85	49	22
7	14	------	118	150	79	25	22		81	138	85	47	23
8	15	------	142	148	80	27	23	9	69	190	81	48	24
9	12	------	144	150	81	27	24		58	185	80	39	24
10	11	------	129	150	76	25	25		56	185	80	33	25
11	11	------	108	152	65	25	26		60	185	79	33	25
12	10	------	109	122	57	25	27		58	185	79	32	24
13	10	------	113	98	50	25	28	8	57	188	81	32	22
14	11	------	115	100	45	25	29		56	195	81	32	21
15	11	------	129	92	46	25	30		58	175	79	31	20
							31		58	------	79	32	------

NOTE.—No gage-height record Oct. 21–31 and Sept. 16–30; discharge based on comparison with records of flow of Middle and North St. Vrain Creeks.

Monthly discharge of South St. Vrain Creek near Ward, Colo., for the year ending September 30, 1927

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	15	----------	10.6	652
May 21–31	84	56	63.2	1,380
June	195	59	136	8,090
July	152	75	103	6,330
August	81	31	54.8	3,370
September	33	20	25.0	1,490

MIDDLE ST. VRAIN CREEK NEAR ALLENS PARK, COLO.

LOCATION.—In NW. ¼ sec. 3, T. 2 N., R. 72 W., at Middle Fork ranch, 9 miles southeast of Allens Park, Boulder County. Nearest tributary, Cave Creek, enters 2 miles upstream.

DRAINAGE AREA.—28 square miles (measured on topographic maps).

RECORDS AVAILABLE.—April 26, 1926, to September 30, 1927.

EQUIPMENT.—Bristol float-type water-stage recorder on left bank 30 feet below private bridge at ranch. Discharge measurements made from single-span bridge or by wading.

CHANNEL AND CONTROL.—Bed composed of gravel and boulders. Control at gravel bar 30 feet downstream; slightly shifting.

EXTREMES OF DISCHARGE.—Maximum stage during year, from water-stage recorder, 2.3 feet at 8 p. m. June 28 (discharge, 194 second-feet); minimum discharge, 3.9 second-feet January 13.

1926–27: Maximum stage recorded, 2.65 feet at 9 p. m. June 6, 1926 (discharge, 322 second-feet); minimum discharge, that of January 13, 1927.

DIVERSIONS AND REGULATION.—Practically no diversion above station. Diurnal fluctuation caused by alternate melting and freezing of mountain snow during spring.

ACCURACY.—Stage-discharge relation slightly shifting; weir used during winter kept free from ice. Rating curve used October 1 to November 20 and April 17 to September 30 fairly well defined between 10 and 200 second-feet by 17 discharge measurements, 9 of which were made during current year. Rating table used January 12 to April 16 was computed from weir table, allowing for velocity of approach. Operation of water-stage recorder satisfactory during open water. Height of water over weir measured to tenths of an inch twice daily. Daily discharge ascertained by applying mean gage height to rating table except period May 15 to September 30 when shifting-control method was used, and except as indicated in footnote to table of daily discharge. Records good.

Daily discharge, in second-feet, of Middle St. Vrain Creek near Allens Park, Colo., for the year ending September 30, 1927

Day	Oct.	Nov.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	9	6	4.5	4.4	4.9	6.6	70	119	116	79	30
2	10	6	4.5	4.9	5.1	7.1	74	127	117	93	29
3	12	6	4.5	4.9	4.9	8.0	75	124	126	85	30
4	9	6	4.8	4.9	4.9	9.0	79	116	124	76	29
5	8	6	5.0	4.9	4.9	8.2	76	126	134	68	28
6	9	6	4.8	4.9	4.9	9.5	76	129	124	68	23
7	8	5	4.6	4.8	4.8	14	84	142	113	80	25
8	6	4	4.5	4.9	5.3	12	85	144	105	89	24
9	13	4	4.5	4.9	5.5	12	72	142	110	85	21
10	12	5	4.5	4.6	5.5	13	68	139	119	71	20
11	10	4	4.5	4.9	4.8	15	64	136	103	65	23
12	10	4	4.4	4.8	4.9	15	64	133	99	59	24
13	9	5	3.9	4.8	5.1	14	64	134	98	54	22
14	8	5	4.2	4.9	6.2	16	80	129	93	56	25
15	8	4	4.8	4.9	6.2	15	108	123	82	58	20
16	6	4	4.4	4.9	5.7	16	122	144	81	51	19
17	8	4	4.9	5.1	5.7	15	144	165	80	49	20
18	6	5	5.1	5.1	5.1	17	155	153	81	42	21
19	6	10	5.7	4.9	5.1	25	144	159	85	42	19
20	6	7	4.9	4.9	5.1	22	148	153	85	46	18
21	7	6	4.2	4.9	5.3	20	151	144	88	43	19
22	6	6	4.2	5.5	5.3	20	150	134	94	40	18
23	7	7	4.2	5.7	5.5	26	142	138	100	41	19
24	6	7	4.2	5.3	5.7	29	133	142	110	41	18
25	6	7	4.2	5.1	5.5	34	129	144	102	40	21
26	6	6	4.2	4.9	5.3	46	134	151	90	41	20
27	5	6	4.6	4.9	5.5	57	129	153	96	42	19
28	5	6	4.6	4.8	5.7	62	133	158	112	48	19
29	5	6	4.9	-------	6.6	56	132	161	112	42	16
30	4	6	4.8	-------	9.0	59	119	151	98	38	16
31	7	-------	4.6	-------	8.2	-------	119	-------	82	36	-------

NOTE.—No gage-height record Nov. 21-30, Jan. 1-11, Feb. 13, 14; discharge based on one current-meter measurement and temperature record.

Monthly discharge of Middle St. Vrain Creek near Allens Park, Colo., for the year ending September 30, 1927

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	13	4	7.65	470
November	10	4	5.63	335
December	-------	-------	5.0	307
January	5.7	3.9	4.57	281
February	5.7	4.4	4.94	274
March	9.0	4.8	5.55	341
April	62.0	6.6	22.6	1,340
May	155	64	107	6,580
June	165	116	140	8,330
July	134	80	102	6,270
August	93	36	57.0	3,500
September	30	16	21.8	1,300
The year	165	-------	40.5	29,300

NOTE.—Mean discharge for December is estimated.

NORTH BOULDER CREEK AT SILVER LAKE, COLO

LOCATION.—In NW. ¼ sec. 28, T. 1 N., R. 73 W., a short distance below outlet of Silver Lake, Boulder County.

DRAINAGE AREA.—8.7 square miles (measured by special survey).

RECORDS AVAILABLE.—August 20, 1913, to September 30, 1927.

EQUIPMENT.—Friez 7-day water-stage recorder, which records head on weir. Discharge measurements made by means of standard sharp-crested weir 10 feet long, having low-water section 5 feet long.

EXTREMES OF DISCHARGE.—No data.

DIVERSIONS AND REGULATION.—No diversions above station. Winter flow increased by storage in Silver Lake (capacity, 2,080 acre-feet).

COOPERATION.—Records of daily discharge furnished by city engineer of Boulder.

Daily discharge, in second-feet, of North Boulder Creek at Silver Lake, Colo., for the year ending September 30, 1927

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	20.8	18.4	17.4	15.0	16.0	19.1	16.0	17.9	78.0	90.7	35.0	22.8
2	20.8	18.4	17.2	14.8	14.8	19.1	16.0	18.4	71.0	81.3	35.0	22.8
3	20.8	18.4	17.2	14.4	12.6	19.1	17.2	18.9	64.0	78.0	35.0	22.8
4	22.1	17.6	17.2	14.6	13.0	19.1	17.2	19.1	56.0	77.2	35.0	38.2
5	22.1	17.9	17.2	14.4	13.7	19.1	17.2	19.1	48.6	77.2	35.0	38.2
6	21.1	17.9	17.2	14.2	12.0	19.1	17.2	26.0	45.1	78.0	35.0	38.2
7	20.6	18.4	17.6	14.4	12.2	19.1	17.2	28.2	55.2	79.7	35.0	38.2
8	19.6	18.4	17.8	14.8	12.0	19.1	17.2	27.4	50.8	79.7	35.0	38.2
9	19.6	18.4	10.1	12.6	12.0	19.1	17.2	26.0	46.5	75.6	35.0	38.2
10	18.6	18.4	11.1	13.0	12.0	18.4	17.6	26.0	46.5	85.6	35.0	38.2
11	18.9	18.4	20.8	12.8	19.1	18.4	17.6	26.0	46.5	96.8	35.0	25.7
12	18.9	18.4	19.6	12.6	20.3	18.4	17.2	25.8	46.5	88.1	35.0	25.7
13	19.1	18.4	18.6	12.8	12.6	18.4	17.2	23.7	48.6	80.5	35.0	25.7
14	19.1	18.4	7.6	13.0	17.2	18.4	17.2	23.7	52.2	77.2	38.3	25.7
15	19.1	18.4	18.4	13.3	16.0	17.9	17.4	28.8	83.8	74.7	38.3	25.7
16	19.8	18.4	18.4	13.3	15.5	17.6	17.6	25.5	77.2	73.1	27.5	25.7
17	19.8	18.4	17.4	13.3	16.0	17.6	17.6	19.3	73.1	71.5	28.7	25.7
18	19.6	17.6	17.2	13.3	14.8	17.2	17.6	19.6	73.9	69.1	22.8	12.5
19	19.6	17.6	16.0	7.6	14.2	17.2	17.6	20.8	77.2	67.5	22.8	12.5
20	19.6	17.6	16.0	7.6	14.2	17.2	17.6	26.0	83.8	66.7	22.8	22.8
21	19.6	18.4	15.5	16.0	14.2	17.2	17.4	27.4	88.1	65.9	22.8	22.8
22	14.8	18.4	15.5	15.1	14.2	17.2	17.4	35.3	85.5	65.9	19.0	21.7
23	18.9	17.9	16.0	14.2	14.4	16.9	17.4	43.3	82.2	63.5	19.0	21.7
24	16.0	17.9	16.0	13.7	14.8	17.2	17.2	43.3	81.3	63.5	19.6	21.7
25	17.4	18.4	16.5	13.7	15.1	17.2	17.6	92.4	86.4	63.5	20.1	31.8
26	17.9	18.4	16.0	13.3	17.2	17.2	17.6	75.6	106	59.7	20.1	31.8
27	17.9	18.4	16.0	13.0	17.2	16.7	17.9	78.0	110	56.0	20.1	31.8
28	17.9	18.4	16.0	7.6	18.4	16.7	17.9	82.2	110	52.2	22.8	28.7
29	17.9	18.4	15.8	8.1	------	16.5	17.9	85.5	110	48.6	22.8	28.7
30	18.4	17.8	15.1	14.8	------	16.2	17.9	92.4	110	48.6	22.8	28.7
31	18.4	------	15.0	14.8	------	16.2	------	85.0	------	35.0	22.8	------

NOTE.—No gage-height record May 31 to June 4; discharge interpolated.

Monthly discharge of North Boulder Creek at Silver Lake, Colo., for the year ending September 30, 1927

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	22.1	14.8	19.2	1,180
November	18.4	17.6	18.2	1,080
December	20.8	7.6	16.2	996
January	16.0	7.6	13.1	806
February	20.3	12.0	14.8	822
March	19.1	16.2	17.9	1,100
April	17.9	16.0	17.4	1,040
May	92.4	17.9	38.9	2,390
June	110	45.1	73.1	4,350
July	96.8	35.0	70.7	4,350
August	38.3	19.0	28.6	1,760
September	38.2	12.5	27.8	1,650
The year	110	7.6	29.7	21,500

THOMPSON RIVER AT MOUTH OF CANYON, NEAR DRAKE, COLO.

LOCATION.—In sec. 4, T. 5 N., R. 70 W., at highway bridge 1 mile above mouth of canyon and 6 miles east of Drake, Larimer County. Nearest tributary, Cedar Creek, enters 2 miles upstream.

DRAINAGE AREA.—301 square miles (measured on topographic maps).

RECORDS AVAILABLE.—March 1 to September 30, 1927. From September 18, 1917, to December 31, 1926, station maintained 5 miles upstream.

EQUIPMENT.—Stevens water-stage recorder fastened to right wall of canyon just above highway bridge. Discharge measurements made from footbridge near gage or by wading.

CHANNEL AND CONTROL.—Bed composed of coarse gravel and small boulders and will shift during high water.

EXTREMES OF DISCHARGE.—Maximum stage during year, from water-stage recorder, 5.12 feet at 4 a. m. June 29 (discharge, 1,060 second-feet); minimum discharge during winter.

1918–1927: Maximum stage, from high-water mark, 9.5 feet on original gage at 6 p. m. July 31, 1919 (discharge computed as 8,000 second-feet from extension of rating curve); minimum discharge during winter.

ACCURACY.—Stage-discharge relation not permanent; affected by ice, observations discontinued during winter. Rating curve used October 1 to December 31 well defined; curve used March 1 to September 30 is well defined between 40 and 1,000 second-feet by 18 measurements made during year. Gage read to quarter-tenths twice daily October 1 to December 31; operation of water-stage recorder satisfactory March 26 to September 30. Daily discharge ascertained by applying mean gage daily height to rating table, using shifting-control method April 4–28 and August 24 to September 18, except as indicated in footnote to table of daily discharge. Records good except those for estimated periods, which are fair.

Daily discharge, in second-feet, of Thompson River at mouth of canyon, near Drake, Colo., for the year ending September 30, 1927

Day	Oct.	Nov.	Dec.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	62	33	41		54	193	352	599	299	116
2	62	33	41		32	234	358	558	320	107
3	64	44	41	23	39	246	430	562	348	104
4	67	53	42		46	231	383	582	320	99
5	63	53	41		42	240	406	599	278	98
6	62	47	40		37	212	458	554	262	96
7	59	46	45		36	246	542	510	292	90
8	56	35	34	25	46	302	689	490	316	89
9	55	25	22		55	228	712	466	390	90
10	64	41			50	207	770	617	288	97
11	66	46			49	188	761	558	252	108
12	62	41	13		78	190	833	470	234	110
13	61	41		22	62	195	770	450	222	113
14	59	41			58	237	644	454	212	117
15	57	22			54	288	716	394	212	115
16	55	24			55	402	658	362	202	94
17	52				60	558	635	352	186	87
18	52		28	20	72	644	838	338	177	90
19	54	20			88	570	882	341	179	94
20	51				83	554	806	327	179	89
21	50				69	622	797	338	173	85
22	49	35			76	694	684	422	169	80
23	48	49	30	29	77	644	671	406	171	88
24	46	42			83	494	806	390	160	92
25	43	44			91	426	842	376	151	99
26	45	27		37	115	474	842	316	160	117
27	46	24	28	36	146	486	905	292	160	110
28	46	27	30	25	173	502	923	334	169	105
29	44	41	33	26	175	502	928	422	160	93
30	44	43	27	35	175	390	824	398	135	92
31	48	-------	30	---- 54	-------	355	-------	341	124	-------

NOTE.—Discharge records Oct. 1 to Dec. 31 are for station 5 miles upstream. Stage-discharge relation affected by ice, Nov. 8, 17–22, Dec. 10–26, and Mar. 1–25; discharge based on temperature and gage-height records and two current-meter measurements.

Monthly discharge of Thompson River at mouth of canyon, near Drake, Colo., for the year ending September 30, 1927

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	67	43	54.6	3,360
November	53	----------	35.2	2,090
December	45	----------	28.8	1,770
January	----------	----------	22	1,350
February	----------	----------	20	1,110
March	54	----------	26.1	1,600
April	175	32	75.9	4,520
May	694	188	379	23,300
June	928	352	696	41,400
July	617	292	439	27,000
August	348	124	223	13,700
September	117	80	98.8	5,880
The year	928	----------	176	127,000

NOTE.—Mean discharge for January and February is based on temperature record and one current-meter measurement.

TARKIO RIVER BASIN

TARKIO RIVER AT FAIRFAX, MO.

LOCATION.—On line between SW. ¼ SW. ¼ sec. 22 and NW. ¼ NW. ¼ sec. 27, T. 64 N., R. 40 W., at highway bridge half a mile west of Fairfax, Atchison County, and 8 miles below junction of East Tarkio and West Tarkio Creeks.

DRAINAGE AREA.—508 square miles (measured on base maps of Missouri and Iowa).

RECORDS AVAILABLE.—March 8, 1922, to September 30, 1927,

EQUIPMENT.—Chain gage on bridge. Discharge measurements made from bridge or by wading.

CHANNEL AND CONTROL.—Bed composed of silt and sand; clean and shifting. Channel is an artificial ditch section. Banks are leveed to prevent overflow. No well-defined control.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 7.53 feet at 4.40 p. m. October 3 (discharge, 1,740 second-feet); minimum discharge, 5 second-feet September 11–15.

1922–1927: Maximum stage, determined from levels to floodmarks, 19.3 feet September 4, 1926 (discharge, 7,940 second-feet); minimum discharge, 1 second-foot December 21, 1924, to January 4, 1925, while river was frozen.

DIVERSIONS AND REGULATION.—None.

ACCURACY.—Stage-discharge relation changed October 3; seriously affected by ice during winter. Rating curve fairly well defined by seven discharge measurements, three of which, between 8 and 129 second-feet, were made during the year. Gage read to hundredths once daily. Daily discharge ascertained by applying daily gage height to rating table. Records fair except those for periods of ice effect, which are poor.

Daily discharge, in second-feet, of Tarkio River at Fairfax, Mo., for the year ending September 30, 1927

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	146	108	108	146	116	62	591	361	82	44	24	10
2	190	108	101	163	146	57	522	319	154	41	30	8
3	1,740	116	108	180	180	49	361	298	340	41	32	7
4	660	108	116	124	246	75	298	237	180	41	29	7
5	407	108	94	124	277	108	237	287	101	41	29	7
6	340	108	52	124	138	163	208	298	88	42	23	24
7	298	108	138	108	101	124	190	246	88	38	20	16
8	256	146	124	53	64	94	319	430	82	38	25	8
9	361	108	116	43	88	108	319	256	82	34	20	8
10	277	101	101	43	75	88	522	208	70	30	20	7
11	277	108	108	43	88	146	277	190	163	30	21	5
12	237	116	237	43	88	246	430	180	298	30	101	5
13	208	116	131	43	101	163	476	180	180	75	82	5
14	199	660	116	43	70	146	591	154	116	70	40	5
15	190	319	101	43	43	138	1,150	138	101	43	25	5
16	180	208	88	43	163	116	660	138	94	94	82	7
17	172	154	88	34	256	116	430	146	94	88	33	33
18	163	124	75	34	88	101	591	138	88	41	29	40
19	146	61	64	34	124	101	875	138	146	35	40	24
20	146	101	64	34	146	101	568	131	82	34	29	20
21	146	228	64	34	116	101	900	138	82	30	22	12
22	138	340	64	34	101	116	591	116	70	27	19	10
23	138	199	75	34	101	108	453	131	64	25	29	8
24	172	163	75	34	88	108	430	146	70	25	20	8
25	146	154	88	34	82	94	407	108	58	32	20	9
26	146	154	88	34	75	88	361	101	48	24	16	88
27	138	124	88	34	55	82	298	101	49	23	14	75
28	131	138	101	43	42	82	266	94	51	45	15	64
29	124	124	116	53	-------	82	1,360	88	45	108	14	38
30	116	131	116	64	-------	82	568	94	39	34	11	25
31	116	-------	131	88	-------	124	-------	88	-------	29	10	-------

NOTE.—Stage-discharge relation affected by ice Dec. 14-31, Jan. 1, 8-31, Feb. 1-3, 10-12; discharge estimated from daily gage heights, observer's notes, and weather records.

Monthly discharge of Tarkio River at Fairfax, Mo., for the year ending September 30, 1927

[Drainage area, 508 square miles]

Month	Discharge in second-feet				Run-off in inches
	Maximum	Minimum	Mean	Per square mile	
October	1,740	116	261	0.514	0.59
November	660	61	161	.317	.35
December	237	52	101	.200	.23
January	180	34	64.1	.126	.15
February	277	42	116	.228	.24
March	246	49	109	.215	.25
April	1,360	190	508	1.00	1.12
May	430	88	182	.358	.41
June	340	39	107	.211	.24
July	108	23	43.0	.085	.10
August	101	10	29.8	.059	.07
September	88	5	19.6	.039	.04
The year	1,740	5	141	.278	3.79

NODAWAY RIVER BASIN

NODAWAY RIVER NEAR BURLINGTON JUNCTION, MO.

LOCATION.—In NE. ¼ sec. 17, T. 65 N., R. 37 W., at highway bridge one-fourth mile below Wabash Railway bridge, 1½ miles west of Burlington Junction, Nodaway County, and 3 miles above Mill Creek.

DRAINAGE AREA.—1,240 square miles (measured on base maps of Missouri and Iowa).

RECORDS AVAILABLE.—March 4, 1922, to September 30, 1927.

EQUIPMENT.—Chain gage on bridge. Discharge measurements made from bridge or by wading.

CHANNEL AND CONTROL.—Bed composed of sand and silt; shifting. Channel is an artificial ditch section. Banks are overflowed at stage of 18 feet. No well-defined control.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 13.25 feet at 6 p. m. October 3 (discharge, 6,800 second-feet); minimum, 2.33 feet at 7.45 a. m. September 2 (discharge, 8 second-feet).

1922–1927: Maximum stage, determined from levels to floodmarks, 19.5 feet September 3, 1926 (discharge, from extension of rating curve, 18,200 second-feet); minimum discharge, 6 second-feet June 1 and July 26, 1925.

DIVERSIONS AND REGULATION.—None.

ACCURACY.—Stage-discharge relation not permanent; affected by ice during winter. Rating curve used until April 20 fairly well defined by 11 discharge measurements; curve used after that date fairly well defined by 14 discharge measurements, 2 of which, at 15 and 217 second-feet, were made during the year. Gage read to hundredths once daily during low stages and twice daily during high stages. Daily discharge ascertained by applying mean daily gage height to rating table; shifting-control method used October 4 to February 5, based upon discharge measurement made December 3. Records good except those for periods of ice effect, which are poor.

Daily discharge, in second-feet, of Nodaway River near Burlington Junction, Mo., for the year ending September 30, 1927

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	416	108	90	140	102	121	1,280	564	208	32	62	11
2	724	104	130	140	121	140	1,140	488	161	30	59	8
3	5,990	108	121	140	161	117	804	400	184	28	65	12
4	2,000	112	130	140	366	121	644	334	220	27	62	11
5	1,230	104	130	161	488	140	416	302	140	27	56	22
6	966	94	74	140	350	416	317	334	117	28	26	14
7	564	100	90	150	302	366	260	350	110	28	62	20
8	416	87	108	140	274	287	452	844	117	22	51	17
9	764	108	121	121	246	274	564	684	117	19	44	14
10	452	97	130	102	208	184	764	644	110	22	28	11
11	366	94	119	85	208	172	604	366	452	21	30	9
12	366	87	130	70	196	1,010	644	274	1,050	21	46	10
13	246	100	80	56	161	452	1,360	246	302	526	49	9
14	260	350	56	43	196	416	1,140	220	161	350	34	9
15	220	334	56	31	317	334	2,600	196	121	110	54	9
16	220	274	43	31	172	287	1,410	184	100	79	46	20
17	196	246	43	20	287	246	1,140	184	97	82	59	130
18	184	208	43	20	287	233	1,700	604	97	49	49	72
19	172	196	43	20	302	196	2,680	804	88	46	44	208
20	150	196	43	20	317	208	2,840	317	80	36	34	63
21	150	150	56	20	317	196	2,240	246	88	32	24	47
22	150	150	56	20	350	208	1,700	220	73	24	23	40
23	150	150	56	20	287	208	1,180	184	65	18	22	35
24	184	172	56	20	196	196	884	196	59	16	19	27
25	161	220	56	20	246	184	644	196	54	103	18	25
26	150	220	56	31	208	172	604	161	41	62	16	98
27	140	246	56	43	140	172	526	150	39	22	15	246
28	140	208	70	43	130	161	452	121	41	46	13	161
29	117	161	85	56	-------	150	3,000	121	36	140	13	130
30	117	74	121	70	-------	161	1,140	317	33	65	13	84
31	112	-------	121	85	-------	121	-------	274	-------	65	12	-------

NOTE.—Stage-discharge relation affected by ice Dec. 14–31, Jan. 1–4, 10–31, and Feb. 1–3; daily discharge ascertained by applying to rating table daily gage heights corrected for ice effect by means of one discharge measurement, observer's notes, and weather records. Discharge interpolated Aug. 22; gage reading probably in error.

Monthly discharge of Nodaway River near Burlington Junction, Mo., for the year September 30, 1927

[Drainage area, 1,240 square miles]

Month	Discharge in second-feet				Run-off in inches
	Maximum	Minimum	Mean	Per square mile	
October	5,990	112	564	0.455	0.52
November	350	74	162	.131	.15
December	130	43	82.9	.067	.08
January	161	20	70.9	.057	.07
February	488	102	.248	.200	.21
March	1,010	117	247	.199	.23
April	3,000	260	1,170	.944	1.05
May	844	121	340	.274	.32
June	1,050	33	152	.123	.14
July	526	16	70.1	.057	.07
August	65	12	37.0	.030	.03
September	246	8	52.4	.042	.05
The year	5,990	8	265	.214	2.92

PLATTE RIVER BASIN (IOWA-MISSOURI)

PLATTE RIVER AT AGENCY, MO.

LOCATION.—In NE. ¼ sec. 29, T. 56 N., R. 34 W., at highway bridge in Agency, Buchanan County, 600 feet below Atchison Topeka & Santa Fe Railway bridge and 8 miles below Third Fork.

DRAINAGE AREA.—1,790 square miles (measured on United States soil-survey maps and base maps of Missouri and Iowa).

RECORDS AVAILABLE.—May 22, 1924, to September 30, 1927.

EQUIPMENT.—Chain gage on bridge. Discharge measurements made from highway or railway bridge or by wading.

CHANNEL AND CONTROL.—Bed composed of rock and mud. Banks are overflowed at stage of 24 feet. Control is a series of rocky riffles 500 feet below gage; practically permanent.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 22.22 feet at noon October 7 (discharge, 14,500 second-feet); minimum, 1.70 feet at 6 p. m. September 17 (discharge, 24 second-feet).

1924–1927: Maximum stage recorded, 26.83 feet at 6 p. m. September 18, 1926 (discharge, 22,600 second-feet); minimum, that of September 17, 1927. Flood of July, 1915, reached a stage of 31.4 feet, determined by levels to chiseled high-water mark on bridge.

DIVERSIONS AND REGULATION.—None.

ACCURACY.—Stage-discharge relation permanent during the year except as affected by ice. Rating curve well defined below and fairly well defined above 2,000 second-feet by 27 discharge measurements. Three of the measurements, covering a range from 33 to 283 second-feet, were made during the year and check the curve closely. Gage read to hundredths twice daily. Daily discharge ascertained by applying mean daily gage height to rating table. Records good except those for periods of ice effect, which are poor.

Daily discharge, in second-feet, of Platte River at Agency, Mo., for the year ending September 30, 1927

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1,510	334	334	150	207	195	5,130	4,480	138	89	68	36
2	3,940	314	314	150	207	166	6,400	2,910	189	77	174	33
3	8,700	295	295	158	258	150	6,860	1,020	968	68	295	32
4	13,400	295	276	172	276	172	6,690	806	5,400	65	183	28
5	13,900	276	258	195	617	224	4,100	752	2,320	63	104	35
6	14,000	276	258	189	1,180	334	1,350	617	752	74	81	58
7	14,500	295	258	183	1,240	563	752	644	488	120	67	138
8	13,100	314	295	183	914	752	1,450	698	334	806	116	132
9	6,570	314	353	177	536	752	1,720	698	240	224	67	60
10	5,720	295	334	150	276	563	5,610	752	192	111	50	48
11	6,690	258	295	125	224	374	7,280	671	166	85	48	42
12	4,750	240	295	102	240	464	8,000	488	644	77	155	36
13	2,480	258	276	102	276	2,320	7,540	590	1,780	140	860	35
14	1,940	295	240	81	374	2,640	7,600	396	1,400	98	1,720	38
15	1,240	418	240	81	334	1,560	8,070	334	968	116	914	32
16	968	698	207	63	295	914	8,000	276	441	396	374	33
17	860	914	177	63	536	752	7,600	258	806	441	140	25
18	752	806	177	63	698	590	6,170	396	536	224	183	107
19	644	464	150	63	276	536	8,380	295	374	135	94	107
20	590	314	125	63	295	563	10,600	276	276	107	140	92
21	536	240	125	63	396	512	10,600	276	295	94	120	45
22	488	240	125	63	418	536	9,140	276	396	68	116	62
23	464	240	125	63	396	536	6,000	224	240	63	276	51
24	671	240	125	63	314	536	4,050	617	172	54	536	47
25	644	314	150	63	276	536	2,590	968	148	54	161	51
26	590	314	150	63	224	488	1,510	644	125	111	96	77
27	536	374	150	63	258	418	1,130	276	116	120	63	89
28	512	374	150	81	207	374	968	207	104	89	52	102
29	441	374	150	102	-------	334	1,450	177	100	207	44	102
30	418	374	150	125	-------	314	2,860	153	98	104	57	74
31	374	-------	150	177	-------	563	--------	138	-------	83	44	-------

NOTE.—Stage-discharge relation affected by ice Dec. 13–31, Jan. 1, 10–31, and Feb. 1, 2; daily discharge estimated from daily gage heights, observer's notes, and weather records.

Monthly discharge of Platte River at Agency, Mo., for the year ending September 30, 1927

[Drainage area, 1,790 square miles]

Month	Discharge in second-feet				Run-off in inches
	Maximum	Minimum	Mean	Per square mile	
October	14,500	374	3,930	2.20	2.54
November	914	240	359	.201	.22
December	353	125	216	.121	.14
January	195	63	111	.062	.07
February	1,240	207	420	.235	.24
March	2,640	150	636	.355	.41
April	10,600	752	5,320	2.97	3.31
May	4,480	138	688	.384	.44
June	5,400	98	674	.377	.42
July	806	54	147	.082	.09
August	1,720	44	239	.134	.15
September	138	25	62	.035	.04
The year	14,500	25	1,070	.598	8.07

KANSAS RIVER BASIN

REPUBLICAN RIVER AT WAKEFIELD, KANS.

LOCATION.—In NE. ¼ sec. 5, T. 10 S., R. 4 E., at highway bridge one-fourth mile north of Union Pacific Railroad station at Wakefield, Clay County, 25 miles above confluence with Smoky Hill River, and 65 miles below Salt Creek, first important tributary above.

DRAINAGE AREA.—24,700 square miles.

RECORDS AVAILABLE.—June 21, 1917, to September 30, 1927.

EQUIPMENT.—Chain gage on upstream side of highway bridge. An auxiliary high-water vertical staff gage is spiked to large cottonwood tree on right bank 25 feet below bridge. Discharge measurements made from downstream side of bridge or by wading.

CHANNEL AND CONTROL.—Bed composed of clean sand; shifting. No well-defined control. Bank-full stage, 11 feet.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 11.62 feet at 6.20 a. m. April 19 (discharge, 16,100 second-feet); minimum, 2.68 feet at 5.20 a. m. September 30 (discharge, 273 second-feet).

1917–1927: Maximum stage recorded, 12.86 feet June 4, 1923 (discharge, 20,100 second-feet); minimum discharge, 16 second-feet October 21, 1922.

REGULATION.—Flow is affected by operation of power plant at Clay Center.

ACCURACY.—Stage-discharge relation not permanent; affected by ice. Rating curves fairly well defined. Gage read to hundredths twice daily. Daily discharge ascertained by applying mean daily gage height to rating table or as explained in footnote to table of daily discharge; shifting-control method used August 14–28. Records fair.

Daily discharge, in second-feet, of Republican River at Wakefield, Kans., for the year ending September 30, 1927

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	750	316	585	450	400	930	1,300	3,290	752	1,290	1,240	1,140
2	855	316	585	450	450	855	1,200	2,150	715	1,190	1,560	955
3	4,240	316	585	445	500	855	1,160	1,910	3,440	1,170	8,610	870
4	1,020	316	585	555	500	750	1,060	1,800	10,800	1,150	4,080	830
5	890	316	565	500	615	750	930	1,680	3,760	1,130	2,630	715
6	820	340	545	418	680	750	890	1,680	2,030	1,110	1,340	870
7	715		525	472	615	715	855	1,560	1,680	1,090	1,340	1,560
8	680		500	528	750	715	2,110	1,460	1,460	1,040	1,340	955
9	680	330	500	528	615	680	970	1,460	2,390	1,000	870	2,630
10	615		500	555	615	680	855	1,460	3,290	912	790	4,080
11	500		528	500	555	648	855	1,340	2,750	870	752	2,270
12	2,500	316	500	500	500	715	890	1,290	2,390	790	6,790	1,560
13	785	340		555	555	785	2,890	1,340	5,410	752	13,100	1,190
14	472			390	750	1,060	7,330	1,560	4,400	680	4,400	830
15	528			390	820	1,000	12,500	1,680	2,390	645	2,630	790
16	500	370	475	390	785	944	9,710	1,560	2,390	645	2,150	680
17	472			390	680	886	10,500	1,340	10,000	715	2,030	580
18	445				418	829	10,500	1,190	5,410	955	1,680	560
19	418	390		400	585	772	14,100	1,140	2,870	870	1,190	520
20	390	500			855	715	7,690	1,000	6,170	3,600	1,560	612
21	390				500	715	5,780	1,040	4,720	9,550	1,680	492
22	390				615	715	6,580	912	3,000	4,080	1,340	440
23	390	480			555	855	7,690	912	3,140	2,150	1,190	440
24	340				648	930	5,230	1,460	3,140	1,910	5,410	415
25	340				1,020	890	4,560	2,630	2,630	1,800	4,400	415
26	365	445	450	350	930	855	3,920	1,460	2,390	1,340	2,870	440
27	340	445			785	820	3,600	1,000	2,150	1,290	2,150	390
28	340				930	820	3,000	912	1,800	1,090	5,970	390
29	340	500			-------	715	2,870	870	1,560	1,340	2,870	365
30	340				-------	820	3,920	830	1,460	2,030	1,800	320
31	316	-------			-------	1,110	--------	870	--------	1,340	1,340	-------

NOTE.—No gage-height record Nov. 7–11, 14–18, 21–25, 28–30, Dec. 1, 2, 5–7, Mar. 15–19, Apr. 1, 2, July 3–6; discharge interpolated. Stage-discharge relation affected by ice Dec. 13 to Jan. 2, Jan. 16, 18–31, and Feb 1-2; discharge based on climatic records.

Monthly discharge of Republican River at Wakefield, Kans., for the year ending September 30, 1927

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	4,240	316	715	44,000
November	----------	----------	392	23,300
December	585	----------	492	30,300
January	555	----------	421	25,900
February	1,020	400	651	36,200
March	1,110	648	815	50,100
April	14,100	855	4,510	268,000
May	3,290	830	1,440	88,500
June	10,800	715	3,350	199,000
July	9,550	645	1,600	98,400
August	13,100	752	2,940	181,000
September	4,080	320	943	56,100
The year	14,100	----------	1,520	1,100,000

KANSAS RIVER AT OGDEN, KANS.

LOCATION.—In SE. ¼ sec. 12, T. 11 S., R. 6 E., at highway bridge one-fourth mile below Sevenmile Creek, three-fourths mile south of Ogden, Riley County, 2 miles below Clark Creek, and 10 miles below point where Smoky Hill and Republican Rivers unite to form Kansas River.

DRAINAGE AREA.—45,200 square miles.

RECORDS AVAILABLE.—June 19, 1917, to September 30, 1927.

EQUIPMENT.—Chain gage on upstream side of highway bridge. A high-water vertical staff gage is spiked to aspen tree on upstream side of road 200 feet from right end of bridge. Discharge measurements made from downstream side of bridge or by wading.

CHANNEL AND CONTROL.—Bed composed of clean sand; shifting. No well-defined control. Bank-full stage, 18 feet.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 17.31 feet at 6.45 p. m. April 19 (discharge, 27,100 second-feet); minimum discharge probably occurred during winter.

1917–1927: Maximum stage recorded, 18.15 feet June 10, 1923 (discharge, 32,600 second-feet); minimum discharge, 103 second-feet October 30, 1922.

REGULATION.—Flow affected by the operation of power plants on tributary streams.

ACCURACY.—Stage-discharge relation permanent; seriously affected by ice, observations discontinued during winter. Rating curve well defined. Gage read to hundredths twice daily. Daily discharge ascertained by applying mean daily gage height to rating table. Records good.

Daily discharge, in second-feet, of Kansas River at Ogden, Kans., for the year ending September 30, 1927

Day	Oct.	Nov.	Apr.	May	June	July	Aug.	Sept.
1	1,940	965	3,540	5,800	1,630	7,010	2,610	10,000
2	1,430	885	4,560	4,560	2,270	6,400	2,610	8,840
3	3,680	885	2,610	3,960	1,940	5,420	4,730	7,440
4	4,730	845	1,830	3,680	11,300	5,070	7,660	6,800
5	2,610	845	1,630	4,400	9,320	4,400	4,900	5,800
6	2,160	845	1,530	5,800	5,800	3,960	5,240	7,440
7	1,940	--------	1,330	6,800	5,420	3,820	4,560	12,800
8	1,730	--------	1,330	5,240	5,610	3,680	3,680	11,800
9	1,630	--------	1,430	4,400	7,220	3,540	2,860	10,300
10	1,630	--------	1,430	4,400	10,500	3,400	2,380	12,500

Daily discharge, in second-feet, of Kansas River at Ogden, Kans., for the year ending September 30, 1927—Continued

Day	Oct.	Nov.	Apr.	May	June	July	Aug.	Sept.
11	1,530		1,530	4,250	11,500	3,120	2,380	11,800
12	4,730		1,530	4,100	11,300	2,860	4,250	10,300
13	3,820		2,490	3,260	15,400	2,730	23,000	8,600
14	3,680		7,890	3,120	13,800	2,990	19,800	5,420
15	3,680		20,800	2,860	10,300	2,730	15,400	4,250
16	3,680		16,100	2,730	9,320	3,260	17,500	3,820
17	3,120		14,000	2,490	23,000	3,680	15,900	3,540
18	2,160		14,000	2,380	20,200	2,990	15,900	3,260
19	1,630		25,700	2,160	17,800	3,960	15,400	3,120
20	1,430		20,200	2,050	17,500	6,200	15,400	2,990
21	1,330		15,900	1,940	23,000	13,000	15,900	3,820
22	1,140		14,800	1,830	17,800	8,840	16,400	3,680
23	1,230		18,100	1,830	17,800	5,240	17,000	3,120
24	1,140		13,800	1,730	18,400	3,960	18,400	2,860
25	1,040		10,800	2,490	18,100	3,820	21,100	2,610
26	1,040		9,800	3,260	16,100	3,400	15,900	2,610
27	1,040		8,600	2,270	14,000	2,990	12,800	2,490
28	965		6,600	1,830	12,500	2,730	12,800	2,380
29	965		5,420	1,630	9,080	2,730	15,400	2,270
30	925		5,240	1,530	6,400	3,540	13,000	2,270
31	845			1,630		3,260	12,300	

Monthly discharge of Kansas River at Ogden, Kans., for the year ending September 30, 1927

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	4,730	845	2,080	128,000
April	25,700	1,330	8,480	505,000
May	6,800	1,530	3,240	199,000
June	23,000	1,630	12,100	720,000
July	13,000	2,730	4,350	267,000
August	21,100	2,380	11,500	707,000
September	12,800	2,270	5,960	355,000

KANSAS RIVER AT WAMEGO, KANS.

LOCATION.—In SE. ¼ sec. 9, T. 10 S., R. 10 E., at highway bridge on Main Street in Wamego, Pottawatomie County, 3 miles below Antelope Creek and 7 miles above Vermilion River.

DRAINAGE AREA.—54,900 square miles.

RECORDS AVAILABLE.—January 1, 1919, to September 30, 1927. The United States Weather Bureau has intermittent records of stage since June 15, 1914.

EQUIPMENT.—Chain gage on downstream side of bridge. Discharge measurements made from bridge or by wading.

CHANNEL AND CONTROL.—Bed composed of clean sand; shifting. No well-defined control. Bank-full stage, 15 feet.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 15.2 feet at 7 a. m. April 20 (discharge, 44,100 second-feet); minimum, 2.3 feet several days in January and February (discharge, 1,050 second-feet).

1919–1927: Maximum stage recorded, 15.8 feet June 10, 1923 (discharge, 46,600 second-feet); minimum, 1.6 feet on days in October, 1922 (discharge, 330 second-feet).

REGULATION.—Low flow may be affected by operation of power plants on tributary streams.

ACCURACY.—Stage-discharge relation permanent; not affected by ice. Rating curve fairly well defined. Gage read to tenths twice daily. Daily discharge ascertained by applying mean daily gage height to rating table. Records fair.

COOPERATION.—Gage-height record furnished by United States Weather Bureau.

Daily discharge, in second-feet, of Kansas River at Wamego, Kans., for the year ending September 30, 1927

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	3,080	1,340	1,410	1,280	1,280	1,050	5,610	7,070	2,350	7,070	3,880	12,400
2	3,080	1,280	1,340	1,280	1,160	1,050	7,070	9,350	2,170	9,350	3,670	10,600
3	9,350	1,220	1,340	1,280	1,160	1,280	6,300	7,070	4,090	6,550	5,170	8,160
4	16,600	1,160	1,280	1,220	1,220	1,690	5,170	5,610	15,200	6,060	9,050	8,160
5	8,450	1,100	1,340	1,220	1,280	1,840	4,300	5,610	16,600	5,170	8,450	8,160
6	5,610	1,160	1,280	1,220	1,220	1,840	3,470	7,340	9,950	4,730	6,060	10,600
7	3,470	1,160	1,410	1,160	1,280	1,840	2,710	8,750	7,610	4,510	13,400	13,800
8	2,710	1,160	1,550	1,160	1,280	1,760	3,470	8,160	6,550	4,300	19,900	24,000
9	2,710	1,280	1,550	1,160	1,220	1,840	4,090	6,550	8,160	4,300	21,000	23,300
10	9,950	1,220	1,480	1,280	1,160	1,760	5,610	6,060	9,950	3,880	20,300	18,800
11	13,400	1,160	1,480	1,280	1,160	1,690	7,070	5,830	12,100	3,470	7,070	15,200
12	12,100	1,160	1,340	1,280	1,160	2,000	5,170	5,170	12,400	3,270	9,350	13,400
13	7,070	1,160	1,340	1,220	1,220	2,000	5,610	5,170	17,400	3,080	27,200	11,200
14	3,270	1,160	1,280	1,220	1,410	1,760	14,500	4,300	21,800	3,270	38,500	7,880
15	5,610	1,840	1,280	1,280	1,410	1,760	33,700	4,300	15,600	3,670	35,900	6,550
16	5,170	4,300	1,280	1,220	1,340	1,690	32,900	4,090	16,600	4,090	35,000	5,390
17	4,510	8,750	1,340	1,220	1,410	1,760	24,800	3,880	32,900	4,510	22,900	4,950
18	4,090	6,550	1,340	1,100	1,410	2,000	21,000	3,470	28,400	4,300	26,000	4,510
19	3,080	4,090	1,280	1,100	1,340	2,000	37,600	3,470	21,000	4,090	24,400	4,090
20	2,350	2,710	1,280	1,050	1,340	2,000	41,900	3,470	18,100	5,830	19,500	3,880
21	2,000	2,000	1,280	1,050	1,220	2,000	27,200	3,270	25,600	13,100	18,800	3,880
22	2,000	1,840	1,340	1,050	1,160	2,000	21,800	3,080	22,500	12,800	17,400	3,880
23	1,620	1,690	1,340	1,050	1,100	2,000	19,500	2,890	20,300	9,350	18,800	4,300
24	1,480	1,620	1,340	1,050	1,100	2,000	16,600	2,530	19,900	7,070	21,000	3,880
25	1,410	1,550	1,280	1,050	1,050	2,000	13,100	2,530	19,500	5,610	25,600	3,880
26	1,340	1,550	1,280	1,160	1,050	2,000	10,200	2,710	17,700	4,730	22,500	3,470
27	1,340	1,480	1,220	1,280	1,050	2,000	10,200	2,530	15,900	4,730	16,600	3,470
28	1,280	1,480	1,160	1,410	1,100	2,000	10,200	2,530	13,800	4,300	18,100	3,470
29	1,280	1,410	1,160	1,410	-------	2,000	8,450	2,710	11,200	3,470	19,500	3,470
30	1,410	1,480	1,280	1,410	-------	2,000	6,810	2,890	8,160	3,080	15,900	4,090
31	1,410	-------	1,280	1,410	-------	2,000	--------	2,710	--------	2,710	13,400	-------

Monthly discharge of Kansas River at Wamego, Kans., for the year ending September 30, 1927

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	16,600	1,280	4,590	282,000
November	8,750	1,100	2,040	121,000
December	1,550	1,160	1,330	81,800
January	1,410	1,050	1,210	74,400
February	1,410	1,050	1,220	67,800
March	2,000	1,050	1,830	113,000
April	41,900	2,710	13,900	827,000
May	9,350	2,530	4,680	288,000
June	32,900	2,170	15,100	898,000
July	13,100	2,710	5,370	330,000
August	38,500	3,670	18,200	1,120,000
September	24,000	3,470	8,430	502,000
The year	41,900	1,050	6,500	4,710,000

KANSAS RIVER AT TOPEKA, KANS.

LOCATION.—In Topeka, Shawnee County, midway between Topeka Avenue and Harrison Street, 300 feet below Chicago, Rock Island & Pacific Railway bridge, 1,460 feet above Melan arch highway bridge on Kansas Avenue, and 1½ miles above Soldier Creek.

DRAINAGE AREA.—56,400 square miles.

RECORDS AVAILABLE.—April 24 to August 31, 1904, and June 12, 1917, to September 30, 1927.

EQUIPMENT.—Gurley long-distance water-stage recorder on right bank. A chain gage on Melan arch highway bridge is read when water-stage recorder is not in operation. Discharge measurements made from downstream side of Sardou Avenue highway bridge, 1 mile below gage, from brickyard highway bridge, 3 miles above gage, and by wading.

CHANNEL AND CONTROL.—Bed composed of sand and silt; shifting. No well-defined control; heavy concrete piers. Melan arch bridge affects stage-discharge relation. Banks protected by levees between which the water is confined at all stages.

EXTREMES OF DISCHARGE.—Maximum stage during year, from water-stage recorder, 20.67 feet at 10 p. m. April 19 (discharge, 67,000 second-feet); minimum gage height, 2.83 feet at 4 p. m. November 2 (discharge, 1,330 second-feet).

1917–1927: Maximum stage recorded, 21.5 feet June 10, 1923 (discharge, 73,700 second-feet); minimum discharge, about 480 second-feet during January, 1925.

A stage of 26.85 feet, referred to present datum, occurred July 7, 1904. The United States Weather Bureau has published a maximum stage of 32.7 feet for the flood of May 30, 1903.

REGULATION.—Effect of operation of power plants on tributaries is not appreciable.

ACCURACY.—Stage-discharge relation not permanent; affected by ice. Rating curves fairly well defined between 1,000 and 70,000 second-feet. Gage heights obtained from water-stage recorder by inspection except for period May 8 to June 1, July 1–20, and July 26 to August 7, when one chain reading

a day was taken at the Melan bridge. Daily discharge obtained by applying mean daily gage height or daily gage reading to rating table, or as explained in footnotes to table of daily discharge. Records good.

COOPERATION.—Gage-height record from chain gage on Melan bridge furnished by United States Weather Bureau.

Daily discharge, in second-feet, of Kansas River at Topeka, Kans., for the year ending September 30, 1927

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	3,280	1,330	1,860	1,400	1,400	2,550	17,700	14,200	2,730	9,330	4,850	13,000
2	3,190	1,190	1,800	1,450	1,400	2,550	13,500	14,000	4,030	9,330	4,850	11,400
3	11,100	1,250	1,800	1,500	1,460	2,480	11,700	9,470	4,120	8,330	4,850	10,400
4	24,400	1,220	1,800	1,560	1,400	2,400	9,250	6,850	11,700	7,110	6,190	9,690
5	13,700	1,170	1,740	1,620	1,510	2,120	6,220	6,850	17,100	7,110	11,600	9,250
6	8,370	1,150	1,740	1,560	1,560	2,060	5,200	7,490	11,900	5,960	10,800	9,030
7	5,400	1,190	1,740	1,560	1,560	1,860	5,000	9,470	8,590	5,500	9,080	12,600
8	3,670	1,460	1,740	1,560	1,510	1,860	4,800	10,800	7,060	4,640	15,600	18,200
9	4,030	1,920	1,740	1,560	1,740	1,860	5,800	9,830	7,060	4,640	18,000	26,800
10	5,800	1,800	1,740	1,560	1,800	1,860	8,150	7,830	7,710	4,430	18,800	20,000
11	12,800	1,740	1,680	1,560	1,740	1,860	7,930	7,110	9,250	4,030	12,800	15,100
12	19,100	1,560	1,560	1,560	1,510	2,400	7,710	7,110	10,600	3,830	8,810	13,700
13	11,700	2,060		1,510	1,510	2,480	3,760	7,110	17,100	4,430	19,100	12,100
14	7,060	2,550		1,400	1,680	2,120	8,150	7,350	21,300	3,830	43,000	10,600
15	5,800	2,700		1,300	1,510	1,990	37,000	9,080	17,400	3,450	37,000	7,930
16	5,800	8,150	1,500		1,620	1,990	38,600	5,960	12,600	3,450	35,300	6,640
17	5,400	9,690			1,800	1,990	29,500	4,850	29,100	4,230	26,400	5,800
18	5,200	7,060		1,200	2,060	2,260	24,000	5,060	41,900	5,060	22,100	5,400
19	4,120	4,600			2,060	2,400	59,300	4,850	26,000	7,350	23,600	4,700
20	3,250	4,030			1,860	2,550	57,400	4,430	21,300	5,730	20,600	4,220
21	2,700	4,500			1,680	2,550	38,000	4,030	22,800	7,930	18,200	4,030
22	2,400	3,670			1,860	2,550	24,800	4,030	23,600	12,800	16,600	3,940
23	2,190	2,850	1,400	1,100	1,990	2,480	20,000	3,830	18,500	11,900	18,200	4,320
24	1,990	2,400			1,740	2,400	18,000	3,640	18,200	8,810	18,200	4,500
25	1,920	2,190			1,800	2,330	16,000	3,450	18,000	6,640	22,400	4,120
26	1,860	1,990			1,680	2,260	14,000	4,230	17,700	5,730	23,200	4,600
27	1,740	2,120			1,990	2,060	12,000	5,730	16,100	5,960	21,000	3,940
28	1,620	2,060	1,350	1,300	2,400	1,860	12,000	5,280	14,600	5,060	18,800	4,220
29	1,620	1,990			-------	1,680	12,000	3,830	13,300	6,650	17,700	4,030
30	1,460	1,990			-------	1,680	10,100	3,260	11,700	4,430	17,100	3,500
31	1,460	-------		1,400	-------	2,930	--------	2,900	--------	3,830	13,700	-------

NOTE.—Stage-discharge relation affected by ice Dec. 13 to Jan. 3, Jan. 10, 11, 14–31, Feb. 1, 2; discharge based on climatic data and engineer's notes. No gage-height record Dec. 22–26, Jan. 23–30, and Apr. 24–29; discharge based on comparison with records of flow at Wamego.

Monthly discharge of Kansas River at Topeka, Kans., for the year ending September 30, 1927

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	24,400	1,460	5,940	365,000
November	9,690	1,150	2,790	166,000
December	1,860	----------	1,550	95,300
January	1,620	----------	1,360	83,600
February	2,400	1,400	1,710	95,000
March	2,930	1,680	2,210	136,000
April	59,300	4,800	17,900	1,070,000
May	14,200	2,900	6,580	405,000
June	41,900	2,730	15,400	916,000
July	12,800	3,450	6,180	380,000
August	43,000	4,850	18,000	1,110,000
September	26,800	3,500	8,930	531,000
The year	59,300	----------	7,390	5,350,000

KANSAS RIVER AT BONNER SPRINGS, KANS.

LOCATION.—In NW. ¼ sec. 32, T. 11 S., R. 23 E., at highway bridge at Bonner Springs, Wyandotte County, half a mile below Wolf Creek, half a mile below Atchison, Topeka & Santa Fe Railway bridge, and 18 miles above mouth of river.

DRAINAGE AREA.—59,600 square miles.

RECORDS AVAILABLE.—July 8, 1917, to September 30, 1927.

EQUIPMENT.—Chain gage on upstream side of highway bridge. Discharge measurements made from downstream side of bridge.

CHANNEL AND CONTROL.—Bed composed of sand and silt; shifting. No well-defined control.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 20.85 feet at 6.10 p. m. April 20 (discharge, 92,700 second-feet); minimum, 4.07 feet at 4.15 p. m. December 27 (discharge, 1,600 second-feet).

1917–1927: Maximum stage recorded, 22.2 feet March 17, 1919 (discharge, 109,000 second-feet); minimum, 2.92 feet October 28, 1922 (discharge, 670 second-feet).

REGULATION.—Flow may be slightly affected by operation of mill and power plant at Lawrence.

ACCURACY.—Stage-discharge relation not permanent; seriously affected by ice. Two fairly well defined rating curves used. Gage read to hundredths twice daily. Daily discharge ascertained by applying mean daily gage height to rating table, or as explained in footnote to table of daily discharge. Records good.

Daily discharge, in second-feet, of Kansas River at Bonner Springs, Kans., for the year ending September 30, 1927

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	4,220	2,190	2,340	2,190	2,660	2,500	28,700	12,400	4,010	11,500	5,150	15,000
2	3,780	2,050	2,340	2,050	2,830	2,660	47,200	18,200	4,670	9,550	6,630	14,000
3	4,670	2,050	2,190	2,050	3,000	2,660	26,100	15,800	5,880	9,820	6,380	12,100
4	22,900	1,910	2,050	1,910	2,660	2,500	17,000	11,800	8,470	9,280	5,880	11,200
5	39,000	1,910	2,050	1,910	2,340	2,660	12,400	10,100	20,800	8,470	7,150	13,000
6	21,900	1,910	2,050	1,770	2,190	2,340	10,100	16,400	23,100	7,410	10,100	11,500
7	12,000	1,910	2,190	1,770	2,050	2,660	9,280	22,700	14,300	6,890	8,200	15,000
8	7,320	1,910	2,340	1,770	2,050	2,660	9,010	17,800	10,100	6,630	8,740	24,600
9	5,630	2,050	2,340	1,770	2,050	2,500	16,200	15,000	9,010	6,130	13,900	35,400
10	8,740	2,660	2,500	1,770	2,050	2,340	23,600	11,500	9,010	5,880	19,100	29,200
11	14,300	3,000	2,340	1,770	2,050	2,190	23,600	9,820	9,280	5,880	20,400	23,100
12	20,000	2,500	2,190	1,770	1,910	3,000	15,800	9,820	10,400	5,390	13,600	17,000
13	26,600	2,340	2,190	1,770	1,910	8,200	13,300	9,280	15,300	5,630	33,100	14,000
14	15,900	2,340	2,050	1,770	2,050	5,880	13,000	9,550	30,300	7,150	43,900	13,300
15	9,010	2,660	2,050	1,510	2,190	6,130	42,000	9,280	29,700	6,380	49,900	11,200
16	7,160	3,180	1,910	1,510	2,340	2,830	63,000	8,200	19,900	5,390	39,000	9,280
17	6,640	4,440	1,910	1,510	2,340	2,660	54,200	7,670	18,200	5,880	36,600	8,200
18	6,380	9,010	1,980	1,510	2,500	2,660	36,000	7,150	54,200	6,890	25,100	7,150
19	5,760	5,880	2,050	1,510	2,500	3,180	68,400	6,890	45,200	7,930	24,100	6,630
20	5,140	4,900	1,910	1,510	2,340	3,570	91,500	6,380	30,800	12,100	25,600	6,130
21	4,440	4,440	2,190	1,510	2,190	3,370	77,300	5,880	29,200	10,400	18,700	5,880
22	3,570	4,080	2,050	1,640	2,050	3,000	49,900	5,630	30,800	9,820	17,800	5,630
23	3,370	3,720	1,910	1,640	2,190	2,660	29,700	5,630	26,100	14,000	18,700	5,630
24	3,180	3,360	1,910	1,640	2,190	2,660	26,600	5,880	22,200	10,900	22,700	6,130
25	3,000	3,000	1,770	1,770	2,050	2,340	27,100	5,150	20,800	9,280	24,100	5,880
26	2,660	2,660	1,640	1,910	2,050	2,340	20,400	5,150	20,400	7,410	26,600	5,630
27	2,660	2,500	1,640	1,910	2,050	2,190	17,800	5,880	18,700	6,380	24,600	6,630
28	2,660	2,500	1,640	2,050	2,340	2,190	16,200	6,380	16,800	6,380	18,700	6,380
29	2,660	2,500	1,640	2,190	-------	2,190	15,000	5,880	15,000	8,470	18,700	5,880
30	2,340	2,500	1,770	2,190	-------	2,340	13,000	5,150	13,600	9,280	19,900	5,880
31	2,340	-------	2,050	2,340	-------	3,180	--------	4,670	--------	5,880	15,800	-------

NOTE.—No gage-height record Oct. 19, Nov. 22–24, Mar. 10, May 6, 20, June 28, Aug. 9, and Sept. 11; discharge interpolated. Stage-discharge relation affected by ice Dec. 14–20 and Jan. 15–31; discharge based on observers' notes and climatic records.

Monthly discharge of Kansas River at Bonner Springs, Kans., for the year ending September 30, 1927

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	39,000	2,340	9,030	555,000
November	9,010	1,910	3,070	183,000
December	2,500	1,640	2,040	125,000
January	2,340	1,510	1,800	111,000
February	3,000	1,910	2,250	125,000
March	8,200	2,190	3,040	187,000
April	91,500	9,010	30,400	1,810,000
May	22,700	4,670	9,580	589,000
June	54,200	4,010	19,500	1,160,000
July	14,000	5,390	8,010	493,000
August	49,900	5,150	20,300	1,250,000
September	35,400	5,630	11,900	708,000
The year	91,500	1,510	10,100	7,300,000

SMOKY HILL RIVER NEAR MENTOR, KANS.

LOCATION.—In SE. ¼ sec. 18, T. 15 S., R. 2 W., at highway bridge 1½ miles east of Mentor, Saline County, and 26 miles above Saline River.

DRAINAGE AREA.—8,210 square miles. Measured on topographic map.

RECORDS AVAILABLE.—December 1, 1923, to September 30, 1927.

EQUIPMENT.—Chain gage on upstream side of bridge. Discharge measurements made from bridge or by wading.

CHANNEL AND CONTROL.—Bed composed of sand and silt; shifting. No well-defined control. Bank-full stage, 20 feet.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 25.8 feet August 17 (discharge, 7,450 second-feet); minimum discharge probably occurred during winter.

1923–1927: Maximum stage recorded, that of August 17, 1927; minimum, 1.2 feet several days in August, 1926 (discharge, 12 second-feet).

REGULATION.—Flow is slightly affected by operation of milldam upstream.

ACCURACY.—Stage-discharge relation permanent; affected by ice. Rating curves fairly well defined below 6,000 second-feet. Gage read to tenths once daily. Daily discharge ascertained by applying daily gage height to rating table. Records fair.

COOPERATION.—Gage-height record furnished by United States Weather Bureau.

Daily discharge, in second-feet, of Smoky Hill River near Mentor, Kans., for the year ending September 30, 1927

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	108	60	60		52	60	68	178	108	666	208	1,480
2	108	60	60		52	60	68	464	100	950	208	1,140
3	124	60	68		52	60	68	330	693	650	218	1,730
4	108	52	68		52	60	68	280	300	560	198	2,890
5	100	45	68		60	60	68	232	320	486	198	1,580
6	100	38	60		60	60	68	223	250	433	179	1,390
7	92	38	60		60	68	76	232	1,670	407	208	1,860
8	92	108	60	30	68	68	76	250	2,240	382	228	1,960
9	92	844	60		52	60	160	270	2,350	346	970	990
10	92	641	60		52	60	205	205	2,930	312	530	856
11	76	310	60		52	68	205	330	1,060	301	1,010	766
12	169	290	60		60	68	116	250	693	279	990	698
13	711	241	60		60	60	92	205	991	268	3,440	650
14	1,060	232			60	60	108	187	1,120	268	4,240	620
15	350	232			60	84	108	178	940	268	5,240	575
16	196	196	50		60	76	92	151	2,080	258	6,850	560
17	124	151			60	84	196	142	3,070	248	7,450	530
18	116	151			68	84	142	133	3,130	893	7,350	500
19	108	124			68	84	2,960	133	3,820	575	7,350	545
20	108	108			60	76	2,790	124	2,480	486	6,120	530
21	100	100			60	76	711	124	3,530	334	4,120	472
22	100	92			60	68	693	124	4,030	358	1,780	486
23	84	92	40		60	68	393	205	4,390	312	1,440	459
24	84	84		25	68	68	350	178	5,240	290	1,930	446
25	84	84			68	60	280	160	5,400	268	1,530	420
26	76	84			68	60	250	133	4,030	248	1,620	420
27	68	76			68	60	232	151	1,340	228	1,780	420
28	68	68	35		68	60	214	133	1,030	218	1,830	407
29	68	60			-------	60	241	142	912	208	3,500	486
30	60	60			-------	60	196	142	732	334	4,090	515
31	60	-------			-------	60	-------	124	-------	290	2,710	-------

NOTE.—Stage-discharge relation affected by ice Dec. 14 to Jan. 31; discharge estimated on basis of climatic data and observer's notes.

Monthly discharge of Smoky Hill River near Mentor, Kans., for the year ending September 30, 1927

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	1,060	60	158	9,720
November	844	38	159	9,460
December	68	----------	50.5	3,110
January	----------	----------	27.4	1,680
February	68	52	60.3	3,350
March	84	60	66.5	4,060
April	2,960	68	376	22,400
May	464	124	197	12,100
June	5,400	100	2,030	121,000
July	950	208	391	24,000
August	7,450	179	2,560	157,000
September	2,890	407	879	52,300
The year	7,450	----------	581	420,000

SMOKY HILL RIVER AT SOLOMON, KANS.

LOCATION.—In SE. ¼ sec. 19, T. 13 S., R. 1 E., at highway bridge one-fourth mile below mouth of Solomon River and 1 mile south of Solomon, Lincoln County.

DRAINAGE AREA.—18,700 square miles.

RECORDS AVAILABLE.—April to July, 1904, and October 24, 1922, to September 30, 1927.

EQUIPMENT.—Chain gage on upstream handrail of bridge. Discharge measurements made from bridge or by wading.

CHANNEL AND CONTROL.—Bed composed of sand and silt; shifting. No well defined control. Bank-full stage, 24 feet.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 26.8 feet August 21 (discharge, 13,700 second-feet); minimum, 3.1 feet January 13 (discharge, 172 second-feet).

1904, 1922–1927: Maximum stage recorded, 27.9 feet (old datum) July 10 and 11, 1904 (discharge not determined). On June 13, 1923, a stage of 25.96 feet was recorded with a discharge of 14,200 second-feet. Minimum discharge, 25 second-feet October 14, 1925.

The maximum stage during the flood of 1903 was determined by levels to be about 35.0 feet.

REGULATION.—Flow is affected by operation of mills and power plants upstream.

ACCURACY.—Stage-discharge relation not permanent; seriously affected by ice. Rating curves fairly well defined. Gage read to tenths once daily. Daily discharge ascertained by applying daily gage reading to rating tables. Records fair.

COOPERATION.—Gage-height record furnished by United States Weather Bureau.

Daily discharge, in second-feet, of Smoky Hill River at Solomon, Kans., for the year ending September 30, 1927

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	620	288	288	264	240	264	288	1,370	505	2,470	860	6,920
2	620	264	313	240	216	264	590	1,050	479	2,860	774	4,240
3	620	240	313	240	240	264	470	1,450	505	2,560	746	2,810
4	590	264	363	264	240	264	442	1,180	1,220	2,090	2,610	2,810
5	590	264	388	264	240	240	363	988	3,730	1,700	4,240	5,920
6	590	288	414	240	240	240	338	4,180	3,560	1,530	3,070	6,780
7	560	288	388	216	216	264	288	2,370	4,710	1,490	1,290	8,460
8	560	288	338	216	240	264	216	2,320	6,990	1,370	665	8,670
9	530	530	313	240	264	240	470	2,560	8,460	1,260	924	8,390
10	500	1,560	288	264	240	240	560	2,520	9,440	1,180	1,530	8,110
11	470	1,400	288	338	264	216	470	2,190	8,320	1,120	1,450	7,690
12	470	1,050	264	264	240	264	530	1,180	3,450	1,080	1,830	5,010
13	2,460	680	264	172	264	288	500	988	3,230	1,020	4,770	2,370
14	2,940	470	230		288	288	414	830	5,780	988	10,300	1,960
15	3,360	530	200		338	1,520	1,560	719	6,040	1,220	12,000	1,830
16	1,720	500	200		442	1,300	2,900	692	7,550	1,410	11,700	1,660
17	890	800	216	190	338	890	3,440	638	8,110	1,220	12,500	1,570
18	650	2,700	216		288	560	3,720	611	11,200	1,290	13,000	1,490
19	590	1,300	216		338	442	5,170	584	12,300	2,470	13,000	1,660
20	500	800	216		363	388	9,300	557	13,200	2,520	13,400	2,910
21	470	620	216		338	388	10,100	557	13,400	1,920	13,700	2,190
22	442	470			313	313	9,300	531	13,100	1,530	12,600	1,740
23	442	388			264	338	5,660	692	11,800	1,660	11,100	1,490
24	414	388			216	313	4,470	746	11,000	1,530	9,440	1,330
25	363	338	200	180	240	313	4,830	665	10,500	1,290	8,460	1,260
26	338	363			240	288	3,620	584	9,790	1,020	8,040	1,220
27	313	338			264	288	1,790	584	9,020	924	8,460	1,180
28	264	313	264		264	313	1,450	531	4,290	860	9,370	1,150
29	240	313	264	216	-------	288	1,260	505	2,960	860	10,900	1,150
30	288	288	288	216	-------	288	1,370	719	2,560	860	8,530	2,710
31	313	-------	264	216	-------	240	-------	611	-------	892	6,710	-------

NOTE.—Stage-discharge relation affected by ice Dec. 14–16, 19, 20, 22–27, and Jan. 14–28; discharge based on climatic data and observer's notes.

Monthly discharge of Smoky Hill River at Solomon, Kans., for the year ending September 30, 1927

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	3,360	240	765	47,000
November	2,700	240	611	36,400
December	414	----------	265	16,300
January	338	172	214	13,200
February	442	216	274	15,200
March	1,520	216	389	23,900
April	10,100	216	2,530	151,000
May	4,180	505	1,150	70,700
June	13,400	479	6,910	411,000
July	2,860	860	1,490	91,600
August	13,700	665	7,030	432,000
September	8,670	1,150	3,560	212,000
The year	13,700	172	2,100	1,520,000

SALINE RIVER AT TESCOTT, KANS.

LOCATION.—In SE. ¼ sec. 16, T. 12 S., R. 5 W., at highway bridge one-fourth mile below old dam half a mile south of Tescott, Ottawa County, half a mile above Dry Creek, and 4 miles below Table Rock Creek.

DRAINAGE AREA.—2,800 square miles.

RECORDS AVAILABLE.—September 3, 1919, to September 30, 1927.

EQUIPMENT.—Chain gage on downstream side of bridge. Discharge measurements made from bridge or by wading.

CHANNEL AND CONTROL.—Bed composed of sand and silt; shifting. No well-defined control. Bank-full stage, 25 feet.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 29.51 feet at 8.30 a. m. August 17 and 18; maximum discharge, 5,510 second-feet June 19 (stage, 28.04 feet); minimum stage, 2.29 feet at 8.10 a. m. October 26 (discharge, 10 second-feet).

1919–1927: Maximum stage and discharge recorded, same as given above; minimum discharge, 0.5 second-foot July 8, 1926.

REGULATION.—Flow is affected by operation of mills at Shady Bend and Lincoln.

ACCURACY.—Stage-discharge relation not permanent; seriously affected by ice, observations discontinued during winter. Standard rating curve fairly well defined. Gage read to hundredths twice daily. Daily discharge ascertained by applying mean daily gage height to rating table; shifting-control method used October 1 to June 4, August 16–20, and September 1–30. Records fair.

Daily discharge, in second-feet, of Saline River at Tescott, Kans., for the year ending September 30, 1927

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	45	22	97	38	63	69	63	90	133	369	84	604
2	45	50	84	42	78	90	78	97	104	314	97	604
3	22	52	78	84	66	78	58	84	90	301	157	930
4	29	78	81	58	63	84	48	97	453	355	90	1,440
5	45	78	84	-------	78	97	72	78	1,440	301	118	835
6	50	90	78	-------	97	72	84	525	2,070	247	118	745
7	55	104	104	-------	66	78	78	1,490	2,300	218	97	817
8	55	97	111	-------	60	84	66	1,870	2,040	200	97	2,250
9	33	97	118	-------	63	78	63	1,560	481	200	289	854
10	29	111	97	-------	72	78	60	247	182	191	495	355
11	33	125	-------	-------	78	84	78	104	125	182	425	341
12	301	118	-------	-------	66	72	84	157	621	165	655	66
13	1,280	97	-------	-------	72	200	84	133	655	165	2,720	227
14	165	90	-------	-------	69	314	78	90	1,530	157	4,700	218
15	97	173	-------	-------		182	165	78	2,280	157	5,300	200
16	111	555	-------	-------		97	763	90	2,890	173	5,300	209
17	45	173	-------	-------	62	118	1,180	104	4,430	209	5,460	397
18	40	118	-------	-------		111	1,650	90	5,460	227	5,460	525
19	35	118	-------	-------		63	854	97	5,480	314	4,820	495
20	33	118	-------	-------	55	78	1,110	90	5,200	247	3,470	182
21	31	84	-------	-------	63	78	1,010	97	4,640	182	1,920	209
22	29	84	-------	-------	60	63	425	72	2,780	157	1,240	173
23	25	84	-------	-------	72	84	209	78	2,070	149	1,400	165
24	27	90	-------	-------	72	149	191	97	2,410	104	1,400	165
25	10	104	-------	-------	66	78	165	97	930	125	1,090	218
26	10	97	-------	-------	72	72	157	111	745	125	1,050	218
27	40	90	-------	-------	52	97	157	191	570	118	990	149
28	13	84	-------	-------	69	141	149	289	510	111	1,140	133
29	14	84	-------	-------	-------	84	341	111	439	118	2,610	141
30	19	90	-------	60	-------	84	97	78	369	104	1,400	141
31	16	-------	50	72	-------	78	-------	118	-------	104	673	-------

NOTE.—Gage-height record missing Feb. 15–19; mean discharge estimated.

Monthly discharge of Saline River at Tescott, Kans., for the year ending September 30, 1927

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	1,280	10	89.7	5,520
November	555	22	112	6,660
December	118	-------	-------	-------
January	84	-------	-------	-------
February	97	52	67.2	3,730
March	314	63	101	6,210
April	1,650	48	321	19,100
May	1,870	72	275	16,900
June	5,480	90	1,780	106,000
July	369	104	196	12,100
August	5,460	84	1,770	109,000
September	2,250	66	467	27,800
The year	5,480	10	-------	-------

SOLOMON RIVER AT NILES, KANS.

LOCATION.—In NW. ¼ sec. 31, T. 12 S., R. 1 W., at highway bridge three-fourths mile west of Niles, Ottawa County, and 7 miles above mouth of river.

DRAINAGE AREA.—6,710 square miles.

RECORDS AVAILABLE.—May 6, 1897, to November 30, 1903, and May 15, 1919, to September 30, 1927. October 1, 1917, to June 23, 1919, records were collected near Bennington, Kans.

EQUIPMENT.—Chain gage on downstream handrail of bridge. Datum lowered 2 feet September 30, 1922. Discharge measurements made from bridge or by wading.

CHANNEL AND CONTROL.—Bed composed of sand and silt; shifting. Bank-full stage, 22 feet. Backwater occurs at this station when Smoky Hill River is at flood stage.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 27.05 feet at 7.30 a. m. June 20 (discharge, 9,860 second-feet); minimum, 3.25 feet at 4.10 p. m. January 19 (discharge, 72 second-feet).

1897–1903, 1919–1927: Maximum stage recorded, 33.8 feet (old datum), June 3, 1903 (discharge, 10,600 second-feet); minimum discharge, 1 second-foot September 4, 1926.

REGULATION.—Flow is affected by operation of power plants upstream.

ACCURACY.—Stage-discharge relation not permanent; affected by ice. Rating curves used are fairly well defined throughout. Gage read to hundredths twice daily. Daily discharge ascertained by applying mean daily gage height to rating table. Records good.

Daily discharge, in second-feet, of Solomon River at Niles, Kans., for the year ending September 30, 1927

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	260	173	200	164	164	155	510	760	220	810	243	1,250
2	260	147	147	164	164	147	308	735	294	710	243	835
3	291	182	190	164	164	155	351	573	268	551	510	735
4	275	220	155	164	173	155	220	510	1,730	490	1,870	1,520
5	245	243	147	111	125	147	182	3,640	3,680	453	3,500	3,500
6	231	255	173	155	155	155	173	2,430	3,540	453	1,220	3,820
7	260	282	210	132	173	164	85	1,490	4,130	417	551	4,280
8	205	308	155	155	118	155	351	890	4,880	400	383	1,980
9	205	641	191	164	125	147	351	664	5,700	367	400	5,030
10	169	417	173	164	91	182	210	551	5,760	351	551	5,540
11	128	336	164	147	173	85	191	453	1,460	336	367	4,680
12	1,430	231	200	173	139	147	210	417	1,800	322	1,700	1,430
13	4,180	155	125	182	118	182	281	383	2,550	322	5,600	835
14	2,120	220		125	308	735	810	336	2,010	308	6,480	687
15	1,100	243		125	336	1,840	2,430	336	5,080	573	3,950	595
16	400	336	130	120	417	735	4,280	322	6,090	530	5,280	530
17	294	2,670		115	281	383	4,880	294	7,760	595	5,760	510
18	281	1,870		111	164	281	5,870	294	8,740	1,250	4,880	510
19	281	735	118	75	231	182	7,640	294	9,690	1,590	4,130	2,150
20	268	435	125	104	191	231	8,480	281	9,760	1,220	4,680	1,430
21	308	322	164		155	164	8,350	453	8,740	735	4,080	687
22	294	231	200	90	147	191	4,380	417	4,930	710	1,800	490
23	268	220	139		118	191	3,540	383	2,430	890	1,800	435
24	220	182	164		80	173	4,530	336	1,870	785	4,330	383
25	220	200	132	80	155	173	4,180	308	1,560	471	5,130	383
26	200	182	191	90	164	155	1,980	351	1,190	351	5,600	351
27	125	191	182	100	164	200	1,220	294	950	308	6,040	367
28	147	191	118	104	155	173	1,010	268	810	322	6,480	351
29	220	200	85	147	-------	155	1,100	268	735	294	3,500	1,250
30	220	220	220	156	-------	80	1,100	231	664	281	1,280	2,350
31	220	-------	173	164	-------	191	-------	220	-------	268	1,560	-------

NOTE.—Stage-discharge relation affected by ice Dec. 14–18, Jan. 16, 17, 21–23, 26, and 27; discharge based on climatic data and observer's notes.

Monthly discharge of Solomon River at Niles, Kans., for the year ending September 30, 1927

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	4,180	125	494	30,400
November	2,670	147	407	24,200
December	220	85	158	9,720
January	182	75	130	7,990
February	417	80	177	9,830
March	1,840	80	265	16,300
April	8,480	85	2,310	137,000
May	3,640	220	619	38,100
June	9,760	220	3,630	216,000
July	1,590	268	563	34,600
August	6,480	243	3,030	186,000
September	5,540	351	1,630	97,000
The year	9,760	75	1,120	807,000

BIG BLUE RIVER AT RANDOLPH, KANS.

LOCATION.—In SW. ¼ sec. 12, T. 7 S., R. 6 E., at highway bridge half a mile above Fancy Creek, three-fourths mile east of Randolph, Riley County, and 15 miles below Black Vermilion River.

DRAINAGE AREA.—8,860 square miles.

RECORDS AVAILABLE.—April 17, 1918, to September 30, 1927.

EQUIPMENT.—Chain gage on upstream handrail of bridge. A vertical staff gage, from 6.0 to 30.9 feet, on right pier, and a vertical staff, from 29.0 to 33.5 feet, painted on concrete foundation for old oil tank on right bank 500 feet west of chain gage, are used during floods. Discharge measurements made from bridge or by wading.

CHANNEL AND CONTROL.—Bed composed of sand and gravel. No well-defined control. Bank-full stage, 20 feet.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 21.44 feet at 7.20 a. m. April 19 (discharge, 21,100 second-feet); minimum, 3.08 feet at 5 p. m. July 13 (discharge, 432 second-feet).

1918–1927: Maximum discharge recorded, 22,300 second-feet June 11, 1919; minimum, 175 second-feet at 7.40 a. m. August 9, 1926.

On May 31, 1903, a stage equivalent to 31.7 feet on the gage was observed by Mr. John Nord, Randolph, Kans.

REGULATION.—Low flow is affected slightly by operation of power plants upstream.

ACCURACY.—Stage-discharge relation permanent; affected by ice. Rating curve well defined between 300 and 10,000 second-feet. Gage read to hundredths twice daily. Daily discharge determined by applying mean daily gage height to rating table, or as explained in footnote to table of daily discharge. Records good.

Daily discharge, in second-feet, of Big Blue River at Randolph, Kans., for the year ending September 30, 1927

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1,000	572	720	1,060	800	1,180	4,130	5,980	1,240	830	1,060	1,570
2	3,630	620	775	1,060	720	1,060	5,980	2,710	1,440	775	1,990	1,310
3	6,800	572	670	940	775	940	1,990	1,920	6,320	720	1,850	1,310
4	4,660	572	670	775	775	885	1,990	1,500	8,840	670	1,240	1,500
5	2,540	549	620	830	620	775	2,140	1,440	3,530	620	940	1,380
6	1,240	526	620	830	775	775	1,780	1,380	1,640	620	3,340	2,620
7	940	526	620	830	885	775	1,500	1,570	1,710	670	12,900	7,400
8	885	504	775	885	720	720	1,440	1,380	1,710	670	15,100	15,100
9	3,250	549	620	940	700	670	2,210	1,380	1,310	620	17,900	10,200
10	11,400	620	720	830	650	670	5,870	1,240	1,240	549	5,320	3,430
11	5,320	620	620	720	600	670	3,070	1,180	1,120	482	3,530	2,800
12	1,500	670	620	720	620	572	2,370	1,120	1,180	526	12,300	2,140
13	1,120	620	600	700	620	720	4,130	1,240	5,870	461	15,800	1,780
14	1,120	2,370	500	650	620	720	12,400	1,570	4,880	720	16,300	1,640
15	940	9,800		600	720	670	14,600	1,380	2,710	1,180	17,100	1,440
16	1,000	6,560			885	830	11,800	1,180	2,210	940	6,440	1,310
17	885	3,530			830	775	7,520	1,120	6,680	3,250	8,360	1,180
18	885	2,060			1,440	775	9,080	1,000	4,130	2,540	11,400	830
19	885	1,780			1,240	775	19,900	940	1,920	1,240	6,440	1,180
20	885	1,440			1,000	720	14,200	1,120	2,210	1,850	3,160	1,060
21	775	1,180		500	830	720	6,560	1,000	2,210	885	2,450	1,000
22	670	1,060			775	670	5,320	775	2,620	1,710	2,140	940
23	670	1,000	500		885	670	4,030	775	2,140	1,990	2,620	940
24	670	1,000			775	670	3,250	1,500	1,570	1,240	8,600	775
25	720	885			1,060	670	2,800	1,850	1,240	1,440	4,440	830
26	720	885			1,380	670	2,450	1,180	1,060	1,570	3,070	885
27	670	775			1,380	620	2,210	775	1,120	940	3,070	885
28	670	775			1,380	670	2,060	720	1,000	830	5,870	1,000
29	670	885		400	-------	620	1,990	720	940	775	2,890	1,310
30	620	670			-------	620	10,800	720	1,240	775	1,850	1,180
31	572	-------			-------	720	---------	775	-------	1,120	1,640	-------

NOTE.—Stage-discharge relation affected by ice Dec. 13–31, Jan. 12–31, and Feb. 9–11; discharge based on climatic data and observer's notes.

Monthly discharge of Big Blue River at Randolph, Kans., for the year ending September 30, 1927

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	11,400	572	1,880	116,000
November	9,800	504	1,470	87,500
December	775	----------	586	36,000
January	1,060	----------	638	39,200
February	1,440	600	873	48,500
March	1,180	572	742	45,600
April	19,900	1,440	5,650	336,000
May	5,980	720	1,390	85,500
June	8,840	940	2,570	153,000
July	3,250	461	1,070	65,800
August	17,900	940	6,490	399,000
September	15,100	775	2,360	140,000
The year	19,900	----------	2,140	1,550,000

DELAWARE RIVER AT VALLEY FALLS, KANS.

LOCATION.—In SW. ¼ sec. 18, T. 8 S., R. 18 E., at highway bridge 300 feet above Atchison, Topeka & Santa Fe Railway bridge, 500 feet below Walnut Creek, a quarter of a mile north of Valley Falls, Jefferson County, and 1 mile below Cedar Creek.

DRAINAGE AREA.—922 square miles.

RECORDS AVAILABLE.—June 16, 1922, to September 30, 1927.

EQUIPMENT.—Chain gage on upstream side of highway bridge. Discharge measurements made from highway bridge or by wading.

CHANNEL AND CONTROL.—Bed composed of silt and rock. Low-water control is a rock riffle 200 feet below gage at site of old masonry dam; practically permanent. Bank-full stage, 22 feet.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 21.20 feet at 6 p. m. April 19 (discharge, 12,900 second-feet); minimum, 1.75 feet at 6 p. m. July 30 (discharge, 28 second-feet).

1922–1927: Maximum stage recorded, 29.72 feet at midnight June 16, 1925 (discharge, from extension of rating curve, 30,000 second-feet); minimum discharge, 1.3 second-feet October 28, 1922.

REGULATION.—None.

ACCURACY.—Stage-discharge relation permanent; slightly affected by ice. Rating curve fairly well defined below 10,000 second-feet. Gage read to hundredths twice daily. Daily discharge ascertained by applying mean daily gage height to rating table. Records fair.

Daily discharge, in second-feet, of Delaware River at Valley Falls, Kans., for the year ending September 30, 1927

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	35	69	93		148	71	7,480	660	118	148	29	36
2	600	68	90		161	71	2,010	600	116	122	60	29
3	6,350	66	93		148	85	750	510	660	108	750	29
4	9,220	66	90		161	96	720	390	4,160	90	161	40
5	6,180	69	93	50	273	108	630	420	1,090	77	58	36
6	450	66	93		360	116	660	750	420	69	480	2,860
7	316	69	102		203	130	1,120	960	346	189	1,060	6,180
8	203	72	104		128	96	4,430	750	316	76	540	7,210
9	2,430	189	104		70	88	6,520	570	288	60	245	992
10	4,030	189	100	53	60	89	2,940	510	259	44	175	450
11	1,280	175	100		78	600	1,740	390	203	43	161	346
12	900	175	80		80	2,010	1,310	360	1,810	42	1,250	288
13	510	175	60		93	960	1,350	540	2,720	331	1,480	203
14	331	161	42		189	450	1,930	660	1,630	316	870	136
15	259	136	38	50	217	360	9,460	510	630	302	390	78
16	217	134	35		189	259	6,010	360	450	259	288	259
17	175	136			161	217	1,180	331	2,770	231	148	100
18	148	136			102	217	930	288	2,640	273	96	92
19	217	128			175	203	12,600	245	750	148	74	92
20	136	118			175	217	5,600	245	1,520	118	56	81
21	116	114	40		175	217	1,350	231	840	114	40	64
22	108	110			161	231	992	331	660	102	40	57
23	102	112			148	217	720	510	480	93	1,480	58
24	86	110			130	203	660	480	390	86	750	64
25	90	102		60	100	161	720	316	346	69	259	136
26	88	98			90	122	720	390	302	54	148	840
27	85	98			81	114	690	288	273	46	175	720
28	82	96	45		74	106	720	217	245	34	870	390
29	78	93			-------	102	660	175	245	30	331	273
30	71	93		118	-------	114	1,060	148	203	28	116	161
31	70	-------		136	-------	1,890	-------	122	-------	29	63	------

NOTE.—Stage-discharge relation affected by ice Dec. 17 to Jan. 9 and Jan. 11–29; discharge based on climatic data and gage-height record.

Monthly discharge of Delaware River at Valley Falls, Kans., for the year ending September 30, 1927

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	9,220	35	1,130	69,500
November	189	66	114	6,780
December	104		62.8	3,860
January	136		58.0	3,570
February	360	60	148	8,220
March	2,010	71	320	19,700
April	12,600	630	2,590	154,000
May	960	122	428	26,300
June	4,160	116	896	53,300
July	331	28	120	7,380
August	1,480	29	408	25,100
September	7,210	29	743	44,200
The year	12,600		583	422,000

GRAND RIVER BASIN

GRAND RIVER NEAR GALLATIN, MO.

LOCATION.—In NW. ¼ sec. 16, T. 59 N., R. 27 W., at highway bridge 1,000 feet above Chicago, Rock Island & Pacific Railway bridge and 2 miles northeast of Gallatin, Daviess County.

DRAINAGE AREA.—2,250 square miles (measured on base maps of Missouri and Iowa).

RECORDS AVAILABLE.—June 30, 1921, to September 30, 1927.

EQUIPMENT.—Chain gage on downstream side of bridge. Discharge measurements made from bridge or by wading.

CHANNEL AND CONTROL.—Bed composed of gravel, sand, and silt. Banks are overflowed at stage of 28 feet. No well-defined control.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 33.90 feet at 5 p. m. October 5 (discharge, 37,100 second-feet); minimum, 2.64 feet September 15 (discharge, 35 second-feet).

1921–1927: Maximum stage recorded, 36.80 feet at 5 p. m. September 17, 1926 (discharge, 53,200 second-feet); minimum, 1.55 feet while river was dammed upstream May 15, 1924 (discharge, determined from extension of rating curve, 10 second-feet).

The United States Weather Bureau has published a maximum stage of 39.3 feet for the flood of July, 1909 (discharge, from extension of present rating curve, 70,000 second-feet).

DIVERSIONS AND REGULATION.—None.

ACCURACY.—Stage-discharge relation changed several times during year; affected by ice during winter. Standard rating curve fairly well defined. Four discharge measurements, covering a range from 60 to 284 second-feet, were made during the current year. Gage read to hundredths twice daily. Daily discharge ascertained by shifting-control method. Records good except for periods of ice effect, which are poor.

Daily discharge, in second-feet, of Grand River near Gallatin, Mo., for the year ending September 30, 1927

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	3,790	448	397	174	244	244	7,300	4,720	235	144	82	76
2	7,580	397	360	190	305	208	15,400	3,620	217	131	124	71
3	19,000	373	373	226	397	217	14,300	1,470	2,020	124	448	82
4	29,600	373	350	226	475	208	6,040	1,430	17,600	112	226	68
5	36,160	373	422	254	2,770	226	2,270	936	8,220	106	106	64
6	36,600	373	373	264	4,480	448	1,470	808	1,640	100	76	88
7	10,600	373	284	284	2,220	1,130	1,160	776	1,000	166	66	88
8	2,820	422	422	284	1,230	1,030	1,920	870	620	397	88	88
9	6,100	422	650	264	776	744	4,480	1,310	503	244	531	76
10	13,700	422	531	226	680	560	9,820	1,230	422	138	174	88
11	11,300	397	397	199	284	448	9,500	1,030	327	109	76	69
12	4,600	397	397	174	208	1,130	7,720	650	904	82	59	60
13	3,350	264	373	158	305	2,670	11,100	531	4,180	94	968	55
14	2,120	373	350	131	475	1,640	9,500	475	3,960	118	1,200	61
15	1,820	531	350	118	448	1,060	11,600	422	1,640	131	422	35
16	1,430	650	327	118	503	808	14,200	350	870	138	151	44
17	1,200	590	305	106	968	590	7,860	305	1,160	166	317	48
18	1,060	560	284	106	904	531	4,360	284	1,820	182	712	327
19	968	448	264	106	650	448	15,200	305	744	124	327	144
20	870	397	226	106	373	475	23,800	305	590	100	151	106
21	808	226	226	106	422	1,310	25,800	284	1,230	76	112	82
22	744	226	208	106	448	968	13,000	284	870	327	76	52
23	712	284	190	106	475	808	4,480	284	560	151	190	60
24	712	284	190	106	397	620	2,420	680	397	71	776	55
25	870	373	190	106	350	531	1,870	4,180	284	106	254	56
26	744	475	174	106	327	475	1,550	1,030	217	264	124	71
27	680	475	174	106	305	373	1,350	475	208	254	82	94
28	650	397	158	106	264	305	1,230	373	182	94	82	208
29	590	373	158	118	------	305	1,390	264	166	100	58	166
30	531	397	158	131	------	284	5,080	217	151	82	63	100
31	503	------	174	144	------	284	------	235	------	69	51	------

NOTE.—Stage-discharge relation affected by ice Dec. 13–31, Jan. 1, 12–31, Feb. 1 and 2; daily discharge estimated from gage heights, observer's notes, and weather records.

Monthly discharge of Grand River near Gallatin, Mo., for the year ending September 30, 1927

[Drainage area, 2,250 square miles]

Month	Discharge in second-feet				Run-off in inches
	Maximum	Minimum	Mean	Per square mile	
October	36,600	503	6,520	2.90	3.34
November	650	226	403	.179	.20
December	650	158	304	.135	.16
January	284	106	160	.071	.08
February	4,480	208	774	.344	.36
March	2,670	208	680	.302	.35
April	25,800	1,160	7,910	3.52	3.93
May	4,720	217	972	.432	.50
June	17,600	151	1,760	.782	.87
July	397	69	145	.064	.07
August	1,200	51	260	.116	.13
September	327	35	89.4	.040	.04
The year	36,600	35	1,660	.738	10.03

GRAND RIVER NEAR SUMNER, MO.

LOCATION.—In NE. ¼ sec. 29, T. 56 N., R. 21 W., at highway bridge 80 feet below Chicago, Burlington & Quincy Railroad bridge, 2 miles southwest of Sumner, Chariton County, and 2½ miles below Locust Creek.

DRAINAGE AREA.—6,880 square miles (measured on base maps of Missouri and Iowa).

RECORDS AVAILABLE.—April 19, 1924, to September 30, 1927.

EQUIPMENT.—Chain gage on highway bridge. Zero of gage is 630.77 feet above mean sea level. Discharge measurements made from highway or railroad bridge.

CHANNEL AND CONTROL.—Bed composed of sand and mud; fairly permanent. Right bank high; left bank is overflowed at stage of 26 feet. No well-defined control.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 30.80 feet at 6 p. m. April 22 (discharge, 47,800 second-feet); minimum, 3.40 feet September 17–19, 25, and 26 (discharge, 240 second-feet).

1924–1927: Maximum stage recorded, 32.42 feet September 21, 1926 (discharge, 56,400 second-feet); minimum discharge, 170 second-feet January 10–19, 1925.

On July 9, river reached a stage of 36.7 feet, determined by levels to floodmarks (discharge, about 150,000 second-feet).

DIVERSIONS AND REGULATION.—None.

ACCURACY.—Stage-discharge relation permanent during year except as affected by ice. Rating curve well defined above and fairly well defined below 1,400 second-feet by 13 discharge measurements, 3 of which, between 386 and 1,740 second-feet, were made during the year. Gage read to hundredths once daily during low stages and twice daily during high stages. Daily discharge ascertained by applying mean daily gage height to rating table. Records good except those for periods of ice effect, which are poor.

Daily discharge, in second-feet, of Grand River near Sumner, Mo., for the year ending September 30, 1927

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	12,400	1,450	1,560	810	4,130	1,500	6,690	9,540	1,070	890	1,120	360
2	19,800	1,340	1,450	810	3,300	1,180	22,300	11,100	1,020	810	690	345
3	26,200	1,280	1,280	810	2,670	1,020	29,200	8,900	2,140	770	770	330
4	30,400	1,180	1,180	810	2,400	975	31,800	5,930	13,200	730	1,180	315
5	34,300	1,180	1,120	850	2,810	1,020	32,300	4,660	26,200	730	1,180	300
6	39,100	1,180	1,070	890	7,560	1,180	23,300	3,230	32,300	690	770	330
7	44,400	1,180	1,180	890	12,700	1,120	11,000	2,740	29,600	690	570	300
8	45,200	1,180	4,730	890	9,440	4,130	6,010	3,230	16,000	650	535	610
9	42,900	1,180	6,690	890	4,360	4,280	6,520	4,130	8,820	650	500	430
10	36,800	1,180	4,810	810	2,810	3,020	15,400	5,370	3,020	890	610	395
11	33,800	1,230	3,230	810	1,740	2,200	22,300	4,360	2,000	730	890	345
12	31,300	1,180	2,950	770	1,340	5,290	25,000	3,680	2,200	650	650	330
13	25,300	1,070	3,460	690	1,340	7,460	26,200	2,530	3,530	650	610	300
14	14,900	1,120	2,810	650	1,680	9,540	27,200	2,140	11,900	650	1,230	285
15	8,100	1,400	1,400	650	2,000	6,440	29,200	1,880	12,600	690	1,740	255
16	5,370	1,740	1,280	610	2,070	3,900	30,800	1,740	6,860	650	1,500	255
17	4,130	2,070	1,340	570	2,810	2,670	32,300	1,560	3,160	770	770	240
18	3,460	1,880	1,450	535	6,600	2,140	32,800	1,450	5,210	1,120	690	240
19	2,950	1,620	1,560	535	5,690	1,810	33,800	1,400	5,690	850	770	240
20	2,740	1,400	1,810	500	3,830	3,900	38,500	1,340	3,230	730	1,120	378
21	2,530	1,120	1,500	500	2,810	5,690	43,600	1,400	2,400	610	690	345
22	2,260	930	1,120	500	2,000	7,120	47,800	1,280	4,430	570	535	285
23	2,140	890	1,070	500	1,940	4,360	46,000	1,280	5,930	690	500	270
24	2,000	975	975	500	1,880	3,300	37,300	1,280	3,380	890	465	255
25	2,140	1,020	930	500	1,680	2,530	27,200	1,500	1,880	690	1,280	240
26	2,140	1,940	890	500	1,450	2,140	14,900	7,120	1,450	570	1,450	240
27	2,140	3,380	890	500	1,400	1,880	8,720	3,980	1,230	850	730	285
28	1,880	4,060	850	500	1,450	1,620	5,050	2,000	1,070	690	535	270
29	1,740	3,530	850	535	-------	1,450	4,360	1,400	975	650	430	300
30	1,680	2,330	810	1,400	-------	1,280	5,210	1,230	930	1,180	395	730
31	1,560	-------	810	3,090	-------	1,230	--------	1,120	--------	2,600	378	------

NOTE.—Stage-discharge relation affected by ice Dec. 16–19, 25–31, and Jan. 12–29; daily discharge estimated from daily gage heights, observer's notes, and weather records.

Monthly discharge of Grand River near Sumner, Mo., for the year ending September 30, 1927

[Drainage area, 6,880 square miles]

Month	Discharge in second-feet				Run-off in inches
	Maximum	Minimum	Mean	Per square mile	
October	45,200	1,560	15,700	2.28	2.63
November	4,060	890	1,570	.228	.25
December	6,690	810	1,840	.267	.31
January	3,090	500	768	.112	.13
February	12,700	1,340	3,420	.497	.52
March	9,540	975	3,140	.456	.53
April	47,800	4,360	24,100	3.50	3.90
May	11,100	1,120	3,370	.490	.56
June	32,300	930	7,110	1.03	1.15
July	2,600	570	806	.117	.13
August	1,740	378	816	.119	.14
September	730	240	327	.048	.05
The year	47,800	240	5,230	.760	10.30

MEDICINE CREEK NEAR GALT, MO.

LOCATION.—In NW. ¼ sec. 34, T. 62 N., R. 22 W., at Quincy, Omaha & Kansas City Railroad bridge 1 mile above West Medicine Creek and 1½ miles east of Galt, Grundy County.

DRAINAGE AREA.—225 square miles (measured on United States soil-survey maps).

RECORDS AVAILABLE.—July 6, 1921, to September 30, 1927.

EQUIPMENT.—Chain gage on upstream side of bridge. Gage datum lowered 3.00 feet October 1, 1926. Discharge measurements made from highway bridge 1,000 feet below gage or by wading.

CHANNEL AND CONTROL.—Bed composed of silt and sand; shifting. Banks are overflowed at stage of 16 feet. Channel was straightened during 1923 by means of a small dredged ditch, which is now rapidly becoming larger through erosion. No well-defined control.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 14.60 feet at 8 a. m. April 19 (discharge, 3,720 second-feet); minimum discharge, 2 second-feet September 15–17 and 24–27.

1921–1927: Maximum stage recorded, 19.0 feet (new datum) September 17, 1926 (discharge, 4,640 second-feet); minimum discharge, less than 1 second-foot August 22 and 29, 1922.

DIVERSIONS AND REGULATION.—None.

ACCURACY.—Stage-discharge relation changed during high water April 1; seriously affected by ice during winter. Rating curve used October 1 to March 31 fairly well defined above 100 second-feet by five discharge measurements, one of which was made during the period. Curve used April 1 to September 30 fairly well defined throughout and checked by two discharge measurements during the period. Gage read to hundredths once daily except some Sundays. Daily discharge ascertained by applying daily gage height to rating table. Records fair except those for period of ice effect, which are poor.

Daily discharge, in second-feet, of Medicine Creek near Galt, Mo., for the year ending September 30, 1927

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1,200	57	109	25	25	57	2,120	250	107	13	13	6
2	1,510	54	a 106	25	37	57	2,120	64	330	13	11	5
3	1,780	46	a 103	25	57	57	670	76	960	12	10	6
4	2,420	46	a 100	37	345	60	330	46	2,670	12	9	6
5	a 2,000	50	a 96	37	276	60	202	43	1,580	11	8	5
6	264	54	93	37	610	64	122	39	166	11	9	4
7	240	a 56	109	31	157	330	122	38	84	11	9	4
8	157	57	133	31	125	166	117	39	76	11	10	5
9	675	50	175	25	78	133	148	56	76	27	9	4
10	a 850	50	101	25	68	97	154	56	76	22	8	4
11	264	46	117	25	64	101	202	52	76	18	6	4
12	175	46	a 117	20	64	435	137	34	670	15	5	4
13	175	50	117	15	54	300	316	29	620	13	7	3
14	125	a 60	109	15	57	157	376	22	500	13	6	3
15	117	71	101	11	35	97	1,220	22	122	12	5	2
16	101	78	85	7	109	85	1,260	22	52	11	6	2
17	a 97	78	71	7	141	71	440	23	60	13	8	2
18	93	82	57	7	101	74	178	19	68	13	9	3
19	74	71	50	7	54	101	3,720	15	76	11	8	3
20	71	54	43	7	74	420	2,340	17	72	10	7	3
21	78	a 54	43	7	71	570	2,280	18	274	9	8	3
22	68	54	37	7	57	228	540	a 19	440	12	9	3
23	68	54	37	7	54	101	166	20	302	13	12	3
24	a 68	57	37	7	50	89	122	36	154	13	46	2
25	68	57	31	7	57	50	92	122	52	13	30	2
26	71	101	31	7	64	37	80	88	24	12	17	2
27	68	390	31	7	64	42	68	68	21	11	9	2
28	68	a 454	25	7	54	43	68	60	18	12	a 8	3
29	64	117	25	11	-------	43	72	127	16	68	a 6	4
30	64	109	25	15	-------	46	360	102	a 14	29	5	5
31	a 60	-------	25	20	-------	50	-------	99	-------	18	6	-------

a Gage not read; discharge estimated.

NOTE.—Stage-discharge relation seriously affected by ice Dec. 17 to Feb. 3; daily discharge estimated from fragmentary gage heights, observer's notes, weather records, one discharge measurement, and discharge of Locust Creek near Milan.

Monthly discharge of Medicine Creek near Galt, Mo., for the year ending September 30, 1927

[Drainage area, 225 square miles]

Month	Discharge in second-feet				Run-off in inches
	Maximum	Minimum	Mean	Per square mile	
October	2,420	60	424	1.88	2.17
November	454	46	86.8	.386	.43
December	175	25	75.5	.336	.39
January	37	7	16.8	.075	.09
February	610	25	107	.476	.50
March	570	37	136	.604	.70
April	3,720	68	671	2.98	3.32
May	250	15	55.5	.247	.28
June	2,670	14	325	1.44	1.61
July	68	9	15.5	.069	.08
August	46	5	10.3	.046	.05
September	6	2	3.57	.016	.02
The year	3,720	2	160	.711	9.64

LOCUST CREEK NEAR MILAN, MO.

LOCATION.—In SW. ¼ sec. 8, T. 62 N., R. 20 W., at Booth's bridge on State highway No. 6, 3½ miles southwest of Milan, Sullivan County, and 14 miles above East Locust Creek.

DRAINAGE AREA.—225 square miles (measured on United States soil-survey maps).

RECORDS AVAILABLE.—July 2, 1921, to September 30, 1927.

EQUIPMENT.—Chain gage bolted to upstream handrail of bridge. Discharge measurements made from bridge or by wading.

CHANNEL AND CONTROL.—Bed composed of sand and gravel. Banks are overflowed at stage of 18 feet. Low-water control is gravel bar 75 feet below gage; subject to occasional changes.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 16.60 feet October 5 (discharge, 2,770 second-feet); minimum, 1.60 feet September 1–7 and 20–23 (discharge, 1 second-foot).

1921–1927: Maximum stage recorded, 18.10 feet September 16 and 17, 1926 (discharge, 3,260 second-feet); minimum discharge, 0.8 second-foot October 1, 1922.

DIVERSIONS AND REGULATION.—None.

ACCURACY.—Stage-discharge relation changed during high water June 5; affected by ice during winter. Rating curve well defined between 10 and 2,800 second-feet and fairly well defined beyond these limits by seven discharge measurements, four of which were made during the year. Gage read to hundredths once daily during low stages and twice daily during high stages. Daily discharge until June 5 ascertained by applying mean daily gage height to rating table; shifting-control method used after that date based on discharge measurement made August 30. Records fair except those for periods of ice effect, which are poor.

Daily discharge, in second-feet, of Locust Creek near Milan, Mo., for the year ending September 30, 1927

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1,100	32	60	18	37	40	1,250	806	22	9	6	1
2	1,780	30	54	18	66	40	2,170	806	22	9	5	1
3	1,940	20	51	20	80	40	2,530	332	332	7	5	1
4	2,620	20	40	29	94	45	532	160	2,008	7	4	1
5	2,770	20	40	28	380	51	290	101	2,290	6	2	1
6	1,530	20	40	26	1,300	115	168	87	1,350	5	2	1
7	332	20	42	24	380	448	152	84	192	5	2	1
8	160	20	420	22	168	310	152	136	115	5	2	7
9	532	20	392	22	129	152	152	168	70	5	2	13
10	806	18	168	20	108	152	152	129	70	5	2	7
11	434	18	136	19	63	226	152	87	54	5	2	3
12	184	18	129	18	63	726	192	66	280	5	2	2
13	271	18	122	14	57	1,130	518	48	894	5	2	2
14	208	19	87	10	42	184	596	37	960	6	2	2
15	144	20	66	7	40	144	1,350	32	208	5	2	2
16	115	26	54	5	184	94	2,000	28	129	5	2	2
17	84	22	48	5	226	87	1,450	24	87	5	2	2
18	73	21	48	5	136	63	916	24	76	3	2	2
19	60	18	42	5	76	63	2,500	21	57	3	2	2
20	60	16	42	5	63	184	2,530	20	60	3	2	1
21	57	14	42	5	45	356	2,620	20	108	3	2	1
22	54	14	37	5	48	226	984	20	63	4	2	1
23	54	13	37	5	57	144	356	20	54	3	5	1
24	51	12	37	5	57	144	300	160	42	2	5	2
25	42	12	32	5	60	66	217	144	29	2	4	2
26	40	290	32	5	60	40	176	356	19	2	2	2
27	40	686	32	5	57	40	168	76	15	2	2	3
28	37	332	27	7	40	45	168	45	15	2	2	3
29	34	129	27	10	-------	45	168	48	11	4	2	3
30	32	94	22	14	-------	42	726	51	11	6	2	5
31	32	-------	18	18	-------	45	-------	34	-------	6	2	-------

NOTE.—Stage-discharge relation affected by ice Dec. 14–31, Jan 1, 2, 13–31, and Feb. 1–4; daily discharge ascertained by applying to rating table daily gage heights corrected for ice effect by means of one discharge measurement, observer's notes, and weather records.

Monthly discharge of Locust Creek near Milan, Mo., for the year ending September 30, 1927

[Drainage area, 225 square miles]

Month	Discharge in second-feet				Run-off in inches
	Maximum	Minimum	Mean	Per square mile	
October	2,770	32	506	2.25	2.59
November	686	12	67.1	.298	.33
December	420	18	78.2	.348	.40
January	29	5	13.0	.058	.07
February	1,300	37	147	.653	.68
March	1,130	40	177	.787	.91
April	2,620	152	854	3.80	4.24
May	806	20	135	.600	.69
June	2,290	11	321	1.43	1.60
July	9	2	4.65	.021	.02
August	6	2	2.65	.012	.01
September	13	1	2.57	.011	.01
The year	2,770	1	191	.849	11.55

CHARITON RIVER BASIN

CHARITON RIVER AT ELMER, MO.

LOCATION.—In SW. ¼ SW. ¼ sec. 2, T. 59 N., R. 16 W., at Atchison, Topeka & Santa Fe Railway bridge three-fourths mile southwest of Elmer, Macon County, and 1 mile below Walnut Creek.

DRAINAGE AREA.—1,660 square miles (measured on base maps of Missouri and Iowa).

RECORDS AVAILABLE.—July 7, 1921, to September 30, 1927.

EQUIPMENT.—Chain gage on bridge; elevation of zero, 687.85 feet above mean sea level. Gage datum lowered 3.00 feet October 1, 1926. Discharge measurements made from bridge or by wading.

CHANNEL AND CONTROL.—Bed composed of sand and mud; shifting. Banks overflowed at stage of 25 feet. Channel was straightened during 1922–23 by means of small dredged ditches about 1½ miles below gage and just above gage. Channel is now becoming larger through erosion. No well-defined control.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 26.10 feet at 4 p. m. April 21 (discharge, 21,800 second-feet); minimum, 2.81 feet September 26 (discharge, 14 second-feet).

1921–1927: Maximum stage recorded, 27.56 feet (new datum) September 21, 1926; maximum discharge, that of April 21, 1927; minimum discharge, that of September 26, 1927.

DIVERSIONS AND REGULATION.—None.

ACCURACY.—Stage-discharge relation changed considerably during year; affected by ice during winter. Rating curve well defined between 40 and 12,000 second-feet by eight discharge measurements; extended beyond these limits. Gage read to hundredths once daily. Daily discharge ascertained by shifting-control method based on five discharge measurements made during year. Records fair except those for periods of ice effect, which are poor.

Daily discharge, in second-feet, of Chariton River at Elmer, Mo., for the year ending September 30, 1927

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	6,500	223	1,220	191	446	694	5,630	2,420	257	240	176	29
2	7,060	214	758	191	634	606	6,700	2,700	223	206	223	26
3	9,700	191	694	198	662	420	6,400	2,990	3,050	206	119	23
4	11,800	191	634	191	606	394	6,100	3,110	9,220	198	77	21
5	11,800	184	578	223	940	331	5,270	3,230	7,300	184	63	23
6	11,500	176	472	223	3,050	420	4,350	3,480	6,300	176	55	32
7	10,000	176	578	214	3,620	1,180	3,900	2,700	5,540	168	58	84
8	7,920	176	2,200	206	3,550	1,990	4,270	1,400	5,090	191	58	56
9	6,300	350	2,100	198	3,480	1,790	4,270	2,810	3,900	214	60	42
10	6,600	293	1,350	206	3,230	1,400	2,420	3,050	3,110	176	60	25
11	6,400	214	1,020	206	3,050	1,140	1,990	2,150	2,590	140	66	42
12	6,300	198	1,140	198	2,870	2,370	1,940	1,020	2,100	133	69	36
13	5,090	184	1,100	191	1,260	4,750	5,450	860	5,090	119	69	33
14	3,350	694	1,060	161	662	4,110	5,900	694	5,270	112	58	30
15	2,100	1,540	1,020	147	606	3,690	7,180	524	5,000	112	55	25
16	1,990	940	980	147	524	3,110	7,300	394	4,270	105	58	20
17	1,020	578	940	133	498	2,100	6,700	331	3,690	119	53	17
18	860	578	860	133	1,440	1,300	6,000	312	2,370	112	50	16
19	694	524	758	133	860	758	13,300	293	1,840	105	50	16
20	498	472	662	119	634	1,990	16,000	257	1,300	98	48	17
21	446	372	578	119	606	2,590	21,600	240	1,300	91	37	16
22	394	274	472	105	606	2,760	19,200	223	1,220	91	40	15
23	331	257	420	105	550	2,590	14,200	214	1,140	91	394	15
24	312	257	331	105	524	1,840	10,300	524	1,060	91	168	15
25	293	257	312	91	472	1,260	9,220	2,150	1,140	91	91	16
26	293	1,100	274	91	472	860	9,060	2,420	900	91	69	14
27	274	940	257	77	524	758	7,920	2,540	726	77	45	17
28	257	1,140	223	77	606	634	6,400	1,490	550	91	40	16
29	240	1,740	206	91	-------	550	3,350	634	331	91	34	26
30	240	1,790	206	133	-------	498	1,690	394	223	91	37	940
31	223	-------	191	240	-------	420	--------	312	-------	133	33	------

NOTE.—Stage-discharge relation affected by ice Dec. 13-20, 25-31, Jan. 1, 2, 14-31, Feb. 1 and 2; daily discharge estimated from daily gage heights, observer's notes, and weather records.

Monthly discharge of Chariton River at Elmer, Mo., for the year ending September 30, 1927

[Drainage area, 1,660 square miles]

Month	Discharge in second-feet				Run-off in inches
	Maximum	Minimum	Mean	Per square mile	
October	11,800	223	3,900	2.35	2.71
November	1,790	176	541	.326	.36
December	2,200	191	761	.458	.53
January	240	77	156	.094	.11
February	3,620	446	1,320	.795	.83
March	4,750	331	1,590	.958	1.10
April	21,600	1,690	7,470	4.50	5.02
May	3,480	214	1,480	.892	1.03
June	9,220	223	2,870	1.73	1.93
July	240	77	134	.081	.09
August	394	33	81.1	.049	.06
September	940	14	56.8	.034	.04
The year	21,600	14	1,690	1.02	13.81

LAMINE RIVER BASIN.

LAMINE RIVER AT CLIFTON CITY, MO.

LOCATION.—In NW. ¼ sec. 16, T. 46 N., R. 19 W., at highway bridge 300 feet above Missouri, Kansas & Texas Railway bridge, three-fourths mile east of Clifton City, Cooper County, and 2 miles below Honey Creek.

DRAINAGE AREA.—598 square miles (measured on topographic maps).

RECORDS AVAILABLE.—June 21, 1922, to September 30, 1927.

EQUIPMENT.—Chain gage on highway bridge. Zero of gage is 622.60 feet above mean sea level. Discharge measurements made from highway or railway bridge or by wading.

CHANNEL AND CONTROL.—Bed composed of coarse gravel. Left bank high; right bank overflowed at stage of 15 feet. Control is a coarse gravel bar 200 feet below gage; practically permanent.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 27.85 feet at 1.15 p. m. April 1 (discharge, 25,000 second-feet); minimum, 1.40 feet September 23 and 24 (discharge, 4 second-feet).

1922–1927: Maximum stage recorded, that of April 1, 1927; minimum discharge, 1 second-foot September 27, 1924.

The flood of September 18, 1905, reached stage of 35.3 feet, determined from levels to high-water mark.

DIVERSIONS AND REGULATION.—None.

ACCURACY.—Stage-discharge relation permanent during year; not affected by ice. Rating curve well defined above and fairly well defined below 10 second-feet by 24 discharge measurements, 6 of which, between 24 and 10,500 second-feet, were made during the year. Gage read to hundredths once daily during low stages and twice daily during high stages. Daily discharge ascertained by applying mean daily gage height to rating table. Records good.

Daily discharge, in second-feet, of Lamine River at Clifton City, Mo., for the year ending September 30, 1927

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	3,600	157	242	152	1,000	95	23,200	173	2,290	41	152	11
2	1,760	142	198	152	1,040	95	10,600	157	1,440	36	86	10
3	5,190	127	179	152	1,000	90	1,360	168	3,420	33	66	9
4	6,340	122	147	152	1,120	90	880	142	2,020	27	44	9
5	9,520	113	142	152	720	104	615	242	580	25	33	9
6	1,480	104	147	147	720	113	510	5,240	388	23	29	9
7	650	99	1,640	142	440	2,200	440	3,700	288	23	23	47
8	475	108	4,190	132	371	3,240	3,500	10,700	1,440	22	25	36
9	3,840	1,680	1,280	122	320	580	5,340	8,100	475	19	58	32
10	6,520	960	960	99	288	405	5,140	6,340	242	17	47	25
11	6,340	440	720	95	257	405	4,590	1,040	184	16	41	19
12	1,160	337	545	90	288	1,000	4,090	580	147	15	31	16
13	615	257	422	304	320	615	11,700	440	2,110	15	39	14
14	440	3,240	320	960	337	371	5,720	337	1,040	16	104	11
15	371	7,620	184	960	388	272	6,460	272	465	16	82	9
16	304	2,200	212	760	304	242	7,190	227	242	16	62	9
17	242	760	157	422	272	545	1,080	184	198	17	51	7
18	212	510	147	320	227	440	720	168	272	16	36	6
19	3,190	371	142	354	184	9,840	3,420	1,360	179	17	41	6
20	7,120	304	147	272	168	20,700	2,560	1,040	288	16	36	5
21	5,840	272	179	212	157	8,100	1,000	242	1,120	31	23	5
22	720	242	198	198	152	1,280	800	272	440	44	20	5
23	510	242	337	152	142	800	685	320	257	22	20	4
24	685	227	880	127	137	580	440	4,740	173	44	19	4
25	545	212	580	127	127	475	354	6,000	132	31	17	5
26	371	510	337	142	113	388	304	1,200	99	25	16	6
27	304	320	272	157	99	320	272	440	82	66	15	5
28	257	242	227	212	95	288	242	320	66	41	14	6
29	242	288	257	3,140	-------	257	212	242	62	242	14	19
30	212	272	168	3,940	-------	257	184	198	47	2,020	12	440
31	179	-------	157	1,280	-------	7,540	-------	510	-------	304	11	-------

Monthly discharge of Lamine River at Clifton City, Mo., for the year ending September 30, 1927

[Drainage area, 598 square miles]

Month	Discharge in second-feet				Run-off in inches
	Maximum	Minimum	Mean	Per square mile	
October	9,520	179	2,230	3.73	4.30
November	7,620	99	749	1.25	1.40
December	4,190	142	507	.848	.98
January	3,940	90	504	.843	.97
February	1,120	95	385	.644	.67
March	20,700	90	1,990	3.33	3.84
April	23,200	184	3,450	5.77	6.44
May	10,700	142	1,940	3.24	3.74
June	3,420	47	671	1.12	1.25
July	2,020	15	106	.177	.20
August	152	11	40.9	.068	.08
September	440	4	26.6	.044	.05
The year	23,200	4	1,050	1.76	23.92

BLACKWATER RIVER AT BLUE LICK, MO.

LOCATION.—On line between secs. 27 and 34, T. 49 N., R. 21 W., at bridge on State highway No. 65 three-fourths mile below Finney Creek and 1 mile south of Blue Lick, Saline County.

DRAINAGE AREA.—1,120 square miles (measured on topographic maps).

RECORDS AVAILABLE.—June 22, 1922, to September 30, 1927.

EQUIPMENT.—Chain gage on bridge. Discharge measurements made from bridge or by wading.

CHANNEL AND CONTROL.—Bed composed of hardpan and silt; shifting. Right bank high; left bank overflowed at stage of 30 feet. Control is gravel bar 300 feet below gage; practically permanent.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 32.01 feet at 11.10 a. m. March 22 (discharge, 17,400 second-feet); minimum, 1.63 feet at 11.30 a. m. September 29 (discharge, 1 second-foot).

1922–1927: Maximum stage recorded, that of March 22, 1927; minimum discharge, 0.6 second-foot June 12 and September 1, 1925.

DIVERSIONS AND REGULATION.—None.

ACCURACY.—Stage-discharge relation changed during high water March 22; affected by ice during winter. Rating curve fairly well defined by 15 discharge measurements, five of which, between 12 and 16,900 second-feet, were made during the year. Gage read to hundredths once daily except Sundays and holidays. Daily discharge ascertained by shifting-control method based on one discharge measurement until March 21 and by applying daily gage height to rating table after that date. Records fair except those for periods of ice effect, which are poor.

Daily discharge, in second-feet, of Blackwater River at Blue Lick, Mo., for the year ending September 30, 1927

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	4,410	155	155	218	2,230	155	7,960	a 177	185	90	75	4
2	4,250	125	155	a 224	1,400	120	14,100	115	644	80	34	3
3	5,320	125	145	229	1,290	125	14,900	262	2,510	b 95	20	3
4	6,280	105	145	207	1,360	125	11,800	251	3,860	b 110	12	b 6
5	7,300	95	b 140	185	1,140	155	2,200	175	b 3,360	125	8	9
6	6,700	105	135	155	b 1,063	b 650	932	3,340	b 3,070	125	4	5
7	4,800	a 108	986	145	986	1,140	348	5,100	2,770	80	b 116	218
8	878	120	2,150	135	734	2,150	1,720	5,000	378	23	229	1,220
9	538	165	1,510	115	b 636	878	3,730	14,700	362	8	490	306
10	a 1,000	968	522	85	538	362	b 5,080	10,800	240	b 8	662	62
11	5,000	306	240	75	262	306	6,440	7,840	120	7	334	b 39
12	5,740	185	b 309	66	306	2,800	6,600	3,280	b 445	11	33	16
13	3,730	155	378	66	b 457	a 3,000	6,600	474	770	24	1,380	10
14	490	a 350	218	57	608	752	7,100	334	1,160	28	a 1,000	5
15	320	986	135	57	734	378	12,300	b 320	120	75	490	6
16	273	1,470	105	57	442	320	14,000	306	105	120	458	3
17	b 244	458	95	48	295	273	a 15,400	262	240	b 88	334	3
18	b 214	273	95	48	218	240	7,400	240	334	57	348	b 2
19	185	229	95	39	442	3,760	7,840	426	b 402	34	165	2
20	1,100	175	110	39	b 314	a 10,000	8,080	196	474	155	70	2
21	2,680	b 135	218	39	185	15,200	11,800	155	2,570	115	b 50	2
22	932	95	120	39	b 196	16,400	6,800	b 138	3,130	b 70	31	2
23	680	110	110	39	207	6,600	2,770	120	1,060	24	24	2
24	b 617	120	860	48	196	4,370	b 1,620	3,340	506	b 22	90	2
25	554	b 208	a 654	48	165	1,800	474	5,000	240	19	165	b 2
26	240	295	a 446	57	155	334	410	5,960	b 229	15	48	3
27	207	590	240	66	b 145	b 282	348	1,250	218	95	28	2
28	175	b 388	155	75	135	229	306	284	175	35	b 19	2
29	196	185	120	95	-------	229	273	b 262	155	48	10	1
30	155	120	175	306	-------	196	240	b 240	95	20	7	458
31	b 155	-------	155	1,870	-------	3,410	-------	218	-------	b 48	5	------

a Discharge estimated from weather records and flow in adjacent drainage basins; gage not read.
b Discharge interpolated.

NOTE.—Stage-discharge relation affected by ice Dec. 15–18 and Jan. 9–31; daily discharge estimated from gage heights, observer's notes, and weather records.

Monthly discharge of Blackwater River at Blue Lick, Mo., for the year ending September 30, 1927

[Drainage area, 1,120 square miles]

Month	Discharge in second-feet				Run-off in inches
	Maximum	Minimum	Mean	Per square mile	
October	7,300	155	2,110	1.88	2.17
November	1,470	95	297	.265	.30
December	2,150	95	357	.319	.37
January	1,870	39	159	.142	.16
February	2,230	135	601	.537	.56
March	16,400	120	2,480	2.21	2.55
April	15,400	240	5,990	5.35	5.97
May	14,700	115	2,280	2.04	2.35
June	3,660	95	991	.885	.99
July	155	7	59.8	.053	.06
August	1,380	4	217	.194	.22
September	1,220	1	80.0	.071	.08
The year	16,400	1	1,300	1.16	15.78

OSAGE (MARAIS DES CYGNES) RIVER BASIN

OSAGE RIVER NEAR QUENEMO, KANS.

LOCATION.—In NW. ¼ sec. 7, T. 17 S., R. 18 E., on highway bridge 2½ miles below Dragoon Creek, 3 miles below Salt Creek, and 3 miles east of Quenemo, Osage County.

DRAINAGE AREA.—1,030 square miles.

RECORDS AVAILABLE.—June 17, 1922, to September 30, 1927.

EQUIPMENT.—Chain gage on upstream handrail of bridge. Discharge measurements made from highway bridge or by wading.

CHANNEL AND CONTROL.—Bed composed of shale and silt; practically permanent. Control for low and medium stages is short riffle over solid rock 300 feet below gage. Bank-full stage, 27 feet.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 34.98 feet at 6. p. m. April 19 (discharge, 15,000 second-feet); minimum, 2.24 feet 4 p. m. October 31 (discharge, 0.4 second-foot).

1922–1927: Maximum discharge recorded, 17,700 second-feet June 11, 1923 (gage height, 34.65 feet); no flow for days in July and August, 1926.

REGULATION.—None.

ACCURACY.—Stage-discharge relation practically permanent; affected by ice. Rating curve fairly well defined below 3,000 second-feet and poorly defined above. Gage read to hundredths twice daily. Daily discharge ascertained by applying mean daily gage height to rating table, except as explained in footnote to table of daily discharge. Records good except those for extremely high and low stages, which are poor.

Daily discharge, in second-feet, of Osage River near Quenemo, Kans., for the year ending September 30, 1927

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	9	1	47	34	658	66	9,820	247	67	73	4,540	247
2	396	16	44	42	456	69	10,800	229	3,920	148	616	58
3	3,690	37	42	52	283	70	2,640	211	6,900	116	320	44
4	11,100	33	40	59	265	74	742	202	2,710	94	229	556
5	10,000	38	47	61	247	80	536	637	637	78	202	679
6	2,320	37	58	66	211	658	396	5,600	556	54	157	637
7	358	80	94	57	202	997	184	11,900	436	44	116	784
8	247	175	265	49	184	658	2,170	10,100	247	40	124	847
9	175	320	358	40	157	283	5,950	10,300	175	31	301	265
10	157	283	320	30	124	211	1,820	2,460	148	40	211	175
11	102	211	265	26	109	175	826	1,110	132	46	109	116
12	556	140	175	28	94	1,920	742	616	140	40	679	94
13	3,520	124	140	23	148	1,060	2,970	377	157	54	2,530	77
14	1,060	157	109	23	202	283	6,850	358	140	109	7,300	64
15	301	193	80	23	229	247	13,200	301	436	211	8,920	52
16	211	175	67	23	193	229	11,000	247	166	175	7,900	44
17	157	157	56	23	175	211	2,780	229	87	1,060	3,360	41
18	140	124	52	30	140	175	1,890	202	1,580	396	742	38
19	320	94	32	28	116	516	14,800	193	4,360	116	339	34
20	4,320	80	32	26	94	1,460	13,600	175	10,900	1,220	247	29
21	889	80	32	25	80	516	1,350	157	10,100	1,130	202	26
22	247	66	32	25	94	476	721	140	2,570	265	247	22
23	193	64	32	25	157	436	637	109	637	193	868	21
24	166	66	32	24	140	358	596	73	358	116	2,820	28
25	124	66	32	25	109	193	576	60	193	80	847	33
26	94	66	37	23	94	140	496	94	94	679	596	39
27	80	60	37	22	80	94	436	132	140	396	358	43
28	40	55	37	33	73	69	377	116	102	229	229	52
29	6	52	37	116	-------	73	320	94	94	4,320	211	61
30	1	49	37	616	-------	80	283	80	68	784	175	80
31	1	-------	40	1,060	-------	140	--------	74	--------	596	124	------

NOTE.—Stage-discharge relation affected by ice Dec. 19–29, Jan. 13–17, and 21–23; discharge based on gage-height record and climatic data.

Monthly discharge of Osage River near Quenemo, Kans., for the year ending September 30, 1927

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	11,100	1	1,320	81,200
November	320	1	103	6,130
December	358	----------	87.3	5,370
January	1,060	22	88.2	5,420
February	658	80	188	10,200
March	1,920	66	388	23,900
April	14,800	184	3,650	217,000
May	11,900	60	1,510	92,800
June	10,900	67	1,610	95,800
July	4,320	31	417	25,600
August	8,920	109	1,470	90,400
September	847	21	176	10,500
The year	14,800	1	914	664,000

OSAGE RIVER NEAR OTTAWA, KANS.

LOCATION.—In NW. ¼ sec. 6, T. 17 S., R. 20 E., at highway bridge on East Seventh Street, 1½ miles southeast of Ottawa, Franklin County, three-fourths mile below Skunk Creek, 2¾ miles below Eightmile Creek, and 3¼ miles below waterworks dam of city of Ottawa.

DRAINAGE AREA.—1,250 square miles.

RECORDS AVAILABLE.—October 27, 1918, to September 30, 1927. From August 26, 1902, to October 31, 1905, records were obtained at Main Street Bridge in Ottawa.

EQUIPMENT.—Stevens water-gage recorder on right bank 100 feet upstream from bridge. Discharge measurements made from bridge or by wading.

CHANNEL AND CONTROL.—Bed composed of shale; practically permanent. No well-defined control. Bank-full stage, 27 feet.

EXTREMES OF DISCHARGE.—Maximum stage during year, from water-stage recorder, 31.38 feet at 2 a. m. April 21 (discharge, 14,900 second-feet); minimum, from water-stage recorder, 1.54 feet October 1 (discharge, 14 second-feet).

1918–1927: Maximum stage recorded, 32.9 feet April 10, 1922 (discharge, 17,400 second-feet); no flow June 27 and 28, 1920.

Highest known stage, about 38 feet, observed by local residents during flood of July, 1909.

DIVERSIONS AND REGULATION.—The city of Ottawa diverts water from storage dams for the city water supply. Low-water flow is regulated by dams upstream.

ACCURACY.—Stage-discharge relation permanent; slightly affected by ice. Rating curves well defined. Operation of water-stage recorder satisfactory. Daily discharge ascertained by applying to rating table, mean daily gage heights obtained from recorder graph by inspection or as explained in footnote to table of daily discharge. Records good except those for estimated periods, which are fair.

Daily discharge, in second-feet, of Osage River near Ottawa, Kans., for the year ending September 30, 1927

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	17	75	62	70	823	95	5,700	416	308	168	3,130	206
2	438	65	59	76	512	92	9,540	386	4,070	144	1,310	172
3	3,420	54	56	78	424	92	5,180	344	6,600	150	554	140
4	8,860	49	54	78	368	94	1,280	324	4,970	150	372	130
5	9,690	47	52	86	337	103	776	358	1,350	130	274	507
6	3,920	48	59	90	334	121	616	3,470	632	98	189	775
7	976	49	113	92	292	264	522	9,600	522	78	142	1,100
8	410	66	199	89	233	1,080	2,650	11,300	386	63	890	856
9	287	155	488	76	193	424	6,720	10,400	296	50	664	461
10	237	396	410	73	159	297	3,090	5,340	213	49	386	260
11	224	316	321	62	133	246	1,280	990	170	49	177	172
12	242	220	244	62	126	1,150	1,170	690	140	45	584	123
13	2,170	161	211	64	189	1,570	3,670	600	260	112	2,566	96
14	2,250	133	193		199	542	6,720	600	446	159	6,550	80
15	590	163	100		342	342	11,600	507	569	112	8,360	72
16	292	326	80		280	270	12,300	416	358	225	8,500	58
17	224	205	60		246	231	7,600	358	386	154	5,810	58
18	179	175	62		207	452	3,470	327	1,100	824	1,630	53
19	167	142	66		179		13,400	291	3,090	233	632	50
20	2,610	119	70	30	148		14,400	263	7,210	2,170	446	46
21	2,080	100	84		139	800	14,500	238	10,300	2,210	344	42
22	410	87	108		140		9,140	220	6,880	616	288	40
23	268	78	124		155		1,590	203	1,240	324	728	40
24	209	75	108		157		1,030	252	600	177	2,080	43
25	187	76	100		142		924	310	461	130	1,430	42
26	159	76	100	44	124	199	824	268	358	130	446	51
27	139	76	98	62	108	179	712	196	299	80	324	70
28	124	75	96	69	98	161	616	154	243	70	302	64
29	108	68	94	211	-------	160	538	132	196	1,790	330	67
30	92	62	92	1,230	-------	160	476	119	165	1,550	302	88
31	81	-------	81	1,450	-------	316	-------	112	-------	648	252	-------

NOTE.—Stage-discharge relation affected by ice Dec. 15–17, 24–29, and Jan. 14–25; discharge based on temperature and gage-height records. No gage-height record Mar. 19–25; mean discharge estimated.

Monthly discharge of Osage River near Ottawa, Kans., for the year ending September 30, 1927

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	9,600	17	1,320	81,200
November	396	47	125	7,440
December	438	52	129	7,930
January	1,450	----------	143	8,790
February	823	98	241	13,400
March	1,570	92	459	28,200
April	14,500	476	4,730	281,000
May	11,300	112	1,590	97,800
June	10,300	140	1,790	107,000
July	2,210	45	416	25,600
August	8,500	177	1,610	99,000
September	1,100	40	199	11,800
The year	14,500	17	1,060	769,000

OSAGE RIVER AT OSCEOLA, MO.

LOCATION.—In NW. ¼ sec. 20, T. 38 N., R. 25 W., at highway bridge in Osceola, St. Clair County, one-fourth mile above St. Louis-San Francisco Railway bridge and three-fourths mile above Gallinipper Creek.

DRAINAGE AREA.—8,180 square miles (measured on topographic maps).

RECORDS AVAILABLE.—July 23, 1921, to September 30, 1927. United States Weather Bureau has obtained records of stage since April 1, 1910.

EQUIPMENT.—Chain gage on downstream side of bridge. Zero of gage is about 682.7 feet above mean sea level. Discharge measurements made from bridge or by wading.

CHANNEL AND CONTROL.—Bed composed of silt, sand, and rock. Right bank high; left bank overflowed at stage of 22 feet. Control is heavy gravel bar one-fourth mile below gage; fairly permanent.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 30.4 feet at 7.45 a. m. April 11 (discharge, from revised high-water rating curve, 70,900 second-feet); minimum, 1.60 feet September 24 and 25 (discharge, 650 second-feet).

1921–1927: Maximum stage recorded, that of April 11, 1927; minimum, 0.60 foot September 4, 1925 (discharge, 40 second-feet).

Floods of December, 1895, and June, 1844, reached stages of 33.3 and 45.3 feet, respectively, as determined from levels to high-water marks; corresponding discharges from extension of present rating curve are 82,000 and 130,000 second-feet.

DIVERSIONS AND REGULATION.—No diversions. Dams above cause no fluctuation at the gage.

ACCURACY.—Stage-discharge relation permanent during year; not affected by ice. Rating curve fairly well defined; checked during the year by three discharge measurements between 1,980 and 31,000 second-feet. Gage read to hundredths twice daily. Daily discharge ascertained by applying mean daily gage height to rating table. Records good.

Daily discharge, in second-feet, of Osage River at Osceola, Mo., for the year ending September 30, 1927

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	17,700	2,380	1,930	2,680	17,700	1,930	39,000	24,400	20,900	2,380	7,400	2,530
2	20,300	2,230	1,860	2,530	15,600	1,930	49,500	8,600	23,900	2,230	6,200	2,380
3	29,500	1,860	1,630	2,380	11,900	1,930	49,500	4,030	19,400	1,930	4,780	2,230
4	34,800	1,700	1,630	2,380	8,000	1,930	41,200	3,430	21,100	1,780	5,820	2,080
5	35,400	1,630	1,630	2,380	6,200	1,930	34,500	3,880	19,000	1,630	5,100	1,860
6	37,000	1,490	1,630	2,230	5,820	2,080	33,100	11,900	18,000	1,490	4,180	1,700
7	38,000	1,490	2,380	2,080	5,460	2,380	32,400	24,600	16,300	1,350	4,180	1,700
8	34,500	1,700	6,200	2,080	4,780	4,630	34,300	23,700	14,000	1,280	53,500	2,080
9	36,400	2,380	10,400	2,080	4,180	10,400	42,300	23,300	5,100	1,210	61,800	2,830
10	44,300	3,280	12,500	1,780	3,880	8,200	59,800	25,900	3,280	1,350	60,400	2,680
11	44,600	2,980	10,200	1,630	3,730	6,400	70,100	28,800	2,980	1,070	52,300	2,380
12	41,200	2,530	7,800	1,630	4,180	4,780	63,600	27,500	2,380	1,000	35,000	1,930
13	36,400	2,530	5,640	2,080	4,940	4,780	60,400	26,100	8,200	930	22,200	1,630
14	30,800	11,100	4,180	6,000	5,640	4,330	59,800	24,400	6,800	1,700	25,000	1,350
15	23,300	16,300	3,280	7,000	5,640	4,180	63,200	17,700	4,940	2,380	33,400	1,210
16	11,500	12,700	2,680	6,200	5,100	4,180	66,100	12,100	3,880	2,380	38,400	1,070
17	6,200	6,800	2,380	3,880	4,180	3,580	69,400	4,480	3,280	3,880	44,000	1,070
18	4,180	4,480	2,380	3,580	3,730	4,330	65,000	3,430	5,820	6,200	52,300	1,070
19	3,580	4,030	2,230	3,580	3,430	20,900	61,500	3,130	11,500	4,480	61,800	930
20	3,130	3,580	2,380	4,780	3,280	37,300	61,800	3,280	19,400	3,130	62,900	930
21	8,000	3,280	2,380	3,880	2,980	39,400	61,500	2,980	44,000	14,600	56,400	846
22	8,400	2,980	3,130	3,280	2,830	41,500	58,000	2,530	48,900	32,700	51,100	818
23	6,600	2,680	4,180	3,130	2,680	37,000	55,700	2,380	44,600	42,300	45,400	790
24	4,940	2,530	6,200	2,980	2,530	31,800	55,700	7,400	30,600	37,500	38,200	678
25	3,430	2,380	6,800	3,130	2,380	34,800	55,400	15,200	23,300	18,200	31,300	650
26	2,830	2,380	5,280	4,330	2,230	32,000	54,200	16,300	21,700	5,820	22,400	720
27	2,530	2,380	3,730	7,400	2,080	27,000	51,400	10,800	20,300	4,330	9,800	720
28	2,380	2,380	3,280	8,000	1,930	16,300	47,200	5,820	15,200	3,580	4,630	776
29	2,080	2,380	3,130	15,000	-------	5,820	41,800	3,430	4,940	3,130	3,580	1,000
30	2,080	2,080	2,830	21,500	-------	4,330	34,500	2,980	2,980	4,030	2,980	4,480
31	2,230	-------	2,680	20,300	-------	14,800	-------	4,940	-------	3,580	2,530	-------

Monthly discharge of Osage River at Osceola, Mo., for the year ending September 30, 1927

[Drainage area, 8,180 square miles]

Month	Discharge in second-feet				Run-off in inches
	Maximum	Minimum	Mean	Per square mile	
October	44,600	2,080	18,700	2.29	2.64
November	16,300	1,490	3,750	.458	.51
December	12,500	1,630	4,150	.507	.58
January	21,500	1,630	5,030	.615	.71
February	17,700	1,930	5,250	.642	.67
March	41,500	1,930	13,400	1.64	1.89
April	70,100	32,400	52,400	6.41	7.15
May	28,800	2,380	12,200	1.49	1.72
June	48,900	2,380	16,200	1.98	2.21
July	42,300	930	6,890	.842	.97
August	62,900	2,530	29,300	3.58	4.13
September	4,480	650	1,570	.192	.21
The year	70,100	650	14,100	1.72	23.39

OSAGE RIVER AT WARSAW, MO.

LOCATION.—In NE. ¼ SW. ¼ sec. 17, T. 40 N., R. 22 W., at Warsaw, Benton County, 3 miles below South Grand River.

DRAINAGE AREA.—11,500 square miles (measured on topographic maps).

RECORDS AVAILABLE.—October 1, 1925, to September 30, 1927. The United States Weather Bureau has records of stage since March, 1917.

EQUIPMENT.—Inclined staff gage of United States Weather Bureau on left bank. Zero of gage is 631.54 feet above mean sea level. Discharge measurements made from highway bridge 1 mile below gage or by wading.

CHANNEL AND CONTROL.—Bed composed of mud and gravel. Left bank high; right bank overflowed at stage of 28 feet. Control is gravel bar 300 feet below gage; practically permanent.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 34.45 feet at 3 p. m. April 17 (discharge, 88,300 second-feet); minimum, 2.2 feet September 21–28 (discharge, 740 second-feet).

1925–1927: Maximum stage recorded, that of April 17, 1927; minimum, 1.2 feet August 12, 1926 (discharge, 90 second-feet).

Floods of December, 1895, and June, 1844, reached stages of 38.1 and 44.4 feet, respectively, determined by United States Weather Bureau from levels to high-water marks; corresponding discharges, from extension of present rating curve, are 101,000 and 135,000 second-feet. Minimum stage determined by Weather Bureau, −0.3 foot October 28, 1917, and other dates.

DIVERSIONS AND REGULATION.—None.

ACCURACY.—Stage-discharge relation permanent during year; not affected by ice. Rating curve fairly well defined by 17 discharge measurements, 9 of which, between 2,080 and 79,700 second-feet, were made during the year. Gage read to tenths once daily. Daily discharge ascertained by applying daily gage height to rating table. Records fair.

Daily discharge, in second-feet, of Osage River at Warsaw, Mo., for the year ending September 30, 1927

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	25,500	4,590	3,750	5,430	27,000	3,120	60,800	36,200	19,300	5,220	6,900	3,750
2	22,700	4,170	3,540	5,220	24,600	2,910	67,200	25,100	49,900	3,540	9,320	3,540
3	38,200	3,540	3,120	3,960	23,400	2,700	68,200	9,760	61,500	3,120	7,340	3,330
4	46,400	3,120	2,910	3,750	15,800	2,700	66,900	5,640	50,500	2,700	9,540	2,910
5	52,400	2,910	2,700	3,750	12,000	2,700	63,100	5,220	35,600	2,310	8,220	2,700
6	51,400	2,500	2,500	3,750	10,200	2,910	53,600	8,880	31,400	2,120	6,900	2,310
7	46,200	2,310	2,700	3,540	9,320	3,540	43,400	33,400	27,900	1,940	5,850	2,120
8	43,700	2,310	8,440	3,330	8,440	6,270	35,900	40,200	30,600	1,770	6,480	2,120
9	39,200	9,100	13,100	2,910	7,340	12,000	46,700	38,900	19,300	1,610	58,200	2,120
10	50,200	7,560	16,800	2,700	6,480	15,600	58,800	39,900	8,880	1,460	78,200	3,540
11	54,900	6,480	16,500	2,500	6,060	11,500	64,800	43,900	6,060	1,460	76,800	3,330
12	54,000	5,220	13,600	2,310	6,060	10,600	72,300	41,200	5,010	1,320	67,600	2,910
13	46,700	4,590	10,600	2,310	6,900	9,540	81,600	32,900	6,270	1,190	50,200	2,310
14	39,700	15,200	8,220	10,200	7,780	8,660	80,200	27,700	13,600	1,190	25,800	1,940
15	33,200	26,000	6,270	12,900	8,440	6,900	82,400	25,800	11,100	2,310	28,400	1,460
16	24,100	23,400	5,220	10,400	8,880	6,480	85,500	22,700	8,220	3,330	36,600	1,320
17	10,600	17,000	4,380	7,340	7,560	6,480	88,300	12,400	6,270	5,010	41,000	1,190
18	8,220	10,200	3,540	6,270	6,480	6,690	86,600	10,600	5,220	5,010	48,100	1,070
19	5,850	7,560	3,540	5,640	5,850	31,600	84,400	9,760	8,440	8,660	52,400	960
20	10,600	6,900	3,540	5,220	5,430	61,500	83,400	4,800	13,600	6,480	56,500	850
21	9,320	6,060	3,540	7,120	5,010	66,200	79,600	5,010	39,200	5,640	59,200	740
22	13,800	5,430	3,540	5,850	4,590	68,200	76,400	4,380	59,500	26,500	58,200	740
23	15,200	5,010	5,640	5,220	4,380	65,500	74,000	3,960	57,500	36,600	53,300	740
24	12,900	4,590	10,900	4,800	4,170	60,500	70,600	5,640	50,800	42,300	47,800	740
25	8,220	4,380	12,200	4,590	4,170	52,700	66,900	20,700	37,200	39,400	41,000	740
26	5,640	4,380	9,980	5,010	3,960	42,600	59,500	31,200	25,100	19,500	32,600	740
27	4,800	4,380	7,560	10,200	3,540	33,600	54,900	25,100	22,700	7,340	22,900	740
28	4,170	4,380	6,060	11,500	3,330	28,200	51,400	13,600	21,000	5,850	10,600	740
29	3,960	4,170	5,220	17,500	-------	16,300	47,800	8,000	13,100	5,220	6,270	850
30	3,330	3,750	5,010	26,700	-------	8,000	42,800	5,640	6,690	5,220	5,010	6,270
31	3,750	-------	4,380	29,900	-------	10,400	-------	5,220	-------	8,000	4,170	-------

Monthly discharge of Osage River at Warsaw, Mo., for the year ending September 30, 1927

[Drainage area, 11,500 square miles]

Month	Discharge in second-feet				Run-off in inches
	Maximum	Minimum	Mean	Per square mile	
October	54,900	3,330	25,400	2.21	2.55
November	26,000	2,310	7,040	.612	.68
December	16,800	2,500	6,740	.586	.68
January	29,900	2,310	7,480	.650	.75
February	27,000	3,330	8,830	.768	.80
March	68,200	2,700	21,500	1.87	2.16
April	88,300	35,900	66,600	5.79	6.46
May	43,900	3,960	19,500	1.70	1.96
June	61,500	5,010	25,000	2.17	2.42
July	42,300	1,190	8,490	.738	.85
August	78,200	4,170	32,900	2.86	3.30
September	6,270	740	1,960	.170	.19
The year	88,300	740	19,300	1.68	22.80

OSAGE RIVER NEAR BAGNELL, MO.

LOCATION.—In N. ½ SE. ¼ sec. 21, T. 40 N., R. 15 W., 1 mile above Little Gravois Creek and 1½ miles above Bagnell, Miller County.

DRAINAGE AREA.—14,000 square miles (measured on topographic maps and base map of Missouri).

RECORDS AVAILABLE.—May 5, 1925, to September 30, 1927.

EQUIPMENT.—Vertical staff gage in six sections fastened to posts or trees on left bank. Zero of gage is 549.75 feet above mean sea level. Discharge measurements made from cable 100 feet above gage or by wading.

CHANNEL AND CONTROL.—Bed composed of mud and gravel. Right bank is high bluff; left bank overflowed at stage of 38 feet. Control is gravel bar half a mile below gage; practically permanent.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 36.61 feet at 6.45 p. m. April 17 (discharge, 106,000 second-feet); minimum discharge, 1,300 second-feet September 25–27.

1925–1927: Maximum stage recorded, that of April 17, 1927; minimum discharge, 324 second-feet September 10–12, 1925.

Flood of December 22, 1895, reached stage of 38.9 feet, determined by levels to high-water mark (discharge from extension of present rating curve, 119,000 second-feet). Cut in rock 4 miles below gage indicates that flood of June, 1844, reached stage of 43.1 feet (discharge from extension of present rating curve, 150,000 second-feet).

DIVERSIONS AND REGULATION.—None.

ACCURACY.—Stage-discharge relation changed April 17; not affected by ice. Rating curves well defined above and fairly well defined below 5,000 second-feet. Five discharge measurements, covering a range from 2,830 to 98,400 second-feet, made during the year, check the respective curves. Gage read to hundredths twice daily. Daily discharge ascertained by applying mean daily gage height to rating table. Records good.

Daily discharge, in second-feet, of Osage River near Bagnell, Mo., for the year ending September 30, 1927

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	28,900	5,390	5,850	5,850	33,500	4,240	64,800	48,500	29,200	8,060	8,580	5,010
2	33,200	6,320	5,390	5,620	30,600	4,010	78,600	89,600	62,000	5,500	8,580	4,530
3	37,600	5,620	4,930	4,930	27,300	3,780	83,800	25,600	76,700	4,770	10,200	4,290
4	52,200	4,930	4,700	5,160	23,300	3,780	81,200	12,500	87,100	4,290	9,660	4,050
5	61,400	4,470	4,240	4,930	18,700	3,550	77,500	8,580	80,400	3,810	11,900	3,570
6	64,800	4,010	4,010	4,700	14,500	3,550	73,800	16,100	58,200	3,570	9,940	4,050
7	62,400	3,550	4,700	4,470	12,800	3,780	67,700	32,900	40,000	3,330	8,320	3,330
8	55,800	3,550	7,810	4,470	11,600	4,930	61,000	42,400	34,500	3,100	7,280	3,100
9	52,600	4,010	14,200	4,240	10,500	9,130	56,800	50,900	32,900	2,760	32,200	2,760
10	59,600	11,600	18,400	4,010	9,400	15,400	61,700	57,200	19,500	2,540	65,900	2,870
11	64,200	10,000	20,800	3,780	8,330	16,900	67,700	58,200	11,900	2,430	78,600	3,330
12	65,200	8,330	19,600	3,340	7,810	13,600	72,800	55,400	8,580	2,320	81,200	3,810
13	63,100	7,056	16,600	4,010	8,070	12,500	80,100	48,100	7,800	2,320	79,300	3,330
14	56,800	7,300	13,400	7,810	9,130	11,600	87,800	37,900	11,900	2,760	70,200	2,870
15	46,400	25,600	10,800	11,600	10,200	10,200	98,000	31,200	16,100	2,870	44,400	2,650
16	36,900	30,200	8,070	16,300	11,100	8,590	103,000	28,600	12,800	3,100	37,300	2,320
17	24,600	26,900	6,800	13,100	11,100	10,000	106,000	23,000	10,500	5,010	41,700	2,120
18	14,800	22,400	5,620	10,200	10,000	11,600	105,000	13,700	8,320	7,280	50,600	1,920
19	10,500	13,400	4,930	8,860	8,330	47,100	102,000	9,940	7,280	6,250	57,500	1,740
20	9,700	10,800	4,700	8,590	7,300	76,700	102,000	7,800	11,300	9,380	60,000	1,650
21	13,100	9,700	4,700	10,200	6,800	84,900	101,000	6,500	31,600	7,540	61,000	1,560
22	12,500	8,330	4,930	9,700	6,080	87,100	98,400	6,500	51,900	9,380	62,400	1,470
23	15,700	7,550	6,080	8,070	5,850	85,600	93,600	6,250	63,100	29,600	62,400	1,380
24	16,900	7,050	10,800	7,050	5,390	80,400	89,000	7,280	64,200	39,600	60,000	1,380
25	13,900	6,560	16,000	6,560	5,160	74,200	84,500	21,400	59,200	44,100	54,400	1,300
26	9,400	6,320	15,700	6,560	4,930	65,600	79,700	32,600	43,700	39,600	46,400	1,300
27	7,050	6,560	13,100	8,590	4,700	53,000	73,100	39,000	28,900	19,200	35,200	1,300
28	5,850	6,560	10,500	14,200	4,240	39,300	66,300	28,000	25,000	8,840	22,100	1,380
29	5,160	6,560	8,330	18,100	-------	29,600	60,000	16,400	22,100	6,760	11,900	2,120
30	4,930	6,080	7,050	25,000	-------	17,800	54,700	10,800	14,600	6,000	7,800	4,290
31	4,930	-------	6,560	32,200	-------	24,300	-------	8,320	-------	6,500	6,000	------

Monthly discharge of Osage River near Bagnell, Mo., for the year ending September 30, 1927

[Drainage area, 14,000 square miles]

Month	Discharge in second-feet				Run-off in inches
	Maximum	Minimum	Mean	Per square mile	
October	65,200	4,930	32,600	2.33	2.69
November	30,200	3,550	9,560	.683	.76
December	20,800	4,010	9,330	.666	.77
January	32,200	3,340	9,100	.650	.75
February	33,500	4,240	11,700	.836	.87
March	87,100	3,550	29,660	2.11	2.43
April	106,000	54,700	81,100	5.79	6.46
May	58,200	6,250	26,800	1.91	2.20
June	87,100	7,280	34,400	2.46	2.74
July	44,100	2,320	9,760	.697	.80
August	81,200	6,000	38,800	2.77	3.19
September	5,010	1,300	2,690	.192	.21
The year	106,000	1,300	24,600	1.76	23.87

SAC RIVER NEAR STOCKTON, MO.

LOCATION.—In W. ½ sec. 11, T. 34 N., R. 26 W., at bridge on State highway No. 54, 1½ miles above Bear Creek and 2½ miles east of Stockton, Cedar County.

DRAINAGE AREA.—1,160 square miles (measured on topographic maps).

RECORDS AVAILABLE.—July 21, 1921, to September 30, 1927.

EQUIPMENT.—Chain gage on downstream side of bridge. Discharge measurements made from bridge or by wading.

CHANNEL AND CONTROL.—Bed composed of mud, sand, and gravel; fairly permanent. Right bank high; left bank overflowed at stage of 18 feet. No well-defined control.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 24.95 feet at 8.30 a. m. April 1 (discharge, 34,800 second-feet); minimum discharge, 290 second-feet September 24–27.

1921–1927: Maximum stage recorded, that of April 1, 1927; minimum, 1.62 feet September 10, 1925 (discharge, 25 second-feet).

Flood of July, 1909, reached stage of 29.3 feet, determined by levels to high-water marks (discharge from extension of rating curve, 53,000 second-feet).

DIVERSIONS AND REGULATION.—None.

ACCURACY.—Stage-discharge relation changed during high water July 21; not affected by ice. Rating curve used October 1 to July 20 fairly well defined; checked during period by six discharge measurements between 570 and 33,100 second-feet. Curve used July 21 to September 30 well defined below and fairly well defined above 6,000 second-feet. Gage read to hundredths once daily. Daily discharge ascertained by applying daily gage height to rating table. Records fair.

Daily discharge, in second-feet, of Sac River near Stockton, Mo., for the year ending September 30, 1927

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	a1,000	890	630	940	2,420	630	34,400	1,700	1,820	890	b1,530	875
2	3,950	706	630	b915	2,240	630	17,100	1,520	3,690	840	b1,500	875
3	b3,720	630	554	890	2,180	592	6,980	1,400	2,480	706	1,470	820
4	3,500	554	554	840	2,180	554	4,600	1,340	1,760	b668	1,410	770
5	3,300	482	b1,340	790	2,060	554	3,500	2,060	1,220	630	1,290	720
6	3,040	b655	2,120	706	b1,940	b1,070	2,910	4,810	1,000	592	675	675
7	2,910	b828	2,060	706	1,820	1,580	2,540	3,820	890	592	930	630
8	2,660	1,000	1,760	668	1,520	1,460	8,220	2,360	790	554	18,400	585
9	2,480	840	1,520	b630	1,340	1,220	18,700	3,040	748	482	21,000	585
10	7,140	706	1,340	592	1,220	1,100	33,200	9,000	668	518	13,700	520
11	4,470	630	b1,280	554	1,160	940	13,300	4,210	630	482	4,860	500
12	3,690	554	1,220	554	1,220	840	9,000	2,660	b1,100	464	3,320	462
13	2,600	482	1,220	482	1,220	2,660	9,420	2,240	1,580	428	2,550	481
14	1,820	b1,570	1,000	1,220	1,160	1,880	11,800	1,940	1,460	630	5,700	426
15	1,460	2,660	1,000	4,340	1,100	1,640	17,800	1,700	890	592	7,770	408
16	1,280	2,360	1,580	3,950	1,050	1,280	22,800	1,460	1,220	518	9,860	390
17	1,160	1,400	1,340	3,040	1,000	1,100	b14,400	1,340	1,880	840	16,800	373
18	1,100	2,540	1,220	2,360	1,000	890	6,180	1,220	1,700	374	22,100	b348
19	1,050	1,820	b1,160	1,820	890	a750	11,500	1,100	3,500	1,050	11,200	322
20	1,000	1,220	1,100	1,760	b890	a10,000	13,300	1,050	10,600	13,300	4,860	322
21	940	b1,160	1,000	1,640	890	11,200	7,140	1,000	13,500	32,300	b4,230	322
22	890	1,100	1,000	1,580	790	6,020	5,300	890	10,600	24,700	3,600	306
23	890	1,100	2,980	b1,520	790	3,620	4,210	890	3,950	a14,000	2,430	306
24	b840	1,000	2,910	1,460	748	2,540	3,430	1,050	2,910	4,650	2,190	290
25	790	940	2,300	1,940	706	2,300	2,480	8,900	2,180	2,930	1,830	290
26	790	890	1,880	5,160	706	2,000	2,720	2,480	b1,820	2,430	1,170	290
27	706	b828	1,700	4,280	b668	1,700	2,420	2,000	1,460	1,770	1,350	290
28	706	b767	1,460	3,560	630	1,580	b2,180	1,520	1,220	1,350	1,350	306
29	630	706	1,220	3,040	-------	1,580	1,940	b1,310	1,050	1,470	1,170	500
30	1,520	706	1,100	b2,910	-------	1,760	1,820	1,100	940	1,590	1,110	540
31	1,160	-------	1,000	2,780	-------	3,240	-------	1,280	-------	b1,560	990	-------

a Discharge estimated from weather records and flow in adjacent drainage basins; gage not read.
b Discharge interpolated.

Monthly discharge of Sac River near Stockton, Mo., for the year ending September 30, 1927

[Drainage area, 1,660 square miles]

Month	Discharge in second-feet				Run-off in inches
	Maximum	Minimum	Mean	Per square mile	
October	7,140	630	2,040	1.76	2.03
November	2,660	482	1,060	.914	1.02
December	2,980	554	1,390	1.20	1.38
January	5,160	482	1,860	1.60	1.84
February	2,420	630	1,270	1.09	1.14
March	11,200	554	2,220	1.91	2.20
April	34,400	1,820	9,840	8.48	9.46
May	9,000	890	2,340	2.02	2.33
June	13,500	630	2,640	2.28	2.54
July	32,300	374	3,670	3.16	3.64
August	22,100	675	5,560	4.79	5.52
September	875	290	484	.417	.47
The year	34,400	290	2,870	2.47	33.57

LITTLE SAC RIVER NEAR SPRINGFIELD, MO.

LOCATION.—In SW. ¼ sec. 26, T. 30 N., R. 22 W., 600 feet above bridge on State highway No. 13, half a mile above South Dry Sac Creek, and 6 miles northwest of Springfield, Greene County.

DRAINAGE AREA.—40 square miles (measured on United States soil survey map).

RECORDS AVAILABLE.—May 5 to June 30, 1927.

EQUIPMENT.—Vertical staff gage in three sections fastened to trees on left bank. Zero of gage is about 1,162 feet above mean sea level. Discharge measurements from highway bridge or by wading.

CHANNEL AND CONTROL.—Bed composed of gravel. Banks are overflowed at stage of 7 feet. Control is gravel bar 200 feet below gage; practically permanent.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 9.80 feet at 10 a. m. August 8 (discharge, 3,930 second-feet); minimum stage, 1.15 feet September 26; minimum discharge, 6 second-feet September 20–26.

Highest known stage about 16 feet; date unknown.

DIVERSIONS AND REGULATION.—None.

ACCURACY.—Stage-discharge relation changed slightly August 17. Rating curve fairly well defined by eight discharge measurements, six of which were made during the year. Gage read to hundredths twice daily. Daily discharge ascertained by applying mean daily gage height to rating table; shifting-control method based upon two discharge measurements made September 16 and 26 was used August 18 to September 30. Records fair.

Daily discharge, in second-feet, of Little Sac River near Springfield, Mo., for the year ending September 30, 1927

Day	May	June	July	Aug.	Sept.	Day	May	June	July	Aug.	Sept.
1	------	106	21	21	19	16	47	19	15	182	8
2	------	136	19	30	18	17	43	63	19	700	8
3	------	90	17	86	17	18	40	27	14	166	8
6	------	68	16	55	15	19	37	52	12	106	7
5	47	51	15	34	15	20	33	420	90	81	6
6	55	45	13	26	13	21	30	244	117	68	6
7	46	41	12	26	12	22	33	111	72	55	6
8	43	34	11	2,090	12	23	27	76	37	48	6
9	660	30	11	290	11	24	820	59	27	42	6
10	233	27	14	150	10	25	233	47	23	36	6
11	130	25	11	111	11	26	111	40	20	31	6
12	95	29	9	90	10	27	81	33	16	27	10
13	76	30	15	76	9	28	63	29	14	26	10
14	63	25	23	150	9	29	52	26	72	26	8
15	55	22	21	117	8	30	45	23	53	23	8
						31	40	------	28	21	------

Monthly discharge of Little Sac River near Springfield, Mo., for the year ending September 30, 1927

[Drainage area, 40 square miles]

Month	Discharge in second-feet				Run-off in inches
	Maximum	Minimum	Mean	Per square mile	
May 5–31	820	27	120	3.00	3.01
June	420	19	67.6	1.69	1.89
July	117	9	27.6	.690	.80
August	2,090	21	161	4.02	4.64
September	19	6	9.93	.248	.28

SOUTH GRAND RIVER NEAR BROWNINGTON, MO.

LOCATION.—In NW. ¼ sec. 17, T. 40 N., R. 25 W., at highway bridge 300 feet below St. Louis-San Francisco Railway bridge, 500 feet below Deepwater Creek, and 1 mile north of Brownington, Henry County.

DRAINAGE AREA.—1,660 square miles (measured on topographic maps).

RECORDS AVAILABLE.—July 24, 1921, to September 30, 1927.

EQUIPMENT.—Chain gage on bridge. Zero of gage is about 686.5 feet above mean sea level. Discharge measurements made from highway or railway bridge or by wading.

CHANNEL AND CONTROL.—Bed composed of sand and gravel. Banks overflowed at stage of 20 feet. Control is a heavy gravel bar 500 feet below gage; fairly permanent.

EXTREMES OF DISCHARGE.—Maximum stage during year, determined from high-water mark on bridge, 27.25 feet March 22 (discharge, 16,500 second-feet); minimum, 1.30 feet September 28 (discharge, 6 second-feet).

1921–1927: Maximum stage, determined by levels to floodmarks, 28.0 feet April 9, 1922 (discharge, 21,100 second-feet); minimum discharge, 0.5 second-foot several days during September, 1925.

DIVERSIONS AND REGULATION.—None.

ACCURACY.—Stage-discharge relation permanent during year; not affected by ice. Rating curve fairly well defined by 12 discharge measurements, 4 of which, ranging from 263 to 6,600 second-feet, were made during the year. Gage read to hundredths once daily during low stages and twice daily during high stages. Daily discharge ascertained by applying mean daily gage height to rating table. Records good except those for estimated periods, which are fair.

Daily discharge, in second-feet, of South Grand River near Brownington, Mo., for the year ending September 30, 1927

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1,110	148	125	155	3,980	148	e 9,000	b 294	810	97	710	68
2	1,560	140	118	b 155	3,100	125	e12,000	255	8,280	91	230	63
3	4,860	125	118	155	1,760	140	13,300	e 230	8,220	85	148	58
4	6,840	118	110	170	1,410	140	e12,000	230	8,940	74	97	50
5	5,420	170	332	178	1,460	140	9,900	230	9,480	b 68	85	41
6	5,300	97	860	162	1,260	170	6,520	7,260	7,800	63	68	36
7	5,520	280	1,160	148	910	1,860	1,060	7,620	5,148	54	58	33
8	4,320	498	1,310	155	760	3,000	4,100	9,120	1,910	49	1,160	32
9	1,110	b 376	1,210	132	565	3,270	6,460	10,600	1,110	41	565	40
10	5,690	255	760	118	430	1,260	8,220	10,900	710	36	1,110	49
11	5,740	410	565	68	390	1,360	8,940	8,760	370	32	960	35
12	2,340	255	430	85	498	2,500	8,460	4,810	e 300	22	475	26
13	1,060	205	350	430	b 509	2,440	8,640	610	1,110	520	195	21
14	610	3,820	230	b 324	520	1,160	8,460	542	635	242	660	17
15	430	3,270	118	218	710	498	11,200	410	1,360	e 200	2,560	16
16	350	2,170	140	205	565	280	e13,000	332	860	1,460	3,160	15
17	298	1,560	110	b 188	b 440	268	e14,000	268	390	e1,500	5,140	12
18	910	430	97	170	315	255	e13,000	230	195	1,160	3,930	12
19	2,220	255	148	170	255	7,440	e11,000	b 204	170	e 800	2,720	11
20	3,880	230	110	e 155	205	10,100	9,840	178	3,710	332	1,360	10
21	e6,000	218	b 148	132	185	e12,000	9,240	170	4,980	2,440	452	10
22	e4,000	205	185	118	205	14,600	b 9,600	155	3,490	5,470	230	9
23	e2,000	185	542	91	b 205	e12,000	9,960	140	1,710	3,980	430	8
24	1,060	185	b 565	74	205	9,660	6,790	5,740	2,010	1,210	588	8
25	860	178	588	97	178	4,700	1,860	6,460	1,210	268	710	9
26	610	178	350	b 111	205	710	760	3,710	520	230	280	9
27	410	170	255	125	148	520	635	960	230	140	170	8
28	280	170	195	760	132	430	635	430	178	91	125	6
29	230	148	162	1,760	-------	370	390	298	155	68	104	1,560
30	195	b 136	140	4,540	-------	860	332	255	110	1,810	85	475
31	162	-------	125	4,040	-------	e 6,000	---------	1,760	-------	1,710	74	------

e Gage not read; discharge estimated from rainfall records and flow of near-by streams.
b Discharge interpolated.

Monthly discharge of South Grand River near Brownington, Mo., for the year ending September 30, 1927

[Drainage area, 1,660 square miles]

Month	Discharge in second-feet				Run-off in inches
	Maximum	Minimum	Mean	Per square mile	
October	6,840	162	2,430	1.46	1.68
November	3,820	97	553	.333	.37
December	1,310	97	376	.227	.26
January	4,540	68	496	.299	.34
February	3,980	132	768	.463	.48
March	14,600	125	3,170	1.91	2.20
April	14,000	332	7,640	4.60	5.13
May	10,900	140	2,680	1.61	1.86
June	9,480	110	2,540	1.53	1.71
July	5,470	22	785	.473	.55
August	5,140	58	924	.557	.64
September	1,560	6	91.6	.055	.06
The year	14,600	6	1,870	1.13	15.28

NIANGUA RIVER NEAR ROACH, MO.

LOCATION.—In SW. ¼ sec. 20, T. 38 N., R. 17 W., at highway bridge on Linn Creek-Roach road 2½ miles above Little Niangua River, 4 miles northeast of Roach, Camden County, and 10 miles below Hahatonka Spring.

DRAINAGE AREA.—About 698 square miles (measured on topographic maps and base map of Missouri).

RECORDS AVAILABLE.—November 18, 1922, to September 30, 1927.

EQUIPMENT.—Vertical staff gage in several sections fastened to trees on left bank 40 feet downstream from bridge. Discharge measurements made from bridge or by wading.

CHANNEL AND CONTROL.—Bed composed of sand and gravel. Left bank high; right bank overflowed at stage of 10 feet. Control is gravel bar 400 feet below gage; fairly permanent.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 17.00 feet at 6.40 p. m. August 9 (discharge, 27,200 second-feet); minimum, 1.23 feet at 6.30 a. m. October 29 (discharge, 329 second-feet).

1923–1927: Maximum stage recorded, that of August 9, 1927; minimum discharge, 160 second-feet August 26 to September 2, 1923.

Flood of September, 1914, reached stage of 23.8 feet, determined from levels to high-water mark.

DIVERSIONS AND REGULATION.—None.

ACCURACY.—Stage-discharge relation changed three times during year; not affected by ice. Two standard rating curves used, both well defined below 4,000 second-feet and fairly well defined between 4,000 and 20,000 second-feet; extended above. Four discharge measurements, covering a range from 626 to 1,860 second-feet, were made during the year. Gage read to hundredths once daily during low stages and twice daily during medium and high stages. Daily discharge ascertained by shifting-control method. Records good below 4,000 second-feet and fair above.

Daily discharge, in second-feet, of Niangua River near Roach, Mo., for the year ending September 30, 1927

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1,880	1,220	1,090	688	1,810	563	10,200	1,220	22,700	1,010	820	820
2	2,100	1,280	912	638	1,610	563	20,920	1,080	13,200	940	650	760
3	1,950	970	856	613	1,480	538	4,370	1,010	21,200	880	760	700
4	3,750	800	744	563	1,350	516	2,510	940	13,400	820	2,250	700
5	4,600	613	744	563	1,220	516	2,090	880	5,260	760	1,770	650
6	6,700	538	638	538	1,160	563	1,850	1,080	3,550	760	1,530	650
7	2,350	538	688	516	1,090	563	2,510	2,170	2,870	700	1,010	650
8	1,350	538	1,030	493	970	638	3,650	2,170	2,870	650	820	700
9	1,220	516	1,680	472	970	2,100	3,450	1,770	2,330	625	18,700	625
10	2,860	638	1,540	450	856	1,680	4,150	10,200	2,090	575	21,200	600
11	4,700	744	1,420	409	800	1,350	4,150	12,900	1,850	525	3,550	600
12	3,210	638	1,220	409	744	1,160	3,250	3,050	1,690	525	2,420	575
13	1,950	588	1,090	493	800	1,090	4,150	2,170	1,610	425	1,850	575
14	1,480	588	970	472	688	1,090	5,140	1,770	1,690	475	1,930	550
15	1,220	912	856	3,390	800	970	11,600	1,610	2,090	575	3,050	550
16	1,090	1,950	744	1,950	912	912	12,400	1,290	1,610	550	2,690	550
17	912	2,020	638	1,350	856	1,280	14,200	1,220	1,150	1,080	2,010	500
18	800	1,880	588	1,160	856	1,480	4,050	1,150	1,450	940	6,460	500
19	688	1,880	538	1,090	800	4,420	3,550	1,080	1,530	650	6,860	500
20	588	1,880	538	2,350	800	7,100	5,740	940	3,850	575	3,150	475
21	563	1,610	538	1,740	688	15,300	7,960	880	5,500	625	2,250	475
22	538	1,350	688	1,280	688	16,200	3,750	820	10,900	760	1,850	475
23	493	1,220	912	1,160	688	4,040	2,780	820	5,860	940	1,610	450
24	450	1,090	1,680	1,090	638	2,860	2,330	820	2,690	1,010	1,450	450
25	430	1,220	1,740	970	638	2,260	2,090	2,690	2,170	760	1,370	450
26	409	1,220	1,420	1,220	638	1,950	1,930	7,000	1,850	625	1,150	475
27	389	1,220	1,160	2,180	638	1,740	1,770	4,260	1,530	575	1,150	475
28	349	1,480	970	2,440	588	1,610	1,690	2,090	1,370	525	1,080	475
29	329	1,220	856	2,100	-------	1,350	1,450	1,690	1,220	525	1,010	500
30	409	1,220	800	2,350	-------	1,280	1,290	1,530	1,080	525	880	700
31	800	-------	744	2,180	-------	2,690	--------	1,290	--------	880	880	------

Monthly discharge of Niangua River near Roach, Mo., for the year ending September 30, 1927

[Drainage area, 698 square miles]

Month	Discharge in second-feet				Run-off in inches
	Maximum	Minimum	Mean	Per square mile	
October	6,700	329	1,630	2.34	2.70
November	2,020	516	1,120	1.60	1.78
December	1,740	538	969	1.39	1.60
January	3,390	409	1,200	1.72	1.98
February	1,810	588	921	1.32	1.38
March	16,200	516	2,590	3.71	4.28
April	20,920	1,290	5,030	7.21	8.04
May	12,900	820	2,370	3.40	3.92
June	22,700	1,080	4,740	6.79	7.58
July	1,080	425	703	1.01	1.16
August	21,200	650	3,170	4.54	5.23
September	820	450	572	.819	.91
The year	22,700	329	2,090	2.99	40.56

GASCONADE RIVER BASIN

GASCONADE RIVER NEAR WAYNESVILLE, MO.

LOCATION.—In SE. ¼ sec. 3, T. 36 N., R. 12 W., at bridge on State Highway No. 17 2½ miles below Roubidou Creek and 4 miles north of Waynesville, Pulaski County.

DRAINAGE AREA.—1,680 square miles (measured on United States soil survey maps).

RECORDS AVAILABLE.—June 9, 1921, to September 30, 1927. Missouri Engineering Experiment Station has records of discharge from August 16, 1914, to July 31, 1921.[3]

EQUIPMENT.—Chain gage on upstream side of bridge. Zero of gage is 739.34 feet above mean sea level. Discharge measurements made from bridge or by wading.

CHANNEL AND CONTROL.—Bed composed of gravel and small boulders. Right bank overflowed at stage of 15 feet. Control is heavy gravel bar 300 feet below gage; practically permanent.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 17.50 feet at 3 p. m. April 2 (discharge, 25,900 second-feet); minimum discharge, 313 second-feet September 23–27.

1921–1927: Maximum stage recorded, 17.50 feet December 21, 1924, and April 2, 1927 (discharge, 25,900 second-feet); minimum discharge, 77 second-feet September 27, 1922.

On August 22, 1915, river reached a stage of 25 feet, determined from levels to high-water marks.

DIVERSIONS AND REGULATION.—None.

ACCURACY.—Stage-discharge relation permanent during year; not affected by ice. Rating curve well defined; checked during year by three discharge measurements between 1,510 and 23,000 second-feet. Gage read to hundredths twice daily. Daily discharge ascertained by applying mean daily gage height to rating table. Records good.

Daily discharge, in second-feet, of Gasconade River near Waynesville, Mo., for the year ending September 30, 1927

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	3,940	4,580	2,480	950	4,580	870	21,900	1,940	22,100	1,070	950	910
2	4,420	3,940	2,060	910	4,100	870	25,100	1,820	16,700	990	1,330	870
3	2,760	2,900	1,940	870	3,460	790	22,900	1,520	21,700	990	1,150	830
4	3,320	1,940	1,820	830	3,320	790	7,210	1,420	18,700	910	1,330	750
5	3,180	1,940	1,820	750	3,040	790	4,900	1,420	8,730	830	2,900	710
6	3,040	1,420	1,720	750	2,760	790	4,260	1,520	5,220	750	2,480	710
7	2,900	1,240	1,820	710	2,340	950	4,900	3,320	3,780	710	1,620	710
8	2,480	1,150	1,620	670	2,060	2,620	8,920	3,940	3,040	750	1,420	635
9	1,720	1,070	1,940	670	1,940	2,900	8,730	3,460	2,760	670	11,900	600
10	7,970	1,150	1,940	600	1,720	2,900	7,780	5,580	2,200	600	19,700	540
11	5,400	1,150	1,940	570	1,520	2,340	10,500	8,350	1,820	570	10,300	540
12	4,740	1,070	2,340	570	1,420	2,200	9,700	7,020	1,720	510	3,940	480
13	3,180	1,150	2,200	1,620	1,420	2,340	10,500	3,620	1,620	480	2,900	480
14	2,900	1,070	2,200	5,060	1,420	2,480	18,700	2,760	1,940	510	9,110	430
15	1,940	2,900	2,060	4,260	1,620	2,100	22,900	3,040	1,940	480	12,300	405
16	1,620	3,620	1,940	3,040	1,820	1,940	23,700	1,940	1,520	455	20,100	405
17	1,330	5,760	1,940	2,760	1,620	1,720	17,300	1,620	1,420	455	12,300	380
18	1,240	4,260	1,070	2,620	1,520	1,520	8,920	1,520	1,330	430	20,100	380
19	1,150	4,420	990	4,260	1,520	1,820	10,900	1,720	1,330	510	20,700	357
20	990	4,580	990	8,540	1,520	9,500	16,300	1,520	1,330	480	9,700	357
21	870	3,940	990	5,940	1,330	16,300	17,300	1,330	11,900	455	4,900	334
22	870	3,460	1,240	2,620	1,240	12,700	8,160	1,330	11,700	1,070	3,460	334
23	710	2,760	1,330	3,180	1,240	5,940	5,580	1,150	7,020	1,330	2,760	313
24	670	2,760	1,520	3,040	1,150	4,260	4,260	7,020	3,620	1,150	2,340	313
25	600	2,900	1,520	2,620	1,070	3,460	4,100	14,700	2,760	910	1,940	313
26	600	3,940	1,420	2,760	1,070	2,760	3,320	12,300	2,340	750	1,720	313
27	570	4,420	1,420	5,060	950	2,480	2,900	6,300	1,720	750	1,520	313
28	510	4,100	1,520	5,580	870	2,060	2,620	4,100	1,520	635	1,330	334
29	790	3,180	1,420	5,060	-------	1,820	2,340	3,180	1,330	600	1,150	357
30	1,420	2,760	1,420	8,920	-------	1,820	2,200	2,760	1,150	1,070	1,070	405
31	2,340	-------	1,330	5,220	-------	5,580	-------	3,320	-------	1,520	990	-------

NOTE.—Gage not read Oct. 5; discharge interpolated. Gage readings probably incorrect Mar. 13 and 15; discharge estimated.

[3] See Missouri Univ. Eng. Exper. Sta. Bull., ser. 22, vol. 21, No. 35, or Missouri Bur. Geology and Mines, 2d ser., vol. 20.

Monthly discharge of Gasconade River near Waynesville, Mo., for the year ending September 30, 1927

[Drainage area, 1,680 square miles]

Month	Discharge in second-feet				Run-off in inches
	Maximum	Minimum	Mean	Per square mile	
October	7,970	510	2,260	1.35	1.56
November	5,760	1,070	2,850	1.70	1.90
December	2,480	990	1,680	1.00	1.15
January	8,920	570	2,970	1.77	2.04
February	4,580	870	1,920	1.14	1.19
March	16,300	790	3,270	1.95	2.25
April	25,100	2,290	10,600	6.31	7.04
May	14,700	1,150	3,760	2.24	2.58
June	22,100	1,150	5,530	3.29	3.67
July	1,520	430	755	.449	.52
August	20,700	950	6,110	3.64	4.20
September	910	313	494	.294	.33
The year	25,100	313	3,520	2.10	28.43

GASCONADE RIVER AT JEROME, MO.

LOCATION.—In S. ½ sec. 13, T. 37 N., R. 10 W., 500 feet north of railway station at Jerome, Phelps County, half a mile below St. Louis-San Francisco Railway bridge, and half a mile below Little Piney Creek.

DRAINAGE AREA.—2,840 square miles (measured on United States soil survey maps).

RECORDS AVAILABLE.—April 12, 1903, to July 21, 1906 (published as "Gasconade River at Arlington, Mo."); January 1, 1923, to September 30, 1927. United States Weather Bureau has records of stage at railroad bridge from 1885 to 1926.

EQUIPMENT.—Staff gage in three sections fastened to trees on left bank. Zero of gage is 657.98 feet above mean sea level. Discharge measurements made from railroad bridge or by wading.

CHANNEL AND CONTROL.—Bed composed of gravel and small boulders. Left bank high; right bank overflowed at stage of 19 feet. Control is coarse gravel bar extending diagonally across river 100 feet below gage; practically permanent.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 21.06 feet at 6.30 a. m. April 2 (discharge, 45,500 second-feet); minimum, 2.01 feet September 25 and 26 (discharge, 850 second-feet).

1903–1906: Maximum discharge recorded, 45,000 second-feet July 23, 1905; minimum, 300 second-feet June 15, 1905.

1923–1927: Maximum stage recorded, that of April 2, 1927; minimum, 1.40 feet September 12 and 13, 1925 (discharge, 400 second-feet).

Flood of January 5, 1897, reached stage of about 31 feet; determined from records of United States Weather Bureau and relationship between gages.

DIVERSIONS AND REGULATION.—None.

ACCURACY.—Stage-discharge relation permanent during year; not affected by ice. Rating curve well defined by 25 discharge measurements, 3 of which, between 2,520 and 41,200 second-feet, were made during the year. Gage read to hundredths twice daily. Daily discharge ascertained by applying mean daily gage height to rating table. Records good.

Daily discharge, in second-feet, of Gasconade River at Jerome, Mo., for the year ending September 30, 1927

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	4,220	5,140	4,080	1,800	7,360	1,680	34,700	3,280	40,200	2,400	2,040	1,800
2	5,460	5,620	3,800	1,680	6,280	1,570	43,100	3,280	37,800	2,280	2,400	1,800
3	4,660	4,080	3,410	1,680	5,780	1,570	34,400	3,020	39,300	2,160	2,280	1,680
4	3,800	3,280	3,020	1,570	5,460	1,460	17,500	2,890	36,700	2,040	2,280	1,680
5	3,670	2,640	2,760	1,460	4,980	1,460	8,700	2,760	19,700	1,920	3,410	1,570
6	3,800	2,280	2,520	1,460	4,500	1,460	6,820	4,360	10,900	1,800	4,080	1,570
7	4,220	2,160	2,520	1,350	4,080	1,920	8,300	6,460	7,900	1,680	3,150	1,460
8	3,410	1,920	2,640	1,350	3,670	2,890	16,000	7,360	6,280	1,680	2,890	1,460
9	3,150	2,040	2,760	1,250	3,280	3,940	14,500	7,540	5,300	1,680	12,700	1,350
10	9,780	1,920	2,890	1,250	3,020	4,220	13,100	8,300	4,500	1,680	18,400	1,350
11	11,300	1,920	3,280	1,150	2,890	3,670	14,800	10,200	4,080	1,460	21,600	1,250
12	6,820	1,800	3,410	1,150	2,640	3,540	15,000	10,200	3,670	1,460	6,820	1,250
13	5,140	1,680	3,410	5,940	2,640	3,670	14,500	6,460	3,670	1,460	5,140	1,200
14	3,800	2,400	3,020	6,820	2,760	3,800	23,200	4,980	3,940	1,460	8,100	1,150
15	3,150	4,360	2,760	6,820	3,020	3,670	37,300	4,080	3,800	1,570	28,200	1,100
16	2,640	8,500	2,400	5,940	3,150	3,280	38,400	3,670	3,410	1,460	29,300	1,050
17	2,400	8,900	2,280	4,820	3,150	3,020	30,700	3,540	3,150	1,680	22,400	1,050
18	2,160	7,180	2,040	4,820	3,020	2,760	17,500	3,150	3,020	1,460	23,200	1,050
19	1,920	6,640	1,920	7,000	2,760	9,340	16,000	5,460	2,890	1,570	26,200	1,000
20	1,680	6,640	1,920	8,300	2,640	11,100	23,800	3,670	2,890	1,570	22,400	1,000
21	1,460	6,280	1,800	9,560	2,400	18,400	25,700	3,150	9,340	1,920	8,100	950
22	1,460	5,460	1,920	5,940	2,400	20,000	12,700	3,150	17,800	2,520	5,620	900
23	1,350	4,820	2,280	5,460	2,280	11,300	9,780	2,890	12,700	2,890	4,360	900
24	1,250	4,660	2,520	4,820	2,160	7,360	7,720	16,500	6,820	2,280	3,800	900
25	1,150	4,500	2,520	4,500	2,040	5,460	6,460	25,400	4,820	1,920	3,280	850
26	1,150	6,460	2,400	5,460	3,150	4,660	5,620	24,300	3,940	1,800	3,020	850
27	1,100	6,820	2,280	7,180	1,800	4,080	4,980	14,000	3,410	1,680	2,640	950
28	1,050	6,100	2,160	8,100	1,680	3,540	4,500	8,300	3,020	1,570	2,400	1,050
29	1,250	5,460	2,040	7,720	-------	3,280	4,080	6,460	2,640	1,460	2,280	1,100
30	1,920	4,660	1,920	8,300	-------	3,150	3,670	5,460	2,400	2,160	2,160	1,250
31	3,670	-------	1,920	8,700	-------	8,900	-------	7,900	-------	1,800	1,920	------

Monthly discharge of Gasconade River at Jerome, Mo., for the year ending September 30, 1927

[Drainage area, 2,840 square miles]

Month	Discharge in second-feet				Run-off in inches
	Maximum	Minimum	Mean	Per square mile	
October	11,300	1,050	3,350	1.18	1.36
November	8,900	1,680	4,540	1.60	1.78
December	4,080	1,800	2,600	.915	1.05
January	9,560	1,150	4,620	1.63	1.88
February	7,360	1,680	3,390	1.19	1.24
March	20,000	1,460	5,170	1.82	2.10
April	43,100	3,670	17,100	6.02	6.72
May	25,400	2,760	7,170	2.52	2.90
June	40,200	2,400	10,300	3.63	4.05
July	2,890	1,460	1,820	.641	.74
August	29,300	1,920	9,240	3.25	3.75
September	1,800	850	1,220	.43	.48
The year	43,100	850	5,880	2.07	28.05

GASCONADE RIVER NEAR RICH FOUNTAIN, MO.

LOCATION.—In SE. ¼ sec. 16, T. 42 N., R. 8 W., at highway bridge on Belle-Rich Fountain Road, just below Brushy Creek, just above Swan Creek, and 4 miles east of Rich Fountain, Osage County.

DRAINAGE AREA.—3,180 square miles (measured on United States soil survey maps).

RECORDS AVAILABLE.—October 10, 1921, to September 30, 1927.

EQUIPMENT.—Chain gage on upstream side of bridge. Zero of gage is 554.24 feet above mean sea level. Discharge measurements made from bridge or by wading.

CHANNEL AND CONTROL.—Bed composed of coarse gravel and rock. Left bank high; right bank overflowed at stage of 20 feet. Control is a heavy gravel bar 800 feet below gage; slightly shifting.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 21.63 feet at 5 p. m. April 3 (discharge, 41,000 second-feet); minimum discharge, 908 second-feet September 23-27.

1921–1927: Maximum stage recorded, that of April 3, 1927; minimum discharge, 410 second-feet September 29 and 30, 1922.

DIVERSIONS AND REGULATION.—None.

ACCURACY.—Stage-discharge relation changed slightly during high water June 3; not affected by ice. Rating curve used October 1 to June 2 well defined above and fairly well defined below 10,000 second-feet by seven discharge measurements, three of which were made during the period. Curve used June 3 to September 30 well defined throughout and checked by one discharge measurement during the period. Gage read to hundredths twice daily. Daily discharge ascertained by applying mean daily gage height to rating table. Records good.

Daily discharge, in second-feet, of Gasconade River near Rich Fountain, Mo., for the year ending September 30, 1927

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	6,160	4,770	4,900	2,000	8,800	1,780	22,900	4,130	16,700	2,900	2,220	2,110
2	6,160	5,290	4,380	1,890	7,610	1,670	31,500	3,890	36,500	2,660	2,110	2,000
3	7,610	5,570	3,770	1,780	6,460	1,670	40,700	3,650	38,000	2,550	2,440	1,890
4	6,620	4,380	3,650	1,780	6,160	1,560	36,500	3,410	37,100	2,440	2,550	1,890
5	5,430	3,530	3,410	1,670	5,860	1,560	19,200	3,290	36,800	2,330	2,780	1,780
6	4,250	2,930	3,050	1,560	5,430	1,450	9,160	7,950	18,900	2,220	3,980	1,780
7	4,380	2,570	3,530	1,450	4,770	1,560	7,610	6,460	10,500	2,110	4,110	1,670
8	4,510	2,330	3,650	1,450	4,380	2,450	15,700	7,950	7,780	2,110	3,500	1,560
9	3,770	2,570	3,650	1,350	3,770	3,170	18,500	10,400	6,700	2,000	3,980	1,450
10	11,200	2,570	3,530	1,200	3,410	4,130	17,900	10,200	5,840	1,890	13,500	1,450
11	11,700	2,330	3,530	1,200	3,170	4,130	16,900	10,100	5,280	1,890	20,000	1,450
12	10,800	2,110	3,650	1,150	3,050	4,010	17,500	11,000	4,630	1,670	16,100	1,350
13	6,940	2,000	3,770	3,530	3,050	3,890	17,500	9,160	4,370	1,670	8,260	1,250
14	5,160	3,410	3,530	8,290	2,930	4,010	21,800	6,160	4,890	1,780	9,080	1,250
15	4,130	5,570	3,050	7,440	2,930	4,010	29,000	5,030	4,630	1,780	12,000	1,200
16	3,530	7,100	2,810	6,460	3,290	3,890	35,600	4,380	4,110	1,670	24,700	1,150
17	2,930	8,800	2,450	5,570	3,290	3,650	36,800	4,010	3,860	1,670	28,700	1,100
18	2,570	9,520	2,330	5,710	3,170	3,290	29,300	3,770	3,740	1,560	22,500	1,100
19	2,330	7,950	2,110	7,100	3,050	15,700	20,300	7,270	3,500	1,450	22,900	1,050
20	2,450	7,440	2,000	8,980	2,930	14,500	19,800	4,900	3,380	1,560	25,800	1,000
21	2,000	6,940	1,890	9,700	2,810	13,100	23,600	4,010	5,560	1,450	19,200	955
22	1,780	5,860	2,220	8,980	2,570	19,600	22,900	4,250	14,100	3,140	7,620	955
23	1,560	6,160	2,330	6,940	2,330	18,900	14,700	3,890	16,900	3,740	5,980	908
24	1,450	5,710	2,330	5,430	2,330	14,500	9,520	8,630	10,700	2,900	4,760	908
25	1,350	5,570	3,290	5,030	2,110	12,300	7,780	19,600	6,400	2,550	4,110	908
26	1,350	7,780	2,930	5,710	2,110	8,290	6,620	24,900	5,020	2,330	3,740	908
27	1,250	7,440	2,690	6,310	2,000	5,860	5,430	23,800	4,500	2,110	3,260	908
28	1,200	7,270	2,570	7,610	1,890	5,030	6,160	13,700	3,860	1,890	3,020	1,000
29	1,450	6,940	2,330	7,270	-------	4,010	5,290	8,120	3,380	1,780	2,660	2,780
30	1,450	6,160	2,110	7,950	-------	3,650	4,770	6,460	3,140	2,110	2,440	1,450
31	3,410	-------	2,000	8,980	-------	15,700	---------	7,440	---------	2,330	2,330	------

Monthly discharge of Gasconade River near Rich Fountain, Mo., for the year ending September 30, 1927

[Drainage area, 3,180 square miles]

Month	Discharge in second-feet				Run-off in inches
	Maximum	Minimum	Mean	Per square mile	
October	11,700	1,200	4,220	1.33	1.53
November	9,520	2,000	5,290	1.66	1.85
December	4,900	1,890	3,010	.947	1.09
January	9,700	1,150	4,890	1.54	1.78
February	8,800	1,890	3,770	1.19	1.24
March	19,600	1,450	6,550	2.06	2.38
April	40,700	4,770	19,000	5.97	6.66
May	24,900	3,290	8,130	2.56	2.95
June	38,000	3,140	11,000	3.46	3.86
July	3,740	1,450	2,140	.673	.78
August	28,700	2,110	9,370	2.95	3.40
September	2,780	908	1,370	.431	.48
The year	40,700	908	6,560	2.06	28.00

PINEY CREEK NEAR BIG PINEY, MO.

LOCATION.—In NE. ¼ sec. 8, T. 34 N., R. 10 W., at Ross highway bridge, 3 miles east of Big Piney, Pulaski County, and 14 miles above Spring Creek.

DRAINAGE AREA.—560 square miles (measured on United States soil survey maps).

RECORDS AVAILABLE.—October 13, 1921, to September 30, 1927.

EQUIPMENT.—Chain gage on upstream side of bridge. Discharge measurements made from bridge or by wading.

CHANNEL AND CONTROL.—Bed composed of gravel and rock. Right bank high; left bank overflowed at stage of 10 feet. Control is coarse gravel and rock bar 300 feet below gage; practically permanent.

EXTREMES OF DISCHARGE.—Maximum stage during year, determined from levels to floodmark, 15.5 feet April 1 (discharge, 14,100 second-feet); minimum, 2.12 feet September 26 (discharge, 186 second-feet).

1921–1927: Maximum stage, that of April 1, 1927; minimum, 1.60 feet July 30 and 31, 1926 (discharge, 76 second-feet).

DIVERSIONS AND REGULATION.—No diversions. Natural regulation through large springs.

ACCURACY.—Stage-discharge relation permanent during year; not affected by ice. Rating curve well defined below and fairly well defined above 10,000 second-feet by 27 discharge measurements, 4 of which were made during the year. Gage read to hundredths once daily; readings somewhat unreliable. Daily discharge ascertained by applying daily gage height to rating table. Records rather poor.

Daily discharge, in second-feet, of Piney Creek near Big Piney, Mo., for the year ending September 30, 1927

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	690	435	950	195	880	600	11,800	1,240	7,420	460	238	410
2	880	435	880	195	880	486	5,210	1,240	8,100	410	231	388
3	880	410	570	214	810	486	2,700	1,240	9,260	410	224	388
4	880	410	512	214	810	570	2,150	1,240	3,300	388	210	365
5	460	388	460	365	630	660	1,400	1,240	2,060	365	204	344
6	435	365	460	541	570		1,240	4,660	1,640	365	204	322
7	410	344	435	1,090	486		2,510	2,600	1,240	365	198	322
8	410	322	388	1,400	460		4,550	1,640	1,090	344	198	301
9	344	365	344	810	435		3,500	1,480	1,090	322	4,220	280
10	322	388	410	570	435	800	3,200	1,400	1,020	301	5,540	280
11	301	388	600	1,880	410		3,000	1,240	1,020	280	2,510	280
12	301	435	570	2,600	410		5,650	1,240	2,510	280	2,420	262
13	280	541	486	2,060	410		6,750	1,090	2,060	262	1,240	245
14	262	570	460	1,240	410		12,000	1,090	1,800	245	810	245
15	245	1,400	435	1,090	365		8,560	1,090	1,720	262	12,200	245
16	245	720	410	1,090	344	880	4,220	1,020	750	262	5,980	231
17	245	570	365	1,090	344	1,090	2,600	1,020	690	245	7,190	224
18	245	4,660	322	1,020	322	1,020	6,860	950	660	245	8,450	217
19	245	2,330	301	1,400	322	950	3,400	750	630	245	1,240	217
20	238	1,400	301	1,240	322	690	3,000	720	630	245	720	210
21	231	1,020	280	1,240	301	690	2,060	660	600	4,110	690	204
22	231	950	322	2,510	301	660	1,880	600	570	1,320	660	204
23	224	880	301	1,240	280	630	1,400	570	570	660	630	198
24	224	880	280	1,160	280	570	1,400	570	486	600	630	192
25	217	1,240	280	1,090	280	541	1,400	7,420	486	570	600	192
26	210	1,020	262	1,090	280	541	1,400	4,330	512	570	570	186
27	210	950	262	1,090	301	512	1,320	2,700	486	460	541	198
28	301	950	245	1,090	322	512	1,320	2,420	486	388	486	231
29	486	950	245	1,020	-------	541	1,320	1,640	460	280	460	280
30	1,090	950	245	950	-------	6,090	1,320	1,480	460	262	435	388
31	570	-------	245	880	-------	7,080	-------	1,240	-------	245	435	-------

NOTE.—Discharge interpolated Nov. 22. Gage readings Mar. 6–15 unreliable; mean discharge estimated.

Monthly discharge of Piney Creek near Big Piney, Mo., for the year ending September 30, 1927

[Drainage area, 560 square miles]

Month	Discharge in second-feet				Run-off in inches
	Maximum	Minimum	Mean	Per square mile	
October	1,090	210	397	0.709	0.82
November	4,660	322	889	1.59	1.77
December	950	245	407	.727	.84
January	2,600	195	1,090	1.95	2.25
February	880	280	443	.791	.82
March	7,080	486	1,090	1.95	2.25
April	12,000	1,240	3,640	6.50	7.25
May	7,420	570	1,670	2.98	3.44
June	9,260	460	1,790	3.20	3.57
July	4,110	245	509	.909	1.05
August	12,200	198	1,950	3.48	4.01
September	410	186	268	.479	.53
The year	12,200	186	1,180	2.11	28.60

MISCELLANEOUS DISCHARGE MEASUREMENTS

Measurements of the flow of streams in the Missouri River Basin at points other than regular gaging stations are recorded in the following table:

Miscellaneous discharge measurements in Missouri River drainage basin during the year ending September 30, 1927

Date	Stream	Tributary to—	Locality	Gage height	Discharge
				Feet	*Sec.-ft.*
Jan. 21	North Fork of Little Boulder River.	Boulder River	¼ mile above mouth, in SW. ¼ sec. 8, T. 5 N., R. 4 W., Montana.	[a] 0.22	2.0
Apr. 2	do	do	do	.23	2.6
June 3	do	do	do	1.61	38.5
8	do	do	do	2.16	68
Aug. 5	do	do	do	.46	4.2
Sept. 13	do	do	do	.42	4.0
June 24	Wolf Creek	Judith River	SE. ¼ sec. 26, T. 16 N., R 11 E., 6 miles southwest of Stanford, Mont.	2.94	90
July 29	do	do	do	1.12	16.7
June 2	Lefthand Creek	South St. Vrain Creek.	Sec. 26, T. 2 N., R. 71 W., Colorado.	.99	23
30	do	do	do	.99	16
Dec. 10	Sac River	Osage River	10 miles west of Collins, Mo.	7.70	4,360
9	Boylers Mill Spring	Buffalo Creek	Boylers Mill, Morgan County, Mo.		1.2
Sept. 11	Hahatonka Spring	Niangua River	Hahatonka, Mo.		123
Jan. 4	Wilkins Spring	Mill Creek	7 miles southwest of Newburg, Mo.		7.2

[a] Ice present.

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