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HAROLD L. ICKES, Secretary  
GEOLOGICAL SURVEY  
W. C. MENDENHALL, Director

Water-Supply Paper 754

# SURFACE WATER SUPPLY *of the* UNITED STATES

PART 2

## NORTH PACIFIC SLOPE BASINS C. PACIFIC SLOPE BASINS IN OREGON AND LOWER COLUMBIA RIVER BASIN

NATHAN C. GROVER, Chief Hydraulic Engineer  
G. H. CANFIELD and G. L. BARKER  
District Engineers

Prepared in cooperation with the States of  
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## ILLUSTRATION

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| FIGURE 1. Typical river-measurement station showing concrete well and<br>house for water-stage recorder and staff gages, cable, and<br>car..... | Page<br>3 |
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# SURFACE WATER SUPPLY OF PACIFIC SLOPE BASINS IN OREGON AND LOWER COLUMBIA RIVER BASIN, 1933

## 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 year ending September 30, 1933.

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 the 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. 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, 1895-1934*

|            |               |            |                |           |                           |
|------------|---------------|------------|----------------|-----------|---------------------------|
| 1895-----  | \$13, 500. 00 | 1911-17--- | \$150, 000. 00 | 1928----- | \$147, 000. 00            |
| 1896-----  | 24, 500. 00   | 1918-----  | 175, 000. 00   | 1929----- | 270, 500. 00              |
| 1897-99--- | 50, 000. 00   | 1919-----  | 148, 244. 10   | 1930----- | 275, 000. 00              |
| 1900-----  | 70, 000. 00   | 1920-----  | 175, 000. 00   | 1931----- | 565, 000. 00              |
| 1901-2---- | 100, 000. 00  | 1921-23--- | 180, 000. 00   | 1932----- | 711, 000. 00              |
| 1903-6---- | 200, 000. 00  | 1924-25--- | 170, 000. 00   | 1933----- | 600, 000. 00              |
| 1907-----  | 150, 000. 00  | 1926-----  | 165, 000. 00   | 1934----- | <sup>1</sup> 540, 000. 00 |
| 1908-10--- | 100, 000. 00  | 1927-----  | 151, 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 6,680 points in the United States and also at many points in Alaska and the

<sup>1</sup> Only \$340,000 available for expenditure.

Hawaiian Islands. In July 1931, 2,800 gaging stations were being maintained by the Geological Survey and the cooperating organizations. Many miscellaneous discharge measurements were 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 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 natural section or stretch of the channel or artificial structure below the gage which determines the stage-discharge relation at the gage.

### EXPLANATION OF DATA

The data presented in this report cover the year beginning October 1, 1932, and ending September 30, 1933. At the beginning of January in most parts of the United States much of the precipitation in

the preceding 3 months is stored in the form of snow or ice, or in ponds, lakes, and swamps, or as underground 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.

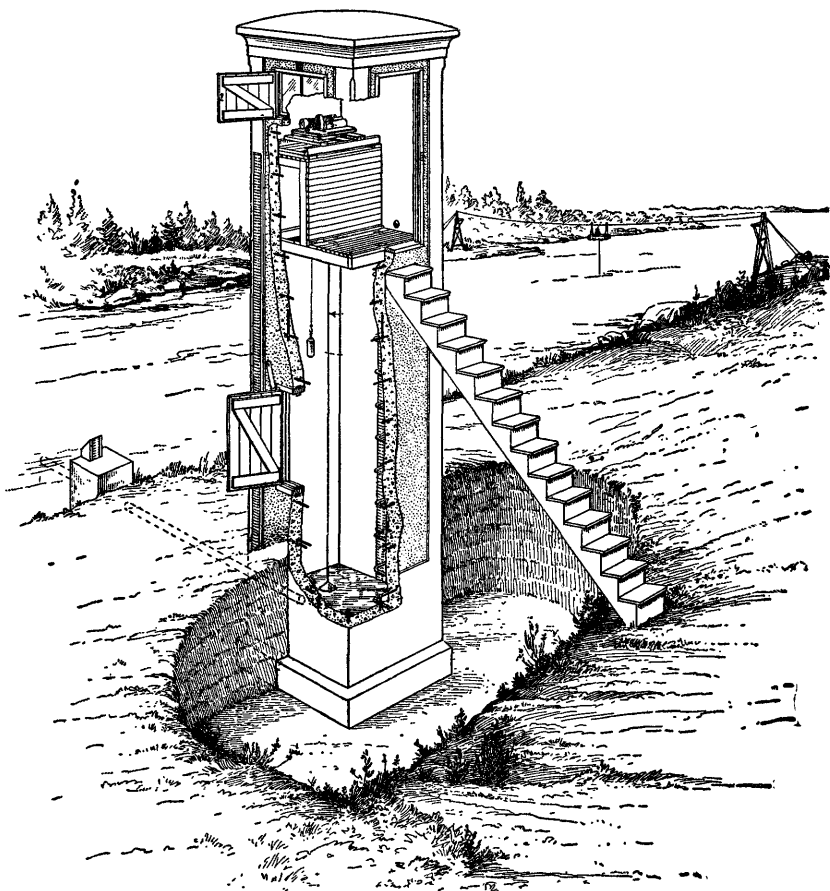


FIGURE 1.—Typical river-measurement station showing concrete well and house for water-stage recorder and staff gages, cable, and car.

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 determining 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.

Rating tables, giving the discharge for any stage, are prepared from the discharge measurements. The application of the daily gage height 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 showing the daily discharge of the stream, and a table of monthly and yearly discharge and run-off.

The description of the station gives information in regard to the location and type of gage, diversions that decrease the flow at the gage, artificial regulation from pondage or storage, and the accuracy of the records. Information under "Discharge" gives the maximum and minimum recorded discharges and the average discharge. The maximum does not necessarily represent the crest discharge unless a water-stage recorder was in operation or a non-recording gage was read at the time of the crest. Likewise, the minimum may not represent the lowest discharge. The average discharge is the average of the mean annual discharges for the years indicated. It is given only for stations for which there are 10 or more complete years of record.

The table of daily discharge gives, in general, the discharge in second-feet corresponding to the daily gage height, which may be a once daily reading or the mean of twice daily readings of a non-recording gage, or the mean daily gage height obtained from a water-stage recorder graph.

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 for intervals of the day or by using the discharge integrator, an instrument for obtaining mean daily discharge from a continuous gage-height graph and containing as an essential element the rating curve of the station.

In the table of monthly discharge the column headed "Maximum" gives the maximum daily discharge and not the discharge when the water surface was at crest height. Likewise, in the column headed "Minimum" the quantity given is the minimum daily discharge. 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 permanency of the stage-discharge relation and (2) on the accuracy of observations of stage, measurements of flow, and interpretation of records.

The station description gives a statement in regard to the general accuracy of the records. "Excellent" indicates that in general the daily records are accurate within 5 percent; "good", within 10 percent; "fair", within 15 percent; and "poor", 20 percent or more.

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.

The table of monthly discharge gives a general idea of the flow at the station. The table of daily discharge allows 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.

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 first be satisfied.

## 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 power, 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 1. North Atlantic slope basins (St. John River to York River).

2. South Atlantic slope and eastern Gulf of Mexico basins (James River to Mississippi River).
3. Ohio River Basin.
4. St. Lawrence River Basin.
5. Hudson Bay and upper Mississippi River Basins.
6. Missouri River Basin.
7. Lower Mississippi River Basin.
8. Western Gulf of Mexico basins.
9. Colorado River Basin.
10. The Great Basin.
11. Pacific slope basins in California.
12. 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, Maine, Statehouse.  
 Boston, Mass., 945 Post Office Building.  
 Hartford, Conn., 203 Federal Building.  
 Albany, N.Y., 353 Broadway.  
 Trenton, N.J., 228 Federal Building.  
 Harrisburg, Pa., 492 Education Building.  
 Charlottesville, Va., University of Virginia.  
 South Charleston, W.Va., Naval Ordnance Plant.  
 Asheville, N.C., 220 Post Office Building.  
 Columbia, S.C., 801 National Loan & Exchange Bank Building.  
 Ocala, Fla., Post Office Building.  
 Montgomery, Ala., Post Office Building.  
 Chattanooga, Tenn., 217 Post Office Building.  
 Columbus, Ohio, Engineering Experiment Station, Ohio State University.  
 Indianapolis, Ind., 319 Federal Building.  
 Urbana, Ill., 302 University New Agricultural Building.  
 Madison, Wis., 337N State Capitol.  
 St. Paul, Minn., 808 New Post Office Building.  
 Iowa City, Iowa, 402 Hydraulic Laboratory, University of Iowa.  
 St. Louis, Mo., Customhouse.

Rolla, Mo., Missouri Geological Survey Building, Missouri School of Mines and Metallurgy.

Topeka, Kans., 305 Federal Building.

Fort Smith, Ark., Post Office Building.

Austin, Tex., State Highway Building.

Santa Fe, N.Mex., State Capitol.

Tucson, Ariz., 210 Post Office Building.

Denver, Colo., 403 Post Office Building.

Salt Lake City, Utah, 303 Federal Building.

Idaho Falls, Idaho, 228 Federal Building.

Boise, Idaho, 429 Federal Building.

Helena, Mont., 421 Federal Building.

Tacoma, Wash., 406 Federal Building.

Portland, Oreg., 606 Post Office Building.

San Francisco, Calif., 303 Customhouse.

Los Angeles, Calif., 510 Eighth and Figueroa Building.

Honolulu, Hawaii, 225 Federal Building.

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

Stream-flow records have been obtained at about 6,680 points in the United States, and the data obtained have been published in the reports tabulated as follows:

*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 Sept. 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.....                                                                                           | 1893-94.               |
| 16th A, pt. 2..... | Descriptive information only.....                                                                                                                    |                        |
| B 140.....         | Descriptions, measurements, gage heights, ratings, and monthly discharge (also many data covering earlier years).                                    | 1895.                  |
| 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).                                               | 1895-96.               |
| W 15.....          | Descriptions, measurements, and gage heights, eastern United States, eastern Mississippi River, and Missouri River above junction with Kansas River. | 1897.                  |
| W 16.....          | Descriptions, measurements, and gage heights, western Mississippi River below junction of Missouri and Platte Rivers, 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.                  |

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

| Report            | Character of data  | Year     |
|-------------------|--------------------|----------|
| W 281 to 292..... | Complete data..... | 1910.    |
| W 301 to 312..... | do.....            | 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.    |
| W 661 to 674..... | do.....            | 1928.    |
| W 681 to 694..... | do.....            | 1929.    |
| W 696 to 709..... | do.....            | 1930.    |
| W 711 to 724..... | do.....            | 1931.    |
| W 726 to 739..... | do.....            | 1932.    |
| W 741 to 754..... | do.....            | 1933.    |

The records at most of the stations discussed in these reports extend over a series of years. Miscellaneous measurements at many points other than regular gaging stations have been made each year and are published under "Miscellaneous discharge measurements" at the end of each report in the same relative order as the regular gaging stations. 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 1933. The data for any particular station will, as a rule, be found in the reports covering the years during which the station was maintained. For example, data for 1910 to 1920 for any station in the area covered by part 3 are published in Water-Supply Papers 283, 303, 323, 353, 383, 403, 433, 453, 473, and 503, which contain records for the Ohio River Basin for those years.

*Numbers of water-supply papers containing results of stream measurements, 1899-1933*

[For basins included see p. 61]

| Year              | 1        | 2        | 3      | 4      | 5           | 6        | 7      | 8      | 9        | 10       | 11     | 12-A   | 12-B   | 12-C   |
|-------------------|----------|----------|--------|--------|-------------|----------|--------|--------|----------|----------|--------|--------|--------|--------|
| 1899 <sup>a</sup> | 35       | 35, 36   | 36     | 36     | 36          | 36, 37   | 37     | 37     | 37, 38   | 38, 39   | 38, 39 | 38     | 38     | 38     |
| 1900 <sup>a</sup> | 47, 48   | 49       | 49     | 49     | 49          | 49, 50   | 50     | 50     | 50       | 50, 51   | 51     | 51     | 51     | 51     |
| 1901 <sup>a</sup> | 65, 75   | 65, 75   | 65, 75 | 65, 75 | 65, 75      | 66, 75   | 66, 75 | 66, 75 | 66, 75   | 66, 75   | 66, 75 | 66, 75 | 66, 75 | 66, 75 |
| 1902 <sup>a</sup> | 82, 83   | 82, 83   | 83     | 83     | 83, 85      | 84       | 84     | 84     | 85       | 85       | 85     | 85     | 85     | 85     |
| 1903 <sup>a</sup> | 97       | 97, 98   | 98     | 97     | 98, 99, 100 | 99       | 99     | 99     | 100      | 100      | 100    | 100    | 100    | 100    |
| 1904 <sup>a</sup> | 126, 127 | 126, 127 | 128    | 128    | 128, 130    | 130, 131 | 131    | 132    | 133      | 133, 134 | 133    | 135    | 135    | 135    |
| 1905 <sup>a</sup> | 166, 167 | 167, 168 | 169    | 170    | 170, 171    | 172      | 173    | 174    | 175, 177 | 176, 177 | 177    | 178    | 178    | 178    |
| 1906 <sup>a</sup> | 203      | 203      | 205    | 206    | 207         | 208      | 209    | 210    | 211, 213 | 212, 213 | 213    | 214    | 214    | 214    |
| 1907 <sup>a</sup> | 242      | 242      | 243    | 244    | 245         | 246      | 247    | 248    | 249      | 250, 251 | 251    | 252    | 252    | 252    |
| 1908 <sup>a</sup> | 282      | 282      | 283    | 284    | 285         | 286      | 287    | 288    | 289      | 290, 291 | 291    | 292    | 292    | 292    |
| 1909 <sup>a</sup> | 281      | 282      | 283    | 284    | 285         | 286      | 287    | 288    | 289      | 290, 291 | 291    | 292    | 292    | 292    |
| 1910 <sup>a</sup> | 301      | 302      | 303    | 304    | 305         | 306      | 307    | 308    | 309      | 310      | 311    | 312    | 312    | 312    |
| 1911 <sup>a</sup> | 321      | 322      | 323    | 324    | 325         | 326      | 327    | 328    | 329      | 330      | 331    | 332-A  | 332-B  | 332-C  |
| 1912 <sup>a</sup> | 351      | 352      | 353    | 354    | 355         | 356      | 357    | 358    | 359      | 360      | 361    | 362-A  | 362-B  | 362-C  |
| 1913 <sup>a</sup> | 381      | 382      | 383    | 384    | 385         | 386      | 387    | 388    | 389      | 390      | 391    | 392    | 393    | 394    |
| 1914 <sup>a</sup> | 401      | 402      | 403    | 404    | 405         | 406      | 407    | 408    | 409      | 410      | 411    | 412    | 413    | 414    |
| 1915 <sup>a</sup> | 431      | 432      | 433    | 434    | 435         | 436      | 437    | 438    | 439      | 440      | 441    | 442    | 443    | 444    |
| 1916 <sup>a</sup> | 451      | 452      | 453    | 454    | 455         | 456      | 457    | 458    | 459      | 460      | 461    | 462    | 463    | 464    |
| 1917 <sup>a</sup> | 471      | 472      | 473    | 474    | 475         | 476      | 477    | 478    | 479      | 480      | 481    | 482    | 483    | 484    |
| 1918 <sup>a</sup> | 501      | 502      | 503    | 504    | 505         | 506      | 507    | 508    | 509      | 510      | 511    | 512    | 513    | 514    |
| 1919 <sup>a</sup> | 521      | 522      | 523    | 524    | 525         | 526      | 527    | 528    | 529      | 530      | 531    | 532    | 533    | 534    |
| 1920 <sup>a</sup> | 541      | 542      | 543    | 544    | 545         | 546      | 547    | 548    | 549      | 550      | 551    | 552    | 553    | 554    |
| 1921 <sup>a</sup> | 561      | 562      | 563    | 564    | 565         | 566      | 567    | 568    | 569      | 570      | 571    | 572    | 573    | 574    |
| 1922 <sup>a</sup> | 581      | 582      | 583    | 584    | 585         | 586      | 587    | 588    | 589      | 590      | 591    | 592    | 593    | 594    |
| 1923 <sup>a</sup> | 601      | 602      | 603    | 604    | 605         | 606      | 607    | 608    | 609      | 610      | 611    | 612    | 613    | 614    |
| 1924 <sup>a</sup> | 621      | 622      | 623    | 624    | 625         | 626      | 627    | 628    | 629      | 630      | 631    | 632    | 633    | 634    |
| 1925 <sup>a</sup> | 641      | 642      | 643    | 644    | 645         | 646      | 647    | 648    | 649      | 650      | 651    | 652    | 653    | 654    |
| 1926 <sup>a</sup> | 661      | 662      | 663    | 664    | 665         | 666      | 667    | 668    | 669      | 670      | 671    | 672    | 673    | 674    |
| 1927 <sup>a</sup> | 681      | 682      | 683    | 684    | 685         | 686      | 687    | 688    | 689      | 690      | 691    | 692    | 693    | 694    |
| 1928 <sup>a</sup> | 696      | 697      | 698    | 699    | 700         | 701      | 702    | 703    | 704      | 705      | 706    | 707    | 708    | 709    |
| 1929 <sup>a</sup> | 711      | 712      | 713    | 714    | 715         | 716      | 717    | 718    | 719      | 720      | 721    | 722    | 723    | 724    |
| 1930 <sup>a</sup> | 726      | 727      | 728    | 729    | 730         | 731      | 732    | 733    | 734      | 735      | 736    | 737    | 738    | 739    |
| 1931 <sup>a</sup> | 741      | 742      | 743    | 744    | 745         | 746      | 747    | 748    | 749      | 750      | 751    | 752    | 753    | 754    |
| 1932 <sup>a</sup> | 746      | 747      | 748    | 749    | 750         | 751      | 752    | 753    | 754      | 755      | 756    | 757    | 758    | 759    |
| 1933 <sup>a</sup> | 751      | 752      | 753    | 754    | 755         | 756      | 757    | 758    | 759      | 760      | 761    | 762    | 763    | 764    |

<sup>a</sup> Rating tables and index to Water-Supply Papers 35-39 contained in Water-Supply

Paper 39. Monthly discharge for 1899 in Twenty-first Annual Report, part 4.

<sup>b</sup> James River only

<sup>c</sup> Gallatin River.

<sup>d</sup> Green and Gunnison Rivers and Colorado River above Gunnison River.

<sup>e</sup> Mojave River only.

<sup>f</sup> Kings and Kern Rivers and south Pacific slope basins.

<sup>g</sup> 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 of monthly discharge for 1900 in Twenty-second Annual Report, part 4.

<sup>h</sup> Wisconsin and Schuykill Rivers to James River.

<sup>i</sup> Scioto River.

<sup>j</sup> Loup and Platte Rivers near Columbus, Nebr., and all tributaries below junction

with Platte River

<sup>k</sup> Tributaries of Mississippi River from east.

<sup>l</sup> Lake Ontario and tributaries to St. Lawrence River proper.

<sup>m</sup> Hudson Bay only.

<sup>n</sup> New England rivers only.

<sup>o</sup> Hudson River to Delaware River, inclusive.

<sup>p</sup> Susquehanna River to Yakin River, inclusive.

<sup>q</sup> Plate and Kansas Rivers.

<sup>r</sup> The Great Basin in California, except Truckee and Carson River Basins.

<sup>s</sup> Below Junction with Gila River.

<sup>t</sup> Rogue, Umpqua, and Siletz Rivers only.

### COOPERATION

The work was done in cooperation with the States as follows: In Oregon with Charles E. Stricklin, State engineer; and in Washington with the Department of Conservation and Development, Erle J. Barnes succeeded by E. F. Banker as director, and Charles J. Bartholet, supervisor of hydraulics.

Acknowledgment is due also to the Corps of Engineers, United States Army, for financial assistance in collecting records published herein.

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### DIVISION OF WORK

The data for stations in Oregon were collected and prepared for publication under the direction of G. H. Canfield, district engineer, assisted by K. N. Phillips, B. S. Barnes, A. H. Williams, A. B. Goodwin, C. A. Young, W. T. Miller, A. R. Peracca, and Miss Belle Irwin, except for stations noted in station descriptions for which data were collected by the State of Oregon under the supervision of Charles E. Stricklin and for which records were computed in the office of the Oregon State engineer and were reviewed, checked, and prepared for publication by G. H. Canfield, K. N. Phillips, and A. H. Williams.

The data for stations in Washington were collected and prepared for publication under the direction of G. L. Parker, district engineer, assisted by D. J. F. Calkins, R. B. Kilgore, G. M. Thayer, H. C. Woster, J. P. Bonner, Frank Stermitz, L. I. Meyer, A. P. Martinson, J. W. Allan, R. F. Bullard, L. F. Maca, B. M. Thomas, M. C. Miller and E. V. Hansen.

The records were reviewed and the manuscript assembled by David S. Jenkins.

## GAGING-STATION RECORDS

## COLUMBIA RIVER

## COLUMBIA RIVER AT THE DALLES, OREG.

LOCATION.—Staff gages at The Dalles and 13 miles upstream, above Celilo Falls.

Zero of gage at The Dalles is 46.86 feet and above Celilo Falls is 37.59 feet above mean sea level by general adjustment of 1929. Discharge measurements made from cable at The Dalles.

DRAINAGE AREA.—237,000 square miles (above measuring section).

RECORDS AVAILABLE.—June 1878 to September 1933; maximum stages 1858 to 1877.

DISCHARGE.—Maximum during year, 722,000 second-feet June 18, 19; minimum, 47,200 second-feet Feb. 14 (gage height, 89.6 feet on gage above Celilo Falls). Maximum gage height June 18, 19, 40.5 feet on gage at The Dalles and 110.0 feet on gage above Celilo Falls.

1858–1933: Maximum, 1,170,000 second-feet June 6, 1894 (gage height, 59.6 feet on gage at The Dalles and 122.5 feet on gage above Celilo Falls); minimum, 40,000 second-feet Jan. 18, 21, 1930, Feb. 3, 4, 1932 (gage height, 88.8 feet on gage above Celilo Falls). Average, 55 years (1878–1933), 201,000 second-feet.

REMARKS.—Records excellent. Storage and diversions for irrigation are only a small part of total run-off. Gage-height records furnished by U. S. Weather Bureau and Corps of Engineers, U. S. Army.

*Discharge, in second-feet, 1932–33*

| Day | Oct.   | Nov.    | Dec.    | Jan.    | Feb.   | Mar.    | Apr.    | May     | June    | July    | Aug.    | Sept.   |
|-----|--------|---------|---------|---------|--------|---------|---------|---------|---------|---------|---------|---------|
| 1   | 88,700 | 77,300  | 95,600  | 88,700  | 73,100 | 73,100  | 121,000 | 286,000 | 453,000 | 565,000 | 282,000 | 158,000 |
| 2   | 86,400 | 77,300  | 88,000  | 86,400  | 73,100 | 69,100  | 123,000 | 289,000 | 495,000 | 557,000 | 275,000 | 156,000 |
| 3   | 86,400 | 77,300  | 88,000  | 88,700  | 73,100 | 71,100  | 126,000 | 286,000 | 514,000 | 541,000 | 272,000 | 153,000 |
| 4   | 81,800 | 77,300  | 100,000 | 88,700  | 73,100 | 75,200  | 126,000 | 282,000 | 529,000 | 553,000 | 261,000 | 150,000 |
| 5   | 81,800 | 79,500  | 105,000 | 88,700  | 71,100 | 81,800  | 131,000 | 279,000 | 549,000 | 526,000 | 254,000 | 147,000 |
| 6   | 79,500 | 79,500  | 110,000 | 91,000  | 71,100 | 86,400  | 147,000 | 279,000 | 577,000 | 518,000 | 247,000 | 147,000 |
| 7   | 77,300 | 79,500  | 110,000 | 93,300  | 69,100 | 86,400  | 150,000 | 279,000 | 593,000 | 507,000 | 243,000 | 145,000 |
| 8   | 77,300 | 77,300  | 110,000 | 95,600  | 69,100 | 86,400  | 150,000 | 275,000 | 597,000 | 495,000 | 240,000 | 142,000 |
| 9   | 77,300 | 81,800  | 110,000 | 93,300  | 65,200 | 84,100  | 145,000 | 275,000 | 597,000 | 480,000 | 233,000 | 139,000 |
| 10  | 77,300 | 84,100  | 108,000 | 110,000 | 59,900 | 81,800  | 142,000 | 268,000 | 601,000 | 465,000 | 226,000 | 139,000 |
| 11  | 77,300 | 81,800  | 95,600  | 121,000 | 58,200 | 81,800  | 134,000 | 268,000 | 653,000 | 457,000 | 219,000 | 136,000 |
| 12  | 77,300 | 79,500  | 95,600  | 116,000 | 59,900 | 86,400  | 126,000 | 261,000 | 676,000 | 450,000 | 212,000 | 131,000 |
| 13  | 77,300 | 79,500  | 93,300  | 116,000 | 50,800 | 86,400  | 121,000 | 261,000 | 653,000 | 442,000 | 209,000 | 131,000 |
| 14  | 77,300 | 79,500  | 91,000  | 108,000 | 47,200 | 91,000  | 121,000 | 261,000 | 657,000 | 435,000 | 206,000 | 131,000 |
| 15  | 77,300 | 81,800  | 86,400  | 100,000 | 53,500 | 100,000 | 121,000 | 268,000 | 676,000 | 427,000 | 200,000 | 128,000 |
| 16  | 77,300 | 95,600  | 79,500  | 100,000 | 55,000 | 103,000 | 123,000 | 279,000 | 691,000 | 420,000 | 200,000 | 126,000 |
| 17  | 77,300 | 95,600  | 75,200  | 95,600  | 58,200 | 105,000 | 126,000 | 293,000 | 714,000 | 413,000 | 200,000 | 123,000 |
| 18  | 77,300 | 100,000 | 73,100  | 93,300  | 65,200 | 105,000 | 131,000 | 304,000 | 722,000 | 405,000 | 196,000 | 123,000 |
| 19  | 77,300 | 108,000 | 81,800  | 88,700  | 67,100 | 110,000 | 134,000 | 311,000 | 718,000 | 390,000 | 196,000 | 123,000 |
| 20  | 77,300 | 126,000 | 84,100  | 86,400  | 73,100 | 110,000 | 136,000 | 318,000 | 699,000 | 390,000 | 193,000 | 123,000 |
| 21  | 77,300 | 126,000 | 86,400  | 86,400  | 77,300 | 110,000 | 136,000 | 322,000 | 676,000 | 383,000 | 193,000 | 123,000 |
| 22  | 77,300 | 121,000 | 91,000  | 81,800  | 86,400 | 110,000 | 142,000 | 322,000 | 668,000 | 376,000 | 193,000 | 121,000 |
| 23  | 77,300 | 116,000 | 91,000  | 79,500  | 95,600 | 110,000 | 147,000 | 325,000 | 653,000 | 365,000 | 187,000 | 121,000 |
| 24  | 77,300 | 110,000 | 95,600  | 79,500  | 91,000 | 110,000 | 158,000 | 332,000 | 641,000 | 354,000 | 187,000 | 118,000 |
| 25  | 77,300 | 108,000 | 100,000 | 79,500  | 88,700 | 105,000 | 175,000 | 343,000 | 625,000 | 347,000 | 184,000 | 116,000 |
| 26  | 77,300 | 105,000 | 100,000 | 77,300  | 88,700 | 103,000 | 196,000 | 354,000 | 613,000 | 336,000 | 184,000 | 116,000 |
| 27  | 77,300 | 100,000 | 98,000  | 75,200  | 77,300 | 100,000 | 216,000 | 365,000 | 601,000 | 322,000 | 181,000 | 116,000 |
| 28  | 77,300 | 98,000  | 98,000  | 77,300  | 75,200 | 95,600  | 233,000 | 390,000 | 593,000 | 311,000 | 175,000 | 116,000 |
| 29  | 77,300 | 98,000  | 95,600  | 75,200  | -----  | 98,000  | 257,000 | 413,000 | 581,000 | 304,000 | 170,000 | 113,000 |
| 30  | 79,500 | 95,600  | 95,600  | 73,100  | -----  | 103,000 | 279,000 | 420,000 | 573,000 | 297,000 | 175,000 | 113,000 |
| 31  | 79,500 | -----   | 93,300  | 71,100  | -----  | 116,000 | -----   | 427,000 | -----   | 289,000 | 167,000 | -----   |

*Discharge, in second-feet, of Columbia River at The Dalles, Oreg., 1932-33—Con.*

| Month          | Maximum | Minimum | Mean    | Per<br>square<br>mile | Run-off |             |
|----------------|---------|---------|---------|-----------------------|---------|-------------|
|                |         |         |         |                       | Inches  | Acre-feet   |
| October.....   | 88,700  | 77,300  | 78,800  | 0.332                 | 0.38    | 4,850,000   |
| November.....  | 126,000 | 77,300  | 93,200  | .393                  | .44     | 5,550,000   |
| December.....  | 110,000 | 73,100  | 95,000  | .401                  | .46     | 5,840,000   |
| January.....   | 121,000 | 71,100  | 90,500  | .382                  | .44     | 5,560,000   |
| February.....  | 95,600  | 47,200  | 70,200  | .296                  | .31     | 3,900,000   |
| March.....     | 116,000 | 69,100  | 94,700  | .400                  | .46     | 5,820,000   |
| April.....     | 279,000 | 121,000 | 152,000 | .641                  | .72     | 9,040,000   |
| May.....       | 427,000 | 261,000 | 311,000 | 1.31                  | 1.51    | 19,100,000  |
| June.....      | 722,000 | 453,000 | 620,000 | 2.62                  | 2.92    | 36,900,000  |
| July.....      | 565,000 | 289,000 | 423,000 | 1.78                  | 2.05    | 26,000,000  |
| August.....    | 282,000 | 167,000 | 212,000 | .895                  | 1.03    | 13,000,000  |
| September..... | 158,000 | 113,000 | 131,000 | .553                  | .62     | 7,800,000   |
| The year.....  | 722,000 | 47,200  | 198,000 | .835                  | 11.34   | 143,000,000 |

## TRIBUTARIES OF COLUMBIA RIVER BELOW SNAKE RIVER

## WALLA WALLA RIVER BASIN

## SOUTH FORK OF WALLA WALLA RIVER NEAR MILTON, OREG.

LOCATION.—Water-stage recorder in SE¼ sec. 10, T. 4 N., R. 37 E., a third of a mile above Pacific Power & Light Co.'s penstock intake and 12 miles southeast of Milton (revised).

RECORDS AVAILABLE.—February to October 1903 (gage heights only); August 1906 to November 1917 (incomplete); May 1931 to September 1933. At station 6 miles downstream, November 1903 to May 1906.

DISCHARGE.—Maximum during year, 1,200 second-feet Nov. 17 (gage height, 4.3 feet); minimum, 89 second-feet Oct. 1 (gage height, 1.62 feet).

1903-17, 1931-33: Maximum recorded, 1,650 second-feet Apr. 14, 1904; flood of May 30-31, 1906, which washed out gage, was probably much higher; minimum, 72 second-feet Feb. 14, 1932. Average, 10 years (1904-5, 1908-15, 1931-32), 172 second-feet.

Maximum stage known, about 9 feet referred to present gage Mar. 31, 1913.

REMARKS.—Records fair except those for November to June, which are poor. No diversions or regulation above station. Records furnished by State engineer.

*Discharge, in second-feet, 1932-33*

| Day     | Oct. | Nov. | Dec. | Jan. | Feb. | Mar. | Apr. | May | June | July | Aug. | Sept. |
|---------|------|------|------|------|------|------|------|-----|------|------|------|-------|
| 1.....  | 90   | 115  | 143  | 126  | 124  | 135  | 238  | 424 | 476  | 183  | 113  | 106   |
| 2.....  | 92   | 114  | 181  | 137  | 123  | 157  | 242  | 410 | 480  | 175  | 113  | 106   |
| 3.....  | 94   | 107  | 187  | 135  | 119  | 205  | 316  | 350 | 484  | 167  | 115  | 106   |
| 4.....  | 93   | 108  | 178  | 133  | 119  | 165  | 330  | 344 | 488  | 159  | 118  | 106   |
| 5.....  | 93   | 130  | 175  | 157  | 121  | 147  | 302  | 316 | 424  | 154  | 116  | 106   |
| 6.....  | 93   | 177  | 167  | 208  | 119  | 143  | 298  | 294 | 396  | 147  | 115  | 106   |
| 7.....  | 93   | 128  | 157  | 223  | 119  | 145  | 277  | 302 | 386  | 147  | 112  | 105   |
| 8.....  | 93   | 216  | 139  | 620  | 116  | 147  | 232  | 294 | 431  | 145  | 110  | 108   |
| 9.....  | 93   | 239  |      | 452  | 115  | 147  | 202  | 274 | 504  | 145  | 110  | 110   |
| 10..... | 93   | 174  |      | 305  | 116  | 147  | 184  | 256 | 476  | 141  | 110  | 109   |
| 11..... | 93   | 149  | 127  | 246  | 116  | 172  | 181  | 249 | 428  | 135  | 110  | 108   |
| 12..... | 94   | 139  |      | 211  | 119  | 260  | 178  | 270 | 410  | 131  | 109  | 108   |
| 13..... | 97   | 142  |      | 199  | 118  | 260  | 181  | 312 | 403  | 127  | 108  | 105   |
| 14..... | 110  | 139  | 127  | 202  | 118  | 232  | 211  |     | 392  | 127  | 108  | 106   |
| 15..... | 97   | 139  |      | 193  | 113  | 239  | 284  |     | 386  | 127  | 108  | 106   |
| 16..... | 97   | 280  |      | 178  | 115  | 274  | 312  |     | 368  | 126  | 109  | 105   |
| 17..... | 102  | 708  | 131  | 167  | 115  | 274  | 266  |     | 347  | 124  | 109  | 106   |
| 18..... | 99   | 354  |      | 159  | 118  | 223  | 235  | 371 | 312  | 123  | 108  | 105   |
| 19..... | 97   | 260  |      | 154  | 116  | 196  | 238  |     | 270  | 121  | 108  | 105   |
| 20..... | 96   | 211  |      | 147  | 118  | 211  | 302  |     | 249  | 119  | 108  | 105   |
| 21..... | 96   | 187  | 116  | 147  | 121  | 232  | 354  |     | 238  | 118  | 108  | 106   |
| 22..... | 103  | 178  | 116  | 141  | 124  | 202  | 442  |     | 223  | 118  | 108  | 108   |
| 23..... | 102  | 165  | 116  | 139  | 131  | 178  | 500  | 392 | 211  | 118  | 106  | 108   |
| 24..... | 99   |      | 113  | 135  | 126  | 159  | 560  | 389 |      | 118  | 106  | 109   |
| 25..... | 99   |      | 113  | 133  | 127  | 157  | 540  | 480 |      | 116  | 108  | 109   |
| 26..... | 102  | 150  | 124  | 131  | 127  | 159  | 484  | 520 |      | 116  | 106  | 109   |
| 27..... | 102  |      | 139  | 129  | 124  | 184  | 580  | 434 | 200  | 115  | 108  | 106   |
| 28..... | 100  |      | 135  | 127  | 127  | 260  | 600  | 400 |      | 115  | 108  | 105   |
| 29..... | 105  |      | 131  | 126  |      | 266  | 560  | 466 |      | 115  | 111  | 105   |
| 30..... | 103  | 145  | 129  | 126  |      | 256  | 480  | 520 |      | 113  | 113  | 105   |
| 31..... | 110  |      | 126  | 126  |      | 260  |      | 492 |      | 113  | 112  |       |

| Month          | Maximum | Minimum | Mean | Run-off in<br>acre-feet |
|----------------|---------|---------|------|-------------------------|
| October.....   | 110     | 90      | 97.7 | 6,010                   |
| November.....  | 708     | 107     | 187  | 11,100                  |
| December.....  | 187     | 113     | 137  | 8,420                   |
| January.....   | 620     | 126     | 187  | 11,500                  |
| February.....  | 131     | 113     | 120  | 6,660                   |
| March.....     | 274     | 135     | 200  | 12,300                  |
| April.....     | 600     | 178     | 337  | 20,100                  |
| May.....       | 520     | 249     | 372  | 22,900                  |
| June.....      | 504     |         | 339  | 20,200                  |
| July.....      | 183     | 113     | 132  | 8,120                   |
| August.....    | 118     | 106     | 110  | 6,760                   |
| September..... | 110     | 105     | 107  | 6,370                   |
| The year.....  | 708     | 90      | 194  | 140,000                 |

## UMATILLA RIVER BASIN

## UMATILLA RIVER ABOVE MCKAY CREEK, NEAR PENDLETON, OREG.

LOCATION.—Water-stage recorder in NE¼ sec. 8, T. 2 N., R. 32 E., a quarter of a mile above mouth of McKay Creek and 2 miles west of Pendleton.

RECORDS AVAILABLE.—May 1921 to September 1933. Comparable records at Pendleton, February 1891 to July 1892, May 1903 to March 1906.

DISCHARGE.—Maximum during year, 5,300 second-feet Feb. 22 (gage height, 9.3 feet); minimum, 11 second-feet Aug. 18 (gage height, 2.70 feet).

1891-92, 1903-6, 1921-33: Maximum (estimated), 13,500 second-feet Apr. 1, 1931 (gage height, 10.7 feet); minimum, 7 second-feet Aug. 14, 1924 (gage height, 1.87 feet). Average, 10 years (1923-33), 462 second-feet.

REMARKS.—Records good except those estimated, Dec. 12-14, 17, 18, Feb. 10-14, and those for Feb. 23, 24, which are fair. Small diversions for irrigation above station. Considerable regulation at low stages caused by operation of mills at Pendleton. Records furnished by State engineer.

*Discharge, in second-feet, 1932-33*

| Day     | Oct. | Nov.  | Dec. | Jan.  | Feb.  | Mar.  | Apr.  | May   | June  | July | Aug. | Sept. |
|---------|------|-------|------|-------|-------|-------|-------|-------|-------|------|------|-------|
| 1.....  | 38   | 62    | 184  | 246   | 217   | 460   | 1,490 | 1,870 | 1,210 | 192  | 38   | 32    |
| 2.....  | 38   | 72    | 187  | 268   | 184   | 659   | 1,400 | 2,320 | 1,090 | 180  | 36   | 31    |
| 3.....  | 38   | 72    | 198  | 450   | 171   | 1,180 | 1,950 | 2,520 | 1,130 | 161  | 35   | 23    |
| 4.....  | 37   | 74    | 201  | 309   | 168   | 956   | 2,550 | 2,520 | 1,130 | 150  | 48   | 24    |
| 5.....  | 38   | 67    | 198  | 420   | 168   | 781   | 2,100 | 2,370 | 1,050 | 136  | 56   | 25    |
| 6.....  | 38   | 72    | 194  | 760   | 184   | 702   | 1,900 | 2,020 | 935   | 118  | 58   | 29    |
| 7.....  | 35   | 92    | 190  | 683   | 153   | 728   | 1,720 | 1,720 | 822   | 103  | 49   | 32    |
| 8.....  | 37   | 110   | 174  | 1,260 | 153   | 795   | 1,400 | 1,500 | 800   | 98   | 38   | 34    |
| 9.....  | 38   | 296   | 142  | 2,100 | 110   | 774   | 1,140 | 1,330 | 972   | 96   | 35   | 37    |
| 10..... | 40   | 306   | 125  | 1,400 |       | 734   | 924   | 1,210 | 1,050 | 92   | 32   | 43    |
| 11..... | 41   | 220   | 120  | 964   | 130   | 760   | 830   | 1,130 | 890   | 87   | 27   | 41    |
| 12..... | 39   | 181   | 120  | 747   |       | 1,260 | 908   | 1,130 | 800   | 81   | 26   | 4     |
| 13..... | 42   | 156   | 122  | 635   |       | 1,580 | 996   | 1,290 | 778   | 76   | 25   | 33    |
| 14..... | 54   | 144   | 124  | 599   |       | 1,400 | 1,140 | 1,540 | 715   | 73   | 25   | 33    |
| 15..... | 57   | 150   | 125  | 587   | 190   | 1,400 | 1,540 | 1,680 | 689   | 66   | 24   | 35    |
| 16..... | 55   | 395   | 144  | 520   | 171   | 580   | 1,800 | 1,680 | 630   | 62   | 23   | 37    |
| 17..... | 55   | 2,250 | 155  | 450   | 153   | 1,720 | 1,580 | 1,590 | 537   | 58   | 21   | 37    |
| 18..... | 55   | 1,440 | 190  | 400   | 153   | 1,360 | 1,250 | 2,020 | 465   | 52   | 18   | 42    |
| 19..... | 52   | 851   | 246  | 375   | 153   | 1,100 | 1,140 | 2,070 | 420   | 47   | 18   | 44    |
| 20..... | 51   | 605   | 187  | 335   | 246   | 1,140 | 1,440 | 1,770 | 361   | 41   | 20   | 44    |
| 21..... | 49   | 485   | 128  | 306   | 1,090 | 1,490 | 1,760 | 1,680 | 322   | 41   | 21   | 48    |
| 22..... | 58   | 405   | 120  | 287   | 1,940 | 1,260 | 2,250 | 1,540 | 301   | 39   | 19   | 50    |
| 23..... | 58   | 335   | 120  | 255   | 1,760 | 1,020 | 2,750 | 1,460 | 274   | 37   | 22   | 57    |
| 24..... | 57   | 282   | 118  | 232   | 752   | 844   | 2,850 | 1,500 | 255   | 39   | 22   | 58    |
| 25..... | 59   | 250   | 118  | 217   | 640   | 747   | 3,230 | 1,590 | 234   | 38   | 22   | 59    |
| 26..... | 59   | 224   | 122  | 205   | 520   | 721   | 2,680 | 1,920 | 214   | 36   | 22   | 61    |
| 27..... | 59   | 201   | 156  | 205   | 425   | 809   | 2,790 | 1,500 | 202   | 36   | 22   | 59    |
| 28..... | 59   | 183   | 194  | 201   | 415   | 1,220 | 3,010 | 1,370 | 220   | 36   | 23   | 57    |
| 29..... | 59   | 181   | 213  | 187   | ----- | 1,580 | 2,680 | 1,330 | 224   | 37   | 24   | 52    |
| 30..... | 57   | 194   | 278  | 184   | ----- | 1,490 | 2,320 | 1,460 | 211   | 47   | 25   | 50    |
| 31..... | 62   | ----- | 268  | 296   | ----- | 1,620 | ----- | 1,370 | ----- | 43   | 23   | ----- |

| Month          | Maximum | Minimum | Mean  | Run-off in acre-feet |
|----------------|---------|---------|-------|----------------------|
| October.....   | 62      | 35      | 48.8  | 3,000                |
| November.....  | 2,250   | 62      | 345   | 20,500               |
| December.....  | 278     | 118     | 166   | 10,200               |
| January.....   | 2,100   | 184     | 521   | 32,000               |
| February.....  | 1,940   | 110     | 384   | 21,300               |
| March.....     | 1,720   | 460     | 1,090 | 67,000               |
| April.....     | 3,230   | 830     | 1,850 | 110,000              |
| May.....       | 2,520   | 1,130   | 1,680 | 103,000              |
| June.....      | 1,210   | 202     | 631   | 37,500               |
| July.....      | 192     | 36      | 77.4  | 4,760                |
| August.....    | 58      | 18      | 28.9  | 1,780                |
| September..... | 61      | 23      | 41.4  | 2,460                |
| The year.....  | 3,230   | 18      | 572   | 414,000              |

## UMATILLA RIVER ABOVE FURNISH RESERVOIR, NEAR YOAKUM, OREG.

LOCATION.—Water-stage recorder in NW¼ sec. 17, T. 2 N., R. 31 E., at Oregon-Washington Railroad & Navigation Co.'s bridge a quarter of a mile above Campbell and 5 miles above Yoakum.

RECORDS AVAILABLE.—June 1915 to September 1933.

DISCHARGE.—Maximum during year, 4,810 second-feet Feb. 22 (gage height, 6.70 feet); minimum, 31 second-feet Oct. 22 (gage height, -0.25 foot).

1915-33: Maximum, 15,200 second-feet Mar. 19, 1932 (gage height, 12.2 feet); minimum, 14 second-feet Aug. 17, 1926 (gage height, 1.17 feet). Average, 17 years (1916-33), 684 second-feet.

REMARKS.—Records good except those for Feb. 21 to Apr. 25, and those estimated, which are fair. Diversions for irrigation above station. Flow regulated to some extent by operation of mills at Pendleton, and since 1927 by storage in McKay Reservoir. Records furnished by State engineer.

*Discharge, in second-feet, 1932-33*

| Day     | Oct. | Nov.  | Dec. | Jan.  | Feb.  | Mar.  | Apr.  | May   | June  | July | Aug. | Sept. |
|---------|------|-------|------|-------|-------|-------|-------|-------|-------|------|------|-------|
| 1.....  | 253  | 66    | 194  | 255   | 252   | 478   | 1,570 | 2,070 | 1,290 | 316  | 299  | 280   |
| 2.....  | 258  | 72    | 192  | 252   | 200   | 725   | 1,460 | 2,540 | 1,150 | 306  | 299  | 277   |
| 3.....  | 258  | 72    | 198  | 420   | 192   | 1,220 | 1,940 | 3,220 | 1,120 | 290  | 299  | 274   |
| 4.....  | 262  | 72    | 207  | 363   | 181   | 1,030 | 2,540 | 3,460 | 1,150 | 280  | 316  | 274   |
| 5.....  | 262  | 71    | 207  | 382   | 179   | 855   | 2,250 | 3,460 | 1,060 | 271  | 319  | 267   |
| 6.....  | 262  | 73    | 207  | 725   | 194   | 775   | 2,070 | 3,100 | 1,000 | 267  | 322  | 271   |
| 7.....  | 255  | 91    | 203  | 700   | 167   | 800   | 1,890 | 2,750 | 855   | 326  | 312  | 271   |
| 8.....  | 179  | 102   | 190  | 1,120 | 163   | 855   | 1,650 | 2,440 | 828   | 352  | 299  | 261   |
| 9.....  | 67   | 234   | 180  | 2,250 | 828   | 1,360 | 1,980 | 1,000 | 335   | 290  | 267  | 267   |
| 10..... | 64   | 281   | 155  | 1,570 | 800   | 1,120 | 1,570 | 1,150 | 335   | 287  | 267  | 267   |
| 11..... | 60   | 222   | 145  | 1,090 | 800   | 970   | 1,460 | 1,030 | 329   | 280  | 267  | 267   |
| 12..... | 54   | 187   | 147  | 800   | 1,320 | 1,000 | 1,460 | 855   | 326   | 283  | 261  | 261   |
| 13..... | 50   | 167   | 148  | 655   | 1,610 | 1,090 | 1,540 | 828   | 329   | 290  | 217  | 217   |
| 14..... | 59   | 161   | 150  | 588   | 1,500 | 1,180 | 1,810 | 775   | 326   | 303  | 214  | 214   |
| 15..... | 62   | 163   | 152  | 588   | 272   | 1,500 | 1,570 | 1,980 | 725   | 290  | 296  | 196   |
| 16..... | 64   | 291   | 155  | 525   | 252   | 1,610 | 1,890 | 1,980 | 655   | 264  | 296  | 202   |
| 17..... | 63   | 2,140 | 170  | 441   | 218   | 1,810 | 1,690 | 1,850 | 588   | 280  | 309  | 202   |
| 18..... | 58   | 1,570 | 259  | 403   | 188   | 1,500 | 1,400 | 2,200 | 505   | 303  | 309  | 202   |
| 19..... | 65   | 910   | 306  | 363   | 167   | 1,220 | 1,220 | 2,640 | 441   | 309  | 309  | 202   |
| 20..... | 60   | 632   | 314  | 326   | 214   | 1,220 | 1,460 | 2,340 | 394   | 322  | 312  | 202   |
| 21..... | 56   | 466   | 209  | 303   | 775   | 1,540 | 1,810 | 2,250 | 359   | 319  | 316  | 205   |
| 22..... | 54   | 386   | 167  | 282   | 1,570 | 1,400 | 2,340 | 2,070 | 339   | 316  | 312  | 208   |
| 23..... | 61   | 326   | 142  | 264   | 1,760 | 1,090 | 2,920 | 1,890 | 312   | 316  | 306  | 211   |
| 24..... | 60   | 282   | 136  | 252   | 814   | 910   | 3,220 | 1,940 | 280   | 309  | 303  | 214   |
| 25..... | 60   | 250   | 134  | 236   | 610   | 775   | 3,460 | 1,850 | 326   | 306  | 303  | 223   |
| 26..... | 60   | 227   | 136  | 225   | 588   | 750   | 2,980 | 2,200 | 329   | 303  | 299  | 184   |
| 27..... | 60   | 209   | 163  | 222   | 448   | 828   | 3,100 | 1,940 | 319   | 299  | 296  | 151   |
| 28..... | 60   | 205   | 200  | 218   | 408   | 1,260 | 3,340 | 1,690 | 329   | 299  | 293  | 144   |
| 29..... | 59   | 190   | 218  | 205   | ----- | 1,650 | 2,980 | 1,570 | 342   | 303  | 296  | 115   |
| 30..... | 64   | 200   | 264  | 200   | ----- | 1,570 | 2,590 | 1,610 | 332   | 303  | 293  | 67    |
| 31..... | 66   | ----- | 272  | 272   | ----- | 1,690 | ----- | 1,540 | ----- | 303  | 280  | ----- |

| Month          | Maximum | Minimum | Mean  | Run-off in acre-feet |
|----------------|---------|---------|-------|----------------------|
| October.....   | 262     | 50      | 109   | 6,700                |
| November.....  | 2,140   | 66      | 344   | 20,500               |
| December.....  | 314     | 134     | 191   | 11,700               |
| January.....   | 2,250   | 200     | 532   | 32,700               |
| February.....  | 1,760   | -----   | 382   | 21,200               |
| March.....     | 1,810   | 478     | 1,160 | 71,300               |
| April.....     | 3,460   | 970     | 2,000 | 119,000              |
| May.....       | 3,460   | 1,460   | 2,140 | 132,000              |
| June.....      | 1,290   | 280     | 689   | 41,000               |
| July.....      | 352     | 264     | 307   | 18,900               |
| August.....    | 322     | 280     | 301   | 18,500               |
| September..... | 280     | 67      | 220   | 13,100               |
| The year.....  | 3,460   | 50      | 699   | 507,000              |

• Estimated.

## UMATILLA RIVER NEAR UMATILLA, OREG.

LOCATION.—Water-stage recorder in NW¼ sec. 21, T. 5 N., R. 28 E., 1½ miles below West Division Main Canal of Umatilla project and 2 miles above Umatilla and mouth of river.

DRAINAGE AREA.—2,280 square miles (revised).

RECORDS AVAILABLE.—October 1903 to September 1933.

DISCHARGE.—Maximum during year, 3,020 second-feet May 6 (gage height, 5.13 feet); minimum, 7 second-feet Oct. 23, 24.

1903-33: Maximum, 19,600 second-feet May 31, 1906 (gage height, 11.0 feet); no flow at times. Average, 29 years (1904-33), 532 second-feet.

REMARKS.—Records good except those estimated for Feb. 9, 10, 12-24, which are poor, and others estimated, which are fair. Several diversions for irrigation above station; Brownell Canal diverts below. Flow regulated by storage in McKay, Furnish, and Cold Springs Reservoirs. Records furnished by State engineer.

*Discharge, in second-feet, 1932-33*

| Day     | Oct. | Nov.  | Dec.  | Jan.  | Feb.  | Mar.  | Apr.  | May   | June  | July | Aug. | Sept. |
|---------|------|-------|-------|-------|-------|-------|-------|-------|-------|------|------|-------|
| 1.....  | 80   | 21    | 73    | 150   | 139   | 314   | 1,350 | 1,810 | * 700 | 8    | 10   | 51    |
| 2.....  |      | 38    | 68    | 139   | 135   | 390   | 1,200 | 1,670 | 585   | 8    | 10   | 53    |
| 3.....  |      | 49    | 61    | 135   | 113   | 540   | 1,240 | 2,490 | 508   | 8    | 10   | 57    |
| 4.....  |      | 53    | 61    | 262   | 105   | 711   | 1,840 | 2,760 | 621   | 8    | 9    | 61    |
| 5.....  | * 65 | 57    | 57    | 238   | 102   | 740   | 2,050 | 2,970 | 740   | 8    | 8    | 57    |
| 6.....  |      | 51    | 61    | 274   | 105   | 730   | 1,670 | 2,970 | 666   | 8    | 8    | 53    |
| 7.....  | 47   | * 45  | 80    | 476   | * 110 | 702   | 1,540 | 2,510 | 555   | 8    | 8    | 59    |
| 8.....  | 59   | * 60  | 117   | 532   | * 100 | 666   | 1,330 | 2,220 | 532   | 8    | 10   | 66    |
| 9.....  | 59   | * 90  | 209   | 940   | * 250 | 666   | 1,040 | 1,840 | 549   | 8    | 18   | 63    |
| 10..... | 45   | * 100 | 214   | 1,510 | * 180 | 666   | 830   | 1,350 | 603   | 8    | 11   | 85    |
| 11..... | 43   | 71    |       | 1,050 | 164   | 630   | 675   | 1,150 | 630   | 8    | 10   | 113   |
| 12..... | 45   | 66    |       | 820   |       | 621   | 612   | 1,050 | 468   | 8    | 10   | 110   |
| 13..... | 36   | 71    | * 202 | 750   |       | 890   | 594   | 1,030 | 327   | 8    | 10   | 99    |
| 14..... | 35   | 59    |       | 711   |       | 1,210 | 576   | 1,120 | 220   | 8    | 10   | 71    |
| 15..... | 31   | 57    |       | 657   |       | 1,080 | 666   | 1,330 | 110   | 10   | 10   | 71    |
| 16..... | 30   | 66    | 220   | 558   |       | 1,140 |       | 1,380 | 63    | 10   | 11   | 80    |
| 17..... | 38   | 113   | 243   | 432   |       | 1,370 |       | 1,260 | 33    | 10   | 11   | 80    |
| 18..... | 36   | 1,250 | * 250 | 484   | * 495 | 1,330 |       | 1,330 | 11    | 10   | 10   | 78    |
| 19..... | 31   | 960   | * 250 | 439   |       | 1,030 | * 947 | 1,910 | 8     | 10   | 10   | 71    |
| 20..... | 30   | 780   | 268   | 418   |       |       |       | 1,930 | 8     | 10   | 10   | 61    |
| 21..... | 28   | 693   | 274   | 397   |       | 1,010 |       | 1,750 | 8     | 10   | 15   | 66    |
| 22..... | 28   | 468   | 243   | 385   |       | 1,180 | 1,340 | 1,790 | 8     | 12   | 17   | 61    |
| 23..... | 25   | 274   | 232   | 320   |       | 950   | 1,810 | 1,430 | 8     | 14   | 19   | 73    |
| 24..... | 19   | 209   | 209   | 232   |       | 780   | 2,240 | 1,500 | 8     | 8    | 20   | 33    |
| 25..... | 23   | 159   | 197   | 164   | 730   | 666   | 2,510 | 1,320 | 8     | 13   | 47   | 88    |
| 26..... | 25   | 135   | 192   | 132   | 648   | 639   | 2,570 | 1,460 | 8     | 12   | 25   | 88    |
| 27..... | 19   | 102   | 192   | 124   | 532   | 612   | 2,220 | 1,500 | 8     | 14   | 20   | 75    |
| 28..... | 13   | 96    | 220   | 113   | 411   | 621   | 2,410 | 1,230 | 8     | 8    | 30   | 51    |
| 29..... | 13   | 85    | 159   | 107   |       | 860   | 2,490 | 1,020 | 8     | 8    | 25   | 53    |
| 30..... | 10   | 80    | 133   | 107   |       | 1,230 | 2,410 | 1,900 | 8     | 8    | 18   | 63    |
| 31..... | 17   |       | 155   | 110   |       | 1,210 |       | 1,920 |       | 10   | 41   |       |

| Month          | Maximum | Minimum | Mean  | Run-off in acre-feet |
|----------------|---------|---------|-------|----------------------|
| October.....   |         | 10      | 38.4  | 2,360                |
| November.....  | 1,250   | 21      | 212   | 12,600               |
| December.....  | 274     | 57      | 177   | 10,900               |
| January.....   | 1,510   | 107     | 425   | 26,100               |
| February.....  |         | 102     | 366   | 20,300               |
| March.....     | 1,370   | 314     | 841   | 51,700               |
| April.....     | 2,570   | 576     | 1,430 | 85,100               |
| May.....       | 2,970   | 900     | 1,640 | 101,000              |
| June.....      | 740     | 8       | 268   | 15,900               |
| July.....      | 20      | 8       | 9.7   | 596                  |
| August.....    | 47      | 8       | 15.9  | 978                  |
| September..... | 113     | 51      | 71.4  | 4,250                |
| The year.....  | 2,970   | 8       | 458   | 332,000              |

\* Estimated.

## McKAY CREEK NEAR PILOT ROCK, OREG.

LOCATION.—Water-stage recorder in SE¼ sec. 23, T. 1 N., R. 32 E., 1 mile above backwater from McKay Dam and 6 miles northeast of Pilot Rock.

RECORDS AVAILABLE.—May to August 1921, October 1926 to September 1933.

DISCHARGE.—Maximum during year, 1,090 second-feet May 2 (gage height, 4.11 feet); no flow at times.

1921, 1926–33: Maximum, 6,000 second-feet Apr. 1, 1931 (gage height, 10.4 feet); no flow at times during summer.

REMARKS.—Records good except those for December, February, and April, which are fair, and those for Nov. 5–9, June 1–30, which are poor. Numerous small diversions for irrigation above station; none between station and McKay Reservoir. Records furnished by State engineer.

*Discharge, in second-feet, 1932–33*

| Day           | Nov.    | Dec. | Jan. | Feb.    | Mar. | Apr. | May   | June                 | July |
|---------------|---------|------|------|---------|------|------|-------|----------------------|------|
| 1.....        | 0       | 16   | 32   | 27      | 143  | 338  | 485   | 75                   | 0.7  |
| 2.....        | 0       | 15   | 31   | 25      | 234  | 360  | 922   | 62                   | a .7 |
| 3.....        | 0       | 15   | 40   | 23      | 382  | 475  | 922   | 51                   | a .6 |
| 4.....        | 0       | a 15 | 40   | 22      | 264  | 485  | 1,020 | 43                   | a .5 |
| 5.....        |         | a 15 | 54   | 23      | 213  | 418  | 922   | 35                   | .5   |
| 6.....        |         | 15   | 122  | 23      | 202  | 396  | 704   | 31                   | .5   |
| 7.....        | a 10    | 15   | 117  | 21      | 234  | 333  | 572   | 30                   | .5   |
| 8.....        |         | 14   | 316  | a 20    | 244  | 264  | 480   | 31                   | .5   |
| 9.....        |         | a 11 | 346  | 20      | 216  | 225  | 414   | 33                   | .4   |
| 10.....       | 21      | a 12 | 222  | a 20    | 195  | 192  | 374   | 41                   | .4   |
| 11.....       | 18      | 12   | 166  | 20      | 205  | 183  | 333   | 34                   | .4   |
| 12.....       | 15      | 12   | 131  |         | 324  | 185  | 299   | 30                   | .3   |
| 13.....       | 15      | 12   | 109  |         | 382  | 188  | 272   | 28                   | .3   |
| 14.....       | 15      | 12   | a 99 |         | 338  | 222  | 261   | 23                   |      |
| 15.....       | 15      | 11   | a 88 | a 20    | 342  | 283  | 275   | 18                   |      |
| 16.....       | 32      | 11   | a 77 |         | 432  | 311  | 261   | 16                   | a .1 |
| 17.....       | 75      | 11   | 67   |         | 455  | 275  | 275   | 12                   |      |
| 18.....       | 72      | 12   | 63   | 20      | 351  | 234  | 369   | 8                    |      |
| 19.....       | 57      | 12   | 60   | 20      | 307  | 219  | 351   | 7                    |      |
| 20.....       | 46      | 12   | 51   | 21      | 351  | 250  | 303   | 7                    |      |
| 21.....       | 39      | 12   | 46   | 25      | 364  | 279  | 268   | 6                    | 0    |
| 22.....       | 33      | 12   | 43   | 51      | 283  | 346  | 240   | 5                    |      |
| 23.....       | 29      | 11   | 40   | 122     | 237  | 382  | 210   | 4                    |      |
| 24.....       | 23      | 11   | 38   | 107     | 200  | 378  | 188   | 4                    |      |
| 25.....       | 20      | 12   | a 36 | 103     | 178  | 369  | 173   | 3                    |      |
| 26.....       | 18      | 12   | a 33 | 140     | 173  | 324  | 166   | 3                    |      |
| 27.....       | 16      | 13   | a 30 | 111     | 210  | 311  | 145   | 2                    |      |
| 28.....       | 16      | 13   | 28   | 105     | 299  | 299  | 129   | 2                    |      |
| 29.....       | 15      | 12   | 28   |         | 328  | 333  | 109   | 1                    |      |
| 30.....       | 16      | 22   | 27   |         | 315  | 470  | 97    | 9                    |      |
| 31.....       |         | 30   | 27   |         | 392  |      | 88    |                      |      |
| Month         | Maximum |      |      | Minimum |      | Mean |       | Run-off in acre-feet |      |
| November..... | 75      |      |      | 0       |      | 21.9 |       | 1,300                |      |
| December..... | 30      |      |      | 11      |      | 13.5 |       | 830                  |      |
| January.....  | 346     |      |      | 27      |      | 84.1 |       | 5,170                |      |
| February..... | 140     |      |      | -----   |      | 42.5 |       | 2,360                |      |
| March.....    | 455     |      |      | 143     |      | 284  |       | 17,500               |      |
| April.....    | 485     |      |      | 183     |      | 311  |       | 18,500               |      |
| May.....      | 1,020   |      |      | 88      |      | 375  |       | 23,100               |      |
| June.....     | 75      |      |      | .9      |      | 21.5 |       | 1,280                |      |
| July.....     | .7      |      |      | 0       |      | .23  |       | 14                   |      |
| The year..... | 1,020   |      |      | 0       |      | 96.6 |       | 70,100               |      |

a Estimated.

NOTE.—No flow during months omitted.

## McKAY RESERVOIR NEAR PENDLETON, OREG.

LOCATION.—Staff gage at reservoir dam in SE¼ sec. 34, T. 2 N., R. 32 E., 4 miles south of Pendleton. Gage readings are elevations above mean sea level.

RECORDS AVAILABLE.—October 1930 to September 1933.

EXTREMES.—Maximum recorded contents during year, 67,700 acre-feet June 1 (elevation, 1,317.0 feet); minimum, 15,700 acre-feet Nov. 1 (elevation, 1,250.2 feet).

1930-33: Maximum contents, 69,920 acre-feet Mar. 22, 1932 (gage height, 1,318.85 feet); minimum, 3,427 acre-feet Oct. 1, 1930 (gage height, 1,219.0 feet).

REMARKS.—Records good. Beginning Oct. 1, 1932, contents based on readings at beginning of month. Summer flow above reservoir entirely diverted for irrigation. McKay Reservoir, completed in 1927 by the U.S. Bureau of Reclamation, has a capacity of 67,700 acre-feet at elevation 1,317.0 feet and stores water for irrigation of lands along Umatilla River near Echo, Stanfield, and Hermiston. Records furnished by State engineer and U.S. Bureau of Reclamation.

*Elevation and contents, 1932-33*

| Date          | Elevation<br>(feet) | Contents<br>(acre-feet) | Change<br>in con-<br>tents<br>during<br>month<br>(acre-feet) | Date          | Elevation<br>(feet) | Contents<br>(acre-feet) | Change<br>in con-<br>tents<br>during<br>month<br>(acre-feet) |
|---------------|---------------------|-------------------------|--------------------------------------------------------------|---------------|---------------------|-------------------------|--------------------------------------------------------------|
| Sept. 30..... | 1,262.40            | 22,240                  | -----                                                        | June 1.....   | 1,317.0             | 67,700                  | +6,200                                                       |
| Nov. 1.....   | 1,250.2             | 15,700                  | <sup>a</sup> -6,540                                          | July 1.....   | 1,313.5             | 63,710                  | -3,990                                                       |
| Dec. 1.....   | 1,250.5             | 15,850                  | +150                                                         | Aug. 1.....   | 1,297.5             | 47,560                  | -16,150                                                      |
| Jan. 1.....   | 1,251.2             | 16,200                  | +350                                                         | Sept. 1.....  | 1,266.0             | 24,370                  | -23,190                                                      |
| Feb. 1.....   | 1,265.0             | 23,770                  | +7,570                                                       | Oct. 1.....   | 1,258.0             | 19,770                  | -4,600                                                       |
| Mar. 1.....   | 1,268.5             | 25,900                  | +2,130                                                       |               |                     |                         |                                                              |
| Apr. 1.....   | 1,292.5             | 43,180                  | +17,280                                                      | The year..... | -----               | -----                   | -2,470                                                       |
| May 1.....    | 1,311.5             | 61,500                  | +18,320                                                      |               |                     |                         |                                                              |

<sup>a</sup> 32 days, Sept. 30 to Nov. 1.

## McKAY CREEK NEAR PENDLETON, OREG.

LOCATION.—Water-stage recorder in sec. 34, T. 2 N., R. 32 E., just above irrigation diversion dam, a quarter of a mile below McKay Dam, and 4 miles south of Pendleton.

RECORDS AVAILABLE.—November 1918 to September 1923, October 1924 to September 1933.

DISCHARGE.—Maximum during year, 850 second-feet July 7 (gage height, 2.20 feet); no flow at times.

1918-33: Maximum, 3,250 second-feet Feb. 10, 1921; no flow at times. Average, 12 years (1919-23, 1924-27, 1928-33), 99.4 second-feet.

REMARKS.—Records good except those estimated for January to April, which are fair. Discharge records include flow diverted by irrigation canal at gage. Diversions for irrigation above McKay Reservoir use total summer flow. Flow completely regulated by storage in McKay Reservoir. Records furnished by State engineer.

*Discharge, in second-feet, 1932-33*

| Day     | Oct. | Apr. | May | June | July | Aug. | Sept. |
|---------|------|------|-----|------|------|------|-------|
| 1.....  | 259  |      | 7   | 42   | 122  | 280  | 275   |
| 2.....  | 259  |      | 71  | 68   | 122  | 280  | 275   |
| 3.....  | 259  |      | 472 | 68   | 122  | 280  | 275   |
| 4.....  | 259  |      | 682 | 68   | 122  | 280  | 270   |
| 5.....  | 259  |      | 767 | 70   | 133  | 280  | 270   |
| 6.....  | 259  |      | 780 | 89   | 156  | 280  | 261   |
| 7.....  | 255  |      | 760 | 138  | 261  | 270  | 256   |
| 8.....  | 74   |      | 682 | 133  | 285  | 275  | 242   |
| 9.....  | 0    |      | 384 | 125  | 261  | 280  | 242   |
| 10..... | 0    |      | 163 | 128  | 265  | 275  | 242   |
| 11..... | 0    | 2    | 172 | 111  | 265  | 275  | 238   |
| 12..... | 0    |      | 144 | 47   | 265  | 270  | 192   |
| 13..... | 0    |      | 87  | 47   | 261  | 275  | 183   |
| 14..... | 0    |      | 87  | 47   | 256  | 289  | 174   |
| 15..... | 0    |      | 72  | 47   | 201  | 289  | 147   |
| 16..... | 0    |      | 50  | 47   | 190  | 299  | 147   |
| 17..... | 0    |      | 48  | 47   | 230  | 314  | 147   |
| 18..... | 0    |      | 118 | 37   | 251  | 314  | 147   |
| 19..... | 0    |      | 405 | 39   | 275  | 314  | 147   |
| 20..... | 0    |      | 372 | 44   | 285  | 314  | 144   |
| 21..... | 0    |      | 427 | 47   | 285  | 314  | 144   |
| 22..... | 0    | 4    | 265 | 47   | 285  | 314  | 144   |
| 23..... | 0    | 4    | 310 | 24   | 285  | 299  | 144   |
| 24..... | 0    | 5    | 223 | 54   | 285  | 294  | 144   |
| 25..... | 0    | 6    | 94  | 114  | 285  | 294  | 133   |
| 26..... | 0    | 6    | 183 | 119  | 285  | 294  | 99    |
| 27..... | 0    | 6    | 212 | 122  | 285  | 294  | 78    |
| 28..... | 0    | 6    | 194 | 119  | 285  | 299  | 78    |
| 29..... | 0    | 7    | 148 | 122  | 285  | 299  | 29    |
| 30..... | 0    | 7    | 90  | 122  | 285  | 285  |       |
| 31..... | 0    |      | 83  |      | 285  | 270  |       |

| Month          | Maximum | Minimum | Mean | Run-off in<br>acre-feet |
|----------------|---------|---------|------|-------------------------|
| October.....   | 259     | 0       | 60.7 | 3,730                   |
| January.....   |         |         | 1.0  | 61                      |
| February.....  |         |         | 1.0  | 56                      |
| April.....     | 7       |         | 3.1  | 184                     |
| May.....       | 780     | 7       | 276  | 17,000                  |
| June.....      | 138     | 37      | 77.7 | 4,620                   |
| July.....      | 285     | 122     | 241  | 14,800                  |
| August.....    | 314     | 270     | 290  | 17,800                  |
| September..... | 275     | 0       | 176  | 10,500                  |
| The year.....  | 780     | 0       | 94.9 | 68,800                  |

NOTE—No flow during months omitted.

## BIRCH CREEK AT RIETH, OREG.

LOCATION.—Water-stage recorder in SE  $\frac{1}{4}$  sec. 13, T. 2 N., R. 31 E., a quarter of a mile above mouth and half a mile (revised) southwest of Rieth.

RECORDS AVAILABLE.—May 1921 to September 1923, April 1927 to September 1933; incomplete.

DISCHARGE.—Maximum during year, 294 second-feet May 5 (gage height, 2.78 feet); no flow at times.

1921-23, 1927-33: Maximum, 1,640 second-feet Jan. 29, 1928 (gage height, 6.00 feet at former gage); no flow at times.

REMARKS.—Records good except those estimated, Jan. 17-19, Feb. 9, 11-15, which are fair, and those for Dec. 19-22, which are poor. Diversions for irrigation above station. Records furnished by State engineer.

*Discharge, in second-feet, 1932-33*

| Day           | Dec.    | Jan.    | Feb.  | Mar. | Apr.                 | May | June  |
|---------------|---------|---------|-------|------|----------------------|-----|-------|
| 1.....        | 0       | 6       | 12    | 18   | 76                   | 170 | 59    |
| 2.....        | 0       | 6       | 12    | 22   | 79                   | 183 | 42    |
| 3.....        | 0       | 6       | 12    | 46   | 104                  | 200 | 34    |
| 4.....        | 0       | 6       | 11    | 53   | 146                  | 232 | 31    |
| 5.....        | 0       | 6       | 12    | 47   | 135                  | 267 | 24    |
| 6.....        | 0       | 6       | 12    | 42   | 129                  | 234 | 19    |
| 7.....        | 0       | 6       | 12    | 43   | 129                  | 218 | 16    |
| 8.....        | 0       | 7       | 12    | 49   | 108                  | 190 | 19    |
| 9.....        | 0       | 16      | 12    | 49   | 98                   | 181 | 23    |
| 10.....       | 0       | 21      | 12    | 49   | 77                   | 168 | 29    |
| 11.....       | 0       | 19      | 12    | 46   | 59                   | 163 | 30    |
| 12.....       | 0       | 18      |       | 47   | 53                   | 172 | 29    |
| 13.....       | 0       | 17      |       | 63   | 46                   | 198 | 26    |
| 14.....       | 0       | 17      |       | 67   | 48                   | 228 | 25    |
| 15.....       | 0       | 16      |       | 64   | 63                   | 256 | 23    |
| 16.....       | 0       | 16      | 12    | 71   | 89                   | 269 | 15    |
| 17.....       | 0       | 15      | 12    | 86   | 94                   | 253 | 14    |
| 18.....       | 0       | 14      | 12    | 80   | 82                   | 265 | 8     |
| 19.....       | 3       | 13      | 12    | 72   | 64                   | 243 | 2     |
| 20.....       |         | 13      | 12    | 68   | 64                   | 218 | 0     |
| 21.....       |         | 14      | 14    | 72   | 79                   | 216 | 0     |
| 22.....       |         | 14      | 14    | 70   | 126                  | 204 | 0     |
| 23.....       |         | 5       | 14    | 62   | 194                  | 188 | 0     |
| 24.....       | 4       | 14      | 16    | 56   | 216                  | 172 | 0     |
| 25.....       | 4       | 14      | 16    | 49   | 228                  | 167 | 0     |
| 26.....       | 4       | 14      | 16    | 42   | 210                  | 165 | 0     |
| 27.....       | 4       | 14      | 13    | 42   | 210                  | 140 | 0     |
| 28.....       | 5       | 14      | 18    | 50   | 224                  | 121 | 0     |
| 29.....       | 5       | 14      | ----- | 64   | 220                  | 100 | 0     |
| 30.....       | 5       | 14      | ----- | 67   | 212                  | 84  | 0     |
| 31.....       | 5       | 13      | ----- | 73   | -----                | 70  | ----- |
| Month         | Maximum | Minimum | Mean  |      | Run-off in acre-feet |     |       |
| December..... | 5       | 0       | 1.7   |      | 105                  |     |       |
| January.....  | 21      | 6       | 12.8  |      | 787                  |     |       |
| February..... | 18      | -----   | 13.1  |      | 728                  |     |       |
| March.....    | 86      | 18      | 55.8  |      | 3,430                |     |       |
| April.....    | 228     | 46      | 122   |      | 7,260                |     |       |
| May.....      | 269     | 70      | 191   |      | 11,700               |     |       |
| June.....     | 59      | 0       | 15.6  |      | 928                  |     |       |
| The year..... | 269     | 0       | 34.6  |      | 24,900               |     |       |

NOTE.—No flow during months omitted.

## DIVERSIONS FROM UMATILLA RIVER BETWEEN FURNISH RESERVOIR AND UMATILLA, OREG.

Furnish Canal diverts from right bank of Umatilla River in sec. 36, T. 3 N., R. 29 E. Crayne-Lisle Canal diverts from left bank of Furnish Canal half a mile below Furnish Canal head gate but above gage on Furnish Canal. Taylor Ditch diverts from left bank of Umatilla River near Nolin. Wilson and Ramos Ditches divert from right bank of Umatilla River half a mile above intake of Umatilla project feed canal, which diverts water from right bank of Umatilla River in SW¼ sec. 22, T. 3 N., R. 29 E., to feed Cold Springs Reservoir of U.S. Bureau of Reclamation. Western Land & Irrigation Co.'s canal diverts from left bank of Umatilla River in NE¼ sec. 21, T. 3 N., R. 29 E.; gage 1 mile below intake. Allen Canal diverts from right bank of Western Land & Irrigation Co.'s canal half a mile below head gate of that canal. Dillon Canal diverts from left bank of Umatilla River in sec. 5, T. 3 N., R. 29 E. Maxwell Canal diverts from right bank of Umatilla River in SW¼ sec. 28, T. 4 N., R. 28 E. West Division Main Canal diverts from left bank of Umatilla River in SW¼ sec. 28, T. 5 N., R. 28 E. Brownell Canal diverts from right bank of Umatilla River 2 miles below West Division Main Canal diversion and 1½ miles above mouth of Umatilla River.

Water diverted by all these canals is used for irrigation of lands on both sides of Umatilla River below Furnish Reservoir, except that diverted by West Division Main Canal, which is applied to lands along Columbia River in vicinity of Irrigon. Records are available from March 1926 to September 1933; records from some of the canals published separately prior to 1926. Records furnished by State engineer.

*Diversions, in acre-feet, 1932-33*

|                         | Furnish Canal | Crayne-Lisle Canal | Taylor Ditch | Wilson and Ramos Ditches | Umatilla project feed Canal | Western Land & Irrigation Co.'s Canal | Allen Canal | Dillon Canal | Maxwell Canal | West Division Main Canal | Brownell Canal |
|-------------------------|---------------|--------------------|--------------|--------------------------|-----------------------------|---------------------------------------|-------------|--------------|---------------|--------------------------|----------------|
| October.....            | 0             | 744                | -----        | -----                    | 4,840                       | 264                                   | 1,240       | 418          | 867           | 7,690                    | 0              |
| November.....           | 0             | 508                | -----        | -----                    | 9,160                       | 0                                     | a 242       | a 103        | -----         | 4,790                    | 0              |
| December.....           | 0             | 0                  | -----        | -----                    | 4,830                       | 0                                     | -----       | -----        | -----         | 812                      | 0              |
| January.....            | 0             | 0                  | -----        | -----                    | 12,700                      | 0                                     | -----       | -----        | -----         | 0                        | 0              |
| February.....           | 0             | 0                  | -----        | -----                    | 6,780                       | 455                                   | -----       | -----        | -----         | 0                        | 0              |
| March.....              | 105           | 0                  | -----        | -----                    | 16,000                      | 338                                   | -----       | -----        | a 476         | 1,780                    | 0              |
| April.....              | 3,950         | 619                | -----        | 436                      | 9,400                       | 8,980                                 | 1,470       | 314          | 2,980         | 7,620                    | 738            |
| May.....                | 3,890         | 258                | -----        | 481                      | 10,900                      | 10,000                                | 1,240       | 342          | 3,420         | 10,500                   | 701            |
| June.....               | 6,070         | 631                | a 123        | 346                      | 9,100                       | 10,200                                | 1,210       | 528          | 3,540         | 10,700                   | 857            |
| July.....               | 5,820         | 132                | 344          | 107                      | 0                           | 11,100                                | 1,140       | 469          | 1,910         | 10,800                   | 1,000          |
| August.....             | 5,300         | 22                 | 516          | 0                        | 0                           | 10,900                                | 1,010       | 354          | 2,090         | 11,600                   | 1,190          |
| September.....          | 1,930         | 0                  | 0            | 0                        | 131                         | 8,630                                 | 1,020       | 206          | 1,800         | 9,460                    | 791            |
| The year or period..... | 27,100        | 2,910              | 983          | 1,370                    | 83,800                      | 60,900                                | -----       | -----        | -----         | 75,800                   | 5,280          |

a Part of month only; record incomplete.

NOTE.—Little or no flow in canals for months for which no record is given.

## JOHN DAY RIVER BASIN

## JOHN DAY RIVER AT PRAIRIE CITY, OREG.

LOCATION.—Staff gage in NE¼ sec. 10, T. 13 S., R. 33 E., above outlet of Prairie power canal, at power plant three-quarters of a mile southwest of Prairie City. Zero of gage is 3,492.55 feet above sea level by general adjustment of 1929.

RECORDS AVAILABLE.—October 1926 to September 1933. At station below outlet of Prairie power canal October 1916 to September 1917, March 1925 to September 1926.

DISCHARGE.—Maximum during year, 385 second-feet June 10, 11 (gage height, 2.13) feet; minimum, 2 second-feet Dec. 8, 21, 22.

1926-33: Maximum (estimated), 1,550 second-feet Mar. 19, 1932 (gage height, 4.7 feet); minimum, that of Dec. 8, 21, 22, 1932.

REMARKS.—Records poor. Diversion above station for irrigation and for power. See page 27 for record of Prairie power canal.

*Discharge, in second-feet, 1932-33*

| Day | Oct. | Nov. | Dec. | Jan. | Feb. | Mar. | Apr. | May | June | July | Aug. | Sept. |
|-----|------|------|------|------|------|------|------|-----|------|------|------|-------|
| 1   | 16   | 8    | 7    | 7    | 9    | 14   | 104  | 202 | 255  | 67   | 12   | 6     |
| 2   | 16   | 8    | 7    | 7    | 8    | 33   | 137  | 248 | 355  | 54   | 10   | 6     |
| 3   | 16   | 7    | 7    | 7    | 10   | 124  | 214  | 202 | 355  | 43   | 11   | 7     |
| 4   | 16   | 7    | 7    | 7    | 22   | 76   | 202  | 272 | 370  | 37   | 14   | 7     |
| 5   | 16   | 7    | 7    | 7    | 16   | 48   | 180  | 285 | 326  | 34   | 13   | 7     |
| 6   | 16   | 8    | 5    | 8    | 10   | 65   | 169  | 260 | 285  | 30   | 12   | 7     |
| 7   | 17   | 8    | 4    | 8    | 9    | 84   | 147  | 236 | 272  | 26   | 12   | 8     |
| 8   | 16   | 13   | 2    | 18   |      | 102  | 132  | 225 | 260  | 23   | 13   | 13    |
| 9   | 16   | 23   |      | 16   |      | 82   | 116  | 214 | 285  | 22   | 12   | 18    |
| 10  | 12   | 18   |      | 10   |      | 137  | 101  | 202 | 385  | 21   | 13   | 23    |
| 11  | 12   | 10   |      | 8    | 6    | 228  | 91   | 180 | 370  | 22   | 12   | 32    |
| 12  | 12   | 8    |      | 8    |      | 241  | 85   | 169 | 326  | 19   | 12   | 33    |
| 13  | 12   | 8    |      | 7    |      | 154  | 77   | 169 | 326  | 16   | 12   | 23    |
| 14  | 12   | 8    | 3    | 8    |      | 135  | 87   | 180 | 326  | 14   | 11   | 34    |
| 15  | 13   | 12   |      | 8    |      | 135  | 106  | 214 | 326  | 14   | 10   | 41    |
| 16  | 14   | 21   |      | 7    | 12   | 154  | 110  | 225 | 298  | 13   | 12   | 37    |
| 17  | 18   | 44   |      | 5    | 8    | 112  | 116  | 236 | 260  | 12   | 12   | 35    |
| 18  | 19   | 29   |      | 6    | 12   | 77   | 101  | 248 | 225  | 12   | 12   | 52    |
| 19  | 16   | 19   | 9    | 8    | 9    | 82   | 89   | 225 | 180  | 12   | 9    | 17    |
| 20  | 14   | 17   | 5    | 14   | 8    | 114  | 104  | 214 | 147  | 12   | 8    | 30    |
| 21  | 13   | 14   | 3    | 16   | 8    | 86   | 125  | 202 | 114  | 12   | 9    | 20    |
| 22  | 17   | 12   | 2    | 17   | 8    | 61   | 147  | 202 | 75   | 13   | 7    | 58    |
| 23  | 16   | 12   | 4    | 14   | 8    | 46   | 169  | 202 | 62   | 14   | 7    | 64    |
| 24  | 16   | 12   | 5    | 10   | 8    | 44   | 214  | 202 | 51   | 15   | 7    | 19    |
| 25  | 16   | 8    | 5    | 9    | 8    | 42   | 236  | 225 | 49   | 17   | 5    | 43    |
| 26  | 13   | 7    | 7    | 16   | 8    | 50   | 236  | 285 | 58   | 15   | 6    | 69    |
| 27  | 13   | 7    | 7    | 12   | 13   | 97   | 248  | 298 | 51   | 12   | 5    | 75    |
| 28  | 12   | 7    | 7    | 12   | 9    | 189  | 260  | 285 | 158  | 12   | 6    | 71    |
| 29  | 12   | 7    | 7    | 9    |      | 141  | 298  | 272 | 134  | 12   | 6    | 41    |
| 30  | 9    | 7    | 5    | 8    |      | 118  | 248  | 312 | 97   | 12   | 6    | 20    |
| 31  | 9    |      | 5    | 8    |      | 124  |      | 370 |      | 12   | 6    |       |

| Month     | River only |         |      |                      | River and Prairie power canal |         |      |                      |
|-----------|------------|---------|------|----------------------|-------------------------------|---------|------|----------------------|
|           | Maximum    | Minimum | Mean | Run-off in acre-feet | Maximum                       | Minimum | Mean | Run-off in acre-feet |
| October   | 19         | 9       | 14.4 | 885                  | 75                            | 39      | 58.1 | 3,570                |
| November  | 44         | 7       | 12.5 | 744                  | 103                           | 61      | 68.8 | 4,090                |
| December  | 9          | 2       | 4.7  | 289                  | 66                            | 43      | 56.5 | 3,480                |
| January   | 18         | 5       | 9.8  | 603                  | 72                            | 28      | 60.6 | 3,730                |
| February  | 22         |         | 9.0  | 500                  | 68                            | 22      | 52.9 | 2,940                |
| March     | 241        | 14      | 103  | 6,330                | 248                           | 68      | 143  | 8,790                |
| April     | 298        | 77      | 155  | 9,220                | 360                           | 136     | 215  | 12,800               |
| May       | 370        | 169     | 234  | 14,400               | 434                           | 221     | 293  | 18,000               |
| June      | 385        | 49      | 229  | 13,600               | 449                           | 115     | 295  | 17,600               |
| July      | 67         | 12      | 20.9 | 1,290                | 134                           | 24      | 58.5 | 3,600                |
| August    | 14         | 5       | 9.7  | 596                  | 57                            | 13      | 30.2 | 1,860                |
| September | 75         | 6       | 30.5 | 1,810                | 92                            | 15      | 44.2 | 2,630                |
| The year  | 385        | 2       | 69.5 | 50,300               | 449                           | 13      | 115  | 83,100               |

## JOHN DAY RIVER AT PICTURE GORGE, NEAR DAYVILLE, OREG.

LOCATION.—Water-stage recorder in sec. 20, T. 12 S., R. 26 E., on John Day highway 0.7 mile above Rock Creek Bridge and 7 miles northwest of Dayville.

Zero of gage is 2,232.10 feet above mean sea level by general adjustment of 1929.

RECORDS AVAILABLE.—April 1926 to September 1933.

DISCHARGE.—Maximum during year, 1,600 second-feet Apr. 29, 30 (gage height, 7.39 feet); minimum (estimated), 4 second-feet July 30 to Aug. 2.

1926-33: Maximum, 4,800 second-feet Mar. 19, 1932 (gage height, 14.0 feet); minimum, 1 second-foot several days in August, September 1930.

REMARKS.—Records excellent except those estimated and those below 10 second-foot or between 40 and 100 second-feet and those July 26 to Sept. 9, which are fair. Numerous diversions for irrigation above station.

*Discharge, in second-feet, 1932-33*

| Day | Oct. | Nov. | Dec. | Jan. | Feb. | Mar. | Apr.  | May   | June  | July | Aug. | Sept. |
|-----|------|------|------|------|------|------|-------|-------|-------|------|------|-------|
| 1   | 13   | 126  | 154  | 143  | 143  | 184  | 765   | 1,320 | 1,240 | 352  | *4   | 13    |
| 2   | 12   | 120  | 154  | 149  | 141  | 229  | 870   | 1,360 | 1,200 | 301  | *4   | 14    |
| 3   | 12   | 121  | 153  | 171  | 135  | 557  | 1,200 | 1,360 | 1,280 | 264  | 6    | 13    |
| 4   | 13   | 120  | 152  | 163  | 123  | 452  | 1,320 | 1,320 | 1,280 | 238  | 8    | 14    |
| 5   | 12   | 123  | 149  | 161  | 131  | 332  | 1,130 | 1,400 | 1,200 | 221  | 8    | 13    |
| 6   | 12   | 131  | 148  | 170  | 149  | 282  | 1,090 | 1,360 | 1,090 | 184  | 11   | 14    |
| 7   | 13   | 135  | 143  | 167  | 122  | 292  | 975   | 1,240 | 1,010 | 152  | 15   | 15    |
| 8   | 11   | 138  |      | 166  |      | 512  | 852   | 1,200 | 940   | 129  | 19   | 15    |
| 9   | 14   | 148  |      | 178  |      | 385  | 730   | 1,090 | 975   | 114  | 26   | 15    |
| 10  | 17   | 154  |      | 171  |      | 352  | 640   | 1,010 | 1,160 | 100  | 22   | 14    |
| 11  | 22   | 152  |      | 162  | *115 | 475  | 595   | 940   | 1,200 | 87   | 20   | 14    |
| 12  | 30   | 150  |      | 153  |      | 715  | 580   | 888   | 1,130 | 80   | 17   | 10    |
| 13  | 36   | 149  |      | 153  |      | 748  | 580   | 852   | 1,050 | 71   | 17   | 8     |
| 14  | 34   | 145  |      | 153  |      | 538  | 610   | 852   | 1,050 | 62   | 15   | 8     |
| 15  | 40   | 150  |      | 155  | 198  | 475  | 685   | 975   | 1,010 | 51   | 11   | 10    |
| 16  | 49   | 163  |      | 149  | 206  | 595  | 800   | 1,050 | 940   | 36   | 13   | 10    |
| 17  | 57   | 184  | *105 | 110  | 184  | 715  | 765   | 1,130 | 818   | 28   | 13   | 9     |
| 18  | 71   | 213  |      | 100  | 178  | 538  | 715   | 1,200 | 715   | 28   | 13   | 11    |
| 19  | 87   | 213  |      | 123  | 170  | 488  | 640   | 1,160 | 610   | 29   | 13   | 13    |
| 20  | 89   | 198  |      | 138  | 178  | 565  | 655   | 1,090 | 512   | 26   | 12   | 14    |
| 21  | 88   | 184  |      | 163  | 184  | 655  | 748   | 1,050 | 452   | 22   | 10   | 16    |
| 22  | 95   | 171  |      | 157  | 178  | 488  | 888   | 1,090 | 385   | 18   | 10   | 19    |
| 23  | 101  | 167  |      | 161  | 178  | 418  | 1,090 | 1,050 | 332   | 13   | 10   | 21    |
| 24  | 104  | 162  |      | 153  | 178  | 385  | 1,240 | 1,050 | 301   | 14   | 10   | 30    |
| 25  | 109  | 161  |      | 148  | 166  | 363  | 1,360 | 1,090 | 273   | 12   | 9    | 44    |
| 26  | 111  | 158  |      | 133  | 164  | 352  | 1,400 | 1,200 | 273   | 10   | 10   | 62    |
| 27  | 117  | 157  | 162  | 155  | 164  | 429  | 1,440 | 1,280 | 255   | 9    | 11   | 77    |
| 28  | 121  | 157  | 158  | 140  | 170  | 715  | 1,520 | 1,200 | 311   | 8    | 10   | 85    |
| 29  | 121  | 154  | 155  | 145  |      | 852  | 1,520 | 1,130 | 407   | 8    | 9    | 85    |
| 30  | 121  | 154  | 149  | 145  |      | 782  | 1,520 | 1,160 | 429   | *4   | 8    | 86    |
| 31  | 125  |      | 146  | 143  |      | 852  |       | 1,200 |       | *4   | 11   |       |

| Month     | Maximum | Minimum | Mean  | Run-off in acre-feet |
|-----------|---------|---------|-------|----------------------|
| October   | 125     | 11      | 59.9  | 3,680                |
| November  | 213     | 120     | 155   | 9,220                |
| December  | 162     |         | 123   | 7,560                |
| January   | 178     | 100     | 151   | 9,280                |
| February  | 206     |         | 152   | 8,440                |
| March     | 852     | 184     | 507   | 31,200               |
| April     | 1,520   | 580     | 964   | 57,400               |
| May       | 1,400   | 852     | 1,140 | 70,100               |
| June      | 1,280   | 255     | 794   | 47,200               |
| July      | 352     | 4       | 86.3  | 5,310                |
| August    | 26      | 4       | 12.1  | 744                  |
| September | 86      | 8       | 25.7  | 1,530                |
| The year  | 1,520   | 4       | 348   | 252,000              |

\* Estimated.

## JOHN DAY RIVER AT SERVICE CREEK, OREG.

LOCATION.—Water-stage recorder in NE¼ sec. 18, T. 9 S., R. 23 E., a quarter of a mile below Service Creek and three-quarters of a mile southwest of Service Creek post office. Zero of gage is 1,635.83 feet above mean sea level by general adjustment of 1929.

RECORDS AVAILABLE.—October 1929 to September 1933.

DISCHARGE.—Maximum during year, 8,510 second-feet Apr. 28 (gage height, 9.53 feet); minimum, 66 second-feet Oct. 8, Aug. 31; minimum gage height, 0.45 foot Aug. 31.

1929-33: Maximum, 28,900 second-feet Mar. 19, 1932 (gage height, 16.75 feet); minimum, 20 second-feet Sept. 6, 1931 (gage height, 0.28 foot).

REMARKS.—Records excellent except those estimated, Feb. 12, 13, June 2-4, July 10-16, which are good. Many diversions for irrigation above station.

*Discharge, in second-feet, 1932-33*

| Day     | Oct. | Nov.  | Dec. | Jan. | Feb.  | Mar.   | Apr.   | May    | June   | July   | Aug. | Sept. |
|---------|------|-------|------|------|-------|--------|--------|--------|--------|--------|------|-------|
| 1.....  | 72   | 240   | 382  | 307  | 349   | 525    | 4, 070 | 6, 380 | 7, 300 | 1, 510 | 116  | 69    |
| 2.....  | 73   | 245   | 379  | 367  | 343   | 580    | 4, 190 | 6, 560 | 6, 700 | 1, 230 | 116  | 68    |
| 3.....  | 71   | 232   | 373  | 392  | 316   | 820    | 5, 770 | 7, 300 | 7, 200 | 1, 080 | 120  | 69    |
| 4.....  | 68   | 240   | 364  | 420  | 301   | 1, 200 | 7, 110 | 6, 920 | 7, 000 | 960    | 129  | 71    |
| 5.....  | 67   | 255   | 367  | 396  | 328   | 980    | 6, 040 | 7, 690 | 6, 560 | 880    | 132  | 71    |
| 6.....  | 68   | 262   | 343  | 402  | 334   | 870    | 5, 700 | 6, 740 | 5, 870 | 805    | 163  | 71    |
| 7.....  | 67   | 262   | 292  | 472  | 277   | 845    | 5, 230 | 5, 870 | 5, 230 | 755    | 173  | 71    |
| 8.....  | 66   | 295   | 178  | 455  | 304   | 980    | 4, 380 | 5, 380 | 4, 790 | 640    | 156  | 70    |
| 9.....  | 67   | 349   | 168  | 490  | 210   | 1, 100 | 3, 530 | 4, 790 | 4, 650 | 575    | 145  | 68    |
| 10..... | 71   | 340   | 117  | 600  | 170   | 950    | 3, 000 | 4, 380 | 5, 380 |        | 143  | 73    |
| 11..... | 74   | 385   | 90   | 508  | 215   | 980    | 2, 700 | 4, 250 | 5, 230 |        | 145  | 78    |
| 12..... | 82   | 307   | 83   | 441  | 301   | 1, 870 | 2, 600 | 4, 000 | 4, 790 |        | 129  | 88    |
| 13..... | 84   | 316   | 83   | 399  | 290   | 2, 910 | 2, 600 | 3, 880 | 4, 790 | 424    | 114  | 88    |
| 14..... | 88   | 301   | 80   | 413  | 300   | 2, 350 | 2, 900 | 4, 250 | 4, 650 |        | 105  | 88    |
| 15..... | 93   | 319   | 87   | 379  | 367   | 1, 990 | 3, 640 | 4, 790 | 4, 510 |        | 100  | 84    |
| 16..... | 94   | 343   | 114  | 373  | 367   | 2, 620 | 4, 380 | 5, 700 | 4, 250 |        | 93   | 87    |
| 17..... | 105  | 355   | 141  | 268  | 385   | 3, 620 | 4, 120 | 6, 040 | 3, 760 | 304    | 90   | 88    |
| 18..... | 114  | 373   | 155  | 228  | 379   | 2, 620 | 3, 530 | 6, 740 | 3, 200 | 275    | 85   | 108   |
| 19..... | 137  | 560   | 187  | 242  | 396   | 2, 120 | 3, 100 | 6, 740 | 2, 800 | 255    | 84   | 123   |
| 20..... | 170  | 560   | 220  | 286  | 410   | 2, 260 | 3, 310 | 6, 040 | 2, 420 | 242    | 81   | 111   |
| 21..... | 180  | 490   | 286  | 319  | 455   | 2, 810 | 4, 000 | 5, 700 | 2, 100 | 230    | 81   | 126   |
| 22..... | 180  | 448   | 265  | 334  | 508   | 2, 350 | 4, 930 | 6, 040 | 1, 900 | 212    | 82   | 147   |
| 23..... | 187  | 410   | 274  | 352  | 542   | 1, 830 | 5, 870 | 5, 870 | 1, 700 | 196    | 82   | 132   |
| 24..... | 193  | 379   | 289  | 367  | 525   | 1, 510 | 6, 560 | 6, 040 | 1, 540 | 183    | 82   | 135   |
| 25..... | 213  | 325   | 307  | 349  | 472   | 1, 370 | 7, 300 | 6, 380 | 1, 400 | 175    | 79   | 140   |
| 26..... | 225  | 304   | 325  | 301  | 455   | 1, 370 | 7, 490 | 7, 300 | 1, 340 | 163    | 78   | 145   |
| 27..... | 220  | 358   | 355  | 358  | 472   | 1, 630 | 7, 690 | 7, 890 | 1, 300 | 150    | 77   | 163   |
| 28..... | 218  | 385   | 367  | 328  | 490   | 3, 680 | 8, 090 | 7, 110 | 1, 200 | 143    | 74   | 179   |
| 29..... | 228  | 379   | 373  | 343  | ----- | 5, 130 | 7, 890 | 6, 920 | 1, 580 | 132    | 75   | 194   |
| 30..... | 238  | 376   | 328  | 343  | ----- | 3, 950 | 7, 490 | 7, 300 | 1, 540 | 124    | 74   | 190   |
| 31..... | 238  | ----- | 358  | 343  | ----- | 4, 440 | -----  | 7, 890 | -----  | 118    | 70   | ----- |

| Month          | Maximum | Minimum | Mean   | Run-off in<br>acre-feet |
|----------------|---------|---------|--------|-------------------------|
| October.....   | 238     | 66      | 131    | 8, 060                  |
| November.....  | 560     | 232     | 348    | 20, 700                 |
| December.....  | 382     | 80      | 249    | 15, 300                 |
| January.....   | 600     | 228     | 373    | 22, 900                 |
| February.....  | 542     | 170     | 366    | 20, 300                 |
| March.....     | 5, 130  | 525     | 2, 010 | 124, 000                |
| April.....     | 8, 090  | 2, 600  | 4, 970 | 296, 000                |
| May.....       | 7, 890  | 3, 880  | 6, 090 | 374, 000                |
| June.....      | 7, 300  | 1, 200  | 3, 890 | 231, 000                |
| July.....      | 1, 510  | 118     | 461    | 28, 300                 |
| August.....    | 173     | 70      | 106    | 6, 520                  |
| September..... | 194     | 68      | 106    | 6, 310                  |
| The year.....  | 8, 090  | 66      | 1, 590 | 1, 150, 000             |

## JOHN DAY RIVER AT McDONALD FERRY, OREG.

LOCATION.—Water-stage recorder in NW¼ sec. 11, T. 1 N., R. 19 E., at McDonald ferry, half a mile below mouth of Rock Creek, and 10 miles east of Klondike. Zero of gage is 392.02 feet above mean sea level.

DRAINAGE AREA.—7,580 square miles (revised).

RECORDS AVAILABLE.—December 1904 to September 1933.

DISCHARGE.—Maximum recorded during year, 8,060 second-feet Apr. 29 (gage height, 5.97 feet); minimum, 61 second-feet Sept. 8 (gage height, 1.20 feet). 1904-33: Maximum, 24,900 second-feet Mar. 20, 1932 (gage height, 10.6 feet); minimum, 4 second-feet Aug. 31, 1931 (gage height, 0.68 foot). Average, 28 years (1905-33), 2,020 second-feet.

Maximum stage known, 12.8 feet probably in 1894 (estimated discharge, 33,000 second-feet).

REMARKS.—Records excellent except those estimated, which are good. Diversions for irrigation above station.

*Discharge, in second-feet, 1932-33*

| Day | Oct. | Nov. | Dec. | Jan. | Feb. | Mar.  | Apr.  | May   | June  | July  | Aug. | Sept. |
|-----|------|------|------|------|------|-------|-------|-------|-------|-------|------|-------|
| 1   | 81   | 236  | 386  | 386  | 367  | 515   | 4,790 | 7,040 | 8,000 | 1,510 | 150  | 72    |
| 2   | 81   | 247  | 380  | 354  | 367  | 562   | 4,440 | 6,200 | 7,400 | 1,540 | 142  | 69    |
| 3   | 78   | 241  | 386  | 373  | 367  | 610   | 4,550 | 6,620 | 6,800 | 1,330 | 138  | 69    |
| 4   | 75   | 241  | 393  | 354  | 367  | 726   | 6,070 | 7,040 | 7,040 | 1,160 | 130  | 72    |
| 5   | 75   | 258  | 386  | 386  | 348  | 990   | 7,040 | 6,900 | 6,900 | 1,040 | 138  | 76    |
| 6   | 75   | 258  | 373  | 427  | 322  | 1,170 | 5,940 | 7,470 | 6,340 | 957   | 142  | 67    |
| 7   | 78   | 252  | 367  | 414  | 328  | 1,010 | 5,620 | 6,620 | 5,800 | 880   | 142  | 64    |
| 8   | 81   | 281  | 367  | 420  | 300  | 979   | 5,280 | 5,800 | 5,300 | 800   | 142  | 64    |
| 9   | 78   | 292  | 322  | 441  | 250  | 946   | 4,440 | 5,280 | 4,800 | 726   | 142  | 67    |
| 10  | 78   | 292  | 263  | 465  | 210  | 1,160 | 3,660 | 4,790 | 4,790 | 658   | 167  | 69    |
| 11  | 81   | 310  |      | 470  | 170  | 1,100 | 3,160 | 4,440 | 5,400 | 626   | 171  | 69    |
| 12  | 83   | 328  |      | 538  | 263  | 1,060 | 2,700 | 4,320 | 5,160 | 570   | 158  | 69    |
| 13  | 86   | 328  |      | 538  |      | 1,470 | 2,620 | 3,980 | 4,790 | 538   | 142  | 72    |
| 14  | 99   | 367  |      | 470  |      | 2,880 | 2,620 | 3,870 | 4,670 | 500   | 138  | 69    |
| 15  | 92   | 341  |      | 434  |      | 2,530 | 2,700 | 4,200 | 4,550 | 462   | 138  | 69    |
| 16  | 96   | 322  |      | 420  |      | 2,200 | 3,660 | 4,790 | 4,440 | 414   | 126  | 75    |
| 17  | 99   | 316  |      | 367  |      | 2,530 | 4,320 | 5,800 | 4,200 | 380   | 112  | 86    |
| 18  | 99   | 328  |      |      | 372  | 3,760 | 4,200 | 5,940 | 3,660 | 354   | 106  | 89    |
| 19  | 102  | 348  |      |      |      | 2,980 | 3,560 | 6,620 | 3,160 | 328   | 99   | 89    |
| 20  | 106  | 368  |      |      |      | 2,440 | 3,160 | 6,620 | 2,790 | 298   | 92   | 86    |
| 21  | 112  | 530  |      |      |      | 2,360 | 3,260 | 5,940 | 2,440 | 269   | 89   | 89    |
| 22  | 126  | 570  |      |      |      | 2,880 | 3,980 | 5,800 | 2,200 | 258   | 83   | 96    |
| 23  | 150  | 500  |      |      |      | 2,700 | 4,790 | 6,070 | 1,960 | 252   | 83   | 119   |
| 24  | 186  | 455  |      |      | 554  | 2,120 | 5,800 | 5,940 | 1,770 | 236   | 78   | 126   |
| 25  | 195  | 420  |      |      | 570  | 1,780 | 6,340 | 6,070 | 1,630 | 220   | 75   | 142   |
| 26  | 200  | 400  |      |      | 554  | 1,560 | 6,900 | 6,200 | 1,470 | 209   | 75   | 150   |
| 27  | 200  | 380  |      |      | 538  | 1,470 | 7,040 | 7,180 | 1,380 | 195   | 72   | 138   |
| 28  | 214  | 348  |      |      | 515  | 1,760 | 7,180 | 7,470 | 1,320 | 186   | 72   | 142   |
| 29  | 225  | 341  |      | 360  |      | 3,500 | 7,760 | 7,200 | 1,240 | 176   | 72   | 138   |
| 30  | 225  | 400  | 386  | 373  |      | 5,540 | 7,470 | 7,000 | 1,280 | 167   | 72   | 146   |
| 31  | 225  |      | 386  | 386  |      | 4,440 |       | 7,500 |       | 158   | 69   |       |

| Month     | Maximum | Minimum | Mean  | Run-off in acre-feet |
|-----------|---------|---------|-------|----------------------|
| October   | 225     | 75      | 122   | 7,500                |
| November  | 570     | 236     | 343   | 20,400               |
| December  | 393     |         | 267   | 16,400               |
| January   | 538     |         | 380   | 23,400               |
| February  | 570     | 170     | 374   | 20,800               |
| March     | 5,540   | 515     | 1,990 | 122,000              |
| April     | 7,760   | 2,620   | 4,840 | 288,000              |
| May       | 7,500   | 3,870   | 6,020 | 370,000              |
| June      | 8,000   | 1,240   | 4,090 | 243,000              |
| July      | 1,540   | 158     | 561   | 34,500               |
| August    | 171     | 69      | 115   | 7,070                |
| September | 150     | 64      | 91.3  | 5,430                |
| The year  | 8,000   | 64      | 1,600 | 1,160,000            |

\* Estimated.

## STRAWBERRY CREEK ABOVE SOUTH FORK, NEAR PRAIRIE CITY, OREG.

LOCATION.—Water-stage recorder in SW¼ sec. 20, T. 14 S., R. 34 E., 100 feet above mouth of South Fork of Strawberry Creek and 8½ miles south of Prairie City.

RECORDS AVAILABLE.—October 1930 to September 1933.

DISCHARGE.—Maximum during year, 150 second-feet June 9 (gage-height, 2.44 feet); minimum, 1.7 second-feet Mar. 4, 5-8, 17-26, 28-31, Apr. 1, 2.

1930-33: Maximum, that of June 9, 1933; minimum, 1.4 second-feet Jan. 8, 19, Oct. 7-21, 23, 24, 26-28, 1931.

REMARKS.—Records fair. No diversions above station. Some natural regulation by Strawberry Lake.

*Discharge, in second-feet, 1932-33*

| Day     | Oct. | Nov. | Dec. | Jan. | Feb. | Mar. | Apr. | May | June | July | Aug. | Sept. |
|---------|------|------|------|------|------|------|------|-----|------|------|------|-------|
| 1.....  | 2.8  | 2.2  | 2.5  | 2.1  | 1.9  | 1.8  | 1.7  | 9.5 | *56  | 39   | 8.0  | 5.0   |
| 2.....  | 2.6  | 2.2  | 2.6  | 2.1  | 1.9  | 1.8  | 1.7  | 8.4 | *55  | 36   | 7.8  | 4.8   |
| 3.....  | 2.6  | 2.1  | 2.5  | 2.1  | 1.9  | 1.8  | 1.8  | 8.1 | *56  | 34   | 8.2  | 4.6   |
| 4.....  | 2.6  | 2.1  | 2.5  | 2.2  | 1.9  | 1.7  | 1.9  | 8.4 | 57   | 28   | 8.2  | 4.6   |
| 5.....  | 2.5  | 2.2  | 2.5  | 2.2  | 1.9  | 1.7  | 1.9  | 8.4 | *54  | 25   | 8.0  | 4.5   |
| 6.....  | 2.5  | 2.4  | 2.4  | 2.1  | 1.9  | 1.8  | 1.9  | 8.8 | *50  | 23   | 7.8  | 4.5   |
| 7.....  | 2.5  | 2.2  | 2.5  | 2.1  | 1.9  | 1.8  | 2.0  | 8.4 | *50  | 21   | 8.0  | 4.3   |
| 8.....  | 2.4  | 2.4  | *2.5 | 2.1  | 1.9  | 1.7  | 2.0  | 8.4 | *52  | 20   | 7.8  | 4.3   |
| 9.....  | 2.4  | 2.4  | 2.5  | 2.1  | *1.8 | 1.7  | 1.9  | 8.4 | 116  | 18   | 7.8  | 4.3   |
| 10..... | 2.4  | 2.2  |      | 2.1  | *1.8 | 1.7  | 1.9  | 8.1 | 133  | 16   | 7.8  | 4.3   |
| 11..... | 2.2  | 2.2  |      | 2.0  | *2.0 | 1.8  | 1.9  | 7.9 | 120  | 16   | 7.5  | 4.2   |
| 12..... | 2.2  | 2.2  |      | 2.0  | 2.0  | 1.8  | 1.9  | 8.1 | 114  | 14   | 7.2  | 4.0   |
| 13..... | 2.2  | 2.4  | *2.0 | 2.0  | 2.0  | 1.8  | 1.9  | 8.4 | 114  | 13   | 7.0  | 4.0   |
| 14..... | 2.4  | 2.2  |      | 2.0  | 2.0  | 1.8  | 1.9  | 9.1 | 122  | 12   | 6.8  | 4.0   |
| 15..... | 2.2  | 2.4  |      | 2.0  | 2.0  | 1.8  | 2.0  | 11  | 127  | 11   | 6.5  | 4.0   |
| 16..... | 2.5  | 2.5  |      | 2.0  | 2.0  | 1.8  | 2.1  | 12  | 129  | 11   | 6.3  | 3.9   |
| 17..... | 2.4  | 3.1  | 2.1  | *2.0 | 1.9  | 1.7  | 2.2  | 12  | 122  | 11   | 6.3  | 3.8   |
| 18..... | 2.2  | 3.1  | 2.1  | *2.0 | 1.9  | 1.7  | 2.2  | 12  | 102  | 10   | 6.3  | 3.9   |
| 19..... | 2.2  | 3.1  | 2.1  | 2.0  | 1.9  | 1.7  | 2.2  | 11  | 82   | 9.9  | 6.1  | 3.8   |
| 20..... | 2.2  | 3.1  | 2.1  | 2.0  | 1.9  | 1.7  | 2.2  | 11  | 72   | 9.6  | 5.9  | 3.6   |
| 21..... | 2.2  | 2.9  | 2.1  | 1.9  | 1.9  | 1.7  | 2.5  | 12  | 66   | 9.3  | 5.7  | 3.6   |
| 22..... | 2.4  | 2.8  | 2.1  | 1.9  | 1.9  | 1.7  | 3.1  | 13  | 60   | 9.0  | 5.6  | 3.8   |
| 23..... | 2.4  | 2.8  | 2.1  | 1.9  | 1.9  | 1.7  | 4.4  | 14  | 56   | 9.0  | 5.6  | 3.6   |
| 24..... | 2.2  | 2.8  | 2.1  |      | 1.9  | 1.7  | 5.7  | 17  | 52   | 8.8  | 5.4  | 3.6   |
| 25..... | 2.2  | 2.8  | 2.1  |      | 1.9  | 1.7  | 7.6  | 22  | 49   | 8.5  | 5.4  | 3.6   |
| 26..... | 2.2  | 2.8  | 2.1  | *1.9 | 1.9  | 1.7  | 7.9  | 28  | 47   | 8.5  | 5.4  | 3.6   |
| 27..... | 2.4  | 2.8  | 2.1  |      | 1.8  | 1.8  | 10   | 28  | 46   | 8.5  | 5.4  | 3.6   |
| 28..... | 2.4  | 2.8  | *2.1 |      | 1.8  | 1.7  | 12   | 29  | 44   | 8.5  | 5.2  | 3.5   |
| 29..... | 2.2  | 2.8  | 2.1  | 1.9  |      | 1.7  | 12   | 37  | 44   | 8.2  | 5.2  | 3.5   |
| 30..... | 2.2  | 2.6  | 2.1  | 1.9  |      | 1.7  | 11   | *45 | 42   | 8.0  | 5.0  | 3.5   |
| 31..... | 2.2  |      | 2.1  | 1.9  |      | 1.7  |      | *58 |      | 8.2  | 5.0  |       |

| Month          | Maximum | Minimum | Mean | Run-off in<br>acre-feet |
|----------------|---------|---------|------|-------------------------|
| October.....   | 2.8     | 2.2     | 2.35 | 144                     |
| November.....  | 3.1     | 2.1     | 2.55 | 152                     |
| December.....  | 2.6     |         | 2.19 | 135                     |
| January.....   | 2.2     | 1.9     | 2.00 | 123                     |
| February.....  | 2.0     | 1.8     | 1.91 | 106                     |
| March.....     | 1.8     | 1.7     | 1.74 | 107                     |
| April.....     | 12      | 1.7     | 3.85 | 229                     |
| May.....       | 58      | 7.9     | 15.8 | 972                     |
| June.....      | 133     | 42      | 76.3 | 4,540                   |
| July.....      | 39      | 8.0     | 15.2 | 935                     |
| August.....    | 8.2     | 5.0     | 6.59 | 405                     |
| September..... | 5.0     | 3.5     | 4.01 | 239                     |
| The year.....  | 133     | 1.7     | 11.2 | 8,090                   |

\* Estimated.

## PRAIRIE POWER CANAL AT PRAIRIE CITY, OREG.

LOCATION.—Staff gage in sec. 11, T. 13 S., R. 33 E., 240 feet above county road bridge over canal and 1 mile south of Prairie City.

RECORDS AVAILABLE.—May 1925 to September 1933.

DISCHARGE.—Maximum during year, 70 second-feet June 14, 16, 18 (gage height, 2.88 feet); no flow at times.

1925-33: Maximum, 71 second-feet Dec. 10, 1929; no flow at times.

REMARKS.—Records good except those for December to March and for September which are fair. Discharge estimated Mar. 3. Canal diverts from John Day River in SE¼ sec. 7, T. 13 S., R. 34 E. Water is used by power plant at Prairie City and is returned to river below gaging station on John Day River at Prairie City.

*Discharge, in second-feet, 1932-33*

| Day     | Oct. | Nov.  | Dec. | Jan. | Feb.  | Mar. | Apr.  | May | June  | July | Aug. | Sept. |
|---------|------|-------|------|------|-------|------|-------|-----|-------|------|------|-------|
| 1-----  | 24   | 56    | 59   | 54   | 49    | 54   | 56    | 62  | 64    | 67   | 36   | 9     |
| 2-----  | 24   | 56    | 59   | 54   | 49    | 56   | 59    | 62  | 64    | 67   | 34   | 9     |
| 3-----  | 26   | 59    | 59   | 52   | 29    | 40   | 59    | 64  | 67    | 64   | 36   | 9     |
| 4-----  | 23   | 56    | 59   | 54   | 30    | 56   | 56    | 64  | 67    | 67   | 40   | 9     |
| 5-----  | 23   | 54    | 56   | 54   | 52    | 30   | 56    | 64  | 64    | 64   | 44   | 9     |
| 6-----  | 24   | 56    | 46   | 54   | 49    | 56   | 59    | 64  | 59    | 64   | 44   | 9     |
| 7-----  | 29   | 59    | 44   | 54   | 17    | 59   | 59    | 64  | 62    | 52   | 40   | 9     |
| 8-----  | 30   | 59    | 44   | 54   | 44    | 33   | 59    | 64  | 64    | 49   | 38   | 9     |
| 9-----  | 29   | 59    | 40   | 54   | 21    | 0    | 59    | 64  | 64    | 49   | 38   | 8     |
| 10----- | 36   | 56    | 49   | 54   | 16    | 0    | 59    | 54  | 64    | 42   | 36   | 4     |
| 11----- | 36   | 56    | 49   | 54   | 17    | 0    | 59    | 49  | 67    | 40   | 29   | 4     |
| 12----- | 32   | 54    | 49   | 52   | 54    | 0    | 59    | 52  | 64    | 40   | 28   | 4     |
| 13----- | 36   | 56    | 52   | 54   | 29    | 0    | 59    | 54  | 67    | 36   | 21   | 7     |
| 14----- | 40   | 56    | 54   | 54   | 52    | 0    | 62    | 54  | 70    | 28   | 18   | 8     |
| 15----- | 40   | 59    | 52   | 52   | 52    | 0    | 59    | 54  | 67    | 16   | 18   | 6     |
| 16----- | 49   | 56    | 54   | 52   | 49    | 21   | 62    | 54  | 70    | 14   | 10   | 6     |
| 17----- | 54   | 59    | 54   | 23   | 52    | 54   | 62    | 54  | 67    | 12   | 8    | 10    |
| 18----- | 56   | 59    | 54   | 28   | 52    | 54   | 59    | 54  | 70    | 12   | 8    | 14    |
| 19----- | 56   | 56    | 54   | 49   | 52    | 56   | 59    | 52  | 64    | 12   | 8    | 28    |
| 20----- | 54   | 56    | 54   | 52   | 52    | 54   | 59    | 54  | 59    | 15   | 8    | 30    |
| 21----- | 56   | 56    | 52   | 49   | 49    | 56   | 59    | 54  | 64    | 21   | 8    | 29    |
| 22----- | 56   | 56    | 52   | 52   | 49    | 56   | 62    | 54  | 64    | 22   | 9    | 15    |
| 23----- | 59   | 56    | 52   | 54   | 52    | 56   | 59    | 62  | 67    | 28   | 8    | 14    |
| 24----- | 59   | 56    | 52   | 52   | 52    | 56   | 62    | 62  | 64    | 28   | 8    | 30    |
| 25----- | 56   | 56    | 49   | 52   | 54    | 59   | 62    | 62  | 67    | 32   | 8    | 17    |
| 26----- | 56   | 54    | 52   | 52   | 52    | 59   | 62    | 62  | 67    | 36   | 9    | 17    |
| 27----- | 59   | 54    | 49   | 49   | 52    | 56   | 59    | 62  | 67    | 36   | 8    | 17    |
| 28----- | 59   | 54    | 52   | 52   | 54    | 59   | 62    | 64  | 67    | 36   | 8    | 17    |
| 29----- | 59   | 54    | 54   | 52   | ----- | 56   | 62    | 64  | 67    | 56   | 8    | 18    |
| 30----- | 56   | 54    | 54   | 49   | ----- | 59   | 64    | 62  | 67    | 40   | 9    | 34    |
| 31----- | 59   | ----- | 49   | 52   | ----- | 56   | ----- | 64  | ----- | 38   | 8    | ----- |

| Month          | Maximum | Minimum | Mean | Run-off in<br>acre-feet |
|----------------|---------|---------|------|-------------------------|
| October-----   | 59      | 23      | 43.7 | 2,680                   |
| November-----  | 59      | 54      | 56.2 | 3,340                   |
| December-----  | 59      | 40      | 51.9 | 3,190                   |
| January-----   | 54      | 23      | 50.7 | 3,120                   |
| February-----  | 54      | 16      | 44.0 | 2,440                   |
| March-----     | 59      | 0       | 40.4 | 2,480                   |
| April-----     | 64      | 56      | 59.8 | 3,560                   |
| May-----       | 64      | 49      | 59.0 | 3,630                   |
| June-----      | 70      | 59      | 65.4 | 3,890                   |
| July-----      | 67      | 12      | 37.5 | 2,310                   |
| August-----    | 44      | 8       | 20.4 | 1,250                   |
| September----- | 34      | 4       | 13.6 | 809                     |
| The year-----  | 70      | 0       | 45.2 | 32,700                  |

## NORTH FORK OF JOHN DAY RIVER NEAR DALE, OREG.

LOCATION.—Water-stage recorder in SE¼ sec. 35, T. 6 S., R. 31 E., three-eighths of a mile below Desolation Creek and 1½ miles northeast of Dale. Zero of gage is 2,775.85 feet above mean sea level by general adjustment of 1929.

RECORDS AVAILABLE.—October 1929 to September 1933.

DISCHARGE.—Maximum during year, 4,040 second-feet May 30 (gage height, 7.63 feet); minimum (estimated), 10 second-feet Dec. 11, 12.

1929-33: Maximum, 4,990 second-feet May 14, 1932 (gage height, 8.4 feet); minimum, that of Dec. 11, 12, 1932.

REMARKS.—Records good except those estimated, Dec. 11 to Feb. 27, which are poor. Some small diversions for irrigation above station; no regulation.

## Discharge, in second-feet, 1932-33

| Day     | Oct. | Nov. | Dec. | Feb. | Mar. | Apr.  | May   | June  | July | Aug. | Sept. |
|---------|------|------|------|------|------|-------|-------|-------|------|------|-------|
| 1.....  | 35   | 55   | 99   |      | 95   | 175   | 1,050 | 3,160 | 555  | 75   | 47    |
| 2.....  | 35   | 65   | 93   |      | 101  | 223   | 980   | 3,050 | 480  | 79   | 45    |
| 3.....  | 34   | 64   | 99   |      | 115  | 310   | 875   | 3,380 | 428  | 84   | 43    |
| 4.....  | 34   | 56   | 79   |      | 115  | 370   | 1,020 | 3,160 | 406  | 111  | 39    |
| 5.....  | 35   | 52   | 67   |      | 91   | 346   | 1,020 | 2,850 | 366  | 117  | 37    |
| 6.....  | 35   | 84   | 75   |      | 86   | 352   | 875   | 2,550 | 324  | 99   | 42    |
| 7.....  | 36   | 95   | 62   |      | 91   | 321   | 810   | 2,300 | 300  | 88   | 44    |
| 8.....  | 40   | 80   | 72   |      | 84   | 279   | 720   | 2,100 | 279  | 82   | 45    |
| 9.....  | 40   | 121  | 30   |      | 99   | 244   | 665   | 2,500 | 265  | 82   | 46    |
| 10..... | 37   | 107  | 20   |      | 88   | 311   | 621   | 2,500 | 250  | 75   | 49    |
| 11..... | 36   | 62   |      |      | 111  | 208   | 594   | 2,350 | 232  | 69   | 47    |
| 12..... | 38   | 77   |      |      | 143  | 202   | 610   | 2,400 | 214  | 62   | 45    |
| 13..... | 37   | 79   |      |      | 134  | 195   | 750   | 2,400 | 195  | 59   | 46    |
| 14..... | 39   | 79   |      |      | 124  | 241   | 1,020 | 2,300 | 182  | 55   | 45    |
| 15..... | 43   | 79   |      | 58   | 132  | 332   | 1,400 | 2,300 | 170  | 55   | 64    |
| 16..... | 45   | 69   |      |      | 166  | 356   | 1,480 | 2,100 | 156  | 55   | 82    |
| 17..... | 59   | 211  |      |      | 154  | 321   | 1,520 | 1,740 | 147  | 54   | 64    |
| 18..... | 61   | 235  |      |      | 136  | 279   | 1,560 | 1,400 | 145  | 54   | 62    |
| 19..... | 55   | 149  |      |      | 130  | 265   | 1,360 | 1,200 | 138  | 56   | 70    |
| 20..... | 51   | 124  |      |      | 134  | 318   | 1,400 | 1,650 | 134  | 54   | 64    |
| 21..... | 50   | 107  | 43   |      | 141  | 410   | 1,520 | 945   | 128  | 50   | 69    |
| 22..... | 56   | 103  |      |      | 130  | 572   | 1,660 | 840   | 121  | 52   | 72    |
| 23..... | 64   | 62   |      |      | 117  | 720   | 1,880 | 750   | 117  | 52   | 72    |
| 24..... | 58   | 79   |      |      | 109  | 840   | 2,150 | 682   | 107  | 52   | 69    |
| 25..... | 55   | 126  |      |      | 121  | 1,080 | 2,650 | 638   | 103  | 49   | 72    |
| 26..... | 56   | 107  |      |      | 119  | 1,240 | 3,270 | 632   | 97   | 47   | 73    |
| 27..... | 62   | 91   |      |      | 136  | 1,560 | 2,950 | 566   | 89   | 47   | 77    |
| 28..... | 64   | 93   |      | 86   | 178  | 1,790 | 2,850 | 750   | 86   | 44   | 72    |
| 29..... | 59   | 107  |      |      | 175  | 1,660 | 3,160 | 692   | 82   | 44   | 64    |
| 30..... | 59   | 107  |      |      | 182  | 1,240 | 3,710 | 698   | 80   | 43   | 59    |
| 31..... | 55   |      |      |      | 188  |       | 3,600 |       | 75   | 46   |       |

| Month          | Maximum | Minimum | Mean  | Run-off in<br>acre-feet |
|----------------|---------|---------|-------|-------------------------|
| October.....   | 64      | 34      | 47.2  | 2,900                   |
| November.....  | 235     | 52      | 97.5  | 5,800                   |
| December.....  | 99      |         | 51.6  | 3,170                   |
| January.....   |         |         | 76    | 4,670                   |
| February.....  |         |         | 59.0  | 3,280                   |
| March.....     | 188     | 84      | 127   | 7,810                   |
| April.....     | 1,790   | 175     | 555   | 33,000                  |
| May.....       | 3,710   | 594     | 1,600 | 98,400                  |
| June.....      | 3,380   | 566     | 1,800 | 107,000                 |
| July.....      | 555     | 75      | 208   | 12,800                  |
| August.....    | 117     | 43      | 64.2  | 3,950                   |
| September..... | 82      | 37      | 57.5  | 3,420                   |
| The year.....  | 3,710   |         | 396   | 286,000                 |

## NORTH FORK OF JOHN DAY RIVER AT MONUMENT, OREG.

LOCATION.—Water-stage recorder in E½ sec. 1, T. 9 S., R. 27 E., just below entrance to canyon, three-quarters of a mile west of Monument.

RECORDS AVAILABLE.—March 1925 to September 1933.

DISCHARGE.—Maximum during year, 6,780 second-feet May 31 (gauge height, 7.95 feet); minimum, 16 second-feet Dec. 12 (gauge height, 1.18 feet).

1925-33: Maximum, 22,000 second-feet (revised) Mar. 18, 1932 (gauge height, 14.8 feet); minimum, 7 second-feet Nov. 24, 1931 (gauge height, 0.78 foot).

REMARKS.—Records good except those estimated and those for Dec. 10-17, which are fair. Several small diversions for irrigation above station.

## Discharge, in second-feet, 1932-33

| Day       | Oct. | Nov.  | Dec. | Jan. | Feb.  | Mar.    | Apr.    | May   | June  | July                 | Aug.  | Sept. |
|-----------|------|-------|------|------|-------|---------|---------|-------|-------|----------------------|-------|-------|
| 1         | 70   |       | 210  | 170  |       | 262     | 2,700   | 4,320 | 5,490 | 920                  | • 115 |       |
| 2         | 69   |       | 207  | 197  |       | 317     | 3,640   | 5,040 | 5,040 | 812                  | • 115 |       |
| 3         | 69   |       | 197  | 200  |       | 484     | 5,040   | 4,890 | 5,490 | 720                  | • 125 |       |
| 4         | 70   |       | 197  | 185  |       | 525     | 5,040   | 5,340 | 5,340 | 655                  | 136   |       |
| 5         | 69   |       | 179  | 185  |       | 456     | 4,040   | 5,340 | 4,740 | 600                  | 159   |       |
| 6         |      | • 154 |      |      |       |         |         |       |       |                      |       |       |
| 6         | 67   |       | 139  | 254  |       | 420     | 4,040   | 4,460 | 4,180 | 537                  | 170   |       |
| 7         | 69   |       | 122  | 240  |       | 440     | 3,510   | 3,770 | 3,770 | 484                  | 150   |       |
| 8         | 70   |       | 62   | 262  |       | 543     | 2,640   | 3,510 | 3,360 | 440                  | 145   |       |
| 9         | 76   |       | 34   | 345  |       | 484     | 2,190   | 3,120 | 3,510 | 410                  | 147   |       |
| 10        | 86   |       | • 28 | 325  |       | 440     | 1,870   | 2,880 | 4,040 | 386                  | 142   |       |
| 11        |      | 84    | 197  | 23   | 262   | 537     | 1,770   | 2,880 | 3,510 | 363                  | 136   |       |
| 12        |      | 82    | 159  | 17   | 227   | 1,620   | 1,820   | 2,640 | 3,510 | 337                  |       |       |
| 13        |      | 82    | 145  | 23   | 207   | 1,670   | 1,820   | 2,820 | 3,510 | 313                  |       |       |
| 14        |      | 82    | 159  | 34   | 191   | 1,320   | 2,240   | 3,250 | 3,250 | 285                  |       |       |
| 15        |      | 84    | 167  | 46   | 194   | 1,270   | 3,120   | 4,040 | 3,250 | 269                  |       |       |
| 16        |      | 90    | 176  | 50   | 176   | 2,360   | 3,250   | 4,320 | 3,000 | 248                  |       | 80    |
| 17        |      | 94    | 173  | 55   | • 130 | 2,190   | 2,760   | 4,740 | 2,520 | 227                  |       | 119   |
| 18        |      | 105   | 405  | 60   | • 110 | 1,470   | 2,240   | 5,340 | 2,080 | 214                  |       | 97    |
| 19        |      | 129   | 376  | 147  | 173   | 1,370   | 2,240   | 4,740 | 1,820 | 207                  |       | 109   |
| 20        |      |       | 281  | 132  | 191   | 1,720   | 2,760   | 4,320 | 1,670 | 197                  |       | 105   |
| 21        |      |       | 248  | 124  | 194   | 1,970   | 3,250   | 4,320 | 1,470 | 189                  | • 83  | 119   |
| 22        |      |       | 223  | 122  | 191   | 1,470   | 4,040   | 4,460 | 1,320 | 182                  |       | 107   |
| 23        |      |       | 204  | 147  | 197   | 1,180   | 4,800   | 4,460 | 1,180 | 173                  |       | 110   |
| 24        |      |       | 150  | 132  | 194   | 984     | 4,890   | 4,600 | 1,060 | 167                  |       | 112   |
| 25        |      | • 127 | 134  | 150  | 182   | 936     | 5,340   | 5,040 | 984   | 156                  |       | 112   |
| 26        |      |       | 188  | 167  | 188   | 220     | 1,030   | 5,340 | 6,280 | 984                  | 153   | 116   |
| 27        |      |       | 204  | 170  | 179   | 227     | 1,720   | 5,640 | 5,800 | 904                  | 147   | 119   |
| 28        |      |       | 194  | 173  | 179   | 237     | 3,900   | 5,960 | 5,340 | 992                  | • 135 | 122   |
| 29        |      |       | 204  | 170  | 170   |         | 3,640   | 5,640 | 5,340 | 1,090                | • 125 | 116   |
| 30        |      |       | 217  | 164  | 167   |         | 2,940   | 4,740 | 6,120 | 1,140                | • 120 | 105   |
| 31        |      |       |      | 156  | • 165 | 3,510   |         | 6,280 |       | • 115                |       |       |
| Month     |      |       |      |      |       | Maximum | Minimum | Mean  |       | Run-off in acre-feet |       |       |
| October   |      |       |      |      |       |         | 67      | 99.1  |       | 6,090                |       |       |
| November  |      |       |      |      |       | 405     |         | 191   |       | 11,400               |       |       |
| December  |      |       |      |      |       | 210     | 17      | 117   |       | 7,190                |       |       |
| January   |      |       |      |      |       | 345     | 110     | 201   |       | 12,400               |       |       |
| February  |      |       |      |      |       | 237     |         | 167   |       | 9,280                |       |       |
| March     |      |       |      |      |       | 3,900   | 262     | 1,400 |       | 86,100               |       |       |
| April     |      |       |      |      |       | 5,960   | 1,770   | 3,610 |       | 215,000              |       |       |
| May       |      |       |      |      |       | 6,280   | 2,640   | 4,510 |       | 277,000              |       |       |
| June      |      |       |      |      |       | 5,490   | 904     | 2,810 |       | 167,000              |       |       |
| July      |      |       |      |      |       | 920     | 115     | 331   |       | 20,400               |       |       |
| August    |      |       |      |      |       | 170     |         | 103   |       | 6,330                |       |       |
| September |      |       |      |      |       | 122     |         | 91.9  |       | 5,470                |       |       |
| The year  |      |       |      |      |       | 6,280   |         | 1,140 |       | 824,000              |       |       |

• Estimated.

## MIDDLE FORK OF JOHN DAY RIVER AT RITTER, OREG.

LOCATION.—Water-stage recorder in NW¼ sec. 8, T. 8 S., R. 30 E., at bridge half a mile south of Ritter.

RECORDS AVAILABLE.—October 1929 to September 1933.

DISCHARGE.—Maximum during year, 1,560 second-feet May 4 (gage height, 5.32 feet); minimum (estimated), 1.0 second-foot Dec. 10.

1929-33: Maximum, 4,000 second-feet Mar. 19, 1932 (gage height, 7.78 feet); minimum, that of Dec. 10, 1932.

REMARKS.—Records good except those during winter, which are fair, and those estimated, which are poor. A few small diversions for irrigation above station.

*Discharge, in second-feet, 1932-33*

| Day | Oct. | Nov. | Dec. | Jan. | Feb. | Mar. | Apr.  | May   | June  | July | Aug. | Sept. |
|-----|------|------|------|------|------|------|-------|-------|-------|------|------|-------|
| 1   | 17   | 36   | 47   | 52   | 38   | 48   | 376   | 1,080 | 1,090 | 193  | 29   | 14    |
| 2   | 17   | 37   | 46   | 53   | 37   | 57   | 515   | 1,290 | 1,050 | 171  | 31   | 16    |
| 3   | 19   | 38   | 48   | 54   | 41   | 132  | 790   | 1,240 | 1,090 | 158  | 34   | 15    |
| 4   | 19   | 37   | 45   | 47   | 45   | 125  | 886   | 1,420 | 1,080 | 142  | 43   | 16    |
| 5   | 16   | 37   | 42   | 50   | 36   | 89   | 741   | 1,290 | 1,000 | 130  | 50   | 16    |
| 6   | 17   | 42   | 34   | 53   | 37   | 74   | 755   | 1,100 | 894   | 117  | 44   | 16    |
| 7   | 20   | 48   | 20   | 46   | 52   | 74   | 654   | 966   | 798   | 110  | 39   | 16    |
| 8   | 23   | 46   | 5    | 44   | 42   | 99   | 515   | 870   | 708   | 101  | 39   | 17    |
| 9   | 24   | 55   |      | 42   |      | 94   | 420   | 783   | 755   | 96   | 37   | 18    |
| 10  | 24   | 57   |      | 39   |      | 79   | 363   | 714   | 806   | 90   | 33   | 25    |
| 11  | 24   | 43   | * 4  | 38   |      | 104  | 349   | 660   | 755   | 84   | 32   | 27    |
| 12  | 24   | 38   |      | 34   |      | 272  | 380   | 616   | 776   | 76   | 29   | 24    |
| 13  | 24   | 40   |      | 32   |      | 205  | 402   | 632   | 776   | 70   |      | 23    |
| 14  | 25   | 42   |      | 33   |      | 169  | 500   | 702   | 748   | 66   |      | 23    |
| 15  | 28   | 43   |      | 33   |      | 195  | 644   | 846   | 702   | 62   | * 20 | 28    |
| 16  | 29   | 46   | 10   | * 30 |      | 287  | 734   | 918   | 632   | 58   |      | 39    |
| 17  | 36   | 92   | 13   | * 25 | 35   | 239  | 627   | 974   | 535   | 52   |      | 35    |
| 18  | 42   | 119  | 18   | * 20 |      | 198  | 530   | 1,080 | 448   | 50   | 16   | 33    |
| 19  | 37   | 79   | 22   | 39   |      | 198  | 555   | 958   | 394   | 48   | 16   | 37    |
| 20  | 34   | 63   | 24   | 42   |      | 272  | 696   | 862   | 346   | 46   | 16   | 35    |
| 21  | 32   | 55   | 28   | 47   |      | 281  | 838   | 878   | 314   | 45   | 16   | 33    |
| 22  | 33   | 52   | 32   | 50   |      | 208  | 966   | 870   | 284   | 44   | 15   | 34    |
| 23  | 36   | 45   | 32   | 52   |      | 173  | 1,100 | 878   | 254   | 42   | 16   | 34    |
| 24  | 39   | 39   | 39   | 48   |      | 152  | 1,180 | 902   | 236   | 40   | 14   | 34    |
| 25  | 38   | 44   | 48   | 47   |      | 148  | 1,290 | 982   | 216   | 38   | 12   | 38    |
| 26  | 35   | 45   | 57   | 51   |      | 152  | 1,290 | 1,120 | 214   | 35   | 11   | 40    |
| 27  | 36   | 44   | 53   | 44   |      | 200  | 1,340 | 1,050 | 193   | 32   | 11   | 38    |
| 28  | 36   | 46   | 52   | 44   | 47   | 373  | 1,340 | 982   | 251   | 29   | 11   | 37    |
| 29  | 35   | 48   | 51   | 40   |      | 394  | 1,380 | 1,010 | 239   | 30   | 11   | 33    |
| 30  | 34   | 47   | 53   | 40   |      | 380  | 1,240 | 1,120 | 236   | 29   | 12   | 32    |
| 31  | 35   |      | 51   | 40   |      | 416  |       | 1,180 |       | 29   | 13   |       |

| Month     | Maximum | Minimum | Mean | Run-off in acre-feet |
|-----------|---------|---------|------|----------------------|
| October   | 42      | 16      | 28.6 | 1,760                |
| November  | 119     | 36      | 50.1 | 2,980                |
| December  | 57      |         | 29.0 | 1,780                |
| January   | 54      | 20      | 42.2 | 2,590                |
| February  | 52      |         | 37.1 | 2,060                |
| March     | 416     | 48      | 190  | 11,700               |
| April     | 1,380   | 349     | 780  | 46,400               |
| May       | 1,420   | 616     | 967  | 59,500               |
| June      | 1,090   | 193     | 594  | 35,300               |
| July      | 193     | 29      | 74.6 | 4,590                |
| August    | 50      | 11      | 23.5 | 1,440                |
| September | 40      | 14      | 27.5 | 1,640                |
| The year  | 1,420   |         | 237  | 172,000              |

\* Estimated.

FOX CREEK AT GORGE NEAR FOX, OREG. <sup>2</sup>

LOCATION.—Water-stage recorder in NW¼ sec. 17, T. 11 S., R. 29 E., at head of gorge 6 miles southwest of Fox.

RECORDS AVAILABLE.—October 1930 to September 1933.

DISCHARGE.—Maximum during year, 323 second-feet Mar. 29 (gage height, 2.95 feet); no flow at times.

1930-33: Maximum, 800 second-feet (revised) Mar. 18, 1932 (gage height, 4.55 feet); no flow at times.

REMARKS.—Records for Mar. 26 to May 31 good; others poor. Several diversions for irrigation in valley above station.

*Discharge, in second-feet, 1932-33*

| Day      | Mar.    | Apr. | May | June | July | Aug. | Day      | Mar. | Apr. | May | June | July | Aug. |
|----------|---------|------|-----|------|------|------|----------|------|------|-----|------|------|------|
| 1.-----  |         | 136  | 88  | 73   | 3.2  | 0    | 16.----- | 1.0  | 36   | 119 | 8.0  | 0.2  | 0    |
| 2.-----  |         | 184  | 121 | 65   | 2.6  | 0    | 17.----- | 16   | 32   | 142 | 6.7  | .2   | 0    |
| 3.-----  |         | 191  | 116 | 72   | 2.2  | 0    | 18.----- | 6.7  | 25   | 159 | 5.8  | .1   | 0    |
| 4.-----  |         | 123  | 175 | 86   | 1.8  | .1   | 19.----- | 4.0  | 22   | 125 | 5.2  | .1   | 0    |
| 5.-----  |         | 85   | 140 | 55   | 1.5  | 0    | 20.----- | 7.6  | 24   | 106 | 4.6  | .1   | 0    |
| 6.-----  |         | 70   | 106 | 39   | 1.2  | 0    | 21.----- | 44   | 29   | 116 | 3.8  | .1   | 0    |
| 7.-----  |         | 54   | 95  | 35   | .9   | .2   | 22.----- | 38   | 36   | 127 | 3.4  | .1   | 0    |
| 8.-----  | } * 0.2 | 43   | 88  | 32   | .7   | .2   | 23.----- | 22   | 45   | 117 | 3.2  | .1   | 0    |
| 9.-----  |         | 38   | 80  | 29   | .7   | .2   | 24.----- | 18   | 54   | 114 | 3.1  | .1   | 0    |
| 10.----- |         | 33   | 80  | 29   | .6   | .1   | 25.----- | 17   | 65   | 116 | 2.9  | 0    | 0    |
| 11.----- |         | 31   | 82  | 24   | .5   | .1   | 26.----- | 18   | 73   | 125 | 2.9  | 0    | 0    |
| 12.----- |         | 28   | 65  | 21   | .4   | .1   | 27.----- | 50   | 85   | 123 | 3.1  | 0    | 0    |
| 13.----- |         | 25   | 64  | 18   | .4   | 0    | 28.----- | 246  | 93   | 108 | 4.6  | 0    | 0    |
| 14.----- |         | 29   | 75  | 16   | .3   | 0    | 29.----- | 215  | 116  | 97  | 5.4  | 0    | 0    |
| 15.----- |         | 32   | 106 | 12   | .2   | 0    | 30.----- | 164  | 104  | 92  | 4.8  | 0    | 0    |
|          |         |      |     |      |      |      | 31.----- | 177  |      | 85  |      | 0    | 0    |

| Month            | Maximum | Minimum | Mean  | Run-off in acre-feet |
|------------------|---------|---------|-------|----------------------|
| October.-----    |         |         | * 0.1 | 6                    |
| November.-----   |         |         | *.1   | 6                    |
| December.-----   |         |         | *.1   | 6                    |
| January.-----    |         |         | *.1   | 6                    |
| February.-----   |         |         | *.1   | 6                    |
| March.-----      | 246     |         | 33.8  | 2,080                |
| April.-----      | 191     | 21      | 64.7  | 3,850                |
| May.-----        | 175     | 64      | 108   | 6,640                |
| June.-----       | 86      | 2.9     | 22.4  | 1,330                |
| July.-----       | 3.2     | 0       | .59   | 36                   |
| August.-----     | .2      | 0       | .03   | 2                    |
| The period.----- | 246     | 0       | 19.3  | 14,000               |

\* Estimated.

NOTE.—Practically no flow during September.

<sup>2</sup> The lower portion of this stream is named Cottonwood Creek.

## DESCHUTES RIVER BASIN

## CRANE PRAIRIE RESERVOIR NEAR LAPINE, OREG.

LOCATION.—Staff gage at reservoir dam in NW¼ sec. 16, T. 21 S., R. 8 E., 15 miles northwest of Lapine. Zero of gage is 4,400.0 feet above mean sea level.

RECORDS AVAILABLE.—November 1922 to September 1933.

EXTREMES.—Maximum contents during year, 41,480 acre-feet June 28, 29 (gage height, 42.08 feet); minimum, 10,400 acre-feet Oct. 5–11 (gage height, 33.86 feet).

1922–33: Maximum contents, 50,830 acre-feet Jan. 10–13, 1924 (gage height, 44.10 feet); no storage at times.

REMARKS.—Records good. Reservoir was completed by North Canal Co. in 1922; gates were first closed Nov. 4, 1922. Capacity of reservoir is 55,200 acre-feet at spillway crest at gage height 45 feet. Stored water is used for irrigation of lands near Bend and Redmond. Records furnished by State engineer.

*Stage and contents, 1932–33*

| Date          | Gage height (feet) | Contents (acre-feet) | Change in contents during month (acre-feet) | Date          | Gage height (feet) | Contents (acre-feet) | Change in contents during month (acre-feet) |
|---------------|--------------------|----------------------|---------------------------------------------|---------------|--------------------|----------------------|---------------------------------------------|
| Sept. 30..... | 33.88              | 10,460               | -----                                       | May 31.....   | 40.40              | 34,210               | +5,870                                      |
| Oct. 31.....  | 34.18              | 11,370               | +910                                        | June 30.....  | 42.04              | 41,300               | +7,090                                      |
| Nov. 30.....  | 35.16              | 14,510               | +3,140                                      | July 31.....  | 40.50              | 34,630               | -6,670                                      |
| Dec. 31.....  | 35.72              | 16,390               | +1,880                                      | Aug. 31.....  | 38.62              | 27,000               | -7,630                                      |
| Jan. 31.....  | 36.54              | 19,250               | +2,860                                      | Sept. 30..... | 38.82              | 27,780               | +780                                        |
| Feb. 28.....  | 36.98              | 20,820               | +1,570                                      |               |                    |                      |                                             |
| Mar. 31.....  | 38.22              | 25,450               | +4,630                                      | The year..... | -----              | -----                | +17,320                                     |
| Apr. 30.....  | 38.96              | 28,340               | +2,890                                      |               |                    |                      |                                             |

DESCHUTES RIVER AT CRANE PRAIRIE, NEAR LAPINE, OREG.

LOCATION.—Water-stage recorder in NW¼ sec. 16, T. 21 S., R. 8 E., 200 yards below Crane Prairie Dam and 15 miles northwest of Lapine.

RECORDS AVAILABLE.—January 1914 to June 1917; February 1922 to September 1933.

DISCHARGE.—Maximum during year, 514 second-feet Aug. 8–11 (gage height, 2.22 feet); minimum, 29 second-feet Mar. 9–21 (gage height, 0.54 foot).

1914–17, 1922–33: Maximum, 604 second-feet Apr. 18, 1924 (gage height, 2.40 feet); minimum, 2.5 second-feet Apr. 24, 1923, caused by closing of dam (gage height, 0.05 foot). Average, 12 years (1914–15, 1922–33), 207 second-feet.

REMARKS.—Records good. Discharge interpolated Sept. 12, 13. Flow partly regulated since Nov. 4, 1922, by storage in Crane Prairie Reservoir. Records furnished by State engineer.

*Discharge, in second-feet, 1932–33*

| Day     | Oct. | Nov.  | Dec. | Jan. | Feb.  | Mar. | Apr.  | May | June  | July | Aug. | Sept. |
|---------|------|-------|------|------|-------|------|-------|-----|-------|------|------|-------|
| 1.....  | 283  | 213   | 207  | 162  | 135   | 120  | 75    | 58  | 151   | 249  | 438  | 383   |
| 2.....  | 283  | 210   | 207  | 162  | 135   | 105  | 75    | 57  | 151   | 249  | 463  | 383   |
| 3.....  | 280  | 210   | 207  | 151  | 135   | 105  | 75    | 55  | 157   | 249  | 497  | 336   |
| 4.....  | 274  | 207   | 207  | 151  | 135   | 105  | 73    | 57  | 162   | 249  | 497  | 339   |
| 5.....  | 261  | 207   | 207  | 151  | 135   | 105  | 73    | 57  | 165   | 249  | 501  | 332   |
| 6.....  | 255  | 207   | 207  | 151  | 135   | 105  | 73    | 58  | 165   | 255  | 501  | 332   |
| 7.....  | 249  | 210   | 207  | 151  | 135   | 105  | 73    | 58  | 170   | 255  | 505  | 332   |
| 8.....  | 243  | 210   | 207  | 151  | 135   | 105  | 73    | 58  | 176   | 299  | 509  | 332   |
| 9.....  | 243  | 210   | 207  | 151  | 135   | 29   | 71    | 57  | 179   | 319  | 514  | 332   |
| 10..... | 243  | 210   | 207  | 151  | 135   | 29   | 69    | 57  | 179   | 319  | 514  | 332   |
| 11..... | 243  | 207   | 190  | 140  | 135   | 29   | 67    | 55  | 182   | 319  | 514  | 332   |
| 12..... | 246  | 207   | 184  | 140  | 135   | 29   | 67    | 55  | 173   | 319  | 509  | 334   |
| 13..... | 249  | 207   | 179  | 140  | 135   | 29   | 65    | 53  | 179   | 322  | 509  | 336   |
| 14..... | 243  | 207   | 173  | 140  | 135   | 29   | 65    | 52  | 184   | 326  | 509  | 339   |
| 15..... | 243  | 207   | 168  | 140  | 125   | 29   | 67    | 52  | 187   | 326  | 509  | 339   |
| 16..... | 243  | 207   | 162  | 140  | 120   | 29   | 67    | 50  | 187   | 329  | 455  | 339   |
| 17..... | 243  | 207   | 162  | 140  | 120   | 29   | 71    | 49  | 187   | 329  | 438  | 339   |
| 18..... | 243  | 207   | 162  | 140  | 120   | 29   | 71    | 46  | 193   | 336  | 438  | 339   |
| 19..... | 237  | 207   | 162  | 140  | 120   | 29   | 71    | 44  | 199   | 372  | 438  | 339   |
| 20..... | 237  | 207   | 162  | 140  | 120   | 29   | 73    | 44  | 204   | 379  | 434  | 339   |
| 21..... | 237  | 207   | 162  | 140  | 120   | 29   | 75    | 42  | 207   | 395  | 430  | 339   |
| 22..... | 237  | 207   | 162  | 140  | 120   | 32   | 75    | 42  | 210   | 399  | 430  | 339   |
| 23..... | 237  | 207   | 162  | 140  | 120   | 32   | 77    | 40  | 213   | 414  | 430  | 339   |
| 24..... | 237  | 207   | 162  | 140  | 120   | 32   | 64    | 39  | 213   | 430  | 430  | 339   |
| 25..... | 231  | 207   | 162  | 140  | 120   | 32   | 58    | 40  | 213   | 434  | 430  | 339   |
| 26..... | 231  | 207   | 162  | 140  | 120   | 32   | 58    | 40  | 213   | 399  | 430  | 339   |
| 27..... | 231  | 207   | 162  | 140  | 120   | 32   | 60    | 49  | 213   | 346  | 426  | 339   |
| 28..... | 231  | 207   | 162  | 135  | 120   | 32   | 62    | 52  | 210   | 406  | 422  | 339   |
| 29..... | 219  | 207   | 162  | 135  | ----- | 32   | 60    | 69  | 237   | 430  | 426  | 343   |
| 30..... | 219  | 207   | 162  | 135  | ----- | 34   | 60    | 143 | 246   | 430  | 426  | 343   |
| 31..... | 216  | ----- | 162  | 135  | ----- | 50   | ----- | 148 | ----- | 430  | 414  | ----- |

| Month          | Maximum | Minimum | Mean | Run-off in acre-feet |
|----------------|---------|---------|------|----------------------|
| October.....   | 283     | 216     | 244  | 15,000               |
| November.....  | 213     | 207     | 208  | 12,400               |
| December.....  | 207     | 162     | 179  | 11,000               |
| January.....   | 162     | 135     | 144  | 8,850                |
| February.....  | 135     | 120     | 128  | 7,110                |
| March.....     | 120     | 29      | 50.7 | 3,120                |
| April.....     | 75      | 58      | 68.8 | 4,090                |
| May.....       | 148     | 39      | 57.3 | 3,520                |
| June.....      | 246     | 151     | 190  | 11,300               |
| July.....      | 434     | 249     | 341  | 21,000               |
| August.....    | 514     | 414     | 464  | 28,500               |
| September..... | 383     | 332     | 340  | 20,200               |
| The year.....  | 514     | 29      | 202  | 146,000              |

## DESCHUTES RIVER AT PRINGLE FALLS, NEAR LAPINE, OREG.

LOCATION.—Water-stage recorder in SW¼ sec. 23, T. 21 S., R. 9 E., half a mile above bridge at Pringle Falls and 7 miles northwest of Lapine.

RECORDS AVAILABLE.—December 1915 to June 1917, June 1922 to September 1933.

DISCHARGE.—Maximum during year, 1,080 second-feet Aug. 6-16 (gage height, 2.56 feet); minimum (estimated), 500 second-feet Feb. 9.

1915-17, 1922-33: Maximum, 1,170 second-feet June 21-27, 29, 30, 1917; minimum, 341 second-feet during period when recorder was stopped, Feb. 1-14, 1932. Average, 10 years (1922-33), 709 second-feet.

REMARKS.—Records good except those estimated in December and February and those for March to May, which are fair. No diversions above station. Flow regulated to small extent since 1922 by storage in Crane Prairie Reservoir. Records furnished by State engineer.

*Discharge, in second-feet, 1932-33*

| Day     | Oct. | Nov. | Dec.  | Jan. | Feb.  | Mar. | Apr. | May   | June | July | Aug.  | Sept. |
|---------|------|------|-------|------|-------|------|------|-------|------|------|-------|-------|
| 1.....  | 782  | 724  | 710   | 662  | 638   | 618  | 583  | 580   | 670  | 800  | 995   | 975   |
| 2.....  | 782  | 724  | 710   | 678  | 638   | 610  | 590  | 576   | 674  | 805  | 1,020 | 960   |
| 3.....  | 782  | 710  | 706   | 662  | 638   | 606  | 594  | 572   | 688  | 805  | 1,050 | 950   |
| 4.....  | 778  | 710  | 706   | 658  | 638   | 602  | 594  | 572   | 688  | 805  | 1,050 | 925   |
| 5.....  | 778  | 724  | 702   | 650  | 638   | 602  | 594  | 576   | 688  | 810  | 1,050 | 910   |
| 6.....  | 764  | 737  | 698   | 646  | 638   | 602  | 598  | 576   | 688  | 810  | 1,080 | 905   |
| 7.....  | 760  | 714  | 698   | 646  | 634   | 602  | 594  | 580   | 688  | 814  | 1,080 | 900   |
| 8.....  | 755  | 714  |       | 646  | * 600 | 602  | 590  | 576   | 692  | 846  | 1,080 | 900   |
| 9.....  | 750  | 714  |       | 650  | * 500 | 566  | 590  | 576   | 702  | 872  | 1,080 |       |
| 10..... | 750  | 710  |       | 650  | * 560 | 538  | 590  | 576   | 697  | 872  | 1,080 |       |
| 11..... | 750  | 710  |       | 646  | 638   | 542  | 590  | 580   | 702  | 872  | 1,080 |       |
| 12..... | 750  | 710  |       | 638  | 634   | 546  | 590  | 576   | 706  | 872  | 1,080 |       |
| 13..... | 755  | 719  |       | 638  | 630   | 538  | 594  | 576   | 710  | 877  | 1,080 |       |
| 14..... | 755  | 719  | * 607 | 642  | 630   | 542  | 594  | 580   | 715  | 882  | 1,080 |       |
| 15..... | 755  | 724  |       | 642  | 642   | 542  | 598  | 580   | 720  | 886  | 1,080 |       |
| 16..... | 755  | 719  |       | 642  | 618   | 546  | 602  | 580   | 724  | 882  | 1,080 |       |
| 17..... | 746  | 710  |       | 642  | 618   | 542  | 602  | 580   | 728  | 882  |       |       |
| 18..... | 746  | 706  |       | 646  | 622   | 542  | 594  | 580   | 733  | 882  |       |       |
| 19..... | 742  | 706  |       | 646  | 618   | 546  | 590  | 576   | 742  | 910  |       |       |
| 20..... | 742  | 706  | 662   | 642  | 618   | 546  | 590  |       | 742  | 935  | * 995 |       |
| 21..... | 737  | 702  | 662   | 646  | 618   | 542  | 590  |       | 751  | 945  |       |       |
| 22..... | 746  | 702  | 666   | 646  | 622   | 542  | 590  |       | 751  | 950  |       |       |
| 23..... | 742  | 702  | 674   | 646  | 622   | 538  | 594  |       | 756  | 955  | 990   |       |
| 24..... | 732  | 702  | 670   | 654  | 618   | 546  | 590  | * 572 | 760  | 975  | 990   |       |
| 25..... | 732  | 702  | 670   | 650  | 618   | 562  | 576  |       | 764  | 990  | 990   |       |
| 26..... | 732  | 706  | 674   | 658  | 618   | 566  | 572  |       | 760  | 995  | 990   |       |
| 27..... | 732  | 706  | 670   | 654  | 618   | 566  | 572  |       | 769  | 925  | 990   |       |
| 28..... | 728  | 724  | 662   | 642  | 622   | 570  | 576  |       | 764  | 930  | 990   |       |
| 29..... | 728  | 714  | 662   | 642  |       | 566  | 576  | 598   | 774  | 995  | 990   |       |
| 30..... | 719  | 714  | 658   | 642  |       | 550  | 576  | 642   | 796  | 995  | 990   | 920   |
| 31..... | 719  |      | 662   | 642  |       | 554  |      | 666   |      | 995  | 990   |       |

| Month          | Maximum | Minimum | Mean   | Run-off in acre-feet |
|----------------|---------|---------|--------|----------------------|
| October.....   | 782     | 719     | 749    | 46, 100              |
| November.....  | 737     | 702     | 713    | 42, 400              |
| December.....  | 710     |         | 652    | 40, 100              |
| January.....   | 678     | 638     | 648    | 39, 800              |
| February.....  | 642     | 500     | 620    | 34, 400              |
| March.....     | 618     | 538     | 564    | 34, 700              |
| April.....     | 602     | 572     | 589    | 35, 000              |
| May.....       | 666     |         | 581    | 35, 700              |
| June.....      | 796     | 670     | 725    | 43, 100              |
| July.....      | 995     | 800     | 896    | 55, 100              |
| August.....    | 1, 080  | 990     | 1, 030 | 63, 300              |
| September..... | 975     | 900     | 916    | 54, 500              |
| The year.....  | 1, 080  | 500     | 724    | 524, 000             |

\* Estimated.

DESCHUTES RIVER AT BENHAM FALLS, NEAR BEND, OREG.

LOCATION.—Water-stage recorder in SE¼ sec. 9, T. 19 S., R. 11 E., 50 yards above head of Benham Falls, 1½ miles below dam site for proposed Benham Falls Reservoir, and 10 miles southwest of Bend.

RECORDS AVAILABLE.—March 1909 to September 1914, August 1920 to September 1921, February 1924 to September 1933.

DISCHARGE.—Maximum during year, 1,770 second-feet June 15, 16 (gage height, 2.16 feet); minimum, 690 second-feet Feb. 8, 9 (gage height, -0.14 foot).

1909-13, 1920-21, 1924-33: Maximum (estimated), 5,000 second-feet Nov. 27, 1909 (gage height not determined); minimum, that of Feb. 8, 9, 1933. Average, 17 years (1905-13, 1924-33), 1,420 second-feet.

REMARKS.—Records good except those estimated, Oct. 5, 6, 8-16, Dec. 8-18, Jan. 18-22, Feb. 9-16, which are fair. Minor diversions for irrigation above station. Some regulation since 1922 caused by storage in Crane Prairie and Crescent Lake Reservoirs. Records furnished by State engineer.

*Discharge, in second-feet, 1932-33*

| Day     | Oct.  | Nov.  | Dec.  | Jan.  | Feb. | Mar.  | Apr.  | May   | June  | July  | Aug.  | Sept. |
|---------|-------|-------|-------|-------|------|-------|-------|-------|-------|-------|-------|-------|
| 1-----  | 1,100 | 1,040 | 1,120 | 1,000 | 975  | 958   | 1,040 | 1,240 | 1,360 | 1,500 | 1,590 | 1,420 |
| 2-----  | 1,100 | 1,040 | 1,120 | 1,020 | 970  | 950   | 1,070 | 1,270 | 1,390 | 1,500 | 1,620 | 1,390 |
| 3-----  | 1,100 | 1,040 | 1,120 | 1,040 | 966  | 942   | 1,120 | 1,300 | 1,420 | 1,470 | 1,650 | 1,390 |
| 4-----  | 1,100 | 1,040 | 1,120 | 1,020 | 962  | 938   | 1,140 | 1,270 | 1,440 | 1,440 | 1,680 | 1,360 |
| 5-----  | 1,100 | 1,070 | 1,120 | 1,000 | 962  | 938   | 1,140 | 1,270 | 1,470 | 1,420 | 1,680 | 1,330 |
| 6-----  | 1,090 | 1,100 | 1,070 | 1,000 | 962  | 946   | 1,140 | 1,270 | 1,500 | 1,420 | 1,710 | 1,330 |
| 7-----  | 1,070 | 1,100 | 1,040 | 985   | 954  | 950   | 1,140 | 1,270 | 1,500 | 1,390 | 1,710 | 1,300 |
| 8-----  |       | 1,070 |       | 985   | 890  | 954   | 1,140 | 1,240 | 1,530 | 1,390 | 1,710 | 1,300 |
| 9-----  |       | 1,100 |       | 985   |      | 934   | 1,100 | 1,220 | 1,560 | 1,420 | 1,710 | 1,300 |
| 10----- |       | 1,100 |       | 985   |      | 898   | 1,070 | 1,220 | 1,560 | 1,440 | 1,710 | 1,300 |
| 11----- |       | 1,100 |       | 990   |      | 898   | 1,070 | 1,200 | 1,560 | 1,440 | 1,710 | 1,300 |
| 12----- | 1,080 | 1,100 |       | 985   |      | 914   | 1,070 | 1,170 | 1,560 | 1,420 | 1,710 | 1,300 |
| 13----- |       | 1,100 | 875   |       | 895  | 914   | 1,070 | 1,170 | 1,560 | 1,420 | 1,710 | 1,300 |
| 14----- |       | 1,100 |       | 980   |      | 914   | 1,070 | 1,140 | 1,650 | 1,390 | 1,710 | 1,330 |
| 15----- |       | 1,100 |       | 985   |      | 914   | 1,070 | 1,140 | 1,770 | 1,390 | 1,710 | 1,330 |
| 16----- |       | 1,100 |       | 990   |      | 922   | 1,070 | 1,170 | 1,740 | 1,390 | 1,710 | 1,330 |
| 17----- | 1,100 | 1,100 |       | 990   | 958  | 926   | 1,100 | 1,200 | 1,710 | 1,390 | 1,710 | 1,330 |
| 18----- | 1,070 | 1,100 |       |       | 950  | 930   | 1,120 | 1,200 | 1,710 | 1,420 | 1,680 | 1,330 |
| 19----- | 1,070 | 1,120 | 1,070 |       | 942  | 938   | 1,100 | 1,200 | 1,710 | 1,420 | 1,650 | 1,330 |
| 20----- | 1,070 | 1,120 | 1,070 | 986   | 942  | 962   | 1,070 | 1,200 | 1,710 | 1,420 | 1,650 | 1,330 |
| 21----- | 1,070 | 1,120 | 1,040 |       | 946  | 975   | 1,070 | 1,200 | 1,710 | 1,440 | 1,620 | 1,330 |
| 22----- | 1,070 | 1,120 | 1,040 |       | 946  | 975   | 1,070 | 1,200 | 1,710 | 1,440 | 1,620 | 1,330 |
| 23----- | 1,100 | 1,100 | 1,020 | 990   | 946  | 975   | 1,100 | 1,200 | 1,680 | 1,470 | 1,620 | 1,330 |
| 24----- | 1,070 | 1,100 | 1,020 | 985   | 946  | 975   | 1,120 | 1,200 | 1,650 | 1,500 | 1,530 | 1,330 |
| 25----- | 1,070 | 1,100 | 1,040 | 985   | 946  | 990   | 1,120 | 1,200 | 1,590 | 1,530 | 1,470 | 1,330 |
| 26----- | 1,070 | 1,100 | 1,070 | 990   | 950  | 1,000 | 1,120 | 1,200 | 1,530 | 1,560 | 1,440 | 1,330 |
| 27----- | 1,070 | 1,100 | 1,040 | 1,000 | 950  | 1,020 | 1,140 | 1,200 | 1,500 | 1,560 | 1,440 | 1,330 |
| 28----- | 1,070 | 1,120 | 1,020 | 1,000 | 958  | 1,040 | 1,170 | 1,220 | 1,500 | 1,500 | 1,420 | 1,330 |
| 29----- | 1,070 | 1,120 | 1,010 | 985   |      | 1,040 | 1,200 | 1,240 | 1,500 | 1,500 | 1,420 | 1,330 |
| 30----- | 1,070 | 1,120 | 1,000 | 985   |      | 1,070 | 1,220 | 1,240 | 1,500 | 1,530 | 1,420 | 1,330 |
| 31----- | 1,040 |       | 1,000 | 980   |      | 1,040 |       | 1,330 |       | 1,560 | 1,420 |       |

| Month          | Maximum | Minimum | Mean  | Run-off in<br>acre-feet |
|----------------|---------|---------|-------|-------------------------|
| October-----   | 1,100   | 1,040   | 1,080 | 66,400                  |
| November-----  | 1,120   | 1,040   | 1,090 | 64,900                  |
| December-----  | 1,120   |         | 993   | 61,100                  |
| January-----   | 1,040   |         | 992   | 61,000                  |
| February-----  |         |         | 935   | 51,900                  |
| March-----     | 1,070   | 898     | 959   | 59,000                  |
| April-----     | 1,220   | 1,040   | 1,110 | 66,000                  |
| May-----       | 1,330   | 1,140   | 1,220 | 75,000                  |
| June-----      | 1,770   | 1,360   | 1,580 | 94,000                  |
| July-----      | 1,560   | 1,390   | 1,450 | 89,200                  |
| August-----    | 1,710   | 1,420   | 1,620 | 99,600                  |
| September----- | 1,420   | 1,300   | 1,330 | 79,100                  |
| The year-----  | 1,770   |         | 1,200 | 867,000                 |

## DESCHUTES RIVER BELOW LAVA ISLAND, NEAR BEND, OREG.

LOCATION.—Water-stage recorder in SW¼ sec. 23, T. 18 S., R. 11 E., three-quarters of a mile below Lava Island, 1 mile below intake of Arnold Canal, and 6 miles southwest of Bend.

RECORDS AVAILABLE.—March 1926 to September 1933.

DISCHARGE.—Maximum during year, 1,540 second-feet June 16 (gage height, 1.35 feet); minimum, 612 second-feet Feb. 9 (gage height, 0.16 foot).

1926-33: Maximum, 1,780 second-feet Jan. 3, 1928 (gage height, 1.55 feet); minimum, that of Feb. 9, 1933.

REMARKS.—Records good except those for Oct. 1 to Dec. 7 and those estimated, Dec. 8-20, Jan. 17-21, Feb. 9-16, which are fair. Arnold Canal diverts water for irrigation above station. Flow regulated by storage in Crescent Lake and Crane Prairie Reservoirs. Records furnished by State engineer.

*Discharge, in second-feet, 1932-33*

| Day | Oct. | Nov.  | Dec.  | Jan. | Feb. | Mar.  | Apr.  | May   | June  | July  | Aug.  | Sept. |
|-----|------|-------|-------|------|------|-------|-------|-------|-------|-------|-------|-------|
| 1   | 969  | 913   | 1,060 | 970  | 922  | 898   | 970   | 1,090 | 1,160 | 1,290 | 1,370 | 1,240 |
| 2   | 961  | 969   | 1,060 | 978  | 914  | 880   | 1,010 | 1,100 | 1,180 | 1,290 | 1,390 | 1,230 |
| 3   | 953  | 969   | 1,040 | 986  | 906  | 890   | 1,040 | 1,110 | 1,220 | 1,270 | 1,410 | 1,230 |
| 4   | 945  | 961   | 1,020 | 962  | 906  | 874   | 1,070 | 1,100 | 1,250 | 1,260 | 1,430 | 1,220 |
| 5   | 945  | 977   | 1,010 | 962  | 914  | 874   | 1,070 | 1,100 | 1,250 | 1,230 | 1,460 | 1,200 |
| 6   | 945  | 1,000 | 994   | 946  | 906  | 866   | 1,070 | 1,090 | 1,260 | 1,220 | 1,470 | 1,180 |
| 7   | 929  | 994   | 953   | 946  | 906  | 874   | 1,080 | 1,090 | 1,300 | 1,210 | 1,470 | 1,160 |
| 8   | 921  | 985   |       | 938  | 874  | 866   | 1,070 | 1,060 | 1,330 | 1,210 | 1,480 | 1,160 |
| 9   | 913  | 1,010 |       | 938  | 866  | 1,040 | 1,060 | 1,060 | 1,350 | 1,220 | 1,490 | 1,160 |
| 10  | 913  | 1,020 |       | 946  | 826  | 994   | 1,040 | 1,350 | 1,290 | 1,490 | 1,490 | 1,160 |
| 11  | 913  | 1,020 |       | 946  |      | 803   | 962   | 1,030 | 1,340 | 1,240 | 1,490 | 1,160 |
| 12  | 913  | 1,010 |       | 938  | 850  | 810   | 954   | 1,010 | 1,330 | 1,250 | 1,500 | 1,160 |
| 13  | 913  | 1,010 |       | 938  |      | 803   | 954   | 986   | 1,340 | 1,240 | 1,490 | 1,160 |
| 14  | 921  | 1,000 | 880   | 946  |      | 803   | 954   | 978   | 1,400 | 1,220 | 1,490 | 1,160 |
| 15  | 921  | 1,000 |       | 946  |      | 826   | 954   | 978   | 1,510 | 1,200 | 1,490 | 1,160 |
| 16  | 929  | 1,020 |       | 946  |      | 850   | 962   | 1,010 | 1,520 | 1,200 | 1,490 | 1,160 |
| 17  | 929  | 1,020 |       |      | 898  | 858   | 978   | 1,000 | 1,500 | 1,200 | 1,490 | 1,160 |
| 18  | 921  | 1,020 |       |      | 890  | 866   | 986   | 1,010 | 1,490 | 1,220 | 1,470 | 1,160 |
| 19  | 921  | 1,040 |       |      | 890  | 874   | 970   | 1,030 | 1,480 | 1,210 | 1,440 | 1,160 |
| 20  | 921  | 1,040 |       | 944  | 890  | 898   | 946   | 1,030 | 1,490 | 1,220 | 1,440 | 1,160 |
| 21  | 921  | 1,040 | 1,010 |      | 882  | 914   | 930   | 1,030 | 1,490 | 1,250 | 1,430 | 1,160 |
| 22  | 921  | 1,030 | 1,000 | 954  | 882  | 914   | 938   | 1,020 | 1,470 | 1,260 | 1,430 | 1,170 |
| 23  | 929  | 1,040 | 986   | 946  | 890  | 906   | 954   | 1,020 | 1,460 | 1,260 | 1,420 | 1,160 |
| 24  | 921  | 1,030 | 994   | 946  | 890  | 914   | 970   | 1,030 | 1,430 | 1,290 | 1,370 | 1,170 |
| 25  | 921  | 977   | 1,000 | 954  | 890  | 922   | 986   | 1,030 | 1,390 | 1,330 | 1,300 | 1,170 |
| 26  | 921  | 953   | 1,030 | 962  | 890  | 938   | 1,030 | 1,030 | 1,350 | 1,370 | 1,270 | 1,170 |
| 27  | 921  | 994   | 986   | 962  | 890  | 946   | 1,000 | 1,030 | 1,310 | 1,360 | 1,260 | 1,170 |
| 28  | 913  | 1,040 | 978   | 946  | 890  | 970   | 1,020 | 1,040 | 1,310 | 1,330 | 1,260 | 1,170 |
| 29  | 913  | 1,050 | 970   | 930  |      | 986   | 1,030 | 1,060 | 1,300 | 1,300 | 1,250 | 1,170 |
| 30  | 905  | 1,040 | 962   | 930  |      | 994   | 1,060 | 1,080 | 1,290 | 1,330 | 1,250 | 1,170 |
| 31  | 898  |       | 954   | 930  |      | 986   |       | 1,130 |       | 1,350 | 1,240 |       |

| Month     | Maximum | Minimum | Mean  | Run-off in acre-feet |
|-----------|---------|---------|-------|----------------------|
| October   | 969     | 898     | 925   | 56,900               |
| November  | 1,050   | 913     | 1,010 | 60,100               |
| December  |         |         | 950   | 58,400               |
| January   | 986     |         | 949   | 58,400               |
| February  |         |         | 883   | 49,000               |
| March     | 994     | 803     | 887   | 54,500               |
| April     | 1,080   | 930     | 998   | 59,400               |
| May       | 1,130   | 978     | 1,050 | 64,600               |
| June      | 1,520   | 1,160   | 1,360 | 80,900               |
| July      | 1,370   | 1,200   | 1,260 | 77,500               |
| August    | 1,500   | 1,240   | 1,410 | 86,700               |
| September | 1,240   | 1,160   | 1,170 | 69,600               |
| The year  | 1,520   |         | 1,070 | 776,000              |

## DESCHUTES RIVER BELOW BEND, OREG.

LOCATION.—Water-stage recorder in SE¼ sec. 20, T. 17 S., R. 12 E., half a mile below North Canal Dam and 2 miles north of Bend.

RECORDS AVAILABLE.—October 1914 to September 1933.

DISCHARGE.—Maximum during year, 1,220 second-feet Dec. 26 (gage height, 3.10 feet); minimum, 10 second-feet July 29 (gage height, 0.78 foot).

1914-33: Maximum, 2,500 second-feet Dec. 7, 1921 (gage height, 3.9 feet); minimum, 1 second-foot Aug. 25, 1930. Average, 19 years (1914-33), 744 second-feet.

Maximum discharge of river in this vicinity since 1905, 4,820 second-feet Nov. 27, 1909.

REMARKS.—Records good except those estimated, which are fair. Six large canals divert above station. Flow regulated by hydroelectric plant at Bend, and since 1922 by storage in Crescent Lake and Crane Prairie Reservoirs. Records furnished by State engineer.

*Discharge, in second-feet, 1932-33*

| Day | Oct.  | Nov.  | Dec.  | Jan.  | Feb.  | Mar.  | Apr.  | May | June | July | Aug. | Sept. |
|-----|-------|-------|-------|-------|-------|-------|-------|-----|------|------|------|-------|
| 1   | 179   | 423   | 1,090 | 949   | 696   | 716   | 850   | 140 | 131  | 183  | 115  | 98    |
| 2   | 175   | 868   | 1,100 | 1,000 | 642   | 922   | 877   | 154 | 131  | 183  | 105  | 100   |
| 3   | 147   | 868   | 1,090 | 1,000 | 635   | 895   | 940   | 179 | 154  | 165  | 112  | 80    |
| 4   | 131   | 868   | 1,090 | 985   | 665   | 895   | 1,060 | 200 | 183  | 147  | 124  | 84    |
| 5   | 134   | 895   | 1,080 | 985   | 665   | 877   | 1,060 | 183 | 200  | 128  | 150  | 100   |
| 6   | 121   | 922   | 1,080 | 967   | 744   | 895   | 1,060 | 196 | 221  | 112  | 175  | 100   |
| 7   | 121   | 922   | 1,030 | 931   | 913   | 877   | 1,050 | 183 | 250  | 107  | 175  | 102   |
| 8   | 110   | 904   | 922   | 886   | 868   | 1,050 | 175   | 264 | 112  | 168  | 128  | 128   |
| 9   | 105   | 922   | 922   | 744   | 868   | 904   | 165   | 319 | 134  | 179  | 147  | 147   |
| 10  | 107   | 913   | 931   |       | 841   | 530   | 131   | 344 | 187  | 175  | 147  | 147   |
| 11  | 107   | 886   | * 859 | 931   |       | 805   | 495   | 118 | 370  | 154  | 179  | 154   |
| 12  | 161   | 886   |       | 949   |       | 805   | 446   | 102 | 344  | 143  | 183  | 112   |
| 13  | 165   | 886   |       | 949   | * 887 | 823   | 344   | 84  | 308  | 128  | 183  | 110   |
| 14  | 179   | 886   |       | 656   |       | 823   | 235   | 72  | 332  | 112  | 179  | 115   |
| 15  | 208   | 877   | 972   | 538   |       | 832   | 154   | 68  | 446  | 93   | 172  | 134   |
| 16  | * 215 | 895   |       | 796   |       | 868   | 137   | 95  | 467  | 78   | 168  | 150   |
| 17  | * 222 | 895   |       | 931   | 886   | 868   | 161   | 84  | 439  | 80   | 161  | 157   |
| 18  | * 228 | 895   |       |       | 868   | 672   | 175   | 93  | 418  | 88   | 150  | 154   |
| 19  | 235   | 895   |       |       | 868   | 397   | 154   | 102 | 390  | 88   | 137  | 172   |
| 20  | 245   | 913   |       |       | 859   | 384   | 134   | 131 | 390  | 93   | 118  | 175   |
| 21  | 245   | 904   | * 917 |       | 841   | 358   | 134   | 172 | 390  | 112  | 112  | 175   |
| 22  | 269   | 886   |       |       | 859   | 351   | 124   | 154 | 390  | 121  | 112  | 179   |
| 23  | 245   | 904   |       | * 952 | 886   | 460   | 110   | 140 | 370  | 131  | 110  | 172   |
| 24  | 240   | 665   |       |       | 886   | 575   | 95    | 147 | 344  | 154  | 86   | 175   |
| 25  | 231   | 495   |       |       | 704   | 796   | 95    | 147 | 303  | 134  | 63   | 231   |
| 26  | 235   | 439   | 1,060 |       | 523   | 805   | 128   | 124 | 250  | 373  | 90   | 226   |
| 27  | 245   | 460   | 1,000 |       | 516   | 805   | 112   | 80  | 213  | 568  | 98   | 226   |
| 28  | 235   | 796   | 985   |       | 530   | 823   | 107   | 51  | 204  | 516  | 100  | 231   |
| 29  | 221   | 1,060 | 976   | 913   |       | 850   | 100   | 42  | 192  | 338  | 100  | 245   |
| 30  | 204   | 1,080 | 958   | 913   |       | 877   | 112   | 72  | 183  | 134  | 95   | 240   |
| 31  | 208   |       | 940   | 720   |       | 877   |       | 121 |      | 115  | 100  |       |

| Month     | Maximum | Minimum | Mean | Run-off in<br>acre-feet |
|-----------|---------|---------|------|-------------------------|
| October   | 269     | 105     | 189  | 11,600                  |
| November  | 1,080   | 423     | 837  | 49,800                  |
| December  | 1,100   |         | 957  | 58,800                  |
| January   | 1,000   | 720     | 915  | 56,300                  |
| February  |         | 516     | 787  | 43,700                  |
| March     | 922     | 351     | 758  | 46,600                  |
| April     | 1,060   | 95      | 431  | 25,600                  |
| May       | 200     | 42      | 126  | 7,750                   |
| June      | 467     | 131     | 298  | 17,700                  |
| July      | 568     | 78      | 168  | 10,300                  |
| August    | 183     | 63      | 135  | 8,300                   |
| September | 245     | 80      | 154  | 9,160                   |
| The year  | 1,100   | 42      | 478  | 346,000                 |

\* Estimated.

## DESCHUTES RIVER NEAR MADRAS, OREG.

LOCATION.—Water-stage recorder in NE¼ sec. 13, T. 10 S., R. 12 E., 1 mile below Pelton dam site, 4 miles above mouth of Shitike Creek, and 9 miles northwest of Madras. Zero of gage is about 1,404 feet above mean sea level, from river profile. Prior to June 6, 1933, gage was 1 mile upstream.

RECORDS AVAILABLE.—October 1923 to September 1933.

DISCHARGE.—Maximum during year, 6,400 second-feet Apr. 5 (gage height, 3.16 feet at upper gage); minimum, 3,180 second-feet Oct. 8-11 (gage height, 0.46 foot at upper gage).

1923-33: Maximum, 10,700 second-feet Feb. 6, 1925 (gage height, 6.54 feet at former gage); minimum, 2,960 second-feet Aug. 15, 1931. Average, 10 years (1923-33), 4,150 second-feet.

REMARKS.—Records excellent except those estimated, which are good. Diversions for irrigation in upper river basin. Gage-height record furnished by Columbia Valley Power Co.

*Discharge, in second-feet, 1932-33*

| Day | Oct.  | Nov.  | Dec.  | Jan.  | Feb.  | Mar.  | Apr.  | May   | June  | July  | Aug.  | Sept. |
|-----|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 1   | 3,280 | 3,400 | 4,360 | 4,300 | 3,900 | 3,840 | 4,780 | 4,540 | 3,950 | 3,830 | 3,490 | 3,350 |
| 2   | 3,280 | 3,630 | 4,420 | 4,420 | 3,950 | 4,180 | 4,900 | 4,300 | 4,020 | 3,900 | 3,490 | 3,350 |
| 3   | 3,280 | 3,930 | 4,420 | 4,420 | 3,900 | 4,360 | 5,020 | 4,360 | 4,100 | 3,980 | 3,490 | 3,340 |
| 4   | 3,250 | 3,930 | 4,420 | 4,360 | 3,950 | 4,420 | 5,650 | 4,360 | 4,180 | 3,900 | 3,470 | 3,330 |
| 5   | 3,230 | 4,470 | 4,420 | 4,420 | 3,950 | 4,360 | 6,150 | 4,360 | 4,380 | 3,830 | 3,480 | 3,340 |
| 6   | 3,230 | 4,450 | 4,360 | 4,420 | 3,950 | 4,300 | 6,020 | 4,300 | 4,300 | 3,760 | 3,490 | 3,370 |
| 7   | 3,220 | 4,000 | 4,360 | 4,360 | 4,000 | 4,300 | 6,020 | 4,300 | 4,240 | 3,780 | 3,520 | 3,350 |
| 8   | 3,210 | 4,300 | 4,180 | 4,360 | 4,120 | 4,240 | 5,900 | 4,120 | 4,420 | 3,830 | 3,550 | 3,330 |
| 9   | 3,180 | 4,420 | 3,780 | 4,360 | 3,860 | 4,240 | 5,400 | 4,120 | 5,650 | 3,900 | 3,540 | 3,350 |
| 10  | 3,180 | 4,180 | 3,730 | 4,300 | 3,660 | 4,240 | 4,780 | 4,000 | 5,900 | 3,830 | 3,520 | 3,380 |
| 11  | 3,200 | 4,120 | 3,730 | 4,240 | 3,900 | 4,180 | 4,420 | 4,000 | 5,400 | 3,830 | 3,510 | 3,410 |
| 12  | 3,210 | 4,120 | 3,900 | 4,240 | 4,300 | 4,180 | 4,300 | 3,950 | 5,280 | 3,830 | 3,490 | 3,420 |
| 13  | 3,340 | 4,180 | 4,000 | 4,300 | 4,240 | 4,240 | 4,240 | 3,840 | 5,150 | 3,830 | 3,480 | 3,370 |
| 14  | 3,360 | 4,180 | 4,060 | 4,300 | 4,240 | 4,240 | 4,300 | 3,840 | 5,150 | 3,760 | 3,480 | 3,370 |
| 15  | 3,310 | 4,240 | 4,120 | 3,900 | 4,240 | 4,240 | 4,420 | 3,840 | 5,240 | 3,760 | 3,480 | 3,440 |
| 16  | 3,320 | 4,540 | 4,240 | 4,000 | 4,210 | 4,300 | 4,540 | 3,840 | 5,410 | 3,760 | 3,480 | 3,440 |
| 17  | 3,270 | 4,660 | 4,360 | 4,180 | 4,300 | 4,660 | 3,950 | 4,990 | 3,690 | 3,690 | 3,490 | 3,480 |
| 18  | 3,260 | 4,420 | 4,360 | 4,180 | 4,300 | 4,420 | 3,900 | 4,670 | 3,620 | 3,620 | 3,480 | 3,470 |
| 19  | 3,290 | 4,300 | 4,540 | 4,300 | 4,180 | 4,000 | 4,240 | 3,950 | 4,430 | 3,620 | 3,470 | 3,420 |
| 20  | 3,300 | 4,300 | 3,950 | 4,240 | 4,180 | 3,950 | 4,060 | 3,950 | 4,360 | 3,620 | 3,420 | 3,440 |
| 21  | 3,320 | 4,300 | 3,950 | 4,300 | 4,180 | 3,950 | 4,060 | 3,950 | 4,280 | 3,550 | 3,380 | 3,470 |
| 22  | 3,350 | 4,240 | 4,120 | 4,300 | 4,180 | 4,060 | 4,300 | 3,950 | 4,200 | 3,550 | 3,370 | 3,540 |
| 23  | 3,380 | 4,180 | 4,420 | 4,300 | 4,180 | 4,000 | 4,540 | 4,000 | 4,130 | 3,550 | 3,380 | 3,490 |
| 24  | 3,360 | 4,180 | 4,360 | 4,300 | 4,240 | 4,060 | 4,780 | 4,000 | 4,060 | 3,550 | 3,380 | 3,490 |
| 25  |       | 3,840 | 4,360 | 4,300 | 4,240 | 4,180 | 4,900 | 4,000 | 4,200 | 3,550 | 3,380 | 3,480 |
| 26  |       | 3,730 | 4,420 | 4,300 | 3,950 | 4,240 | 5,020 | 3,950 | 4,200 | 3,550 | 3,330 | 3,540 |
| 27  | 3,360 | 3,780 | 4,420 | 4,300 | 3,840 | 4,300 | 4,900 | 3,950 | 4,060 | 3,760 | 3,340 | 3,540 |
| 28  |       | 3,840 | 4,360 | 4,300 | 3,840 | 4,300 | 5,020 | 3,900 | 3,980 | 3,900 | 3,370 | 3,540 |
| 29  |       | 4,420 | 4,360 | 4,240 |       | 4,540 | 5,020 | 3,900 | 3,980 | 3,900 | 3,370 | 3,550 |
| 30  | 3,360 | 4,420 | 4,300 | 4,240 |       | 4,780 | 4,780 | 3,950 | 3,900 | 3,760 | 3,370 | 3,540 |
| 31  | 3,380 |       | 4,300 | 4,240 |       | 4,780 |       | 3,950 |       | 3,510 | 3,350 |       |

| Month     | Maximum | Minimum | Mean  | Run-off in acre-feet |
|-----------|---------|---------|-------|----------------------|
| October   |         | 3,180   | 3,300 | 203,000              |
| November  | 4,660   | 3,400   | 4,160 | 248,000              |
| December  | 4,540   | 3,730   | 4,230 | 260,000              |
| January   | 4,420   | 3,900   | 4,280 | 263,000              |
| February  |         | 3,660   | 4,060 | 225,000              |
| March     | 4,780   | 3,840   | 4,250 | 261,000              |
| April     | 6,150   | 4,060   | 4,850 | 289,000              |
| May       | 4,540   | 3,840   | 4,040 | 248,000              |
| June      | 5,900   | 3,900   | 4,540 | 270,000              |
| July      | 3,980   | 3,510   | 3,740 | 230,000              |
| August    | 3,550   | 3,330   | 3,450 | 212,000              |
| September | 3,550   | 3,330   | 3,430 | 204,000              |
| The year  | 6,150   | 3,180   | 4,020 | 2,910,000            |

\* Estimated.

DESCHUTES RIVER AT MOODY, NEAR BIGGS, OREG.

LOCATION.—Water-stage recorder in SE¼ sec. 26, T. 2 N., R. 15 E., at Moody, 1½ miles above mouth and 5 miles southwest of Biggs. Zero of gage is 167.43 feet above mean sea level by general adjustment of 1929.

DRAINAGE AREA.—10,500 square miles (revised).

RECORDS AVAILABLE.—July 1906 to September 1933. October 1897 to December 1899 at station near Moro, 10 miles above mouth.

DISCHARGE.—Maximum during year, 10,000 second-feet June 10 (gage height, 4.03 feet); minimum, 3,640 second-feet Oct. 8 (gage height, 2.18 feet).

1906-33: Maximum, 43,600 second-feet Jan. 7, 1923 (gage height, 10.2 feet); minimum, 3,380 second-feet Sept. 16-19, 1931 (gage height, 2.06 feet). Average, 28 years (1898-99, 1906-33), 5,980 second-feet.

REMARKS.—Records excellent except those estimated, Dec. 11-13, Aug. 7-29, which are good. Diversions for irrigation in upper river basin. Gage-height record furnished by Eastern Oregon Land Co.

*Discharge, in second-feet, 1932-33*

| Day | Oct.  | Nov.  | Dec.  | Jan.  | Feb.  | Mar.  | Apr.  | May   | June  | July  | Aug.  | Sept. |
|-----|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 1   | 3,730 | 3,840 | 5,010 | 5,010 | 4,710 | 4,710 | 5,800 | 6,860 | 6,140 | 5,160 | 4,110 | 3,820 |
| 2   | 3,730 | 3,890 | 5,320 | 5,160 | 4,430 | 4,710 | 5,800 | 6,670 | 5,970 | 5,010 | 4,080 | 3,820 |
| 3   | 3,730 | 4,300 | 5,640 | 5,480 | 4,430 | 5,010 | 5,970 | 6,310 | 5,970 | 5,160 | 4,080 | 3,820 |
| 4   | 3,730 | 4,430 | 5,480 | 5,160 | 4,430 | 5,160 | 6,310 | 6,310 | 6,140 | 5,160 | 4,080 | 3,840 |
| 5   | 3,680 | 4,430 | 5,320 | 5,320 | 4,430 | 5,010 | 7,040 | 6,140 | 6,490 | 5,010 | 4,080 | 3,840 |
| 6   | 3,680 | 5,160 | 5,160 | 5,640 | 4,430 | 5,010 | 7,420 | 5,970 | 6,490 | 4,860 | 4,060 | 3,860 |
| 7   | 3,680 | 5,320 | 5,160 | 5,480 | 4,430 | 4,860 | 7,230 | 5,970 | 6,490 | 4,860 |       | 3,890 |
| 8   | 3,660 | 5,010 | 5,010 | 5,480 | 4,570 | 5,010 | 7,230 | 5,800 | 6,490 | 4,860 |       | 3,860 |
| 9   | 3,660 | 5,320 | 4,570 | 5,640 | 4,570 | 4,860 | 6,860 | 5,640 | 8,000 | 5,010 |       | 3,840 |
| 10  | 3,660 | 5,160 | 4,430 | 5,640 | 4,080 | 4,860 | 6,310 | 5,480 | 9,800 | 5,010 |       | 3,860 |
| 11  | 3,660 | 4,860 | 4,500 | 5,320 | 4,300 | 4,860 | 5,640 | 5,480 | 8,800 | 4,860 |       | 3,890 |
| 12  | 3,680 | 4,710 | 4,500 | 5,160 | 4,860 | 4,860 | 5,320 | 5,320 | 7,810 | 4,860 |       | 3,960 |
| 13  | 3,750 | 4,710 | 4,500 | 5,160 | 4,710 | 4,860 | 5,160 | 5,320 | 7,810 | 4,710 |       | 3,890 |
| 14  | 3,860 | 4,860 | 4,570 | 5,160 | 4,710 | 4,860 | 5,160 | 5,320 | 8,000 | 4,710 |       | 3,840 |
| 15  | 3,890 | 4,860 | 4,570 | 5,010 | 4,860 | 5,010 | 5,320 | 5,480 | 8,000 | 4,710 |       | 3,910 |
| 16  | 3,820 | 5,640 | 4,570 | 4,710 | 4,860 | 5,010 | 5,640 | 5,480 | 8,000 | 4,710 |       | 3,980 |
| 17  | 3,800 | 6,490 | 4,710 | 4,710 | 4,710 | 5,160 | 5,640 | 5,480 | 7,810 | 4,710 |       | 3,960 |
| 18  | 3,770 | 6,310 | 5,010 | 4,710 | 4,710 | 5,160 | 5,800 | 5,640 | 7,230 | 4,570 | 3,990 | 3,960 |
| 19  | 3,750 | 5,640 | 5,010 | 4,860 | 4,710 | 5,160 | 5,480 | 5,480 | 6,670 | 4,430 |       | 3,940 |
| 20  | 3,770 | 5,320 | 5,160 | 4,860 | 4,710 | 4,860 | 5,320 | 5,480 | 6,140 | 4,430 |       | 3,910 |
| 21  | 3,800 | 5,160 | 4,710 | 4,860 | 4,860 | 4,860 | 5,160 | 5,480 | 5,970 | 4,430 |       | 3,910 |
| 22  | 3,820 | 5,160 | 4,710 | 5,010 | 5,160 | 5,010 | 5,320 | 5,480 | 5,800 | 4,300 |       | 3,960 |
| 23  | 3,890 | 5,010 | 5,010 | 4,860 | 5,480 | 5,010 | 5,800 | 5,480 | 5,800 | 4,300 |       | 4,140 |
| 24  | 3,890 | 5,010 | 5,160 | 4,860 | 5,320 | 4,860 | 6,140 | 5,640 | 5,640 | 4,300 |       | 4,060 |
| 25  | 3,840 | 4,860 | 5,010 | 4,860 | 5,010 | 4,860 | 6,490 | 5,800 | 5,640 | 4,300 |       | 4,060 |
| 26  | 3,840 | 4,570 | 5,160 | 4,860 | 5,010 | 5,010 | 6,860 | 5,970 | 5,800 | 4,300 |       | 4,010 |
| 27  | 3,840 | 4,430 | 5,480 | 4,860 | 4,860 | 5,010 | 6,860 | 5,970 | 5,640 | 4,300 |       | 4,060 |
| 28  | 3,820 | 4,430 | 5,320 | 4,860 | 4,570 | 5,160 | 7,230 | 5,970 | 5,480 | 4,430 |       | 4,040 |
| 29  | 3,840 | 4,570 | 5,160 | 4,860 | ----- | 5,320 | 7,420 | 5,970 | 5,320 | 4,570 |       | 4,040 |
| 30  | 3,820 | 5,010 | 5,160 | 4,860 | ----- | 5,640 | 7,230 | 6,140 | 5,320 | 4,430 | 3,820 | 4,060 |
| 31  | 3,820 | ----- | 5,010 | 4,710 | ----- | 5,800 | ----- | 6,310 | ----- | 4,300 | 3,820 | ----- |

| Month     | Maximum | Minimum | Mean  | Run-off in acre-feet |
|-----------|---------|---------|-------|----------------------|
| October   | 3,890   | 3,660   | 3,770 | 232,000              |
| November  | 6,490   | 3,840   | 4,950 | 295,000              |
| December  | 5,640   | 4,430   | 4,970 | 306,000              |
| January   | 5,640   | 4,710   | 5,070 | 312,000              |
| February  | 5,480   | 4,080   | 4,710 | 262,000              |
| March     | 5,800   | 4,710   | 5,020 | 309,000              |
| April     | 7,420   | 5,160   | 6,170 | 367,000              |
| May       | 6,860   | 5,320   | 5,800 | 357,000              |
| June      | 9,800   | 5,320   | 6,990 | 398,000              |
| July      | 5,160   | 4,300   | 4,670 | 287,000              |
| August    | -----   | -----   | 4,000 | 246,000              |
| September | 4,140   | 3,820   | 3,930 | 234,000              |
| The year  | 9,800   | 3,660   | 4,980 | 3,600,000            |

## ODELL CREEK NEAR CRESCENT, OREG.

LOCATION.—Water-stage recorder in SW¼ sec. 25, T. 23 S., R. 6 E., at outlet of Odell Lake, 3½ miles north of Crescent Lake and 14 miles northwest of Crescent.

DRAINAGE AREA.—39 square miles (revised).

RECORDS AVAILABLE.—August 1911 to August 1914 (incomplete), December 1923 to June 1924, May to September 1933.

DISCHARGE.—Maximum during year, 402 second-feet June 11 (gage height, 1.51 feet); minimum, 20 second-feet June 7; minimum gage height, 0.40 foot Sept. 14.

1911-14, 1923-24, 1933: Maximum, that of June 11, 1933; minimum, that of June 7, 1933.

REMARKS.—Records good. No diversions above station. Discharge regulated at times by debris collecting on fish racks or by boards used to change lake level at summer-resort docks, at outlet of Odell Lake.

*Discharge, in second-feet, 1932-33*

| Day     | May | June | July | Aug. | Sept. | Day     | May | June | July | Aug. | Sept. |
|---------|-----|------|------|------|-------|---------|-----|------|------|------|-------|
| 1.....  |     | 54   | 165  | 73   | 34    | 16..... |     | 320  | 109  | 54   | 28    |
| 2.....  |     | 97   | 189  | 71   | 34    | 17..... |     | 320  | 106  | 51   | 31    |
| 3.....  |     | 66   | 182  | 69   | 34    | 18..... |     | 305  | 103  | 52   | 31    |
| 4.....  |     | 138  | 170  | 67   | 36    | 19..... |     | 254  | 100  | 54   | 33    |
| 5.....  |     | 87   | 170  | 64   | 34    | 20..... |     | 205  | 95   | 49   | 38    |
| 6.....  |     | 74   | 160  | 62   | 36    | 21..... |     | 236  | 95   | 44   | 38    |
| 7.....  |     | 86   | 156  | 62   | 34    | 22..... |     | 190  | 100  | 43   | 44    |
| 8.....  |     | 135  | 156  | 60   | 33    | 23..... |     | 178  | 100  | 43   | 41    |
| 9.....  |     | 268  | 153  | 58   | 34    | 24..... |     | 181  | 95   | 43   | 58    |
| 10..... |     | 353  | 133  | 58   | 34    | 25..... |     | 240  | 90   | 41   | 54    |
| 11..... |     | 383  | 118  | 58   | 33    | 26..... |     | 170  | 88   | 40   | 58    |
| 12..... |     | 335  | 106  | 54   | 34    | 27..... | 54  | 147  | 88   | 41   | 54    |
| 13..... |     | 325  | 100  | 54   | 33    | 28..... | 57  | 157  | 85   | 43   | 56    |
| 14..... |     | 330  | 98   | 54   | 31    | 29..... | 59  | 177  | 80   | 41   | 54    |
| 15..... |     | 330  | 115  | 54   | 27    | 30..... | 50  | 139  | 75   | 37   | 54    |
|         |     |      |      |      |       | 31..... | 45  |      | 73   | 36   | ---   |

| Month           | Maximum | Minimum | Mean | Per square mile | Run-off |           |
|-----------------|---------|---------|------|-----------------|---------|-----------|
|                 |         |         |      |                 | Inches  | Acre-feet |
| May 27-31.....  | 59      | 45      | 53.0 | 1.36            | 0.25    | 526       |
| June.....       | 383     | 54      | 209  | 5.36            | 5.98    | 12,400    |
| July.....       | 189     | 73      | 118  | 3.03            | 3.49    | 7,260     |
| August.....     | 73      | 36      | 52.6 | 1.35            | 1.56    | 3,230     |
| September.....  | 58      | 27      | 39.1 | 1.00            | 1.12    | 2,330     |
| The period..... |         |         |      |                 |         | 25,700    |

## LITTLE DESCHUTES RIVER NEAR LAPINE, OREG.

LOCATION.—Water-stage recorder in sec. 2, T. 22 S., R. 10 E., at bridge at former town of Rosland,  $1\frac{1}{2}$  miles north of Lapine. Zero of gage is 4,192.81 feet above mean sea level by general adjustment of 1929.

RECORDS AVAILABLE.—September 1910 to October 1913 (incomplete), June to November 1918, August to October 1920, May 1924 to September 1933.

DISCHARGE.—Maximum during year, 792 second-feet June 13 (gage height, 6.43 feet); minimum recorded, 36 second-feet Oct. 13 (gage height, 1.25 feet); probably less than 36 second-feet at times when stage was affected by ice.

1910-13, 1918, 1920, 1924-33: Maximum, that of June 13, 1933; minimum, 8 second-feet Sept. 2, 3, 1931 (gage height, 0.71 foot).

REMARKS.—Records good except those for Nov. 5, 6, June 14-21, and those estimated, which are fair. Stage-discharge relation affected by ice Dec. 5 to Mar. 28. Small diversions for irrigation above station. Flow regulated since August 1922 by storage in Crescent Lake Reservoir. Records furnished by State engineer.

## Discharge, in second-feet, 1932-33

| Day     | Oct. | Nov. | Dec.            | Jan.            | Mar.            | Apr.            | May | June | July             | Aug.             | Sept.           |
|---------|------|------|-----------------|-----------------|-----------------|-----------------|-----|------|------------------|------------------|-----------------|
| 1.....  | 41   | 39   | 111             |                 | <sup>a</sup> 46 | 125             | 406 | 422  | 360              | 330              | 80              |
| 2.....  | 41   | 39   | 102             |                 |                 | 143             | 406 | 454  | 330              | 338              | 78              |
| 3.....  | 40   | 39   | 94              |                 |                 | 155             | 398 | 505  | 308              | 338              | 77              |
| 4.....  | 39   | 40   | 89              |                 |                 | 167             | 382 | 556  | 286              | 338              | 76              |
| 5.....  | 37   | 43   |                 |                 |                 | 173             | 358 | 573  | 265              | 338              | 75              |
| 6.....  | 36   | 55   |                 |                 |                 | 192             | 358 | 573  | 251              | 338              | 76              |
| 7.....  | 36   | 92   |                 |                 |                 | 192             | 334 | 573  | 237              | 330              | 77              |
| 8.....  | 36   | 103  |                 |                 |                 | 161             | 312 | 556  | 237              | 330              | 78              |
| 9.....  | 37   | 97   |                 |                 |                 | 139             | 297 | 539  | 237              |                  | 77              |
| 10..... | 37   | 93   |                 |                 |                 | 127             | 275 | 539  | 223              |                  | 76              |
| 11..... | 38   | 89   |                 |                 |                 | 123             | 254 | 590  | 216              |                  | 74              |
| 12..... | 38   | 79   |                 |                 |                 | 118             | 240 | 775  | 204              |                  | 74              |
| 13..... | 38   | 71   |                 |                 |                 | <sup>b</sup> 19 | 233 | 775  | 190              | <sup>b</sup> 320 | 73              |
| 14..... | 38   | 67   |                 |                 |                 | 126             | 247 | 741  | 178              |                  | 72              |
| 15..... | 40   | 75   |                 |                 | <sup>b</sup> 55 | 138             | 261 | 707  | 171              |                  | 74              |
| 16..... | 45   | 85   | <sup>b</sup> 54 |                 |                 | 149             | 275 | 690  | 197              |                  | 78              |
| 17..... | 45   | 117  |                 |                 |                 | 161             | 290 | 690  | 210              |                  | 80              |
| 18..... | 44   | 135  |                 |                 |                 | 147             | 304 | 690  | <sup>b</sup> 205 |                  | 79              |
| 19..... | 44   | 132  |                 |                 |                 | 130             | 304 | 673  | <sup>b</sup> 200 | 308              | 78              |
| 20..... | 42   | 120  |                 |                 |                 | 122             | 282 | 656  | <sup>b</sup> 195 | 308              | 80              |
| 21..... | 41   | 110  |                 |                 |                 | 127             | 290 | 606  | <sup>b</sup> 190 | 308              | 81              |
| 22..... | 41   | 100  |                 |                 |                 | 148             | 297 | 542  | 197              | 286              | 82              |
| 23..... | 42   | 99   |                 |                 |                 | 167             | 304 | 494  | 251              | 138              | 85              |
| 24..... | 45   | 78   |                 |                 |                 | 180             | 312 | 446  | 265              | 105              | 84              |
| 25..... | 46   | 76   |                 |                 |                 | 199             | 327 | 414  | 265              | 94               | 83              |
| 26..... | 44   | 77   |                 |                 |                 | 240             | 334 | 398  | 265              | 86               | 83              |
| 27..... | 41   | 71   |                 | <sup>a</sup> 50 |                 | 261             | 350 | 398  | 258              | 83               |                 |
| 28..... | 40   | 81   | <sup>a</sup> 55 |                 |                 | 290             | 366 | 414  | 251              | 81               | <sup>b</sup> 80 |
| 29..... | 39   | 95   | <sup>b</sup> 53 |                 | 108             | 334             | 382 | 414  | 244              | 80               |                 |
| 30..... | 39   | 112  | <sup>b</sup> 52 |                 | 115             | 374             | 398 | 383  | 286              | 80               |                 |
| 31..... | 39   |      | <sup>b</sup> 50 |                 | 119             |                 | 406 |      | 323              | 80               |                 |

| Month          | Maximum | Minimum | Mean            | Run-off in<br>acre-feet |
|----------------|---------|---------|-----------------|-------------------------|
| October.....   | 46      | 36      | 40.3            | 2,480                   |
| November.....  | 135     | 39      | 83.3            | 4,960                   |
| December.....  | 111     |         | 59.6            | 3,660                   |
| January.....   |         |         | <sup>b</sup> 50 | 3,070                   |
| February.....  |         |         | <sup>b</sup> 42 | 2,330                   |
| March.....     | 119     |         | 60.4            | 3,710                   |
| April.....     | 374     | 118     | 174             | 10,400                  |
| May.....       | 406     | 233     | 322             | 19,800                  |
| June.....      | 775     | 383     | 560             | 53,300                  |
| July.....      | 360     | 171     | 242             | 14,900                  |
| August.....    | 338     | 80      | 255             | 15,700                  |
| September..... | 85      | 72      | 78.3            | 4,660                   |
| The year.....  | 775     |         | 164             | 119,000                 |

<sup>a</sup> Discharge measurement.

<sup>b</sup> Estimated.

## CRESCENT LAKE RESERVOIR NEAR CRESCENT, OREG.

LOCATION.—Staff gage at reservoir dam in sec. 11, T. 24 S., R. 6 E., 14 miles west of Crescent. Zero of gage is 4,826.0 feet above mean sea level.

RECORDS AVAILABLE.—August 1922 to September 1933.

EXTREMES.—Maximum contents during year, 44,490 acre-feet July 14 (gage height, 12.28 feet); minimum, 15,530 acre-feet Oct. 12 (gage height, 4.41 feet).

1922-33: Maximum contents, 72,460 acre-feet July 15, 1923 (gage height, 19.55 feet); minimum, 9,640 acre-feet Oct. 21, 1931 (gage height, 2.75 feet).

REMARKS.—Records excellent. Contents given are those above zero of gage and elevation of gate sill. Water stored in Crescent Lake Reservoir, completed in 1922, is used by Deschutes County Municipal Improvement District through its canal diverting from Deschutes River at Bend for irrigation of lands near Tumalo. Capacity of reservoir is 86,050 acre-feet at spillway crest at gage height 23.0 feet. Records furnished by State engineer.

*Stage and contents, 1932-33*

| Date          | Gage height (feet) | Contents (acre-feet) | Change in contents during month (acre-feet) | Date          | Gage height feet | Contents (acre-feet) | Change in contents during month (acre-feet) |
|---------------|--------------------|----------------------|---------------------------------------------|---------------|------------------|----------------------|---------------------------------------------|
| Sept. 30..... | 4.53               | 15,960               | -----                                       | May 31.....   | 7.90             | 28,170               | +3,550                                      |
| Oct. 31.....  | 4.47               | 15,740               | -220                                        | June 30.....  | 11.29            | 40,750               | +12,580                                     |
| Nov. 30.....  | 4.98               | 17,580               | +1,840                                      | July 31.....  | 10.75            | 40,500               | -250                                        |
| Dec. 31.....  | 5.20               | 18,370               | +790                                        | Aug. 31.....  | 8.54             | 30,520               | -9,980                                      |
| Jan. 31.....  | 5.80               | 20,530               | +2,160                                      | Sept. 30..... | 8.74             | 31,260               | +740                                        |
| Feb. 28.....  | 5.96               | 21,110               | +580                                        |               |                  |                      |                                             |
| Mar. 31.....  | 6.48               | 22,990               | +1,880                                      | The year..... |                  |                      | +15,300                                     |
| Apr. 30.....  | 6.93               | 24,620               | +1,630                                      |               |                  |                      |                                             |

\* Estimated.

## CRESCENT CREEK AT CRESCENT LAKE, NEAR CRESCENT, OREG.

LOCATION.—Water-stage recorder in sec. 11, T. 24 S., R. 6 E., 100 yards below dam at outlet of Crescent Lake and 14 miles west of Crescent.

RECORDS AVAILABLE.—January 1911 to July 1915, July 1927 to September 1928, incomplete; October 1928 to September 1933.

DISCHARGE.—Maximum during year, 271 second-feet July 28 to Aug. 5 (maximum gage height, 2.55 feet); no flow most of year.

1911-15, 1927-33: Maximum, 313 second-feet July 9, 1929; no flow at times.

REMARKS.—Records good. Flow regulated since 1922 by storage in Crescent Lake Reservoir, this storage being released July 14 to Aug. 21 for Deschutes County Municipal Improvement District Canal near Bend. Records furnished by State engineer.

*Discharge, in second-feet, 1932-33*

| Day     | July | Aug. | Day     | July | Aug. | Day     | July | Aug. |
|---------|------|------|---------|------|------|---------|------|------|
| 1.....  | 0    | 271  | 11..... | 0    | 262  | 21..... | 128  | 95   |
| 2.....  | 0    | 271  | 12..... | 0    | 262  | 22..... | 171  | 0    |
| 3.....  | 0    | 271  | 13..... | 0    | 262  | 23..... | 174  | 0    |
| 4.....  | 0    | 271  | 14..... | 34   | 262  | 24..... | 179  | 0    |
| 5.....  | 0    | 271  | 15..... | 82   | 262  | 25..... | 177  | 0    |
| 6.....  | 0    | 262  | 16..... | 82   | 262  | 26..... | 176  | 0    |
| 7.....  | 0    | 262  | 17..... | 82   | 262  | 27..... | 174  | 0    |
| 8.....  | 0    | 262  | 18..... | 82   | 262  | 28..... | 210  | 0    |
| 9.....  | 0    | 262  | 19..... | 81   | 262  | 29..... | 271  | 0    |
| 10..... | 0    | 262  | 20..... | 81   | 253  | 30..... | 271  | 0    |
|         |      |      |         |      |      | 31..... | 271  | 0    |

| Month         | Maximum | Minimum | Mean | Run-off in acre-feet |
|---------------|---------|---------|------|----------------------|
| July.....     | 271     | 0       | 87.9 | 5,400                |
| August.....   | 271     | 0       | 173  | 10,600               |
| The year..... | 271     | 0       | 22.2 | 16,000               |

NOTE.—No flow during months omitted.

## DIVERSIONS FROM DESCHUTES RIVER NEAR BEND, OREG.

The following canals divert from Deschutes River between the gaging station at Benham Falls and the station below Bend: Arnold Canal diverts from right bank of Deschutes River at head of Lava Island, in SW¼ sec. 27, T. 18 S., R. 11 E.; water used for irrigation of lands southeast of Bend. Central Oregon Canal diverts on right bank in NE¼ sec. 13, T. 18 S., R. 11 E.; water used for irrigation of lands east of Bend. Beginning Oct. 1, 1932, record of flow of Central Oregon Canal obtained above intake of Pilot Butte Canal. Deschutes County Municipal Improvement District Canal diverts from left bank in NE¼ sec. 32, T. 17 S., R. 12 E., at Bend; water used to supplement flow of Tumalo project feed canal for irrigation of lands near Tumalo; water stored at Crescent Lake Reservoir is diverted by this canal. North and Swalley Canals divert from right bank in NE¼ sec. 29, T. 17 S., R. 12 E.; water used to irrigate lands north of Bend, mostly near Redmond. No other diversions between gaging stations at Benham Falls and below Bend.

Records are available from October 1926 to September 1933; records for each of these canals published separately prior to 1926. Records furnished by State engineer.

*Diversions, in acre-feet, 1932-33*

| Month          | Arnold Canal | Central Oregon Canal | Deschutes County Municipal Improvement District Canal | North Canal | Swalley Canal | Total   |
|----------------|--------------|----------------------|-------------------------------------------------------|-------------|---------------|---------|
| October.....   | 4,210        | 20,000               | 1,860                                                 | 20,700      | 4,220         | 50,990  |
| November.....  | 298          | 2,170                | 6,250                                                 | 2,260       | 2,490         | 13,468  |
| December.....  | 135          | 1,350                | 0                                                     | 996         | 271           | 2,752   |
| January.....   | 74           | 990                  | 0                                                     | 959         | 394           | 2,417   |
| February.....  | 0            | 3,030                | 0                                                     | 2,270       | 144           | 5,444   |
| March.....     | 258          | 2,990                | 3,190                                                 | 1,800       | 332           | 8,570   |
| April.....     | 1,840        | 13,400               | 2,270                                                 | 14,500      | 1,460         | 33,470  |
| May.....       | 4,860        | 20,000               | 6,210                                                 | 23,900      | 4,140         | 59,110  |
| June.....      | 5,450        | 26,200               | 982                                                   | 27,700      | 5,650         | 65,982  |
| July.....      | 5,480        | 26,900               | 1,820                                                 | 31,100      | 6,060         | 71,360  |
| August.....    | 5,980        | 29,800               | 10,800                                                | 31,400      | 6,580         | 84,560  |
| September..... | 5,250        | 24,300               | 4,880                                                 | 25,400      | 4,940         | 64,770  |
| The year.....  | 33,835       | 171,130              | 38,262                                                | 182,985     | 36,681        | 462,893 |

## TUMALO CREEK NEAR BEND, OREG.

LOCATION.—Water-stage recorder in SE¼ sec. 23, T. 17 S., R. 11 E., a quarter of a mile above diversion dam of feed canal of Tumalo project, 4 miles above mouth, and 4 miles northwest of Bend.

DRAINAGE AREA.—57 square miles.

RECORDS AVAILABLE.—November 1913 to September 1933; also during winters from October 1906 to April 1913, except 1909 and 1910.

DISCHARGE.—Maximum during year, 625 second-feet June 9 (gage height, 3.60 feet); minimum, 6 second-feet Nov. 21–23 (gage height, 0.71 foot).

1906–8, 1911–33: Maximum, 1,420 second-feet about Jan. 6, 1923 (gage height, 4.55 feet); minimum, 4.0 second-feet Oct. 28, 1922 (gage height, 0.55 foot). Average, 18 years (1913–21, 1923–33), 82.9 second-feet.

REMARKS.—Records good except those for Dec. 6 to Feb. 17, which are fair. Columbia Southern Canal diverts above station. Records furnished by State engineer.

*Discharge, in second-feet, 1932–33*

| Day     | Oct. | Nov. | Dec. | Jan. | Feb. | Mar. | Apr. | May | June | July  | Aug.  | Sept. |    |    |
|---------|------|------|------|------|------|------|------|-----|------|-------|-------|-------|----|----|
| 1.....  | 54   | 60   | 63   | 65   | a 52 | 49   | 47   | 111 | 228  | a 177 | a 28  | 72    |    |    |
| 2.....  | 56   | 59   | 69   | 66   | a 51 | 49   | 49   | 103 | 216  |       | a 44  | 70    |    |    |
| 3.....  | 58   | 59   | 69   | 66   | a 50 | 47   | 52   | 96  | 266  |       | a 53  | 72    |    |    |
| 4.....  | 58   | 59   | 67   | 63   | 50   | 45   | 52   | 92  | 266  |       | a 41  | 72    |    |    |
| 5.....  | 59   | 73   | 66   | 63   | 50   | 46   | 52   | 88  | 251  |       | a 26  | 77    |    |    |
| 6.....  | 58   | 83   | a 50 | 65   | 50   | 49   | 55   | 85  | 228  | a 177 | a 21  | 75    |    |    |
| 7.....  | 56   | 65   |      | 63   | 49   | 54   | 82   | 225 | 172  |       | a 27  | 69    |    |    |
| 8.....  | 55   | 43   |      | 63   | 47   | 54   | 78   | 320 | 224  |       | a 40  | 66    |    |    |
| 9.....  | 54   | 15   |      | 63   | 46   | 52   | 73   | 536 | 200  |       | a 40  | 66    |    |    |
| 10..... | 54   | 8    |      | 62   | 46   | 51   | 73   | 464 | 181  |       | a 36  | 66    |    |    |
| 11..... | 51   | 7    | a 50 | 61   | a 45 | 47   | 51   | 70  | 393  | 165   | a 36  | 70    |    |    |
| 12..... | 51   | 8    |      | 60   |      | 47   | 50   | 67  | 379  | 174   | a 33  | 69    |    |    |
| 13..... | 56   | 8    |      | 56   |      | 45   | 51   | 69  | 421  | 170   | a 33  | 73    |    |    |
| 14..... | 70   | 8    |      | 55   |      | 44   | 54   | 76  | 478  | 167   | a 33  | 78    |    |    |
| 15..... | 62   | 8    |      |      |      | 44   | 59   | 75  | 492  | 179   | a 30  | 80    |    |    |
| 16..... | 58   | 12   | a 60 | a 50 | 50   | 44   | 60   | 75  | 464  | 179   | a 30  | 81    |    |    |
| 17..... | 52   | 16   |      |      |      | 43   | 58   | 73  | 365  | 149   | a 28  | 81    |    |    |
| 18..... | 50   | 13   |      |      |      | 42   | 56   | 70  | 298  | 147   | 27    | 80    |    |    |
| 19..... | 51   | 10   |      |      |      | 43   | 55   | 69  | 270  | 147   | 28    | 73    |    |    |
| 20..... | 52   | 8    |      |      |      | 43   | 56   | 69  | 246  | 138   | 27    | 73    |    |    |
| 21..... | 54   | 7    | a 60 | a 50 | 50   | 40   | 60   | 70  | 212  | 142   | 21    | 78    |    |    |
| 22..... | 56   | 7    |      |      |      | 51   | 40   | 69  | 72   | 193   | 142   | 19    | 86 |    |
| 23..... | 55   | 14   |      |      |      | 51   | 42   | 80  | 73   | 181   | 149   | 19    | 83 |    |
| 24..... | 52   | 56   |      |      |      | 50   | 42   | 90  | 80   | 207   | 156   | 20    | 83 |    |
| 25..... | 52   | 56   |      |      |      | 50   | 42   | 98  | 107  | 248   | 158   | 34    | 77 |    |
| 26..... | 54   | 59   | 65   | 52   | 49   | 42   | 100  | 130 | 234  | 142   | 77    | 88    |    |    |
| 27..... | 55   | 63   |      |      |      | 44   | 116  | 132 | 222  | 67    | 75    | 83    |    |    |
| 28..... | 58   | 66   |      |      |      | a 52 | 50   | 46  | 118  | 154   | a 200 | 52    | 75 | 85 |
| 29..... | 56   | 67   |      |      |      | a 52 |      | 45  | 132  | 210   | a 185 | 57    | 77 | 88 |
| 30..... | 55   | 65   |      |      |      | 52   |      | 46  | 120  | 241   | a 165 | 54    | 73 | 80 |
| 31..... | 59   |      | 65   | 52   |      | 47   |      | 225 |      | 34    | 70    |       |    |    |

| Month          | Tumalo Creek |         |      |                      | Columbia Southern Canal (run-off in acre-feet) | Combined run-off in acre-feet |
|----------------|--------------|---------|------|----------------------|------------------------------------------------|-------------------------------|
|                | Maximum      | Minimum | Mean | Run-off in acre-feet |                                                |                               |
| October.....   | 70           | 50      | 55.5 | 3,410                | 0                                              | 3,410                         |
| November.....  | 83           | 7       | 36.1 | 2,150                | 1,670                                          | 3,820                         |
| December.....  | 69           |         | 56.7 | 3,490                | 0                                              | 3,490                         |
| January.....   | 66           |         | 55.8 | 3,430                | 0                                              | 3,430                         |
| February.....  | 52           |         | 48.2 | 2,680                | 0                                              | 2,680                         |
| March.....     | 49           | 40      | 44.9 | 2,760                | 0                                              | 2,760                         |
| April.....     | 132          | 47      | 68.4 | 4,070                | 0                                              | 4,070                         |
| May.....       | 241          | 67      | 99.6 | 6,120                | 0                                              | 6,120                         |
| June.....      | 536          | 165     | 295  | 17,600               | 4,980                                          | 22,580                        |
| July.....      | 224          | 34      | 149  | 9,160                | 4,870                                          | 14,030                        |
| August.....    | 77           | 19      | 39.4 | 2,420                | 3,080                                          | 5,500                         |
| September..... | 88           | 66      | 78.5 | 4,550                | 0                                              | 4,550                         |
| The year.....  | 536          | 7       | 85.3 | 61,840               | 14,600                                         | 76,440                        |

• Estimated.

SQUAW CREEK NEAR SISTERS, OREG.

LOCATION.—Water-stage recorder in NW¼ sec. 32, T. 15 S., R. 10 E., immediately above intake of McCallister Ditch and 4 miles south of Sisters.

DRAINAGE AREA.—63 square miles.

RECORDS AVAILABLE.—Irrigation seasons, 1913, 1914, 1916-25, October 1925 to September 1933. July 1906 to May 1913 at station below intake of McCallister Ditch and 700 feet downstream.

DISCHARGE.—Maximum during year, 925 second-feet June 9 (gage height, 2.98 feet); minimum, 36 second-feet Mar. 4.

1906-14, 1916-33: Maximum (estimated), 1,940 second-feet Nov. 22, 1909 (gage height, 7.5 feet at former station); minimum, 19 second-feet Dec. 6, 1922. Average, 21 years (1906-18, 1919-20, 1925-33), 106 second-feet.

REMARKS.—Records good except those estimated, which are fair. Pole Creek, a tributary above station, has been entirely diverted from its natural channel near mouth through a canal for irrigation of lands near Sisters. Records furnished by State engineer.

*Discharge, in second-feet, 1932-33*

| Day            | Oct.    | Nov. | Dec. | Jan. | Feb. | Mar.    | Apr. | May  | June | July                 | Aug. | Sept. |
|----------------|---------|------|------|------|------|---------|------|------|------|----------------------|------|-------|
| 1.....         | * 79    | 52   | 68   | 53   | * 44 | 38      | 42   | 96   | 182  | 315                  | 192  | 102   |
| 2.....         | 80      | 52   | 76   | 52   | * 43 | 39      | 45   | 91   | 189  | 380                  | 202  | 102   |
| 3.....         | 78      | 50   | 70   | 52   | * 42 | 38      | 49   | 89   | 234  | 406                  | 198  | 105   |
| 4.....         | 74      | 50   | 66   | 52   | * 40 | 40      | 49   | 89   | 238  | 370                  | 172  | 107   |
| 5.....         | 76      | 70   | 62   | 53   | 39   | 38      | 49   | 84   | 230  | 340                  | 151  | 107   |
| 6.....         | 78      | 104  | 59   | 52   | 38   | 39      | 50   | 80   | 230  | 340                  | 151  | 107   |
| 7.....         | 66      | 59   | 50   | 50   |      | 40      | 50   | 78   | 241  | 350                  | 167  | 90    |
| 8.....         | 60      | 91   | 46   | 46   |      | 39      | 50   | 74   | 458  | 422                  | 172  | 85    |
| 9.....         | 60      | 97   | 47   | 47   |      | 39      | 49   | 71   | 860  | 590                  | 175  | 85    |
| 10.....        | 60      | 70   | 46   | 46   |      | 38      | 46   | 69   | 538  | 355                  | 172  | 87    |
| 11.....        | 91      | 60   |      | * 46 |      | 39      | 48   | 67   | 433  | 345                  | 172  | 90    |
| 12.....        | 102     | 57   | * 45 | * 46 |      | 42      | 49   | 65   | 428  | 360                  | 166  | 90    |
| 13.....        | 78      | 65   |      | 46   | * 38 | 39      | 50   | 71   | 455  | 350                  | 163  | 90    |
| 14.....        | 70      | 62   |      | 46   |      | 39      | 53   | 76   | 488  | 345                  | 166  | 105   |
| 15.....        | 56      | 86   |      |      |      | 40      | 58   | 76   | 570  | 355                  | 160  | 89    |
| 16.....        | 52      | 121  |      |      |      | 40      | 56   | 76   | 576  | 360                  | 157  | 100   |
| 17.....        | 52      | 126  | 49   |      |      | 40      | 53   | 74   | 490  | 291                  | 166  | 100   |
| 18.....        | 52      | 100  | 40   |      |      | 40      | 52   | 71   | 400  | 282                  | 160  | 94    |
| 19.....        | 50      | 82   | 49   |      |      | 40      | 52   | 71   | 360  | 287                  | 160  | 81    |
| 20.....        |         | 74   | 52   |      |      | 43      | 54   | 74   | 360  | 260                  | 140  | 83    |
| 21.....        |         | 71   | 52   |      | 42   | 42      | 59   | 76   | 345  | 244                  | 124  | 81    |
| 22.....        | * 53    | 66   | 52   | * 44 | 40   | 40      | 65   | 80   | 335  | 232                  | 122  | 92    |
| 23.....        |         | 66   | 52   |      | 39   | 40      | 74   | 86   | 325  | 228                  | 127  | 87    |
| 24.....        |         | 63   | 52   |      | 39   | 39      | 78   | 98   | 345  | 244                  | 135  | 89    |
| 25.....        | 53      | 62   | 53   |      | 38   | 39      | 84   | 117  | 438  | 260                  | 129  | 79    |
| 26.....        | 53      | 65   | 52   |      | 38   | 39      | 86   | 130  | 422  | 256                  | 119  | 85    |
| 27.....        | 52      | 73   | 53   |      | 38   | 40      | 96   | 130  | 428  | 236                  | 119  | 79    |
| 28.....        | 50      | 73   | 52   |      | 38   | 42      | 107  | 139  | 395  | 212                  | 119  | 83    |
| 29.....        | 52      | 78   | 52   |      |      | 40      | 107  | 163  | 360  | 212                  | 112  | 102   |
| 30.....        | 49      | 71   | 54   |      |      | 42      | 100  | 189  | 330  | 200                  | 100  | 83    |
| 31.....        | 52      |      | 53   | 44   |      | 40      |      | 189  |      | 198                  | 100  |       |
| Month          | Maximum |      |      |      |      | Minimum |      | Mean |      | Run-off in acre-feet |      |       |
| October.....   | 102     |      |      |      |      | 49      |      | 62.6 |      | 3,850                |      |       |
| November.....  | 126     |      |      |      |      | 50      |      | 73.9 |      | 4,400                |      |       |
| December.....  | 76      |      |      |      |      |         |      | 52.5 |      | 3,230                |      |       |
| January.....   | 53      |      |      |      |      |         |      | 46.3 |      | 2,850                |      |       |
| February.....  | 44      |      |      |      |      |         |      | 38.9 |      | 2,160                |      |       |
| March.....     | 43      |      |      |      |      | 38      |      | 39.8 |      | 2,450                |      |       |
| April.....     | 107     |      |      |      |      | 42      |      | 62.0 |      | 3,690                |      |       |
| May.....       | 189     |      |      |      |      | 65      |      | 94.8 |      | 5,830                |      |       |
| June.....      | 860     |      |      |      |      | 182     |      | 390  |      | 23,200               |      |       |
| July.....      | 422     |      |      |      |      | 198     |      | 304  |      | 18,700               |      |       |
| August.....    | 202     |      |      |      |      | 100     |      | 150  |      | 9,220                |      |       |
| September..... | 107     |      |      |      |      | 79      |      | 92.0 |      | 5,470                |      |       |
| The year.....  | 860     |      |      |      |      |         |      | 117  |      | 85,000               |      |       |

\* Estimated.

## CROOKED RIVER NEAR CULVER, OREG.

LOCATION.—Staff gage in SW¼ sec. 11, T. 12 S., R. 12 E., just below Cove power plant and 3 miles northwest of Culver.

RECORDS AVAILABLE.—October 1917 to September 1933.

DISCHARGE.—Maximum during year, 3,090 second-feet Apr. 5 (gage height, 2.90 feet); minimum, 1,180 second-feet June 25-30, July 1-8, 11, 17-31, Aug. 17, 19-21, 25, 26 (gage height 0.46 foot).

1917-33: Maximum, 7,320 second-feet Feb. 6, 1925 (gage height, 5.6 feet); minimum, 970 second-feet July 12 to Sept. 5, 1921. Average, 16 years (1917-33), 1,380 second-feet.

REMARKS.—Records fair. Flow regulated slightly by storage in Ochoco Reservoir. Summer flow above Prineville diverted for irrigation. Springs increase flow about 1,000 second-feet in a few miles above station. Gage-height record furnished by Pacific Power & Light Co.

*Discharge, in second-feet, 1932-33*

| Day     | Oct.  | Nov.  | Dec.  | Jan.  | Feb.  | Mar.  | Apr.  | May   | June  | July  | Aug.  | Sept. |
|---------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 1.....  | 1,210 | 1,190 | 1,310 | 1,250 | 1,250 | 1,310 | 1,770 | 2,220 | 1,430 | 1,180 | 1,180 | 1,190 |
| 2.....  | 1,210 | 1,190 | 1,310 | 1,250 | 1,250 | 1,310 | 1,840 | 1,980 | 1,400 | 1,180 | 1,180 | 1,160 |
| 3.....  | 1,200 | 1,190 | 1,310 | 1,250 | 1,250 | 1,430 | 1,910 | 1,980 | 1,370 | 1,180 | 1,180 | 1,190 |
| 4.....  | 1,190 | 1,190 | 1,310 | 1,250 | 1,250 | 1,430 | 2,570 | 1,980 | 1,370 | 1,180 | 1,180 | 1,190 |
| 5.....  | 1,190 | 1,190 | 1,310 | 1,250 | 1,250 | 1,400 | 3,090 | 1,910 | 1,560 | 1,180 | 1,180 | 1,190 |
| 6.....  | 1,190 | 1,200 | 1,310 | 1,250 | 1,250 | 1,400 | 2,870 | 1,910 | 1,560 | 1,180 | 1,180 | 1,190 |
| 7.....  | 1,190 | 1,210 | 1,280 | 1,250 | 1,250 | 1,430 | 2,870 | 1,910 | 1,560 | 1,180 | 1,180 | 1,190 |
| 8.....  | 1,190 | 1,210 | 1,280 | 1,250 | 1,250 | 1,370 | 2,670 | 1,770 | 1,430 | 1,180 | 1,180 | 1,190 |
| 9.....  | 1,190 | 1,220 | 1,250 | 1,250 | 1,250 | 1,370 | 2,220 | 1,770 | 1,370 | 1,250 | 1,180 | 1,190 |
| 10..... | 1,190 | 1,220 | 1,250 | 1,250 | 1,250 | 1,430 | 1,910 | 1,700 | 1,370 | 1,200 | 1,180 | 1,200 |
| 11..... | 1,190 | 1,220 | 1,250 | 1,250 | 1,250 | 1,430 | 1,770 | 1,700 | 1,310 | 1,180 | 1,180 | 1,200 |
| 12..... | 1,190 | 1,230 | 1,250 | 1,250 | 1,250 | 1,430 | 1,700 | 1,700 | 1,370 | 1,200 | 1,180 | 1,200 |
| 13..... | 1,190 | 1,230 | 1,250 | 1,250 | 1,250 | 1,430 | 1,560 | 1,630 | 1,310 | 1,200 | 1,180 | 1,200 |
| 14..... | 1,190 | 1,230 | 1,250 | 1,250 | 1,250 | 1,430 | 1,770 | 1,630 | 1,310 | 1,190 | 1,180 | 1,200 |
| 15..... | 1,190 | 1,240 | 1,250 | 1,250 | 1,250 | 1,430 | 1,910 | 1,630 | 1,280 | 1,190 | 1,180 | 1,200 |
| 16..... | 1,190 | 1,250 | 1,250 | 1,250 | 1,250 | 1,430 | 2,220 | 1,630 | 1,280 | 1,190 | 1,180 | 1,200 |
| 17..... | 1,190 | 1,250 | 1,250 | 1,250 | 1,250 | 1,370 | 2,390 | 1,770 | 1,280 | 1,180 | 1,180 | 1,200 |
| 18..... | 1,190 | 1,250 | 1,250 | 1,250 | 1,250 | 1,370 | 2,220 | 1,630 | 1,250 | 1,180 | 1,200 | 1,200 |
| 19..... | 1,190 | 1,250 | 1,250 | 1,250 | 1,250 | 1,370 | 1,980 | 1,700 | 1,250 | 1,180 | 1,180 | 1,200 |
| 20..... | 1,190 | 1,250 | 1,250 | 1,250 | 1,250 | 1,430 | 1,770 | 1,770 | 1,240 | 1,180 | 1,180 | 1,200 |
| 21..... | 1,190 | 1,250 | 1,250 | 1,250 | 1,250 | 1,430 | 1,910 | 1,700 | 1,200 | 1,180 | 1,180 | 1,200 |
| 22..... | 1,190 | 1,280 | 1,250 | 1,250 | 1,250 | 1,560 | 2,140 | 1,630 | 1,200 | 1,180 | 1,200 | 1,200 |
| 23..... | 1,190 | 1,280 | 1,250 | 1,250 | 1,250 | 1,560 | 2,300 | 1,630 | 1,200 | 1,180 | 1,200 | 1,200 |
| 24..... | 1,190 | 1,280 | 1,250 | 1,250 | 1,250 | 1,490 | 2,480 | 1,630 | 1,190 | 1,180 | 1,200 | 1,200 |
| 25..... | 1,190 | 1,280 | 1,250 | 1,250 | 1,250 | 1,430 | 2,670 | 1,630 | 1,180 | 1,180 | 1,180 | 1,200 |
| 26..... | 1,190 | 1,280 | 1,250 | 1,250 | 1,310 | 1,430 | 2,770 | 1,630 | 1,180 | 1,180 | 1,180 | 1,200 |
| 27..... | 1,190 | 1,310 | 1,250 | 1,250 | 1,310 | 1,430 | 2,570 | 1,630 | 1,180 | 1,180 | 1,190 | 1,200 |
| 28..... | 1,190 | 1,310 | 1,250 | 1,250 | 1,310 | 1,430 | 2,670 | 1,490 | 1,180 | 1,180 | 1,190 | 1,200 |
| 29..... | 1,190 | 1,310 | 1,250 | 1,250 | ----- | 1,490 | 2,570 | 1,490 | 1,180 | 1,180 | 1,190 | 1,200 |
| 30..... | 1,190 | 1,310 | 1,250 | 1,250 | ----- | 1,770 | 2,390 | 1,490 | 1,180 | 1,180 | 1,200 | 1,200 |
| 31..... | 1,190 | ----- | 1,250 | 1,250 | ----- | 1,770 | ----- | 1,430 | ----- | 1,180 | 1,190 | ----- |

| Month          | Maximum | Minimum | Mean  | Run-off in acre-feet |
|----------------|---------|---------|-------|----------------------|
| October.....   | 1,210   | 1,190   | 1,190 | 73,200               |
| November.....  | 1,310   | 1,190   | 1,240 | 73,800               |
| December.....  | 1,310   | 1,250   | 1,280 | 77,500               |
| January.....   | 1,250   | 1,250   | 1,250 | 76,900               |
| February.....  | 1,310   | 1,250   | 1,280 | 70,000               |
| March.....     | 1,770   | 1,310   | 1,440 | 88,500               |
| April.....     | 3,090   | 1,560   | 2,250 | 134,000              |
| May.....       | 2,220   | 1,430   | 1,720 | 106,000              |
| June.....      | 1,560   | 1,180   | 1,310 | 78,000               |
| July.....      | 1,250   | 1,180   | 1,190 | 73,200               |
| August.....    | 1,200   | 1,180   | 1,180 | 72,600               |
| September..... | 1,200   | 1,190   | 1,200 | 71,400               |
| The year.....  | 3,090   | 1,180   | 1,370 | 995,000              |

LOCATION.—Staff gage in NE¼ sec. 19, T. 11 S., R. 11 E., at Montgomery ranch, 8 miles northwest of Grandview.

DISCHARGE.—Maximum during year, 2,780 second-feet June 9 (gage height, 1.50 feet); minimum, 1,140 second-feet Feb. 9 (gage height, 0.20 foot).

1921-33: Maximum, about 5,780 second-feet Jan. 7, 1923 (gage height, 3.32 feet); minimum, 1,080 second-feet Feb. 17, 1932 (gage height, 0.14 foot).

REMARKS.—Records excellent. No diversion or regulation above station.

| Day | Oct.   | Nov.   | Dec.   | Jan.   | Feb.   | Mar.   | Apr.   | May    | June   | July     | Aug.   | Sept.  |
|-----|--------|--------|--------|--------|--------|--------|--------|--------|--------|----------|--------|--------|
| 1   | 1, 240 | 1, 220 | 1, 340 | 1, 230 | 1, 240 | 1, 260 | 1, 320 | 1, 450 | 1, 620 | 1, 680   | 1, 450 | 1, 320 |
| 2   | 1, 240 | 1, 220 | 1, 340 | 1, 400 | 1, 240 | 1, 260 | 1, 320 | 1, 450 | 1, 620 | 1, 740   | 1, 450 | 1, 320 |
| 3   | 1, 240 | 1, 220 | 1, 340 | 1, 280 | 1, 240 | 1, 260 | 1, 340 | 1, 450 | 1, 620 | 1, 800   | 1, 450 | 1, 320 |
| 4   | 1, 240 | 1, 220 | 1, 340 | 1, 280 | 1, 220 | 1, 240 | 1, 340 | 1, 450 | 1, 740 | 1, 740   | 1, 450 | 1, 320 |
| 5   | 1, 240 | 1, 340 | 1, 300 | 1, 320 | 1, 220 | 1, 240 | 1, 340 | 1, 450 | 1, 740 | 1, 680   | 1, 450 | 1, 320 |
| 6   | 1, 240 | 1, 500 | 1, 300 | 1, 320 | 1, 220 | 1, 240 | 1, 340 | 1, 450 | 1, 680 | 1, 680   | 1, 450 | 1, 320 |
| 7   | 1, 240 | 1, 320 | 1, 280 | 1, 340 | 1, 220 | 1, 240 | 1, 340 | 1, 450 | 1, 740 | 1, 680   | 1, 450 | 1, 320 |
| 8   | 1, 220 | 1, 360 | 1, 240 | 1, 340 | 1, 200 | 1, 260 | 1, 340 | 1, 450 | 2, 060 | 1, 740   | 1, 450 | 1, 300 |
| 9   | 1, 220 | 1, 400 | 1, 180 | 1, 340 | 1, 140 | 1, 260 | 1, 340 | 1, 400 | 2, 780 | 1, 740   | 1, 450 | 1, 300 |
| 10  | 1, 220 | 1, 320 | 1, 180 | 1, 340 | 1, 200 | 1, 260 | 1, 340 | 1, 400 | 2, 480 | 1, 680   | 1, 450 | 1, 300 |
| 11  | 1, 220 | 1, 260 | 1, 180 | 1, 320 | 1, 220 | 1, 260 | 1, 340 | 1, 400 | 2, 340 | 1, 680   | 1, 450 | 1, 300 |
| 12  | 1, 220 | 1, 260 | 1, 180 | 1, 300 | 1, 240 | 1, 260 | 1, 340 | 1, 400 | 2, 200 | 1, 680   | 1, 400 | 1, 300 |
| 13  | 1, 240 | 1, 400 | 1, 180 | 1, 300 | 1, 200 | 1, 260 | 1, 340 | 1, 400 | 2, 200 | 1, 680   | 1, 400 | 1, 300 |
| 14  | 1, 450 | 1, 320 | 1, 180 | 1, 300 | 1, 200 | 1, 260 | 1, 340 | 1, 400 | 1, 200 | 1, 680   | 1, 400 | 1, 300 |
| 15  | 1, 280 | 1, 450 | 1, 180 | 1, 300 | 1, 280 | 1, 260 | 1, 340 | 1, 400 | 2, 340 | 1, 680   | 1, 400 | 1, 300 |
| 16  | 1, 240 | 1, 680 | 1, 200 | 1, 280 | 1, 240 | 1, 280 | 1, 340 | 1, 400 | 2, 200 | 1, 740   | 1, 400 | 1, 320 |
| 17  | 1, 220 | 1, 800 | 1, 240 | 1, 220 | 1, 220 | 1, 300 | 1, 340 | 1, 400 | 2, 200 | 1, 680   | 1, 450 | 1, 320 |
| 18  | 1, 220 | 1, 560 | 1, 280 | 1, 220 | 1, 220 | 1, 300 | 1, 340 | 1, 400 | 1, 930 | 1, 620   | 1, 400 | 1, 320 |
| 19  | 1, 220 | 1, 500 | 1, 400 | 1, 240 | 1, 220 | 1, 300 | 1, 340 | 1, 400 | 1, 930 | 1, 560   | 1, 400 | 1, 300 |
| 20  | 1, 220 | 1, 340 | 1, 320 | 1, 240 | 1, 220 | 1, 320 | 1, 340 | 1, 400 | 1, 800 | 1, 560   | 1, 400 | 1, 300 |
| 21  | 1, 220 | 1, 340 | 1, 300 | 1, 240 | 1, 220 | 1, 320 | 1, 340 | 1, 400 | 1, 800 | 1, 560   | 1, 400 | 1, 300 |
| 22  | 1, 220 | 1, 340 | 1, 300 | 1, 240 | 1, 220 | 1, 320 | 1, 340 | 1, 400 | 1, 800 | 1, 560   | 1, 340 | 1, 340 |
| 23  | 1, 220 | 1, 320 | 1, 300 | 1, 240 | 1, 240 | 1, 300 | 1, 340 | 1, 400 | 1, 800 | 1, 500   | 1, 340 | 1, 340 |
| 24  | 1, 220 | 1, 300 | 1, 280 | 1, 240 | 1, 240 | 1, 300 | 1, 400 | 1, 450 | 1, 740 | 1, 560   | 1, 340 | 1, 340 |
| 25  | 1, 220 | 1, 300 | 1, 280 | 1, 240 | 1, 240 | 1, 300 | 1, 400 | 1, 450 | 1, 860 | 1, 560   | 1, 340 | 1, 340 |
| 26  | 1, 220 | 1, 300 | 1, 340 | 1, 260 | 1, 260 | 1, 300 | 1, 450 | 1, 500 | 1, 800 | 1, 500   | 1, 340 | 1, 340 |
| 27  | 1, 220 | 1, 300 | 1, 340 | 1, 260 | 1, 260 | 1, 320 | 1, 450 | 1, 500 | 1, 800 | 1, 500   | 1, 340 | 1, 340 |
| 28  | 1, 220 | 1, 300 | 1, 300 | 1, 260 | 1, 260 | 1, 320 | 1, 450 | 1, 500 | 1, 740 | 1, 500</ |        |        |

| Month          | Maximum | Minimum | Mean   | Run-off in<br>acre-feet |
|----------------|---------|---------|--------|-------------------------|
| October.....   | 1, 450  | 1, 220  | 1, 240 | 76, 200                 |
| November.....  | 1, 800  | 1, 220  | 1, 360 | 80, 900                 |
| December.....  | 1, 400  | 1, 180  | 1, 270 | 78, 100                 |
| January.....   | 1, 400  | 1, 220  | 1, 280 | 78, 700                 |
| February.....  | 1, 280  | 1, 140  | 1, 230 | 68, 300                 |
| March.....     | 1, 340  | 1, 240  | 1, 280 | 78, 700                 |
| April.....     | 1, 450  | 1, 320  | 1, 360 | 80, 900                 |
| May.....       | 1, 620  | 1, 400  | 1, 450 | 89, 200                 |
| June.....      | 2, 780  | 1, 620  | 1, 940 | 115, 000                |
| July.....      | 1, 800  | 1, 450  | 1, 630 | 100, 000                |
| August.....    | 1, 450  | 1, 320  | 1, 400 | 86, 100                 |
| September..... | 1, 340  | 1, 300  | 1, 320 | 78, 600                 |
| The year.....  | 2, 780  | 1, 140  | 1, 400 | 1, 010, 000             |

## LAKE CREEK NEAR SISTERS, OREG.

LOCATION.—Water-stage recorder in SE¼ sec. 24, T. 13 S., R. 8 E., a quarter of a mile below Suttle Lake, 6 miles from mouth of creek, and 13 miles northwest of Sisters.

DRAINAGE AREA.—20.5 square miles.

RECORDS AVAILABLE.—April 1915 to September 1933. Occasional readings during summers of 1911 to 1913.

DISCHARGE.—Maximum during year (estimated), 269 second-feet June 9; minimum, 16 second-feet Dec. 16, Aug. 26 (gage height, 0.68 foot).  
1911–13, 1915–33: Maximum, 302 second-feet Jan. 10, 1923 (gage height, 2.58 feet); minimum, 15 second-feet July 29, 30, 1932 (gage height, 0.64 foot). Average, 17 years (1915–18, 1919–33), 52.9 second-feet.

REMARKS.—Records good except those estimated, which are fair. Stage-discharge relation affected by ice Feb. 9–19. No diversions above station. Occasional regulation by storage in Suttle Lake. Records furnished by State engineer.

*Discharge, in second-feet, 1932–33*

| Day     | Oct. | Nov. | Dec. | Jan. | Feb. | Mar. | Apr. | May | June | July | Aug. | Sept. |
|---------|------|------|------|------|------|------|------|-----|------|------|------|-------|
| 1.....  | 26   | 27   | 41   | 43   | 42   | 39   | 39   | 73  | 185  | 81   | 36   | 30    |
| 2.....  | 26   | 29   | 42   | 41   | 40   | 38   | 40   | 78  |      | 76   | 35   | 30    |
| 3.....  | 26   | 30   | 41   | 49   | 39   | 38   | 40   | 81  |      | 72   | 30   | 28    |
| 4.....  | 26   | 30   | 41   | 48   | 38   | 37   | 40   | 84  |      | 68   | 32   | 34    |
| 5.....  | 26   | 34   | 41   | 48   | 37   | 36   | 40   | 85  |      | 66   | 32   | 32    |
| 6.....  | 24   | 38   | 41   | 52   | 36   | 35   | 41   | 85  | 261  | 64   | 32   | 32    |
| 7.....  | 26   | 37   | 40   | 48   | 35   | 37   | 42   | 85  |      | 66   | 33   | 31    |
| 8.....  | 25   | 38   | 39   | 46   | 34   | 35   | 44   | 84  |      | 71   | 33   | 30    |
| 9.....  | 25   | 37   | 39   | 47   | 35   | 35   | 44   | 81  |      | 65   | 33   | 30    |
| 10..... | 25   | 36   | 38   | 48   | 35   | 35   | 45   | 79  |      | 57   | 33   | 31    |
| 11..... | 25   | 35   | 37   | 47   | 35   | 34   | 46   | 77  | 261  | 53   | 33   | 30    |
| 12..... | 25   | 34   | 36   | 45   |      | 35   | 47   | 74  | 253  | 38   | 33   | 30    |
| 13..... | 26   | 34   | 34   | 45   |      | 35   | 45   | 71  | 230  | 41   | 34   | 30    |
| 14..... | 28   | 36   | 32   | 44   |      | 34   | 45   | 69  | 215  | 43   | 34   | 30    |
| 15..... | 28   | 38   | 32   | 45   |      | 34   | 44   | 70  | 208  | 44   | 34   | 32    |
| 16..... | 29   | 42   | 30   | 44   | 37   | 34   | 44   | 71  | 192  | 44   | 33   | 32    |
| 17..... | 28   | 42   | 30   | 44   |      | 36   | 45   | 73  | 181  | 43   | 33   | 31    |
| 18..... | 28   | 44   | 32   | 44   |      | 36   | 45   | 73  | 164  | 43   | 30   | 31    |
| 19..... | 27   | 49   | 37   | 43   |      | 35   | 46   | 74  | 144  | 42   | 30   | 31    |
| 20..... | 27   | 52   | 39   | 42   |      | 36   | 47   | 74  | 131  | 41   | 30   | 30    |
| 21..... | 27   | 54   | 37   | 42   | 37   | 36   | 47   | 74  | 129  | 41   | 30   | 32    |
| 22..... | 28   | 52   | 37   | 41   | 38   | 36   | 48   | 73  | 118  | 40   | 30   | 32    |
| 23..... | 29   | 49   | 39   | 41   | 39   | 36   | 48   | 75  | 116  | 40   | 30   | 32    |
| 24..... | 29   | 48   | 39   | 42   | 39   | 36   | 49   | 97  | 110  | 40   | 30   | 32    |
| 25..... | 28   | 45   | 40   | 42   | 37   | 36   | 50   |     | 106  | 39   | 31   | 32    |
| 26..... | 27   | 44   | 43   | 42   | 38   | 37   | 52   |     | 99   | 39   | 30   | 32    |
| 27..... | 27   | 42   | 44   | 44   | 39   | 38   | 54   |     | 95   | 38   | 31   | 32    |
| 28..... | 27   | 42   | 44   | 44   | 39   | 40   | 59   |     | 93   | 36   | 30   | 30    |
| 29..... | 26   | 42   | 43   | 42   | 40   | 40   | 62   | 97  | 90   | 36   | 30   | 31    |
| 30..... | 26   | 41   | 41   | 42   | 40   | 40   | 66   |     | 85   | 36   | 30   | 31    |
| 31..... | 26   | 41   | 41   | 42   | 40   | 40   | 66   |     | 85   | 36   | 30   | 31    |

| Month          | Maximum | Minimum | Mean | Run-off in acre-feet |
|----------------|---------|---------|------|----------------------|
| October.....   | 29      | 24      | 26.6 | 1,640                |
| November.....  | 54      | 27      | 40.0 | 2,380                |
| December.....  | 44      | 30      | 38.4 | 2,300                |
| January.....   | 52      | 41      | 44.7 | 2,750                |
| February.....  | 42      | 36.8    | 39.4 | 2,040                |
| March.....     | 41      | 34      | 37.5 | 2,240                |
| April.....     | 66      | 39      | 40.8 | 2,790                |
| May.....       | 69      | 69      | 81.9 | 5,040                |
| June.....      | 85      | 85      | 162  | 9,540                |
| July.....      | 81      | 36      | 49.6 | 3,050                |
| August.....    | 36      | 30      | 31.8 | 1,960                |
| September..... | 34      | 28      | 31.0 | 1,840                |
| The year.....  | -----   | 24      | 52.1 | 37,720               |

## WHITE RIVER BELOW TYGH VALLEY, OREG.

LOCATION.—Water-stage recorder in NW¼ sec. 8, T. 4 S., R. 14 E., just below Pacific Power & Light Co.'s plant at White River Falls and 4½ miles below Tygh Valley.

DRAINAGE AREA.—393 square miles.

RECORDS AVAILABLE.—October 1917 to September 1933.

DISCHARGE.—Maximum during year, 2,200 second-feet June 9 (gage height, 5.12 feet); minimum, 40 second-feet Aug. 13 (gage height, 0.10 foot).

1917-33: Maximum, 13,300 second-feet Jan. 6, 1923 (gage height, about 13.3 feet); minimum, 10 second-feet Dec. 11-14, 1919, Aug. 9, 1931. Average, 16 years (1917-33), 430 second-feet.

REMARKS.—Records good except those estimated, Dec. 8-18, Mar. 31, Apr. 3, 5, 7, Aug. 15, 16, 18, 19, which are fair. Diversions for irrigation above station. Low-water flow regulated to some extent by operation of power plant. Gage-height record furnished by Pacific Power & Light Co.

*Discharge, in second-feet, 1932-33*

| Day     | Oct. | Nov.  | Dec. | Jan. | Feb. | Mar. | Apr.  | May   | June  | July | Aug. | Sept. |
|---------|------|-------|------|------|------|------|-------|-------|-------|------|------|-------|
| 1.....  | 107  | 167   | 273  | 311  | 292  | 389  | 500   | 1,170 | 1,170 | 540  | 196  | 152   |
| 2.....  | 104  | 167   | 820  | 430  | 281  | 363  | 500   | 1,110 | 1,110 | 540  | 194  | 150   |
| 3.....  | 107  | 165   | 820  | 373  | 262  | 357  | 625   | 1,050 | 1,200 | 500  | 192  | 147   |
| 4.....  | 105  | 176   | 580  | 342  | 255  | 327  | 720   | 990   | 1,170 | 482  | 196  | 146   |
| 5.....  | 103  | 228   | 540  | 445  | 252  | 322  | 720   | 960   | 1,230 | 448  | 198  | 147   |
| 6.....  | 103  | 580   | 448  | 670  | 270  | 316  | 720   | 930   | 1,200 | 430  | 192  | 153   |
| 7.....  | 103  | 357   | 395  | 560  | 242  | 333  | 695   | 820   | 1,140 | 416  | 184  | 152   |
| 8.....  | 102  | 402   |      | 770  | 262  | 327  | 625   | 720   | 1,490 | 420  | 180  | 147   |
| 9.....  | 102  | 465   |      | 930  | 206  | 319  | 560   | 670   | 2,100 | 409  | 171  | 147   |
| 10..... | 103  | 333   |      | 795  | 228  | 322  | 500   | 625   | 1,620 | 376  | 165  | 147   |
| 11..... | 105  | 278   |      | 648  | 333  | 322  | 482   | 580   | 1,340 | 354  | 164  | 144   |
| 12..... | 108  | 252   |      | 560  | 333  | 325  | 520   | 625   | 1,300 | 354  | 164  | 144   |
| 13..... | 140  | 262   | 269  | 500  | 273  | 325  | 500   | 695   | 1,410 | 339  | 160  | 144   |
| 14..... | 142  | 351   |      | 482  | 292  | 322  | 520   | 820   | 1,490 | 336  | 160  | 147   |
| 15..... | 134  | 357   |      | 465  | 275  | 325  | 625   | 795   | 1,450 | 327  | 158  | 188   |
| 16..... | 126  | 960   |      | 420  | 247  | 354  | 602   | 795   | 1,370 | 322  | 160  | 173   |
| 17..... | 138  | 1,260 |      | 345  | 240  | 376  | 580   | 820   | 1,200 | 308  | 164  | 164   |
| 18..... | 134  | 930   |      | 382  | 240  | 373  | 580   | 820   | 1,050 | 294  | 165  | 153   |
| 19..... | 131  | 670   | 363  | 395  | 233  | 376  | 540   | 795   | 930   | 286  | 166  | 153   |
| 20..... | 126  | 520   | 333  | 366  | 250  | 420  | 580   | 795   | 902   | 273  | 167  | 150   |
| 21..... | 125  | 465   | 305  | 373  | 363  | 465  | 625   | 820   | 848   | 257  | 158  | 155   |
| 22..... | 136  | 448   | 275  | 342  | 520  | 423  | 745   | 848   | 795   | 255  | 150  | 182   |
| 23..... | 153  | 366   | 333  | 339  | 580  | 402  | 902   | 875   | 745   | 245  | 150  | 186   |
| 24..... | 148  | 322   | 281  | 319  | 412  | 385  | 1,020 | 990   | 695   | 238  | 150  | 196   |
| 25..... | 142  | 311   | 278  | 311  | 369  | 363  | 1,110 | 1,140 | 745   | 235  | 150  | 192   |
| 26..... | 150  | 300   | 448  | 305  | 465  | 360  | 1,110 | 1,170 | 695   | 228  | 146  | 180   |
| 27..... | 150  | 302   | 416  | 311  | 395  | 376  | 1,230 | 1,140 | 648   | 219  | 153  | 182   |
| 28..... | 146  | 292   | 363  | 300  | 392  | 448  | 1,370 | 1,170 | 625   | 213  | 157  | 171   |
| 29..... | 142  | 278   | 339  | 292  |      | 482  | 1,450 | 1,230 | 602   | 208  | 153  | 178   |
| 30..... | 150  | 275   | 342  | 283  |      | 465  | 1,170 | 1,370 | 560   | 210  | 155  | 169   |
| 31..... | 146  |       | 325  | 283  |      | 520  |       | 1,230 |       | 200  | 155  |       |

| Month          | Maximum | Minimum | Mean  | Run-off in acre-feet |
|----------------|---------|---------|-------|----------------------|
| October.....   | 153     | 102     | 126   | 7,750                |
| November.....  | 1,260   | 165     | 408   | 24,300               |
| December.....  | 820     |         | 362   | 22,300               |
| January.....   | 930     | 283     | 440   | 27,100               |
| February.....  | 580     | 206     | 313   | 17,400               |
| March.....     | 520     | 316     | 374   | 23,000               |
| April.....     | 1,450   | 482     | 748   | 44,500               |
| May.....       | 1,370   | 580     | 922   | 56,700               |
| June.....      | 2,100   | 560     | 1,090 | 64,900               |
| July.....      | 540     | 200     | 331   | 20,400               |
| August.....    | 198     | 146     | 167   | 10,300               |
| September..... | 196     | 144     | 161   | 9,580                |
| The year.....  | 2,100   | 102     | 453   | 328,000              |

## Klickitat River Basin

## Klickitat River near Glenwood, Wash.

LOCATION.—Water-stage recorder in SE¼ sec. 14, T. 7 N., R. 12 E., half a mile below Dairy Creek, 3 miles below Big Muddy Creek, and 5 miles north of Glenwood.

DRAINAGE AREA.—356 square miles.

RECORDS AVAILABLE.—December 1910 to September 1933, incomplete. October 1909 to December 1910 at a point 1 mile upstream.

DISCHARGE.—Maximum during year, 3,950 second-feet June 9, 15 (gage height, 4.76 feet); minimum, 249 second-feet Feb. 9 (gage height, 1.07 feet).

1909-33: Maximum, 6,250 second-feet Nov. 24, 1909 (gage height, 5.20 feet on original gage); minimum, 204 second-feet Nov. 28, 1931 (gage height, 0.96 foot). Average, 16 years (1909-20, 1928-33), 841 second-feet.

REMARKS.—Records good. No diversions or regulation above station.

## Discharge, in second-feet, 1932-33

| Day     | Oct. | Nov.  | Dec.  | Jan. | Feb.  | Mar. | Apr.  | May   | June  | July  | Aug. | Sept. |
|---------|------|-------|-------|------|-------|------|-------|-------|-------|-------|------|-------|
| 1.....  | 373  | 417   | 842   | 450  | 440   | 377  | 550   | 1,950 | 2,500 | 1,490 | 770  | 540   |
| 2.....  | 377  | 465   | 974   | 445  | 422   | 381  | 565   | 1,820 | 2,430 | 1,490 | 747  | 535   |
| 3.....  | 377  | 422   | 1,070 | 435  | 412   | 373  | 664   | 1,640 | 2,780 | 1,400 | 747  | 535   |
| 4.....  | 368  | 404   | 942   | 440  | 417   | 347  | 720   | 1,540 | 3,130 | 1,360 | 724  | 535   |
| 5.....  | 360  | 577   | 888   | 495  | 422   | 364  | 720   | 1,490 | 3,200 | 1,310 | 747  | 553   |
| 6.....  | 356  | 732   | 772   | 515  | 417   | 368  | 739   | 1,400 | 3,130 | 1,310 | 747  | 571   |
| 7.....  | 347  | 560   | 706   | 520  | 381   | 381  | 732   | 1,360 | 2,850 | 1,360 | 724  | 522   |
| 8.....  | 343  | 640   | 565   | 676  | 394   | 368  | 700   | 1,270 | 3,280 | 1,360 | 724  | 499   |
| 9.....  | 347  | 682   | 535   | 682  | 291   | 368  | 670   | 1,230 | 3,650 | 1,270 | 724  | 499   |
| 10..... | 356  | 590   | 535   | 618  | 345   | 377  | 652   | 1,150 | 2,920 | 1,230 | 702  | 508   |
| 11..... | 417  | 550   | 515   | 575  | 417   | 381  | 646   | 1,150 | 2,570 | 1,230 | 702  | 504   |
| 12..... | 525  | 545   | 505   | 560  | 435   | 404  | 652   | 1,230 | 2,570 | 1,270 | 702  | 494   |
| 13..... | 455  | 1,310 | 505   | 550  | 390   | 390  | 652   | 1,400 | 3,130 | 1,230 | 679  | 490   |
| 14..... | 520  | 1,270 | 505   | 545  | 394   | 390  | 713   | 1,590 | 3,650 | 1,270 | 679  | 494   |
| 15..... | 480  | 1,010 | 505   | 505  | 390   | 386  | 821   | 1,540 | 3,720 | 1,270 | 679  | 494   |
| 16..... | 417  | 1,230 | 545   | 480  | 381   | 445  | 835   | 1,540 | 3,580 | 1,230 | 679  | 494   |
| 17..... | 381  | 2,290 | 535   | 445  | 368   | 440  | 814   | 1,490 | 2,990 | 1,150 | 656  | 486   |
| 18..... | 364  | 2,020 | 525   | 495  | 373   | 435  | 814   | 1,490 | 2,500 | 1,070 | 656  | 486   |
| 19..... | 343  | 1,310 | 520   | 485  | 373   | 440  | 800   | 1,490 | 2,150 | 1,040 | 634  | 476   |
| 20..... | 347  | 1,070 | 535   | 480  | 368   | 475  | 842   | 1,540 | 2,020 | 1,000 | 589  | 499   |
| 21..... | 347  | 982   | 520   | 490  | 373   | 475  | 888   | 1,590 | 1,950 | 935   | 580  | 476   |
| 22..... | 364  | 872   | 505   | 485  | 377   | 455  | 1,020 | 1,700 | 1,880 | 905   | 571  | 522   |
| 23..... | 351  | 772   | 495   | 475  | 373   | 445  | 1,230 | 1,760 | 1,820 | 905   | 584  | 535   |
| 24..... | 343  | 713   | 485   | 475  | 360   | 440  | 1,400 | 1,950 | 1,760 | 905   | 584  | 522   |
| 25..... | 343  | 676   | 485   | 460  | 364   | 440  | 1,540 | 2,500 | 1,880 | 905   | 576  | 499   |
| 26..... | 368  | 658   | 525   | 460  | 408   | 435  | 1,700 | 2,710 | 1,880 | 875   | 562  | 490   |
| 27..... | 377  | 700   | 500   | 460  | 390   | 495  | 2,080 | 2,430 | 1,700 | 848   | 566  | 499   |
| 28..... | 364  | 682   | 480   | 450  | 386   | 565  | 2,570 | 2,500 | 1,590 | 820   | 562  | 544   |
| 29..... | 364  | 888   | 470   | 450  | ----- | 555  | 2,570 | 2,780 | 1,540 | 848   | 540  | 562   |
| 30..... | 364  | 926   | 445   | 445  | ----- | 570  | 2,080 | 3,200 | 1,490 | 820   | 530  | 571   |
| 31..... | 368  | ----- | 445   | 445  | ----- | 570  | ----- | 2,850 | ----- | 770   | 544  | ----- |

| Month          | Maximum | Minimum | Mean  | Per square mile | Run-off |           |
|----------------|---------|---------|-------|-----------------|---------|-----------|
|                |         |         |       |                 | Inches  | Acre-feet |
| October.....   | 525     | 343     | 381   | 1.07            | 1.23    | 23,400    |
| November.....  | 2,290   | 404     | 865   | 2.43            | 2.71    | 51,500    |
| December.....  | 1,070   | 445     | 593   | 1.67            | 1.92    | 36,500    |
| January.....   | 682     | 435     | 500   | 1.40            | 1.61    | 30,700    |
| February.....  | 440     | 291     | 388   | 1.09            | 1.14    | 21,500    |
| March.....     | 570     | 347     | 430   | 1.21            | 1.40    | 26,400    |
| April.....     | 2,570   | 550     | 1,050 | 2.95            | 3.29    | 62,500    |
| May.....       | 3,200   | 1,150   | 1,780 | 5.00            | 5.76    | 109,000   |
| June.....      | 3,720   | 1,490   | 2,540 | 7.13            | 7.96    | 151,000   |
| July.....      | 1,490   | 770     | 1,130 | 3.17            | 3.66    | 69,500    |
| August.....    | 770     | 530     | 652   | 1.83            | 2.11    | 40,100    |
| September..... | 571     | 463     | 513   | 1.44            | 1.61    | 30,500    |
| The year.....  | 3,720   | 291     | 902   | 2.53            | 34.40   | 653,000   |

KLICKITAT RIVER AT PITT, WASH.

LOCATION.—Staff gage in NE¼ sec. 32, T. 4 N., R. 13 E., at Pitt, 3 miles southwest of Klickitat and 10½ miles above mouth.

DRAINAGE AREA.—1,160 square miles.

RECORDS AVAILABLE.—October 1928 to September 1933. Comparable records at former stations at Klickitat and near Lyle, May 1907 to December 1912.

DISCHARGE.—Maximum during year, 5,220 second-feet June 9; maximum gage height, 4.78 feet Feb. 22; minimum, 584 second-feet Feb. 9 (gage height, 1.09 feet).

1907-12, 1928-33: Maximum, 13,600 second-feet Mar. 31, 1931 (gage height, 10.3 feet); minimum, 485 second-feet Dec. 28-31, 1930 (gage height, 0.88 foot).

REMARKS.—Records good below and fair above 4,000 second-feet. Minor diversions for irrigation above station; no regulation.

*Discharge, in second-feet, 1932-33*

| Day | Oct. | Nov.  | Dec.  | Jan.  | Feb.  | Mar.  | Apr.  | May   | June  | July  | Aug.  | Sept. |
|-----|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 1   | 650  | 671   | 1,230 | 966   | 798   | 1,730 | 2,920 | 3,540 | 3,380 | 2,220 | 1,150 | 790   |
| 2   | 650  | 727   | 1,320 | 2,320 | 776   | 1,550 | 2,770 | 3,540 | 3,380 | 2,220 | 1,110 | 790   |
| 3   | 650  | 713   | 1,500 | 1,400 | 755   | 1,610 | 3,070 | 3,220 | 3,540 | 2,090 | 1,110 | 790   |
| 4   | 638  | 678   | 1,360 | 2,650 | 748   | 1,330 | 3,220 | 2,920 | 4,020 | 2,090 | 1,110 | 790   |
| 5   | 626  | 776   | 1,320 | 2,860 | 755   | 1,280 | 3,070 | 2,770 | 4,020 | 1,970 | 1,070 | 790   |
| 6   | 644  | 1,190 | 1,190 | 1,900 | 783   | 1,280 | 2,920 | 2,620 | 4,020 | 1,970 | 1,110 | 910   |
| 7   | 614  | 902   | 1,110 | 1,740 | 692   | 1,440 | 2,770 | 2,620 | 3,700 | 1,970 | 1,070 | 830   |
| 8   | 620  | 918   | 846   | 2,260 | 734   | 1,380 | 2,480 | 2,480 | 4,020 | 2,090 | 1,070 | 790   |
| 9   | 614  | 998   | 762   | 2,380 | 590   | 1,330 | 2,350 | 2,220 | 4,870 | 1,970 | 1,070 | 755   |
| 10  | 608  | 870   | 806   | 2,080 | 650   | 1,440 | 2,090 | 2,090 | 4,190 | 1,850 | 1,030 | 790   |
| 11  | 638  | 822   | 806   | 1,690 | 748   | 1,610 | 2,090 | 2,090 | 3,540 | 1,850 | 1,030 | 790   |
| 12  | 783  | 790   | 838   | 1,590 | 776   | 1,730 | 2,990 | 2,090 | 3,540 | 1,850 | 1,030 | 755   |
| 13  | 741  | 1,230 | 854   | 1,450 | 699   | 1,970 | 1,970 | 2,350 | 4,020 | 1,850 | 990   | 755   |
| 14  | 755  | 1,360 | 918   | 1,400 | 706   | 1,970 | 2,090 | 2,480 | 4,700 | 1,850 | 990   | 755   |
| 15  | 748  | 1,400 | 966   | 1,270 | 734   | 1,850 | 2,350 | 2,480 | 4,870 | 1,850 | 990   | 755   |
| 16  | 706  | 1,540 | 1,070 | 1,150 | 699   | 2,350 | 2,350 | 2,480 | 4,700 | 1,850 | 990   | 755   |
| 17  | 657  | 2,450 | 1,070 | 958   | 692   | 2,480 | 2,220 | 2,480 | 4,190 | 1,730 | 990   | 755   |
| 18  | 632  | 2,720 | 982   | 1,030 | 692   | 2,480 | 2,220 | 2,350 | 3,540 | 1,610 | 950   | 755   |
| 19  | 626  | 1,800 | 958   | 1,010 | 706   | 2,480 | 2,090 | 2,350 | 3,220 | 1,550 | 950   | 755   |
| 20  | 614  | 1,500 | 886   | 974   | 748   | 2,620 | 2,090 | 2,480 | 3,070 | 1,490 | 910   | 720   |
| 21  | 614  | 1,320 | 918   | 982   | 1,400 | 2,480 | 2,220 | 2,480 | 2,920 | 1,440 | 870   | 720   |
| 22  | 626  | 1,270 | 854   | 934   | 3,820 | 2,220 | 2,480 | 2,620 | 2,770 | 1,350 | 870   | 790   |
| 23  | 632  | 1,110 | 1,030 | 934   | 3,860 | 2,090 | 2,770 | 2,620 | 2,770 | 1,330 | 870   | 830   |
| 24  | 626  | 1,070 | 982   | 902   | 1,850 | 1,970 | 3,070 | 2,770 | 2,620 | 1,330 | 870   | 830   |
| 25  | 614  | 1,010 | 1,030 | 870   | 1,610 | 1,850 | 3,220 | 3,380 | 2,620 | 1,330 | 870   | 790   |
| 26  | 620  | 958   | 3,140 | 854   | 1,730 | 1,850 | 3,380 | 3,700 | 2,620 | 1,280 | 830   | 755   |
| 27  | 638  | 1,030 | 2,450 | 854   | 1,610 | 2,220 | 3,700 | 3,380 | 2,620 | 1,280 | 830   | 790   |
| 28  | 638  | 1,010 | 1,230 | 838   | 1,730 | 2,920 | 4,190 | 3,380 | 2,350 | 1,190 | 870   | 830   |
| 29  | 626  | 1,150 | 2,320 | 838   | ----- | 2,920 | 4,360 | 3,700 | 2,350 | 1,190 | 830   | 870   |
| 30  | 626  | 1,320 | 1,030 | 806   | ----- | 3,070 | 3,700 | 4,360 | 2,220 | 1,240 | 870   | 790   |
| 31  | 626  | ----- | 942   | 822   | ----- | 3,220 | ----- | 3,860 | ----- | 1,150 | 790   | ----- |

| Month     | Maximum | Minimum | Mean  | Per square mile | Run-off |           |
|-----------|---------|---------|-------|-----------------|---------|-----------|
|           |         |         |       |                 | Inches  | Acre-feet |
| October   | 783     | 608     | 648   | 0.559           | 0.64    | 39,800    |
| November  | 2,720   | 671     | 1,180 | 1.02            | 1.14    | 70,200    |
| December  | 3,140   | 762     | 1,180 | 1.02            | 1.18    | 72,600    |
| January   | 2,860   | 806     | 1,380 | 1.19            | 1.37    | 84,800    |
| February  | 3,860   | 590     | 1,150 | .991            | 1.03    | 63,900    |
| March     | 3,220   | 1,280   | 2,020 | 1.74            | 2.01    | 124,000   |
| April     | 4,360   | 1,970   | 2,740 | 2.36            | 2.63    | 163,000   |
| May       | 4,360   | 2,090   | 2,840 | 2.45            | 2.82    | 175,000   |
| June      | 4,870   | 2,220   | 3,480 | 3.00            | 3.35    | 207,000   |
| July      | 2,220   | 1,150   | 1,680 | 1.45            | 1.67    | 103,000   |
| August    | 1,150   | 790     | 971   | .837            | .96     | 59,700    |
| September | 910     | 720     | 786   | .678            | .76     | 46,800    |
| The year  | 4,870   | 590     | 1,670 | 1.44            | 19.56   | 1,210,000 |

## HOOD RIVER BASIN

## HOOD RIVER NEAR HOOD RIVER, OREG.

LOCATION.—Water-stage recorder in SE¼ sec. 36, T. 3 N., R. 10 E., at Powerdale, a quarter of a mile above Pacific Power & Light Co.'s plant and three-quarters of a mile south of Hood River. Zero of gage is 106.23 feet above mean sea level by general adjustment of 1929.

DRAINAGE AREA.—329 square miles.

RECORDS AVAILABLE.—March 1913 to September 1933.

DISCHARGE.—Maximum during year, 7,890 second-feet June 9 (gage height, 7.5 feet); minimum, 30 second-feet Oct. 4 (gage height, 1.82 feet).

1913-33: Maximum 34,000 second-feet Jan. 6, 1923 (gage height, 11.1 feet); minimum, 3 second-feet Aug. 9, 1926 (gage height, 1.45 feet). Average (including flow of conduit), 20 years (1913-33), 1,070 second-feet.

REMARKS.—Records good. Discharge estimated Dec. 11-16, Sept. 3. Diversions for irrigation above station. Pacific Power & Light Co.'s conduit diverts water around gage. Low-water flow regulated by pondage at sawmill at Dec. Gage-height record furnished by Pacific Power & Light Co.

*Discharge, in second-feet, 1932-33*

| Day | Oct. | Nov.  | Dec.  | Jan.  | Feb.  | Mar.  | Apr.  | May   | June  | July | Aug. | Sept. |
|-----|------|-------|-------|-------|-------|-------|-------|-------|-------|------|------|-------|
| 1   | 42   | 555   | 790   | 1,160 | 538   | 1,060 | 1,320 | 1,370 | 1,170 | 832  | 203  | 45    |
| 2   | 76   | 729   | 2,100 | 2,740 | 505   | 902   | 1,320 | 1,370 | 1,110 | 947  | 196  | 42    |
| 3   | 69   | 911   | 1,620 | 1,960 | 479   | 850   | 1,470 | 1,270 | 1,290 | 850  | 200  | 68    |
| 4   | 47   | 620   | 1,230 | 1,750 | 479   | 750   | 1,490 | 1,370 | 1,330 | 807  | 257  | 44    |
| 5   | 42   | 1,980 | 1,030 | 2,990 | 538   | 850   | 1,350 | 1,320 | 1,320 | 742  | 266  | 44    |
| 6   | 44   | 3,080 | 790   | 3,430 | 486   | 675   | 1,260 | 1,190 | 1,210 | 750  | 436  | 104   |
| 7   | 38   | 1,750 | 710   | 2,740 | 416   | 974   | 1,160 | 1,240 | 1,210 | 750  | 266  | 65    |
| 8   | 40   | 2,900 | 512   | 3,430 | 369   | 947   | 1,040 | 1,060 | 4,130 | 750  | 257  | 63    |
| 9   | 35   | 2,030 | 374   | 3,340 | 280   | 875   | 1,040 | 994   | 5,640 | 734  | 215  | 90    |
| 10  | 39   | 1,240 | 369   | 2,820 | 280   | 875   | 816   | 929   | 3,080 | 640  | 182  | 266   |
| 11  | 56   | 920   | 375   | 2,260 | 347   | 850   | 866   | 832   | 2,490 | 696  | 179  | 82    |
| 12  | 208  | 726   |       | 1,890 | 598   | 929   | 974   | 1,010 | 2,260 | 726  | 162  | 70    |
| 13  | 237  | 1,350 |       | 1,680 | 352   | 1,000 | 893   | 1,010 | 2,490 | 661  | 147  | 63    |
| 14  | 377  | 1,540 |       | 1,680 | 364   | 956   | 902   | 1,130 | 2,490 | 675  | 130  | 112   |
| 15  | 298  | 2,280 |       | 1,530 | 352   | 947   | 1,060 | 1,140 | 2,410 | 703  | 125  | 364   |
| 16  | 193  | 3,430 | 398   | 1,370 | 364   | 1,000 | 1,060 | 1,050 | 2,180 | 703  | 136  | 262   |
| 17  | 186  | 2,900 |       | 1,230 | 330   | 1,110 | 938   | 1,040 | 1,820 | 605  | 153  | 258   |
| 18  | 119  | 1,960 |       | 884   | 386   | 1,110 | 850   | 994   | 1,580 | 564  | 139  | 211   |
| 19  | 92   | 1,320 |       | 790   | 538   | 1,170 | 798   | 938   | 1,370 | 524  | 142  | 182   |
| 20  | 71   | 1,190 |       | 682   | 710   | 446   | 1,350 | 816   | 1,250 | 646  | 182  | 159   |
| 21  | 65   | 1,110 | 570   | 689   | 790   | 1,280 | 866   | 994   | 1,210 | 380  | 90   | 203   |
| 22  | 197  | 1,200 | 466   | 696   | 1,300 | 1,150 | 994   | 984   | 1,150 | 336  | 67   | 538   |
| 23  | 229  | 1,100 | 570   | 640   | 1,680 | 1,030 | 1,300 | 1,180 | 1,110 | 422  | 65   | 492   |
| 24  | 163  | 875   | 605   | 640   | 1,180 | 947   | 1,380 | 1,340 | 1,100 | 369  | 65   | 758   |
| 25  | 114  | 675   | 807   | 570   | 1,000 | 884   | 1,420 | 1,580 | 1,220 | 369  | 61   | 538   |
| 26  | 122  | 612   | 2,100 | 570   | 1,300 | 902   | 1,380 | 1,570 | 1,210 | 325  | 54   | 524   |
| 27  | 97   | 654   | 2,030 | 584   | 1,110 | 929   | 1,610 | 1,320 | 1,080 | 295  | 76   | 505   |
| 28  | 87   | 584   | 1,620 | 550   | 1,100 | 1,130 | 1,890 | 1,370 | 1,010 | 266  | 50   | 518   |
| 29  | 90   | 577   | 1,370 | 612   | ----- | 1,240 | 1,750 | 1,580 | 974   | 295  | 44   | 557   |
| 30  | 97   | 626   | 1,240 | 524   | ----- | 1,370 | 1,620 | 1,750 | 866   | 633  | 54   | 446   |
| 31  | 168  | ----- | 1,120 | 550   | ----- | 1,560 | ----- | 1,360 | ----- | 266  | 50   | ----- |

| Month     | Maximum | Minimum | Mean  | Run-off in acre-feet |
|-----------|---------|---------|-------|----------------------|
| October   | 377     | 35      | 121   | 7,440                |
| November  | 3,430   | 555     | 1,380 | 82,100               |
| December  | 2,100   | -----   | 862   | 53,000               |
| January   | 3,430   | 524     | 1,520 | 93,500               |
| February  | 1,680   | 280     | 640   | 35,500               |
| March     | 1,560   | 675     | 1,020 | 62,700               |
| April     | 1,890   | 798     | 1,190 | 70,800               |
| May       | 1,750   | 832     | 1,200 | 73,800               |
| June      | 5,640   | 866     | 1,760 | 105,000              |
| July      | 947     | 266     | 583   | 35,800               |
| August    | 436     | 44      | 150   | 9,220                |
| September | 758     | 42      | 256   | 15,200               |
| The year  | 5,640   | 35      | 889   | 644,000              |

*Combined discharge, in second-feet, of Hood River and Pacific Power & Light Co.'s conduit near Hood River, Oreg., 1932-33*

| Day | Oct. | Nov.   | Dec.   | Jan.   | Feb.   | Mar.   | Apr.   | May    | June   | July   | Aug. | Sept.  |
|-----|------|--------|--------|--------|--------|--------|--------|--------|--------|--------|------|--------|
| 1   | 392  | 907    | 1, 110 | 1, 440 | 800    | 1, 310 | 1, 560 | 1, 680 | 1, 530 | 1, 220 | 622  | 415    |
| 2   | 375  | 1, 070 | 2, 410 | 2, 890 | 760    | 1, 200 | 1, 450 | 1, 680 | 1, 480 | 1, 340 | 615  | 403    |
| 3   | 411  | 1, 180 | 1, 940 | 1, 960 | 739    | 1, 140 | 1, 720 | 1, 680 | 1, 620 | 1, 250 | 613  | 384    |
| 4   | 392  | 939    | 1, 460 | 1, 750 | 731    | 1, 050 | 1, 750 | 1, 680 | 1, 670 | 1, 180 | 659  | 366    |
| 5   | 392  | 2, 340 | 1, 290 | 2, 990 | 731    | 992    | 1, 620 | 1, 640 | 1, 690 | 1, 120 | 656  | 399    |
| 6   | 401  | 3, 340 | 1, 110 | 3, 430 | 746    | 977    | 1, 520 | 1, 510 | 1, 640 | 1, 150 | 606  | 509    |
| 7   | 381  | 2, 100 | 1, 040 | 2, 740 | 694    | 1, 280 | 1, 460 | 1, 460 | 1, 640 | 1, 160 | 646  | 446    |
| 8   | 360  | 3, 260 | 883    | 3, 430 | 703    | 1, 220 | 1, 320 | 1, 380 | 4, 560 | 1, 180 | 669  | 430    |
| 9   | 355  | 2, 380 | 792    | 3, 340 | 623    | 1, 140 | 1, 200 | 1, 320 | 6, 060 | 1, 110 | 627  | 429    |
| 10  | 361  | 1, 590 | 805    | 2, 820 | 672    | 1, 140 | 1, 110 | 1, 270 | 3, 490 | 1, 030 | 601  | 400    |
| 11  | 383  | 1, 240 | 715    | 2, 260 | 735    | 1, 120 | 1, 150 | 1, 230 | 2, 840 | 1, 110 | 600  | 408    |
| 12  | 597  | 1, 070 |        | 1, 890 | 865    | 1, 140 | 1, 260 | 1, 290 | 2, 690 | 1, 140 | 583  | 420    |
| 13  | 677  | 1, 600 |        | 1, 630 | 734    | 1, 240 | 1, 200 | 1, 340 | 2, 920 | 1, 080 | 577  | 422    |
| 14  | 817  | 1, 860 |        | 1, 680 | 732    | 1, 200 | 1, 220 | 1, 400 | 2, 920 | 1, 090 | 560  | 492    |
| 15  | 738  | 2, 590 |        | 1, 530 | 715    | 1, 180 | 1, 380 | 1, 470 | 2, 810 | 1, 120 | 555  | 753    |
| 16  | 621  | 3, 760 | 816    | 1, 370 | 684    | 1, 240 | 1, 300 | 1, 400 | 2, 590 | 1, 110 | 566  | 446    |
| 17  | 613  | 3, 220 |        | 1, 230 | 651    | 1, 320 | 1, 240 | 1, 380 | 2, 230 | 1, 010 | 583  | 590    |
| 18  | 514  | 2, 270 |        | 1, 220 | 662    | 1, 320 | 1, 170 | 1, 340 | 1, 900 | 982    | 561  | 579    |
| 19  | 484  | 1, 640 |        | 1, 170 | 688    | 1, 280 | 1, 130 | 1, 290 | 1, 760 | 940    | 554  | 562    |
| 20  | 471  | 1, 380 |        | 1, 060 | 729    | 1, 580 | 1, 150 | 1, 310 | 1, 660 | 859    | 520  | 519    |
| 21  | 465  | 1, 470 | 990    | 1, 050 | 1, 090 | 1, 530 | 1, 190 | 1, 280 | 1, 620 | 798    | 455  | 585    |
| 22  | 618  | 1, 290 | 880    | 951    | 1, 580 | 1, 380 | 1, 310 | 1, 300 | 1, 550 | 755    | 436  | 910    |
| 23  | 659  | 1, 100 | 972    | 949    | 1, 990 | 1, 260 | 1, 520 | 1, 520 | 1, 510 | 727    | 437  | 865    |
| 24  | 591  | 1, 080 | 979    | 926    | 1, 510 | 1, 170 | 1, 690 | 1, 680 | 1, 470 | 782    | 449  | 1, 040 |
| 25  | 536  | 974    | 1, 070 | 880    | 1, 280 | 1, 100 | 1, 750 | 1, 920 | 1, 610 | 785    | 442  | 891    |
| 26  | 552  | 933    | 2, 390 | 864    | 1, 490 | 1, 030 | 1, 700 | 1, 910 | 1, 610 | 743    | 425  | 885    |
| 27  | 519  | 942    | 2, 360 | 855    | 1, 400 | 1, 150 | 1, 930 | 1, 670 | 1, 480 | 715    | 409  | 871    |
| 28  | 517  | 912    | 1, 960 | 818    | 1, 370 | 1, 380 | 2, 210 | 1, 640 | 1, 420 | 670    | 411  | 888    |
| 29  | 520  | 904    | 1, 720 | 798    | -----  | 1, 500 | 2, 070 | 1, 910 | 1, 380 | 705    | 411  | 927    |
| 30  | 522  | 943    | 1, 570 | 782    | -----  | 1, 680 | 1, 720 | 2, 090 | 1, 270 | 771    | 440  | 812    |
| 31  | 576  | -----  | 1, 460 | 827    | -----  | 1, 790 | -----  | 1, 710 | -----  | 668    | 429  | -----  |

| Month     | Maximum | Minimum | Mean   | Run-off in<br>acre-feet |
|-----------|---------|---------|--------|-------------------------|
| October   | 817     | 355     | 510    | 31, 400                 |
| November  | 3, 760  | 904     | 1, 680 | 100, 000                |
| December  | 2, 410  | -----   | 1, 210 | 74, 400                 |
| January   | 3, 430  | 782     | 1, 660 | 102, 000                |
| February  | 1, 990  | 623     | 932    | 51, 800                 |
| March     | 1, 790  | 977     | 1, 260 | 77, 500                 |
| April     | 2, 210  | 1, 110  | 1, 470 | 87, 500                 |
| May       | 2, 090  | 1, 230  | 1, 530 | 94, 100                 |
| June      | 6, 060  | 1, 270  | 2, 150 | 128, 000                |
| July      | 1, 340  | 668     | 977    | 60, 100                 |
| August    | 669     | 409     | 539    | 33, 100                 |
| September | 1, 040  | 366     | 602    | 35, 800                 |
| The year  | 6, 060  | 355     | 1, 210 | 876, 000                |

## WEST FORK OF HOOD RIVER NEAR DEE, OREG.

LOCATION.—Water-stage recorder in SE¼ sec. 1, T. 1 N., R. 9 E., a quarter of a mile above Dead Point Creek, half a mile above junction with Hood River, and 1 mile northwest of Dee. Zero of gage is 864.11 feet above mean sea level.

DRAINAGE AREA.—96 square miles.

RECORDS AVAILABLE.—August 1913 to September 1915 (incomplete) a quarter of a mile above present site; June 1932 to September 1933.

DISCHARGE.—Maximum during year, 4,780 second-feet June 9 (gage height, 8.0 feet); minimum, 117 second-feet Oct. 9 (gage height, 1.78 feet).

1913-15, 1932-33: Maximum, that of June 9, 1932; minimum, 100 second-feet Sept. 29, 30, 1915.

REMARKS.—Records good except those estimated, Oct. 12-16, 22, 23, 31, Nov. 1-3, 5, 6, Dec. 8-19, and those for December to February, which are fair. Diversions for irrigation above station; no regulation.

*Discharge, in second-feet, 1932-33*

| Day | Oct. | Nov.  | Dec.  | Jan.  | Feb. | Mar.  | Apr.  | May   | June  | July  | Aug. | Sept. |
|-----|------|-------|-------|-------|------|-------|-------|-------|-------|-------|------|-------|
| 1   | 123  | 400   | 674   | 721   | 317  | 554   | 870   | 920   | 970   | 604   | 255  | 169   |
| 2   | 123  | 600   | 1,610 | 1,230 | 285  | 505   | 820   | 945   | 895   | 627   | 252  | 164   |
| 3   | 123  | 660   | 1,170 | 870   | 265  | 479   | 995   | 895   | 920   | 604   | 255  | 160   |
| 4   | 123  | 523   | 895   | 941   | 255  | 445   | 1,040 | 945   | 945   | 563   | 278  | 162   |
| 5   | 122  | 1,500 | 770   | 2,060 | 258  | 415   | 970   | 945   | 970   | 558   | 302  | 173   |
| 6   | 122  | 2,200 | 650   | 1,920 | 268  | 406   | 895   | 870   | 945   | 572   | 265  | 193   |
| 7   | 122  | 1,410 | 572   | 1,560 | 255  | 627   | 845   | 845   | 920   | 581   | 249  | 169   |
| 8   | 118  | 2,140 | 412   | 2,160 | 249  | 614   | 770   | 795   | 2,540 | 576   | 246  | 162   |
| 9   | 117  | 1,230 |       | 1,950 | 213  | 554   | 721   | 770   | 3,640 | 540   | 240  | 160   |
| 10  | 118  | 1,020 |       | 1,560 | 221  | 523   | 650   | 721   | 1,840 | 492   | 232  | 158   |
| 11  | 120  | 770   | 412   | 1,200 | 249  | 492   | 650   | 698   | 1,410 | 501   | 226  | 156   |
| 12  |      | 650   |       | 995   | 381  | 536   | 746   | 721   | 1,380 | 514   | 221  | 154   |
| 13  |      | 1,040 |       | 845   | 317  | 604   | 721   | 746   | 1,500 | 492   | 218  | 152   |
| 14  |      | 1,170 | 412   | 795   | 292  | 581   | 721   | 795   | 1,500 | 488   | 221  | 214   |
| 15  | 274  | 1,700 |       | 746   | 278  | 568   | 795   | 820   | 1,380 | 492   | 213  | 344   |
| 16  |      | 2,290 |       | 674   | 265  | 581   | 770   | 820   | 1,200 | 466   | 216  | 262   |
| 17  | 243  | 1,740 | 412   | 604   | 252  | 650   | 721   | 820   | 1,040 | 419   | 216  | 226   |
| 18  | 238  | 1,200 |       | 550   | 249  | 650   | 674   | 795   | 920   | 389   | 208  | 238   |
| 19  | 213  | 945   |       | 510   | 255  | 650   | 650   | 770   | 820   | 385   | 210  | 205   |
| 20  | 191  | 770   | 604   | 466   | 265  | 895   | 627   | 746   | 770   | 352   | 195  | 198   |
| 21  |      | 175   | 820   | 545   | 436  | 895   | 650   | 721   | 795   | 332   | 184  | 238   |
| 22  |      | 250   | 721   | 453   | 415  | 650   | 795   | 721   | 770   | 317   | 179  | 440   |
| 23  |      | 280   | 627   | 501   | 389  | 845   | 721   | 895   | 895   | 746   | 313  | 179   |
| 24  |      | 262   | 563   | 449   | 368  | 698   | 650   | 995   | 995   | 746   | 313  | 179   |
| 25  |      | 255   | 505   | 479   | 348  | 581   | 581   | 995   | 1,120 | 820   | 310  | 179   |
| 26  |      | 249   | 449   | 1,320 | 332  | 698   | 545   | 945   | 1,120 | 795   | 295  | 175   |
| 27  |      | 235   | 462   | 1,260 | 336  | 650   | 572   | 1,120 | 1,020 | 746   | 285  | 175   |
| 28  |      | 221   | 432   | 1,020 | 317  | 604   | 746   | 1,260 | 970   | 721   | 275  | 177   |
| 29  |      | 210   | 436   | 895   | 302  | ----- | 820   | 1,140 | 1,100 | 674   | 295  | 175   |
| 30  |      | 213   | 466   | 795   | 295  | ----- | 920   | 995   | 1,200 | 627   | 295  | 193   |
| 31  |      | 250   | ----- | 721   | 310  | ----- | 995   | ----- | 1,070 | ----- | 265  | 177   |

| Month     | Maximum | Minimum | Mean  | Run-off in acre-feet |
|-----------|---------|---------|-------|----------------------|
| October   | -----   | 117     | 200   | 12,300               |
| November  | 2,290   | 400     | 981   | 58,400               |
| December  | 1,610   | -----   | 656   | 40,300               |
| January   | 2,160   | 295     | 845   | 52,000               |
| February  | 845     | 213     | 377   | 20,900               |
| March     | 995     | 406     | 631   | 38,800               |
| April     | 1,260   | 627     | 846   | 50,300               |
| May       | 1,200   | 698     | 881   | 54,200               |
| June      | 3,640   | 627     | 1,130 | 67,200               |
| July      | 627     | 265     | 436   | 26,800               |
| August    | 302     | 175     | 216   | 13,300               |
| September | 523     | 152     | 269   | 16,000               |
| The year  | 3,640   | 117     | 622   | 450,000              |

## PACIFIC POWER &amp; LIGHT CO.'S CONDUIT NEAR HOOD RIVER, OREG.

LOCATION.—Venturi meter in NE $\frac{1}{4}$  sec. 36, T. 3 N., R. 10 E., at Pacific Power & Light Co.'s plant on Hood River, half a mile southeast of town of Hood River.

RECORDS AVAILABLE.—October 1922 to September 1933. At station on tailrace of old plant October 1913 to September 1914; January 1916 to July 1922.

DISCHARGE.—Maximum during year, 510 second-feet Dec. 30; no flow when power plant was occasionally shut down.

1913-14, 1916-33: Maximum, that of Dec. 30, 1932. Average, 11 years (1922-33), 343 second-feet.

REMARKS.—Records good. Discharge determined from hourly readings of Venturi meter checked by occasional discharge measurements. Pacific Power & Light Co.'s conduit diverts from Hood River in SE $\frac{1}{4}$  sec. 11, T. 2 N., R. 10 E., immediately below mouth of Neal Creek. Water is returned to river in NE $\frac{1}{4}$  sec. 36, T. 3 N., R. 10 E., being diverted around the gage on Hood River near Hood River. Meter readings furnished by Pacific Power & Light Co.

*Discharge, in second-feet, 1931-32*

| Day     | Oct. | Nov.  | Dec. | Jan. | Feb.  | Mar. | Apr.  | May | June  | July | Aug. | Sept. |
|---------|------|-------|------|------|-------|------|-------|-----|-------|------|------|-------|
| 1.....  | 350  | 352   | 316  | 284  | 262   | 249  | 240   | 309 | 361   | 388  | 419  | 370   |
| 2.....  | 299  | 341   | 308  | 150  | 255   | 301  | 129   | 314 | 367   | 394  | 419  | 361   |
| 3.....  | 342  | 274   | 324  | 0    | 260   | 294  | 252   | 313 | 335   | 401  | 413  | 316   |
| 4.....  | 346  | 319   | 226  | 0    | 252   | 304  | 262   | 313 | 337   | 374  | 402  | 322   |
| 5.....  | 350  | 362   | 264  | 0    | 193   | 142  | 271   | 320 | 374   | 383  | 390  | 355   |
| 6.....  | 357  | 262   | 323  | 0    | 260   | 302  | 263   | 316 | 430   | 404  | 170  | 405   |
| 7.....  | 343  | 347   | 334  | 0    | 278   | 302  | 297   | 215 | 427   | 406  | 380  | 381   |
| 8.....  | 320  | 359   | 371  | 0    | 334   | 268  | 282   | 320 | 426   | 425  | 412  | 367   |
| 9.....  | 320  | 349   | 418  | 0    | 343   | 260  | 164   | 330 | 422   | 375  | 412  | 339   |
| 10..... | 322  | 347   | 436  | 0    | 392   | 264  | 294   | 345 | 410   | 388  | 419  | 134   |
| 11..... | 327  | 320   | 217  | 0    | 388   | 266  | 288   | 394 | 346   | 410  | 421  | 326   |
| 12..... | 389  | 340   | 142  | 0    | 267   | 214  | 284   | 277 | 430   | 414  | 421  | 350   |
| 13..... | 440  | 250   | 420  | 0    | 382   | 242  | 310   | 330 | 430   | 415  | 430  | 359   |
| 14..... | 440  | 321   | 431  | 0    | 368   | 249  | 323   | 268 | 433   | 417  | 430  | 380   |
| 15..... | 440  | 310   | 416  | 0    | 363   | 235  | 319   | 331 | 403   | 419  | 430  | 389   |
| 16..... | 428  | 329   | 412  | 0    | 320   | 239  | 242   | 353 | 414   | 408  | 430  | 384   |
| 17..... | 427  | 325   | 418  | 0    | 321   | 205  | 306   | 341 | 411   | 408  | 430  | 332   |
| 18..... | 395  | 310   | 364  | 340  | 276   | 207  | 317   | 344 | 320   | 418  | 422  | 368   |
| 19..... | 392  | 318   | 422  | 349  | 150   | 113  | 331   | 348 | 393   | 416  | 412  | 380   |
| 20..... | 400  | 188   | 422  | 355  | 283   | 227  | 333   | 347 | 407   | 413  | 338  | 360   |
| 21..... | 400  | 357   | 420  | 358  | 300   | 252  | 321   | 286 | 407   | 418  | 365  | 382   |
| 22..... | 421  | 89    | 414  | 255  | 277   | 231  | 312   | 315 | 403   | 419  | 369  | 372   |
| 23..... | 430  | 0     | 402  | 309  | 306   | 230  | 222   | 338 | 402   | 305  | 372  | 373   |
| 24..... | 428  | 208   | 374  | 286  | 328   | 220  | 307   | 338 | 366   | 413  | 384  | 280   |
| 25..... | 422  | 299   | 267  | 310  | 285   | 216  | 328   | 341 | 387   | 416  | 381  | 353   |
| 26..... | 430  | 321   | 292  | 294  | 191   | 130  | 325   | 344 | 401   | 418  | 371  | 361   |
| 27..... | 422  | 288   | 325  | 271  | 293   | 220  | 324   | 350 | 404   | 420  | 333  | 366   |
| 28..... | 430  | 328   | 345  | 268  | 270   | 250  | 323   | 273 | 405   | 404  | 361  | 370   |
| 29..... | 430  | 327   | 346  | 186  | ----- | 264  | 324   | 331 | 401   | 410  | 367  | 370   |
| 30..... | 425  | 317   | 334  | 258  | ----- | 308  | 99    | 341 | 405   | 138  | 386  | 366   |
| 31..... | 408  | ----- | 343  | 277  | ----- | 233  | ----- | 349 | ----- | 402  | 379  | ----- |

| Month          | Maximum | Minimum | Mean | Run-off in acre-feet |
|----------------|---------|---------|------|----------------------|
| October.....   | 440     | 299     | 389  | 23,900               |
| November.....  | 362     | 0       | 295  | 17,600               |
| December.....  | 436     | 142     | 350  | 21,500               |
| January.....   | 358     | 0       | 147  | 9,040                |
| February.....  | 392     | 150     | 293  | 16,300               |
| March.....     | 308     | 113     | 240  | 14,800               |
| April.....     | 333     | 99      | 280  | 16,700               |
| May.....       | 394     | 215     | 324  | 19,900               |
| June.....      | 433     | 320     | 395  | 23,500               |
| July.....      | 425     | 138     | 395  | 24,300               |
| August.....    | 430     | 170     | 389  | 23,900               |
| September..... | 405     | 134     | 352  | 20,900               |
| The year.....  | 440     | 0       | 321  | 232,000              |

## WHITE SALMON RIVER BASIN

## WHITE SALMON RIVER AT HUSUM, WASH.

LOCATION.—Water-stage recorder in SW¼ sec. 30, T. 4 N., R. 11 E., 500 feet above mouth of Rattlesnake Creek at Husum.

RECORDS AVAILABLE.—September 1909 to October 1919, October 1929 to September 1933.

DISCHARGE.—Maximum during year, 3,660 second-feet June 9 (gage height, 6.23 feet); minimum, 497 second-feet Oct. 7 (gage height, 1.56 feet).

1909-19, 1929-33: Maximum, 7,500 second-feet Dec. 29, 1917 (gage height, 10.0 feet at old gage); minimum, 340 second-feet Dec. 30, 1930 (gage height, 0.64 foot). Average, 13 years (1909-18, 1929-33), 964 second-feet.

REMARKS.—Records good except those estimated Feb. 2-14, which are fair. Numerous diversions for irrigation near Trout Lake. Springs increase flow by a large amount in a few miles above station.

*Discharge, in second-feet, 1932-33*

| Day     | Oct. | Nov.  | Dec.  | Jan.  | Feb.  | Mar.  | Apr.  | May   | June  | July  | Aug. | Sept. |
|---------|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|------|-------|
| 1.....  | 537  | 567   | 1,100 | 795   | 755   | 855   | 1,210 | 1,640 | 1,750 | 1,540 | 985  | 795   |
| 2.....  | 537  | 682   | 1,240 | 835   | 720   | 835   | 1,210 | 1,750 | 1,720 | 1,540 | 962  | 795   |
| 3.....  | 537  | 665   | 1,330 | 795   |       | 835   | 1,270 | 1,640 | 1,790 | 1,510 | 940  | 795   |
| 4.....  | 522  | 614   | 1,210 | 795   |       | 815   | 1,300 | 1,580 | 1,950 | 1,510 | 962  | 775   |
| 5.....  | 522  | 766   | 1,100 | 992   |       | 795   | 1,270 | 1,510 | 2,030 | 1,480 | 985  | 795   |
| 6.....  | 507  | 1,180 | 1,030 | 1,130 | 650   | 795   | 1,270 | 1,450 | 2,070 | 1,450 | 985  | 835   |
| 7.....  | 504  | 1,100 | 940   | 1,130 |       | 835   | 1,240 | 1,420 | 1,950 | 1,480 | 962  | 835   |
| 8.....  | 504  | 1,060 | 815   | 1,300 |       | 835   | 1,180 | 1,390 | 2,290 | 1,510 | 962  | 815   |
| 9.....  | 502  | 1,080 | 735   | 1,420 |       | 815   | 1,130 | 1,330 | 3,550 | 1,480 | 940  | 815   |
| 10..... | 507  | 962   | 755   | 1,360 | 660   | 815   | 1,080 | 1,300 | 2,920 | 1,420 | 940  | 815   |
| 11..... | 522  | 835   | 718   | 1,240 |       | 835   | 1,080 | 1,300 | 2,380 | 1,390 | 918  | 795   |
| 12..... | 522  | 775   | 682   | 1,160 |       | 875   | 1,080 | 1,360 | 2,280 | 1,420 | 895  | 775   |
| 13..... | 582  | 1,100 | 682   | 1,100 |       | 940   | 1,060 | 1,450 | 2,420 | 1,390 | 918  | 775   |
| 14..... | 614  | 1,540 | 665   | 1,060 | 665   | 918   | 1,080 | 1,510 | 2,620 | 1,390 | 895  | 775   |
| 15..... | 598  | 1,360 | 665   | 1,030 |       | 918   | 1,130 | 1,510 | 2,620 | 1,390 | 875  | 795   |
| 16..... | 582  | 1,580 | 682   | 985   | 648   | 985   | 1,130 | 1,510 | 2,620 | 1,360 | 875  | 795   |
| 17..... | 567  | 1,790 | 700   | 895   | 648   | 1,010 | 1,080 | 1,480 | 2,330 | 1,330 | 895  | 775   |
| 18..... | 552  | 1,540 | 682   | 918   | 665   | 985   | 1,080 | 1,420 | 2,070 | 1,270 | 855  | 775   |
| 19..... | 552  | 1,300 | 682   | 918   | 648   | 962   | 1,060 | 1,420 | 1,870 | 1,270 | 875  | 775   |
| 20..... | 537  | 1,130 | 700   | 895   | 665   | 1,010 | 1,080 | 1,450 | 1,750 | 1,210 | 855  | 775   |
| 21..... | 537  | 1,080 | 700   | 855   | 700   | 1,030 | 1,100 | 1,480 | 1,680 | 1,180 | 835  | 795   |
| 22..... | 552  | 1,080 | 682   | 835   | 795   | 985   | 1,160 | 1,510 | 1,640 | 1,160 | 835  | 875   |
| 23..... | 567  | 1,010 | 665   | 835   | 875   | 962   | 1,240 | 1,540 | 1,610 | 1,130 | 835  | 875   |
| 24..... | 552  | 940   | 665   | 815   | 835   | 940   | 1,300 | 1,640 | 1,580 | 1,130 | 835  | 875   |
| 25..... | 552  | 875   | 682   | 815   | 815   | 918   | 1,360 | 1,830 | 1,610 | 1,130 | 835  | 835   |
| 26..... | 567  | 835   | 835   | 795   | 875   | 918   | 1,360 | 1,870 | 1,610 | 1,100 | 815  | 815   |
| 27..... | 552  | 855   | 855   | 795   | 895   | 1,010 | 1,480 | 1,790 | 1,610 | 1,080 | 815  | 815   |
| 28..... | 537  | 835   | 815   | 775   | 875   | 1,130 | 1,640 | 1,790 | 1,580 | 1,060 | 815  | 835   |
| 29..... | 537  | 940   | 795   | 775   | 1,180 |       | 1,750 | 1,830 | 1,540 | 1,030 | 795  | 855   |
| 30..... | 522  | 1,080 | 775   | 755   | 1,240 |       | 1,640 | 1,950 | 1,540 | 1,030 | 795  | 815   |
| 31..... | 522  | ----- | 755   | 755   | 1,240 |       | ----- | 1,910 | ----- | 1,010 | 795  | ----- |

| Month          | Maximum | Minimum | Mean  | Run-off in acre-feet |
|----------------|---------|---------|-------|----------------------|
| October.....   | 614     | 502     | 543   | 33,400               |
| November.....  | 1,790   | 567     | 1,040 | 61,900               |
| December.....  | 1,330   | 665     | 817   | 50,200               |
| January.....   | 1,420   | 755     | 953   | 58,600               |
| February.....  | 895     | -----   | 719   | 39,900               |
| March.....     | 1,240   | 795     | 943   | 58,000               |
| April.....     | 1,750   | 1,060   | 1,240 | 73,800               |
| May.....       | 1,950   | 1,300   | 1,570 | 96,500               |
| June.....      | 3,550   | 1,540   | 2,030 | 121,000              |
| July.....      | 1,540   | 1,010   | 1,300 | 79,900               |
| August.....    | 985     | 795     | 887   | 54,500               |
| September..... | 875     | 775     | 809   | 48,100               |
| The year.....  | 3,550   | 502     | 1,070 | 776,000              |

**SANDY RIVER BASIN**  
**SANDY RIVER NEAR MARMOT, OREG.**

**LOCATION.**—Water-stage recorder in SE¼ sec. 24, T. 2 S., R. 5 E., three-quarters of a mile southwest of Marmot, 2 miles above Sandy River Dam of Portland General Electric Co., and 5 miles below mouth of Salmon River.

**DRAINAGE AREA.**—262 square miles.

**RECORDS AVAILABLE.**—August 1911 to December 1915; July 1919 to September 1933. Combined discharge of Sandy River below dam and canal gives same results January 1916 to June 1919.

**DISCHARGE.**—Maximum during year, 9,870 second-feet June 9 (gage height, 9.30 feet); minimum, 242 second-feet Oct. 8–10 (gage height, 1.82 feet).

1911–33: Maximum, about 29,200 second-feet Jan. 6, 1923 (gage height, 17.5 feet); minimum, 210 second-feet Oct. 14, 15, 1931. Average, 22 years (1911–33), 1,340 second-feet.

**REMARKS.**—Records fair. No diversions or regulation above station. Gage-height record furnished by Portland General Electric Co.

*Discharge, in second-feet, 1932–33*

| Day | Oct. | Nov.    | Dec.    | Jan.  | Feb.  | Mar.  | Apr.  | May   | June  | July  | Aug. | Sept. |
|-----|------|---------|---------|-------|-------|-------|-------|-------|-------|-------|------|-------|
| 1   | 274  | 1,760   | 1,000   | 2,240 | 1,040 | 1,460 | 2,040 | 2,520 | 2,810 | 1,260 | 591  | • 430 |
| 2   | 274  | 1,800   | 1,370   | 3,500 | 935   | 1,380 | 2,040 | 2,690 | 2,930 | 1,260 | 574  | 385   |
| 3   | 284  | 2,040   | 2,750   | 2,240 | 870   | 1,380 | 2,810 | 2,410 | 3,110 | 1,220 | 591  | • 360 |
| 4   | 270  | 1,660   | • 2,370 | 2,300 | 840   | 1,220 | 2,580 | 2,690 | 3,050 | 1,140 | 646  | 385   |
| 5   | 266  | 2,990   | 1,990   | 4,220 | 870   | 1,100 | 2,240 | 2,630 | 3,110 | 1,140 | 732  | • 440 |
| 6   | 263  | 5,710   | 1,580   | 5,020 | 935   | 1,180 | 2,140 | 2,300 | 2,870 | 1,100 | 608  | 452   |
| 7   | 252  | 3,180   | 1,460   | 3,640 | 840   | 1,840 | 1,940 | 2,140 | 2,690 | 1,100 | 564  | • 400 |
| 8   | 246  | 4,850   | 1,140   | 5,710 | • 820 | 1,620 | 1,660 | 1,890 | 6,470 | 1,100 | 586  | 361   |
| 9   | 246  | 4,690   | 1,040   | 5,360 | • 760 | 1,420 | 1,460 | 1,800 | 8,820 | 1,070 | 574  | 361   |
| 10  | 246  | 2,930   | 1,040   | 3,920 | • 700 | 1,340 | 1,300 | 1,800 | 5,710 | 1,040 | 552  | • 345 |
| 11  | 246  | 1,990   | • 971   | 2,810 | • 800 | 1,340 | 1,500 | 1,760 | 4,370 | 1,000 | 552  | 345   |
| 12  | 385  | 1,620   | 902     | 2,300 | 1,180 | 1,710 | 1,890 | 1,840 | 4,530 | 1,040 | 525  | 345   |
| 13  | 547  | 1,890   | • 860   | 1,990 | 902   | 1,760 | 1,800 | 1,940 | 4,530 | 968   | 525  | 341   |
| 14  | 618  | 2,520   | • 820   | 1,940 | 810   | 1,580 | 1,990 | 2,360 | 4,070 | 1,000 | 542  | 506   |
| 15  | 608  | 3,640   | • 790   | 1,760 | 1,000 | 1,500 | 2,240 | 2,410 | 3,640 | 1,000 | 525  | 780   |
| 16  | 536  | 6,820   | • 770   | 1,540 | 968   | 1,800 | 1,940 | 2,460 | 3,180 | 968   | 530  | 602   |
| 17  | 732  | 7,800   | 738     | 1,340 | 902   | 1,840 | 1,660 | 2,520 | 2,690 | 870   | 536  | 515   |
| 18  | 564  | 4,850   | 750     | 1,260 | 902   | 1,710 | 1,460 | 2,520 | 2,360 | 840   | 500  | 547   |
| 19  | 434  | 3,240   | 1,800   | 1,140 | 870   | 1,660 | 1,580 | 2,360 | 2,090 | 810   | 500  | 457   |
| 20  | 385  | 2,580   | 1,620   | 1,070 | 902   | 2,810 | 1,620 | 2,300 | 1,890 | 780   | 475  | 426   |
| 21  | 369  | 2,360   | 1,460   | 1,040 | 1,340 | 2,410 | 1,940 | 2,190 | 1,840 | 732   | 444  | 470   |
| 22  | 902  | 2,240   | 1,300   | 968   | 1,710 | 1,890 | 2,300 | 2,240 | 1,760 | 646   | 430  | 840   |
| 23  | 968  | 1,800   | 1,420   | 935   | 2,140 | 1,580 | 2,810 | 2,810 | 1,710 | 646   | 430  | 780   |
| 24  | 810  | 1,620   | 1,300   | 902   | 1,660 | 1,380 | 2,870 | 3,370 | 1,620 | 738   | 434  | 1,000 |
| 25  | 674  | 1,380   | 2,200   | 840   | 1,420 | 1,260 | 2,810 | 4,070 | 1,760 | 732   | 426  | 902   |
| 26  | 674  | 1,180   | 3,110   | 902   | 1,710 | 1,180 | 2,690 | 3,780 | 1,660 | 684   | 408  | 780   |
| 27  | 635  | • 1,120 | 3,370   | 1,070 | 1,580 | 1,420 | 3,370 | 3,240 | 1,540 | 662   | 403  | 732   |
| 28  | 591  | 1,070   | 2,870   | 935   | 1,540 | 2,040 | 3,640 | 3,370 | 1,460 | 635   | 430  | 845   |
| 29  | 608  | 1,040   | 3,050   | 870   | ----- | 2,090 | 3,180 | 3,920 | 1,380 | 662   | 408  | 968   |
| 30  | 684  | 968     | 2,930   | 870   | ----- | 2,410 | 2,580 | 4,070 | 1,300 | 679   | 444  | 810   |
| 31  | 968  | -----   | 2,410   | 1,040 | ----- | 2,630 | ----- | 3,240 | ----- | 618   | 412  | ----- |

| Month     | Maximum | Minimum | Mean  | Per square mile | Run-off |           |
|-----------|---------|---------|-------|-----------------|---------|-----------|
|           |         |         |       |                 | Inches  | Acre-feet |
| October   | 968     | 246     | 502   | 1.92            | 2.21    | 30,900    |
| November  | 7,800   | 968     | 2,780 | 10.6            | 11.83   | 165,000   |
| December  | 3,370   | 738     | 1,720 | 6.56            | 7.56    | 106,000   |
| January   | 5,710   | 840     | 2,120 | 8.09            | 9.33    | 130,000   |
| February  | 2,140   | 700     | 1,110 | 4.24            | 4.42    | 61,600    |
| March     | 2,810   | 1,100   | 1,680 | 6.41            | 7.39    | 108,000   |
| April     | 3,640   | 1,300   | 2,200 | 8.40            | 9.37    | 131,000   |
| May       | 4,070   | 1,760   | 2,630 | 10.0            | 11.53   | 162,000   |
| June      | 8,820   | 1,300   | 3,030 | 11.6            | 12.94   | 180,000   |
| July      | 1,260   | 618     | 908   | 3.47            | 4.00    | 55,800    |
| August    | 732     | 403     | 513   | 1.96            | 2.26    | 31,500    |
| September | 1,000   | 341     | 633   | 2.15            | 2.40    | 33,500    |
| The year  | 8,820   | 246     | 1,640 | 6.26            | 85.24   | 1,190,000 |

• Estimated.

## SANDY RIVER BELOW BULL RUN RIVER, NEAR BULL RUN, OREG.

LOCATION.—Water-stage recorder in NW¼ sec. 30, T. 1 S., R. 5 E., 1 mile below Bull Run River and 2 miles northwest of Bull Run. Zero of gage is about 202 feet above mean sea level by U.S. Geological Survey river profiles.

DRAINAGE AREA.—440 square miles.

RECORDS AVAILABLE.—April 1910 to September 1914 (three-quarters of a mile upstream from present site); October 1929 to September 1933.

DISCHARGE.—Maximum during year, 22,600 second-feet June 9 (gage height, 12.4 feet); minimum, 83 second-feet Oct. 4 (gage-height, 0.74 foot).

1910-14, 1929-33: Maximum, 58,000 second-feet Mar. 31, 1931 (gage height, 20.6 feet); minimum, 53 second-feet Oct. 4, 1931 (gage height, 0.53 foot).

REMARKS.—Records excellent except those estimated, Dec. 14, 15, which are good. No diversions for irrigation above station. Flow regulated by Bull Run power plant of Portland General Electric Co.

*Discharge, in second-feet, 1932-33*

| Day | Oct.  | Nov.   | Dec.  | Jan.   | Feb.  | Mar.  | Apr.  | May   | June   | July  | Aug.  | Sept. |
|-----|-------|--------|-------|--------|-------|-------|-------|-------|--------|-------|-------|-------|
| 1   | 332   | 3,640  | 1,800 | 4,110  | 2,100 | 3,120 | 3,900 | 3,970 | 4,220  | 1,950 | 862   | 664   |
| 2   | 294   | 5,030  | 7,480 | 7,710  | 1,800 | 2,860 | 3,500 | 4,750 | 4,230  | 1,670 | 720   | 636   |
| 3   | 358   | 4,870  | 5,980 | 5,190  | 1,720 | 2,690 | 4,620 | 4,240 | 4,850  | 1,780 | 708   | 420   |
| 4   | 348   | 3,760  | 3,810 | 4,810  | 1,590 | 2,690 | 4,320 | 4,740 | 4,380  | 1,540 | 845   | 318   |
| 5   | 326   | 7,340  | 3,260 | 9,610  | 1,630 | 2,590 | 3,660 | 4,620 | 4,740  | 1,720 | 1,140 | 604   |
| 6   | 318   | 11,100 | 2,690 | 9,850  | 1,760 | 2,260 | 3,340 | 4,180 | 4,280  | 1,430 | 824   | 654   |
| 7   | 290   | 6,820  | 2,260 | 7,040  | 1,590 | 3,440 | 3,230 | 3,610 | 4,210  | 1,560 | 927   | 570   |
| 8   | 308   | 10,900 | 1,950 | 11,400 | 1,580 | 3,180 | 2,710 | 3,480 | 12,100 | 1,460 | 772   | 614   |
| 9   | 262   | 9,370  | 1,570 | 10,300 | 1,320 | 2,720 | 2,510 | 3,460 | 18,500 | 1,440 | 847   | 645   |
| 10  | 312   | 5,360  | 1,600 | 7,710  | 1,160 | 2,720 | 2,140 | 3,240 | 9,850  | 1,580 | 728   | 330   |
| 11  | 337   | 3,690  | 1,470 | 5,340  | 1,370 | 2,860 | 2,490 | 3,050 | 7,040  | 1,380 | 817   | 486   |
| 12  | 460   | 2,730  | 1,430 | 4,140  | 2,310 | 3,780 | 3,460 | 3,090 | 6,820  | 1,320 | 676   | 476   |
| 13  | 773   | 3,520  | 1,340 | 3,500  | 2,000 | 3,870 | 2,980 | 3,020 | 7,040  | 1,280 | 452   | 515   |
| 14  | 806   | 4,940  | 1,300 | 3,470  | 1,750 | 3,200 | 3,280 | 3,750 | 6,400  | 1,340 | 676   | 818   |
| 15  | 945   | 6,940  | 1,250 | 3,090  | 2,180 | 2,920 | 3,660 | 4,150 | 5,720  | 1,310 | 599   | 1,450 |
| 16  | 678   | 12,300 | 1,210 | 2,630  | 2,100 | 3,250 | 3,300 | 4,530 | 4,950  | 920   | 647   | 1,460 |
| 17  | 906   | 14,100 | 1,130 | 2,350  | 1,900 | 3,410 | 2,840 | 4,340 | 4,080  | 1,320 | 662   | 1,190 |
| 18  | 890   | 8,650  | 1,220 | 2,250  | 1,800 | 3,140 | 2,480 | 4,270 | 3,530  | 1,190 | 682   | 1,370 |
| 19  | 536   | 5,830  | 4,650 | 1,960  | 1,820 | 3,340 | 2,100 | 3,890 | 3,150  | 1,030 | 630   | 1,070 |
| 20  | 510   | 4,560  | 4,340 | 1,900  | 1,920 | 5,390 | 2,490 | 3,860 | 2,840  | 879   | 420   | 1,000 |
| 21  | 624   | 3,870  | 3,560 | 1,760  | 2,620 | 4,750 | 2,900 | 3,590 | 2,700  | 869   | 732   | 1,020 |
| 22  | 1,560 | 3,670  | 2,880 | 1,620  | 3,550 | 3,520 | 3,530 | 3,530 | 2,590  | 964   | 554   | 1,770 |
| 23  | 2,130 | 2,980  | 3,380 | 1,640  | 4,810 | 2,990 | 4,270 | 5,080 | 2,550  | 824   | 536   | 2,080 |
| 24  | 1,900 | 2,600  | 3,000 | 1,550  | 3,660 | 2,510 | 4,420 | 5,660 | 2,320  | 958   | 510   | 2,690 |
| 25  | 1,300 | 2,160  | 3,060 | 1,400  | 2,890 | 2,220 | 4,420 | 6,610 | 2,530  | 900   | 568   | 2,760 |
| 26  | 1,190 | 2,020  | 8,350 | 1,620  | 3,460 | 2,190 | 4,170 | 5,960 | 2,620  | 795   | 633   | 1,980 |
| 27  | 1,040 | 1,860  | 7,940 | 2,110  | 3,330 | 2,240 | 4,950 | 4,980 | 2,230  | 896   | 328   | 1,480 |
| 28  | 960   | 1,750  | 6,400 | 1,760  | 3,220 | 3,580 | 5,730 | 5,150 | 2,200  | 831   | 641   | 1,820 |
| 29  | 1,000 | 1,700  | 6,820 | 1,700  | ----- | 3,930 | 4,820 | 5,970 | 2,100  | 702   | 515   | 2,360 |
| 30  | 1,080 | 1,680  | 6,190 | 1,660  | ----- | 4,580 | 3,950 | 6,380 | 1,840  | 826   | 546   | 1,780 |
| 31  | 1,600 | -----  | 5,000 | 1,920  | ----- | 5,260 | ----- | 4,910 | -----  | 890   | 588   | ----- |

| Month     | Maximum | Minimum | Mean  | Per square mile | Run-off |           |
|-----------|---------|---------|-------|-----------------|---------|-----------|
|           |         |         |       |                 | Inches  | Acre-feet |
| October   | 2,130   | 262     | 786   | 1.79            | 2.06    | 48,300    |
| November  | 14,100  | 1,680   | 5,320 | 12.1            | 13.50   | 317,000   |
| December  | 8,350   | 1,130   | 3,490 | 7.93            | 9.14    | 215,000   |
| January   | 11,400  | 1,400   | 4,100 | 9.32            | 10.74   | 252,000   |
| February  | 4,810   | 1,160   | 2,250 | 5.11            | 5.32    | 125,000   |
| March     | 5,390   | 2,190   | 3,260 | 7.41            | 8.54    | 200,000   |
| April     | 5,730   | 2,100   | 3,540 | 8.05            | 8.98    | 211,000   |
| May       | 6,610   | 3,020   | 4,390 | 9.98            | 11.51   | 270,000   |
| June      | 18,500  | 1,840   | 4,890 | 11.1            | 12.38   | 291,000   |
| July      | 1,950   | 702     | 1,210 | 2.75            | 3.17    | 74,400    |
| August    | 1,140   | 328     | 670   | 1.52            | 1.75    | 41,200    |
| September | 2,890   | 318     | 1,170 | 2.66            | 2.97    | 69,600    |
| The year  | 18,500  | 262     | 2,920 | 6.64            | 90.06   | 2,110,000 |

## LITTLE ZIGZAG RIVER AT TWIN BRIDGES, NEAR RHODODENDRON, OREG.

LOCATION.—Water-stage recorder probably in sec. 15 of unsurveyed T. 3 S., R. 8 E., 500 feet above upper of Twin Bridges on Mount Hood Loop highway, 5½ miles east of Rhododendron.

DRAINAGE AREA.—3.7 square miles.

RECORDS AVAILABLE.—March 1926 to September 1933.

DISCHARGE.—Maximum during year, 80 second-feet June 8 (gage height, 2.03 feet); minimum, 16 second-feet Oct. 4.

1926-33: Maximum (estimated), 250 second-feet Mar. 31, 1931 (gage height, about 3.5 feet); minimum, 15 second-feet Feb. 1-13, 16-18, 1932.

REMARKS.—Records fair. No diversions or regulation above station.

*Discharge, in second-feet, 1932-33*

| Day | Oct. | Nov. | Dec. | Jan. | Feb. | Mar. | Apr. | May  | June | July | Aug. | Sept. |
|-----|------|------|------|------|------|------|------|------|------|------|------|-------|
| 1   | 18   | 27   | 30   | 31   | 26   | 23   | 24   | 32   | * 40 | 34   | 26   | 23    |
| 2   | 18   | 26   | 45   | 30   | 26   | 23   | 25   | 31   | 41   | 34   | 26   | 23    |
| 3   | 18   | 25   | 32   | 32   | 26   | 23   | 26   | 32   | * 43 | 33   | 26   | 23    |
| 4   | 16   | 24   | 28   | 32   | 26   | 23   | 26   | 33   | * 43 | 33   | 26   | 22    |
| 5   | * 16 | 34   | 25   | 41   | 26   | 23   | 25   | 33   | * 45 | 32   | 26   | 22    |
| 6   | * 17 | 39   | 24   | 30   | 26   | 23   | 25   | 32   | * 40 | 32   | 25   | 22    |
| 7   | * 18 | 28   | 23   | 34   | 26   | 23   | 25   | 32   | 38   | 31   | 25   | 23    |
| 8   | 18   | 36   | 23   | 35   | 25   | 23   | 23   | 32   | 64   | 31   | 25   | 23    |
| 9   | 18   | 31   | 23   | 28   | 23   | 23   | 23   | 32   | 53   | 31   | 25   | 23    |
| 10  | 18   | 24   | 26   | 26   | 23   | 23   | 23   | 32   | 42   | 31   | 25   | 23    |
| 11  | 18   | * 24 | 25   | 25   | * 25 | 23   | 23   | 32   | 44   | 31   | 25   | 23    |
| 12  | 20   | * 25 | 28   | 28   | 24   | 23   | 23   | 32   | 47   | 31   | 25   | 23    |
| 13  | 19   | 25   | 25   | 25   | 24   | 24   | 24   | 34   | 47   | 30   | 25   | 23    |
| 14  | 19   | * 28 | 25   | 25   | 24   | 24   | 24   | 34   | 46   | 30   | 25   | 23    |
| 15  | 20   | 32   | 25   | 25   | 24   | 24   | 24   | 45   | 30   | 25   | 23   | 23    |
| 16  | * 20 | 45   | * 24 | 24   | 24   | 24   | 24   | 44   | 29   | 25   | 23   | 23    |
| 17  | * 19 | 44   | 23   | 24   | 24   | 24   | 23   | 42   | 29   | 25   | 23   | 23    |
| 18  | * 19 | 34   | 23   | 23   | 23   | 23   | 23   | 40   | 29   | 24   | 23   | 23    |
| 19  | * 18 | 32   | 23   | 23   | 23   | 23   | 23   | 39   | 29   | 24   | 23   | 23    |
| 20  | 18   | 30   | 23   | 23   | 23   | 26   | 25   | * 33 | 39   | 29   | 24   | 23    |
| 21  | 20   | 31   | 23   | 23   | 24   | 26   | 26   | 39   | 29   | 24   | 23   | 23    |
| 22  | 23   | 31   | 25   | 23   | 23   | 26   | 26   | 39   | 28   | 24   | 24   | 24    |
| 23  | 23   | 30   | 24   | 23   | 23   | 27   | 27   | 38   | 28   | 23   | 23   | 23    |
| 24  | 22   | 29   | 25   | 23   | 23   | 28   | 28   | 38   | 28   | 23   | 23   | 23    |
| 25  | 22   | 28   | 25   | 23   | 23   | 28   | 28   | 38   | 27   | 23   | 23   | 23    |
| 26  | 23   | 26   | 34   | * 24 | 23   | 23   | 29   | 34   | 38   | 27   | 23   | 23    |
| 27  | 23   | * 25 | 33   | 23   | 23   | 25   | 32   | 36   | 27   | 23   | 23   | 23    |
| 28  | 23   | * 25 | 30   | 23   | 23   | 25   | 33   | 36   | 27   | 23   | 23   | 23    |
| 29  | 24   | 24   | 36   | 24   | 24   | 31   | 31   | * 41 | 35   | 27   | 23   | 23    |
| 30  | 23   | 25   | 32   | 25   | 25   | 30   | 30   | 35   | 26   | 23   | 23   | 23    |
| 31  | 27   | 29   | 26   | 26   | 25   | 25   | 25   | 26   | 26   | 23   | 23   | 23    |

| Month          | Maximum | Minimum | Mean | Per square mile | Run-off |           |
|----------------|---------|---------|------|-----------------|---------|-----------|
|                |         |         |      |                 | Inches  | Acre-feet |
| October.....   | 27      | 16      | 19.9 | 5.38            | 6.20    | 1,220     |
| November.....  | 45      | 24      | 29.6 | 8.00            | 8.93    | 1,760     |
| December.....  | 45      | 26.9    | 7.27 | 8.38            | 1,650   |           |
| January.....   | 41      | 26.7    | 7.22 | 8.32            | 1,640   |           |
| February.....  | 26      | 23      | 24.4 | 6.59            | 6.86    | 1,360     |
| March.....     | 26      | 23      | 23.6 | 6.38            | 7.36    | 1,450     |
| April.....     | 33      | 23      | 25.7 | 6.95            | 7.75    | 1,530     |
| May.....       | 34.0    | 11.3    | 9.19 | 10.60           | 2,090   |           |
| June.....      | 64      | 35      | 41.8 | 11.3            | 12.61   | 2,490     |
| July.....      | 34      | 26      | 29.6 | 8.00            | 9.22    | 1,820     |
| August.....    | 26      | 23      | 24.4 | 6.59            | 7.60    | 1,500     |
| September..... | 24      | 22      | 22.9 | 6.19            | 6.91    | 1,360     |
| The year.....  | 64      | 16      | 27.5 | 7.43            | 100.74  | 19,900    |

\* Estimated.

## SALMON RIVER NEAR GOVERNMENT CAMP, OREG.

LOCATION.—Water-stage recorder in sec. 31, T. 3 S., R. 9 E., near lower end of Red Top Meadows, 4 miles southeast of Government Camp.

DRAINAGE AREA.—8.0 square miles.

RECORDS AVAILABLE.—May 1910 to May 1912, April 1926 to September 1933.

DISCHARGE.—Maximum during year, 266 second-feet June 8 (gage height, 3.08 feet); minimum, 19 second-feet Oct. 10, 11.

1910-12, 1926-33: Maximum, 424 second-feet Mar. 31, 1931 (gage height, 3.55 feet); minimum, 12 second-feet Nov. 21, 1929, Oct. 19, 1930.

REMARKS.—Records fair. Discharge estimated Dec. 8-21, Feb. 9. No diversions or regulation above station.

*Discharge, in second-feet, 1932-33*

| Day     | Oct. | Nov. | Dec. | Jan. | Feb. | Mar. | Apr. | May | June | July | Aug. | Sept. |
|---------|------|------|------|------|------|------|------|-----|------|------|------|-------|
| 1.....  | 21   | 39   | 74   | 41   | 30   | 28   | 30   | 69  | 98   | 94   | 52   | 32    |
| 2.....  | 21   | 37   | 149  | 44   | 30   | 28   | 33   | 67  | 107  | 97   | 51   | 31    |
| 3.....  | 21   | 32   | 80   | 40   | 30   | 28   | 40   | 56  | 112  | 95   | 54   | 31    |
| 4.....  | 21   | 31   | 71   | 48   | 30   | 27   | 39   | 66  | 113  | 91   | 55   | 30    |
| 5.....  | 21   | 118  | 69   | 79   | 30   | 26   | 37   | 57  | 116  | 91   | 62   | 31    |
| 6.....  | 21   | 99   | 61   | 74   | 30   | 27   | 38   | 50  | 105  | 90   | 51   | 31    |
| 7.....  | 20   | 54   | 52   | 74   | 30   | 28   | 36   | 46  | 102  | 92   | 48   | 30    |
| 8.....  | 20   | 121  |      | 101  | 29   | 27   | 32   | 44  | 209  | 94   | 47   | 28    |
| 9.....  | 20   | 69   |      | 77   | 25   | 26   | 30   | 46  | 196  | 90   | 47   | 28    |
| 10..... | 20   | 47   |      | 60   | 27   | 26   | 30   | 48  | 138  | 86   | 46   | 28    |
| 11..... | 20   | 40   |      | 50   | 28   | 26   | 33   | 51  | 132  | 88   | 46   | 28    |
| 12..... | 25   | 38   |      | 46   | 28   | 26   | 35   | 56  | 154  | 90   | 44   | 28    |
| 13..... | 24   | 56   |      | 44   | 27   | 26   | 35   | 69  | 160  | 88   | 43   | 27    |
| 14..... | 27   | 44   |      | 43   | 26   | 26   | 38   | 67  | 166  | 86   | 43   | 39    |
| 15..... | 24   | 159  | 35   | 41   | 26   | 26   | 41   | 64  | 160  | 85   | 42   | 39    |
| 16..... | 25   | 172  |      | 39   | 26   | 29   | 36   | 64  | 149  | 83   | 42   | 31    |
| 17..... | 30   | 172  |      | 37   | 26   | 28   | 32   | 67  | 132  | 79   | 41   | 28    |
| 18..... | 25   | 99   |      | 36   | 26   | 27   | 32   | 63  | 119  | 75   | 40   | 30    |
| 19..... | 24   | 82   |      | 36   | 26   | 28   | 32   | 62  | 114  | 72   | 42   | 27    |
| 20..... | 21   | 72   |      | 35   | 27   | 34   | 36   | 66  | 112  | 71   | 39   | 26    |
| 21..... | 21   | 81   |      | 35   | 27   | 31   | 40   | 68  | 113  | 70   | 35   | 31    |
| 22..... | 27   | 65   | 35   | 35   | 27   | 29   | 46   | 69  | 113  | 68   | 35   | 41    |
| 23..... | 27   | 56   | 35   | 35   | 28   | 28   | 56   | 81  | 105  | 66   | 35   | 37    |
| 24..... | 26   | 48   | 35   | 33   | 28   | 28   | 62   | 93  | 104  | 65   | 36   | 39    |
| 25..... | 28   | 48   | 35   | 33   | 28   | 28   | 63   | 100 | 114  | 65   | 36   | 33    |
| 26..... | 28   | 47   | 63   | 33   | 30   | 27   | 72   | 96  | 107  | 64   | 34   | 35    |
| 27..... | 28   | 45   | 56   | 32   | 30   | 30   | 85   | 98  | 103  | 62   | 34   | 31    |
| 28..... | 27   | 44   | 44   | 32   | 28   | 34   | 84   | 107 | 103  | 60   | 35   | 32    |
| 29..... | 28   | 43   | 65   | 32   |      | 31   | 73   | 127 | 97   | 61   | 34   | 34    |
| 30..... | 27   | 41   | 52   | 31   |      | 32   | 58   | 122 | 95   | 61   | 35   | 30    |
| 31..... | 37   |      | 44   | 30   |      | 32   |      | 103 |      | 55   | 32   |       |

| Month          | Maximum | Minimum | Mean | Per square mile | Run-off |           |
|----------------|---------|---------|------|-----------------|---------|-----------|
|                |         |         |      |                 | Inches  | Acre-feet |
| October.....   | 37      | 20      | 24.4 | 3.05            | 3.52    | 1,500     |
| November.....  | 172     | 31      | 70.0 | 8.75            | 9.76    | 4,170     |
| December.....  | 149     |         | 48.7 | 6.09            | 7.02    | 2,990     |
| January.....   | 101     | 30      | 45.4 | 5.68            | 6.55    | 2,790     |
| February.....  | 30      | 25      | 28.0 | 3.50            | 3.64    | 1,560     |
| March.....     | 34      | 26      | 28.3 | 3.54            | 4.08    | 1,740     |
| April.....     | 85      | 30      | 44.5 | 5.56            | 6.20    | 2,650     |
| May.....       | 127     | 44      | 72.3 | 9.04            | 10.42   | 4,450     |
| June.....      | 209     | 95      | 125  | 15.6            | 17.40   | 7,440     |
| July.....      | 97      | 55      | 78.5 | 9.81            | 11.31   | 4,330     |
| August.....    | 62      | 32      | 42.5 | 5.31            | 6.12    | 2,610     |
| September..... | 41      | 26      | 31.5 | 3.94            | 4.40    | 1,870     |
| The year.....  | 209     | 20      | 53.3 | 6.66            | 90.42   | 38,600    |

## SALMON RIVER BELOW LINNEY CREEK, OREG.

LOCATION.—Water-stage recorder 200 feet below Linney Creek, 9 miles south-east of Welches, and 11 miles downstream from gaging station on Salmon River near Government Camp.

DRAINAGE AREA.—54 square miles.

RECORDS AVAILABLE.—October 1927 to September 1933.

DISCHARGE.—Maximum during year, 1,590 second-feet June 8 (gage height, 3.42 feet); minimum, 54 second-feet Oct. 11 (gage height, 0.31 foot).

1927-33: Maximum, 5,080 second-feet Mar. 31, 1931 (gage height, 5.81 feet); minimum, 44 second-feet Nov. 21, 1929 (gage height, 0.27 foot).

REMARKS.—Records good except those for July to September and those estimated, which are fair. No diversions or regulation above station.

*Discharge, in second-feet, 1932-33*

| Day     | Oct. | Nov. | Dec.  | Jan. | Feb.  | Mar.  | Apr.  | June   | July | Aug. | Sept. |
|---------|------|------|-------|------|-------|-------|-------|--------|------|------|-------|
| 1.....  | 57   | 166  | 259   | 213  | 137   | 126   |       | a 590  | 281  | 139  | 98    |
| 2.....  | 57   | 186  | 561   | 208  | 133   | 124   |       | a 620  | 275  | 135  | 9     |
| 3.....  | 57   | 168  | 400   | 197  | 129   | 126   |       | a 650  | 265  | 135  | 96    |
| 4.....  | 56   | 152  | 325   | 202  | 128   | 120   |       | a 680  | 256  | 139  | 95    |
| 5.....  | 56   | 393  | 328   | 321  | 128   | 119   |       | 664    | 244  | 148  | 95    |
| 6.....  | 57   | 520  | 281   | 393  | 124   | 120   |       | 631    | 241  | 137  | 100   |
| 7.....  | 57   | 335  | 250   | 328  | a 113 | 133   |       | 590    | 232  | 131  | 96    |
| 8.....  | 56   | 502  | 192   | 460  | a 108 | 129   |       | 1, 190 | 229  | 128  | 93    |
| 9.....  | 56   | 460  |       | 480  | a 100 | 126   |       | 1, 320 | 224  | 128  | 90    |
| 10..... | 56   | 321  |       | 408  | a 104 | 122   | a 237 | 938    | 216  | 124  | 90    |
| 11..... | 54   | 262  |       | 346  | 129   | 122   |       | 790    | 210  | 120  | 90    |
| 12..... | 73   | 227  |       | 304  | 135   | 131   |       | 766    | 205  | 120  | 90    |
| 13..... | 90   | 304  | a 130 | 281  | 131   | 137   |       | 760    | 200  | 117  | 88    |
| 14..... | 106  | 332  |       | 265  | 131   | 133   |       | 714    | 197  | 117  | 103   |
| 15..... | 84   | 512  |       | 247  | 119   | 135   |       | 664    | 194  | 115  | 133   |
| 16..... | 93   | 888  |       | 227  | 115   | 164   |       | 610    | 192  | 113  | 110   |
| 17..... | 113  | 946  |       | 202  | 113   | 164   |       | 556    | 183  | 113  | 110   |
| 18..... | 90   | 631  | 159   | 210  | 113   |       |       | 498    | 176  | 110  | 100   |
| 19..... | 74   | 484  | 192   | 202  | 112   |       | 256   | 460    | 173  | 112  | 92    |
| 20..... | 70   | 412  | 173   | 186  | 110   |       | 318   | 428    | 171  | 112  | 90    |
| 21..... | 68   | 420  | 159   | 181  | 115   |       | 360   | 408    | 166  | 108  | 96    |
| 22..... | 129  | 374  | 154   | 171  | 126   |       | 420   | 385    | 164  | 106  | 129   |
| 23..... | 126  | 308  | 156   | 166  | 135   |       | 489   | 370    | 159  | 106  | 119   |
| 24..... | 108  | 278  | 148   | 159  | 126   | a 210 | 530   | 349    | 159  | 101  | 144   |
| 25..... | 98   | 253  | 146   | 156  | 122   |       | 548   | 356    | 156  | 101  | 126   |
| 26..... | 96   | 238  | 259   | 152  | 133   |       | 580   | 338    | 152  | 100  | 112   |
| 27..... | 88   | 232  | 275   | 152  | 129   |       | 692   | 321    | 152  | 100  | 106   |
| 28..... | 85   | 221  | 250   | 146  | 128   |       | a 660 | 308    | 148  | 100  | 103   |
| 29..... | 98   | 216  | 256   | 141  |       |       | a 600 | 297    | 144  | 100  | 110   |
| 30..... | 100  | 213  | 265   | 141  |       |       | a 520 | 288    | 146  | 105  | 105   |
| 31..... | 124  |      | 229   | 141  |       |       |       |        | 144  | 100  | ----- |

| Month          | Maximum | Minimum | Mean  | Per square mile | Run-off |           |
|----------------|---------|---------|-------|-----------------|---------|-----------|
|                |         |         |       |                 | Inches  | Acre-feet |
| October.....   | 129     | 54      | 81.7  | 1.51            | 1.74    | 5,020     |
| November.....  | 946     | 152     | 365   | 6.76            | 7.54    | 21,700    |
| December.....  | 561     | -----   | 212   | 3.93            | 4.53    | 13,000    |
| January.....   | 480     | 141     | 238   | 4.41            | 5.08    | 14,600    |
| February.....  | 137     | 100     | 122   | 2.26            | 2.35    | 6,780     |
| March.....     | -----   | 119     | 167   | 3.09            | 3.56    | 10,300    |
| April.....     | 692     | -----   | 341   | 6.31            | 7.04    | 20,300    |
| May.....       | -----   | -----   | a 545 | 10.1            | 11.64   | 33,500    |
| June.....      | 1,320   | 288     | 585   | 10.8            | 12.05   | 34,800    |
| July.....      | 281     | 144     | 195   | 3.61            | 4.16    | 12,000    |
| August.....    | 148     | 100     | 117   | 2.17            | 2.50    | 7,190     |
| September..... | 144     | 88      | 103   | 1.91            | 2.13    | 6,130     |
| The year.....  | 1,320   | 54      | 256   | 4.74            | 64.32   | 185,000   |

a Estimated.

## SALMON RIVER AT WELCHES, OREG.

LOCATION.—Staff gage in  $S\frac{1}{2}$  sec. 9, T. 3 S., R. 7 E., just below Sheeny Creek and three-quarters of a mile southeast of Welches.

DRAINAGE AREA.—100 square miles.

RECORDS AVAILABLE.—August 1913 to September 1914; July 1920 to September 1921; April 1925 to September 1933.

DISCHARGE.—Maximum during year, 4,050 second-feet June 8 (gage height, 5.1 feet); minimum, 73 second-feet Oct. 8–11 (gage height, 0.44 foot).

1913–14, 1920–21, 1925–33: Maximum (estimated), 13,000 second-feet Mar. 31, 1931 (gage height, 9.80 feet at former gage 500 feet downstream); minimum, 65 second-feet Dec. 3–6, 1929, Aug. 31 to Sept. 3, 1931. Average, 10 years (1913–14, 1920–21, 1925–33), 436 second-feet.

REMARKS.—Records fair. Discharge estimated Aug. 3, 11–13. No diversion or regulation above station.

*Discharge, in second-feet, 1932–33*

| Day     | Oct. | Nov.  | Dec.  | Jan.  | Feb.  | Mar.  | Apr.  | May   | June  | July | Aug. | Sept. |
|---------|------|-------|-------|-------|-------|-------|-------|-------|-------|------|------|-------|
| 1.....  | 80   | 568   | 389   | 650   | 322   | 322   | 595   | 1,090 | 955   | 430  | 155  | 144   |
| 2.....  | 80   | 568   | 1,400 | 1,090 | 322   | 322   | 595   | 1,090 | 1,020 | 430  | 155  | 137   |
| 3.....  | 80   | 568   | 1,090 | 710   | 301   | 344   | 955   | 1,020 | 1,090 | 430  | 160  | 137   |
| 4.....  | 76   | 437   | 770   | 830   | 281   | 281   | 830   | 1,090 | 1,090 | 405  | 175  | 137   |
| 5.....  | 76   | 650   | 740   | 1,400 | 301   | 261   | 770   | 1,090 | 1,090 | 405  | 216  | 144   |
| 6.....  | 76   | 1,970 | 568   | 1,400 | 301   | 344   | 740   | 955   | 1,020 | 380  | 195  | 163   |
| 7.....  | 76   | 1,090 | 514   | 1,160 | 261   | 568   | 650   | 890   | 955   | 355  | 155  | 144   |
| 8.....  | 73   | 1,770 | 413   | 1,970 | 224   | 437   | 462   | 830   | 2,740 | 355  | 144  | 126   |
| 9.....  | 73   | 1,400 | 301   | 1,580 | 204   | 366   | 462   | 770   | 3,280 | 355  | 137  | 116   |
| 10..... | 73   | 1,020 | 322   | 1,240 | 204   | 322   | 366   | 770   | 1,840 | 321  | 137  | 102   |
| 11..... | 73   | 650   | 281   | 955   | 221   | 322   | 514   | 770   | 1,470 | 297  | 137  | 109   |
| 12..... | 111  | 514   | 281   | 830   | 281   | 487   | 595   | 830   | 1,470 | 297  | 137  | 116   |
| 13..... | 178  | 540   | 261   | 680   | 344   | 487   | 568   | 890   | 1,470 | 288  | 137  | 109   |
| 14..... | 224  | 1,240 | 261   | 650   | 322   | 413   | 710   | 1,020 | 1,310 | 274  | 137  | 163   |
| 15..... | 190  | 2,180 | 242   | 514   | 344   | 462   | 680   | 1,020 | 1,150 | 260  | 137  | 247   |
| 16..... | 153  | 2,180 | 242   | 462   | 301   | 568   | 650   | 1,020 | 1,010 | 270  | 144  | 199   |
| 17..... | 224  | 2,180 | 261   | 437   | 301   | 540   | 540   | 1,020 | 945   | 260  | 144  | 171   |
| 18..... | 174  | 1,400 | 413   | 462   | 261   | 462   | 462   | 1,020 | 820   | 238  | 144  | 159   |
| 19..... | 126  | 955   | 710   | 437   | 242   | 462   | 487   | 955   | 760   | 225  | 144  | 133   |
| 20..... | 104  | 830   | 514   | 389   | 261   | 1,020 | 568   | 955   | 730   | 225  | 137  | 116   |
| 21..... | 121  | 830   | 437   | 366   | 413   | 680   | 650   | 890   | 700   | 216  | 137  | 144   |
| 22..... | 413  | 830   | 389   | 344   | 540   | 514   | 770   | 890   | 672   | 216  | 126  | 355   |
| 23..... | 301  | 680   | 437   | 344   | 595   | 413   | 955   | 1,090 | 645   | 208  | 123  | 225   |
| 24..... | 242  | 568   | 389   | 322   | 413   | 344   | 1,020 | 1,240 | 618   | 195  | 123  | 355   |
| 25..... | 190  | 514   | 389   | 322   | 322   | 344   | 1,090 | 1,400 | 645   | 183  | 116  | 278   |
| 26..... | 184  | 462   | 1,770 | 322   | 487   | 301   | 1,090 | 1,320 | 590   | 183  | 116  | 191   |
| 27..... | 159  | 437   | 955   | 322   | 389   | 487   | 1,320 | 1,240 | 535   | 175  | 116  | 191   |
| 28..... | 159  | 389   | 955   | 301   | 322   | 650   | 1,240 | 1,160 | 535   | 175  | 109  | 212   |
| 29..... | 159  | 366   | 1,160 | 301   | ----- | 680   | 1,240 | 1,400 | 508   | 175  | 109  | 278   |
| 30..... | 210  | 366   | 955   | 281   | ----- | 830   | 1,090 | 1,580 | 480   | 183  | 144  | 234   |
| 31..... | 224  | ----- | 770   | 344   | ----- | 770   | ----- | 1,090 | ----- | 167  | 144  | ----- |

| Month          | Maximum | Minimum | Mean  | Per square mile | Run-off |            |
|----------------|---------|---------|-------|-----------------|---------|------------|
|                |         |         |       |                 | Inches  | Acres-feet |
| October.....   | 413     | 73      | 151   | 1.51            | 1.74    | 9,280      |
| November.....  | 2,180   | 366     | 938   | 9.38            | 10.46   | 55,800     |
| December.....  | 1,770   | 242     | 599   | 5.99            | 6.91    | 36,800     |
| January.....   | 1,970   | 281     | 691   | 6.91            | 7.97    | 42,500     |
| February.....  | 595     | 204     | 324   | 3.24            | 3.37    | 18,000     |
| March.....     | 1,020   | 261     | 478   | 4.78            | 5.51    | 29,400     |
| April.....     | 1,320   | 366     | 755   | 7.55            | 8.42    | 44,900     |
| May.....       | 1,580   | 770     | 1,040 | 10.4            | 11.99   | 64,000     |
| June.....      | 3,280   | 480     | 1,070 | 10.7            | 11.94   | 63,700     |
| July.....      | 430     | 167     | 277   | 2.77            | 3.19    | 17,000     |
| August.....    | 216     | 109     | 142   | 1.42            | 1.64    | 8,730      |
| September..... | 355     | 102     | 178   | 1.78            | 1.99    | 10,600     |
| The year.....  | 3,280   | 73      | 554   | 5.54            | 75.13   | 401,000    |

## BULL RUN RESERVOIR NEAR BULL RUN, OREG.

LOCATION.—Water-stage recorder in SW¼ sec. 16, T. 1 S., R. 6 E., at Bear Creek Dam of City of Portland, 8½ miles northeast of Bull Run. Gage readings are elevations above mean sea level.

RECORDS AVAILABLE.—October 1928 to September 1933.

EXTREMES.—Maximum contents during year, 29,970 acre-feet June 9 (gage height, 1,043.60 feet); minimum, 22,170 acre-feet Oct. 12 (gage height, 1,022.90 feet).

1928-33: Maximum contents, 31,600 acre-feet Mar. 31, 1931 (gage height, 1,047.40 feet); minimum, 20,530 acre-feet Oct. 4, 1931.

REMARKS.—Records excellent. Bear Creek Dam on Bull Run River was completed in March 1929 and stores water in Bull Run Reservoir for water supply of city of Portland. Capacity of reservoir at crest of spillway, gage height 1,036 feet, is 26,930 acre-feet, and at center line of outlet valves, gage height 890 feet, is 213 acre-feet, which is dead storage. Gage-height record furnished by Portland Water Bureau.

*Stage and contents, 1932-33*

| Date          | Gage height (feet) | Contents (acre-feet) | Change in contents during month (acre-feet) | Date          | Gage height (feet) | Contents (acre-feet) | Change in contents during month (acre-feet) |
|---------------|--------------------|----------------------|---------------------------------------------|---------------|--------------------|----------------------|---------------------------------------------|
| Sept. 30..... | 1,025.50           | 23,080               | -----                                       | May 31.....   | 1,038.14           | 27,760               | +130                                        |
| Oct. 31.....  | 1,037.26           | 27,420               | +4,340                                      | June 30.....  | 1,037.20           | 27,400               | -360                                        |
| Nov. 30.....  | 1,037.06           | 27,340               | -80                                         | July 31.....  | 1,036.50           | 27,120               | -280                                        |
| Dec. 31.....  | 1,038.02           | 27,720               | +380                                        | Aug. 31.....  | 1,034.70           | 26,440               | -680                                        |
| Jan. 31.....  | 1,036.90           | 27,280               | -440                                        | Sept. 30..... | 1,037.46           | 27,500               | +1,060                                      |
| Feb. 28.....  | 1,037.44           | 27,490               | +210                                        | The year..... | -----              | -----                | +4,420                                      |
| Mar. 31.....  | 1,038.38           | 27,860               | +370                                        |               |                    |                      |                                             |
| Apr. 30.....  | 1,037.80           | 27,630               | -230                                        |               |                    |                      |                                             |

## BULL RUN RIVER BELOW BULL RUN RESERVOIR, OREG.

LOCATION.—Water-stage recorder in SE¼ sec. 17, T. 1 S., R. 6 E., half a mile below Bull Run Reservoir and 8 miles northeast of Bull Run.

DRAINAGE AREA.—77 square miles.

RECORDS AVAILABLE.—October 1929 to September 1933.

DISCHARGE.—Maximum during year, 8,240 second-feet June 9 (gage height, 7.05 feet); minimum, 87 second-feet Oct. 1-3, 5-7 (gage height, 0.15 foot).

1929-33: Maximum, 15,700 second-feet Mar. 31, 1931 (gage height, 10.85 feet); minimum (estimated), 5 second-feet Oct. 10, 11, 1930.

REMARKS.—Records good except those below 150 second-feet, which are fair. No diversions above station. Flow regulated by storage in Bull Run Lake and Bull Run Reservoir. Gage-height record furnished by Portland Water Bureau.

## Discharge, in second-feet, 1932-33

| Day     | Oct. | Nov.  | Dec.  | Jan.  | Feb.  | Mar.  | Apr.  | May   | June  | July | Aug. | Sept. |
|---------|------|-------|-------|-------|-------|-------|-------|-------|-------|------|------|-------|
| 1-----  | 87   | 1,280 | 620   | 906   | 427   | 615   | 1,000 | 968   | 968   | 463  | 181  | 124   |
| 2-----  | 87   | 1,940 | 3,140 | 1,590 | 370   | 580   | 850   | 1,330 | 920   | 455  | 139  | 124   |
| 3-----  | 87   | 1,760 | 1,940 | 1,030 | 328   | 590   | 1,000 | 1,140 | 1,030 | 435  | 148  | 124   |
| 4-----  | 88   | 1,330 | 1,060 | 1,340 | 311   | 524   | 968   | 1,280 | 984   | 411  | 170  | 124   |
| 5-----  | 87   | 3,140 | 850   | 3,520 | 325   | 467   | 836   | 1,230 | 1,020 | 411  | 290  | 124   |
| 6-----  | 87   | 3,060 | 660   | 2,710 | 346   | 475   | 768   | 1,030 | 936   | 411  | 239  | 124   |
| 7-----  | 87   | 1,760 | 556   | 1,940 | 325   | 822   | 698   | 906   | 952   | 408  | 197  | 123   |
| 8-----  | 88   | 3,360 | 447   | 3,830 | 314   | 738   | 615   | 885   | 4,350 | 399  | 172  | 123   |
| 9-----  | 88   | 1,940 | 378   | 2,780 | 257   | 630   | 542   | 952   | 5,980 | 384  | 160  | 123   |
| 10----- | 88   | 1,140 | 350   | 1,940 | 260   | 650   | 475   | 850   | 2,570 | 356  | 155  | 123   |
| 11----- | 88   | 787   | 314   | 1,280 | 297   | 774   | 610   | 762   | 1,760 | 336  | 150  | 124   |
| 12----- | 90   | 645   | 290   | 936   | 600   | 1,040 | 871   | 720   | 1,700 | 325  | 143  | 115   |
| 13----- | 90   | 1,230 | 269   | 780   | 484   | 1,030 | 762   | 714   | 1,760 | 318  | 141  | 115   |
| 14----- | 91   | 1,430 | 251   | 750   | 411   | 822   | 768   | 808   | 1,640 | 311  | 139  | 121   |
| 15----- | 93   | 2,150 | 236   | 665   | 423   | 704   | 836   | 1,070 | 1,430 | 308  | 135  | 135   |
| 16----- | 93   | 3,440 | 230   | 575   | 399   | 808   | 744   | 1,150 | 1,280 | 294  | 132  | 443   |
| 17----- | 94   | 3,360 | 219   | 498   | 364   | 885   | 640   | 1,080 | 1,080 | 278  | 132  | 427   |
| 18----- | 93   | 1,820 | 281   | 459   | 364   | 871   | 560   | 1,050 | 920   | 260  | 130  | 399   |
| 19----- | 93   | 1,180 | 1,820 | 407   | 364   | 871   | 506   | 944   | 815   | 239  | 130  | 374   |
| 20----- | 121  | 906   | 1,590 | 378   | 419   | 1,330 | 552   | 885   | 732   | 227  | 132  | 304   |
| 21----- | 188  | 850   | 1,180 | 367   | 660   | 1,180 | 640   | 824   | 714   | 216  | 128  | 287   |
| 22----- | 590  | 794   | 871   | 336   | 906   | 864   | 726   | 801   | 676   | 219  | 128  | 779   |
| 23----- | 850  | 650   | 960   | 332   | 1,280 | 692   | 892   | 1,230 | 655   | 199  | 128  | 864   |
| 24----- | 682  | 547   | 815   | 308   | 371   | 585   | 936   | 1,500 | 635   | 191  | 128  | 1,280 |
| 25----- | 506  | 467   | 801   | 297   | 670   | 516   | 960   | 1,700 | 676   | 183  | 126  | 1,180 |
| 26----- | 411  | 407   | 3,320 | 300   | 801   | 475   | 906   | 1,550 | 682   | 175  | 126  | 657   |
| 27----- | 354  | 374   | 2,570 | 374   | 762   | 547   | 1,060 | 1,240 | 635   | 170  | 126  | 469   |
| 28----- | 311  | 350   | 1,760 | 346   | 670   | 906   | 1,180 | 1,090 | 595   | 162  | 124  | 719   |
| 29----- | 339  | 360   | 1,700 | 318   | ----- | 1,040 | 1,040 | 1,420 | 547   | 170  | 124  | 878   |
| 30----- | 378  | 415   | 1,480 | 308   | ----- | 1,230 | 892   | 1,500 | 502   | 175  | 123  | 645   |
| 31----- | 516  | ----- | 1,090 | 384   | ----- | 1,380 | ----- | 1,070 | ----- | 210  | 124  | ----- |

| Month          | Observed                 |         |        |                      | Change in contents Bull Run Reservoir in acre-feet | Corrected for storage |                          |                 |                   |
|----------------|--------------------------|---------|--------|----------------------|----------------------------------------------------|-----------------------|--------------------------|-----------------|-------------------|
|                | Discharge in second-feet |         |        | Run-off in acre-feet |                                                    | Run-off in acre-feet  | Discharge in second-feet |                 | Run-off in inches |
|                | Maximum                  | Minimum | Mean   |                      |                                                    |                       | Mean                     | Per square mile |                   |
|                |                          |         |        |                      |                                                    |                       |                          |                 |                   |
| October-----   | 850                      | 87      | 224    | 13, 800              | +4, 340                                            | 18, 100               | 294                      | 3. 82           | 4. 40             |
| November-----  | 3, 440                   | 350     | 1, 430 | 85, 100              | -80                                                | 85, 000               | 1, 430                   | 18. 6           | 20. 75            |
| December-----  | 3, 320                   | 219     | 1, 030 | 63, 300              | +380                                               | 63, 700               | 1, 040                   | 13. 5           | 15. 56            |
| January-----   | 3, 830                   | 297     | 1, 030 | 63, 300              | -440                                               | 62, 900               | 1, 020                   | 13. 2           | 15. 22            |
| February-----  | 1, 280                   | 257     | 500    | 27, 800              | +210                                               | 28, 000               | 504                      | 6. 55           | 6. 82             |
| March-----     | 1, 380                   | 467     | 795    | 48, 900              | +370                                               | 49, 300               | 802                      | 10. 4           | 11. 99            |
| April-----     | 1, 180                   | 475     | 794    | 47, 200              | -230                                               | 47, 000               | 790                      | 10. 3           | 11. 49            |
| May-----       | 1, 700                   | 714     | 1, 090 | 67, 000              | +130                                               | 67, 100               | 1, 090                   | 14. 2           | 16. 37            |
| June-----      | 5, 980                   | 502     | 1, 300 | 77, 400              | -360                                               | 77, 000               | 1, 290                   | 16. 8           | 18. 74            |
| July-----      | 463                      | 162     | 293    | 18, 000              | -280                                               | 17, 700               | 288                      | 3. 74           | 4. 31             |
| August-----    | 290                      | 123     | 148    | 9, 100               | -680                                               | 8, 420                | 137                      | 1. 78           | 2. 05             |
| September----- | 1, 280                   | 115     | 385    | 22, 900              | +1, 060                                            | 24, 000               | 403                      | 5. 23           | 5. 84             |
| The year-----  | 5, 980                   | 87      | 752    | 544, 000             | +4, 420                                            | 548, 000              | 757                      | 9. 83           | 133. 54           |

## BULL RUN RIVER NEAR BULL RUN, OREG.

LOCATION.—Water-stage recorder in SE¼ sec. 25, T. 1 S., R. 5 E., 1½ miles above intake of Portland water-supply pipe line and 5 miles east of Bull Run.

DRAINAGE AREA.—102 square miles.

RECORDS AVAILABLE.—January 1895 to September 1933.

DISCHARGE.—Maximum during year, 9,740 second-feet June 9 (gage height, 8.98 feet); minimum, 110 second-feet Oct. 1-4 (gage height, 1.02 feet).

1895-1933: Maximum, 20,600 second-feet Mar. 31, 1931 (gage height, 13.8 feet); minimum, 63 second-feet Aug. 13-16, 1926. Average, 38 years (1895-1933), 817 second-feet.

REMARKS.—Records good. Discharge Dec. 8, 9, Feb. 8-10, Mar. 11 to Apr. 7, determined from discharge over dam and flow through conduits. No diversions above station. Flow regulated by storage in Bull Run Lake and Bull Run Reservoir. Gage-height record furnished by Portland Water Bureau.

## Discharge, in second-feet, 1932-33

| Day     | Oct.  | Nov.  | Dec.  | Jan.  | Feb.  | Mar.  | Apr.  | May   | June  | July | Aug.  | Sept. |
|---------|-------|-------|-------|-------|-------|-------|-------|-------|-------|------|-------|-------|
| 1.....  | 112   | 1,700 | 755   | 1,380 | 610   | 850   | 1,360 | 1,300 | 1,180 | 560  | 239   | 154   |
| 2.....  | 112   | 2,590 | 3,440 | 2,370 | 545   | 790   | 1,100 | 1,790 | 1,180 | 550  | 180   | 158   |
| 3.....  | 112   | 2,480 | 2,480 | 1,560 | 490   | 820   | 1,260 | 1,560 | 1,300 | 530  | 192   | 158   |
| 4.....  | 110   | 1,840 | 1,380 | 1,880 | 455   | 735   | 1,270 | 1,740 | 1,220 | 500  | 218   | 154   |
| 5.....  | 112   | 3,310 | 1,100 | 4,390 | 460   | 685   | 1,120 | 1,700 | 1,260 | 490  | 351   | 154   |
| 6.....  | 112   | 4,320 | 880   | 3,600 | 490   | 660   | 1,020 | 1,420 | 1,140 | 490  | 302   | 166   |
| 7.....  | 115   | 2,660 | 735   | 2,540 | 475   | 1,070 | 927   | 1,260 | 1,180 | 480  | 239   | 154   |
| 8.....  | 115   | 3,860 | 583   | 4,690 | 432   | 1,000 | 790   | 1,180 | 4,920 | 470  | 218   | 154   |
| 9.....  | 115   | 3,060 | 508   | 3,570 | 336   | 880   | 710   | 1,300 | 6,820 | 460  | 201   | 154   |
| 10..... | 115   | 1,790 | 470   | 2,650 | 348   | 880   | 635   | 1,180 | 3,200 | 425  | 188   | 154   |
| 11..... | 115   | 1,180 | 445   | 1,740 | 380   | 1,120 | 735   | 1,040 | 2,260 | 390  | 188   | 154   |
| 12..... | 135   | 913   | 420   | 1,260 | 735   | 1,430 | 1,100 | 970   | 2,100 | 380  | 180   | 147   |
| 13..... | 152   | 1,190 | 400   | 1,070 | 660   | 1,430 | 970   | 940   | 2,150 | 370  | 177   | 147   |
| 14..... | 175   | 1,840 | 351   | 1,000 | 560   | 1,170 | 970   | 1,040 | 1,940 | 360  | 173   | 307   |
| 15..... | 226   | 2,320 | 292   | 880   | 590   | 1,020 | 1,040 | 1,380 | 1,740 | 360  | 169   | 465   |
| 16..... | 189   | 4,250 | 288   | 760   | 570   | 1,120 | 940   | 1,520 | 1,470 | 351  | 166   | 685   |
| 17..... | 226   | 4,540 | 274   | 710   | 520   | 1,270 | 820   | 1,420 | 1,300 | 338  | 166   | 635   |
| 18..... | 192   | 2,650 | 365   | 635   | 515   | 1,220 | 735   | 1,380 | 1,100 | 315  | 166   | 610   |
| 19..... | 172   | 1,700 | 2,160 | 565   | 520   | 1,220 | 660   | 1,260 | 970   | 292  | 166   | 540   |
| 20..... | 175   | 1,300 | 2,040 | 505   | 595   | 1,770 | 710   | 1,140 | 880   | 255  | 166   | 455   |
| 21..... | 230   | 1,180 | 1,600 | 485   | 880   | 1,650 | 790   | 1,070 | 850   | 162  | 425   | 255   |
| 22..... | 760   | 1,070 | 1,180 | 450   | 1,220 | 1,220 | 910   | 1,040 | 790   | 154  | 979   | 154   |
| 23..... | 1,070 | 880   | 1,300 | 435   | 1,700 | 972   | 1,100 | 1,600 | 790   | 154  | 1,070 | 154   |
| 24..... | 880   | 735   | 1,100 | 410   | 1,180 | 792   | 1,180 | 1,890 | 735   | 154  | 1,070 | 154   |
| 25..... | 685   | 635   | 1,100 | 395   | 940   | 705   | 1,220 | 2,100 | 790   | 218  | 151   | 1,520 |
| 26..... | 560   | 570   | 4,060 | 400   | 1,070 | 662   | 1,140 | 1,890 | 790   | 218  | 151   | 951   |
| 27..... | 485   | 530   | 3,440 | 520   | 1,040 | 747   | 1,340 | 1,560 | 735   | 209  | 151   | 685   |
| 28..... | 415   | 495   | 2,420 | 475   | 910   | 1,220 | 1,560 | 1,470 | 710   | 205  | 154   | 940   |
| 29..... | 450   | 495   | 2,420 | 445   | ----- | 1,430 | 1,340 | 1,700 | 635   | 209  | 158   | 1,100 |
| 30..... | 515   | 550   | 2,100 | 435   | ----- | 1,650 | 1,180 | 1,840 | 610   | 222  | 162   | 850   |
| 31..... | 712   | ----- | 1,600 | 565   | ----- | 1,880 | ----- | 1,420 | ----- | 248  | 162   | ----- |

| Month          | Observed                 |         |       |                      | Change in contents Bull Run Reservoir in acre-feet | Corrected for storage |                          |                 |                   |
|----------------|--------------------------|---------|-------|----------------------|----------------------------------------------------|-----------------------|--------------------------|-----------------|-------------------|
|                | Discharge in second-feet |         |       | Run-off in acre-feet |                                                    | Run-off in acre-feet  | Discharge in second-feet |                 | Run-off in inches |
|                | Maximum                  | Minimum | Mean  |                      |                                                    |                       | Mean                     | Per square mile |                   |
| October.....   | 1,070                    | 110     | 311   | 19,100               | +4,340                                             | 23,400                | 381                      | 3.74            | 4.31              |
| November.....  | 4,540                    | 495     | 1,890 | 112,000              | —80                                                | 112,000               | 1,880                    | 18.4            | 20.53             |
| December.....  | 4,060                    | 274     | 1,340 | 82,400               | +380                                               | 82,800                | 1,350                    | 13.2            | 15.22             |
| January.....   | 4,690                    | 395     | 1,380 | 84,800               | —440                                               | 84,400                | 1,370                    | 13.4            | 15.45             |
| February.....  | 1,700                    | 336     | 687   | 38,200               | +210                                               | 38,400                | 691                      | 6.77            | 7.05              |
| March.....     | 1,880                    | 660     | 1,100 | 67,600               | +370                                               | 68,000                | 1,110                    | 10.9            | 12.57             |
| April.....     | 1,560                    | 635     | 1,020 | 60,700               | —230                                               | 60,500                | 1,020                    | 10.0            | 11.16             |
| May.....       | 2,100                    | 940     | 1,420 | 87,300               | +130                                               | 87,400                | 1,420                    | 13.9            | 16.03             |
| June.....      | 6,820                    | 610     | 1,560 | 92,800               | —360                                               | 92,400                | 1,550                    | 15.2            | 16.96             |
| July.....      | 560                      | 205     | 352   | 21,600               | —280                                               | 21,300                | 346                      | 3.39            | 3.91              |
| August.....    | 351                      | 151     | 186   | 11,400               | —680                                               | 10,700                | 174                      | 1.71            | 1.97              |
| September..... | 1,620                    | 147     | 528   | 31,400               | +1,060                                             | 32,500                | 546                      | 5.75            | 5.97              |
| The year.....  | 6,820                    | 110     | 981   | 709,000              | +4,420                                             | 714,000               | 986                      | 9.67            | 131.13            |

## LITTLE SANDY RIVER NEAR BULL RUN, OREG.

LOCATION.—Water-stage recorder in NE¼ sec. 10, T. 2 S., R. 5 E., three-eighths of a mile above Portland General Electric Co.'s dam and tunnel from Sandy River and 3 miles east of Bull Run. Zero of gage is 710.51 feet above mean sea level, by surveys of Portland General Electric Co. referred to adjustment of 1924.

DRAINAGE AREA.—23 square miles.

RECORDS AVAILABLE.—May 1911 to April 1913, fragmentary; July 1919 to September 1933.

DISCHARGE.—Maximum during year, 1,530 second-feet Nov. 16 (gage height, 5.95 feet); minimum, 10 second-feet Oct. 1-11.

1911-13, 1919-33: Maximum, 3,950 second-feet Nov. 20, 1921 (gage height, 9.18 feet); minimum, 10 second-feet Sept. 17, 1924, Sept. 2-5, 1931, Sept. 30, Oct. 1-11, 1932. Average, 14 years (1919-33), 141 second-feet.

REMARKS.—Records good. Discharge estimated Dec. 9-16, Feb. 9, 10. No diversions or regulation above station. Gage-height record furnished by Portland General Electric Co.

*Discharge, in second-feet, 1932-33*

| Day     | Oct. | Nov.  | Dec. | Jan. | Feb.  | Mar. | Apr.  | May | June  | July | Aug. | Sept. |
|---------|------|-------|------|------|-------|------|-------|-----|-------|------|------|-------|
| 1.....  | 10   | 302   | 82   | 272  | 134   | 215  | 245   | 228 | 230   | 85   | 25   | 21    |
| 2.....  | 10   | 380   | 400  | 422  | 123   | 200  | 220   | 272 | 255   | 82   | 24   | 19    |
| 3.....  | 10   | 380   | 281  | 329  | 112   | 188  | 245   | 250 | 260   | 76   | 28   | 18    |
| 4.....  | 10   | 275   | 174  | 329  | 104   | 165  | 235   | 308 | 255   | 71   | 39   | 18    |
| 5.....  | 10   | 563   | 190  | 625  | 106   | 161  | 205   | 269 | 260   | 68   | 77   | 22    |
| 6.....  | 10   | 780   | 143  | 508  | 106   | 151  | 192   | 220 | 228   | 65   | 46   | 32    |
| 7.....  | 10   | 474   | 122  | 415  | 100   | 215  | 172   | 198 | 260   | 62   | 35   | 24    |
| 8.....  | 10   | 961   | 94   | 810  | 94    | 192  | 153   | 188 | 788   | 59   | 31   | 21    |
| 9.....  | 10   | 580   | 65   | 544  | 80    | 176  | 134   | 192 | 966   | 59   | 28   | 18    |
| 10..... | 10   | 314   |      | 374  | 80    | 178  | 120   | 185 | 470   | 55   | 27   | 18    |
| 11..... | 10   | 210   | 65   | 266  | 94    | 198  | 170   | 183 | 380   | 51   | 25   | 18    |
| 12..... | 31   | 159   |      | 222  | 159   | 240  | 232   | 174 | 390   | 48   | 24   | 18    |
| 13..... | 59   | 190   |      | 200  | 138   | 232  | 198   | 185 | 384   | 46   | 23   | 18    |
| 14..... | 74   | 255   |      | 188  | 120   | 202  | 200   | 218 | 341   | 43   | 23   | 182   |
| 15..... | 122  | 423   |      | 167  | 153   | 178  | 218   | 284 | 302   | 41   | 22   | 290   |
| 16..... | 90   | 970   | 65   | 143  | 145   | 212  | 185   | 284 | 252   | 39   | 21   | 198   |
| 17..... | 167  | 1,080 |      | 55   | 129   | 134  | 225   | 157 | 269   | 220  | 37   | 21    |
| 18..... | 98   | 499   |      | 88   | 120   | 127  | 228   | 139 | 258   | 185  | 35   | 20    |
| 19..... | 66   | 344   |      | 362  | 109   | 134  | 230   | 129 | 232   | 170  | 34   | 22    |
| 20..... | 53   | 266   |      | 290  | 100   | 157  | 401   | 145 | 220   | 159  | 33   | 22    |
| 21..... | 48   | 228   | 235  | 96   | 195   | 320  | 165   | 200 | 153   | 32   | 21   | 106   |
| 22..... | 174  | 190   | 205  | 89   | 228   | 245  | 192   | 205 | 145   | 31   | 20   | 210   |
| 23..... | 210  | 153   | 222  | 86   | 290   | 198  | 232   | 356 | 138   | 30   | 19   | 195   |
| 24..... | 147  | 129   | 208  | 85   | 240   | 167  | 235   | 365 | 132   | 30   | 18   | 302   |
| 25..... | 111  | 112   | 202  | 79   | 210   | 147  | 230   | 380 | 149   | 29   | 18   | 235   |
| 26..... | 96   | 98    | 633  | 94   | 235   | 132  | 222   | 326 | 132   | 27   | 18   | 190   |
| 27..... | 81   | 91    | 494  | 125  | 220   | 157  | 263   | 275 | 119   | 27   | 18   | 165   |
| 28..... | 74   | 86    | 374  | 109  | 225   | 242  | 272   | 296 | 109   | 26   | 18   | 190   |
| 29..... | 84   | 86    | 566  | 102  | ----- | 242  | 238   | 341 | 100   | 29   | 23   | 202   |
| 30..... | 84   | 84    | 432  | 97   | ----- | 344  | 205   | 326 | 94    | 31   | 30   | 143   |
| 31..... | 158  | ----- | 326  | 130  | ----- | 332  | ----- | 252 | ----- | 26   | 24   | ----- |

| Month          | Maximum | Minimum | Mean | Per square mile | Run-off |            |
|----------------|---------|---------|------|-----------------|---------|------------|
|                |         |         |      |                 | Inches  | Acres-feet |
| October.....   | 210     | 10      | 68.8 | 2.99            | 3.45    | 4,230      |
| November.....  | 1,080   | 84      | 355  | 15.4            | 17.18   | 21,100     |
| December.....  | 633     | 55      | 219  | 9.52            | 10.98   | 13,500     |
| January.....   | 810     | 79      | 238  | 10.3            | 11.87   | 14,600     |
| February.....  | 290     | 80      | 152  | 6.61            | 6.88    | 8,440      |
| March.....     | 401     | 132     | 216  | 9.39            | 10.83   | 13,300     |
| April.....     | 272     | 120     | 198  | 8.61            | 9.61    | 11,800     |
| May.....       | 380     | 174     | 256  | 11.1            | 12.80   | 15,700     |
| June.....      | 966     | 94      | 268  | 11.7            | 13.05   | 15,900     |
| July.....      | 85      | 26      | 45.4 | 1.97            | 2.27    | 2,790      |
| August.....    | 77      | 18      | 26.1 | 1.13            | 1.30    | 1,600      |
| September..... | 302     | 18      | 115  | 5.00            | 5.58    | 6,840      |
| The year.....  | 1,080   | 10      | 179  | 7.78            | 105.80  | 130,000    |

## WILLAMETTE RIVER BASIN

## MIDDLE FORK OF WILLAMETTE RIVER AT EULA, OREG.

LOCATION.—Staff gage in sec. 18, T. 20 S., R. 2 E., a quarter of a mile southwest of Eula and 8 miles below mouth of North Fork.

DRAINAGE AREA.—950 square miles. Prior to October 1931 943 square miles at gaging cable a mile above gage; discharge measurements now made at the site of the gage.

RECORDS AVAILABLE.—July 1923 to September 1933.

DISCHARGE.—Maximum during year, 20,600 second-feet June 9 (gage height, 10.6 feet); minimum, 604 second-feet Oct. 11–13 (gage height, 1.32 feet).

1923–33: Maximum, 55,100 second-feet Feb. 21, 1927 (gage height, 17.0 feet); minimum, 450 second-feet Nov. 24, 25, Dec. 5, 6, 1929, Sept. 4–6, 16, 17, 1931.

REMARKS.—Records good except those estimated and those June 9–30, which are fair. No diversions above station. Considerable diurnal fluctuation during low water, owing to logging operations upstream. Gage-height record October to April furnished by U.S. Weather Bureau.

## Discharge, in second-feet, 1932–33

| Day | Oct.  | Nov.  | Dec.  | Jan.  | Feb.  | Mar.  | Apr.  | May   | June   | July  | Aug.  | Sept. |
|-----|-------|-------|-------|-------|-------|-------|-------|-------|--------|-------|-------|-------|
| 1   | 631   | 710   | 1,870 | 3,600 | 3,000 | 3,900 | 4,220 | 5,220 | 7,280  | 3,230 | 1,140 | 834   |
| 2   | 631   | 1,140 | 2,650 | 6,320 | 2,400 | 4,220 | 4,060 | 4,710 | 6,320  | 3,230 | 1,100 | 834   |
| 3   | 622   | 1,280 | 3,310 | 7,480 | 2,080 | 4,060 | 5,580 | 4,380 | 6,890  | 3,360 | 1,100 | 820   |
| 4   | 622   | 1,030 | 2,770 | 4,710 | 2,080 | 3,900 | 6,130 | 5,220 | 7,480  | 3,230 | 1,140 | 820   |
| 5   | 622   | 1,100 | 2,410 | 5,220 | 2,080 | 2,900 | 5,580 |       | 7,080  | 3,100 | 1,100 | 820   |
| 6   | 613   | 6,130 | 2,190 | 5,940 | 2,400 | 3,170 | 5,220 |       | 6,890  | 3,100 | 1,090 | 1,030 |
| 7   | 613   | 3,170 | 2,080 | 5,050 | 2,080 | 3,600 | 4,710 |       | 6,130  | 3,100 | 1,090 | 960   |
| 8   | 613   | 2,080 | 1,770 | 4,380 | 1,970 | 3,600 | 4,220 |       | 7,880  | 2,980 | 1,060 | 820   |
| 9   | 613   | 4,710 | 1,320 | 4,220 | 1,900 | 3,600 | 3,750 |       | 17,800 | 2,860 | 1,020 | 820   |
| 10  | 613   | 2,900 | 1,240 | 3,750 | 1,800 | 3,450 | 3,450 |       | 14,100 | 2,740 | 1,000 | 807   |
| 11  | 604   | 2,080 |       | 3,450 | 1,870 | 3,900 | 3,170 |       | 10,700 | 2,400 | 988   | 794   |
| 12  | 604   | 1,670 |       | 3,170 | 1,970 | 5,400 | 3,170 |       | 9,900  | 2,290 | 967   | 794   |
| 13  | 604   | 1,490 |       | 3,170 | 2,400 | 5,050 | 3,310 | 5,200 | 10,200 | 2,290 | 967   | 781   |
| 14  | 622   | 2,400 | 1,130 | 3,600 | 2,080 | 4,380 | 3,600 |       | 10,200 | 2,290 | 967   | 781   |
| 15  | 640   | 3,500 |       | 3,450 | 4,220 | 4,060 | 4,380 |       | 9,660  | 2,180 | 960   | 1,260 |
| 16  | 822   | 7,680 |       | 2,900 | 5,050 | 4,060 | 4,540 |       | 8,740  | 2,130 | 953   | 988   |
| 17  | 1,170 | 7,280 | 1,240 | 2,650 | 3,600 | 4,060 | 3,900 |       | 7,090  | 1,980 | 932   | 890   |
| 18  | 850   | 5,580 | 1,400 | 2,530 | 2,900 | 3,750 | 3,600 |       | 5,810  | 1,830 | 918   | 918   |
| 19  | 740   | 3,600 | 1,870 | 2,410 | 2,770 | 3,450 | 3,170 |       | 5,140  | 1,600 | 918   | 904   |
| 20  | 700   | 2,530 | 3,450 | 2,190 | 2,410 | 4,220 | 3,170 |       | 4,500  | 1,640 | 890   | 890   |
| 21  | 680   | 2,300 | 2,650 | 2,190 | 2,650 | 4,220 | 3,170 |       | 4,500  | 1,560 | 890   | 988   |
| 22  | 822   | 1,970 | 2,080 | 2,080 | 2,650 | 3,750 | 3,750 | 4,060 | 4,350  | 1,510 | 876   | 960   |
| 23  | 1,240 | 1,870 | 3,450 | 2,080 | 3,450 | 3,750 | 4,880 | 4,710 | 4,350  | 1,510 | 862   | 1,040 |
| 24  | 940   | 1,670 | 3,170 | 1,870 | 2,900 | 3,450 | 5,400 | 4,710 | 4,050  | 1,420 | 855   | 1,060 |
| 25  | 850   | 1,580 | 3,030 | 1,870 | 2,770 | 2,650 | 5,400 | 7,080 | 4,980  | 1,340 | 848   | 1,100 |
| 26  | 795   | 1,400 | 3,750 | 1,970 | 3,030 | 2,650 | 5,220 | 7,680 | 4,820  | 1,300 | 834   | 1,070 |
| 27  | 768   | 1,400 | 6,320 | 4,500 | 2,900 | 2,900 | 5,580 | 6,890 | 4,500  | 1,260 | 834   | 1,030 |
| 28  | 740   | 1,400 | 5,940 | 3,570 | 2,770 | 3,450 | 7,080 | 6,320 | 4,200  | 1,260 | 834   | 918   |
| 29  | 720   | 1,490 | 5,050 | 2,500 |       | 3,750 | 7,280 | 7,680 | 3,910  | 1,220 | 848   | 932   |
| 30  | 740   | 2,080 | 4,710 | 2,000 |       | 3,750 | 6,320 | 8,960 | 3,490  | 1,180 | 876   | 904   |
| 31  | 700   |       | 4,220 | 2,190 |       | 4,710 |       | 7,680 |        | 1,180 | 834   |       |

| Month     | Maximum | Minimum | Mean  | Per square mile | Run-off |           |
|-----------|---------|---------|-------|-----------------|---------|-----------|
|           |         |         |       |                 | Inches  | Acre-feet |
| October   | 1,240   | 604     | 727   | 0.765           | 0.88    | 44,700    |
| November  | 7,680   | 710     | 2,640 |                 | 3.10    | 157,000   |
| December  | 6,320   |         | 2,600 |                 | 2.74    | 160,000   |
| January   | 7,480   | 1,870   | 3,450 | 3.63            | 4.18    | 212,000   |
| February  | 5,050   | 1,800   | 2,650 | 2.79            | 2.90    | 147,000   |
| March     | 5,400   | 2,650   | 3,800 | 4.00            | 4.61    | 234,000   |
| April     | 7,280   | 3,170   | 4,570 | 4.81            | 5.37    | 272,000   |
| May       | 8,960   |         | 5,640 | 5.94            | 6.85    | 347,000   |
| June      | 17,800  | 3,490   | 7,100 | 7.47            | 8.33    | 422,000   |
| July      | 3,360   | 1,180   | 2,140 | 2.25            | 2.59    | 132,000   |
| August    | 1,140   | 834     | 958   | 1.01            | 1.16    | 58,900    |
| September | 1,260   | 781     | 919   | .967            | 1.08    | 54,700    |
| The year  | 17,800  | 604     | 3,100 | 3.26            | 44.21   | 2,240,000 |

• Estimated.

## WILLAMETTE RIVER AT SPRINGFIELD, OREG.

LOCATION.—Water-stage recorder in SE¼ sec. 34, T. 17 S., R. 3 W., at highway bridge at Springfield. Zero of gage is 424.16 feet above mean sea level by general adjustment of 1929.

DRAINAGE AREA.—2,030 square miles.

RECORDS AVAILABLE.—November 1911 to September 1913; October 1928 to September 1933. At Eugene, 4 miles downstream, June 1919 to September 1928.

DISCHARGE.—Maximum during year, 55,600 second-feet Jan. 2 (gage height, 16.4 feet); minimum, 641 second-feet Oct. 13 (gage height, 1.46 feet).

1911-13, 1919-33: Maximum, 73,300 second-feet Feb. 21, 1927 (gage height at Eugene, 17.0 feet); minimum, 500 second-feet Aug. 11, 1926. Average, 15 years (1912-13, 1919-33), 5,050 second-feet. Maximum discharge in recent years, 96,000 second-feet Nov. 23, 1909 (gage height at Eugene, 21.5 feet).

REMARKS.—Records excellent except those estimated Nov. 10, Dec. 6, 7, 11-17, Feb. 9, 10, Mar. 2-13, June 25 to July 10, which are good. Slight diurnal fluctuation during low water, owing to logging operations in Middle Fork of Willamette River Basin. No diversions above station.

## Discharge, in second-feet, 1932-33

| Day     | Oct.  | Nov.   | Dec.   | Jan.   | Feb.   | Mar.   | Apr.   | May    | June   | July  | Aug.  | Sept. |       |
|---------|-------|--------|--------|--------|--------|--------|--------|--------|--------|-------|-------|-------|-------|
| 1-----  | 684   | 1,000  | 3,990  | 11,400 | 11,100 | 10,700 | 10,100 | 7,690  | 9,450  | 3,690 | 1,360 | 958   |       |
| 2-----  | 675   | 1,400  | 4,320  | 36,500 | 9,150  | 9,900  | 9,150  | 7,690  | 8,550  |       | 1,350 | 949   |       |
| 3-----  | 666   | 3,160  | 5,650  | 37,700 | 7,410  |        | 10,400 | 7,410  | 8,850  |       | 1,280 | 940   |       |
| 4-----  | 666   | 2,320  | 4,780  | 18,300 | 6,440  |        | 11,400 | 9,150  | 9,760  |       | 1,330 | 931   |       |
| 5-----  | 666   | 2,250  | 3,990  | 14,300 | 6,580  |        | 10,100 | 10,400 | 9,150  |       | 1,360 | 931   |       |
| 6-----  | 666   | 10,600 | 3,600  | 16,700 | 7,690  | 9,900  | 9,150  | 10,400 | 8,850  | 3,690 | 1,310 | 994   |       |
| 7-----  | 666   | 7,130  | 3,300  | 15,100 | 6,990  |        | 8,550  | 10,400 | 8,260  |       | 1,270 | 1,160 |       |
| 8-----  | 666   | 4,660  | 2,890  | 12,500 | 6,310  |        | 7,690  | 10,700 | 9,150  |       | 1,240 | 1,070 |       |
| 9-----  | 658   | 8,850  | 2,400  | 11,100 | 5,400  |        | 6,850  | 11,800 | 23,300 |       | 1,220 | 985   |       |
| 10----- | 658   | 5,500  | 2,180  | 11,800 | 4,500  |        | 6,040  | 10,100 | 24,300 |       | 1,180 | 949   |       |
| 11----- | 666   | 4,210  | 1,830  | 10,400 | 4,660  | 10,700 | 5,650  | 8,550  | 17,100 | 2,890 | 1,160 | 949   |       |
| 12----- | 658   | 3,160  |        | 8,850  | 5,780  |        | 6,180  | 7,410  | 14,700 | 2,720 | 1,150 | 922   |       |
| 13----- | 650   | 2,640  |        | 7,970  | 7,690  |        | 6,580  | 7,130  | 14,700 | 2,720 | 1,130 | 904   |       |
| 14----- | 709   | 4,100  |        | 8,260  | 6,850  |        | 6,720  | 6,990  | 13,900 | 2,640 | 1,120 | 949   |       |
| 15----- | 850   | 6,040  |        | 8,850  | 13,400 | 9,150  | 7,690  | 7,130  | 13,200 | 2,560 | 1,100 | 1,230 |       |
| 16----- | 985   | 12,100 | 1,830  | 7,690  | 23,400 | 9,150  | 7,690  | 7,410  | 11,800 | 2,480 | 1,090 | 1,420 |       |
| 17----- | 1,780 | 12,100 |        | 6,580  | 15,100 | 9,760  | 6,990  | 7,970  | 9,760  | 2,320 | 1,080 | 1,210 |       |
| 18----- | 1,500 | 9,150  |        | 2,320  | 6,040  | 11,100 | 8,850  | 6,040  | 8,260  | 7,970 | 2,180 | 1,070 | 1,090 |
| 19----- | 1,100 | 6,580  |        | 6,990  | 5,780  | 8,850  | 8,260  | 5,520  | 7,970  | 6,990 | 2,040 | 1,050 | 1,210 |
| 20----- | 922   | 5,020  |        | 13,200 | 5,140  | 7,970  | 9,150  | 5,140  | 7,690  | 6,310 | 1,970 | 1,040 | 1,150 |
| 21----- | 850   | 4,100  | 10,400 | 5,140  | 8,260  | 10,400 | 5,270  | 7,410  | 5,910  | 1,900 | 1,030 | 1,160 |       |
| 22----- | 1,110 | 3,780  | 7,690  | 4,900  | 9,150  | 9,150  | 6,040  | 7,130  | 5,650  | 1,840 | 1,020 | 1,310 |       |
| 23----- | 2,800 | 3,260  | 11,400 | 4,660  | 10,700 | 7,690  | 7,410  | 7,970  | 5,520  | 1,780 | 994   | 1,480 |       |
| 24----- | 1,900 | 2,890  | 12,500 | 4,900  | 11,100 | 6,720  | 8,260  | 9,450  | 5,400  | 1,710 | 949   | 1,460 |       |
| 25----- | 1,390 | 2,560  | 11,100 | 5,650  | 9,150  | 6,040  | 8,850  | 10,400 | 5,450  | 1,640 | 958   | 1,540 |       |
| 26----- | 1,120 | 2,320  | 15,500 | 5,910  | 9,150  | 5,520  | 8,260  | 11,400 |        | 1,620 | 958   | 1,510 |       |
| 27----- | 1,020 | 2,180  | 21,700 | 13,600 | 9,760  | 5,520  | 7,970  | 10,100 |        | 1,570 | 940   | 1,350 |       |
| 28----- | 967   | 2,180  | 20,000 | 11,400 | 9,760  | 7,130  | 9,760  | 9,150  |        | 1,520 | 940   | 1,230 |       |
| 29----- | 922   | 2,560  | 15,500 | 8,850  | 11,400 | 8,260  | 10,400 | 10,100 |        | 1,470 | 940   | 1,230 |       |
| 30----- | 922   | 4,100  | 15,100 | 7,410  |        | 8,550  | 9,450  | 11,800 |        | 1,450 | 967   | 1,300 |       |
| 31----- | 931   | 12,500 | 12,500 | 7,970  |        | 11,400 | 11,100 | 11,100 |        | 1,440 | 976   | ----- |       |

| Month          | Maximum | Minimum | Mean   | Per square mile | Run-off |           |
|----------------|---------|---------|--------|-----------------|---------|-----------|
|                |         |         |        |                 | Inches  | Acre-feet |
| October.....   | 2,800   | 650     | 981    | 0.483           | 0.56    | 60,300    |
| November.....  | 12,100  | 1,000   | 4,730  | 2.33            | 2.60    | 281,000   |
| December.....  | 21,700  | -----   | 7,280  | 3.59            | 4.14    | 448,000   |
| January.....   | 37,700  | 4,660   | 11,000 | 5.42            | 6.25    | 676,000   |
| February.....  | 23,400  | 4,500   | 9,050  | 4.46            | 4.64    | 503,000   |
| March.....     | -----   | 5,520   | 9,060  | 4.46            | 5.14    | 557,000   |
| April.....     | 11,400  | 5,140   | 7,840  | 3.86            | 4.31    | 467,000   |
| May.....       | 11,800  | 6,990   | 8,980  | 4.42            | 5.10    | 552,000   |
| June.....      | 24,300  | -----   | 9,710  | 4.78            | 5.33    | 578,000   |
| July.....      | -----   | 1,440   | 2,560  | 1.26            | 1.45    | 157,000   |
| August.....    | 1,360   | 940     | 1,110  | .547            | .63     | 68,200    |
| September..... | 1,540   | 904     | 1,150  | .567            | .63     | 68,400    |
| The year.....  | 37,700  | 650     | 6,100  | 3.00            | 40.78   | 4,420,000 |

## WILLAMETTE RIVER AT ALBANY, OREG.

LOCATION.—Staff gage in SW¼ sec. 6, T. 11 S., R. 3 W., at Albany, just below mouth of Calapooya River. Zero of gage is 171.70 feet above mean sea level by general adjustment of 1929.

DRAINAGE AREA.—4,840 square miles.

RECORDS AVAILABLE.—November 1878 to April 1882, January 1892 to September 1933; some fragmentary records 1883 to 1888.

DISCHARGE.—Maximum during year, 94,500 second-feet Jan. 4 (gage height, 20.8 feet); minimum, 2,400 second-feet Oct. 1–15 (gage height, 0.5 foot).

1878–82, 1892–1933: Maximum, 229,000 second-feet Jan. 14, 1881 (gage height, 32.8 feet); minimum, about 1,870 second-feet Sept. 21–27, 1879 (gage height, 0.2 foot). Minimum in recent years, 1,890 second-feet Sept. 5, 1931 (gage height, 0.26 foot). Average, 38 years (1895–1933), 13,800 second-feet.

Maximum stage known, 36.0 feet Dec. 8, 1861 (estimated discharge, 274,000 second-feet).

REMARKS.—Records excellent. No regulation. Albany power canal diverts water from South Santiam River into Willamette River above station. Gage-height record furnished by U.S. Weather Bureau.

## Discharge, in second-feet, 1932–33

| Day | Oct.  | Nov.   | Dec.   | Jan.   | Feb.   | Mar.   | Apr.   | May    | June   | July   | Aug.  | Sept. |
|-----|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|-------|-------|
| 1   | 2,400 | 3,240  | 9,800  | 35,200 | 25,100 | 31,500 | 29,100 | 20,000 | 23,900 | 12,000 | 4,680 | 3,320 |
| 2   | 2,400 | 3,460  | 9,800  | 44,600 | 28,700 | 32,700 | 26,700 | 17,900 | 20,800 | 11,300 | 4,440 | 3,320 |
| 3   | 2,400 | 3,910  | 11,900 | 71,400 | 25,100 | 32,300 | 23,500 | 17,900 | 19,300 | 10,700 | 4,440 | 3,320 |
| 4   | 2,400 | 6,930  | 16,300 | 90,000 | 21,100 | 32,300 | 25,100 | 17,200 | 19,300 | 10,100 | 4,440 | 3,320 |
| 5   | 2,400 | 6,390  | 14,200 | 70,800 | 19,000 | 29,100 | 26,300 | 19,000 | 19,700 | 10,100 | 4,440 | 3,320 |
| 6   | 2,400 | 6,390  | 12,200 | 46,400 | 18,200 | 25,500 | 23,500 | 19,300 | 20,800 | 10,100 | 4,440 | 3,320 |
| 7   | 2,400 | 21,400 | 10,700 | 42,800 | 16,100 | 22,700 | 21,500 | 21,900 | 20,000 | 9,540  | 4,440 | 3,320 |
| 8   | 2,400 | 17,500 | 9,800  | 39,000 | 16,100 | 23,900 | 20,400 | 22,300 | 19,300 | 9,540  | 4,440 | 3,320 |
| 9   | 2,400 | 11,900 | 8,920  | 33,000 | 16,100 | 23,900 | 19,000 | 23,900 | 20,000 | 9,540  | 4,210 | 3,540 |
| 10  | 2,400 | 19,800 | 7,770  | 30,700 | 15,100 | 22,700 | 17,500 | 27,100 | 38,500 | 9,240  | 4,210 | 3,540 |
| 11  | 2,400 | 14,900 | 6,650  | 29,900 | 13,700 | 23,900 | 15,800 | 25,100 | 51,100 | 8,940  | 4,210 | 3,320 |
| 12  | 2,400 | 11,000 | 6,390  | 27,100 | 15,400 | 26,300 | 14,700 | 21,900 | 43,700 | 8,550  | 4,210 | 3,320 |
| 13  | 2,400 | 9,210  | 6,390  | 23,500 | 20,000 | 30,700 | 14,700 | 19,300 | 34,800 | 8,070  | 4,210 | 3,320 |
| 14  | 2,400 | 8,050  | 6,120  | 21,100 | 23,500 | 33,600 | 15,400 | 17,900 | 33,100 | 7,790  | 4,210 | 3,320 |
| 15  | 2,400 | 10,700 | 5,120  | 21,900 | 23,900 | 29,500 | 15,400 | 17,200 | 31,900 | 7,510  | 3,980 | 3,320 |
| 16  | 2,600 | 13,800 | 5,850  | 21,900 | 35,200 | 26,300 | 16,800 | 17,500 | 29,900 | 7,240  | 3,980 | 3,320 |
| 17  | 3,240 | 25,400 | 5,590  | 20,400 | 43,700 | 24,700 | 17,500 | 17,900 | 27,500 | 7,240  | 3,980 | 3,540 |
| 18  | 4,370 | 25,800 | 5,590  | 18,200 | 37,300 | 26,300 | 16,500 | 18,600 | 24,300 | 6,970  | 3,980 | 3,980 |
| 19  | 4,140 | 21,800 | 8,920  | 16,800 | 31,500 | 22,700 | 15,100 | 19,300 | 20,800 | 6,700  | 3,980 | 3,980 |
| 20  | 3,460 | 17,100 | 16,700 | 16,800 | 29,300 | 21,900 | 13,700 | 18,200 | 18,200 | 6,440  | 3,980 | 3,980 |
| 21  | 3,240 | 13,200 | 32,300 | 16,100 | 23,900 | 21,900 | 12,300 | 17,500 | 16,500 | 6,180  | 3,760 | 3,980 |
| 22  | 3,020 | 12,200 | 31,500 | 15,800 | 24,300 | 25,100 | 12,300 | 17,500 | 15,100 | 5,920  | 3,760 | 3,980 |
| 23  | 3,240 | 11,300 | 31,900 | 15,400 | 27,900 | 21,900 | 13,000 | 16,500 | 14,400 | 5,660  | 3,760 | 4,210 |
| 24  | 5,850 | 10,100 | 36,000 | 15,100 | 31,900 | 19,700 | 15,800 | 17,900 | 14,400 | 5,410  | 3,760 | 4,440 |
| 25  | 5,080 | 9,210  | 37,300 | 14,700 | 32,300 | 17,900 | 18,200 | 20,400 | 13,700 | 5,160  | 3,540 | 4,440 |
| 26  | 4,370 | 8,630  | 35,200 | 20,000 | 28,300 | 16,500 | 18,600 | 22,300 | 13,300 | 5,160  | 3,540 | 4,680 |
| 27  | 3,680 | 8,050  | 36,500 | 27,500 | 25,900 | 15,400 | 17,900 | 25,100 | 14,700 | 4,920  | 3,540 | 4,440 |
| 28  | 3,460 | 7,210  | 46,900 | 39,000 | 28,700 | 17,200 | 17,500 | 22,700 | 14,400 | 4,920  | 3,540 | 4,440 |
| 29  | 3,240 | 7,210  | 48,300 | 39,000 | -----  | 20,000 | 20,000 | 20,400 | 14,000 | 4,920  | 3,320 | 4,210 |
| 30  | 3,240 | 8,630  | 42,000 | 31,900 | -----  | 22,700 | 20,800 | 21,500 | 13,000 | 4,680  | 3,320 | 4,210 |
| 31  | 3,240 | -----  | 38,100 | 28,500 | -----  | 25,100 | -----  | 23,900 | -----  | 4,680  | 3,320 | ----- |

| Month     | Maximum | Minimum | Mean   | Per square mile | Run-off |            |
|-----------|---------|---------|--------|-----------------|---------|------------|
|           |         |         |        |                 | Inches  | Acres-feet |
| October   | 5,850   | 2,400   | 3,080  | 0.636           | 0.73    | 189,000    |
| November  | 25,800  | 3,240   | 11,800 | 2.44            | 2.72    | 702,000    |
| December  | 48,300  | 5,590   | 19,400 | 4.01            | 4.62    | 1,190,000  |
| January   | 90,000  | 14,700  | 31,800 | 6.57            | 7.57    | 1,960,000  |
| February  | 43,700  | 13,700  | 24,900 | 5.14            | 5.35    | 1,380,000  |
| March     | 33,600  | 15,400  | 24,700 | 5.10            | 5.88    | 1,520,000  |
| April     | 29,100  | 12,300  | 18,500 | 3.82            | 4.26    | 1,100,000  |
| May       | 27,100  | 16,500  | 20,200 | 4.17            | 4.81    | 1,240,000  |
| June      | 51,100  | 13,000  | 22,700 | 4.69            | 5.23    | 1,350,000  |
| July      | 12,000  | 4,680   | 7,600  | 1.57            | 1.81    | 467,000    |
| August    | 4,680   | 3,320   | 4,000  | .826            | .95     | 246,000    |
| September | 4,680   | 3,320   | 3,740  | .773            | .86     | 223,000    |
| The year  | 90,000  | 2,400   | 16,000 | 3.31            | 44.79   | 11,600,000 |

## WILLAMETTE RIVER AT SALEM, OREG.

LOCATION.—Staff gage in SW¼ sec. 22, T. 7 S., R. 3 W., at highway bridge at Salem. Zero of gage is 113.59 feet above mean sea level by general adjustment of 1929.

DRAINAGE AREA.—7,280 square miles.

RECORDS AVAILABLE.—October 1909 to December 1916, October 1927 to September 1933.

DISCHARGE.—Maximum during year, 115,000 second-feet Jan. 5 (gage height, 16.3 feet); minimum, 3,170 second-feet Oct. 1-12 (gage height, -3.4 feet).

1909-16, 1927-33: Maximum, 315,000 second-feet Nov. 25, 1909 (gage height, 30.5 feet); minimum, 2,500 second-feet Sept. 5-8, 1931 (gage height, -3.5 feet). Average, 13 years (1909-16, 1927-33), 22,300 second-feet.

Maximum known discharge (estimated), 500,000 second-feet Dec. 4, 1861 (gage height, about 39 feet). Flood of Feb. 5, 1890, reached a stage of 37.1 feet.

REMARKS.—Records good. Discharge estimated May 31. A few small irrigation diversions above station; part of flow of Salem Canal diverted from North Santiam River returns to Willamette River below gage. No regulation. Gage-height record furnished by U.S. Weather Bureau.

*Discharge, in second-feet, 1932-33*

| Day     | Oct.   | Nov.   | Dec.   | Jan.    | Feb.   | Mar.   | Apr.   | May    | June   | July   | Aug.  | Sept.  |
|---------|--------|--------|--------|---------|--------|--------|--------|--------|--------|--------|-------|--------|
| 1.....  | 3,170  | 5,310  | 17,700 | 57,300  | 37,100 | 50,400 | 46,500 | 33,000 | 38,200 | 18,500 | 6,410 | 4,050  |
| 2.....  | 3,170  | 7,880  | 18,400 | 68,800  | 39,300 | 50,400 | 44,000 | 30,000 | 33,000 | 17,800 | 6,410 | 4,050  |
| 3.....  | 3,170  | 14,300 | 29,500 | 100,000 | 36,000 | 50,400 | 37,100 | 30,000 | 31,000 | 17,100 | 5,880 | 4,050  |
| 4.....  | 3,170  | 15,600 | 31,600 | 110,000 | 31,000 | 47,800 | 40,400 | 29,100 | 31,000 | 17,100 | 5,880 | 4,050  |
| 5.....  | 3,170  | 14,300 | 26,600 | 115,000 | 27,300 | 44,000 | 41,600 | 31,000 | 33,000 | 16,400 | 5,880 | 4,050  |
| 6.....  | 3,170  | 22,200 | 22,200 | 93,000  | 26,400 | 38,200 | 37,100 | 33,000 | 32,000 | 15,700 | 5,880 | 4,050  |
| 7.....  | 3,170  | 39,600 | 19,100 | 79,700  | 25,600 | 36,000 | 34,000 | 35,000 | 31,000 | 15,400 | 5,880 | 4,440  |
| 8.....  | 3,170  | 34,400 | 17,700 | 69,500  | 24,700 | 40,400 | 32,000 | 35,000 | 30,000 | 15,000 | 5,880 | 5,360  |
| 9.....  | 3,170  | 42,000 | 15,600 | 58,300  | 23,100 | 40,400 | 30,000 | 39,300 | 47,800 | 14,700 | 5,880 | 4,870  |
| 10..... | 3,170  | 39,600 | 13,600 | 54,300  | 22,300 | 37,100 | 28,200 | 41,600 | 79,700 | 14,700 | 5,620 | 4,440  |
| 11..... | 3,170  | 30,500 | 11,200 | 50,400  | 20,000 | 38,200 | 24,700 | 39,300 | 84,500 | 14,400 | 5,360 | 4,050  |
| 12..... | 3,170  | 23,000 |        | 45,200  | 23,100 | 44,000 | 23,100 | 34,000 | 70,200 | 13,100 | 5,360 | 4,050  |
| 13..... | 3,450  | 17,700 |        | 38,200  | 30,000 | 53,000 | 24,700 | 31,000 | 59,700 | 12,400 | 5,360 | 4,050  |
| 14..... | 4,080  | 17,000 |        | 34,000  | 33,000 | 55,000 | 23,900 | 28,200 | 54,300 | 12,400 | 5,360 | 4,050  |
| 15..... | 4,450  | 20,300 | 10,000 | 34,000  | 33,000 | 47,800 | 26,400 | 28,200 | 51,700 | 11,800 | 5,110 | 4,050  |
| 16..... | 3,310  | 29,500 |        | 35,000  | 45,200 | 41,600 | 24,700 | 30,000 | 47,800 | 11,800 | 4,870 | 5,880  |
| 17..... | 4,860  | 48,100 |        | 32,000  | 57,000 | 41,600 | 27,300 | 30,000 | 44,000 | 11,800 | 4,870 | 6,410  |
| 18..... | 7,340  | 48,100 | 10,100 | 27,300  | 54,300 | 41,600 | 25,600 | 33,000 | 37,100 | 11,100 | 4,870 | 6,410  |
| 19..... | 7,340  | 39,600 | 14,300 | 27,300  | 45,200 | 38,200 | 23,100 | 33,000 | 32,000 | 10,500 | 4,870 | 5,880  |
| 20..... | 5,780  | 30,500 | 37,200 | 26,400  | 38,200 | 35,500 | 22,300 | 31,000 | 27,300 | 9,260  | 4,870 | 5,880  |
| 21..... | 4,860  | 23,900 | 51,900 | 23,900  | 35,000 | 37,100 | 21,500 | 31,000 | 24,700 | 9,260  | 4,870 | 5,880  |
| 22..... | 4,650  | 21,900 | 51,900 | 25,600  | 36,000 | 39,300 | 21,500 | 29,100 | 23,100 | 8,660  | 4,650 | 6,410  |
| 23..... | 5,310  | 19,100 | 51,900 | 23,900  | 42,800 | 36,000 | 23,100 | 28,200 | 23,100 | 8,660  | 4,440 | 8,660  |
| 24..... | 9,800  | 17,700 | 58,700 | 23,100  | 54,300 | 32,000 | 25,600 | 31,000 | 22,300 | 8,370  | 4,440 | 9,260  |
| 25..... | 10,100 | 15,600 | 60,100 | 25,600  | 50,400 | 28,200 | 29,100 | 33,000 | 22,300 | 8,080  | 4,440 | 9,260  |
| 26..... | 7,880  | 14,300 | 54,600 | 28,200  | 50,400 | 26,400 | 31,000 | 38,200 | 22,300 | 8,080  | 4,440 | 10,500 |
| 27..... | 6,810  | 13,000 | 69,500 | 45,800  | 41,600 | 23,900 | 31,000 | 40,400 | 23,100 | 7,510  | 4,050 | 9,260  |
| 28..... | 6,290  | 12,400 | 78,100 | 55,700  | 46,500 | 26,400 | 30,000 | 36,000 | 22,300 | 7,510  | 4,050 | 8,660  |
| 29..... | 5,310  | 13,000 | 78,900 | 57,000  | -----  | 33,000 | 34,000 | 34,000 | 21,500 | 6,950  | 4,050 | 8,080  |
| 30..... | 5,310  | 15,600 | 70,300 | 47,800  | -----  | 37,100 | 36,000 | 36,000 | 20,700 | 6,410  | 4,050 | 8,660  |
| 31..... | 4,860  | -----  | 61,500 | 39,300  | -----  | 42,800 | -----  | 37,100 | -----  | 6,410  | 4,050 | -----  |

| Month          | Maximum | Minimum | Mean   | Per square mile | Run-off |            |
|----------------|---------|---------|--------|-----------------|---------|------------|
|                |         |         |        |                 | Inches  | Acres-foot |
| October.....   | 10,100  | 3,170   | 4,830  | 0.663           | 0.76    | 297,000    |
| November.....  | 48,100  | 5,310   | 23,500 | 3.23            | 3.60    | 1,400,000  |
| December.....  | 78,900  | -----   | 33,300 | 4.57            | 5.27    | 2,050,000  |
| January.....   | 115,000 | 23,100  | 50,100 | 6.88            | 7.93    | 3,080,000  |
| February.....  | 57,000  | 20,000  | 36,700 | 5.04            | 5.25    | 2,040,000  |
| March.....     | 55,000  | 23,900  | 39,800 | 5.47            | 6.31    | 2,450,000  |
| April.....     | 46,500  | 21,500  | 30,000 | 4.12            | 4.60    | 1,790,000  |
| May.....       | 41,600  | 28,200  | 33,200 | 4.56            | 5.26    | 2,040,000  |
| June.....      | 84,500  | 20,700  | 37,400 | 5.14            | 5.74    | 2,230,000  |
| July.....      | 18,500  | 6,410   | 11,800 | 1.62            | 1.87    | 726,000    |
| August.....    | 6,410   | 4,050   | 5,100  | .701            | .81     | 314,000    |
| September..... | 10,500  | 4,050   | 5,960  | .819            | .91     | 355,000    |
| The year.....  | 115,000 | 3,170   | 25,900 | 3.56            | 48.31   | 18,800,000 |

## COAST FORK OF WILLAMETTE RIVER AT SAGINAW, OREG.

LOCATION.—Chain gage in NW¼ sec. 15, T. 20 S., R. 3 W., at Saginaw, 1 mile below mouth of Row River. Zero of gage is 595.47 feet above mean sea level by general adjustment of 1929.

DRAINAGE AREA.—529 square miles.

RECORDS AVAILABLE.—October 1923 to September 1933.

DISCHARGE.—Maximum during year, 26,100 second-feet Jan. 2 (gage height, 12.64 feet); minimum, 33 second-feet Oct. 8–13 (gage height, 0.86 foot).

1923–33: Maximum, 28,600 second-feet Feb. 20, 1927 (gage height, 12.9 feet); minimum, 7 second-feet July 31, 1928.

REMARKS.—Records fair. No diversions or regulation above station. Gage-height record October to April furnished by U.S. Weather Bureau.

*Discharge, in second-feet, 1932–33*

| Day     | Oct. | Nov.               | Dec.               | Jan.   | Feb.               | Mar.               | Apr.  | May                | June             | July | Aug. | Sept. |
|---------|------|--------------------|--------------------|--------|--------------------|--------------------|-------|--------------------|------------------|------|------|-------|
| 1.....  | 39   | 113                | 1,260              | 4,070  | 3,920              | 3,490              | 2,540 | 1,260              | 1,160            | 379  | 106  | 61    |
| 2.....  | 36   | 195                | 925                | 17,700 | 2,800              | <sup>a</sup> 4,370 | 2,160 | 1,470              | 1,210            | 355  | 106  | 52    |
| 3.....  | 36   | 1,020              | 1,060              | 11,000 | 2,410              | 3,920              | 2,800 | 1,580              | 1,260            | 355  | 141  | 61    |
| 4.....  | 36   | 518                | 880                | 5,520  | 2,410              | 2,800              | 2,670 | 1,920              | 1,110            | 295  | 113  | 66    |
| 5.....  | 36   | 252                | 715                | 4,680  | 2,410              | 2,410              | 2,410 | 2,670              | 1,060            | 284  | 141  | 71    |
| 6.....  | 36   | 6,420              | 635                | 4,840  | 2,800              | 2,670              | 2,410 | 2,540              | 970              | 273  | 126  | 93    |
| 7.....  | 36   | 1,580              | 555                | 4,070  | 2,280              | 2,670              | 1,690 | 2,670              | 970              | 273  | 113  | 93    |
| 8.....  | 33   | 480                | 448                | 3,350  | 2,040              | 2,800              | 1,580 | 2,930              | 970              | 262  | 106  | 93    |
| 9.....  | 33   | 2,800              | 355                | 2,930  | 1,800              | 2,930              | 1,470 | 3,630              | 3,770            | 251  | 93   | 66    |
| 10..... | 33   | 1,360              | 343                | 3,350  | <sup>a</sup> 1,400 | 2,280              | 1,260 | 2,800              | 3,070            | 240  | 93   | 61    |
| 11..... | 33   | 675                | 240                | 2,800  | 1,470              | 2,410              | 1,260 | 2,280              | 2,160            | 222  | 82   | 61    |
| 12..... | 33   | 635                | 231                | 2,410  | 1,690              | 3,630              | 1,360 | 1,920              | 1,800            | 213  | 82   | 57    |
| 13..... | 33   | 448                | <sup>a</sup> 220   | 2,160  | 2,280              | 3,490              | 1,470 | 1,800              | 1,690            | 195  | 77   | 57    |
| 14..... | 48   | 715                | <sup>a</sup> 220   | 2,410  | 2,040              | 2,670              | 1,470 | 1,690              | 1,470            | 187  | 77   | 61    |
| 15..... | 106  | 1,360              | <sup>a</sup> 220   | 2,040  | <sup>a</sup> 5,000 | 2,280              | 1,800 | 1,690              | <sup>a</sup> 210 | 179  | 61   | 113   |
| 16..... | 119  | 3,770              | <sup>a</sup> 270   | 2,160  | 8,520              | 2,280              | 1,690 | 1,580              | 1,160            | 179  | 66   | 163   |
| 17..... | 555  | <sup>a</sup> 3,000 | 343                | 1,920  | 4,220              | 2,670              | 1,470 | 1,690              | 838              | 171  | 66   | 119   |
| 18..... | 284  | 1,580              | 415                | 1,800  | 3,210              | 2,280              | 1,360 | 1,800              | 795              | 171  | 61   | 93    |
| 19..... | 148  | 1,160              | 1,470              | 1,580  | 2,540              | 2,040              | 1,210 | 1,690              | 635              | 163  | 57   | 106   |
| 20..... | 119  | 880                | 4,620              | 1,260  | 1,920              | 2,280              | 1,160 | 1,580              | <sup>a</sup> 580 | 155  | 61   | 113   |
| 21..... | 100  | 715                | 3,350              | 1,470  | 2,410              | 2,670              | 1,210 | 1,470              | <sup>a</sup> 550 | 141  | 66   | 141   |
| 22..... | 119  | 675                | 2,160              | 1,360  | 2,800              | 2,160              | 1,260 | 1,360              | <sup>a</sup> 530 | 133  | 71   | 141   |
| 23..... | 880  | 675                | <sup>a</sup> 4,000 | 1,360  | 3,350              | 1,800              | 1,580 | <sup>a</sup> 1,690 | 518              | 126  | 52   | 231   |
| 24..... | 391  | 555                | 4,070              | 1,360  | 3,350              | 1,690              | 1,690 | 1,920              | <sup>a</sup> 520 | 126  | 52   | 213   |
| 25..... | 240  | 403                | 3,920              | 1,800  | 2,540              | 1,470              | 1,580 | 1,800              | <sup>a</sup> 580 | 126  | 52   | 171   |
| 26..... | 179  | 343                | 4,370              | 1,580  | 2,670              | 1,360              | 1,470 | 1,800              | <sup>a</sup> 540 | 126  | 48   | 179   |
| 27..... | 148  | 355                | 7,200              | 7,200  | 2,930              | 1,360              | 1,360 | 1,470              | 480              | 119  | 48   | 148   |
| 28..... | 133  | 448                | 4,840              | 3,770  | 2,670              | 2,040              | 1,800 | 1,470              | 448              | 119  | 57   | 126   |
| 29..... | 119  | 448                | 4,370              | 2,800  | -----              | 2,160              | 1,690 | 1,690              | 415              | 113  | 61   | 148   |
| 30..... | 113  | 1,800              | 4,680              | 2,410  | -----              | 2,160              | 1,470 | 1,690              | 403              | 106  | 61   | 171   |
| 31..... | 113  | -----              | 3,210              | 2,280  | -----              | 3,350              | ----- | 1,470              | -----            | 106  | 66   | ----- |

| Month          | Maximum | Minimum | Mean  | Per square mile | Run-off |            |
|----------------|---------|---------|-------|-----------------|---------|------------|
|                |         |         |       |                 | Inches  | Acres-feet |
| October.....   | 880     | 33      | 141   | 0.267           | 0.31    | 8,670      |
| November.....  | 6,420   | 113     | 1,180 | 2.23            | 2.49    | 70,200     |
| December.....  | 7,200   | 220     | 1,980 | 3.74            | 4.31    | 122,000    |
| January.....   | 17,700  | 1,260   | 3,630 | 6.67            | 7.69    | 217,000    |
| February.....  | 8,520   | 1,400   | 2,850 | 5.39            | 5.61    | 158,000    |
| March.....     | 4,370   | 1,360   | 2,540 | 4.80            | 5.53    | 156,000    |
| April.....     | 2,800   | 1,160   | 1,600 | 3.18            | 3.55    | 100,000    |
| May.....       | 3,630   | 1,260   | 1,980 | 3.69            | 4.14    | 117,000    |
| June.....      | 3,770   | 403     | 1,100 | 2.08            | 2.32    | 65,500     |
| July.....      | 379     | 106     | 198   | .374            | .43     | 12,200     |
| August.....    | 141     | 48      | 79.4  | .150            | .17     | 4,880      |
| September..... | 281     | 52      | 111   | .210            | .23     | 6,600      |
| The year.....  | 17,700  | 33      | 1,430 | 2.70            | 36.78   | 1,040,000  |

<sup>a</sup> Estimated.

## McKENZIE RIVER AT McKENZIE BRIDGE, OREG.

LOCATION.—Water-stage recorder in NE¼ sec. 18, T. 16 S., R. 6 E., 1.7 miles east of McKenzie Bridge. Zero of gage is 1,418.92 feet above mean sea level by general adjustment of 1929.

DRAINAGE AREA.—353 square miles (at measuring section three-quarters of a mile above gage).

RECORDS AVAILABLE.—August 1910 to September 1933.

DISCHARGE.—Maximum during year, 7,150 second-feet June 9 (gage height, 4.86 feet); minimum, 1,030 second-feet Oct. 20, 21 (gage height, 1.04 feet).

1910-33: Maximum, 18,000 second-feet Jan. 6, 1923 (gage height, 8.3 feet from high-water marks at former gage at highway bridge); minimum, 805 second-feet Oct. 20, 1931. Average, 14 years (1913-14, 1915-16, 1918-21, 1923-25, 1926-33), 1,650 second-feet.

REMARKS.—Records good except those estimated, Jan. 14 to Feb. 16, which are fair. No diversions or regulation above station.

*Discharge, in second-feet, 1932-33*

| Day | Oct.  | Nov.  | Dec.  | Jan.  | Feb.  | Mar.  | Apr.  | May   | June  | July  | Aug.  | Sept. |
|-----|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 1   | 1,060 | 1,080 | 1,470 | 1,680 |       | 1,300 | 1,740 | 2,300 | 2,940 | 2,860 | 1,520 | 1,300 |
| 2   | 1,060 | 1,170 | 2,000 | 1,740 |       | 1,310 | 1,800 | 2,300 | 2,940 | 2,780 | 1,520 | 1,290 |
| 3   | 1,060 | 1,150 | 2,000 | 1,620 |       | 1,320 | 2,000 | 2,220 | 3,280 | 2,780 | 1,520 | 1,280 |
| 4   | 1,030 | 1,130 | 1,800 | 1,570 |       | 1,290 | 2,000 | 2,370 | 3,370 | 2,690 | 1,470 | 1,270 |
| 5   | 1,060 | 2,140 | 1,680 | 1,740 |       | 1,280 | 1,930 | 2,370 | 3,280 | 2,610 | 1,470 | 1,290 |
| 6   | 1,060 | 2,300 | 1,620 | 2,070 |       | 1,280 | 1,860 | 2,300 | 3,200 | 2,610 | 1,470 | 1,290 |
| 7   | 1,060 | 1,570 | 1,570 | 1,930 |       | 1,370 | 1,860 | 2,300 | 3,120 | 2,530 | 1,470 | 1,290 |
| 8   | 1,060 | 1,860 | 1,470 | 1,800 |       | 1,380 | 1,740 | 2,220 | 4,640 | 2,530 | 1,420 | 1,260 |
| 9   | 1,050 | 1,930 | 1,420 | 1,860 | 1,140 | 1,360 | 1,680 | 2,140 | 6,750 | 2,450 | 1,420 | 1,250 |
| 10  | 1,050 | 1,570 | 1,420 | 1,800 |       | 1,360 | 1,620 | 2,070 | 5,590 | 2,300 | 1,420 | 1,240 |
| 11  | 1,050 | 1,470 | 1,370 | 1,740 |       | 1,370 | 1,620 | 2,000 | 4,740 | 2,220 | 1,420 | 1,240 |
| 12  | 1,050 | 1,380 | 1,360 | 1,680 |       | 1,520 | 1,620 | 1,930 | 4,740 | 2,220 | 1,420 | 1,230 |
| 13  | 1,080 | 1,520 | 1,340 | 1,620 |       | 1,570 | 1,620 | 1,930 | 5,020 | 2,140 | 1,420 | 1,230 |
| 14  | 1,080 | 1,680 | 1,330 |       |       | 1,520 | 1,680 | 2,000 | 5,020 | 2,070 | 1,420 | 1,270 |
| 15  | 1,070 | 2,070 | 1,320 |       |       | 1,520 | 1,740 | 2,070 | 4,740 | 2,070 | 1,420 | 1,270 |
| 16  | 1,090 | 2,690 | 1,300 |       |       | 1,520 | 1,740 | 2,070 | 4,360 | 2,000 | 1,420 | 1,250 |
| 17  | 1,070 | 2,610 | 1,290 |       | 1,180 | 1,570 | 1,740 | 2,140 | 3,910 | 1,930 | 1,420 | 1,250 |
| 18  | 1,050 | 2,220 | 1,310 |       | 1,180 | 1,520 | 1,680 | 2,070 | 3,640 | 1,860 | 1,380 | 1,250 |
| 19  | 1,040 | 1,930 | 1,570 |       | 1,180 | 1,520 | 1,620 | 2,070 | 3,460 | 1,800 | 1,380 | 1,230 |
| 20  | 1,030 | 1,800 | 1,520 |       | 1,170 | 1,620 | 1,620 | 2,070 | 3,280 | 1,740 | 1,380 | 1,240 |
| 21  | 1,030 | 1,740 | 1,420 |       | 1,200 | 1,680 | 1,620 | 2,000 | 3,280 | 1,740 | 1,360 | 1,250 |
| 22  | 1,110 | 1,680 | 1,420 | 1,310 | 1,220 | 1,620 | 1,740 | 2,000 | 3,200 | 1,680 | 1,360 | 1,300 |
| 23  | 1,080 | 1,620 | 1,520 |       | 1,280 | 1,570 | 1,930 | 2,300 | 3,200 | 1,680 | 1,360 | 1,270 |
| 24  | 1,060 | 1,570 | 1,470 |       | 1,280 | 1,520 | 2,070 | 2,530 | 3,200 | 1,680 | 1,350 | 1,280 |
| 25  | 1,050 | 1,520 | 1,470 |       | 1,260 | 1,470 | 2,140 | 2,860 | 3,460 | 1,680 | 1,340 | 1,280 |
| 26  | 1,050 | 1,470 | 1,620 |       | 1,270 | 1,420 | 2,070 | 2,860 | 3,460 | 1,620 | 1,340 | 1,270 |
| 27  | 1,050 | 1,420 | 1,860 |       | 1,270 | 1,420 | 2,220 | 2,780 | 3,370 | 1,620 | 1,330 | 1,270 |
| 28  | 1,050 | 1,420 | 1,930 |       | 1,290 | 1,570 | 2,610 | 2,780 | 3,200 | 1,620 | 1,330 | 1,270 |
| 29  | 1,050 | 1,420 | 1,800 |       |       | 1,620 | 2,610 | 3,200 | 3,030 | 1,570 | 1,320 | 1,270 |
| 30  | 1,050 | 1,470 | 1,800 |       |       | 1,680 | 2,450 | 3,370 | 2,860 | 1,570 | 1,310 | 1,260 |
| 31  | 1,060 |       | 1,680 |       |       | 1,800 |       | 3,200 |       | 1,570 | 1,310 |       |

| Month     | Maximum | Minimum | Mean  | Per square mile | Run-off |           |
|-----------|---------|---------|-------|-----------------|---------|-----------|
|           |         |         |       |                 | Inches  | Acre-feet |
| October   | 1,110   | 1,030   | 1,060 | 3.00            | 3.46    | 65,200    |
| November  | 2,690   | 1,080   | 1,690 | 4.79            | 5.34    | 101,000   |
| December  | 2,000   | 1,290   | 1,550 | 4.39            | 5.06    | 95,300    |
| January   | 2,070   |         | 1,500 | 4.25            | 4.90    | 92,200    |
| February  | 1,290   |         | 1,180 | 3.34            | 4.38    | 65,500    |
| March     | 1,800   | 1,280   | 1,480 | 4.19            | 4.83    | 91,000    |
| April     | 2,610   | 1,620   | 1,880 | 5.33            | 5.95    | 112,000   |
| May       | 3,370   | 1,930   | 2,350 | 6.66            | 7.68    | 144,000   |
| June      | 6,750   | 2,860   | 3,810 | 10.79           | 12.04   | 227,000   |
| July      | 2,860   | 1,570   | 2,070 | 5.88            | 6.76    | 127,000   |
| August    | 1,520   | 1,310   | 1,400 | 3.97            | 4.58    | 86,100    |
| September | 1,300   | 1,230   | 1,260 | 3.57            | 3.98    | 75,000    |
| The year  | 6,750   | 1,030   | 1,770 | 5.01            | 68.06   | 1,280,000 |

## McKENZIE RIVER NEAR VIDA, OREG.

LOCATION.—Water-stage recorder in NE¼ sec. 5, T. 17 S., R. 3 E., 1 mile above head of Martin Rapids and 5 miles east of Vida. Zero of gage is 855.56 feet above mean sea level by general adjustment of 1929.

DRAINAGE AREA.—930 square miles.

RECORDS AVAILABLE.—September 1924 to September 1933. At Martin Rapids (gage heights only), June 1910 to March 1911.

DISCHARGE.—Maximum during year, 24,900 second-feet June 9 (gage height, 8.60 feet); minimum, 1,470 second-feet Oct. 11 (gage height, 0.56 foot).

1924-33: Maximum, 47,200 second-feet Feb. 20, 1927 (gage height, 14.2 feet); minimum, 1,260 second-feet Nov. 7, 1930, Sept. 17, Oct. 4, 8, 9, 1931 (gage height, 0.36 foot).

Flood of Jan. 6, 1923, reached a stage of 17.25 feet (estimated discharge, 60,000 second-feet).

REMARKS.—Records excellent except those estimated, Oct. 28, 29, 31, Nov. 1-5, 15-20, which are good. No diversion or regulation above station. Gage-height record furnished by Eugene Water Board.

*Discharge, in second-feet, 1932-33*

| Day     | Oct.  | Nov.  | Dec.  | Jan.  | Feb.  | Mar.  | Apr.  | May   | June   | July  | Aug.  | Sept. |
|---------|-------|-------|-------|-------|-------|-------|-------|-------|--------|-------|-------|-------|
| 1-----  | 1,520 | 2,780 | 3,010 | 5,200 | 3,360 | 4,620 | 5,820 | 6,200 | 7,510  | 4,940 | 2,510 | 1,980 |
| 2-----  | 1,520 |       | 5,670 | 8,320 | 3,100 | 4,400 | 5,820 | 6,080 | 7,510  | 4,940 | 2,510 | 1,980 |
| 3-----  | 1,520 |       | 6,080 | 6,330 | 2,920 | 4,510 | 7,510 | 5,700 | 8,320  | 4,940 | 2,430 | 1,980 |
| 4-----  | 1,510 |       | 4,730 | 5,080 | 2,840 | 4,100 | 7,240 | 6,460 | 8,600  | 4,620 | 2,510 | 1,900 |
| 5-----  | 1,510 |       | 4,100 | 6,080 | 2,920 | 3,820 | 6,460 | 6,720 | 8,320  | 4,510 | 2,430 | 1,980 |
| 6-----  | 1,510 | 8,880 | 3,720 | 8,320 | 3,010 | 3,910 | 6,200 | 6,330 | 8,050  | 4,400 | 2,430 | 2,120 |
| 7-----  | 1,500 | 4,620 | 3,450 | 6,980 | 2,920 | 5,320 | 5,700 | 6,200 | 7,510  | 4,400 | 2,350 | 1,980 |
| 8-----  | 1,500 | 5,180 | 3,180 | 6,200 | 2,920 | 4,960 | 5,200 | 5,950 | 12,500 | 4,300 | 2,350 | 1,980 |
| 9-----  | 1,490 | 6,330 | 2,840 | 6,460 | 2,590 | 4,400 | 4,620 | 5,820 | 23,400 | 4,200 | 2,350 | 1,900 |
| 10----- | 1,490 | 4,200 | 2,760 | 6,460 | 2,670 | 4,300 | 4,300 | 5,320 | 17,300 | 3,910 | 2,280 | 1,900 |
| 11----- | 1,480 | 3,450 | 2,670 | 5,580 | 2,760 | 4,400 | 4,200 | 4,940 | 12,900 | 3,720 | 2,280 | 1,900 |
| 12----- | 1,480 | 3,010 | 2,590 | 4,940 | 3,540 | 6,460 | 4,510 | 4,730 | 12,300 | 3,720 | 2,280 | 1,900 |
| 13----- | 1,570 | 3,270 | 2,590 | 4,620 | 3,540 | 6,330 | 4,400 | 4,940 | 12,600 | 3,630 | 2,280 | 1,830 |
| 14----- | 1,760 | 4,730 | 2,510 | 4,730 | 3,180 | 5,450 | 4,940 | 5,080 | 11,900 | 3,540 | 2,280 | 1,980 |
| 15----- | 1,630 |       | 2,430 | 4,620 | 4,000 | 4,960 | 5,450 | 5,450 | 11,300 | 3,540 | 2,200 | 2,280 |
| 16----- | 2,050 | 6,530 | 2,430 | 4,200 | 4,200 | 5,450 | 5,320 | 5,450 | 10,100 | 3,450 | 2,200 | 2,050 |
| 17----- | 1,980 |       | 2,430 | 3,910 | 3,540 | 5,700 | 4,940 | 5,820 | 8,600  | 3,270 | 2,200 | 1,980 |
| 18----- | 1,700 |       | 2,590 | 3,720 | 3,360 | 5,200 | 4,400 | 5,700 | 7,510  | 3,180 | 2,220 | 2,050 |
| 19----- | 1,580 |       | 5,000 | 3,540 | 3,100 | 5,080 | 4,100 | 5,450 | 6,980  | 3,100 | 2,200 | 1,980 |
| 20----- | 1,550 |       | 4,730 | 3,360 | 3,100 | 6,330 | 4,100 | 5,700 | 6,460  | 3,010 | 2,200 | 1,980 |
| 21----- | 1,520 | 3,910 | 4,000 | 3,270 | 3,540 | 6,200 | 4,510 | 5,450 | 6,330  | 2,920 | 2,120 | 2,050 |
| 22----- | 2,250 | 3,820 | 3,630 | 3,180 | 4,200 | 5,320 | 5,080 | 5,450 | 6,080  | 2,920 | 2,120 | 2,430 |
| 23----- | 2,280 | 3,540 | 4,730 | 3,100 | 5,200 | 4,730 | 6,200 | 6,460 | 6,080  | 2,840 | 2,120 | 2,280 |
| 24----- | 1,900 | 3,270 | 4,300 | 3,010 | 4,400 | 4,300 | 6,720 | 7,510 | 5,820  | 2,840 | 2,120 | 2,350 |
| 25----- | 1,700 | 3,100 | 4,300 | 2,920 | 3,820 | 4,000 | 6,720 | 8,600 | 6,460  | 2,760 | 2,050 | 2,430 |
| 26----- | 1,700 | 2,920 | 6,980 | 3,010 | 4,200 | 3,820 | 6,200 | 8,600 | 6,460  | 2,760 | 2,050 | 2,280 |
| 27----- | 1,630 | 2,840 | 7,780 | 3,540 | 4,100 | 3,910 | 6,980 | 7,510 | 6,200  | 2,670 | 2,050 | 2,200 |
| 28----- | 1,620 | 2,840 | 7,510 | 3,270 | 4,100 | 5,200 | 8,050 | 7,510 | 5,950  | 2,590 | 2,050 | 2,120 |
| 29----- | 1,620 | 2,920 | 6,460 | 3,100 | ----- | 5,700 | 7,780 | 8,600 | 5,450  | 2,590 | 2,050 | 2,280 |
| 30----- | 1,610 | 3,010 | 6,080 | 2,920 | ----- | 5,950 | 6,720 | 9,470 | 5,080  | 2,590 | 2,050 | 2,120 |
| 31----- | 1,620 | ----- | 5,450 | 3,180 | ----- | 6,720 | ----- | 8,600 | -----  | 2,510 | 1,980 | ----- |

| Month          | Maximum | Minimum | Mean  | Per square mile | Run-off |           |
|----------------|---------|---------|-------|-----------------|---------|-----------|
|                |         |         |       |                 | Inches  | Acre-feet |
| October-----   | 2,280   | 1,480   | 1,650 | 1.77            | 2.04    | 101,000   |
| November-----  |         |         | 4,300 | 4.62            | 5.16    | 256,000   |
| December-----  | 7,780   | 2,430   | 4,220 | 4.54            | 5.23    | 259,000   |
| January-----   | 8,320   | 2,920   | 4,620 | 4.97            | 5.73    | 284,000   |
| February-----  | 5,200   | 2,590   | 3,470 | 3.73            | 3.88    | 193,000   |
| March-----     | 6,720   | 3,820   | 5,020 | 5.40            | 6.23    | 309,000   |
| April-----     | 8,050   | 4,100   | 5,670 | 6.10            | 6.81    | 337,000   |
| May-----       | 9,470   | 4,730   | 6,380 | 6.86            | 7.91    | 392,000   |
| June-----      | 23,400  | 5,080   | 8,990 | 9.67            | 10.79   | 535,000   |
| July-----      | 4,940   | 2,510   | 3,530 | 3.80            | 4.38    | 217,000   |
| August-----    | 2,510   | 1,980   | 2,230 | 2.40            | 2.77    | 137,000   |
| September----- | 2,430   | 1,830   | 2,070 | 2.23            | 2.49    | 123,000   |
| The year-----  | 23,400  | 1,480   | 4,340 | 4.67            | 63.42   | 3,140,000 |

## LONG TOM RIVER AT MONROE, OREG.

LOCATION.—Staff gage in NE¼ sec. 33, T. 14 S., R. 5 W., at Monroe, a quarter of a mile below mouth of Shafer Creek. Zero of gage is 261.97 feet above mean sea level.

DRAINAGE AREA.—391 square miles.

RECORDS AVAILABLE.—November 1920 to September 1933; incomplete prior to 1928.

DISCHARGE.—Maximum during year, 13,000 second-feet Jan. 3 (gage height, 15.6 feet); minimum, 14 second-feet Oct. 6, 7, 10.

1920-33: Maximum, about 18,600 second-feet Jan. 7, 1923; minimum, 8 second-feet Sept. 5-19, 23, 1924. Average, 10 years (1921-25, 1927-33), 691 second-feet.

Maximum stage known, about 19.5 feet in February 1890.

REMARKS.—Records good. Discharge interpolated Dec. 14. No diversions above station. Some fluctuation at low stages owing to pondage at mill dam at Monroe.

*Discharge, in second-feet, 1932-33*

| Day     | Oct. | Nov.  | Dec.  | Jan.   | Feb.  | Mar.  | Apr.  | May   | June  | July | Aug. | Sept. |
|---------|------|-------|-------|--------|-------|-------|-------|-------|-------|------|------|-------|
| 1.....  | 16   | 26    | 197   | 2,280  | 3,280 | 2,860 | 1,670 | 221   | 221   | 131  | 47   | 37    |
| 2.....  | 16   | 31    | 334   | 4,500  | 2,680 | 2,990 | 1,520 | 221   | 205   | 124  | 47   | 37    |
| 3.....  | 16   | 37    | 375   | 10,600 | 2,470 | 3,130 | 1,250 | 221   | 205   | 124  | 47   | 30    |
| 4.....  | 16   | 41    | 334   | 10,000 | 2,120 | 3,060 | 1,010 | 256   | 205   | 118  | 47   | 31    |
| 5.....  | 15   | 66    | 294   | 5,520  | 1,730 | 2,620 | 860   | 256   | 205   | 112  | 51   | 31    |
| 6.....  | 14   | 105   | 256   | 3,960  | 1,550 | 2,240 | 760   | 294   | 205   | 105  | 55   | 33    |
| 7.....  | 14   | 145   | 238   | 3,130  | 1,370 | 1,850 | 660   | 354   | 189   | 105  | 51   | 33    |
| 8.....  | 15   | 182   | 205   | 2,370  | 1,220 | 1,640 | 660   | 535   | 189   | 99   | 53   | 37    |
| 9.....  | 15   | 221   | 166   | 1,880  | 1,100 | 1,460 | 585   | 1,100 | 275   | 93   | 51   | 43    |
| 10..... | 14   | 189   | 131   | 1,700  | 1,040 | 1,310 | 560   | 1,310 | 375   | 93   | 49   | 37    |
| 11..... | 15   | 159   | 118   | 1,490  | 1,100 | 1,490 | 510   | 1,610 | 610   | 87   | 47   | 36    |
| 12..... | 15   | 166   | 118   | 1,310  | 1,490 | 1,760 | 463   | 1,310 | 585   | 87   | 43   | 34    |
| 13..... | 16   | 138   | 99    | 1,100  | 1,730 | 1,820 | 440   | 985   | 463   | 81   | 40   | 33    |
| 14..... | 18   | 112   | 93    | 985    | 1,850 | 1,820 | 418   | 735   | 334   | 81   | 39   | 32    |
| 15..... | 19   | 118   | 87    | 1,010  | 2,470 | 1,640 | 375   | 610   | 275   | 76   | 37   | 31    |
| 16..... | 22   | 189   | 81    | 1,160  | 3,360 | 1,460 | 354   | 535   | 256   | 70   | 33   | 31    |
| 17..... | 28   | 334   | 81    | 1,130  | 4,080 | 1,430 | 354   | 535   | 221   | 70   | 33   | 34    |
| 18..... | 31   | 396   | 131   | 1,010  | 3,740 | 1,280 | 354   | 585   | 205   | 68   | 34   | 43    |
| 19..... | 33   | 440   | 486   | 1,040  | 3,280 | 1,160 | 354   | 585   | 189   | 68   | 34   | 41    |
| 20..... | 28   | 334   | 1,430 | 1,190  | 2,740 | 1,010 | 314   | 510   | 174   | 66   | 34   | 43    |
| 21..... | 28   | 238   | 2,800 | 1,220  | 2,240 | 910   | 294   | 418   | 174   | 63   | 34   | 45    |
| 22..... | 28   | 189   | 3,960 | 1,220  | 2,160 | 860   | 275   | 396   | 166   | 61   | 33   | 43    |
| 23..... | 27   | 159   | 4,820 | 1,280  | 2,420 | 810   | 275   | 396   | 159   | 59   | 34   | 41    |
| 24..... | 28   | 145   | 4,820 | 1,370  | 2,680 | 735   | 256   | 396   | 145   | 59   | 33   | 49    |
| 25..... | 27   | 124   | 4,990 | 1,920  | 2,570 | 685   | 256   | 396   | 145   | 59   | 29   | 53    |
| 26..... | 31   | 118   | 4,660 | 2,860  | 2,280 | 660   | 256   | 375   | 145   | 55   | 28   | 51    |
| 27..... | 31   | 105   | 4,210 | 4,350  | 2,040 | 685   | 238   | 354   | 145   | 55   | 28   | 51    |
| 28..... | 28   | 105   | 4,080 | 5,900  | 2,280 | 1,130 | 238   | 314   | 138   | 53   | 30   | 53    |
| 29..... | 27   | 118   | 3,850 | 6,720  | ----- | 1,430 | 221   | 275   | 138   | 51   | 31   | 53    |
| 30..... | 27   | 138   | 3,280 | 4,660  | ----- | 1,340 | 221   | 256   | 131   | 51   | 34   | 47    |
| 31..... | 25   | ----- | 2,470 | 3,850  | ----- | 1,550 | ----- | 238   | ----- | 49   | 34   | ----- |

| Month          | Maximum | Minimum | Mean  | Per square mile | Run-off |           |
|----------------|---------|---------|-------|-----------------|---------|-----------|
|                |         |         |       |                 | Inches  | Acre-feet |
| October.....   | 33      | 14      | 22.0  | 0.056           | 0.06    | 1,350     |
| November.....  | 440     | 26      | 162   | .414            | .46     | 9,640     |
| December.....  | 4,990   | 81      | 1,590 | 4.07            | 4.69    | 97,800    |
| January.....   | 10,600  | 985     | 2,990 | 7.65            | 8.82    | 184,000   |
| February.....  | 4,080   | 1,040   | 2,250 | 5.75            | 5.99    | 125,000   |
| March.....     | 3,130   | 660     | 1,580 | 4.04            | 4.66    | 97,200    |
| April.....     | 1,670   | 221     | 533   | 1.36            | 1.52    | 31,700    |
| May.....       | 1,610   | 221     | 535   | 1.37            | 1.68    | 32,900    |
| June.....      | 610     | 131     | 236   | .604            | .67     | 14,000    |
| July.....      | 131     | 49      | 79.8  | .204            | .24     | 4,910     |
| August.....    | 55      | 28      | 39.4  | .101            | .12     | 2,420     |
| September..... | 53      | 30      | 39.8  | .102            | .11     | 2,370     |
| The year.....  | 10,600  | 14      | 833   | 2.13            | 28.92   | 603,000   |

## NORTH SANTIAM RIVER AT DETROIT, OREG.

LOCATION.—Water-stage recorder in NE¼ sec. 12, T. 10 S., R. 5 E., 1 mile east of Detroit. Zero of gage is 1,475.4 feet above mean sea level.

DRAINAGE AREA.—226 square miles.

RECORDS AVAILABLE.—January 1907 to October 1909, October 1928 to September 1933. Comparable records at gage above Boulder Creek near Hoover, August 1910 to October 1913.

DISCHARGE.—Maximum during year, 7,580 second-feet June 9 (gage height, 7.26 feet); minimum, 367 second-feet Oct. 11 (gage height, 0.64 foot).

1907-9, 1928-33: Maximum discharge, 15,000 second-feet Mar. 31, 1931 (gage height, about 12.0 feet); minimum, 295 second-feet Oct. 9-12, 14-16, 20, 21, 1931.

REMARKS.—Records good except those estimated, Nov. 2-4, Dec. 10-14, and those for Jan. 12 to Apr. 26, which are fair. No diversions or regulation above station.

*Discharge, in second-feet, 1932-33*

| Day     | Oct. | Nov.  | Dec.  | Jan.  | Feb.  | Mar.  | Apr.  | May   | June  | July  | Aug. | Sept. |
|---------|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|------|-------|
| 1.....  | 382  | 553   | 940   | 1,060 | 655   | 800   | 1,300 | 1,840 | 2,310 | 1,410 | 632  | 501   |
| 2.....  | 379  | 1,700 | 1,410 | 1,210 | 637   | 775   | 1,300 | 1,800 | 2,310 | 1,440 | 624  | 497   |
| 3.....  | 382  | 1,400 | 1,410 | 1,060 | 628   | 800   | 1,520 | 1,680 | 2,550 | 1,440 | 628  | 485   |
| 4.....  | 379  | 700   | 1,210 | 1,000 | 624   | 800   | 1,560 | 1,720 | 2,550 | 1,380 | 628  | 485   |
| 5.....  | 373  | 2,370 | 1,150 | 1,210 | 624   | 725   | 1,480 | 1,720 | 2,500 | 1,340 | 614  | 497   |
| 6.....  | 376  | 2,040 | 1,030 | 1,680 | 624   | 725   | 1,410 | 1,600 | 2,450 | 1,300 | 606  | 537   |
| 7.....  | 373  | 1,440 | 970   | 1,440 | 596   | 910   | 1,340 | 1,620 | 2,260 | 1,270 | 606  | 501   |
| 8.....  | 370  | 2,170 | 828   | 1,380 | 601   | 882   | 1,240 | 1,620 | 3,780 | 1,300 | 601  | 485   |
| 9.....  | 370  | 1,760 | 750   | 1,440 | 517   | 882   | 1,150 | 1,480 | 7,000 | 1,240 | 596  | 482   |
| 10..... | 370  | 1,410 | 1,410 | 1,410 | 592   | 882   | 1,090 | 1,380 | 5,350 | 1,150 | 588  | 478   |
| 11..... | 367  | 1,180 | 666   | 1,270 | 610   | 910   | 1,030 | 1,300 | 4,060 | 1,090 | 578  | 471   |
| 12..... | 397  | 1,000 | 666   | 1,180 | 628   | 1,150 | 1,030 | 1,340 | 3,920 | 1,120 | 574  | 471   |
| 13..... | 464  | 1,090 | 666   | 1,120 | 592   | 1,180 | 1,030 | 1,410 | 4,060 | 1,090 | 570  | 468   |
| 14..... | 509  | 1,270 | 666   | 1,090 | 583   | 1,120 | 1,060 | 1,520 | 3,920 | 1,060 | 570  | 505   |
| 15..... | 440  | 1,810 | 637   | 1,030 | 624   | 1,030 | 1,180 | 1,600 | 3,640 | 1,090 | 561  | 583   |
| 16..... | 529  | 2,810 | 632   | 970   | 606   | 1,060 | 1,240 | 1,600 | 3,140 | 1,060 | 561  | 529   |
| 17..... | 493  | 2,550 | 632   | 910   | 592   | 1,090 | 1,180 | 1,640 | 2,700 | 940   | 557  | 509   |
| 18..... | 432  | 1,960 | 678   | 910   | 592   | 1,060 | 1,120 | 1,600 | 2,360 | 882   | 549  | 521   |
| 19..... | 409  | 1,560 | 1,150 | 855   | 583   | 1,060 | 1,060 | 1,520 | 2,080 | 882   | 545  | 485   |
| 20..... | 397  | 1,340 | 1,030 | 828   | 583   | 1,150 | 1,090 | 1,560 | 1,960 | 828   | 529  | 509   |
| 21..... | 391  | 1,240 | 940   | 800   | 637   | 1,180 | 1,180 | 1,560 | 1,920 | 800   | 517  | 565   |
| 22..... | 596  | 1,180 | 910   | 775   | 678   | 1,120 | 1,270 | 1,560 | 1,840 | 775   | 513  | 725   |
| 23..... | 537  | 1,060 | 970   | 750   | 800   | 1,060 | 1,600 | 1,720 | 1,800 | 750   | 517  | 628   |
| 24..... | 474  | 970   | 910   | 750   | 725   | 970   | 1,800 | 2,000 | 1,760 | 750   | 517  | 665   |
| 25..... | 443  | 882   | 882   | 725   | 700   | 910   | 1,880 | 2,360 | 2,000 | 750   | 505  | 642   |
| 26..... | 436  | 855   | 1,150 | 725   | 775   | 882   | 1,880 | 2,400 | 1,920 | 725   | 497  | 614   |
| 27..... | 429  | 828   | 1,300 | 750   | 750   | 940   | 2,040 | 2,220 | 1,840 | 700   | 497  | 588   |
| 28..... | 422  | 828   | 1,270 | 700   | 775   | 1,150 | 2,310 | 2,260 | 1,720 | 678   | 501  | 576   |
| 29..... | 422  | 882   | 1,210 | 678   | ----- | 1,240 | 2,260 | 2,600 | 1,560 | 655   | 509  | 607   |
| 30..... | 422  | 940   | 1,180 | 655   | ----- | 1,300 | 2,000 | 2,810 | 1,520 | 655   | 525  | 557   |
| 31..... | 443  | ----- | 1,120 | 678   | ----- | 1,380 | ----- | 2,550 | ----- | 642   | 509  | ----- |

| Month          | Maximum | Minimum | Mean  | Per square mile | Run-off |           |
|----------------|---------|---------|-------|-----------------|---------|-----------|
|                |         |         |       |                 | Inches  | Acre-feet |
| October.....   | 596     | 367     | 426   | 1.88            | 2.17    | 26,200    |
| November.....  | 2,810   | 553     | 1,390 | 6.15            | 6.86    | 82,700    |
| December.....  | 1,410   | 632     | 958   | 4.23            | 4.88    | 58,800    |
| January.....   | 1,680   | 655     | 1,000 | 4.42            | 5.10    | 61,500    |
| February.....  | 1,800   | 517     | 640   | 2.83            | 2.95    | 35,500    |
| March.....     | 1,380   | 725     | 1,000 | 4.42            | 5.10    | 61,500    |
| April.....     | 2,310   | 1,030   | 1,420 | 6.28            | 7.01    | 84,500    |
| May.....       | 2,810   | 1,300   | 1,790 | 7.92            | 9.13    | 110,000   |
| June.....      | 7,000   | 1,520   | 2,760 | 12.2            | 13.61   | 164,000   |
| July.....      | 1,440   | 642     | 1,010 | 4.47            | 5.15    | 62,100    |
| August.....    | 632     | 497     | 559   | 2.47            | 2.85    | 34,400    |
| September..... | 725     | 468     | 538   | 2.38            | 2.66    | 32,000    |
| The year.....  | 7,000   | 367     | 1,120 | 4.96            | 67.47   | 813,000   |

## NORTH SANTIAM RIVER AT MEHAMA, OREG.

LOCATION.—Water-stage recorder in NW¼ sec. 18, T. 9 S., R. 2 E., at Mehama, half a mile below Little North Santiam River. Prior to June 15, 1933, staff gage at same datum but located 200 feet upstream was used.

DRAINAGE AREA.—665 square miles.

RECORDS AVAILABLE.—July 1905 to March 1907, October 1910 to September 1914; September 1921 to September 1933.

DISCHARGE.—Maximum during year, 26,300 second-feet June 9 (gage height, 10.4 feet); minimum, 540 second-feet Oct. 10, 11 (gage height, 1.50 feet).

1905-7, 1910-14, 1921-33: Maximum, 62,900 second-feet Nov. 20, 1921, Jan. 6, 1923 (gage height, 17.5 feet); minimum, 420 second-feet Sept. 18, 1924 (gage height, 1.45 feet). Average, 16 years (1905-6, 1911-14, 1921-33), 3,320 second-feet.

REMARKS.—Records good. Discharge estimated Nov. 8, Dec. 13-16, July 17, 18, 23-28, 30. No diversions for irrigation or regulation above station. Gage-height record October to April furnished by U.S. Weather Bureau.

*Discharge, in second-feet, 1932-33*

| Day     | Oct.  | Nov.   | Dec.  | Jan.   | Feb.  | Mar.  | Apr.  | May    | June   | July  | Aug.  | Sept. |
|---------|-------|--------|-------|--------|-------|-------|-------|--------|--------|-------|-------|-------|
| 1.....  | 576   | 2,080  | 2,870 | 5,840  | 2,870 | 4,220 | 6,100 | 5,840  | 7,170  | 3,320 | 1,190 | 847   |
| 2.....  | 564   | 4,010  | 7,450 | 10,100 | 2,370 | 3,810 | 5,590 | 6,360  | 6,900  | 3,420 | 1,150 | 829   |
| 3.....  | 570   | 4,430  | 6,900 | 6,900  | 2,220 | 4,220 | 7,450 | 5,590  | 7,450  | 3,420 | 1,160 | 812   |
| 4.....  | 564   | 3,230  | 5,100 | 5,340  | 2,080 | 3,610 | 7,170 | 6,100  | 7,450  | 3,230 | 1,210 | 804   |
| 5.....  | 564   | 10,400 | 4,220 | 7,730  | 2,080 | 3,420 | 6,360 | 6,360  | 7,450  | 3,050 | 1,210 | 829   |
| 6.....  | 558   | 14,500 | 3,420 | 11,000 | 2,220 | 3,230 | 5,840 | 5,840  | 7,450  | 3,050 | 1,130 | 1,020 |
| 7.....  | 558   | 7,730  | 3,230 | 7,450  | 2,080 | 5,590 | 5,590 | 5,590  | 6,630  | 2,960 | 1,110 | 920   |
| 8.....  | 552   | 13,000 | 2,700 | 7,170  | 2,080 | 5,100 | 4,650 | 5,100  | 11,900 | 3,050 | 1,110 | 847   |
| 9.....  | 582   | 10,400 | 2,220 | 7,730  | 1,680 | 4,430 | 4,220 | 5,840  | 24,800 | 2,870 | 1,090 | 820   |
| 10..... | 546   | 8,300  | 2,150 | 7,730  | 1,680 | 4,430 | 3,810 | 4,870  | 16,500 | 2,530 | 1,060 | 804   |
| 11..... | 540   | 4,870  | 1,940 | 6,360  | 1,940 | 4,650 | 3,420 | 4,650  | 11,000 | 2,370 | 1,040 | 804   |
| 12..... | 540   | 3,810  | 1,810 | 5,100  | 3,230 | 6,630 | 4,010 | 4,430  | 10,700 | 2,530 | 1,010 | 796   |
| 13..... | 804   | 3,050  | 1,700 | 4,650  | 2,700 | 6,900 | 4,010 | 4,650  | 11,600 | 2,370 | 1,010 | 788   |
| 14..... | 1,010 | 4,870  | 1,620 | 4,430  | 2,370 | 5,590 | 4,220 | 4,870  | 11,300 | 2,370 | 1,010 | 910   |
| 15..... | 910   | 7,450  | 1,580 | 4,430  | 3,230 | 4,650 | 5,340 | 5,590  | 9,780  | 2,370 | 980   | 2,080 |
| 16..... | 1,090 | 13,300 | 1,560 | 3,810  | 3,230 | 4,870 | 5,100 | 5,840  | 8,590  | 2,370 | 970   | 1,560 |
| 17..... | 2,220 | 9,780  | 1,560 | 3,230  | 2,700 | 5,340 | 4,650 | 6,100  | 7,450  | 2,050 | 950   | 1,330 |
| 18..... | 1,330 | 7,170  | 1,560 | 3,050  | 2,530 | 5,100 | 4,010 | 5,840  | 6,100  | 1,950 | 940   | 1,330 |
| 19..... | 1,060 | 5,590  | 6,360 | 2,870  | 2,370 | 4,650 | 3,610 | 5,590  | 5,100  | 1,880 | 930   | 1,240 |
| 20..... | 865   | 4,650  | 5,100 | 2,530  | 2,370 | 5,590 | 3,810 | 5,840  | 4,650  | 1,680 | 920   | 1,190 |
| 21..... | 796   | 4,010  | 4,870 | 2,530  | 2,700 | 6,100 | 4,430 | 5,590  | 4,650  | 1,620 | 892   | 1,560 |
| 22..... | 1,110 | 4,430  | 4,010 | 2,870  | 3,810 | 5,100 | 4,870 | 5,340  | 4,650  | 1,560 | 874   | 2,760 |
| 23..... | 2,700 | 3,610  | 4,870 | 2,370  | 6,360 | 4,430 | 6,100 | 5,840  | 4,430  |       | 865   | 2,530 |
| 24..... | 1,940 | 3,230  | 4,430 | 2,370  | 4,650 | 3,810 | 6,900 | 6,630  | 4,320  |       | 856   | 2,620 |
| 25..... | 1,560 | 2,700  | 4,220 | 2,220  | 3,610 | 3,420 | 6,900 | 8,880  | 4,980  |       | 847   | 2,620 |
| 26..... | 1,330 | 2,530  | 7,450 | 1,940  | 3,810 | 3,230 | 6,630 | 8,590  | 4,870  | 1,440 | 829   | 2,080 |
| 27..... | 1,330 | 2,220  | 8,010 | 3,230  | 4,010 | 3,230 | 7,450 | 7,450  | 4,650  |       | 829   | 1,880 |
| 28..... | 1,220 | 2,220  | 9,180 | 3,230  | 4,010 | 5,100 | 5,590 | 7,170  | 4,320  |       | 829   | 1,680 |
| 29..... | 1,110 | 2,220  | 7,170 | 2,370  | ----- | 6,360 | 8,300 | 10,100 | 3,810  |       | 1,280 | 847   |
| 30..... | 1,110 | 2,870  | 6,900 | 2,370  | ----- | 5,840 | 7,450 | 8,880  | 3,420  |       | 1,280 | 910   |
| 31..... | 1,110 | -----  | 5,840 | 2,370  | ----- | 7,170 | ----- | 8,300  | -----  |       | 1,280 | 883   |

| Month          | Maximum | Minimum | Mean  | Per square mile | Run-off |           |
|----------------|---------|---------|-------|-----------------|---------|-----------|
|                |         |         |       |                 | Inches  | Acre-feet |
| October.....   | 2,700   | 540     | 1,010 | 1.52            | 1.75    | 62,100    |
| November.....  | 14,500  | 2,080   | 5,760 | 8.66            | 9.66    | 343,000   |
| December.....  | 9,180   | 1,560   | 4,260 | 6.41            | 7.39    | 262,000   |
| January.....   | 11,000  | 1,940   | 4,670 | 7.02            | 8.09    | 287,000   |
| February.....  | 6,360   | 1,680   | 2,890 | 4.35            | 4.53    | 160,000   |
| March.....     | 7,170   | 3,230   | 4,830 | 7.26            | 8.37    | 297,000   |
| April.....     | 8,590   | 3,420   | 5,550 | 8.35            | 9.32    | 330,000   |
| May.....       | 10,100  | 4,430   | 6,250 | 9.40            | 10.84   | 384,000   |
| June.....      | 24,800  | 3,420   | 7,800 | 11.7            | 13.05   | 464,000   |
| July.....      | 3,420   | 1,280   | 2,210 | 3.32            | 3.83    | 136,000   |
| August.....    | 1,210   | 829     | 988   | 1.49            | 1.72    | 60,800    |
| September..... | 2,760   | 788     | 1,410 | 2.12            | 2.36    | 83,900    |
| The year.....  | 24,800  | 540     | 3,970 | 5.97            | 80.91   | 2,870,000 |

## BREITENBUSH RIVER ABOVE FRENCH CREEK, NEAR DETROIT, OREG.

LOCATION.—Water-stage recorder in NE¼ sec. 36, T. 9 S., R. 5 E., a tenth of a mile below Canyon Creek, 1½ miles above French Creek, and 2 miles east of Detroit. Zero of gage is 1, 559.4 feet above mean sea level.

DRAINAGE AREA.—108 square miles.

RECORDS AVAILABLE.—June 1932 to September 1933. October 1910 to October 1913, fragmentary record below French Creek, comparable except for inflow from French Creek.

DISCHARGE.—Maximum during year, 4,690 second-feet June 9 (gage height, 6.7 feet); minimum, 111 second-feet Oct. 12 (gage height, 0.66 foot).

1932-33: Maximum, that of June 9, 1933; minimum, that of Oct. 12, 1932.

REMARKS.—Records good. No diversions or regulation above station.

*Discharge, in second feet, 1932-33*

| Day | Oct. | Nov.  | Dec.  | Jan.  | Feb.  | Mar.  | Apr.  | May   | June  | July | Aug. | Sept. |
|-----|------|-------|-------|-------|-------|-------|-------|-------|-------|------|------|-------|
| 1   | 120  | 324   | 598   | 625   | 277   | 365   | 880   | 1,120 | 1,300 | 725  | 297  | 179   |
| 2   | 119  | 600   | 1,260 | 705   | 262   | 353   | 940   | 1,090 | 1,330 | 740  | 287  | 174   |
| 3   | 119  | 496   | 1,030 | 578   | 253   | 369   | 1,300 | 1,000 | 1,470 | 760  | 287  | 170   |
| 4   | 117  | 397   | 790   | 546   | 250   | 342   | 1,260 | 1,030 | 1,440 | 732  | 294  | 168   |
| 5   | 115  | 2,070 | 650   | 949   | 253   | 320   | 1,090 | 1,000 | 1,440 | 705  | 280  | 174   |
| 6   | 115  | 2,120 | 555   | 1,360 | 256   | 334   | 1,060 | 910   | 1,360 | 678  | 265  | 216   |
| 7   | 115  | 1,060 | 501   | 1,000 | 247   | 528   | 940   | 880   | 1,260 | 678  | 265  | 187   |
| 8   | 114  | 1,780 | 425   | 1,030 | 247   | 524   | 790   | 880   | 2,880 | 732  | 268  | 176   |
| 9   | 114  | 1,470 | 409   | 1,190 | 250   | 461   | 678   | 850   | 4,450 | 678  | 259  | 170   |
| 10  | 114  | 910   | 385   | 1,060 | 250   | 492   | 600   | 760   | 3,100 | 578  | 250  | 166   |
| 11  | 112  | 650   | 353   | 850   | 250   | 542   | 600   | 705   | 2,180 | 600  | 244  | 162   |
| 12  | 127  | 532   | 338   | 732   | 268   | 880   | 650   | 760   | 2,320 | 625  | 233  | 160   |
| 13  | 181  | 708   | 328   | 650   | 253   | 820   | 650   | 850   | 2,470 | 600  | 227  | 158   |
| 14  | 230  | 790   | 320   | 625   | 244   | 650   | 760   | 940   | 2,270 | 600  | 227  | 231   |
| 15  | 176  | 1,980 | 284   | 578   | 265   | 578   | 940   | 970   | 2,130 | 625  | 222  | 365   |
| 16  | 256  | 2,520 | 274   | 528   | 247   | 650   | 880   | 970   | 1,780 | 600  | 222  | 274   |
| 17  | 222  | 1,820 | 265   | 483   | 241   | 732   | 760   | 1,000 | 1,400 | 506  | 216  | 227   |
| 18  | 181  | 1,220 | 294   | 457   | 239   | 650   | 678   | 970   | 1,160 | 470  | 212  | 225   |
| 19  | 160  | 880   | 737   | 413   | 233   | 650   | 650   | 910   | 1,000 | 478  | 209  | 202   |
| 20  | 152  | 732   | 625   | 389   | 233   | 880   | 760   | 910   | 970   | 437  | 207  | 206   |
| 21  | 150  | 705   | 550   | 373   | 314   | 820   | 880   | 910   | 970   | 405  | 199  | 297   |
| 22  | 358  | 650   | 506   | 353   | 413   | 678   | 1,030 | 910   | 940   | 377  | 194  | 518   |
| 23  | 300  | 555   | 578   | 334   | 506   | 578   | 1,300 | 1,030 | 940   | 369  | 190  | 421   |
| 24  | 239  | 492   | 501   | 320   | 389   | 501   | 1,400 | 1,260 | 910   | 389  | 190  | 483   |
| 25  | 206  | 445   | 470   | 307   | 324   | 461   | 1,440 | 1,660 | 1,120 | 385  | 185  | 413   |
| 26  | 299  | 413   | 850   | 320   | 385   | 429   | 1,360 | 1,620 | 1,030 | 369  | 185  | 377   |
| 27  | 206  | 393   | 1,120 | 334   | 405   | 542   | 1,620 | 1,360 | 970   | 357  | 187  | 349   |
| 28  | 196  | 381   | 1,000 | 300   | 369   | 940   | 1,780 | 1,400 | 880   | 334  | 187  | 331   |
| 29  | 194  | 417   | 820   | 290   | ----- | 940   | 1,620 | 1,740 | 760   | 320  | 194  | 377   |
| 30  | 185  | 461   | 760   | 280   | ----- | 940   | 1,300 | 1,900 | 705   | 317  | 199  | 297   |
| 31  | 206  | ----- | 678   | 300   | ----- | 1,060 | ----- | 1,500 | ----- | 310  | 183  | ----- |

| Month     | Maximum | Minimum | Mean  | Per square mile | Run-off |           |
|-----------|---------|---------|-------|-----------------|---------|-----------|
|           |         |         |       |                 | Inches  | Acre-feet |
| October   | 358     | 112     | 174   | 1.61            | 1.86    | 10,700    |
| November  | 2,520   | 324     | 932   | 8.63            | 9.63    | 55,500    |
| December  | 1,260   | 265     | 589   | 5.45            | 6.28    | 36,200    |
| January   | 1,360   | 280     | 589   | 5.45            | 6.28    | 36,200    |
| February  | 506     | 233     | 290   | 2.69            | 2.80    | 16,100    |
| March     | 1,060   | 320     | 613   | 5.68            | 6.55    | 37,700    |
| April     | 1,780   | 600     | 1,020 | 9.44            | 10.53   | 60,700    |
| May       | 1,900   | 705     | 1,090 | 10.1            | 11.64   | 67,000    |
| June      | 4,450   | 705     | 1,560 | 14.4            | 16.07   | 92,800    |
| July      | 760     | 310     | 532   | 4.93            | 5.68    | 32,700    |
| August    | 297     | 183     | 228   | 2.11            | 2.43    | 14,000    |
| September | 518     | 158     | 262   | 2.43            | 2.71    | 15,600    |
| The year  | 4,450   | 112     | 657   | 6.08            | 82.46   | 475,000   |

## LITTLE NORTH SANTIAM RIVER NEAR MEHAMA, OREG.

LOCATION.—Staff and wire-weight gages in NW¼ sec. 16, T. 9 S., R. 2 E., 2 miles east of Mehama and mouth of river.

DRAINAGE AREA.—110 square miles.

RECORDS AVAILABLE.—October 1931 to September 1933. Comparable records at station 4 miles upstream July to September 1924; July to September 1931.

DISCHARGE.—1931-32: Maximum during year, 13,900 second-feet Mar. 18 (gage height, 12.46 feet); minimum, 26 second-feet Sept. 29 (gage height, 2.25 feet). 1932-33: Maximum, 10,600 second-feet June 8 (gage height, 11.09 feet); minimum, 22 second-feet Oct. 10 (gage height, 2.18 feet).

1924, 1931-33: Maximum, that of Mar. 18, 1932; minimum, 22 second-feet Sept. 16, 1924, and Oct. 10, 1932.

REMARKS.—Records good except those estimated, which are fair. Records for year ending Sept. 30, 1932, supersede those published in Water-Supply Paper 739. No regulation or diversions above station.

*Discharge, in second-feet, 1931-33*

| Day     | Oct.    | Nov.  | Dec.  | Jan.  | Feb.  | Mar.  | Apr.  | May   | June  | July | Aug. | Sept. |
|---------|---------|-------|-------|-------|-------|-------|-------|-------|-------|------|------|-------|
| 1931-32 |         |       |       |       |       |       |       |       |       |      |      |       |
| 1-----  | 33      | 338   | 270   | 1,260 | 270   | 1,620 | 1,710 | 1,620 | 890   | 210  | 63   | 41    |
| 2-----  | 31      | 240   | 338   | 965   | 240   | 2,350 | 1,530 | 1,370 | 830   | 198  | 63   | 41    |
| 3-----  | 30      | 213   | 555   | 840   | 226   | 1,520 | 1,530 | 1,140 | 770   | 265  | 70   | 39    |
| 4-----  | 31      | 177   | 840   | 780   | 200   | 1,180 | 1,290 | 1,070 | 710   | 222  | 65   | 41    |
| 5-----  | • 100   | 156   | 691   | 965   | 188   | 1,260 | 1,210 | 1,010 | 575   | 185  | 57   | 39    |
| 6-----  | 61      | 104   | 582   | 1,260 | 338   | 2,780 | 1,070 | 950   | 655   | 172  | 62   | 36    |
| 7-----  | 56      | • 850 | 662   | 1,030 | 460   | 3,250 | 1,010 | 1,010 | 628   | 150  | 65   | 35    |
| 8-----  | 49      | 1,720 | 634   | 900   | 555   | 2,210 | 890   | 1,079 | 575   | 140  | 55   | 36    |
| 9-----  | 43      | 1,180 | 530   | 2,780 | 506   | 1,620 | 890   | 1,140 | 682   | 131  | 64   | 36    |
| 10----- | 39      | 1,260 | 483   | 1,950 | 634   | 1,260 | 950   | 1,290 | 890   | 140  | 79   | 34    |
| 11----- | 37      | 417   | 347   | 2,780 | 662   | 1,100 | 1,140 | 1,070 | 830   | 150  | 75   | 31    |
| 12----- | 36      | 226   | 303   | 2,780 | 662   | 965   | 1,370 | 1,140 | 830   | 140  | 68   | 28    |
| 13----- | 34      | 555   | 286   | 1,620 | 634   | 900   | 1,210 | 1,140 | 890   | 131  | 58   | 32    |
| 14----- | 33      | 900   | 255   | 1,100 | 460   | 1,620 | 1,450 | 1,010 | 830   | 131  | 58   | 27    |
| 15----- | 31      | 634   | 255   | 840   | 396   | 1,620 | 1,210 | 770   | 655   | 140  | 54   | 27    |
| 16----- | 30      | 750   | 226   | 750   | 320   | 1,720 | 1,450 | 710   | 500   | 131  | 54   | 28    |
| 17----- | 31      | 2,350 | 1,620 | 1,720 | 270   | 4,470 | 2,020 | 890   | 390   | 114  | 55   | 28    |
| 18----- | 31      | 1,830 | 2,490 | 3,250 | 270   | 1,600 | 2,250 | 1,010 | 370   | 95   | 55   | 28    |
| 19----- | 30      | 2,490 | 1,950 | 2,210 | 255   | 6,560 | 1,620 | 950   | 295   | 102  | 55   | 28    |
| 20----- | 30      | 2,780 | 2,630 | 1,620 | 270   | 3,320 | 1,450 | 1,140 | 350   | 102  | 53   | 46    |
| 21----- | 30      | • 900 | 1,830 | 1,180 | 320   | 2,250 | 1,210 | 950   | 410   | 102  | 48   | 43    |
| 22----- | 150     | • 750 | 1,340 | 965   | 338   | 1,530 | 1,070 | 890   | 370   | 105  | 46   | 41    |
| 23----- | 510     | 662   | 1,100 | 720   | 376   | 1,290 | 950   | 1,010 | 350   | 94   | 44   | 33    |
| 24----- | 510     | 555   | 1,100 | 634   | 720   | 5,760 | 890   | 1,010 | 312   | 89   | 44   | 32    |
| 25----- | 755     | 460   | 900   | 530   | 1,340 | 3,790 | 1,070 | 770   | 295   | 83   | 46   | 28    |
| 26----- | • 1,450 | 438   | 750   | 506   | 4,470 | 2,250 | 2,070 | 682   | 265   | 82   | 39   | 30    |
| 27----- | 1,620   | 396   | 900   | 438   | 4,470 | 1,810 | 1,140 | 550   | 265   | 74   | 41   | 30    |
| 28----- | 2,350   | 347   | 750   | 376   | 3,420 | 3,790 | 1,070 | 600   | 250   | 70   | 40   | 27    |
| 29----- | 1,100   | 320   | 634   | 376   | 2,350 | 2,750 | 1,070 | 1,010 | 250   | 75   | 42   | 26    |
| 30----- | 582     | 286   | 750   | 347   | ----- | 2,130 | 1,210 | 1,290 | 198   | 68   | 51   | 27    |
| 31----- | 438     | ----- | 1,83  | 338   | ----- | 1,710 | ----- | 1,010 | ----- | 65   | 48   | ----- |

Discharge, in second-feet, of Little North Santiam River near Mehama, Oreg., 1931-33—Continued

| Day     | Oct.  | Nov.  | Dec.  | Jan.  | Feb.  | Mar.  | Apr.  | May   | June  | July | Aug. | Sept. |
|---------|-------|-------|-------|-------|-------|-------|-------|-------|-------|------|------|-------|
| 1932-33 |       |       |       |       |       |       |       |       |       |      |      |       |
| 1       | 27    | 950   | 682   | 1,810 | 890   | 1,070 | 1,450 | 1,140 | 1,140 | 500  | 92   | 53    |
| 2       | 24    | 1,810 | 3,320 | 3,630 | 710   | 1,010 | 1,370 | 1,370 | 1,290 | 500  | 86   | 43    |
| 3       | 24    | 1,210 | 1,810 | 2,250 | 575   | 1,070 | 2,020 | 1,210 | 1,370 | 550  | 89   | 53    |
| 4       | 24    | 1,810 | 1,140 | 1,530 | 550   | 950   | 1,620 | 1,620 | 1,290 | 525  | 94   | 40    |
| 5       | 23    | 3,630 | 950   | 2,620 | 600   | 890   | 1,370 | 1,450 | 1,370 | 455  | 105  | 49    |
| 6       | 23    | 3,960 | 740   | 4,300 | 655   | 830   | 1,290 | 1,370 | 1,290 | 455  | 97   | 112   |
| 7       | 24    | 1,910 | 628   | 2,890 | 550   | 2,020 | 1,140 | 1,140 | 1,210 | 455  | 88   | 103   |
| 8       | 24    | 5,010 | 478   | 2,370 | 525   | 1,450 | 950   | 1,140 | 6,360 | 455  | 83   | 89    |
| 9       | 23    | 2,890 |       | 2,750 | * 350 | 1,140 | 830   | 1,210 | 8,640 | 410  | 81   | 52    |
| 10      | 22    | 1,450 |       | 2,490 | * 350 | 1,210 | 682   | 1,010 | 3,630 | 350  | 73   | 50    |
| 11      | 23    | 950   |       | 1,530 | 455   | 1,210 | 710   | 890   | 2,130 | 330  | 69   | 45    |
| 12      | 29    | 770   | * 256 | 1,290 | 1,010 | 1,210 | 1,010 | 890   | 2,250 | 370  | 69   | 41    |
| 13      | 185   | 830   |       | 1,070 | 890   | 1,810 | 890   | 950   | 2,250 | 350  | 70   | 39    |
| 14      | 410   | 1,290 |       | 950   | 740   | 1,290 | 1,070 | 1,070 | 2,020 | 330  | 68   | 140   |
| 15      | 198   | 2,370 |       | 950   | 1,070 | 1,070 | 1,290 | 1,290 | 1,710 | 330  | 63   | 830   |
| 16      | 600   | 4,130 |       | 830   | 950   | 1,290 | 1,140 | 1,370 | 1,450 | 295  | 61   | 600   |
| 17      | 710   | 2,890 | 222   | 710   | 830   | 1,370 | 890   | 1,450 | 1,140 | 235  | 59   | 390   |
| 18      | 350   | 1,810 | 295   | 600   | 740   | 1,290 | 830   | 1,370 | 950   | 222  | 57   | 432   |
| 19      | 222   | 1,210 | 2,020 | 575   | 682   | 1,210 | 710   | 1,210 | 830   | 198  | 57   | 350   |
| 20      | 172   | 950   | 1,530 | 500   | 682   | 2,130 | 740   | 1,370 | 740   | 172  | 57   | 265   |
| 21      | 150   | 890   | 1,070 | 478   | 1,070 | 1,620 | 950   | 1,210 | 830   | 172  | 55   | 478   |
| 22      | 830   | 1,010 | 890   | 455   | 1,620 | 1,210 | 1,210 | 1,140 | 770   | 172  | 53   | 1,210 |
| 23      | 1,070 | 830   | 1,140 | 410   | 2,620 | 950   | 1,620 | 1,370 | 770   | 160  | 52   | 1,710 |
| 24      | 655   | 682   | 1,010 | 410   | 1,530 | 830   | 1,620 | 2,020 | 710   | 150  | 50   | 1,450 |
| 25      | 432   | 575   | 1,140 | 390   | 1,070 | 710   | 1,530 | 2,370 | 890   | 140  | 48   | 1,070 |
| 26      | 410   | 478   | 5,190 | 410   | 950   | 628   | 1,370 | 2,020 | 830   | 131  | 46   | 682   |
| 27      | 370   | 432   | 4,130 | 682   | 1,210 | 710   | 1,620 | 1,450 | 770   | 122  | 42   | 575   |
| 28      | 350   | 390   | 3,030 | 575   | 1,140 | 1,530 | 1,910 | 1,450 | 740   | 122  | 42   | 500   |
| 29      | * 300 | 432   | 2,250 | 500   |       | 1,450 | 1,620 | 2,020 | 628   | 114  | 47   | 770   |
| 30      | 280   | 500   | 1,910 | 455   |       | 1,620 | 1,290 | 1,810 | 525   | 112  | 73   | 655   |
| 31      | 280   |       | 1,710 | 682   |       | 1,810 |       | 1,450 |       | 100  | 59   |       |

| Month     | Maximum | Minimum | Mean  | Per square mile | Run-off |           |
|-----------|---------|---------|-------|-----------------|---------|-----------|
|           |         |         |       |                 | Inches  | Acre-feet |
| 1931-32   |         |         |       |                 |         |           |
| October   | 2,350   | 30      | 332   | 3.02            | 3.48    | 20,400    |
| November  | 2,780   | 104     | 809   | 7.35            | 8.20    | 48,100    |
| December  | 2,630   | 226     | 898   | 8.16            | 9.41    | 55,200    |
| January   | 3,250   | 338     | 1,220 | 11.1            | 12.80   | 75,000    |
| February  | 4,470   | 188     | 883   | 8.03            | 8.66    | 50,800    |
| March     | 11,600  | 900     | 2,640 | 24.0            | 27.67   | 162,000   |
| April     | 2,250   | 890     | 1,270 | 11.5            | 12.83   | 75,600    |
| May       | 1,620   | 550     | 1,010 | 9.18            | 10.58   | 62,100    |
| June      | 890     | 198     | 537   | 4.88            | 5.44    | 32,000    |
| July      | 265     | 65      | 128   | 1.16            | 1.34    | 7,870     |
| August    | 79      | 39      | 55.4  | .504            | .58     | 3,410     |
| September | 46      | 26      | 33.3  | .303            | .34     | 1,980     |
| The year  | 11,600  | 26      | 819   | 7.45            | 101.33  | 594,000   |
| 1932-33   |         |         |       |                 |         |           |
| October   | 1,070   | 22      | 267   | 2.43            | 2.80    | 16,400    |
| November  | 5,010   | 390     | 1,600 | 14.5            | 16.18   | 95,200    |
| December  | 5,190   |         | 1,270 | 11.5            | 13.26   | 78,100    |
| January   | 4,300   | 390     | 1,330 | 12.1            | 13.95   | 81,800    |
| February  | 2,620   | 350     | 893   | 8.12            | 8.46    | 49,600    |
| March     | 2,130   | 628     | 1,240 | 11.3            | 13.03   | 76,200    |
| April     | 2,020   | 682     | 1,220 | 11.1            | 12.38   | 72,600    |
| May       | 2,370   | 890     | 1,380 | 12.5            | 14.41   | 84,800    |
| June      | 8,640   | 525     | 1,680 | 15.3            | 17.07   | 100,000   |
| July      | 550     | 100     | 290   | 2.64            | 3.04    | 17,800    |
| August    | 105     | 42      | 67.3  | .612            | .71     | 4,140     |
| September | 1,710   | 39      | 429   | 3.90            | 4.35    | 25,500    |
| The year  | 8,640   | 22      | 971   | 8.83            | 119.64  | 702,000   |

\* Estimated.

## SOUTH SANTIAM RIVER AT WATERLOO, OREG.

LOCATION.—Staff gage in NW¼ sec. 28, T. 12 S., R. 1 W., 200 yards below highway bridge at Waterloo and 4 miles above Hamilton Creek. Zero of gage is 370.2 feet above mean sea level.

DRAINAGE AREA.—640 square miles.

RECORDS AVAILABLE.—July 1905 to March 1907; October 1910 to December 1911; July 1923 to September 1933.

DISCHARGE.—Maximum during year, 23,800 second-feet June 9 (gage height, 11.6 feet); minimum, 126 second-feet Oct. 5 (gage height, 2.07 feet).

1905-7, 1910-11, 1923-33: Maximum, 70,000 second-feet Mar. 31, 1931 (gage height, 22.0 feet); minimum, 100 second-feet several days in September, October, November 1925. Average, 11 years (1905-6, 1923-33), 2,780 second-feet.

REMARKS.—Records fair. No diversions or regulation above station. Gage-height record October to April furnished by U. S. Weather Bureau.

*Discharge, in second-feet, 1932-33*

| Day | Oct.  | Nov.   | Dec.   | Jan.   | Feb.  | Mar.  | Apr.  | May   | June   | July  | Aug. | Sept. |
|-----|-------|--------|--------|--------|-------|-------|-------|-------|--------|-------|------|-------|
| 1   | 135   | 2,000  | 3,000  | 6,000  | 2,800 | 5,760 | 6,000 | 5,760 | 4,610  | 2,040 | 436  | 235   |
| 2   | 135   | 3,500  | 9,000  | 12,200 | 2,800 | 5,060 | 5,520 | 5,520 | 4,610  | 2,040 | 420  | 215   |
| 3   | 135   | 3,370  | 8,000  | 8,900  | 2,800 | 5,060 | 5,060 | 5,760 | 4,830  | 2,040 | 405  | 215   |
| 4   | 129   | 2,700  | 6,000  | 6,240  | 2,620 | 5,060 | 6,740 | 5,760 | 4,610  | 1,900 | 436  | 201   |
| 5   | 129   | 6,490  | 4,500  |        | 2,620 | 5,520 | 6,990 | 6,000 | 4,610  | 1,760 | 484  | 187   |
| 6   | 129   | 10,100 | 3,400  |        | 2,620 | 5,520 | 5,060 | 5,760 | 4,830  | 1,760 | 420  | 293   |
| 7   | 129   | 6,000  | 2,620  |        | 2,270 | 6,000 | 4,610 | 5,520 | 4,390  | 1,760 | 405  | 420   |
| 8   | 129   | 9,000  | 2,270  |        | 2,270 | 5,760 | 4,180 | 5,760 | 15,000 | 1,620 | 405  | 332   |
| 9   | 129   | 8,000  | 1,880  | 8,500  | 1,800 | 4,610 | 3,370 | 5,520 | 22,000 | 1,560 | 382  | 252   |
| 10  | 129   | 5,500  | 1,660  |        | 1,590 | 4,610 | 3,180 | 5,060 | 14,500 | 1,420 | 360  | 224   |
| 11  | 129   | 3,000  | 1,460  |        | 2,110 | 4,610 | 2,990 | 4,500 | 11,000 | 1,360 | 332  | 215   |
| 12  | 190   | 2,270  | 1,320  |        | 2,800 | 7,250 | 2,800 | 4,100 | 10,100 | 1,300 | 312  | 215   |
| 13  | 350   | 2,990  | 1,200  | 5,060  | 3,570 | 6,990 | 3,370 | 4,000 | 8,610  | 1,120 | 293  | 201   |
| 14  | 470   | 3,970  | 1,150  | 4,610  | 3,370 | 6,000 | 3,770 | 4,400 | 7,250  | 1,120 | 293  | 215   |
| 15  | 400   | 9,000  | 1,120  | 4,390  | 5,060 | 5,520 | 3,970 | 5,060 | 6,000  | 1,060 | 280  | 500   |
| 16  | 825   | 12,500 | 1,100  | 4,180  | 6,000 | 5,290 | 4,180 | 5,520 | 5,760  | 1,000 | 280  | 632   |
| 17  | 1,390 | 11,300 | 1,080  | 3,770  | 4,610 | 5,290 | 3,770 | 5,760 | 5,520  | 1,000 | 269  | 542   |
| 18  | 1,590 | 8,900  | 2,270  | 3,180  | 3,370 | 5,520 | 3,180 | 5,520 | 4,610  | 890   | 269  | 420   |
| 19  | 825   | 6,240  | 6,000  | 2,800  | 3,180 | 5,000 | 2,990 | 5,520 | 3,770  | 890   | 269  | 500   |
| 20  | 470   | 6,000  | 6,000  | 2,440  | 2,990 | 7,000 | 2,990 | 5,520 | 3,010  | 780   | 252  | 585   |
| 21  | 325   | 5,060  | 5,290  | 2,270  | 3,570 | 5,520 | 3,370 | 5,760 | 3,010  | 730   | 252  | 1,000 |
| 22  | 2,500 | 3,970  | 4,180  | 2,110  | 5,060 | 5,060 | 4,180 | 6,000 | 3,010  | 680   | 252  | 2,300 |
| 23  | 2,110 | 3,180  | 5,060  | 2,110  | 6,990 | 5,060 | 5,060 | 6,490 | 2,830  | 680   | 235  | 2,000 |
| 24  | 1,460 | 2,270  | 4,500  | 2,270  | 5,760 | 3,770 | 5,060 | 6,990 | 2,660  | 585   | 224  | 1,500 |
| 25  | 1,030 | 1,800  | 4,400  | 2,270  | 5,060 | 3,370 | 5,060 | 7,510 | 2,830  | 585   | 224  | 1,900 |
| 26  | 730   | 1,520  | 12,800 | 2,440  | 4,830 | 3,370 | 5,060 | 7,250 | 3,010  | 585   | 224  | 2,040 |
| 27  | 635   | 1,390  | 11,300 | 3,570  | 5,060 | 2,990 | 6,000 | 7,250 | 3,010  | 542   | 224  | 1,060 |
| 28  | 550   | 1,300  | 11,300 | 3,770  | 5,060 | 3,970 | 6,740 | 7,510 | 2,660  | 500   | 215  | 890   |
| 29  | 510   | 1,300  | 8,900  | 3,370  |       | 5,760 | 6,240 | 7,780 | 2,310  | 500   | 219  | 1,360 |
| 30  | 550   | 2,000  | 8,610  | 3,370  |       | 6,490 | 6,000 | 7,250 | 2,190  | 484   | 235  | 1,240 |
| 31  | 700   |        | 8,050  | 2,990  |       | 7,250 |       | 6,000 |        | 460   | 280  |       |

| Month     | Maximum | Minimum | Mean  | Per square mile | Run-off |           |
|-----------|---------|---------|-------|-----------------|---------|-----------|
|           |         |         |       |                 | Inches  | Acre-feet |
| October   | 2,500   | 129     | 614   | 0.959           | 1.11    | 37,800    |
| November  | 12,500  | 1,300   | 4,890 | 7.64            | 8.52    | 291,000   |
| December  | 12,800  | 1,080   | 4,820 | 7.53            | 8.68    | 296,000   |
| January   |         | 2,110   | 5,240 | 8.19            | 9.44    | 322,000   |
| February  | 6,990   | 1,590   | 3,670 | 5.73            | 5.97    | 204,000   |
| March     | 7,250   | 2,990   | 5,290 | 8.27            | 9.53    | 325,000   |
| April     | 6,990   | 2,800   | 4,580 | 7.16            | 7.99    | 273,000   |
| May       | 7,780   | 4,000   | 5,870 | 9.17            | 10.57   | 361,000   |
| June      | 22,000  | 2,190   | 5,910 | 9.23            | 10.30   | 352,000   |
| July      | 2,040   | 460     | 1,120 | 1.75            | 2.02    | 68,900    |
| August    | 484     | 215     | 309   | .483            | .56     | 19,000    |
| September | 2,300   | 187     | 730   | 1.14            | 1.27    | 43,400    |
| The year  | 22,000  | 129     | 3,580 | 5.59            | 75.96   | 2,590,000 |

\* Estimated.

## MIDDLE SANTIAM RIVER NEAR FOSTER, OREG.

LOCATION.—Water-stage recorder in SE¼ sec. 2, T. 13 S., R. 2 E., half a mile above mouth of Green Peter Creek and 8 miles northeast of Foster. Zero of gage is 733.44 feet above mean sea level.

DRAINAGE AREA.—271 square miles.

RECORDS AVAILABLE.—August 1931 to September 1933.

DISCHARGE.—Maximum during year, 19,300 second-feet June 9 (gage height, 14.36 feet); minimum, 62 second-feet Oct. 9 (gage height, 1.38 feet).

1931-33: Maximum, 29,500 second-feet Mar. 18, 1932 (gage height, 17.84 feet); minimum, that of Oct. 9, 1932.

REMARKS.—Records excellent except those estimated, Dec. 10-21, which are fair. No regulation or diversions above station.

*Discharge, in second-feet, 1932-33*

| Day     | Oct.  | Nov.  | Dec.  | Jan.  | Feb.  | Mar.  | Apr.  | May   | June   | July  | Aug. | Sept. |
|---------|-------|-------|-------|-------|-------|-------|-------|-------|--------|-------|------|-------|
| 1.....  | 72    | 1,060 | 1,690 | 2,810 | 1,300 | 2,210 | 3,030 | 2,700 | 2,700  | 1,120 | 236  | 126   |
| 2.....  | 72    | 2,160 | 4,880 | 4,300 | 1,060 | 2,120 | 3,030 | 2,810 | 2,700  | 1,120 | 227  | 118   |
| 3.....  | 70    | 1,900 | 3,500 | 3,030 | 955   | 2,210 | 4,160 | 2,700 | 3,030  | 1,120 | 227  | 116   |
| 4.....  | 66    | 1,370 | 2,400 | 2,700 | 895   | 1,940 | 3,630 | 3,260 | 2,920  | 1,020 | 245  | 113   |
| 5.....  | 65    | 6,340 | 1,940 | 4,580 | 1,020 | 1,730 | 3,030 | 3,260 | 2,810  | 988   | 236  | 124   |
| 6.....  | 64    | 6,320 | 1,570 | 7,380 | 1,060 | 1,770 | 2,810 | 3,030 | 2,700  | 988   | 221  | 243   |
| 7.....  | 63    | 3,140 | 1,370 | 4,440 | 988   | 3,030 | 2,600 | 2,700 | 2,600  | 955   | 208  | 180   |
| 8.....  | 63    | 5,660 | 1,160 | 3,890 | 925   | 2,700 | 2,210 | 3,030 | 10,800 | 925   | 202  | 143   |
| 9.....  | 62    | 4,730 | 1,020 | 4,160 | 775   | 2,260 | 1,900 | 3,140 | 16,500 | 865   | 196  | 128   |
| 10..... | 63    | 2,700 |       | 3,760 | 775   | 2,260 | 1,690 | 2,600 | 7,940  | 748   | 188  | 118   |
| 11..... | 63    | 1,900 |       | 2,920 | 835   | 2,450 | 1,690 | 2,160 | 5,180  | 695   | 182  | 114   |
| 12..... | 94    | 1,420 |       | 2,400 | 1,490 | 4,300 | 1,980 | 2,080 | 5,030  | 720   | 176  | 113   |
| 13..... | 236   | 1,850 |       | 2,120 | 1,450 | 3,630 | 1,900 | 2,160 | 4,880  | 670   | 171  | 111   |
| 14..... | 374   | 2,810 |       | 2,300 | 1,230 | 2,920 | 2,260 | 2,350 | 4,580  | 670   | 165  | 145   |
| 15..... | 247   | 5,840 | 1,360 | 2,120 | 1,450 | 2,400 | 2,700 | 2,810 | 3,890  | 645   | 161  | 377   |
| 16..... | 575   | 7,380 |       | 1,770 | 1,420 | 2,810 | 2,350 | 2,920 | 3,260  | 598   | 158  | 323   |
| 17..... | 548   | 4,880 |       | 1,610 | 1,260 | 2,920 | 1,980 | 3,380 | 2,600  | 522   | 152  | 270   |
| 18..... | 298   | 3,260 |       | 1,450 | 1,160 | 2,700 | 1,770 | 3,140 | 2,160  | 474   | 149  | 263   |
| 19..... | 212   | 2,400 |       | 1,300 | 1,120 | 2,600 | 1,570 | 2,810 | 1,940  | 436   | 145  | 238   |
| 20..... | 165   | 1,900 |       | 1,160 | 1,120 | 3,500 | 1,650 | 3,030 | 1,770  | 408   | 145  | 268   |
| 21..... | 158   | 1,730 |       | 1,120 | 1,810 | 3,140 | 1,940 | 2,700 | 1,770  | 384   | 143  | 502   |
| 22..... | 1,230 | 1,610 | 1,980 | 1,020 | 2,700 | 2,600 | 2,450 | 2,600 | 1,730  | 362   | 140  | 1,160 |
| 23..... | 1,090 | 1,370 | 2,810 | 955   | 4,300 | 2,120 | 3,030 | 3,140 | 1,650  | 344   | 135  | 895   |
| 24..... | 670   | 1,200 | 2,260 | 925   | 2,700 | 1,850 | 3,260 | 3,900 | 1,610  | 329   | 132  | 925   |
| 25..... | 458   | 1,020 | 2,260 | 895   | 2,080 | 1,650 | 3,260 | 4,580 | 1,810  | 317   | 129  | 1,160 |
| 26..... | 432   | 925   | 6,490 | 895   | 2,400 | 1,530 | 2,920 | 4,160 | 1,730  | 298   | 126  | 748   |
| 27..... | 398   | 835   | 6,490 | 1,230 | 2,350 | 1,850 | 3,500 | 3,260 | 1,650  | 286   | 124  | 598   |
| 28..... | 332   | 805   | 5,180 | 1,020 | 2,160 | 3,030 | 4,020 | 3,260 | 1,490  | 273   | 124  | 530   |
| 29..... | 332   | 925   | 4,300 | 925   |       | 3,260 | 3,630 | 4,020 | 1,300  | 263   | 128  | 835   |
| 30..... | 368   | 1,200 | 3,630 | 865   |       | 3,630 | 2,920 | 4,020 | 1,160  | 254   | 161  | 620   |
| 31..... | 415   |       | 3,030 | 1,200 |       | 4,020 |       | 3,140 |        | 245   | 140  | ----- |

| Month          | Maximum | Minimum | Mean  | Per square mile | Run-off |           |
|----------------|---------|---------|-------|-----------------|---------|-----------|
|                |         |         |       |                 | Inches  | Acre-feet |
| October.....   | 1,230   | 62      | 302   | 1.11            | 1.28    | 18,600    |
| November.....  | 7,380   | 805     | 2,690 | 9.93            | 11.08   | 160,000   |
| December.....  | 6,490   |         | 2,400 | 8.86            | 10.22   | 148,000   |
| January.....   | 7,380   | 865     | 2,300 | 8.49            | 9.79    | 141,000   |
| February.....  | 4,300   | 775     | 1,530 | 5.65            | 5.88    | 85,000    |
| March.....     | 4,300   | 1,530   | 2,620 | 9.67            | 11.15   | 161,000   |
| April.....     | 4,160   | 1,570   | 2,630 | 9.70            | 10.82   | 156,000   |
| May.....       | 4,580   | 2,080   | 3,060 | 11.3            | 13.03   | 188,000   |
| June.....      | 16,500  | 1,160   | 3,530 | 13.0            | 14.50   | 210,000   |
| July.....      | 1,120   | 245     | 614   | 2.27            | 2.62    | 37,800    |
| August.....    | 245     | 124     | 170   | .627            | .72     | 10,500    |
| September..... | 1,160   | 111     | 387   | 1.43            | 1.60    | 23,000    |
| The year.....  | 16,500  | 62      | 1,850 | 6.83            | 92.69   | 1,340,000 |

## ALBANY POWER CANAL NEAR LEBANON, OREG.

LOCATION.—Staff gage in SW $\frac{1}{4}$  sec. 2, T. 12 S., R. 2 W., an eighth of a mile below spillway and 1 mile north of Lebanon.

RECORDS AVAILABLE.—April 1926 to September 1933. February to December 1919 at station near Albany.

DISCHARGE.—Maximum recorded during year, 290 second-feet frequently during year; maximum recorded gage height, 3.45 feet Jan. 23; minimum recorded discharge, 62 second-feet part of day, Oct. 25-29 (gage height, 1.10 feet).

1919, 1926-33: Maximum recorded, 302 second-feet Jan. 10, 1932 (gage height, 3.52 feet); probably almost dry at times.

REMARKS.—Records good. Gage read about three times a week; mean monthly discharge is mean of discharges on days gage was read. This canal diverts from South Santiam River at Lebanon and discharges into Calapooya River at mouth. Lebanon ditch discharges into canal just below canal intake. Water is used for power and water supply at Albany. Gage-height record furnished by Mountain States Power Co.

*Discharge, in second-feet, 1932-33*

| Day | Oct. | Nov. | Dec. | Jan. | Feb. | Mar. | Apr. | May | June | July | Aug. | Sept. |
|-----|------|------|------|------|------|------|------|-----|------|------|------|-------|
| 1   |      |      |      | 245  | 290  | 278  |      | 290 |      | 267  |      |       |
| 2   |      | 267  | 234  | 212  | 267  | 290  | 290  | 290 | 290  | 267  | 267  |       |
| 3   | 106  |      |      | 223  |      |      |      |     |      |      |      |       |
| 4   |      | 278  |      |      |      |      |      |     |      |      | 256  |       |
| 5   | 102  |      | 245  | 267  | 278  |      | 278  | 290 | 290  | 267  |      | 139   |
| 6   |      |      |      |      |      | 278  |      |     |      |      |      |       |
| 7   | 106  |      |      |      |      |      |      |     |      | 267  |      |       |
| 8   | 98   | 278  | 234  | 267  | 278  | 278  | 278  | 290 | 290  | 267  | 245  | 139   |
| 9   |      | 267  | 223  | 267  |      |      |      |     | 290  |      | 245  | 149   |
| 10  | 89   |      |      |      | 278  | 278  | 278  | 290 |      | 267  |      |       |
| 11  |      | 267  |      | 256  |      |      |      |     |      |      | 223  | 159   |
| 12  | 89   |      | 223  |      |      |      | 290  | 290 | 290  | 267  |      |       |
| 13  |      |      |      | 278  | 245  | 278  |      |     |      |      |      | 169   |
| 14  | 223  | 267  | 212  |      |      |      | 290  |     | 278  | 267  | 245  |       |
| 15  |      |      |      |      | 201  | 290  |      | 290 |      |      |      | 234   |
| 16  |      |      | 223  | 245  | 278  |      |      |     | 278  |      | 159  |       |
| 17  | 290  | 234  |      |      | 278  | 290  | 290  | 290 |      | 267  |      |       |
| 18  |      |      |      | 245  |      |      |      |     |      |      | 159  | 278   |
| 19  | 267  | 234  |      |      |      |      | 290  | 290 | 278  | 290  |      |       |
| 20  |      |      | 234  | 245  | 278  | 290  |      |     |      |      |      | 278   |
| 21  | 267  | 223  |      |      |      |      | 290  |     | 278  | 290  | 159  |       |
| 22  |      |      | 245  |      | 278  | 290  |      | 290 |      |      |      | 290   |
| 23  |      | 245  |      | 290  |      |      |      |     | 278  |      | 159  |       |
| 24  | 256  |      | 245  |      | 267  | 278  | 290  | 278 |      | 290  |      | 179   |
| 25  | 190  | 245  |      | 278  |      |      |      |     |      |      | 159  | 179   |
| 26  |      |      | 256  |      |      |      | 290  | 290 | 278  | 290  |      |       |
| 27  | 197  |      | 256  | 245  | 278  | 278  |      |     |      |      |      | 179   |
| 28  | 197  | 212  |      |      |      |      | 290  |     | 278  | 278  | 159  |       |
| 29  | 197  |      | 267  | 256  |      | 290  |      | 290 |      |      |      | 201   |
| 30  |      | 234  |      | 267  |      |      |      |     |      |      |      |       |
| 31  | 278  |      | 256  | 290  |      | 278  |      | 290 |      | 267  |      |       |

| Month    | Mean | Run-off in<br>acre-feet | Month     | Mean | Run-off in<br>acre-feet |
|----------|------|-------------------------|-----------|------|-------------------------|
| October  | 185  | 11,400                  | May       | 289  | 17,800                  |
| November | 250  | 14,900                  | June      | 283  | 16,800                  |
| December | 240  | 14,800                  | July      | 274  | 16,800                  |
| January  | 257  | 15,800                  | August    | 203  | 12,500                  |
| February | 269  | 14,900                  | September | 198  | 11,800                  |
| March    | 283  | 17,400                  |           |      |                         |
| April    | 287  | 17,100                  | The year  | 251  | 182,000                 |

## HASKINS CREEK NEAR McMinnville, OREG.

LOCATION.—Water-stage recorder in NE¼ sec. 13, T. 3 S., R. 6 W., 300 feet above flow line of McMinnville water-supply reservoir and 11 miles northwest of McMinnville.

DRAINAGE AREA.—5.7 square miles.

RECORDS AVAILABLE.—October 1928 to September 1933.

DISCHARGE.—Maximum during year, 225 second-feet Dec. 19 (gage height, 2.68 feet); minimum, 1.0 second-foot Oct. 8 (gage height, 0.55 foot).

1928-33: Maximum, 610 second-feet Mar. 31, 1931 (gage height, 4.00 feet); minimum, that of Oct. 8, 1932.

REMARKS.—Records good. Discharge estimated Feb. 26. No diversions or regulations above station. Gage-height record furnished by city of McMinnville.

*Discharge, in second-feet, 1932-33*

| Day     | Oct. | Nov.  | Dec. | Jan. | Feb.  | Mar. | Apr.  | May | June  | July | Aug. | Sept. |
|---------|------|-------|------|------|-------|------|-------|-----|-------|------|------|-------|
| 1.....  | 1.2  | 16    | 135  | 94   | 38    | 72   | 90    | 38  | 19    | 11   | 4.0  | 2.9   |
| 2.....  | 1.2  | 22    | 200  | 196  | 35    | 85   | 80    | 35  | 18    | 11   | 4.0  | 2.7   |
| 3.....  | 1.2  | 21    | 138  | 142  | 33    | 81   | 76    | 34  | 18    | 11   | 4.2  | 2.4   |
| 4.....  | 1.2  | 16    | 98   | 140  | 31    | 73   | 71    | 35  | 17    | 9.7  | 4.7  | 2.4   |
| 5.....  | 1.1  | 46    | 72   | 158  | 30    | 65   | 65    | 36  | 16    | 9.0  | 4.9  | 3.2   |
| 6.....  | 1.2  | 45    | 56   | 162  | 28    | 77   | 59    | 40  | 16    | 9.0  | 4.7  | 4.0   |
| 7.....  | 1.1  | 30    | 43   | 135  | 28    | 87   | 56    | 60  | 15    | 8.7  | 4.2  | 3.2   |
| 8.....  | 1.1  | 36    | 36   | 125  | 26    | 81   | 51    | 76  | 25    | 8.7  | 4.0  | 2.7   |
| 9.....  | 1.2  | 26    | 31   | 129  | 25    | 73   | 47    | 73  | 50    | 8.3  | 3.8  | 2.7   |
| 10..... | 1.2  | 23    | 28   | 126  | 25    | 81   | 43    | 65  | 46    | 8.0  | 3.8  | 2.6   |
| 11..... | 1.3  | 16    | 26   | 106  | 28    | 125  | 40    | 57  | 36    | 7.7  | 3.7  | 2.6   |
| 12..... | 2.5  | 13    | 24   | 89   | 32    | 151  | 40    | 49  | 30    | 7.3  | 3.0  | 2.6   |
| 13..... | 2.2  | 89    | 22   | 74   | 30    | 125  | 37    | 44  | 26    | 7.0  | 2.9  | 2.4   |
| 14..... | 3.6  | 107   | 21   | 73   | 28    | 102  | 37    | 38  | 23    | 6.3  | 2.7  | 3.0   |
| 15..... | 3.4  | 117   | 19   | 65   | 33    | 97   | 36    | 36  | 22    | 6.1  | 2.7  | 3.8   |
| 16..... | 3.4  | 103   | 18   | 58   | 31    | 103  | 36    | 35  | 20    | 5.8  | 2.6  | 3.5   |
| 17..... | 3.0  | 72    | 18   | 52   | 31    | 94   | 35    | 36  | 19    | 5.8  | 2.7  | 3.5   |
| 18..... | 2.2  | 52    | 39   | 47   | 33    | 89   | 32    | 34  | 18    | 5.6  | 2.7  | 3.8   |
| 19..... | 2.1  | 41    | 160  | 42   | 36    | 83   | 30    | 33  | 17    | 5.6  | 2.6  | 3.2   |
| 20..... | 2.0  | 31    | 151  | 38   | 43    | 85   | 30    | 30  | 16    | 5.4  | 2.6  | 3.2   |
| 21..... | 2.1  | 30    | 113  | 37   | 86    | 80   | 30    | 29  | 16    | 5.4  | 2.4  | 4.7   |
| 22..... | 6.2  | 25    | 115  | 35   | 149   | 71   | 30    | 27  | 15    | 5.8  | 2.3  | 12    |
| 23..... | 5.0  | 22    | 117  | 35   | 158   | 63   | 31    | 29  | 15    | 5.2  | 2.3  | 7.0   |
| 24..... | 3.8  | 20    | 110  | 35   | 100   | 58   | 31    | 30  | 15    | 4.9  | 2.6  | 9.4   |
| 25..... | 2.8  | 18    | 109  | 23   | 94    | 53   | 30    | 28  | 14    | 4.7  | 2.4  | 6.3   |
| 26..... | 2.5  | 17    | 145  | 36   | 100   | 50   | 30    | 27  | 13    | 4.5  | 2.3  | 5.8   |
| 27..... | 2.4  | 16    | 121  | 42   | 81    | 60   | 30    | 25  | 13    | 4.5  | 2.6  | 4.5   |
| 28..... | 2.2  | 18    | 106  | 36   | 77    | 74   | 30    | 23  | 13    | 4.5  | 3.0  | 6.3   |
| 29..... | 2.8  | 66    | 97   | 36   | ----- | 82   | 29    | 22  | 12    | 4.5  | 3.2  | 5.4   |
| 30..... | 3.0  | 71    | 82   | 34   | ----- | 114  | 28    | 22  | 11    | 4.2  | 3.2  | 4.5   |
| 31..... | 7.0  | ----- | 77   | 38   | ----- | 110  | ----- | 20  | ----- | 4.0  | 3.2  | ----- |

| Month          | Maximum | Minimum | Mean | Per square mile | Run-off |           |
|----------------|---------|---------|------|-----------------|---------|-----------|
|                |         |         |      |                 | Inches  | Acre-feet |
| October.....   | 7.0     | 1.1     | 2.49 | 0.437           | 0.50    | 153       |
| November.....  | 117     | 13      | 40.8 | 7.16            | 7.99    | 2,430     |
| December.....  | 200     | 18      | 81.5 | 14.3            | 16.49   | 5,010     |
| January.....   | 196     | 23      | 78.6 | 13.8            | 15.91   | 4,830     |
| February.....  | 158     | 25      | 52.5 | 9.21            | 9.59    | 2,920     |
| March.....     | 151     | 50      | 85.3 | 15.0            | 17.29   | 5,240     |
| April.....     | 90      | 28      | 43.0 | 7.54            | 8.41    | 2,560     |
| May.....       | 76      | 20      | 37.6 | 6.60            | 7.61    | 2,310     |
| June.....      | 50      | 11      | 20.1 | 3.53            | 3.94    | 1,200     |
| July.....      | 11      | 4.0     | 6.75 | 1.18            | 1.36    | 415       |
| August.....    | 4.9     | 2.3     | 3.23 | .567            | .65     | 199       |
| September..... | 12      | 2.4     | 4.21 | .739            | .82     | 251       |
| The year.....  | 200     | 1.1     | 38.0 | 6.67            | 90.56   | 27,500    |

## MOLALLA RIVER NEAR CANBY, OREG.

LOCATION.—Staff gage in NE¼ sec. 9, T. 4 S., R. 1 E., at bridge 1½ miles south of Canby. Zero of gage is 104.56 feet above mean sea level by general adjustment of 1929.

DRAINAGE AREA.—323 square miles.

RECORDS AVAILABLE.—August 1928 to September 1933.

DISCHARGE.—Maximum during year, 8,390 second-feet Jan. 2 (gage height, 8.3 feet); minimum, 40 second-feet Oct. 6, 7, 10 (gage height, 1.53 feet).

1928-33: Maximum, 22,300 second-feet Mar. 31, 1931 (gage height, 14.7 feet); minimum, that of Oct. 6, 7, 10, 1932.

REMARKS.—Records good. A few small irrigation diversions above gage.

*Discharge, in second-feet, 1932-33*

| Day | Oct. | Nov.  | Dec.  | Jan.  | Feb.  | Mar.  | Apr.  | May   | June  | July | Aug. | Sept. |
|-----|------|-------|-------|-------|-------|-------|-------|-------|-------|------|------|-------|
| 1   | 48   | 700   | 1,060 | 2,680 | 1,290 | 2,550 | 2,300 | 1,380 | 1,470 | 595  | 130  | 93    |
| 2   | 48   | 1,760 | 1,470 | 6,710 | 1,160 | 2,300 | 1,960 | 1,660 | 1,470 | 595  | 123  | 90    |
| 3   | 48   | 2,070 | 1,470 | 4,970 | 990   | 2,180 | 2,180 | 1,560 | 1,380 | 562  | 130  | 75    |
| 4   | 44   | 1,660 | 1,560 | 3,400 | 912   | 1,860 | 2,070 | 1,560 | 1,380 | 562  | 153  | 70    |
| 5   | 44   | 2,550 | 1,110 | 2,550 | 950   | 1,660 | 1,760 | 1,560 | 1,380 | 530  | 177  | 78    |
| 6   | 40   | 4,640 | 980   | 5,140 | 1,030 | 1,560 | 1,560 | 1,660 | 1,380 | 500  | 157  | 102   |
| 7   | 42   | 2,820 | 860   | 2,400 | 950   | 2,180 | 1,470 | 1,660 | 1,290 | 500  | 145  | 116   |
| 8   | 42   | 4,000 | 700   | 2,960 | 875   | 1,960 | 1,380 | 1,660 | 1,860 | 470  | 137  | 116   |
| 9   | 42   | 5,310 | 560   | 3,100 | 765   | 1,660 | 1,200 | 1,290 | 6,530 | 342  | 130  | 116   |
| 10  | 40   | 3,100 | 560   | 3,100 | 730   | 1,760 | 1,070 | 1,560 | 4,800 | 342  | 123  | 109   |
| 11  | 44   | 1,960 | 490   | 2,420 | 730   | 2,070 | 990   | 1,380 | 2,960 | 415  | 116  | 106   |
| 12  | 63   | 1,470 | 460   | 1,960 | 950   | 3,400 | 1,160 | 1,200 | 2,680 | 388  | 106  | 93    |
| 13  | 126  | 1,290 | 460   | 1,660 | 990   | 3,400 | 1,160 | 1,290 | 2,680 | 360  | 102  | 87    |
| 14  | 166  | 1,860 | 430   | 1,660 | 990   | 2,820 | 1,200 | 1,290 | 2,420 | 360  | 99   | 130   |
| 15  | 238  | 3,250 | 430   | 1,660 | 1,660 | 2,070 | 1,380 | 1,470 | 2,180 | 355  | 99   | 229   |
| 16  | 295  | 4,800 | 430   | 1,380 | 1,960 | 2,070 | 1,380 | 1,560 | 1,760 | 310  | 96   | 238   |
| 17  | 430  | 3,250 | 375   | 1,200 | 1,660 | 2,070 | 1,200 | 1,660 | 1,470 | 274  | 96   | 224   |
| 18  | 270  | 2,420 | 860   | 1,160 | 1,470 | 1,860 | 1,070 | 1,660 | 1,200 | 265  | 96   | 247   |
| 19  | 185  | 1,860 | 2,300 | 1,110 | 1,200 | 1,660 | 950   | 1,660 | 1,030 | 252  | 96   | 265   |
| 20  | 140  | 1,380 | 2,820 | 1,030 | 1,110 | 1,960 | 912   | 1,760 | 950   | 229  | 96   | 238   |
| 21  | 116  | 1,060 | 2,550 | 912   | 1,200 | 2,180 | 950   | 1,560 | 875   | 216  | 96   | 247   |
| 22  | 295  | 1,110 | 2,550 | 875   | 1,660 | 1,860 | 1,110 | 1,560 | 875   | 203  | 93   | 340   |
| 23  | 780  | 1,110 | 3,250 | 838   | 2,680 | 1,560 | 1,380 | 1,860 | 838   | 186  | 90   | 415   |
| 24  | 490  | 980   | 2,550 | 838   | 2,300 | 1,380 | 1,470 | 2,070 | 800   | 177  | 87   | 562   |
| 25  | 370  | 900   | 2,420 | 838   | 1,960 | 1,200 | 1,470 | 2,300 | 875   | 177  | 78   | 628   |
| 26  | 300  | 740   | 3,850 | 1,160 | 2,070 | 1,070 | 1,470 | 2,550 | 912   | 177  | 78   | 470   |
| 27  | 270  | 665   | 5,310 | 1,860 | 2,180 | 1,110 | 1,470 | 1,960 | 875   | 169  | 72   | 388   |
| 28  | 248  | 665   | 3,550 | 1,560 | 2,300 | 1,960 | 1,760 | 1,860 | 838   | 153  | 70   | 335   |
| 29  | 230  | 940   | 2,960 | 1,380 | ----- | 2,070 | 1,660 | 1,960 | 730   | 145  | 72   | 342   |
| 30  | 205  | 1,110 | 2,820 | 1,200 | ----- | 2,300 | 1,470 | 1,860 | 730   | 137  | 84   | 415   |
| 31  | 270  | ----- | 2,680 | 1,200 | ----- | 2,550 | ----- | 1,760 | ----- | 137  | 102  | ----- |

| Month     | Maximum | Minimum | Mean  | Per square mile | Run-off |           |
|-----------|---------|---------|-------|-----------------|---------|-----------|
|           |         |         |       |                 | Inches  | Acre-feet |
| October   | 780     | 40      | 193   | 0.598           | 0.69    | 11,900    |
| November  | 5,310   | 665     | 2,050 | 6.35            | 7.08    | 122,000   |
| December  | 5,310   | 375     | 1,740 | 5.39            | 6.21    | 107,000   |
| January   | 6,710   | 838     | 2,160 | 6.69            | 7.71    | 133,000   |
| February  | 2,680   | 730     | 1,380 | 4.27            | 4.45    | 76,600    |
| March     | 3,400   | 1,070   | 2,010 | 6.22            | 7.17    | 124,000   |
| April     | 2,300   | 912     | 1,420 | 4.40            | 4.91    | 84,500    |
| May       | 2,550   | 1,200   | 1,670 | 5.17            | 5.96    | 103,000   |
| June      | 6,530   | 730     | 1,690 | 5.23            | 5.84    | 101,000   |
| July      | 595     | 137     | 325   | 1.01            | 1.16    | 20,000    |
| August    | 177     | 70      | 107   | .331            | .38     | 6,580     |
| September | 628     | 70      | 232   | .718            | .80     | 13,800    |
| The year  | 6,710   | 40      | 1,250 | 3.87            | 52.36   | 903,000   |

## PUDDING RIVER AT AURORA, OREG.

LOCATION.—Staff gage in SE¼ sec. 12, T. 4 S., R. 1 W., at highway bridge at Aurora, half a mile above mouth of Mill Creek. Zero of gage is 76.79 feet above mean sea level by general adjustment of 1929.

DRAINAGE AREA.—493 square miles.

RECORDS AVAILABLE.—October 1928 to September 1933.

DISCHARGE.—Maximum during year, 7,780 second-feet Jan. 3 (gage height, 19.27 feet); minimum, 48 second-feet Oct. 6, 11 (gage height, 0.41 foot).

1928-33: Maximum, 9,950 second-feet Apr. 1, 1931 (gage height, 21.4 feet); minimum, 48 second-feet Oct. 2, 1929, Oct. 6, 11, 1932.

Maximum known stage, 25.0 feet Jan. 9, 1923 (discharge, about 14,500 second-feet).

REMARKS.—Records good. No diversions or regulation above station.

*Discharge, in second-feet, 1932-33*

| Day | Oct. | Nov.  | Dec.  | Jan.  | Feb.  | Mar.  | Apr.  | May   | June  | July | Aug. | Sept. |
|-----|------|-------|-------|-------|-------|-------|-------|-------|-------|------|------|-------|
| 1   | 54   | 250   | 1,670 | 4,280 | 2,660 | 3,990 | 3,230 | 844   | 1,060 | 380  | 110  | 92    |
| 2   | 54   | 554   | 1,500 | 5,150 | 2,540 | 4,040 | 2,820 | 890   | 960   | 360  | 110  | 95    |
| 3   | 53   | 1,280 | 1,530 | 7,500 | 2,230 | 3,820 | 2,260 | 1,140 | 890   | 360  | 108  | 95    |
| 4   | 51   | 1,580 | 1,470 | 7,050 | 1,950 | 3,690 | 2,020 | 1,060 | 890   | 322  | 108  | 94    |
| 5   | 50   | 1,380 | 1,330 | 6,630 | 1,720 | 3,270 | 1,750 | 1,080 | 844   | 312  | 120  | 92    |
| 6   | 48   | 1,900 | 1,170 | 6,470 | 1,570 | 2,820 | 1,660 | 1,160 | 798   | 294  | 150  | 91    |
| 7   | 50   | 2,300 | 1,070 | 6,230 | 1,480 | 2,700 | 1,450 | 1,210 | 776   | 285  | 148  | 104   |
| 8   | 40   | 2,130 | 1,000 | 5,850 | 1,360 | 2,580 | 1,390 | 1,300 | 798   | 267  | 132  | 132   |
| 9   | 50   | 2,590 | 848   | 5,320 | 1,270 | 2,620 | 1,300 | 1,540 | 1,980 | 268  | 120  | 132   |
| 10  | 50   | 3,240 | 658   | 4,660 | 1,110 | 2,660 | 1,118 | 1,780 | 3,430 | 240  | 114  | 118   |
| 11  | 48   | 2,730 | 637   | 3,860 | 1,040 | 3,270 | 1,080 | 1,690 | 3,390 | 232  | 105  | 97    |
| 12  | 55   | 2,000 | 637   | 3,430 | 1,160 | 3,950 | 1,060 | 1,450 | 2,540 | 224  | 102  | 88    |
| 13  | 69   | 1,500 | 574   | 3,100 | 1,750 | 4,570 | 1,060 | 1,300 | 2,020 | 215  | 98   | 87    |
| 14  | 99   | 1,470 | 554   | 2,780 | 1,750 | 4,520 | 1,060 | 1,210 | 1,540 | 206  | 92   | 85    |
| 15  | 175  | 1,640 | 534   | 2,460 | 2,060 | 4,120 | 1,010 | 1,160 | 1,270 | 198  | 91   | 95    |
| 16  | 216  | 2,510 | 534   | 2,300 | 3,140 | 3,600 | 1,040 | 1,330 | 1,080 | 190  | 91   | 138   |
| 17  | 259  | 2,880 | 534   | 1,920 | 3,020 | 3,350 | 1,010 | 1,450 | 985   | 182  | 90   | 215   |
| 18  | 341  | 2,550 | 554   | 1,660 | 2,740 | 3,140 | 960   | 1,540 | 867   | 174  | 88   | 232   |
| 19  | 304  | 2,030 | 1,000 | 1,570 | 2,260 | 2,820 | 890   | 1,570 | 776   | 166  | 84   | 215   |
| 20  | 208  | 1,610 | 2,960 | 1,540 | 1,950 | 2,540 | 821   | 1,570 | 688   | 158  | 83   | 198   |
| 21  | 167  | 1,380 | 3,240 | 1,510 | 1,920 | 2,500 | 776   | 1,540 | 645   | 146  | 87   | 198   |
| 22  | 167  | 1,280 | 3,840 | 1,690 | 2,260 | 2,380 | 798   | 1,390 | 624   | 141  | 84   | 224   |
| 23  | 259  | 1,140 | 4,130 | 1,690 | 2,900 | 2,120 | 867   | 1,300 | 603   | 135  | 80   | 303   |
| 24  | 360  | 892   | 4,690 | 1,600 | 3,730 | 1,880 | 890   | 1,570 | 603   | 134  | 77   | 400   |
| 25  | 322  | 870   | 4,550 | 1,690 | 3,730 | 1,720 | 913   | 1,720 | 561   | 129  | 74   | 440   |
| 26  | 322  | 826   | 4,330 | 1,880 | 3,520 | 1,510 | 913   | 1,750 | 540   | 126  | 73   | 500   |
| 27  | 304  | 826   | 4,420 | 2,660 | 3,230 | 1,390 | 890   | 1,600 | 520   | 122  | 74   | 440   |
| 28  | 233  | 763   | 4,370 | 3,950 | 3,310 | 1,690 | 913   | 1,390 | 500   | 118  | 73   | 420   |
| 29  | 199  | 848   | 4,420 | 3,950 | ----- | 2,160 | 936   | 1,240 | 440   | 114  | 72   | 380   |
| 30  | 191  | 1,440 | 4,330 | 3,520 | ----- | 2,460 | 890   | 1,240 | 420   | 114  | 77   | 360   |
| 31  | 191  | ----- | 4,130 | 2,900 | ----- | 3,180 | ----- | 1,180 | ----- | 112  | 91   | ----- |

| Month     | Maximum | Minimum | Mean  | Per square mile | Run-off |           |
|-----------|---------|---------|-------|-----------------|---------|-----------|
|           |         |         |       |                 | Inches  | Acre-feet |
| October   | 360     | 48      | 161   | 0.327           | 0.38    | 9,900     |
| November  | 3,240   | 250     | 1,610 | 3.27            | 3.65    | 95,800    |
| December  | 4,690   | 534     | 2,170 | 4.40            | 5.07    | 133,000   |
| January   | 7,500   | 1,510   | 3,570 | 7.24            | 8.35    | 220,000   |
| February  | 3,730   | 1,040   | 2,260 | 4.58            | 4.77    | 126,000   |
| March     | 4,570   | 1,390   | 2,940 | 5.96            | 6.87    | 181,000   |
| April     | 3,230   | 776     | 1,260 | 2.56            | 2.86    | 75,000    |
| May       | 1,780   | 844     | 1,360 | 2.76            | 3.18    | 83,600    |
| June      | 3,430   | 420     | 1,100 | 2.23            | 2.49    | 65,500    |
| July      | 380     | 112     | 207   | .420            | .48     | 12,700    |
| August    | 150     | 72      | 97    | .197            | .23     | 5,960     |
| September | 500     | 85      | 205   | .416            | .46     | 12,200    |
| The year  | 7,500   | 48      | 1,410 | 2.86            | 38.79   | 1,020,000 |

## TUALATIN RIVER NEAR WILLAMETTE, OREG.

LOCATION.—Staff gage in SW¼ sec. 34, T. 2 S., R. 1 E., 300 feet above county bridge and 1 mile northwest of Willamette.

DRAINAGE AREA.—710 square miles.

RECORDS AVAILABLE.—July 1928 to September 1933.

DISCHARGE.—Maximum during year, 8,320 second-feet Jan. 2 (gage height, 10.04 feet); minimum, 8 second-feet Oct. 1, 2 (gage height, 0.48 foot).

1928-33: Maximum, that of Jan. 2, 1933; minimum, 2 second-feet Aug. 14-21, 1928 (gage height, 0.25 foot).

REMARKS.—Records good except those below 300 second-feet, which are fair. Oswego Canal diverts from Tualatin River above station and returns water to Willamette River below station. Some regulation in low-water season by flash-boards on crest of Oswego Canal diversion dam.

## Discharge, in second-feet, 1932-33

| Day     | Oct. | Nov.  | Dec.  | Jan.  | Feb.  | Mar.  | Apr.  | May   | June  | July | Aug. | Sept. |
|---------|------|-------|-------|-------|-------|-------|-------|-------|-------|------|------|-------|
| 1.....  | 9    | 109   | 2,070 | 6,770 | 4,960 | 4,430 | 2,730 | 870   | 705   | 332  | 61   | 45    |
| 2.....  | 8    | 225   | 2,470 | 5,320 | 4,690 | 4,560 | 3,190 | 870   | 655   | 315  | 41   | 48    |
| 3.....  | 9    | 360   | 2,640 | 8,140 | 4,430 | 4,690 | 3,290 | 930   | 655   | 315  | 36   | 44    |
| 4.....  | 10   | 532   | 2,730 | 7,780 | 4,180 | 4,820 | 3,190 | 990   | 605   | 315  | 32   | 42    |
| 5.....  | 10   | 605   | 2,910 | 7,780 | 3,820 | 4,820 | 3,190 | 930   | 560   | 298  | 32   | 40    |
| 6.....  | 10   | 705   | 2,910 | 7,780 | 3,600 | 4,820 | 3,000 | 930   | 538   | 280  | 49   | 49    |
| 7.....  | 10   | 930   | 3,000 | 7,440 | 3,290 | 4,960 | 2,730 | 930   | 515   | 265  | 66   | 53    |
| 8.....  | 10   | 1,110 | 2,820 | 7,100 | 3,000 | 4,820 | 2,470 | 1,050 | 515   | 265  | 83   | 56    |
| 9.....  | 12   | 1,110 | 2,390 | 6,930 | 2,640 | 4,820 | 2,230 | 815   | 705   | 250  | 84   | 68    |
| 10..... | 15   | 1,050 | 2,150 | 6,610 | 2,230 | 4,820 | 1,910 | 1,550 | 930   | 250  | 74   | 59    |
| 11..... | 18   | 930   | 1,350 | 6,290 | 1,910 | 5,100 | 1,690 | 1,620 | 1,230 | 250  | 63   | 53    |
| 12..... | 23   | 655   | 1,170 | 5,980 | 1,690 | 5,680 | 1,550 | 1,550 | 1,110 | 250  | 55   | 43    |
| 13..... | 32   | 580   | 1,110 | 5,680 | 1,690 | 5,680 | 1,410 | 1,480 | 930   | 235  | 55   | 38    |
| 14..... | 35   | 760   | 990   | 5,240 | 1,690 | 5,830 | 1,350 | 1,290 | 760   | 235  | 47   | 34    |
| 15..... | 43   | 1,290 | 870   | 4,690 | 1,830 | 5,980 | 1,230 | 1,170 | 655   | 220  | 42   | 39    |
| 16..... | 50   | 1,990 | 815   | 4,060 | 1,990 | 6,130 | 1,230 | 1,110 | 605   | 220  | 41   | 45    |
| 17..... | 57   | 2,230 | 705   | 3,820 | 2,150 | 6,130 | 1,230 | 1,050 | 560   | 208  | 41   | 45    |
| 18..... | 56   | 2,310 | 705   | 3,600 | 2,150 | 5,830 | 1,170 | 1,050 | 515   | 195  | 41   | 50    |
| 19..... | 55   | 2,230 | 1,760 | 3,190 | 2,150 | 5,380 | 1,110 | 1,110 | 492   | 195  | 40   | 56    |
| 20..... | 47   | 2,070 | 3,580 | 2,730 | 2,150 | 5,100 | 1,050 | 1,110 | 470   | 182  | 32   | 72    |
| 21..... | 44   | 1,620 | 4,590 | 2,640 | 2,150 | 4,690 | 990   | 1,110 | 450   | 170  | 31   | 125   |
| 22..... | 52   | 1,230 | 5,320 | 2,390 | 2,390 | 4,300 | 930   | 1,050 | 430   | 170  | 30   | 145   |
| 23..... | 54   | 1,110 | 6,100 | 2,390 | 2,470 | 3,940 | 930   | 990   | 410   | 145  | 28   | 170   |
| 24..... | 56   | 930   | 6,770 | 2,640 | 3,000 | 3,600 | 930   | 990   | 390   | 145  | 26   | 182   |
| 25..... | 64   | 870   | 7,050 | 3,190 | 3,290 | 3,390 | 930   | 1,050 | 390   | 145  | 23   | 220   |
| 26..... | 71   | 760   | 7,330 | 3,390 | 3,490 | 3,090 | 930   | 990   | 390   | 145  | 22   | 220   |
| 27..... | 63   | 655   | 7,330 | 5,100 | 3,600 | 2,820 | 870   | 990   | 390   | 145  | 20   | 220   |
| 28..... | 45   | 655   | 7,190 | 5,240 | 4,060 | 2,640 | 870   | 930   | 350   | 145  | 22   | 195   |
| 29..... | 43   | 760   | 7,050 | 5,240 | ----- | 2,640 | 870   | 870   | 350   | 135  | 25   | 158   |
| 30..... | 45   | 1,290 | 6,770 | 5,100 | ----- | 2,310 | 870   | 815   | 350   | 121  | 30   | 145   |
| 31..... | 52   | ----- | 6,360 | 4,960 | ----- | 2,550 | ----- | 760   | ----- | 78   | 41   | ----- |

|                | River only   |              |       |                            | River and Oswego Canal (combined) |              |       |                                          |                       |           |
|----------------|--------------|--------------|-------|----------------------------|-----------------------------------|--------------|-------|------------------------------------------|-----------------------|-----------|
|                | Maxi-<br>mum | Mini-<br>mum | Mean  | Run-off<br>in<br>acre-feet | Maxi-<br>mum                      | Mini-<br>mum | Mean  | Sec-<br>ond-fee<br>per<br>square<br>mile | Run-off               |           |
|                |              |              |       |                            |                                   |              |       |                                          | Depth<br>in<br>inches | Acre-feet |
| October.....   | 71           | 8            | 35.7  | 2,200                      | 128                               | 59           | 90.0  | 0.127                                    | 0.15                  | 5,530     |
| November.....  | 2,310        | 109          | 1,060 | 63,100                     | 2,380                             | 144          | 1,100 | 1.55                                     | 1.73                  | 65,500    |
| December.....  | 7,330        | 705          | 3,580 | 220,000                    | 7,570                             | 742          | 3,690 | 5.20                                     | 6.00                  | 227,000   |
| January.....   | 8,320        | 2,390        | 5,230 | 322,000                    | 8,570                             | 2,400        | 5,350 | 7.54                                     | 8.69                  | 329,000   |
| February.....  | 4,960        | 1,690        | 2,880 | 160,000                    | 4,960                             | 1,690        | 2,880 | 4.06                                     | 4.23                  | 160,000   |
| March.....     | 6,130        | 2,310        | 4,530 | 279,000                    | 6,140                             | 2,310        | 4,530 | 6.38                                     | 7.36                  | 279,000   |
| April.....     | 3,290        | 870          | 1,670 | 99,400                     | 3,290                             | 870          | 1,670 | 2.35                                     | 2.62                  | 99,400    |
| May.....       | 1,620        | 815          | 1,060 | 65,200                     | 1,620                             | 805          | 1,070 | 1.51                                     | 1.74                  | 65,800    |
| June.....      | 1,230        | 350          | 587   | 34,900                     | 1,280                             | 387          | 627   | .883                                     | .99                   | 37,300    |
| July.....      | 332          | 78           | 214   | 13,200                     | 367                               | 127          | 246   | .346                                     | .40                   | 15,100    |
| August.....    | 84           | 20           | 42.4  | 2,610                      | 151                               | 81           | 103   | .145                                     | .17                   | 6,330     |
| September..... | 220          | 34           | 92.0  | 5,470                      | 256                               | 95           | 147   | .207                                     | .23                   | 8,750     |
| The year....   | 8,320        | 8            | 1,750 | 1,270,000                  | 8,570                             | 59           | 1,790 | 2.52                                     | 34.31                 | 1,300,000 |

## OSWEGO CANAL NEAR OSWEGO, OREG.

LOCATION.—Staff gage in SW¼ sec. 17, T. 2 S., R. 1 E., 3 miles southwest of Oswego.

RECORDS AVAILABLE.—October 1928 to September 1933.

DISCHARGE.—Maximum during year, 248 second-feet Jan. 2 (gage height, 8.02 feet); no flow at times.

1928-33: Maximum, 258 second-feet Apr. 4, 12, 1931 (gage height, 8.20 feet); no flow at times.

REMARKS.—Records fair. Discharge estimated Feb. 24-26, July 4. Oswego Canal diverts from Tualatin River in NW¼ sec. 20, three-quarters of a mile above gage; diversion dam on Tualatin River is in NE¼ sec. 33, about 3 miles by river below canal.

*Discharge, in second-feet, 1932-33*

| Day     | Oct. | Nov.  | Dec. | Jan. | Feb.  | Mar. | Apr.  | May | June  | July | Aug. | Sept. |
|---------|------|-------|------|------|-------|------|-------|-----|-------|------|------|-------|
| 1.....  | 55   | 35    | 66   | 213  | 3     | 3    | 2     | 0   | 39    | 35   | 51   | 61    |
| 2.....  | 51   | 33    | 77   | 248  | 3     | 4    |       | 0   | 41    | 36   | 57   | 61    |
| 3.....  | 51   | 29    | 80   | 238  | 3     | 3    |       | 0   | 41    | 36   | 55   | 63    |
| 4.....  | 51   | 30    | 80   | 228  | 3     | 3    |       | 0   | 43    | 36   | 57   | 63    |
| 5.....  | 53   | 33    | 82   | 238  | 2     | 3    |       | 0   | 39    | 36   | 63   | 63    |
| 6.....  | 53   | 35    | 57   | 233  | 2     | 5    | 2     | 0   | 39    | 36   | 63   | 63    |
| 7.....  | 53   | 43    | 82   | 233  | 2     | 4    |       | 0   | 37    | 36   | 63   | 63    |
| 8.....  | 53   | 41    | 72   | 233  | 0     | 4    |       | 0   | 43    | 36   | 68   | 63    |
| 9.....  | 51   | 41    | 70   | 223  | 0     | 5    |       | 0   | 49    | 35   | 63   | 63    |
| 10..... | 51   | 39    | 59   | 213  | 0     | 6    |       | 0   | 51    | 35   | 63   | 63    |
| 11..... | 53   | 35    | 49   | 184  | 0     | 6    | 2     | 0   | 51    | 33   | 63   | 63    |
| 12..... | 53   | 37    | 43   | 171  | 0     | 7    |       | 0   | 49    | 33   | 63   | 63    |
| 13..... | 53   | 37    | 41   | 163  | 0     | 5    |       | 0   | 45    | 33   | 61   | 63    |
| 14..... | 55   | 37    | 37   | 151  | 2     | 5    |       | 0   | 39    | 32   | 61   | 61    |
| 15..... | 55   | 51    | 37   | 128  | 3     | 5    |       | 0   | 41    | 32   | 61   | 63    |
| 16..... | 57   | 63    | 37   | 112  | 2     | 6    | 0     | 0   | 41    | 32   | 61   | 63    |
| 17..... | 57   | 63    | 37   | 85   | 2     | 6    | 0     | 0   | 39    | 33   | 59   | 63    |
| 18..... | 57   | 66    | 37   | 77   | 2     | 7    | 0     | 0   | 39    | 32   | 59   | 66    |
| 19..... | 57   | 61    | 63   | 35   | 2     | 7    | 0     | 0   | 39    | 32   | 61   | 66    |
| 20..... | 57   | 61    | 115  | 25   | 2     | 7    | 0     | 0   | 39    | 32   | 59   | 66    |
| 21..... | 57   | 47    | 144  | 13   | 2     | 6    | 0     | 0   | 37    | 30   | 59   | 59    |
| 22..... | 55   | 43    | 151  | 10   | 2     | 6    | 0     | 0   | 37    | 30   | 59   | 55    |
| 23..... | 57   | 39    | 198  | 9    | 2     | 5    | 0     | 0   | 37    | 30   | 59   | 41    |
| 24..... | 57   | 37    | 218  | 9    | 2     | 5    | 0     | 0   | 37    | 30   | 61   | 36    |
| 25..... | 59   | 35    | 233  | 11   | 2     | 4    | 0     | 39  | 37    | 30   | 61   | 36    |
| 26..... | 57   | 35    | 233  | 7    | 3     | 4    | 0     | 51  | 37    | 21   | 61   | 35    |
| 27..... | 57   | 35    | 238  | 11   | 3     | 3    | 0     | 51  | 37    | 20   | 61   | 35    |
| 28..... | 53   | 35    | 233  | 15   | 4     | 3    | 0     | 49  | 37    | 20   | 59   | 35    |
| 29..... | 53   | 37    | 218  | 17   | ----- | 4    | 0     | 47  | 37    | 16   | 61   | 35    |
| 30..... | 53   | 47    | 213  | 17   | ----- | 3    | 0     | 45  | 37    | 35   | 61   | 35    |
| 31..... | 49   | ----- | 208  | 15   | ----- | 3    | ----- | 45  | ----- | 49   | 61   | ----- |

| Month          | Maximum | Minimum | Mean | Run-off in<br>acre-feet |
|----------------|---------|---------|------|-------------------------|
| October.....   | 59      | 49      | 54.3 | 3,340                   |
| November.....  | 66      | 29      | 42.0 | 2,500                   |
| December.....  | 238     | 37      | 113  | 6,950                   |
| January.....   | 248     | 7       | 115  | 7,070                   |
| February.....  | 4       | 0       | 1.9  | 106                     |
| March.....     | 7       | 3       | 4.7  | 289                     |
| April.....     | -----   | 0       | 0.8  | 48                      |
| May.....       | 51      | 0       | 10.5 | 646                     |
| June.....      | 51      | 37      | 40.5 | 2,410                   |
| July.....      | 49      | 16      | 32.0 | 1,970                   |
| August.....    | 68      | 51      | 60.5 | 3,720                   |
| September..... | 66      | 35      | 55.5 | 3,300                   |
| The year.....  | 248     | 0       | 44.7 | 32,300                  |

## CLACKAMAS RIVER AT BIG BOTTOM, OREG.

LOCATION.—Water-stage recorder in SW¼ sec. 26, T. 6 S., R. 7 E., just below Pot Creek at lower end of Big Bottom, half a mile above proposed dam site, and 28 miles southeast of Estacada.

DRAINAGE AREA. 132 square miles.

RECORDS AVAILABLE.—April 1920 to September 1933.

DISCHARGE.—Maximum during year, 2,940 second-feet June 9 (gage height, 5.64 feet); minimum, 213 second-feet Oct. 3, 4 (gage height, 1.42 feet).

1920-33: Maximum, 6,750 second-feet Mar. 31, 1931 (gage height, 8.28 feet); minimum, 190 second-feet several days in August and September 1931 (gage height, 1.25 feet). Average, 13 years (1920-33), 444 second-feet.

REMARKS.—Records fair. Discharge estimated Feb. 9 to Mar. 1, Mar. 8-18. No regulation or diversions above station. Field data furnished by Portland General Electric Co.

*Discharge, in second-feet, 1932-33*

| Day | Oct. | Nov.  | Dec. | Jan. | Feb. | Mar. | Apr. | May   | June  | July | Aug. | Sept. |
|-----|------|-------|------|------|------|------|------|-------|-------|------|------|-------|
| 1   | 217  | 265   | 416  | 430  | 320  | 330  | 521  | 822   | 1,050 | 580  | 297  | 263   |
| 2   | 217  | 348   | 540  | 484  | 314  | 330  | 502  | 822   | 1,020 | 580  | 294  | 260   |
| 3   | 215  | 336   | 521  | 441  | 308  | 333  | 540  | 770   | 1,120 | 560  | 294  | 260   |
| 4   | 213  | 308   | 466  | 424  | 305  | 366  | 560  | 770   | 1,120 | 540  | 300  | 257   |
| 5   | 215  | 757   | 441  | 502  | 305  | 323  | 560  | 770   | 1,120 | 521  | 300  | 260   |
| 6   | 215  | 1,050 | 410  | 645  | 305  | 330  | 560  | 720   | 1,120 | 521  | 291  | 279   |
| 7   | 215  | 670   | 392  | 560  | 300  | 265  | 540  | 695   | 1,050 | 502  | 288  | 265   |
| 8   | 215  | 701   | 355  | 560  | 300  |      | 521  | 670   | 1,770 | 484  | 285  | 257   |
| 9   | 215  | 745   | 333  | 600  |      |      | 502  | 645   | 2,830 | 484  | 282  | 254   |
| 10  | 215  | 560   | 326  | 580  |      |      | 484  | 600   | 2,060 | 466  | 279  | 252   |
| 11  | 215  | 466   | 320  | 540  |      |      | 466  | 580   | 1,630 | 444  | 277  | 252   |
| 12  | 224  | 420   | 314  | 602  |      |      | 466  | 600   | 1,590 | 434  | 277  | 252   |
| 13  | 252  | 448   | 314  | 484  |      | 393  | 448  | 622   | 1,670 | 424  | 274  | 252   |
| 14  | 282  | 521   | 317  | 484  |      |      | 466  | 670   | 1,670 | 413  | 274  | 274   |
| 15  | 247  | 790   | 308  | 466  |      |      | 502  | 695   | 1,590 | 402  | 271  | 311   |
| 16  | 279  | 1,220 | 314  | 441  |      |      | 502  | 695   | 1,430 | 392  | 268  | 279   |
| 17  | 277  | 878   | 308  | 427  |      |      | 502  | 720   | 1,260 | 378  | 268  | 271   |
| 18  | 247  | 695   | 311  | 420  |      |      | 484  | 695   | 1,050 | 368  | 268  | 265   |
| 19  | 236  | 580   | 502  | 402  | 315  | 413  | 466  | 670   | 932   | 358  | 368  | 263   |
| 20  | 231  | 521   | 444  | 392  |      | 438  | 466  | 670   | 850   | 345  | 268  | 263   |
| 21  | 229  | 502   | 406  | 385  |      | 448  | 484  | 670   | 822   | 339  | 265  | 285   |
| 22  | 314  | 502   | 385  | 375  |      | 441  | 521  | 670   | 795   | 333  | 265  | 345   |
| 23  | 294  | 448   | 410  | 368  |      | 427  | 560  | 720   | 770   | 326  | 263  | 314   |
| 24  | 263  | 420   | 382  | 365  |      | 413  | 622  | 795   | 720   | 320  | 263  | 314   |
| 25  | 249  | 399   | 371  | 355  |      | 402  | 670  | 932   | 770   | 314  | 263  | 311   |
| 26  | 247  | 382   | 466  | 355  |      | 396  | 695  | 990   | 770   | 311  | 260  | 294   |
| 27  | 244  | 378   | 521  | 358  |      | 413  | 770  | 960   | 720   | 308  | 260  | 285   |
| 28  | 239  | 371   | 502  | 342  |      | 466  | 878  | 960   | 695   | 305  | 260  | 277   |
| 29  | 239  | 388   | 466  | 336  |      | 484  | 905  | 1,080 | 645   | 302  | 265  | 282   |
| 30  | 239  | 416   | 466  | 330  |      | 502  | 850  | 1,260 | 600   | 302  | 274  | 277   |
| 31  | 239  |       | 444  | 330  |      | 540  |      | 1,150 |       | 297  | 268  |       |

| Month     | Maximum | Minimum | Mean  | Per square mile | Run-off |           |
|-----------|---------|---------|-------|-----------------|---------|-----------|
|           |         |         |       |                 | Inches  | Acre-feet |
| October   | 314     | 213     | 240   | 1.82            | 2.10    | 14,800    |
| November  | 1,220   | 265     | 550   | 4.17            | 4.65    | 32,700    |
| December  | 540     | 308     | 402   | 3.05            | 3.52    | 24,700    |
| January   | 645     | 330     | 441   | 3.34            | 3.85    | 27,100    |
| February  |         |         | 313   | 2.37            | 2.47    | 17,400    |
| March     | 540     | 323     | 401   | 3.04            | 3.50    | 24,700    |
| April     | 905     | 448     | 567   | 4.30            | 4.80    | 33,700    |
| May       | 1,260   | 580     | 777   | 5.89            | 6.79    | 47,800    |
| June      | 2,830   | 600     | 1,170 | 8.86            | 9.88    | 69,600    |
| July      | 580     | 297     | 408   | 3.09            | 3.56    | 25,100    |
| August    | 300     | 260     | 275   | 2.08            | 2.40    | 16,900    |
| September | 345     | 252     | 276   | 2.09            | 2.33    | 16,400    |
| The year  | 2,830   | 213     | 485   | 3.67            | 49.85   | 351,000   |

## CLACKAMAS RIVER ABOVE THREE LYNX CREEK, OREG.

LOCATION.—Water-stage recorder in NE¼ sec. 21, T. 5 S., R. 6 E., 500 feet above Three Lynx Creek and 17 miles southeast of Estacada. Zero of gage is 1,098 feet above mean sea level.

DRAINAGE AREA.—488 square miles.

RECORDS AVAILABLE.—October 1911 to December 1913; October 1921 to September 1933.

DISCHARGE.—Maximum during year, 15,600 second-feet June 9 (gage height, 9.60 feet); minimum, 618 second-feet Oct. 4 (gage height, 0.87 foot).

1911-13, 1921-33: Maximum, 34,800 second-feet Mar. 31, 1931 (gage height, 15.5 feet); minimum, 375 second-feet Aug. 10, 16, 1924; minimum stage, 0.63 foot Oct. 15, 1931. Average, 14 years (1911-13, 1921-33), 1,850 second-feet.

REMARKS.—Records good except those estimated, which are fair. Water diverted from Oak Grove Fork is used in power plant on Clackamas River just above station. Field data furnished by Portland General Electric Co.

## Discharge, in second-feet, 1932-33

| Day | Oct.  | Nov.    | Dec.  | Jan.    | Feb.    | Mar.    | Apr.  | May   | June   | July  | Aug.  | Sept. |
|-----|-------|---------|-------|---------|---------|---------|-------|-------|--------|-------|-------|-------|
| 1   | 685   | 1,240   | 1,680 | 2,310   | * 1,350 | * 1,950 | 2,740 | 3,530 | 4,110  | 2,260 | 980   | 805   |
| 2   | 670   | 1,910   | 2,680 | 3,270   | 1,240   | * 1,800 | 2,570 | 3,530 | 4,110  | 2,260 | 980   | 830   |
| 3   | 650   | 1,910   | 2,620 | 2,620   | 1,210   | * 1,650 | 2,970 | 3,270 | 4,430  | 2,260 | 1,010 | 720   |
| 4   | 650   | 1,590   | 2,160 | 2,260   | 1,140   | * 1,500 | 3,030 | 3,400 | 4,430  | 2,210 | 1,010 | 770   |
| 5   | 670   | 5,260   | 2,010 |         | 1,140   | 1,470   | 2,910 | 3,400 | 4,590  | 2,060 | 1,040 | 830   |
| 6   | 660   | 7,280   | 1,770 |         | 1,280   | 1,510   | 2,790 | 3,150 | 4,430  | 2,060 | 950   | 890   |
| 7   | 650   | 3,960   | 1,640 |         | * 1,160 | 1,910   | 2,620 | 3,030 | 4,110  | 2,010 | 1,010 | 830   |
| 8   | 665   | 4,340   | 1,390 |         | 1,140   | 1,960   | 2,460 | 2,970 | 8,700  | 2,010 | 980   | 830   |
| 9   | 650   |         | 1,320 |         | 950     | 1,820   | 2,260 | 2,850 | 14,500 | 1,960 | 980   | 830   |
| 10  | 660   |         | 1,210 |         | 1,070   | 1,860   | 2,060 | 2,680 | 9,450  | 1,820 | 980   | 805   |
| 11  | 655   | * 2,730 | 1,180 |         | 1,180   | 1,860   | 2,010 | 2,520 | 6,800  | 1,680 | 920   | 765   |
| 12  | 685   |         | 1,140 |         | 1,210   | 2,360   | 2,010 | 2,570 | 6,400  | 1,680 | 890   | 770   |
| 13  | 805   |         | 1,100 |         | 1,210   | 2,570   | 1,960 | 2,680 | 7,000  | 1,590 | 830   | 770   |
| 14  | 980   |         | 1,070 |         | 1,140   | 2,310   | 2,060 | 2,850 | 7,000  | 1,550 | 890   | 860   |
| 15  | 830   |         | 1,070 |         | 1,210   | 2,060   | 2,360 | 3,030 | 6,400  | 1,550 | 860   | 1,100 |
| 16  | 1,000 | 6,540   | 1,100 |         | 1,180   | 2,110   | 2,410 | 3,030 | 5,640  | 1,470 | 860   | 950   |
| 17  | 1,180 | 4,760   | 1,100 | * 2,060 | 1,180   | 2,210   | 2,310 | 3,030 | 4,590  | 1,430 | 890   | 860   |
| 18  | 920   | 3,530   | 1,070 |         | 1,140   | 2,110   | 2,160 | 3,030 | 3,960  | 1,350 | 890   | 950   |
| 19  | 780   | 2,740   | 3,070 |         | 1,100   | 2,060   | 2,010 | 2,910 | 3,530  | 1,280 | 920   | 890   |
| 20  | 745   | 2,310   | 2,740 |         | 1,180   | 2,410   | 2,060 | 2,910 | 3,270  | 1,240 | 830   | 860   |
| 21  | 730   | 2,260   | 2,360 |         | 1,280   | 2,460   | 2,210 | 2,850 | 3,150  | 1,210 | 860   | 980   |
| 22  | 1,180 | 2,160   | 2,010 |         | 1,430   | 2,260   | 2,410 | 2,850 | 3,030  | 1,180 | 830   | 1,360 |
| 23  | 1,210 | 1,910   | 2,210 |         |         | 2,060   | 2,910 | 3,150 | 3,030  | 1,140 | 860   | 1,240 |
| 24  | 1,070 | 1,680   | 2,010 |         |         | 1,860   | 3,270 | 3,530 | 2,910  | 1,140 | 860   | 1,320 |
| 25  | 920   | 1,590   | 1,860 |         |         | 1,720   | 3,530 | 4,590 | 3,150  | 1,100 | 860   | 1,350 |
| 26  | 890   | 1,510   | 2,920 |         | * 1,850 | 1,640   | 3,400 | 4,760 | 3,030  | 1,070 | 860   | 1,180 |
| 27  | 890   | 1,390   | 3,400 |         |         | 1,860   | 3,810 | 4,110 | 2,910  | 1,040 | 860   | 1,070 |
| 28  | 860   | 1,430   | 3,150 |         |         | 2,360   | 4,430 | 4,110 | 2,790  | 1,010 | 920   | 1,010 |
| 29  | 805   | 1,470   | 2,850 |         |         | 2,680   | 4,270 | 4,930 | 2,570  | 1,040 | 1,040 | 1,040 |
| 30  | * 830 | 1,680   | 2,740 |         |         | 2,790   | 3,810 | 5,640 | 2,360  | 920   | 830   | 980   |
| 31  | * 960 |         | 2,520 |         |         | 3,150   |       | 4,760 |        | 1,010 | 805   |       |

| Month     | Maximum | Minimum | Mean  | Per square mile | Run-off |           |
|-----------|---------|---------|-------|-----------------|---------|-----------|
|           |         |         |       |                 | Inches  | Acre-feet |
| October   | 1,210   | 650     | 824   | 1.69            | 1.95    | 50,700    |
| November  | 7,280   | 1,240   | 2,830 | 5.80            | 6.47    | 168,000   |
| December  | 3,400   | 1,070   | 1,970 | 4.04            | 4.66    | 121,000   |
| January   |         |         | 2,130 | 4.36            | 5.03    | 131,000   |
| February  |         | 950     | 1,330 | 2.73            | 2.84    | 73,900    |
| March     | 3,150   | 1,470   | 2,080 | 4.26            | 4.91    | 128,000   |
| April     | 4,430   | 1,960   | 2,730 | 5.59            | 6.24    | 162,000   |
| May       | 5,640   | 2,520   | 3,410 | 6.99            | 8.06    | 210,000   |
| June      | 14,500  | 2,360   | 4,880 | 10.00           | 11.16   | 290,000   |
| July      | 2,260   | 920     | 1,540 | 3.16            | 3.64    | 94,700    |
| August    | 1,040   | 805     | 912   | 1.87            | 2.16    | 56,100    |
| September | 1,360   | 770     | 948   | 1.94            | 2.16    | 56,400    |
| The year  | 14,500  | 650     | 2,130 | 4.36            | 59.28   | 1,540,000 |

\* Estimated.

## CLACKAMAS RIVER NEAR CAZADERO, OREG.

LOCATION.—Water-stage recorder in NE¼ sec. 11, T. 4 S., R. 4 E., half a mile above backwater from Cazadero Dam of Portland General Electric Co. and 3 miles southeast of Cazadero. Zero of gage is 532.0 feet above mean sea level; published gage readings have been reduced to mean sea level datum.

DRAINAGE AREA.—665 square miles.

RECORDS AVAILABLE.—January 1909 to September 1933.

DISCHARGE.—Maximum during year, 18,300 second-feet June 9 (gage height, 543.90 feet); minimum, 631 second-feet Oct. 5 (gage height, 532.59 feet).

1909-33: Maximum, 60,800 second-feet Mar. 31, 1931 (gage height, 556.5 feet); minimum, 410 second-feet Oct. 20, 1925, Sept. 28, 1930, caused by shut-down in power plant at Three Lynx (gage height, 532.03 feet). Average, 24 years (1909-33), 2,620 second-feet.

REMARKS.—Records good below and fair above 6,000 second-feet. Some diurnal fluctuation during low water owing to operation of Oak Grove power plant. Field data furnished by Portland General Electric Co.

*Discharge, in second-feet, 1932-33*

| Day     | Oct.  | Nov.  | Dec.  | Jan.  | Feb.  | Mar.  | Apr.  | May   | June   | July  | Aug.  | Sept. |
|---------|-------|-------|-------|-------|-------|-------|-------|-------|--------|-------|-------|-------|
| 1.....  | 702   | 2,030 | 2,300 | 3,750 | 2,120 | 3,030 | 3,970 | 4,670 | 5,180  | 2,730 | 1,180 | 948   |
| 2.....  | 698   | 3,060 | 3,470 | 6,010 | 1,900 | 2,730 | 3,640 | 4,670 | 5,050  | 2,730 | 1,180 | 948   |
| 3.....  | 686   | 3,160 | 3,640 | 4,430 | 1,740 | 2,630 | 4,310 | 4,310 | 5,440  | 2,730 | 1,180 | 865   |
| 4.....  | 682   | 2,510 | 3,030 | 3,750 | 1,700 | 2,430 | 4,310 | 4,550 | 5,440  | 2,630 | 1,210 | 920   |
| 5.....  | 674   | 6,710 | 2,830 | 4,920 | 1,700 | 2,250 | 4,080 | 4,550 | 5,440  | 2,530 | 1,300 | 948   |
| 6.....  | 682   | 9,860 | 2,480 | 6,960 | 1,900 | 2,300 | 3,860 | 4,190 | 5,440  | 2,530 | 1,120 | 1,090 |
| 7.....  | 678   | 5,860 | 2,300 | 5,440 | 1,740 | 3,130 | 3,640 | 4,080 | 5,180  | 2,380 | 1,210 | 975   |
| 8.....  | 690   | 7,500 | 1,980 | 5,580 | 1,670 | 3,030 | 3,330 | 3,970 | 9,420  | 2,380 | 1,120 | 948   |
| 9.....  | 682   | 7,660 | 1,780 | 6,010 | 1,390 | 2,830 | 3,030 | 3,860 | 17,000 | 2,300 | 1,090 | 920   |
| 10..... | 682   | 4,920 | 1,740 | 5,580 | 1,530 | 2,830 | 2,830 | 3,640 | 11,100 | 2,160 | 1,090 | 892   |
| 11..... | 678   | 3,640 | 1,670 | 4,550 | 1,670 | 2,930 | 2,830 | 3,330 | 8,090  | 2,070 | 1,090 | 865   |
| 12..... | 770   | 2,930 | 1,600 | 3,860 | 1,860 | 3,750 | 3,130 | 3,430 | 7,840  | 2,070 | 1,090 | 892   |
| 13..... | 992   | 3,030 | 1,600 | 3,430 | 1,860 | 3,860 | 2,930 | 3,530 | 8,220  | 1,940 | 1,000 | 865   |
| 14..... | 1,210 | 3,750 | 1,560 | 3,430 | 1,700 | 3,430 | 3,030 | 3,750 | 8,090  | 1,860 | 1,030 | 1,030 |
| 15..... | 1,020 | 6,600 | 1,530 | 3,230 | 1,980 | 3,130 | 3,430 | 3,970 | 7,480  | 1,860 | 1,000 | 1,330 |
| 16..... | 1,210 | 9,220 | 1,560 | 2,930 | 2,020 | 3,230 | 3,430 | 4,080 | 6,630  | 1,820 | 1,000 | 1,150 |
| 17..... | 1,600 | 7,300 | 1,500 | 2,630 | 1,860 | 3,330 | 3,230 | 4,190 | 5,580  | 1,700 | 1,000 | 1,030 |
| 18..... | 1,210 | 5,440 | 1,500 | 2,630 | 1,780 | 3,130 | 3,030 | 4,080 | 4,790  | 1,640 | 1,000 | 1,150 |
| 19..... | 965   | 4,310 | 4,090 | 2,430 | 1,670 | 3,130 | 2,830 | 3,970 | 4,190  | 1,560 | 1,000 | 1,060 |
| 20..... | 910   | 3,530 | 3,860 | 2,200 | 1,780 | 3,860 | 2,930 | 3,860 | 3,970  | 1,500 | 892   | 1,030 |
| 21..... | 882   | 3,430 | 3,430 | 2,160 | 2,070 | 3,860 | 3,030 | 3,750 | 3,860  | 1,460 | 1,030 | 1,180 |
| 22..... | 1,820 | 3,330 | 2,930 | 2,020 | 2,630 | 3,430 | 3,330 | 3,860 | 3,760  | 1,420 | 975   | 1,640 |
| 23..... | 1,830 | 2,930 | 3,330 | 2,070 | 3,330 | 3,030 | 3,970 | 4,190 | 3,750  | 1,360 | 920   | 1,600 |
| 24..... | 1,490 | 2,630 | 3,130 | 1,940 | 2,930 | 2,830 | 4,430 | 4,790 | 3,530  | 1,390 | 948   | 1,700 |
| 25..... | 1,280 | 2,380 | 2,930 | 1,860 | 2,430 | 2,530 | 4,670 | 5,860 | 3,750  | 1,330 | 975   | 1,780 |
| 26..... | 1,210 | 2,200 | 4,860 | 1,900 | 2,730 | 2,340 | 4,430 | 6,160 | 3,750  | 1,300 | 975   | 1,530 |
| 27..... | 1,180 | 2,070 | 5,440 | 2,160 | 2,930 | 2,630 | 4,920 | 5,310 | 3,530  | 1,270 | 892   | 1,360 |
| 28..... | 1,110 | 2,020 | 4,920 | 2,020 | 2,830 | 3,530 | 5,720 | 5,180 | 3,430  | 1,240 | 920   | 1,300 |
| 29..... | 1,110 | 2,070 | 4,670 | 1,820 | ----- | 3,860 | 5,580 | 6,010 | 3,130  | 1,270 | 920   | 1,390 |
| 30..... | 1,140 | 2,380 | 4,550 | 1,860 | ----- | 3,970 | 4,920 | 6,960 | 2,930  | 1,150 | 1,030 | 1,270 |
| 31..... | 1,440 | ----- | 3,970 | 2,020 | ----- | 4,430 | ----- | 6,010 | -----  | 1,240 | 975   | ----- |

| Month          | Maximum | Minimum | Mean  | Per square mile | Run-off |           |
|----------------|---------|---------|-------|-----------------|---------|-----------|
|                |         |         |       |                 | Inches  | Acre-feet |
| October.....   | 1,830   | 674     | 1,030 | 1.55            | 1.79    | 63,300    |
| November.....  | 9,860   | 2,020   | 4,280 | 6.44            | 7.18    | 255,000   |
| December.....  | 5,440   | 1,500   | 2,910 | 4.38            | 5.05    | 179,000   |
| January.....   | 6,960   | 1,820   | 3,410 | 5.13            | 5.91    | 210,000   |
| February.....  | 3,330   | 1,390   | 2,050 | 3.08            | 3.21    | 114,000   |
| March.....     | 4,430   | 2,250   | 3,140 | 4.72            | 5.44    | 193,000   |
| April.....     | 5,720   | 2,830   | 3,760 | 5.65            | 6.30    | 224,000   |
| May.....       | 6,960   | 3,330   | 4,480 | 6.74            | 7.77    | 275,000   |
| June.....      | 17,000  | 2,930   | 5,830 | 8.77            | 9.78    | 347,000   |
| July.....      | 2,730   | 1,150   | 1,860 | 2.80            | 3.23    | 114,000   |
| August.....    | 1,300   | 892     | 1,040 | 1.56            | 1.80    | 64,000    |
| September..... | 1,780   | 865     | 1,150 | 1.73            | 1.93    | 68,400    |
| The year.....  | 17,000  | 674     | 2,910 | 4.38            | 59.39   | 2,110,000 |

## OAK GROVE FORK ABOVE POWER PLANT INTAKE, OREG.

LOCATION.—Water-stage recorder in SW¼ sec. 3, T. 6 S., R. 7 E., two-thirds of a mile above Kink Creek, 1 mile above intake of Oak Grove power development of Portland General Electric Co., and 24 miles southeast of Estacada.

DRAINAGE AREA.—126 square miles.

RECORDS AVAILABLE.—December 1923 to September 1933. At site 1 mile downstream, below Kink Creek, May 1909 to December 1923 (incomplete). Records comparable except for slight inflow from springs and Kink Creek.

DISCHARGE.—Maximum during year, 1,760 second-feet June 9 (gage height, 3.73 feet); minimum, 266 second-feet Oct. 9–11 (gage height, 1.53 feet).

1909–33: Maximum, 5,000 second-feet Jan. 7, 1923 (gage height, 5.45 feet); minimum, 236 second-feet Oct. 15, 16, 18, 1931 (gage height, 1.42 feet).

REMARKS.—Records fair. No diversions or regulation above station. Field data furnished by Portland General Electric Co.

*Discharge, in second-feet, 1932–33*

| Day     | Oct. | Nov.  | Dec. | Jan. | Feb.  | Mar. | Apr.  | May   | June  | July | Aug. | Sept. |
|---------|------|-------|------|------|-------|------|-------|-------|-------|------|------|-------|
| 1.....  | 273  | 333   | 402  | 470  | 354   | 345  | 442   | 790   | 1,000 | 560  | 374  | 329   |
| 2.....  | 270  | 379   | 598  | 480  | 345   | 345  | 451   | 790   | 1,000 | 550  | 374  | 329   |
| 3.....  | 270  | 350   | 540  | 438  | 341   | 341  | 490   | 760   | 1,040 | 535  | 374  | 325   |
| 4.....  | 270  | 333   | 490  | 442  | 337   | 333  | 515   | 760   | 1,040 | 520  | 384  | 325   |
| 5.....  | 270  | 553   | 475  | 505  | 337   | 329  | 525   | 760   | 1,000 | 505  | 388  | 329   |
| 6.....  | 270  | 664   | 446  | 545  | 341   | 337  | 530   | 724   | 1,000 | 500  | 379  | 329   |
| 7.....  | 270  | 540   | 428  | 520  | 333   | 350  | 530   | 712   | 960   | 490  | 374  | 325   |
| 8.....  | 270  | 626   | 406  | 588  | 329   | 350  | 500   | 694   | 1,380 | 455  | 370  | 321   |
| 9.....  | 270  | 610   | 388  | 632  | 321   | 345  | 480   | 682   | 1,680 | 475  | 362  | 321   |
| 10..... | 266  | 490   | 374  | 588  | 329   | 350  | 460   | 664   | 1,390 | 460  | 358  | 317   |
| 11..... | 266  | 433   | 362  | 540  | 337   | 350  | 465   | 664   | 1,250 | 456  | 358  | 317   |
| 12..... | 283  | 402   | 354  | 515  | 341   | 362  | 470   | 694   | 1,200 | 446  | 354  | 317   |
| 13..... | 283  | 406   | 350  | 495  | 329   | 362  | 470   | 718   | 1,200 | 442  | 354  | 313   |
| 14..... | 302  | 424   | 341  | 495  | 329   | 358  | 495   | 760   | 1,200 | 438  | 354  | 350   |
| 15..... | 283  | 592   | 337  | 485  | 333   | 358  | 530   | 760   | 1,120 | 428  | 354  | 345   |
| 16..... | 302  | 760   | 337  | 460  | 325   | 374  | 525   | 760   | 1,080 | 424  | 350  | 329   |
| 17..... | 296  | 790   | 333  | 446  | 321   | 379  | 505   | 790   | 960   | 420  | 350  | 321   |
| 18..... | 280  | 676   | 341  | 442  | 325   | 370  | 495   | 760   | 885   | 415  | 350  | 321   |
| 19..... | 273  | 593   | 433  | 433  | 321   | 379  | 495   | 760   | 820   | 410  | 350  | 317   |
| 20..... | 270  | 535   | 406  | 420  | 321   | 410  | 520   | 760   | 790   | 406  | 345  | 317   |
| 21..... | 273  | 540   | 379  | 415  | 333   | 406  | 545   | 760   | 760   | 402  | 345  | 325   |
| 22..... | 325  | 515   | 374  | 406  | 341   | 397  | 593   | 760   | 724   | 402  | 345  | 379   |
| 23..... | 310  | 475   | 384  | 402  | 345   | 388  | 648   | 790   | 700   | 397  | 345  | 333   |
| 24..... | 290  | 451   | 370  | 397  | 329   | 384  | 682   | 850   | 682   | 392  | 341  | 341   |
| 25..... | 280  | 433   | 358  | 388  | 329   | 379  | 706   | 885   | 694   | 392  | 341  | 341   |
| 26..... | 280  | 420   | 479  | 388  | 350   | 370  | 718   | 960   | 664   | 388  | 341  | 329   |
| 27..... | 276  | 415   | 500  | 384  | 350   | 397  | 790   | 960   | 642   | 388  | 341  | 321   |
| 28..... | 273  | 406   | 475  | 374  | 350   | 424  | 850   | 960   | 620   | 384  | 341  | 321   |
| 29..... | 287  | 402   | 530  | 370  | ----- | 428  | 820   | 1,080 | 598   | 384  | 341  | 321   |
| 30..... | 283  | 406   | 530  | 366  | ----- | 446  | 760   | 1,120 | 582   | 379  | 341  | 317   |
| 31..... | 310  | ----- | 495  | 366  | ----- | 451  | ----- | 1,080 | ----- | 379  | 333  | ----- |

| Month          | Maximum | Minimum | Mean | Per square mile | Run-off |           |
|----------------|---------|---------|------|-----------------|---------|-----------|
|                |         |         |      |                 | Inches  | Acre-feet |
| October.....   | 325     | 266     | 281  | 2.23            | 2.57    | 17,300    |
| November.....  | 790     | 333     | 498  | 3.95            | 4.41    | 29,600    |
| December.....  | 598     | 333     | 420  | 3.33            | 3.84    | 25,800    |
| January.....   | 632     | 366     | 458  | 3.63            | 4.18    | 28,200    |
| February.....  | 354     | 321     | 335  | 2.66            | 2.77    | 18,600    |
| March.....     | 451     | 329     | 374  | 2.97            | 3.42    | 23,000    |
| April.....     | 850     | 442     | 567  | 4.50            | 5.02    | 33,700    |
| May.....       | 1,120   | 664     | 805  | 6.39            | 7.37    | 49,500    |
| June.....      | 1,660   | 582     | 954  | 7.57            | 8.45    | 56,800    |
| July.....      | 560     | 379     | 440  | 3.49            | 4.02    | 27,100    |
| August.....    | 288     | 333     | 355  | 2.82            | 3.25    | 21,800    |
| September..... | 379     | 313     | 328  | 2.60            | 2.90    | 19,500    |
| The year.....  | 1,660   | 266     | 485  | 3.85            | 52.20   | 351,000   |

## LEWIS RIVER BASIN

## LEWIS RIVER ABOVE MUDDY RIVER, NEAR COUGAR, WASH.

LOCATION.—Water-stage recorder in SW¼ sec. 30, T. 7 N., R. 7 E., 2 miles above mouth of Muddy River and 15 miles due east of Cougar.

DRAINAGE AREA.—227 square miles.

RECORDS AVAILABLE.—August to October 1909; August 1927 to September 1933.

DISCHARGE.—Maximum during year, 10,300 second-feet June 9 (gage height, 7.42 feet); minimum, 242 second-feet Oct. 11 (gage height, 0.49 foot).

1927–33: Maximum, 14,500 second-feet Nov. 25, 1927 (gage height, 8.97 feet); minimum, 175 second-feet Nov. 21, 1929.

REMARKS.—Records good except those for periods Oct. 12 to Dec. 13, Dec. 16 to Jan. 11, July 31 to Aug. 4, Aug. 6–16, Sept. 1–23, which were estimated and are fair. No diversions or regulation above station.

*Discharge, in second-feet, 1932–33*

| Day | Oct. | Nov.  | Dec.  | Jan.  | Feb.  | Mar.  | Apr.  | May   | June  | July  | Aug.  | Sept. |
|-----|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 1   | 277  | 1,300 | 2,300 | 1,350 | 637   | 615   | 1,360 | 2,340 | 2,940 | 2,130 | 900   | 450   |
| 2   | 277  |       |       |       | 610   | 604   | 1,360 | 2,340 | 2,940 | 2,130 |       |       |
| 3   | 281  |       |       |       | 593   | 615   | 1,540 | 2,240 | 3,410 | 2,180 |       |       |
| 4   | 273  |       |       |       | 588   | 576   | 1,540 | 2,240 | 3,560 | 2,080 |       |       |
| 5   | 269  |       |       |       | 582   | 571   | 1,500 | 2,180 | 3,640 | 2,130 |       |       |
| 6   | 265  | 2,050 | 1,450 | 2,900 | 566   | 697   | 1,500 | 2,030 | 3,480 | 2,240 | 1,070 | 450   |
| 7   | 257  |       |       |       | 535   | 1,030 | 1,410 | 1,930 | 3,130 | 2,340 |       |       |
| 8   | 253  |       |       |       | 520   | 925   | 1,320 | 1,880 | 6,280 | 2,340 |       |       |
| 9   | 249  |       |       |       | 450   | 869   | 1,190 | 1,780 | 8,920 | 2,130 |       |       |
| 10  | 245  |       |       |       | 510   | 848   | 1,110 | 1,730 | 5,770 | 1,930 |       |       |
| 11  | 253  | 2,250 | 980   | 1,980 | 545   | 911   | 1,110 | 1,780 | 4,560 | 1,880 | 800   | 450   |
| 12  |      |       |       |       | 530   | 1,280 | 1,110 | 1,930 | 4,840 | 1,980 |       |       |
| 13  |      |       |       |       | 1,680 | 490   | 1,320 | 1,110 | 2,080 | 5,990 |       |       |
| 14  | 410  |       |       |       | 1,590 | 510   | 1,190 | 1,150 | 2,240 | 6,210 |       |       |
| 15  |      |       |       |       | 810   | 1,410 | 510   | 1,150 | 1,230 | 2,180 |       |       |
| 16  |      | 380   | 2,500 | 920   | 1,280 | 500   | 1,230 | 2,230 | 2,130 | 2,080 | 650   | 430   |
| 17  |      |       |       |       | 1,190 | 490   | 1,230 | 1,150 | 2,080 | 4,040 |       |       |
| 18  |      |       |       |       | 1,110 | 480   | 1,190 | 1,150 | 2,080 | 3,340 |       |       |
| 19  |      |       |       |       | 1,030 | 475   | 1,150 | 1,110 | 2,030 | 3,000 |       |       |
| 20  |      |       |       |       | 995   | 480   | 1,280 | 1,230 | 2,130 | 2,810 |       |       |
| 21  |      | 400   | 1,350 | 1,050 | 960   | 525   | 1,230 | 1,360 | 2,180 | 2,750 | 588   | 480   |
| 22  |      |       |       |       | 904   | 576   | 1,150 | 1,500 | 2,290 | 2,690 |       |       |
| 23  |      |       |       |       | 862   | 576   | 1,070 | 1,830 | 2,510 | 2,630 |       |       |
| 24  |      |       |       |       | 836   | 530   | 1,030 | 2,030 | 3,060 | 2,570 |       |       |
| 25  |      |       |       |       | 784   | 535   | 995   | 2,130 | 3,790 | 2,810 |       |       |
| 26  |      | 450   | 1,150 | 1,450 | 766   | 626   | 960   | 2,080 | 3,640 | 2,940 | 465   | 810   |
| 27  |      |       |       |       | 760   | 626   | 995   | 2,460 | 3,200 | 2,750 |       |       |
| 28  |      |       |       |       | 718   | 626   | 1,150 | 2,810 | 3,130 | 2,570 |       |       |
| 29  |      |       |       |       | 694   |       | 1,190 | 2,750 | 3,560 | 2,460 |       |       |
| 30  |      |       |       |       | 664   |       | 1,320 | 2,510 | 3,870 | 2,240 |       |       |
| 31  |      |       |       |       | 664   | 1,460 |       | 3,340 |       |       | 930   | 450   |

| Month     | Maximum | Minimum | Mean  | Per square mile | Run-off |           |
|-----------|---------|---------|-------|-----------------|---------|-----------|
|           |         |         |       |                 | Inches  | Acre-feet |
| October   |         | 245     | 359   | 1.58            | 1.82    | 22,100    |
| November  |         |         | 1,770 | 7.80            | 8.70    | 105,000   |
| December  |         | 810     | 1,340 | 5.90            | 6.80    | 82,400    |
| January   |         | 664     | 1,450 | 6.39            | 7.37    | 89,200    |
| February  | 637     | 450     | 544   | 2.40            | 2.50    | 30,200    |
| March     | 1,460   | 571     | 1,030 | 4.54            | 5.23    | 63,300    |
| April     | 2,810   | 1,110   | 1,560 | 6.87            | 7.66    | 92,800    |
| May       | 3,870   | 1,730   | 2,450 | 10.8            | 12.45   | 151,000   |
| June      | 8,920   | 2,240   | 3,880 | 17.1            | 19.08   | 231,000   |
| July      | 2,340   | 930     | 1,710 | 7.53            | 8.68    | 105,000   |
| August    | 1,070   | 450     | 646   | 2.85            | 3.29    | 39,700    |
| September | 1,050   |         | 595   | 2.62            | 2.92    | 35,400    |
| The year  | 8,920   | 245     | 1,450 | 6.39            | 86.50   | 1,050,000 |

## LEWIS RIVER NEAR COUGAR, WASH.

LOCATION.—Water-stage recorder in SE¼ sec. 29, T. 7 N., R. 5 E., 1 mile below Swift Creek and 4 miles east of Cougar.

DRAINAGE AREA.—483 square miles.

RECORDS AVAILABLE.—July 1910 to March 1912; June 1924 to September 1933. July 1909 to June 1910 at site 1,000 feet above Swift Creek.

DISCHARGE.—Maximum during year, 16,700 second-feet June 9 (gage height, 8.44 feet); minimum, 708 second-feet Oct. 10, 11 (gage height, 0.59 foot). 1910-12, 1924-33: Maximum, 27,900 second-feet Nov. 25, 1927 (gage height, 11.3 feet); minimum, 454 second-feet Oct. 21, 1931 (gage height, 0.01 foot).

Maximum stage known, 14 feet during flood of Dec. 17 or 18, 1917.

REMARKS.—Records good except those estimated, which are fair. No diversions or regulation above station.

*Discharge, in second-feet, 1932-33*

| Day     | Oct.  | Nov.   | Dec.  | Jan.  | Feb.  | Mar.  | Apr.  | May   | June   | July  | Aug.  | Sept. |
|---------|-------|--------|-------|-------|-------|-------|-------|-------|--------|-------|-------|-------|
| 1.....  | 764   | 2,620  | 6,730 | 2,940 | 1,730 | 2,020 | 4,280 | 5,470 | 6,310  | 4,460 | 1,960 | 1,120 |
| 2.....  | 764   | 4,460  | 9,100 | 2,780 | 1,680 | 1,960 | 4,110 | 5,680 | 6,100  | 4,370 | 1,900 | 1,080 |
| 3.....  | 778   | 3,770  | 8,600 | 2,560 | 1,630 | 2,020 | 4,370 | 5,470 | 6,730  | 4,370 | 1,900 | 1,080 |
| 4.....  | 757   | 3,260  | 6,940 | 2,860 | 1,580 | 1,900 | 4,280 | 5,470 | 6,940  | 4,280 | 2,020 | 1,070 |
| 5.....  | 743   | 6,670  | 5,680 | 5,040 | 1,580 | 1,840 | 4,110 | 5,470 | 7,160  | 4,280 | 2,350 | 1,160 |
| 6.....  | 743   | 9,500  | 4,750 | 5,890 | 1,530 | 2,420 | 4,020 | 5,160 | 6,940  | 4,560 | 2,020 | 1,340 |
| 7.....  | 729   | 6,740  | 4,110 | 6,170 | 1,480 | 3,680 | 3,860 | 5,050 | 6,310  | 4,750 | 1,840 | 1,200 |
| 8.....  | 722   | 7,160  | 3,430 | 8,850 | 1,480 | 3,260 | 3,600 | 4,950 | 10,700 | 4,850 | 1,780 | 1,120 |
| 9.....  | 715   | 6,310  |       | 9,100 | 1,300 | 2,940 | 3,340 | 4,750 | 15,300 | 4,460 | 1,730 | 1,080 |
| 10..... | 708   | 5,050  |       | 7,850 | 1,380 | 2,940 | 3,100 | 4,650 | 11,600 | 4,110 | 1,680 | 1,060 |
| 11..... | 736   | 4,200  | 2,600 | 6,310 | 1,480 | 3,340 | 3,020 | 4,460 | 9,100  | 3,860 | 1,630 | 1,050 |
| 12..... | 904   | 4,180  |       | 5,260 | 1,480 | 4,750 | 3,020 | 4,950 | 9,100  | 4,020 | 1,580 | 1,020 |
| 13..... | 940   | 10,200 |       | 4,560 | 1,340 | 4,650 | 2,940 | 4,650 | 10,400 | 4,110 | 1,530 | 1,020 |
| 14..... | 1,390 | 9,360  |       | 4,280 | 1,380 | 4,280 | 3,020 | 5,050 | 11,000 | 4,370 | 1,530 | 1,060 |
| 15..... | 1,530 | 8,970  | 2,080 | 3,860 | 1,380 | 3,940 | 3,260 | 5,050 | 10,700 | 4,560 | 1,480 | 1,200 |
| 16..... | 1,380 | 10,700 | 2,020 | 3,430 | 1,340 | 4,110 | 3,180 | 5,050 | 9,880  | 4,460 | 1,430 | 1,250 |
| 17..... | 1,160 | 9,880  | 1,960 | 3,180 | 1,340 | 4,110 | 3,020 | 4,950 | 8,350  | 3,860 | 1,430 | 1,160 |
| 18..... | 1,030 | 8,350  | 1,960 | 3,020 | 1,340 | 3,940 | 2,940 | 5,050 | 6,940  | 3,520 | 1,380 | 1,200 |
| 19..... | 955   | 6,730  | 2,960 | 2,780 | 1,300 | 3,860 | 2,860 | 4,850 | 6,310  | 3,260 | 1,340 | 1,200 |
| 20..... | 911   | 5,470  | 2,860 | 2,630 | 1,340 | 4,020 | 3,020 | 4,850 | 5,890  | 3,100 | 1,340 | 1,200 |
| 21..... | 897   | 5,470  | 2,700 | 2,490 | 1,580 | 3,940 | 3,260 | 4,850 | 5,680  | 2,860 | 1,250 | 1,710 |
| 22..... | 1,240 | 4,750  | 2,630 | 2,420 | 2,220 | 3,680 | 3,600 | 4,950 | 5,680  | 2,700 | 1,250 | 1,420 |
| 23..... | 1,300 | 4,200  | 2,630 | 2,280 | 2,210 | 3,430 | 4,280 | 5,470 | 5,470  | 2,630 | 1,290 | 2,350 |
| 24..... | 1,120 | 3,770  | 2,420 | 2,210 | 1,900 | 3,180 | 4,650 | 6,520 | 5,470  | 2,700 | 1,200 | 2,550 |
| 25..... | 1,080 | 3,430  | 2,420 | 2,080 | 1,840 | 2,940 | 4,850 | 7,610 | 5,890  | 2,630 | 1,200 | 2,020 |
| 26..... | 1,200 | 3,100  | 3,940 | 2,020 | 2,350 | 2,860 | 4,750 | 7,610 | 6,100  | 2,560 | 1,160 | 1,960 |
| 27..... | 1,200 | 3,020  | 3,940 | 2,020 | 2,350 | 2,860 | 5,260 | 6,940 | 5,890  | 2,420 | 1,160 | 1,960 |
| 28..... | 1,120 | 2,940  | 3,520 | 1,900 | 2,140 | 3,340 | 6,100 | 6,520 | 5,470  | 2,210 | 1,120 | 2,180 |
| 29..... | 1,160 | 4,660  | 3,260 | 1,840 | ----- | 3,680 | 6,100 | 7,160 | 5,260  | 2,210 | 1,160 | 2,280 |
| 30..... | 1,160 | 6,100  | 3,020 | 1,780 | ----- | 4,370 | 5,680 | 7,610 | 4,850  | 2,140 | 1,160 | 2,020 |
| 31..... | 1,480 | -----  | 3,020 | 1,780 | ----- | 4,750 | ----- | 7,160 | -----  | 2,020 | 1,160 | ----- |

| Month          | Maximum | Minimum | Mean  | Per square mile | Run-off |           |
|----------------|---------|---------|-------|-----------------|---------|-----------|
|                |         |         |       |                 | Inches  | Acre-feet |
| October.....   | 1,530   | 708     | 1,010 | 2.09            | 2.41    | 62,100    |
| November.....  | 10,700  | 2,620   | 5,830 | 12.1            | 13.50   | 347,000   |
| December.....  | 9,100   | 1,960   | 3,620 | 7.49            | 8.64    | 223,000   |
| January.....   | 9,100   | 1,780   | 3,750 | 7.76            | 8.95    | 231,000   |
| February.....  | 2,350   | 1,300   | 1,630 | 3.37            | 3.51    | 90,500    |
| March.....     | 4,750   | 1,840   | 3,390 | 7.02            | 8.09    | 208,000   |
| April.....     | 6,100   | 2,860   | 3,930 | 8.14            | 9.08    | 234,000   |
| May.....       | 7,610   | 4,460   | 5,580 | 11.6            | 13.37   | 343,000   |
| June.....      | 15,300  | 4,850   | 7,580 | 15.7            | 17.52   | 451,000   |
| July.....      | 4,850   | 2,020   | 3,570 | 7.39            | 8.52    | 220,000   |
| August.....    | 2,350   | 1,120   | 1,510 | 3.13            | 3.61    | 92,800    |
| September..... | 2,420   | 1,020   | 1,460 | 3.02            | 3.37    | 86,900    |
| The year.....  | 15,300  | 708     | 3,580 | 7.41            | 100.57  | 2,590,000 |

## LEWIS RIVER AT ARIEL, WASH.

LOCATION.—Water-stage recorder in NW¼NE¼ sec. 4, T. 5 N., R. 2 E., at Ariel, half a mile below Ariel Dam and power plant. Zero of gage is 44.00 feet above mean sea level.

DRAINAGE AREA.—733 square miles.

RECORDS AVAILABLE.—July 1922 to September 1933. July to November 1909 for station 3 miles upstream.

DISCHARGE.—Maximum during year, 34,700 second-feet Jan. 8 (gage height, 15.25 feet); minimum, 250 second-feet Oct. 2 (gage height, 1.13 feet).

1909, 1922-33: Maximum, 59,000 second-feet Nov. 25, 1927 (gage height, 19.5 feet); no flow at times June 30, July 1-3, and 6-9, 1931 (caused by regulation during construction of Ariel Dam). Average, 10 years (1923-33), 4,350 second-feet.

REMARKS.—Records excellent. Discharge estimated Nov. 11, 12. No diversions above station. Regulation caused by operation of power plant and storage in Lake Merwin Reservoir.

## Discharge, in second-feet, 1932-33

| Day     | Oct.  | Nov.   | Dec.   | Jan.   | Feb.  | Mar.   | Apr.  | May    | June   | July  | Aug.  | Sept. |
|---------|-------|--------|--------|--------|-------|--------|-------|--------|--------|-------|-------|-------|
| 1.....  | 1,980 | 3,070  | 11,600 | 6,740  | 3,110 | 5,040  | 8,050 | 8,310  | 8,420  | 5,610 | 1,980 | 1,600 |
| 2.....  | 950   | 2,990  | 25,400 | 7,710  | 2,820 | 4,960  | 7,280 | 8,800  | 7,980  | 5,570 | 2,500 | 1,460 |
| 3.....  | 2,520 | 2,730  | 17,400 | 6,130  | 2,780 | 4,930  | 8,200 | 8,400  | 8,700  | 5,560 | 2,220 | 980   |
| 4.....  | 3,100 | 2,560  | 12,200 | 7,840  | 2,750 | 4,650  | 7,850 | 8,580  | 9,640  | 5,470 | 2,440 | 555   |
| 5.....  | 3,210 | 2,220  | 8,390  | 16,900 | 2,640 | 3,930  | 7,030 | 8,670  | 9,560  | 5,180 | 3,230 | 1,510 |
| 6.....  | 3,550 | 3,600  | 6,580  | 17,500 | 2,680 | 6,440  | 6,830 | 8,170  | 9,040  | 5,420 | 2,520 | 1,750 |
| 7.....  | 3,640 | 5,970  | 4,440  | 16,400 | 2,440 | 11,100 | 6,320 | 7,960  | 8,590  | 4,900 | 1,990 | 1,820 |
| 8.....  | 3,530 | 13,400 | 5,400  | 30,300 | 2,500 | 7,230  | 5,750 | 8,710  | 14,500 | 4,610 | 2,210 | 1,670 |
| 9.....  | 1,680 | 10,500 | 4,600  | 23,200 | 2,000 | 7,030  | 5,110 | 8,430  | 22,900 | 4,340 | 1,940 | 1,580 |
| 10..... | 2,720 | 6,080  | 4,650  | 16,800 | 1,900 | 6,180  | 4,810 | 8,090  | 17,600 | 4,660 | 2,050 | 1,110 |
| 11..... | 2,760 | 7,000  | 3,680  | 10,900 | 2,470 | 8,350  | 4,620 | 6,840  | 13,500 | 4,410 | 1,890 | 1,540 |
| 12..... | 2,240 | 10,000 | 3,840  | 9,090  | 2,580 | 12,000 | 5,130 | 6,990  | 12,000 | 5,050 | 1,910 | 1,710 |
| 13..... | 1,640 | 20,800 | 3,160  | 7,900  | 2,430 | 10,400 | 4,710 | 6,860  | 14,900 | 4,850 | 1,670 | 1,720 |
| 14..... | 1,620 | 20,400 | 3,090  | 7,460  | 1,940 | 8,610  | 4,910 | 7,040  | 15,400 | 5,520 | 1,830 | 1,720 |
| 15..... | 1,240 | 16,600 | 3,110  | 6,300  | 2,480 | 7,510  | 5,090 | 7,790  | 15,200 | 5,000 | 1,720 | 1,690 |
| 16..... | 658   | 22,900 | 2,880  | 5,140  | 2,190 | 8,000  | 5,480 | 7,820  | 13,100 | 5,450 | 1,640 | 1,570 |
| 17..... | 1,870 | 18,800 | 3,000  | 5,140  | 2,620 | 8,430  | 4,600 | 7,510  | 11,000 | 4,540 | 1,590 | 1,210 |
| 18..... | 1,730 | 14,200 | 3,250  | 4,920  | 2,520 | 7,970  | 4,660 | 7,670  | 9,390  | 4,450 | 1,670 | 1,610 |
| 19..... | 1,970 | 10,600 | 6,780  | 4,290  | 1,870 | 7,160  | 4,180 | 7,390  | 8,250  | 3,850 | 1,470 | 1,720 |
| 20..... | 1,950 | 7,610  | 6,850  | 3,870  | 2,680 | 8,170  | 4,630 | 6,800  | 7,390  | 3,940 | 1,610 | 1,760 |
| 21..... | 1,980 | 8,510  | 7,210  | 4,590  | 3,480 | 7,990  | 5,060 | 7,070  | 7,670  | 3,680 | 1,540 | 2,070 |
| 22..... | 1,710 | 6,880  | 5,940  | 3,710  | 7,900 | 6,960  | 5,770 | 7,100  | 7,300  | 3,430 | 1,590 | 4,190 |
| 23..... | 1,850 | 4,090  | 8,180  | 3,200  | 7,580 | 5,990  | 6,330 | 8,390  | 7,340  | 3,380 | 1,520 | 4,540 |
| 24..... | 2,290 | 4,890  | 6,140  | 3,420  | 6,160 | 5,230  | 7,070 | 10,200 | 6,710  | 3,460 | 1,530 | 5,000 |
| 25..... | 2,340 | 5,440  | 6,360  | 3,250  | 4,780 | 4,780  | 7,250 | 12,300 | 7,950  | 3,320 | 1,550 | 3,800 |
| 26..... | 2,020 | 5,110  | 14,000 | 3,820  | 7,440 | 4,540  | 6,890 | 11,900 | 7,710  | 3,180 | 1,440 | 3,800 |
| 27..... | 2,010 | 3,720  | 11,700 | 3,820  | 6,590 | 4,860  | 7,390 | 10,100 | 7,570  | 3,320 | 1,040 | 3,600 |
| 28..... | 1,980 | 3,990  | 9,440  | 3,590  | 5,720 | 6,150  | 9,630 | 9,390  | 7,180  | 2,760 | 1,490 | 3,550 |
| 29..... | 1,740 | 8,920  | 8,940  | 2,900  | ----- | 6,880  | 9,130 | 10,100 | 6,960  | 3,110 | 1,640 | 4,450 |
| 30..... | 1,450 | 9,230  | 7,060  | 3,240  | ----- | 9,920  | 8,210 | 11,200 | 6,300  | 2,910 | 1,690 | 3,540 |
| 31..... | 2,440 | -----  | 7,410  | 2,930  | ----- | 10,600 | ----- | 9,840  | -----  | 2,560 | 1,610 | ----- |

| Month          | Observed                 |         |         |                      | Gain or loss in storage in Lake Merwin Reservoir in acre-feet | Corrected for storage |                          |                 |                   |
|----------------|--------------------------|---------|---------|----------------------|---------------------------------------------------------------|-----------------------|--------------------------|-----------------|-------------------|
|                | Discharge in second-feet |         |         | Run-off in acre-feet |                                                               | Run-off in acre-feet  | Discharge in second-feet |                 | Run-off in inches |
|                | Maximum                  | Minimum | Mean    |                      |                                                               |                       | Mean                     | Per square mile |                   |
| October .....  | 3, 640                   | 658     | 2, 140  | 132, 000             | -31, 100                                                      | 101, 000              | 1, 640                   | 2. 24           | 2. 58             |
| November.....  | 22, 900                  | 2, 220  | 8, 760  | 521, 000             | +110, 000                                                     | 631, 000              | 10, 600                  | 14. 5           | 16. 13            |
| December.....  | 25, 400                  | 2, 880  | 7, 510  | 462, 000             | 0                                                             | 462, 000              | 7, 510                   | 10. 2           | 11. 76            |
| January.....   | 30, 300                  | 2, 900  | 8, 160  | 502, 000             | 0                                                             | 502, 000              | 8, 160                   | 11. 1           | 12. 80            |
| February.....  | 7, 900                   | 1, 870  | 3, 540  | 197, 000             | -12, 500                                                      | 184, 000              | 3, 310                   | 4. 52           | 4. 71             |
| March.....     | 12, 000                  | 3, 930  | 7, 160  | 440, 000             | -3, 400                                                       | 437, 000              | 7, 110                   | 9. 70           | 11. 18            |
| April.....     | 9, 630                   | 4, 180  | 6, 270  | 373, 000             | +400                                                          | 373, 000              | 6, 270                   | 8. 55           | 9. 54             |
| May.....       | 12, 300                  | 6, 800  | 8, 530  | 524, 000             | 0                                                             | 524, 000              | 8, 520                   | 11. 6           | 13. 37            |
| June.....      | 22, 900                  | 6, 300  | 10, 300 | 613, 000             | +19, 300                                                      | 632, 000              | 10, 600                  | 14. 5           | 16. 18            |
| July.....      | 5, 610                   | 2, 560  | 4, 310  | 265, 000             | +6, 900                                                       | 272, 000              | 4, 420                   | 6. 03           | 6. 95             |
| August.....    | 3, 230                   | 1, 040  | 1, 830  | 113, 000             | -1, 700                                                       | 111, 000              | 1, 810                   | 2. 47           | 2. 85             |
| September..... | 5, 000                   | 555     | 2, 290  | 136, 000             | +1, 700                                                       | 138, 000              | 2, 320                   | 3. 17           | 3. 54             |
| The year ..... | 30,300                   | 555     | 5,910   | 4,280,000            | +89,600                                                       | 4,370,000             | 6,040                    | 8.24            | 111.64            |

## MUDDY RIVER NEAR COUGAR, WASH.

LOCATION.—Water-stage recorder in SE¼ sec. 24, T. 7 N., R. 6 E., three-quarters of a mile above mouth and 14 miles east of Cougar.

DRAINAGE AREA.—136 square miles.

RECORDS AVAILABLE.—August to October 1909; August 1927 to September 1933.

DISCHARGE.—Maximum during year not determined; minimum, 135 second-feet Oct. 10, 11 (gage height, 1.30 feet).

1909, 1927-33: Maximum, 7,240 second-feet Nov. 25, 1927 (gage height, 8.40 feet); minimum, 94 second-feet Dec. 5-7, 1929.

REMARKS.—Records good except those estimated, Dec. 5-12, Feb. 9 to Mar. 13, May 14 to June 23, June 30 to July 23, July 27 to Sept. 22, Sept. 29, 30, which are fair. No diversions or regulation above station.

## Discharge, in second-feet, 1932-33

| Day | Oct. | Nov.  | Dec.  | Jan.  | Feb. | Mar.  | Apr.  | May   | June  | July  | Aug. | Sept. |
|-----|------|-------|-------|-------|------|-------|-------|-------|-------|-------|------|-------|
| 1   | 154  | 582   | 2,420 | 764   | 410  |       | 1,340 | 2,080 |       |       |      |       |
| 2   | 154  | 1,250 | 3,230 | 736   | 400  |       | 1,340 | 2,080 |       |       |      |       |
| 3   | 152  | 982   | 3,230 | 666   | 391  | 570   | 1,430 | 2,080 | 2,050 | 1,450 | 600  | 300   |
| 4   | 152  | 878   | 2,540 | 701   | 381  |       | 1,430 | 1,960 |       |       |      |       |
| 5   | 152  | 2,240 |       | 1,200 | 376  |       | 1,380 | 1,860 |       |       |      |       |
| 6   | 152  | 3,160 | 1,450 | 1,430 | 367  |       | 1,340 | 1,700 |       |       |      |       |
| 7   | 149  | 2,360 |       | 1,670 | 353  |       | 1,250 | 1,700 |       |       |      |       |
| 8   | 142  | 2,240 |       | 2,600 | 336  | 950   | 1,120 | 1,660 | 2,900 | 1,450 | 530  | 300   |
| 9   | 137  | 1,960 |       | 2,840 |      |       | 1,040 | 1,610 |       |       |      |       |
| 10  | 135  | 1,660 |       | 2,480 |      |       | 952   | 1,520 |       |       |      |       |
| 11  | 135  | 1,380 | 880   | 2,020 | 330  | 1,250 | 922   | 1,430 |       |       |      |       |
| 12  | 166  | 1,340 |       | 1,700 |      |       | 900   | 1,480 |       |       |      |       |
| 13  | 166  | 2,980 | 708   | 1,480 |      |       | 878   | 1,520 | 2,850 | 1,300 | 450  |       |
| 14  | 319  | 2,840 | 666   | 1,340 |      | 1,340 | 908   |       |       |       |      | 270   |
| 15  | 349  | 2,840 | 662   | 1,160 |      | 1,250 | 960   |       |       |       |      |       |
| 16  | 284  | 3,100 | 593   | 1,040 | 330  | 1,340 | 915   | 1,650 |       |       |      |       |
| 17  | 235  | 3,100 | 562   | 945   |      | 1,300 | 892   |       | 2,550 | 1,200 | 400  |       |
| 18  | 204  | 2,720 | 568   | 885   |      | 1,200 | 855   |       |       |       |      |       |
| 19  | 190  | 2,240 | 957   | 820   |      | 1,160 | 834   |       |       |       |      | 350   |
| 20  | 182  | 1,800 | 841   | 771   |      | 1,200 | 892   |       |       |       |      |       |
| 21  | 179  | 1,700 | 750   | 715   | 480  | 1,160 | 960   | 1,600 | 1,900 | 870   |      |       |
| 22  | 223  | 1,380 | 729   | 694   |      | 1,080 | 1,120 |       |       |       |      | 612   |
| 23  | 226  | 1,200 | 694   | 638   |      | 1,000 | 1,380 |       |       |       | 350  |       |
| 24  | 207  | 1,040 | 652   | 619   |      | 938   | 1,520 |       | 1,800 | 789   |      | 531   |
| 25  | 198  | 960   | 638   | 568   |      | 878   | 1,610 |       | 1,960 | 785   |      | 457   |
| 26  | 207  | 885   | 930   | 550   | 620  | 841   | 1,660 | 2,200 | 2,080 | 771   |      | 468   |
| 27  | 201  | 855   | 930   | 531   |      | 870   | 1,910 |       | 2,020 |       |      | 436   |
| 28  | 198  | 855   | 862   | 502   |      | 1,040 | 2,240 |       | 1,960 |       | 320  | 462   |
| 29  | 207  | 1,750 | 827   | 479   |      | 1,160 | 2,240 | 2,200 | 1,910 | 670   |      | 490   |
| 30  | 207  | 2,240 | 764   | 457   |      | 1,380 | 2,020 |       | 1,700 |       |      | 450   |
| 31  | 267  |       | 757   | 446   |      | 1,430 |       |       |       |       |      |       |

| Month     | Maximum | Minimum | Mean  | Per square mile | Run-off |           |
|-----------|---------|---------|-------|-----------------|---------|-----------|
|           |         |         |       |                 | Inches  | Acre-feet |
| October   | 349     | 135     | 194   | 1.43            | 1.65    | 11,900    |
| November  | 3,160   | 582     | 1,820 | 13.4            | 14.95   | 108,000   |
| December  | 3,230   | 562     | 1,120 | 8.24            | 9.50    | 68,900    |
| January   | 2,840   | 446     | 1,080 | 7.94            | 9.15    | 66,400    |
| February  |         |         | 422   | 3.10            | 3.23    | 23,400    |
| March     | 1,430   |         | 1,040 | 7.65            | 8.82    | 64,000    |
| April     | 2,240   | 834     | 1,270 | 9.34            | 10.42   | 75,600    |
| May       |         | 1,430   | 1,520 | 13.4            | 15.45   | 112,000   |
| June      |         | 1,700   | 2,240 | 17.2            | 19.19   | 139,000   |
| July      |         |         | 1,130 | 8.31            | 9.58    | 69,500    |
| August    |         |         | 438   | 3.22            | 3.71    | 26,900    |
| September | 612     |         | 354   | 2.60            | 2.90    | 21,100    |
| The year  |         | 135     | 1,090 | 8.01            | 108.55  | 787,000   |

## SWIFT CREEK NEAR COUGAR, WASH.

LOCATION.—Water-stage recorder in NW¼ sec. 28, T. 7 N., R. 5 E., one-eighth of a mile above mouth, 1½ miles east of Peterson ranch, and 5 miles east of Cougar.

DRAINAGE AREA.—26 square miles.

RECORDS AVAILABLE.—July to October 1909; June 1924 to November 1933 (discontinued).

DISCHARGE.—Maximum during period October 1932 to November 1933, 1,490 second-feet Nov. 2, 1933 (gage height, 3.13 feet); minimum, 121 second-feet Oct. 9 (gage height, 0.80 foot).

1909, 1924-33: Maximum, 1,900 second-feet Nov. 24, 1927 (gage height, 3.7 feet); minimum, 80 second-feet Sept. 17, 21, Oct. 7, 1924, Oct. 20, 1931.

REMARKS.—Records good except those estimated for Dec. 7-11, 1932, June 25, Nov. 25-30, 1933, which are fair. No diversions or regulation above station.

*Discharge, in second-feet, 1932-33*

| Day     | Oct. | Nov. | Dec. | Jan. | Feb. | Mar. | Apr. | May | June | July | Aug. | Sept. |
|---------|------|------|------|------|------|------|------|-----|------|------|------|-------|
| 1932-33 |      |      |      |      |      |      |      |     |      |      |      |       |
| 1.....  | 131  | 360  | 527  | 286  | 185  | 179  | 263  | 256 | 310  | 357  | 256  | 179   |
| 2.....  | 131  | 429  | 726  | 278  | 185  | 179  | 245  | 270 | 306  | 248  | 252  | 176   |
| 3.....  | 131  | 352  | 515  | 263  | 179  | 179  | 241  | 266 | 318  | 348  | 263  | 173   |
| 4.....  | 129  | 334  | 386  | 314  | 179  | 168  | 234  | 266 | 314  | 339  | 278  | 173   |
| 5.....  | 127  | 598  | 327  | 576  | 176  | 163  | 228  | 270 | 318  | 344  | 314  | 190   |
| 6.....  | 127  | 470  | 298  | 551  | 173  | 218  | 221  | 259 | 310  | 348  | 282  | 196   |
| 7.....  | 123  | 356  | 250  | 587  | 168  | 252  | 215  | 256 | 302  | 352  | 270  | 179   |
| 8.....  | 123  | 406  |      | 765  | 163  | 221  | 205  | 263 | 685  | 352  | 266  | 182   |
| 9.....  | 123  | 311  |      | 611  | 158  | 202  | 196  | 263 | 732  | 339  | 259  | 179   |
| 10..... | 123  | 264  |      | 473  | 158  | 208  | 190  | 248 | 503  | 331  | 256  | 176   |
| 11..... | 131  | 218  |      | 386  | 160  | 266  | 190  | 266 | 416  | 327  | 252  | 170   |
| 12..... | 146  | 276  | 215  | 351  | 156  | 390  | 190  | 221 | 411  | 335  | 248  | 170   |
| 13..... | 137  | 760  | 212  | 298  | 156  | 323  | 185  | 212 | 450  | 339  | 245  | 168   |
| 14..... | 264  | 545  | 208  | 290  | 156  | 278  | 182  | 215 | 473  | 344  | 241  | 179   |
| 15..... | 231  | 626  | 202  | 266  | 150  | 256  | 182  | 241 | 467  | 352  | 238  | 182   |
| 16..... | 200  | 700  | 202  | 248  | 148  | 270  | 182  | 266 | 444  | 348  | 234  | 190   |
| 17..... | 178  | 605  | 202  | 234  | 148  | 266  | 179  | 270 | 400  | 327  | 231  | 170   |
| 18..... | 168  | 428  | 212  | 234  | 148  | 252  | 176  | 274 | 371  | 314  | 228  | 185   |
| 19..... | 158  | 339  | 338  | 231  | 148  | 245  | 176  | 266 | 357  | 306  | 221  | 170   |
| 20..... | 153  | 306  | 298  | 221  | 150  | 263  | 176  | 263 | 348  | 302  | 218  | 187   |
| 21..... | 153  | 339  | 266  | 215  | 173  | 248  | 176  | 259 | 344  | 298  | 212  | 241   |
| 22..... | 188  | 298  | 270  | 212  | 221  | 234  | 179  | 266 | 344  | 294  | 208  | 287   |
| 23..... | 175  | 278  | 266  | 205  | 199  | 221  | 193  | 294 | 335  | 286  | 205  | 278   |
| 24..... | 160  | 245  | 256  | 205  | 176  | 215  | 199  | 362 | 331  | 286  | 205  | 266   |
| 25..... | 160  | 228  | 259  | 202  | 179  | 208  | 205  | 386 | 363  | 286  | 199  | 234   |
| 26..... | 168  | 215  | 433  | 193  | 218  | 199  | 208  | 366 | 395  | 282  | 196  | 259   |
| 27..... | 163  | 215  | 400  | 193  | 199  | 205  | 221  | 335 | 381  | 278  | 193  | 234   |
| 28..... | 160  | 224  | 339  | 193  | 188  | 221  | 241  | 318 | 386  | 266  | 190  | 257   |
| 29..... | 175  | 331  | 318  | 188  |      | 234  | 241  | 339 | 376  | 278  | 193  | 234   |
| 30..... | 160  | 357  | 294  | 185  |      | 313  | 241  | 348 | 362  | 270  | 196  | 218   |
| 31..... | 242  |      | 294  | 188  |      | 302  |      | 331 |      | 259  | 185  |       |

| Day     | Oct. | Nov. | Day     | Oct. | Nov. | Day     | Oct. | Nov. |
|---------|------|------|---------|------|------|---------|------|------|
| 1.....  | 208  | 351  | 11..... | 156  | 208  | 21..... | 215  | 190  |
| 2.....  | 199  | 817  | 12..... | 150  | 199  | 22..... | 367  | 182  |
| 3.....  | 190  | 680  | 13..... | 148  | 193  | 23..... | 509  | 176  |
| 4.....  | 185  | 422  | 14..... | 148  | 188  | 24..... | 371  | 176  |
| 5.....  | 179  | 331  | 15..... | 146  | 185  | 25..... | 352  |      |
| 6.....  | 173  | 290  | 16..... | 158  | 185  | 26..... | 290  | 160  |
| 7.....  | 168  | 263  | 17..... | 150  | 176  | 27..... | 322  |      |
| 8.....  | 163  | 241  | 18..... | 163  | 173  | 28..... | 609  |      |
| 9.....  | 160  | 228  | 19..... | 330  | 185  | 29..... | 581  |      |
| 10..... | 158  | 218  | 20..... | 266  | 176  | 30..... | 485  |      |
|         |      |      |         |      |      | 31..... | 376  |      |

Discharge, in second-feet, of Swift Creek near Cougar, Wash., 1932-33—Continued

| Month           | Maximum | Minimum | Mean | Per square mile | Run-off |           |
|-----------------|---------|---------|------|-----------------|---------|-----------|
|                 |         |         |      |                 | Inches  | Acre-feet |
| 1932-35         |         |         |      |                 |         |           |
| October.....    | 264     | 123     | 159  | 6.12            | 7.06    | 9,780     |
| November.....   | 760     | 215     | 380  | 14.6            | 16.29   | 22,600    |
| December.....   | 726     | 202     | 307  | 11.8            | 13.60   | 18,900    |
| January.....    | 765     | 185     | 310  | 11.9            | 13.72   | 19,100    |
| February.....   | 221     | 148     | 171  | 6.58            | 6.85    | 9,500     |
| March.....      | 390     | 163     | 238  | 9.15            | 10.55   | 14,600    |
| April.....      | 263     | 176     | 205  | 7.88            | 8.79    | 12,200    |
| May.....        | 386     | 212     | 281  | 10.8            | 12.45   | 17,300    |
| June.....       | 732     | 302     | 395  | 15.2            | 16.96   | 23,500    |
| July.....       | 357     | 259     | 317  | 12.2            | 14.07   | 19,500    |
| August.....     | 314     | 185     | 233  | 8.96            | 10.33   | 14,300    |
| September.....  | 287     | 168     | 203  | 7.81            | 8.71    | 12,100    |
| The year.....   | 765     | 123     | 267  | 10.3            | 139.38  | 193,000   |
| 1933            |         |         |      |                 |         |           |
| October.....    | 609     | 146     | 260  | 10.0            | 11.53   | 16,000    |
| November.....   | 817     |         | 246  | 9.46            | 10.56   | 14,600    |
| The period..... |         |         |      |                 |         | 30,600    |

## CANYON CREEK NEAR AMBOY, WASH.

LOCATION.—Water-stage recorder in SW¼ sec. 4, T. 5 N., R. 4 E., at wagon bridge 6 miles northeast of Amboy.

DRAINAGE AREA.—62 square miles.

RECORDS AVAILABLE.—July 1922 to September 1933.

DISCHARGE.—Average, 11 years (1922-33), 410 second-feet. Maximum and minimum stages, 1922-33, are given in the table below.

REMARKS.—Records good 1922-26, excellent 1927-28, fair 1929-30, good 1931-33, except estimated records, which are fair. No diversions or regulation above station. Records for 1922-32 supersede those published in previous water-supply papers.

*Maximum and minimum stages for years ending Sept. 30, 1922-33*

| Year         | Maximum      |                      |                           | Minimum           |                      |                           |
|--------------|--------------|----------------------|---------------------------|-------------------|----------------------|---------------------------|
|              | Date         | Gage height, in feet | Discharge, in second-feet | Date              | Gage height, in feet | Discharge, in second-feet |
| 1922.....    | Sept. 7..... | 1.38                 | 170                       | Aug. 28-30.....   | .....                | 35                        |
| 1922-23..... | Dec. 24..... | (*)                  | (*)                       | Sept. 19.....     | 0.33                 | 19                        |
| 1923-24..... | Dec. 6.....  | 7.2                  | 4,350                     | Oct. 2.....       | .33                  | 19                        |
| 1924-25..... | Feb. 3.....  | 8.3                  | 5,560                     | Sept. 24, 25..... | .18                  | 20                        |
| 1925-26..... | Feb. 6.....  | 7.93                 | 5,120                     | Oct. 19-24.....   | .14                  | 17                        |
| 1926-27..... | Feb. 1.....  | 8.55                 | 5,890                     | Aug. 29.....      | .28                  | 32                        |
| 1927-28..... | Nov. 25..... | 11.6                 | 10,000                    | Sept. 30.....     | .36                  | 23                        |
| 1928-29..... | Apr. 14..... | 6.10                 | 3,140                     | Oct. 1.....       | .36                  | 23                        |
| 1929-30..... | Feb. 7.....  | 7.16                 | 4,350                     | Sept. 22, 23..... | .29                  | 24                        |
| 1930-31..... | Mar. 31..... | 11.18                | 9,370                     | Oct. 4, 5.....    | .....                | 24                        |
| 1931-32..... | Feb. 26..... | 8.06                 | 5,340                     | Sept. 27-30.....  | .17                  | 22                        |
| 1932-33..... | .....        | (*)                  | (*)                       | Oct. 8, 9.....    | .14                  | 19                        |

\* About 11.3 (from high-water marks).

† About 9,500 second-feet.

• Not determined.

*Discharge, in second-feet, 1922-33*

| Day     | July | Aug. | Sept. | Day     | July | Aug. | Sept. | Day     | July | Aug. | Sept. |
|---------|------|------|-------|---------|------|------|-------|---------|------|------|-------|
| 1922    |      |      |       | 1922    |      |      |       | 1922    |      |      |       |
| 1.....  |      | 42   | 79    | 11..... |      | 79   | 67    | 21..... |      | 40   | 41    |
| 2.....  |      | 41   | 50    | 12..... |      | 61   | 62    | 22..... |      | 39   | 41    |
| 3.....  |      | 41   | 45    | 13..... |      | 69   | 57    | 23..... |      | 38   | 41    |
| 4.....  |      | 40   | 45    | 14..... |      | 55   | 54    | 24..... |      | 38   | 40    |
| 5.....  |      | 39   | 94    | 15..... |      | 50   | 50    | 25..... | 47   | 37   | 39    |
| 6.....  |      | 38   | 132   | 16..... |      | 47   | 48    | 26..... | 46   | 37   | 56    |
| 7.....  |      | 38   | 170   | 17..... |      | 44   | 46    | 27..... | 45   | 36   | 73    |
| 8.....  |      | 37   | 132   | 18..... |      | 42   | 46    | 28..... | 45   | 35   | 78    |
| 9.....  |      | 37   | 94    | 19..... |      | 41   | 45    | 29..... | 44   | 35   | 82    |
| 10..... |      | 35   | 80    | 20..... |      | 41   | 43    | 30..... | 44   | 35   | 69    |
|         |      |      |       |         |      |      |       | 31..... | 43   | 45   | ..... |

Discharge, in second-feet, of Canyon Creek near Amboy, Wash., 1922-33—Contd.

| Day     | Oct. | Nov.  | Dec.  | Jan.  | Feb.  | Mar.  | Apr.  | May   | June  | July  | Aug. | Sept. |
|---------|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|------|-------|
| 1922-33 |      |       |       |       |       |       |       |       |       |       |      |       |
| 1.....  | 55   | 460   | 131   | 3,400 | 200   | 440   | 715   | 383   | 402   | 108   | 51   | 29    |
| 2.....  | 58   | 440   | 150   | 5,600 |       | 440   | 583   | 346   | 383   | 100   | 50   | 29    |
| 3.....  | 61   | 346   | 217   | 4,500 |       | 383   | 583   | 310   | 346   | 103   | 49   | 27    |
| 4.....  | 181  | 310   | 181   | 3,400 |       | 346   | 500   | 293   | 310   | 100   | 48   | 26    |
| 5.....  | 200  | 260   | 170   | 5,600 |       | 346   | 500   | 310   | 293   | 88    | 47   | 26    |
| 6.....  | 150  | 217   | 160   | 6,780 | 200   | 808   | 480   | 310   | 276   | 276   | 45   | 26    |
| 7.....  | 140  | 204   | 140   | 7,430 |       | 855   | 626   | 346   | 260   | 670   | 43   | 25    |
| 8.....  | 120  | 192   | 131   | 3,470 |       | 715   | 583   | 402   | 245   | 440   | 42   | 24    |
| 9.....  | 99   | 170   | 170   | 3,140 |       | 500   | 480   | 460   | 231   | 276   | 42   | 23    |
| 10..... | 92   | 150   | 245   | 3,580 |       | 440   | 421   | 421   | 217   | 217   | 41   | 23    |
| 11..... | 85   | 150   | 181   | 2,500 | 200   | 500   | 421   | 383   | 181   | 191   | 41   | 25    |
| 12..... | 80   | 150   | 160   | 1,460 |       | 626   | 402   | 328   | 170   | 166   | 40   | 25    |
| 13..... | 76   | 131   | 150   | 1,100 |       | 122   | 903   | 383   | 293   | 204   | 143  | 39    |
| 14..... | 72   | 131   | 140   | 951   |       | 126   | 670   | 328   | 260   | 181   | 112  | 38    |
| 15..... | 67   | 122   | 131   | 1,150 |       | 131   | 460   | 310   | 245   | 160   | 107  | 38    |
| 16..... | 64   | 122   | 122   | 1,050 | 200   | 122   | 480   | 310   | 245   | 160   | 103  | 36    |
| 17..... | 61   | 383   | 110   | 2,300 |       | 131   | 500   | 383   | 231   | 140   | 96   | 36    |
| 18..... | 58   | 480   | 150   | 1,700 |       | 204   | 421   | 346   | 192   | 131   | 89   | 36    |
| 19..... | 56   | 402   | 670   | 1,900 |       | 310   | 421   | 328   | 181   | 131   | 83   | 35    |
| 20..... | 56   | 383   | 715   | 1,300 |       | 276   | 460   | 480   | 160   | 122   | 78   | 35    |
| 21..... | 55   | 346   | 670   | 1,050 | 200   | 260   | 402   | 460   | 160   | 110   | 71   | 38    |
| 22..... | 52   | 276   | 583   | 951   |       | 276   | 383   | 402   | 181   | 105   | 74   | 62    |
| 23..... | 50   | 245   | 3,500 | 670   |       | 310   | 383   | 383   | 150   | 99    | 70   | 38    |
| 24..... | 130  | 217   | 8,000 | 583   |       | 346   | 583   | 346   | 150   | 122   | 66   | 45    |
| 25..... | 421  | 192   | 5,600 | 421   |       | 383   | 500   | 346   | 160   | 113   | 64   | 35    |
| 26..... | 700  | 170   | 3,400 | 346   | 200   | 541   | 460   | 364   | 181   | 110   | 63   | 33    |
| 27..... | 700  | 160   | 5,000 | 421   |       | 346   | 583   | 383   | 260   | 105   | 63   | 33    |
| 28..... | 510  | 160   | 3,400 | 383   |       | 346   | 715   | 364   | 260   | 102   | 61   | 32    |
| 29..... | 440  | 150   | 2,300 | 276   |       | ----- | 855   | 310   | 440   | 99    | 58   | 32    |
| 30..... | 440  | 140   | 2,300 | 260   |       | ----- | 1,000 | 276   | 541   | 92    | 57   | 32    |
| 31..... | 480  | ----- | 2,300 | 240   | ----- | ----- | 855   | ----- | 421   | ----- | 55   | 31    |
| 1923-24 |      |       |       |       |       |       |       |       |       |       |      |       |
| 1.....  | 19   | 36    | 440   | 599   | 2,920 | 540   | 237   | 169   | 59    | 40    | 30   | 28    |
| 2.....  | 19   | 78    | 383   | 482   | 2,000 | 464   | 318   | 173   | 59    | 40    | 30   | 28    |
| 3.....  | 21   | 66    | 293   | 409   | 1,300 | 409   | 467   | 157   | 56    | 40    | 30   | 28    |
| 4.....  | 22   | 51    | 245   | 321   | 2,100 | 357   | 384   | 216   | 54    | 39    | 30   | 28    |
| 5.....  | 23   | 42    | 310   | 254   | 3,360 | 314   | 334   | 211   | 54    | 38    | 30   | 27    |
| 6.....  | 52   | 40    | 4,350 | 243   | 1,900 | 292   | 296   | 173   | 68    | 37    | 29   | 27    |
| 7.....  | 38   | 38    | 3,140 | 208   | 1,530 | 260   | 347   | 157   | 73    | 37    | 28   | 27    |
| 8.....  | 32   | 36    | 1,530 | 314   | 1,150 | 229   | 334   | 148   | 63    | 37    | 28   | 30    |
| 9.....  | 25   | 34    | 1,030 | 260   | 837   | 226   | 308   | 153   | 61    | 37    | 28   | 28    |
| 10..... | 22   | 33    | 704   | 1,250 | 682   | 226   | 265   | 162   | 56    | 37    | 28   | 28    |
| 11..... | 21   | 32    | 620   | 1,050 | 747   | 208   | 283   | 173   | 54    | 36    | 28   | 27    |
| 12..... | 20   | 36    | 501   | 814   | 1,050 | 200   | 228   | 169   | 53    | 36    | 28   | 27    |
| 13..... | 20   | 33    | 416   | 559   | 1,380 | 190   | 216   | 155   | 52    | 35    | 27   | 26    |
| 14..... | 19   | 39    | 599   | 449   | 1,000 | 160   | 229   | 135   | 52    | 35    | 27   | 26    |
| 15..... | 45   | 35    | 860   | 482   | 814   | 155   | 200   | 125   | 50    | 39    | 29   | 26    |
| 16..... | 132  | 33    | 704   | 423   | 640   | 150   | 277   | 119   | 50    | 37    | 29   | 26    |
| 17..... | 383  | 32    | 620   | 409   | 640   | 140   | 283   | 116   | 48    | 36    | 31   | 25    |
| 18..... | 217  | 30    | 640   | 374   | 559   | 133   | 501   | 108   | 116   | 35    | 82   | 28    |
| 19..... | 132  | 32    | 682   | 321   | 475   | 129   | 467   | 96    | 76    | 35    | 76   | 29    |
| 20..... | 100  | 34    | 520   | 283   | 409   | 157   | 413   | 93    | 63    | 35    | 47   | 28    |
| 21..... | 93   | 42    | 416   | 260   | 392   | 251   | 334   | 91    | 56    | 34    | 42   | 28    |
| 22..... | 80   | 42    | 357   | 234   | 388   | 171   | 308   | 85    | 50    | 34    | 39   | 28    |
| 23..... | 74   | 670   | 314   | 340   | 445   | 150   | 271   | 82    | 48    | 33    | 37   | 94    |
| 24..... | 64   | 1,350 | 324   | 321   | 392   | 144   | 234   | 79    | 47    | 32    | 35   | 88    |
| 25..... | 56   | 808   | 704   | 292   | 402   | 138   | 203   | 76    | 46    | 30    | 32   | 112   |
| 26..... | 51   | 480   | 579   | 367   | 540   | 127   | 185   | 79    | 45    | 30    | 30   | 68    |
| 27..... | 47   | 364   | 482   | 374   | 579   | 166   | 171   | 76    | 49    | 30    | 30   | 55    |
| 28..... | 45   | 383   | 2,200 | 460   | 640   | 262   | 164   | 73    | 42    | 30    | 30   | 48    |
| 29..... | 42   | 808   | 2,400 | 814   | 599   | 302   | 155   | 71    | 42    | 30    | 30   | 44    |
| 30..... | 40   | 626   | 1,400 | 1,350 | ----- | 232   | 171   | 71    | 41    | 30    | 29   | 98    |
| 31..... | 38   | ----- | 814   | 2,400 | ----- | 208   | ----- | 66    | ----- | 30    | 28   | ----- |

Discharge, in second-feet, of Canyon Creek near Amboy, Wash., 1922-33—Contd.

| Day     | Oct.  | Nov.  | Dec.  | Jan.  | Feb.  | Mar.  | Apr. | May | June | July | Aug. | Sept. |    |
|---------|-------|-------|-------|-------|-------|-------|------|-----|------|------|------|-------|----|
| 1924-25 |       |       |       |       |       |       |      |     |      |      |      |       |    |
| 1.....  | 283   | 1,320 | 314   | 1,080 | 2,810 | 576   | 315  | 347 | 200  | 96   | 37   | 26    |    |
| 2.....  | 289   | 2,150 | 579   | 1,280 | 3,580 | 561   | 287  | 329 |      | 92   | 37   | 25    |    |
| 3.....  | 248   | 1,180 | 579   | 1,460 | 4,570 | 516   | 290  | 306 |      | 90   | 36   | 25    |    |
| 4.....  | 190   | 1,080 | 907   | 1,660 |       | 472   | 301  | 298 |      | 79   | 35   | 24    |    |
| 5.....  | 153   | 1,050 | 930   | 2,500 |       | 442   | 290  | 312 |      | 85   | 34   | 24    |    |
| 6.....  | 127   | 930   | 725   | 1,380 | 2,400 | 399   | 281  | 332 | 284  | 83   | 32   | 24    |    |
| 7.....  | 121   | 1,100 | 620   | 1,030 |       | 364   | 270  | 347 |      | 81   | 32   | 23    |    |
| 8.....  | 193   | 1,460 | 520   | 837   |       | 1,300 | 344  | 262 |      | 315  | 79   | 31    | 24 |
| 9.....  | 234   | 1,300 | 478   | 814   |       | 1,150 | 335  | 306 |      | 284  | 76   | 31    | 23 |
| 10..... | 198   | 930   | 884   | 1,100 |       | 903   | 324  | 361 |      | 270  | 326  | 71    | 31 |
| 11..... | 166   | 907   | 3,200 | 814   | 761   | 301   | 414  | 262 | 315  | 69   | 31   | 22    |    |
| 12..... | 173   | 725   | 1,900 | 792   | 658   | 301   | 428  | 248 | 321  | 64   | 31   | 22    |    |
| 13..... | 274   | 579   | 1,300 | 661   | 561   | 318   | 370  | 245 | 306  | 60   | 31   | 22    |    |
| 14..... | 265   | 620   | 1,150 | 540   | 531   | 304   | 332  | 250 | 295  | 60   | 50   | 21    |    |
| 15..... | 237   | 704   | 1,150 | 449   | 516   | 358   | 370  | 248 | 276  | 59   | 38   | 21    |    |
| 16..... | 203   | 620   | 1,000 | 384   | 486   | 501   | 414  | 259 | 253  | 56   | 34   | 21    |    |
| 17..... | 176   | 540   |       | 340   | 457   | 639   | 457  | 256 | 231  | 54   | 32   | 21    |    |
| 18..... | 157   | 540   |       | 860   | 414   | 531   | 622  | 245 | 209  | 52   | 29   | 23    |    |
| 19..... | 144   | 1,570 |       | 650   | 399   | 591   | 903  | 236 | 193  | 52   | 28   | 25    |    |
| 20..... | 133   | 1,400 |       |       | 486   | 715   | 761  | 236 | 175  | 51   | 27   | 22    |    |
| 21..... | 123   | 2,180 | 1,800 |       | 639   | 606   | 606  | 259 | 166  | 50   | 27   | 22    |    |
| 22..... | 114   | 1,700 |       |       | 784   | 546   | 576  | 223 | 148  | 50   | 28   | 21    |    |
| 23..... | 118   | 1,180 |       |       | 903   | 501   | 531  | 196 | 139  | 48   | 32   | 20    |    |
| 24..... | 121   | 884   |       | 1,300 | 927   | 442   | 501  | 180 | 131  | 46   | 29   | 20    |    |
| 25..... | 211   | 704   |       | 930   | 855   | 414   | 457  | 170 | 125  | 45   | 29   | 20    |    |
| 26..... | 274   | 559   | 500   | 907   | 808   | 370   | 414  | 161 | 115  | 44   | 37   | 21    |    |
| 27..... | 501   | 475   |       | 1,080 | 761   | 344   | 399  | 157 | 109  | 44   | 31   | 22    |    |
| 28..... | 830   | 402   |       | 1,300 | 658   | 329   | 350  | 188 | 103  | 41   | 29   | 22    |    |
| 29..... | 1,130 | 354   |       | 3,140 | 2,580 | 301   | 344  | 188 | 100  | 40   | 27   | 28    |    |
| 30..... | 1,530 | 324   |       | 1,750 | 3,250 | 295   | 338  | 170 | 96   | 38   | 28   | 40    |    |
| 31..... | 1,380 |       | 1,150 | 3,250 |       | 273   |      | 154 |      | 38   | 26   |       |    |
| 1925-26 |       |       |       |       |       |       |      |     |      |      |      |       |    |
| 1.....  | 27    | 21    | 516   | 273   | 414   | 603   | 180  | 99  | 238  | 55   | 29   | 68    |    |
| 2.....  | 26    | 20    | 622   | 248   | 384   | 499   | 172  | 98  | 221  | 51   | 28   | 60    |    |
| 3.....  | 24    | 20    | 639   | 239   | 399   | 444   | 238  | 128 | 207  | 48   | 27   | 51    |    |
| 4.....  | 24    | 21    | 676   | 248   | 802   | 396   | 243  | 304 | 195  | 44   | 27   | 44    |    |
| 5.....  | 22    | 21    | 676   | 501   | 1,150 | 355   | 218  | 330 | 184  | 44   | 27   | 42    |    |
| 6.....  | 21    | 21    | 576   | 516   | 3,690 | 312   | 210  | 305 | 174  | 44   | 27   | 40    |    |
| 7.....  |       | 21    | 486   | 442   | 2,350 | 279   | 201  | 284 | 164  | 44   | 26   | 39    |    |
| 8.....  |       | 21    | 414   | 384   | 1,350 | 265   | 190  | 355 | 154  | 44   | 26   | 38    |    |
| 9.....  |       | 26    | 370   | 347   | 1,000 | 245   | 184  | 355 | 149  | 43   | 24   | 36    |    |
| 10..... |       | 92    | 457   | 306   | 1,020 | 229   | 186  | 317 | 137  | 43   | 24   | 34    |    |
| 11..... | 20    | 287   | 1,120 | 284   | 903   | 212   | 188  | 279 | 132  | 42   | 24   | 33    |    |
| 12..... | 20    | 370   | 1,500 | 264   | 715   | 293   | 178  | 247 | 126  | 42   | 24   | 30    |    |
| 13..... | 20    | 324   | 1,100 | 245   | 560   | 368   | 168  | 229 | 120  | 39   | 24   | 29    |    |
| 14..... | 20    | 248   | 761   | 278   | 480   | 355   | 166  | 214 | 113  | 39   | 24   | 29    |    |
| 15..... | 20    | 329   | 591   | 361   | 461   | 355   | 160  | 197 | 111  | 39   | 24   | 62    |    |
| 16..... | 19    | 516   | 486   | 532   | 444   | 330   | 154  | 186 | 106  | 39   | 23   | 268   |    |
| 17..... | 19    | 761   | 442   | 832   | 480   | 305   | 149  | 247 | 103  | 39   | 28   | 291   |    |
| 18..... | 18    | 658   | 457   | 696   | 461   | 342   | 143  | 382 | 98   | 38   | 83   | 225   |    |
| 19..... | 17    | 472   | 428   | 576   | 499   | 330   | 149  | 355 | 104  | 37   | 73   | 166   |    |
| 20..... | 17    | 370   | 761   | 606   | 715   | 355   | 147  | 396 | 103  | 36   | 57   | 139   |    |
| 21..... | 17    | 290   | 3,140 | 832   | 976   | 317   | 139  | 412 | 91   | 34   | 55   | 236   |    |
| 22..... | 17    | 329   | 2,200 | 784   | 1,100 | 300   | 151  | 396 | 86   | 33   | 40   | 976   |    |
| 23..... | 17    | 212   | 2,450 | 658   | 1,070 | 291   | 137  | 368 | 79   | 33   | 34   | 539   |    |
| 24..... | 17    | 198   | 1,250 | 561   | 2,920 | 270   | 132  | 355 | 75   | 33   | 30   | 342   |    |
| 25..... | 20    | 236   | 855   | 486   | 1,700 | 247   | 122  | 310 | 72   | 33   | 29   | 268   |    |
| 26..... | 19    | 217   | 639   | 428   | 1,150 | 232   | 117  | 295 | 67   | 32   | 99   | 221   |    |
| 27..... | 30    | 262   | 516   | 384   | 927   | 214   | 113  | 298 | 64   | 32   | 91   | 190   |    |
| 28..... | 56    | 242   | 428   | 364   | 738   | 203   | 111  | 279 | 62   | 32   | 58   | 190   |    |
| 29..... | 42    | 234   | 384   | 428   |       | 192   | 106  | 282 | 60   | 31   | 48   | 195   |    |
| 30..... | 30    | 295   | 335   | 457   |       | 176   | 104  | 265 | 57   | 29   | 47   | 195   |    |
| 31..... | 25    |       | 301   | 428   |       | 180   |      | 249 |      | 30   | 44   |       |    |

Discharge, in second-feet, of Canyon Creek near Amboy, Wash., 1922-33—Contd.

| Day     | Oct.  | Nov.  | Dec.  | Jan.  | Feb.  | Mar.  | Apr.  | May   | June  | July | Aug. | Sept. |
|---------|-------|-------|-------|-------|-------|-------|-------|-------|-------|------|------|-------|
| 1926-27 |       |       |       |       |       |       |       |       |       |      |      |       |
| 1.....  | 192   | 186   | 1,500 | 1,310 | 3,300 | 740   | 254   | 390   | 345   | 131  | 51   | 84    |
| 2.....  | 298   | 178   | 1,340 | 3,580 | 3,250 | 672   | 264   | 420   | 351   | 125  | 50   | 52    |
| 3.....  | 368   | 166   | 985   | 2,450 | 1,600 | 545   | 267   | 628   | 339   | 122  | 49   | 78    |
| 4.....  | 291   | 158   | 740   | 1,530 | 1,160 | 450   | 309   | 605   | 342   | 118  | 47   | 104   |
| 5.....  | 240   | 152   | 585   | 1,210 | 885   | 420   | 300   | 485   | 339   | 113  | 47   | 94    |
| 6.....  | 225   | 307   | 468   | 960   | 695   | 405   | 309   | 420   | 390   | 107  | 46   | 105   |
| 7.....  | 368   | 293   | 405   | 985   | 545   | 435   | 375   | 378   | 468   | 102  | 45   | 107   |
| 8.....  | 480   | 256   | 348   | 810   | 435   | 468   | 348   | 351   | 650   | 97   | 45   | 90    |
| 9.....  | 444   | 234   | 306   | 650   | 384   | 405   | 312   | 333   | 545   | 94   | 44   | 57    |
| 10..... | 368   | 218   | 286   | 545   | 342   | 405   | 292   | 312   | 450   | 92   | 44   | 64    |
| 11..... | 444   | 207   | 629   | 450   | 306   | 390   | 272   | 294   | 405   | 87   | 44   | 685   |
| 12..... | 560   | 288   | 545   | 420   | 278   | 730   | 254   | 324   | 360   | 86   | 43   | 545   |
| 13..... | 784   | 951   | 450   | 960   | 252   | 935   | 250   | 345   | 330   | 81   | 43   | 420   |
| 14..... | 581   | 927   | 384   | 860   | 237   | 785   | 257   | 435   | 306   | 80   | 42   | 339   |
| 15..... | 480   | 1,180 | 369   | 672   | 330   | 628   | 303   | 485   | 280   | 78   | 38   | 272   |
| 16..... | 2,360 | 1,220 | 810   | 545   | 435   | 545   | 312   | 468   | 267   | 74   | 37   | 223   |
| 17..... | 1,350 | 808   | 1,110 | 505   | 435   | 545   | 390   | 485   | 242   | 74   | 37   | 189   |
| 18..... | 855   | 581   | 985   | 740   | 835   | 485   | 485   | 420   | 223   | 70   | 36   | 163   |
| 19..... | 581   | 444   | 785   | 650   | 860   | 450   | 390   | 485   | 207   | 69   | 36   | 158   |
| 20..... | 444   | 603   | 695   | 505   | 2,500 | 420   | 336   | 545   | 196   | 69   | 36   | 134   |
| 21..... | 355   | 670   | 650   | 420   | 2,150 | 468   | 294   | 468   | 189   | 67   | 35   | 127   |
| 22..... | 303   | 625   | 545   | 378   | 1,630 | 450   | 267   | 420   | 182   | 65   | 34   | 118   |
| 23..... | 265   | 927   | 450   | 330   | 1,360 | 450   | 270   | 390   | 174   | 64   | 33   | 113   |
| 24..... | 342   | 832   | 405   | 289   | 1,040 | 468   | 336   | 387   | 178   | 62   | 34   | 107   |
| 25..... | 293   | 1,300 | 378   | 252   | 860   | 420   | 468   | 420   | 163   | 61   | 35   | 100   |
| 26..... | 307   | 1,150 | 336   | 228   | 740   | 375   | 565   | 405   | 152   | 60   | 34   | 95    |
| 27..... | 284   | 951   | 324   | 348   | 605   | 336   | 628   | 384   | 152   | 57   | 34   | 238   |
| 28..... | 263   | 1,000 | 450   | 628   | 525   | 303   | 565   | 366   | 148   | 56   | 33   | 492   |
| 29..... | 240   | 2,770 | 785   | 485   | ----- | 283   | 435   | 372   | 142   | 55   | 38   | 1,010 |
| 30..... | 221   | 1,590 | 1,940 | 420   | ----- | 280   | 354   | 357   | 134   | 52   | 44   | 672   |
| 31..... | 201   | ----- | 1,160 | 405   | ----- | 278   | ----- | 339   | ----- | 52   | 42   | ----- |
| 1927-28 |       |       |       |       |       |       |       |       |       |      |      |       |
| 1.....  | 505   | 267   | 1,340 | 200   | 370   | 159   | 1,430 | 1,280 | 143   | 70   | 52   | 28    |
| 2.....  | 485   | 420   | 1,670 | 302   | 484   | 153   | 975   | 925   | 143   | 69   | 52   | 27    |
| 3.....  | 2,150 | 405   | 1,250 | 1,080 | 434   | 149   | 753   | 708   | 133   | 80   | 51   | ----- |
| 4.....  | 2,250 | 363   | 900   | 1,340 | 398   | 161   | 666   | 572   | 126   | 69   | 49   | ----- |
| 5.....  | 1,600 | 345   | 730   | 1,370 | 391   | 245   | 627   | 502   | 122   | 207  | 48   | ----- |
| 6.....  | 1,060 | 390   | 568   | 2,450 | 434   | 310   | 536   | 484   | 122   | 212  | 48   | 26    |
| 7.....  | 740   | 405   | 451   | 1,400 | 434   | 318   | 467   | 467   | 116   | 180  | 47   | ----- |
| 8.....  | 525   | 525   | 463   | 1,100 | 401   | 330   | 414   | 450   | 107   | 159  | 47   | ----- |
| 9.....  | 485   | 485   | 476   | 1,050 | 360   | 887   | 388   | 417   | 102   | 145  | 46   | ----- |
| 10..... | 545   | 405   | 399   | 950   | 318   | 2,940 | 395   | 391   | 105   | 133  | 44   | 24    |
| 11..... | 650   | 366   | 354   | 975   | 339   | 3,020 | 417   | 370   | 105   | 122  | 42   | 26    |
| 12..... | 525   | 339   | 332   | 1,900 | 302   | 1,310 | 875   | 336   | 103   | 112  | 40   | 83    |
| 13..... | 435   | 381   | 288   | 3,640 | 280   | 950   | 1,000 | 307   | 102   | 105  | 40   | 70    |
| 14..... | 381   | 1,140 | 250   | 1,430 | 262   | 646   | 730   | ----- | 102   | 98   | 39   | 51    |
| 15..... | 327   | 1,540 | 235   | 925   | 240   | 536   | 627   | ----- | 109   | 95   | 39   | 39    |
| 16..... | 289   | 1,850 | 268   | 687   | 223   | 467   | 572   | 271   | 114   | 90   | 37   | 35    |
| 17..... | 278   | 1,560 | 252   | 554   | 210   | 434   | 666   | ----- | 109   | 86   | 35   | 32    |
| 18..... | 348   | 1,260 | 230   | 450   | 198   | 417   | 753   | ----- | 105   | 84   | 34   | 31    |
| 19..... | 280   | 1,180 | 214   | 379   | 187   | 434   | 687   | ----- | 102   | 81   | 32   | 31    |
| 20..... | 264   | 1,360 | 200   | 336   | 178   | 417   | 608   | 235   | 102   | 76   | 32   | 29    |
| 21..... | 242   | 1,340 | 185   | 299   | 178   | 554   | 627   | 233   | 96    | 72   | 32   | 27    |
| 22..... | 223   | 985   | 174   | 275   | 205   | 730   | 666   | 221   | 93    | 70   | 32   | 25    |
| 23..... | 247   | 910   | 165   | 250   | 194   | 800   | 708   | 200   | 86    | 68   | 32   | 25    |
| 24..... | 250   | 4,560 | 157   | 243   | 183   | 925   | 708   | 189   | 80    | 65   | 32   | 25    |
| 25..... | 225   | 6,860 | 147   | 262   | 185   | 730   | 590   | 185   | 78    | 62   | 32   | 25    |
| 26..... | 212   | 2,300 | 149   | 255   | 194   | 708   | 519   | 172   | 76    | 59   | 31   | 25    |
| 27..... | 196   | 1,660 | 255   | 248   | 185   | 825   | 502   | 161   | 74    | 59   | 31   | 25    |
| 28..... | 223   | 2,350 | 302   | 255   | 178   | 1,280 | 572   | 168   | 76    | 58   | 32   | 24    |
| 29..... | 260   | 1,430 | 247   | 407   | 168   | 1,220 | 536   | 196   | 76    | 56   | 31   | 24    |
| 30..... | 242   | 1,280 | 205   | 646   | ----- | 2,640 | 1,280 | 187   | 72    | 55   | 31   | 23    |
| 31..... | 228   | ----- | 200   | 646   | ----- | 3,080 | ----- | 155   | ----- | 53   | 29   | ----- |

Discharge, in second-feet, of Canyon Creek near Amboy, Wash., 1922-33—Contd.

| Day     | Oct. | Nov.   | Dec.   | Jan.   | Feb.   | Mar.   | Apr.   | May    | June  | July | Aug. | Sept. |
|---------|------|--------|--------|--------|--------|--------|--------|--------|-------|------|------|-------|
| 1928-29 |      |        |        |        |        |        |        |        |       |      |      |       |
| 1.....  | 24   | 105    | 289    | 1, 150 | 218    | 380    | 502    | 467    | 202   | 138  | 48   | 32    |
| 2.....  | 42   | 102    | 264    |        | 204    | 447    | 443    | 590    | 202   | 130  | 46   | 32    |
| 3.....  | 60   | 103    | 246    |        | 186    | 502    | 393    | 606    | 192   | 124  | 46   | 31    |
| 4.....  | 180  | 131    | 226    |        | 175    | 502    | 357    | 536    | 188   | 117  | 44   | 31    |
| 5.....  | 316  | 114    | 211    |        | 164    | 627    | 321    | 502    | 206   | 117  | 42   | 30    |
| 6.....  | 275  | 103    | 197    | 484    | 151    | 627    | 292    | 467    | 211   | 110  | 41   | 30    |
| 7.....  | 746  | 98     | 208    | 406    | 519    | 289    | 430    | 206    | 107   | 40   | 29   | 29    |
| 8.....  | 730  | 170    | 348    | 345    | 447    | 275    | 403    | 202    | 98    | 39   | 29   | 29    |
| 9.....  | 554  | 1, 700 | 519    | 304    | 450    | 264    | 377    | 197    | 96    | 39   | 29   | 29    |
| 10..... | 467  | 2, 200 | 1, 400 | 272    | 572    | 264    | 351    | 188    | 93    | 38   | 29   | 29    |
| 11..... | 342  | 1, 250 | 975    | 254    | 120    | 572    | 289    | 367    | 183   | 90   | 37   | 28    |
| 12..... | 275  | 875    | 687    | 238    |        | 484    | 309    | 426    | 177   | 87   | 37   | 28    |
| 13..... | 233  | 687    | 536    | 230    |        | 413    | 467    | 436    | 197   | 82   | 37   | 27    |
| 14..... | 205  | 572    | 440    | 228    |        | 364    | 2, 100 | 403    | 208   | 77   | 36   | 27    |
| 15..... | 313  | 484    | 364    | 218    |        | 400    | 1, 400 | 373    | 386   | 74   | 35   | 26    |
| 16..... | 434  | 554    | 315    | 206    | 108    | 433    | 1, 000 | 367    | 373   | 73   | 35   | 26    |
| 17..... | 434  | 484    | 278    | 220    | 117    | 393    | 776    | 354    | 426   | 70   | 36   | 26    |
| 18..... | 373  | 419    | 251    | 270    | 107    | 367    | 627    | 354    | 519   | 69   | 35   | 26    |
| 19..... | 307  | 361    | 230    | 218    | 103    | 370    | 572    | 370    | 666   | 67   | 36   | 26    |
| 20..... | 258  | 312    | 208    | 202    | 197    | 538    | 1, 020 | 386    | 536   | 66   | 36   | 26    |
| 21..... | 226  | 278    | 199    | 192    | 270    | 1, 220 | 950    | 390    | 423   | 64   | 35   | 27    |
| 22..... | 198  | 246    | 188    | 183    | 267    | 776    | 776    | 400    | 348   | 60   | 34   | 30    |
| 23..... | 180  | 218    | 175    | 172    | 436    | 572    | 666    | 390    | 265   | 59   | 41   | 33    |
| 24..... | 163  | 197    | 172    | 172    | 436    | 467    | 590    | 396    | 259   | 58   | 38   | 29    |
| 25..... | 149  | 183    | 440    | 220    | 554    | 430    | 572    | 393    | 233   | 56   | 36   | 28    |
| 26..... | 139  | 312    | 824    | 330    | 484    | 884    | 572    | 357    | 208   | 58   | 36   | 26    |
| 27..... | 129  | 400    | 776    | 275    | 436    | 1, 190 | 554    | 304    | 190   | 56   | 35   | 26    |
| 28..... | 122  | 336    | 708    | 243    | 393    | 1, 250 | 519    | 270    | 172   | 55   | 34   | 26    |
| 29..... | 118  | 286    | 1, 500 | 243    | -----  | 975    | 627    | 238    | 160   | 54   | 34   | 26    |
| 30..... | 116  | 272    | 1, 800 | 243    | -----  | 708    | 536    | 218    | 147   | 53   | 33   | 26    |
| 31..... | 111  | -----  | 1, 350 | 243    | -----  | 590    | -----  | 211    | ----- | 50   | 33   | ----- |
| 1929-30 |      |        |        |        |        |        |        |        |       |      |      |       |
| 1.....  | 26   | 27     | 25     | 687    | 2, 430 | 311    | 288    | 277    | 270   | 74   | 38   | 25    |
| 2.....  | 26   | 27     | 26     | 687    | 1, 900 | 277    | 262    | 275    | 322   | 73   | 38   |       |
| 3.....  | 26   | 27     | 25     | 536    | 1, 310 | 257    | 254    | 259    | 322   | 70   | 37   |       |
| 4.....  | 26   | 26     | 25     | 666    | 1, 250 | 236    | 254    | 238    | 329   | 69   | 36   |       |
| 5.....  | 26   | 26     | 25     | 572    | 2, 200 | 233    | 220    | 223    | 311   | 67   | 35   |       |
| 6.....  | 26   | 27     | 25     | 467    | 1, 190 | 215    | 210    | 228    | 285   | 64   | 35   | 25    |
| 7.....  | 26   | 26     | 25     | 390    | 2, 500 | 205    | 259    | 225    | 262   | 60   | 34   |       |
| 8.....  | 27   | 26     | 56     | 336    | 2, 320 | 207    | 296    | 212    | 236   | 59   | 35   |       |
| 9.....  | 34   | 25     | 298    | 289    | 1, 180 | 212    | 272    | 202    | 212   | 56   | 34   |       |
| 10..... | 28   | 29     | 627    | -----  | 1, 490 | 205    | 244    | 190    | 200   | 54   | 34   |       |
| 11..... | 27   | 29     | 330    | -----  | 1, 460 | 202    | 228    | 177    | 187   | 53   | 32   | 34    |
| 12..... | 26   | 26     | 213    | -----  | 1, 100 | 210    | 218    | 165    | 170   | 50   | 30   | 29    |
| 13..... | 26   | 26     | 614    | -----  | 2, 060 | 207    | 212    | 155    | 158   | 48   | 30   | 28    |
| 14..... | 26   | 25     | 2, 050 | -----  | 2, 500 | 192    | 275    | 167    | 146   | 47   | 30   | 27    |
| 15..... | 26   | 25     | 900    | -----  | 1, 380 | 177    | 280    | 163    | 135   | 47   | 30   | 26    |
| 16..... | 28   | 25     | 776    | -----  | 1, 050 | 160    | 262    | 153    | 124   | 47   | 30   | 26    |
| 17..... | 36   | 35     | 590    | -----  | 857    | 148    | 246    | 148    | 120   | 46   | 30   | 25    |
| 18..... | 33   | 29     | 572    | 130    | 857    | 139    | 233    | 144    | 114   | 46   | 29   | 25    |
| 19..... | 30   | 27     | 590    |        | 1, 460 | 130    | 225    | 233    | 110   | 44   | 29   | 25    |
| 20..... | 29   | 26     | 502    |        | 1, 280 | 192    | 215    | 752    | 107   | 41   | 29   | 24    |
| 21..... | 28   | 25     | 436    |        | 1, 530 | 1, 100 | 218    | 1, 120 | 103   | 44   | 29   | 24    |
| 22..... | 28   | 25     | 825    |        | 904    | 1, 150 | 220    | 857    | 96    | 43   | 29   | 24    |
| 23..... | 27   | 25     | 1, 370 | -----  | 810    | 834    | 194    | 604    | 93    | 42   | 28   | 24    |
| 24..... | 26   | 26     | 950    | -----  | 672    | 1, 100 | 184    | 463    | 91    | 41   | 28   | 26    |
| 25..... | 26   | 28     | 776    | -----  | 558    | 976    | 170    | 380    | 88    | 40   | 27   | 27    |
| 26..... | 26   | 29     | 646    | -----  | 458    | 718    | 175    | 332    | 88    | 39   | 26   | 27    |
| 27..... | 29   | 28     | 536    | -----  | 394    | 568    | 262    | 298    | 88    | 39   | 26   | 30    |
| 28..... | 29   | 26     | 436    | 93     | 345    | 479    | 337    | 280    | 91    | 38   | 26   | 34    |
| 29..... | 27   | 26     | 367    | 208    | -----  | 428    | 327    | 264    | 82    | 37   | 26   | 29    |
| 30..... | 26   | 25     | 380    | 236    | -----  | 366    | 303    | 231    | 77    | 38   | 25   | 27    |
| 31..... | 27   | -----  | 373    | 400    | -----  | 322    | -----  | 223    | ----- | 38   | 25   | ----- |

Discharge, in second-feet, of Canyon Creek near Amboy, Wash., 1922-33—Contd.

| Day     | Oct.  | Nov.  | Dec.  | Jan.  | Feb.  | Mar.  | Apr.  | May   | June | July | Aug. | Sept. |    |
|---------|-------|-------|-------|-------|-------|-------|-------|-------|------|------|------|-------|----|
| 1930-31 |       |       |       |       |       |       |       |       |      |      |      |       |    |
| 1       | 26    | 64    | 158   | 153   | 400   | 450   | 3,880 | 219   | 68   | 219  | 44   | 28    |    |
| 2       | 25    | 55    | 184   | 220   | 345   | 458   | 1,740 | 209   | 65   | 193  | 42   | 28    |    |
| 3       | 25    | 54    | 175   | 342   | 311   | 446   | 1,170 | 200   | 65   | 176  | 41   | 28    |    |
| 4       | 24    | 50    | 160   | 463   | 285   | 405   | 840   | 190   | 63   | 160  | 41   | 28    |    |
| 5       | 24    | 48    | 146   | 952   | 264   | 358   | 840   | 181   | 62   | 126  | 40   | 28    |    |
| 6       | 31    | 46    | 128   | 834   | 236   | 319   | 818   | 198   | 60   | 110  | 39   | 31    |    |
| 7       | 112   | 43    | 114   | 581   | 218   | 290   | 1,140 | 193   | 59   |      | 39   | 34    |    |
| 8       | 74    | 42    | 110   | 432   | 202   | 267   | 1,020 | 167   | 55   |      | 38   | 30    |    |
| 9       | 51    | 60    | 110   | 355   | 187   | 327   | 774   | 152   | 56   |      | 37   | 34    |    |
| 10      | 42    | 116   | 110   | 340   | 175   | 467   | 623   | 142   | 61   | 36   | 30   | 30    |    |
| 11      | 37    | 98    | 142   | 554   | 163   | 649   | 519   | 138   | 56   | 79   | 36   | 29    |    |
| 12      | 35    | 329   | 177   | 554   | 153   | 834   | 455   | 138   | 53   |      | 35   | 29    |    |
| 13      | 34    | 296   | 492   | 463   | 144   | 718   | 540   | 140   | 53   |      | 34   | 29    |    |
| 14      | 35    | 207   | 353   | 458   | 135   | 532   | 623   | 134   | 59   |      | 33   | 28    |    |
| 15      | 38    | 408   | 372   | 514   | 135   | 436   | 623   | 124   | 73   | 33   | 28   | 28    |    |
| 16      | 35    | 649   | 363   | 810   | 137   | 414   | 540   | 138   | 104  | 70   | 33   | 27    |    |
| 17      | 36    | 454   | 414   | 976   | 382   | 421   | 455   | 163   | 132  |      | 32   | 28    |    |
| 18      | 35    | 335   | 388   | 718   | 1,270 | 1,120 | 390   | 154   | 146  |      | 30   | 60    |    |
| 19      | 33    | 345   | 366   | 545   | 1,150 | 1,400 | 344   | 134   | 158  |      | 58   | 29    | 91 |
| 20      | 31    | 408   | 337   | 436   | 764   | 1,320 | 308   | 124   | 128  | 56   | 28   | 49    |    |
| 21      | 32    | 414   | 309   | 380   | 545   | 1,400 | 281   | 115   | 119  | 55   | 28   | 40    |    |
| 22      | 32    | 414   | 277   | 402   | 436   | 1,150 | 257   | 106   | 160  | 54   | 28   | 37    |    |
| 23      | 33    | 408   | 298   | 741   | 385   | 880   | 245   | 100   | 165  | 52   | 27   | 34    |    |
| 24      | 38    | 358   | 283   | 904   | 337   | 718   | 228   | 97    | 214  | 51   | 27   | 32    |    |
| 25      | 45    | 316   | 259   | 810   | 316   | 604   | 211   | 93    | 203  | 48   | 27   | 32    |    |
| 26      | 76    | 280   | 233   | 928   | 340   | 492   | 200   | 90    | 577  | 47   | 27   | 31    |    |
| 27      | 167   | 249   | 212   | 857   | 411   | 428   | 203   | 84    | 482  | 46   | 28   | 30    |    |
| 28      | 112   | 218   | 194   | 764   | 428   | 408   | 225   | 81    | 359  | 46   | 27   | 30    |    |
| 29      | 87    | 194   | 182   | 672   | 1,910 | 536   | 236   | 76    | 299  | 45   | 26   | 30    |    |
| 30      | 74    | 167   | 170   | 581   |       | 1,910 | 228   | 73    | 251  | 45   | 26   | 35    |    |
| 31      | 71    | 158   | 479   | 7,290 |       | 7,290 | 69    | 69    | 44   | 26   | 44   | 26    |    |
| 1931-32 |       |       |       |       |       |       |       |       |      |      |      |       |    |
| 1       | 33    | 377   | 188   | 462   | 203   | 1,020 | 937   | 560   | 270  | 108  | 48   | 41    |    |
| 2       | 32    | 353   | 178   | 403   | 188   | 990   | 937   | 560   | 275  | 105  | 46   | 37    |    |
| 3       | 31    | 290   | 181   | 374   | 176   | 774   | 1,080 | 478   | 278  | 170  | 45   | 36    |    |
| 4       | 47    | 254   | 171   | 400   | 169   | 887   | 887   | 432   | 267  | 146  | 44   | 34    |    |
| 5       | 171   | 225   | 165   | 582   | 160   |       | 887   | 407   | 249  | 117  | 43   | 33    |    |
| 6       | 86    | 231   | 160   | 687   | 156   | 2,450 | 796   | 383   | 228  | 103  | 42   | 32    |    |
| 7       | 61    | 988   | 304   | 560   | 160   |       | 752   | 390   | 213  | 95   | 42   | 31    |    |
| 8       | 51    | 1,170 | 302   | 736   | 222   |       | 687   | 380   | 206  | 87   | 42   | 32    |    |
| 9       | 46    | 1,720 | 260   | 1,050 | 266   | 560   | 602   | 390   | 230  | 85   | 48   | 30    |    |
| 10      | 42    | 1,430 | 245   | 911   | 311   |       | 560   | 451   | 283  | 101  | 51   | 28    |    |
| 11      | 39    | 880   | 211   | 2,490 | 284   | 670   | 560   | 403   | 300  | 101  | 50   | 28    |    |
| 12      | 37    | 644   | 195   | 1,820 | 257   |       | 602   | 396   | 308  | 90   | 50   | 28    |    |
| 13      | 36    | 794   | 188   | 1,030 | 219   |       | 602   | 400   | 310  | 87   | 48   | 28    |    |
| 14      | 35    | 1,110 | 169   | 752   | 193   | 644   | 644   | 367   | 297  | 99   | 45   | 28    |    |
| 15      | 33    | 863   | 158   | 581   | 176   |       | 644   | 581   | 321  | 267  | 91   | 44    | 28 |
| 16      | 33    | 892   | 164   | 490   | 160   | 815   | 581   | 297   | 220  | 88   | 43   | 27    |    |
| 17      | 33    | 1,370 | 1,060 | 566   | 152   |       | 3,140 | 875   | 308  | 189  | 82   | 42    | 27 |
| 18      | 32    | 1,340 | 1,860 | 2,350 | 146   |       | 4,440 | 990   | 338  | 172  | 76   | 41    | 27 |
| 19      | 32    | 2,460 | 1,740 | 1,790 | 142   | 1,660 | 1,170 | 356   | 159  | 73   | 41   | 27    |    |
| 20      | 33    | 1,730 | 1,910 | 1,200 | 260   |       | 1,660 | 1,080 | 414  | 154  | 72   | 40    | 42 |
| 21      | 35    | 998   | 1,350 | 863   | 666   | 1,110 | 840   | 396   | 161  | 69   | 40   | 30    |    |
| 22      | 151   | 709   | 942   | 687   | 540   | 687   | 353   | 166   | 66   | 40   | 40   | 26    |    |
| 23      | 346   | 540   | 796   | 540   | 447   | 796   | 581   | 367   | 157  | 63   | 40   | 24    |    |
| 24      | 407   | 428   | 911   | 455   | 631   | 2,190 | 540   | 353   | 143  | 60   | 40   | 24    |    |
| 25      | 699   | 384   | 752   | 410   | 1,670 | 2,030 | 511   | 310   | 139  | 57   | 40   | 23    |    |
| 26      | 730   | 326   | 687   | 365   | 4,540 | 1,340 | 540   | 281   | 135  | 56   | 40   | 22    |    |
| 27      | 1,130 | 281   | 730   | 329   | 2,970 | 1,170 | 581   | 262   | 131  | 55   | 40   | 22    |    |
| 28      | 2,250 | 248   | 644   | 290   | 2,000 | 2,060 | 560   | 259   | 125  | 52   | 40   | 22    |    |
| 29      | 1,150 | 225   | 519   | 266   | 1,360 | 1,700 | 482   | 275   | 121  | 51   | 42   | 22    |    |
| 30      | 688   | 206   | 455   | 245   | 1,050 | 1,368 | 474   | 291   | 117  | 50   | 44   | 22    |    |
| 31      | 474   | 458   | 222   | 222   |       | 1,050 | 286   | 286   | 48   | 42   | 42   | 42    |    |

Discharge, in second-feet, of Canyon Creek near Amboy, Wash., 1922-33—Contd.

| Day     | Oct. | Nov.  | Dec.  | Jan.  | Feb.  | Mar.  | Apr.  | May   | June  | July | Aug. | Sept. |
|---------|------|-------|-------|-------|-------|-------|-------|-------|-------|------|------|-------|
| 1932-33 |      |       |       |       |       |       |       |       |       |      |      |       |
| 1.....  | 22   | 1,000 | 1,570 | 1,700 | 286   | 687   | 860   | 602   | 443   | 262  | 69   | 57    |
| 2.....  | 21   |       | 3,170 |       | 269   | 644   |       | 818   | 432   | 259  | 69   | 54    |
| 3.....  | 21   |       | 1,890 |       | 233   | 687   |       | 774   | 511   | 256  | 70   | 50    |
| 4.....  | 20   |       | 1,140 |       | 226   | 581   |       | 752   | 507   | 241  | 96   | 48    |
| 5.....  | 20   | 1,500 | 818   | 2,700 | 246   | 507   | 430   | 796   | 490   | 233  | 159  | 58    |
| 6.....  | 20   |       | 644   |       | 251   |       |       | 818   | 443   | 243  | 114  | 101   |
| 7.....  | 20   |       | 515   |       | 233   |       |       | 863   | 417   | 243  | 91   | 72    |
| 8.....  | 19   |       | 403   |       | 210   | 1,200 |       | 937   | 2,150 | 241  | 80   | 60    |
| 9.....  | 19   | 1,600 | 335   | 910   | 196   |       | 590   | 1,050 | 2,580 | 223  | 74   | 56    |
| 10..... | 20   |       | 291   |       | 191   |       |       | 840   | 1,380 | 203  | 70   | 51    |
| 11..... | 22   |       | 259   |       | 208   |       |       | 666   | 963   | 186  | 66   | 48    |
| 12..... | 54   |       | 230   | 540   | 254   |       |       | 581   | 937   | 184  | 60   | 45    |
| 13..... | 58   | 1,600 | 216   |       | 220   | 1,500 | 590   | 511   | 963   | 184  | 57   | 45    |
| 14..... | 69   |       | 208   |       | 213   |       |       | 503   | 911   | 184  | 56   | 55    |
| 15..... | 115  |       | 191   |       | 226   |       |       | 540   | 796   | 184  | 52   | 112   |
| 16..... | 88   | 2,060 | 184   | 286   | 210   |       | 1,100 | 494   | 519   | 687  | 179  | 51    |
| 17..... |      |       | 175   |       | 393   |       |       | 425   | 560   | 560  | 161  | 49    |
| 18..... |      |       | 199   |       | 350   |       |       | 377   | 540   | 451  | 143  | 49    |
| 19..... |      |       | 750   |       | 313   |       |       | 350   | 560   | 400  | 133  | 49    |
| 20..... | 70   | 240   | 1,050 | 242   | 246   | 1,230 | 361   | 540   | 367   | 121  | 48   | 161   |
| 21..... |      |       | 708   |       | 625   |       |       | 507   | 358   | 114  | 46   | 294   |
| 22..... |      |       | 644   |       | 1,010 | 1,440 |       | 515   | 498   | 341  | 103  | 46    |
| 23..... |      |       | 560   |       | 1,170 | 243   |       | 602   | 623   | 581  | 333  | 99    |
| 24..... |      | 180   | 458   | 1,400 | 246   | 818   | 581   | 602   | 897   | 335  | 95   | 45    |
| 25..... |      |       | 386   |       | 905   | 752   |       | 581   | 1,020 | 373  | 90   | 45    |
| 26..... |      |       | 341   |       | 2,950 | 1,140 |       | 540   | 840   | 373  | 85   | 45    |
| 27..... |      |       | 313   |       | 347   | 887   | 1,580 | 623   | 644   | 344  | 80   | 45    |
| 28..... |      | 180   | 297   | 1,400 | 286   | 774   |       | 752   | 581   | 341  | 76   | 45    |
| 29..... |      |       | 540   |       | 259   |       |       | 840   | 666   | 687  | 324  | 79    |
| 30..... |      |       | 887   |       | 238   |       |       | 708   | 289   | 82   | 74   | 403   |
| 31..... |      |       |       |       | 286   |       | 1,510 | 560   |       | 78   | 70   |       |

| Month           | Maximum | Minimum | Mean  | Per square mile | Run-off |           |
|-----------------|---------|---------|-------|-----------------|---------|-----------|
|                 |         |         |       |                 | Inches  | Acre-feet |
| 1922            |         |         |       |                 |         |           |
| July 25-31..... | 47      | 43      | 44.9  | 0.724           | 0.19    | 623       |
| August.....     | 79      | 35      | 43.1  | .695            | .80     | 2,650     |
| September.....  | 170     | 39      | 66.6  | 1.07            | 1.19    | 3,960     |
| The period..... |         |         |       |                 |         | 7,230     |
| 1922-23         |         |         |       |                 |         |           |
| October.....    | 700     | 50      | 186   | 3.00            | 3.46    | 11,400    |
| November.....   | 480     | 122     | 242   | 3.90            | 4.35    | 14,400    |
| December.....   | 8,000   | 110     | 1,330 | 21.5            | 24.79   | 81,800    |
| January.....    | 7,430   | 240     | 2,190 | 35.3            | 40.70   | 135,000   |
| February.....   | 541     | 122     | 235   | 3.79            | 3.95    | 13,100    |
| March.....      | 1,000   | 346     | 562   | 9.06            | 10.44   | 34,600    |
| April.....      | 715     | 276     | 427   | 6.89            | 7.69    | 25,400    |
| May.....        | 541     | 150     | 290   | 4.68            | 5.40    | 17,800    |
| June.....       | 402     | 92      | 187   | 3.02            | 3.37    | 11,100    |
| July.....       | 670     | 55      | 137   | 2.21            | 2.55    | 8,420     |
| August.....     | 62      | 31      | 40.1  | .647            | .75     | 2,470     |
| September.....  | 34      | 19      | 23.6  | .381            | .43     | 1,400     |
| The year.....   | 8,000   | 19      | 493   | 7.95            | 107.88  | 357,000   |

Discharge, in second-feet, of Canyon Creek near Amboy, Wash., 1922-33—Contd.

| Month          | Maximum | Minimum | Mean  | Per square mile | Run-off |           |
|----------------|---------|---------|-------|-----------------|---------|-----------|
|                |         |         |       |                 | Inches  | Acre-feet |
| 1923-24        |         |         |       |                 |         |           |
| October.....   | 383     | 19      | 64.3  | 1.04            | 1.20    | 3,950     |
| November.....  | 1,350   | 30      | 212   | 3.42            | 3.82    | 12,600    |
| December.....  | 4,350   | 245     | 922   | 14.9            | 17.18   | 56,700    |
| January.....   | 2,400   | 208     | 539   | 8.69            | 10.02   | 33,100    |
| February.....  | 3,360   | 388     | 1,030 | 16.6            | 17.90   | 59,200    |
| March.....     | 540     | 127     | 229   | 3.69            | 4.25    | 14,100    |
| April.....     | 501     | 155     | 286   | 4.61            | 5.14    | 17,000    |
| May.....       | 216     | 66      | 124   | 2.00            | 2.31    | 7,620     |
| June.....      | 116     | 41      | 56.1  | .905            | 1.01    | 3,340     |
| July.....      | 40      | 30      | 35.0  | .565            | .65     | 2,150     |
| August.....    | 82      | 27      | 34.1  | .550            | .63     | 2,100     |
| September..... | 112     | 25      | 40.3  | .650            | .73     | 2,400     |
| The year.....  | 4,350   | 19      | 295   | 4.76            | 64.84   | 214,000   |
| 1924-25        |         |         |       |                 |         |           |
| October.....   | 1,530   | 114     | 332   | 5.35            | 6.17    | 20,400    |
| November.....  | 2,180   | 324     | 982   | 15.8            | 17.63   | 58,400    |
| December.....  | 3,200   | -----   | 912   | 14.7            | 16.95   | 56,100    |
| January.....   | 3,250   | 340     | 1,350 | 21.8            | 25.13   | 83,000    |
| February.....  | 4,570   | 399     | 1,270 | 20.5            | 21.35   | 70,500    |
| March.....     | 715     | 273     | 429   | 6.92            | 7.98    | 26,400    |
| April.....     | 903     | 262     | 418   | 6.74            | 7.52    | 24,900    |
| May.....       | 347     | 154     | 247   | 3.98            | 4.59    | 15,200    |
| June.....      | 326     | 96      | 203   | 3.27            | 3.65    | 12,100    |
| July.....      | 96      | 38      | 61.1  | .985            | 1.14    | 3,760     |
| August.....    | 50      | 26      | 31.9  | .515            | .59     | 1,960     |
| September..... | 40      | 20      | 23.2  | .374            | .42     | 1,380     |
| The year.....  | 4,570   | 20      | 517   | 8.34            | 113.12  | 374,000   |
| 1925-26        |         |         |       |                 |         |           |
| October.....   | 56      | 17      | 22.8  | .368            | .42     | 1,400     |
| November.....  | 761     | 20      | 238   | 3.84            | 4.28    | 14,200    |
| December.....  | 3,140   | 301     | 825   | 13.3            | 15.33   | 50,700    |
| January.....   | 832     | 239     | 451   | 7.27            | 8.38    | 27,700    |
| February.....  | 3,690   | 384     | 1,030 | 16.6            | 17.29   | 57,200    |
| March.....     | 603     | 176     | 306   | 4.94            | 5.70    | 18,800    |
| April.....     | 243     | 104     | 162   | 2.61            | 2.91    | 9,640     |
| May.....       | 412     | 98      | 284   | 4.58            | 5.28    | 17,500    |
| June.....      | 238     | 57      | 122   | 1.97            | 2.20    | 7,260     |
| July.....      | 55      | 29      | 38.8  | .626            | .72     | 2,390     |
| August.....    | 99      | 23      | 39.5  | .637            | .73     | 2,430     |
| September..... | 976     | 29      | 169   | 2.73            | 3.05    | 10,100    |
| The year.....  | 3,690   | 17      | 303   | 4.89            | 66.29   | 219,000   |
| 1926-27        |         |         |       |                 |         |           |
| October.....   | 2,360   | 192     | 477   | 7.69            | 8.87    | 29,300    |
| November.....  | 2,770   | 152     | 706   | 11.4            | 12.72   | 42,000    |
| December.....  | 1,500   | 286     | 663   | 10.7            | 12.34   | 40,800    |
| January.....   | 3,580   | 228     | 791   | 12.8            | 14.76   | 48,600    |
| February.....  | 3,300   | 237     | 999   | 16.1            | 16.77   | 55,500    |
| March.....     | 935     | 278     | 483   | 7.79            | 8.98    | 29,700    |
| April.....     | 628     | 250     | 349   | 5.63            | 6.28    | 20,800    |
| May.....       | 628     | 294     | 417   | 6.73            | 7.76    | 25,600    |
| June.....      | 650     | 134     | 288   | 4.65            | 5.19    | 17,100    |
| July.....      | 131     | 52      | 81.3  | 1.31            | 1.51    | 5,000     |
| August.....    | 51      | 33      | 40.5  | .653            | .75     | 2,490     |
| September..... | 1,010   | 52      | 234   | 3.77            | 4.21    | 13,900    |
| The year.....  | 3,580   | 33      | 457   | 7.37            | 100.14  | 331,000   |
| 1927-28        |         |         |       |                 |         |           |
| October.....   | 2,250   | 196     | 538   | 8.68            | 10.01   | 33,100    |
| November.....  | 6,860   | 267     | 1,200 | 20.8            | 23.21   | 76,800    |
| December.....  | 1,570   | 147     | 418   | 6.74            | 7.77    | 25,700    |
| January.....   | 3,640   | 200     | 849   | 13.7            | 15.79   | 52,200    |
| February.....  | 484     | 168     | 280   | 4.52            | 4.88    | 16,100    |
| March.....     | 3,080   | 149     | 896   | 14.5            | 16.72   | 55,100    |
| April.....     | 1,430   | 388     | 676   | 10.9            | 12.16   | 40,200    |
| May.....       | 1,280   | 155     | 359   | 5.79            | 6.68    | 22,100    |
| June.....      | 143     | 72      | 103   | 1.66            | 1.85    | 6,130     |
| July.....      | 212     | 53      | 95.2  | 1.54            | 1.78    | 5,850     |
| August.....    | 52      | 29      | 38.7  | .624            | .72     | 2,380     |
| September..... | 83      | 23      | 31.2  | .503            | .56     | 1,860     |
| The year.....  | 6,860   | 23      | 465   | 7.50            | 102.13  | 338,000   |

Discharge, in second-feet, of Canyon Creek near Amboy, Wash., 1922-33—Contd.

| Month          | Maximum | Minimum | Mean  | Per square mile | Run-off |           |
|----------------|---------|---------|-------|-----------------|---------|-----------|
|                |         |         |       |                 | Inches  | Acre-feet |
| 1928-29        |         |         |       |                 |         |           |
| October.....   | 746     | 24      | 265   | 4.27            | 4.92    | 16,300    |
| November.....  | 2,200   | 98      | 452   | 7.29            | 8.13    | 26,900    |
| December.....  | 1,800   | 172     | 527   | 8.50            | 9.80    | 32,400    |
| January.....   |         | 172     | 399   | 6.44            | 7.42    | 24,500    |
| February.....  | 554     |         | 217   | 3.50            | 3.64    | 12,100    |
| March.....     | 1,250   | 364     | 596   | 9.61            | 11.08   | 36,600    |
| April.....     | 2,100   | 264     | 611   | 9.85            | 10.99   | 36,400    |
| May.....       | 608     | 211     | 391   | 6.31            | 7.28    | 24,000    |
| June.....      | 666     | 147     | 270   | 4.35            | 4.85    | 16,100    |
| July.....      | 138     | 50      | 80.9  | 1.30            | 1.50    | 4,970     |
| August.....    | 48      | 33      | 37.8  | .610            | .70     | 2,320     |
| September..... | 33      | 26      | 28.2  | .455            | .51     | 1,680     |
| The year.....  | 2,200   | 24      | 324   | 5.23            | 70.82   | 234,000   |
| 1929-30        |         |         |       |                 |         |           |
| October.....   | 36      | 26      | 27.6  | .445            | .51     | 1,700     |
| November.....  | 35      | 25      | 26.7  | .431            | .48     | 1,590     |
| December.....  | 2,050   | 25      | 496   | 8.00            | 9.22    | 30,500    |
| January.....   | 687     |         | 255   | 4.11            | 4.74    | 15,700    |
| February.....  | 2,500   | 345     | 1,340 | 21.6            | 22.49   | 74,400    |
| March.....     | 1,150   | 130     | 392   | 6.32            | 7.29    | 24,100    |
| April.....     | 337     | 170     | 245   | 3.95            | 4.41    | 14,600    |
| May.....       | 1,120   | 144     | 311   | 5.02            | 5.79    | 19,100    |
| June.....      | 329     | 77      | 167   | 2.69            | 3.00    | 9,940     |
| July.....      | 74      | 37      | 50.1  | .808            | .93     | 3,080     |
| August.....    | 38      | 25      | 30.6  | .494            | .57     | 1,880     |
| September..... | 34      | 24      | 26.5  | .427            | .48     | 1,580     |
| The year.....  | 2,500   | 24      | 274   | 4.42            | 59.91   | 198,000   |
| 1930-31        |         |         |       |                 |         |           |
| October.....   | 167     | 24      | 50.0  | .806            | .93     | 3,070     |
| November.....  | 649     | 42      | 238   | 3.84            | 4.28    | 14,200    |
| December.....  | 492     | 110     | 238   | 3.84            | 4.43    | 14,600    |
| January.....   | 976     | 153     | 588   | 9.48            | 10.93   | 36,200    |
| February.....  | 1,270   | 135     | 366   | 5.90            | 6.14    | 20,300    |
| March.....     | 7,290   | 267     | 887   | 14.3            | 16.49   | 54,500    |
| April.....     | 3,880   | 200     | 665   | 10.7            | 11.94   | 39,600    |
| May.....       | 219     | 69      | 136   | 2.19            | 2.52    | 8,360     |
| June.....      | 577     | 53      | 147   | 2.37            | 2.64    | 8,750     |
| July.....      | 219     | 44      | 86.5  | 1.40            | 1.61    | 5,320     |
| August.....    | 44      | 26      | 32.8  | .529            | .61     | 2,020     |
| September..... | 91      | 27      | 34.3  | .553            | .62     | 2,040     |
| The year.....  | 7,290   | 24      | 289   | 4.66            | 63.14   | 209,000   |
| 1931-32        |         |         |       |                 |         |           |
| October.....   | 2,250   | 31      | 290   | 4.68            | 5.40    | 17,800    |
| November.....  | 2,460   | 206     | 782   | 12.6            | 14.06   | 46,500    |
| December.....  | 1,910   | 158     | 582   | 9.39            | 10.83   | 35,800    |
| January.....   | 2,490   | 222     | 771   | 12.4            | 14.30   | 47,400    |
| February.....  | 4,540   | 142     | 649   | 10.5            | 11.32   | 37,300    |
| March.....     | 4,440   |         | 1,610 | 26.0            | 29.98   | 99,000    |
| April.....     | 1,170   | 474     | 720   | 11.6            | 12.94   | 42,800    |
| May.....       | 560     | 259     | 370   | 5.97            | 6.88    | 22,800    |
| June.....      | 210     | 117     | 209   | 3.37            | 3.76    | 12,400    |
| July.....      | 170     | 48      | 84.0  | 1.35            | 1.56    | 5,160     |
| August.....    | 51      | 40      | 43.3  | .698            | .80     | 2,660     |
| September..... | 42      | 22      | 28.7  | .463            | .52     | 1,710     |
| The year.....  | 4,540   | 22      | 512   | 8.26            | 112.35  | 371,000   |
| 1932-33        |         |         |       |                 |         |           |
| October.....   |         | 19      | 98.6  | 1.59            | 1.83    | 6,060     |
| November.....  |         | 297     | 1,080 | 17.4            | 19.41   | 64,300    |
| December.....  | 3,170   | 175     | 948   | 15.3            | 17.64   | 58,300    |
| January.....   |         | 228     | 996   | 16.1            | 18.56   | 61,200    |
| February.....  | 1,440   | 191     | 438   | 7.06            | 7.35    | 24,300    |
| March.....     |         | 421     | 997   | 16.1            | 18.56   | 61,300    |
| April.....     |         |         | 577   | 9.31            | 10.39   | 34,300    |
| May.....       | 1,050   | 498     | 687   | 11.1            | 12.80   | 42,200    |
| June.....      | 2,580   | 289     | 660   | 10.6            | 11.83   | 39,300    |
| July.....      | 262     | 76      | 163   | 2.63            | 3.03    | 10,000    |
| August.....    | 159     | 45      | 64.4  | 1.04            | 1.20    | 3,960     |
| September..... | 774     | 45      | 227   | 3.66            | 4.08    | 13,500    |
| The year.....  |         | 19      | 578   | 9.32            | 126.68  | 419,000   |

## EAST FORK OF LEWIS RIVER NEAR HEISSON, WASH.

LOCATION.—Water-stage recorder in N½ sec. 17, T. 4 N., R. 3 E., just above Basket Creek and 1½ miles northeast of Heisson.

DRAINAGE AREA.—124 square miles.

RECORDS AVAILABLE.—September 1929 to September 1933.

DISCHARGE.—Maximum during year, 7,860 second-feet Jan. 8 (gage height, 8.9 feet); minimum, 41 second-feet Oct. 5 (gage height, 0.20 foot).

1929-33: Maximum, 15,500 second-feet Mar. 31, 1931 (gage height, 12.2 feet); minimum, that of Oct. 5, 1932.

REMARKS.—Records good except those estimated, Oct. 13-15, Feb. 9-11, July 1 to Aug. 3, which are fair. No diversions or regulation above station.

*Discharge, in second-feet, 1932-33*

| Day     | Oct. | Nov.  | Dec.  | Jan.  | Feb.  | Mar.  | Apr.  | May   | June  | July  | Aug. | Sept. |
|---------|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|------|-------|
| 1.....  | 46   | 1,490 | 2,300 | 2,300 | 865   | 1,420 | 1,530 | 1,010 | 820   | 310   | 100  | 85    |
| 2.....  | 46   | 2,340 | 4,720 | 3,360 | 740   | 1,360 | 1,390 | 1,500 | 848   |       |      | 77    |
| 3.....  | 46   | 1,760 | 3,200 | 2,290 | 625   | 1,530 | 1,600 | 1,160 | 930   |       |      | 71    |
| 4.....  | 42   | 1,250 | 2,060 | 2,660 | 565   | 1,250 | 1,390 | 1,100 | 875   |       |      | 68    |
| 5.....  | 42   | 2,580 | 1,570 | 4,320 | 546   | 1,070 | 1,190 | 1,130 | 848   |       |      | 105   |
| 6.....  | 45   | 2,960 | 1,220 | 3,530 | 528   | 1,850 | 1,070 | 1,250 | 738   | 290   | 167  | 248   |
| 7.....  | 46   | 1,920 | 980   | 3,890 | 476   | 2,950 | 950   | 1,460 | 660   |       |      | 124   |
| 8.....  | 45   | 2,990 | 715   | 6,610 | 434   | 2,100 | 765   | 1,740 | 2,500 |       |      | 107   |
| 9.....  | 40   | 2,280 | 625   | 4,380 | 390   | 1,640 | 645   | 1,980 | 3,440 |       |      | 98    |
| 10..... | 46   | 1,460 | 546   | 3,070 |       | 1,530 | 565   | 1,550 | 2,020 |       |      | 90    |
| 11..... | 47   | 1,040 | 493   | 2,190 | 493   | 2,260 | 755   | 1,250 | 1,480 | 230   | 88   | 84    |
| 12..... | 124  | 980   | 493   | 1,680 |       | 3,350 | 1,010 | 1,070 | 1,410 |       |      | 83    |
| 13..... | 170  | 3,630 | 476   | 1,360 |       | 2,590 | 865   | 958   | 1,310 |       |      | 79    |
| 14..... |      | 2,960 | 400   | 1,250 |       | 1,920 | 890   | 1,010 | 1,160 |       |      | 76    |
| 15..... |      | 2,890 | 378   | 1,030 |       | 1,560 | 920   | 1,100 | 1,010 |       |      | 73    |
| 16..... | 175  | 3,600 | 363   | 840   | 528   | 1,840 | 815   | 1,100 | 848   | 180   | 69   | 261   |
| 17..... | 183  | 3,230 | 339   | 740   | 493   | 1,800 | 668   | 1,100 | 685   |       |      | 69    |
| 18..... | 156  | 2,340 | 430   | 668   | 528   | 1,530 | 585   | 1,160 | 592   |       |      | 70    |
| 19..... | 126  | 1,720 | 1,800 | 605   | 528   | 1,390 | 546   | 1,100 | 530   |       |      | 71    |
| 20..... | 109  | 1,320 | 2,090 | 546   | 623   | 1,920 | 645   | 1,100 | 495   |       |      | 70    |
| 21..... | 100  | 1,250 | 2,100 | 510   | 1,380 | 1,560 | 815   | 1,010 | 480   | 130   | 67   | 779   |
| 22..... | 525  | 1,130 | 1,830 | 493   | 2,400 | 1,220 | 950   | 1,010 | 449   |       |      | 62    |
| 23..... | 605  | 980   | 2,390 | 510   | 2,390 | 1,010 | 1,070 | 1,220 | 434   |       |      | 58    |
| 24..... | 426  | 840   | 2,140 | 546   | 1,640 | 840   | 1,010 | 1,700 | 434   |       |      | 58    |
| 25..... | 325  | 690   | 1,960 | 528   | 1,460 | 740   | 980   | 1,850 | 464   |       |      | 55    |
| 26..... | 328  | 625   | 4,960 | 652   | 1,870 | 715   | 840   | 1,480 | 420   | 100   | 53   | 660   |
| 27..... | 305  | 565   | 3,600 | 1,220 | 1,640 | 918   | 1,070 | 1,160 | 391   |       |      | 53    |
| 28..... | 265  | 528   | 2,790 | 890   | 1,600 | 1,320 | 1,220 | 1,130 | 405   |       |      | 58    |
| 29..... | 265  | 1,020 | 2,590 | 790   | ----- | 1,390 | 950   | 1,280 | 377   |       |      | 136   |
| 30..... | 250  | 1,720 | 2,140 | 690   | ----- | 2,260 | 765   | 1,250 | 364   |       |      | 186   |
| 31..... | 659  | ----- | 2,190 | 949   | ----- | 2,160 | ----- | 958   | ----- | ----- | 114  | ----- |

| Month          | Maximum | Minimum | Mean  | Per square mile | Run-off |           |
|----------------|---------|---------|-------|-----------------|---------|-----------|
|                |         |         |       |                 | Inches  | Acre-feet |
| October.....   | 659     | 42      | 191   | 1.54            | 1.78    | 11,700    |
| November.....  | 3,630   | 528     | 1,800 | 14.5            | 16.18   | 107,000   |
| December.....  | 4,960   | 339     | 1,740 | 14.0            | 16.14   | 107,000   |
| January.....   | 6,610   | 493     | 1,780 | 14.4            | 16.60   | 109,000   |
| February.....  | 2,400   | -----   | 887   | 7.15            | 7.44    | 49,300    |
| March.....     | 3,350   | 415     | 1,650 | 13.3            | 15.33   | 101,000   |
| April.....     | 1,600   | 546     | 949   | 7.65            | 8.54    | 56,500    |
| May.....       | 1,980   | 958     | 1,250 | 10.1            | 11.64   | 76,900    |
| June.....      | 3,440   | 364     | 914   | 7.37            | 8.22    | 54,400    |
| July.....      | -----   | -----   | 203   | 1.64            | 1.89    | 12,500    |
| August.....    | 276     | 53      | 95.8  | .773            | .89     | 5,890     |
| September..... | 1,190   | 68      | 365   | 2.94            | 3.28    | 21,700    |
| The year.....  | 6,610   | 42      | 986   | 7.95            | 107.93  | 713,000   |

## COWLITZ RIVER BASIN

## COWLITZ RIVER AT PACKWOOD, WASH.

LOCATION.—Water-stage recorder in SE¼ sec. 16, T. 13 N., R. 9 E., half a mile above Skate Creek and half a mile northwest of Packwood.

DRAINAGE AREA.—287 square miles.

RECORDS AVAILABLE.—September 1929 to September 1933. July 1911 to December 1919, 1 mile upstream.

DISCHARGE.—Maximum during year, 20,500 second-feet Nov. 13 (gage height, 9.87 feet); minimum, 292 second-feet Oct. 9 (gage height, 2.45 feet).

1911-19, 1929-33: Maximum, 22,700 second-feet Dec. 29, 1917 (gage height, 10.1 feet, former datum); minimum, 160 second-feet Nov. 21, 1929 (gage height, 2.10 feet).

Average, 12 years (1911-19, 1929-33), 1,580 second-feet.

REMARKS.—Records good. Discharge estimated Apr. 21. No diversions or regulation.

*Discharge, in second-feet, 1932-33*

| Day     | Oct.  | Nov.   | Dec.  | Jan.  | Feb.  | Mar.  | Apr.  | May   | June  | July  | Aug.  | Sept. |
|---------|-------|--------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 1.....  | 442   | 1,050  | 2,830 | 773   | 456   | 486   | 946   | 2,420 | 3,770 | 4,100 | 2,460 | 710   |
| 2.....  | 468   | 1,780  | 8,570 | 762   | 414   | 470   | 946   | 2,200 | 3,770 | 4,440 | 2,480 | 710   |
| 3.....  | 488   | 1,490  | 5,900 | 690   | 407   | 470   | 1,240 | 2,080 | 4,790 | 4,440 | 2,480 | 710   |
| 4.....  | 436   | 1,280  | 3,770 | 850   | 400   | 449   | 1,370 | 1,950 | 5,640 | 4,320 | 2,350 | 730   |
| 5.....  | 405   | 2,380  | 2,930 | 1,430 | 407   | 435   | 1,310 | 1,840 | 5,270 | 4,440 | 2,820 | 730   |
| 6.....  | 375   | 3,340  | 2,240 | 1,820 | 394   | 542   | 1,270 | 1,670 | 4,670 | 4,790 | 2,410 | 828   |
| 7.....  | 348   | 2,200  | 1,840 | 2,880 | 382   | 839   | 1,180 | 1,550 | 3,990 | 5,030 | 2,330 | 640   |
| 8.....  | 318   | 3,470  | 1,420 | 6,570 | 364   | 795   | 1,060 | 1,400 | 5,390 | 5,270 | 2,410 | 577   |
| 9.....  | 300   | 3,100  | 1,270 | 5,150 | 358   | 740   | 946   | 1,340 | 5,900 | 4,670 | 2,310 | 622   |
| 10..... | 309   | 2,280  | 1,150 | 3,660 | 358   | 730   | 850   | 1,310 | 4,210 | 4,210 | 2,120 | 640   |
| 11..... | 363   | 1,760  | 1,010 | 2,520 | 364   | 828   | 850   | 1,370 | 3,560 | 4,440 | 2,060 | 631   |
| 12..... | 576   | 4,490  | 946   | 1,960 | 358   | 1,100 | 839   | 1,680 | 4,560 | 5,030 | 2,000 | 595   |
| 13..... | 495   | 13,000 | 850   | 1,620 | 340   | 1,150 | 795   | 1,900 | 7,300 | 5,270 | 1,850 | 534   |
| 14..... | 1,210 | 4,670  | 784   | 1,490 | 340   | 1,060 | 850   | 2,200 | 8,570 | 5,770 | 1,800 | 740   |
| 15..... | 1,130 | 3,140  | 740   | 1,290 | 335   | 996   | 983   | 2,150 | 9,620 | 6,160 | 1,760 | 850   |
| 16..... | 846   | 6,810  | 710   | 1,130 | 330   | 958   | 958   | 2,060 | 7,760 | 5,770 | 1,820 | 1,020 |
| 17..... | 672   | 10,400 | 650   | 1,020 | 320   | 946   | 910   | 2,010 | 6,030 | 4,790 | 1,720 | 762   |
| 18..... | 546   | 6,220  | 660   | 922   | 320   | 910   | 862   | 2,010 | 4,910 | 4,320 | 1,610 | 730   |
| 19..... | 468   | 3,990  | 839   | 839   | 325   | 874   | 828   | 1,980 | 4,560 | 4,210 | 1,500 | 660   |
| 20..... | 442   | 3,140  | 806   | 773   | 330   | 983   | 898   | 2,010 | 4,320 | 3,880 | 1,230 | 730   |
| 21..... | 546   | 2,930  | 751   | 740   | 352   | 983   | 1,000 | 2,130 | 4,440 | 3,560 | 1,110 | 996   |
| 22..... | 756   | 2,520  | 730   | 690   | 449   | 886   | 1,430 | 2,220 | 4,440 | 3,460 | 1,050 | 1,460 |
| 23..... | 672   | 2,130  | 751   | 660   | 463   | 828   | 1,900 | 2,260 | 4,440 | 3,560 | 1,090 | 1,160 |
| 24..... | 600   | 1,820  | 730   | 640   | 421   | 762   | 2,260 | 2,930 | 4,440 | 3,880 | 1,110 | 983   |
| 25..... | 680   | 1,600  | 740   | 586   | 421   | 700   | 2,390 | 4,560 | 4,910 | 3,770 | 1,070 | 806   |
| 26..... | 1,230 | 1,490  | 1,050 | 577   | 586   | 670   | 2,150 | 5,390 | 5,270 | 3,560 | 970   | 934   |
| 27..... | 1,330 | 1,660  | 1,020 | 550   | 568   | 660   | 2,720 | 4,100 | 5,150 | 3,350 | 996   | 1,310 |
| 28..... | 1,080 | 1,610  | 898   | 526   | 534   | 730   | 3,560 | 3,770 | 5,030 | 2,820 | 1,040 | 2,440 |
| 29..... | 900   | 2,920  | 862   | 494   | ----- | 762   | 3,560 | 4,670 | 4,440 | 3,350 | 839   | 2,330 |
| 30..... | 756   | 3,040  | 839   | 478   | ----- | 886   | 2,930 | 5,640 | 4,100 | 3,040 | 795   | 1,610 |
| 31..... | 819   | -----  | 784   | 478   | ----- | 1,040 | ----- | 4,670 | ----- | 2,500 | 740   | ----- |

| Month          | Maximum | Minimum | Mean  | Per square mile | Run-off |           |
|----------------|---------|---------|-------|-----------------|---------|-----------|
|                |         |         |       |                 | Inches  | Acre-feet |
| October.....   | 1,330   | 309     | 646   | 2.25            | 2.59    | 39,700    |
| November.....  | 13,000  | 1,050   | 3,390 | 11.8            | 13.17   | 202,000   |
| December.....  | 8,570   | 650     | 1,580 | 5.51            | 6.35    | 97,200    |
| January.....   | 6,570   | 478     | 1,440 | 5.02            | 5.79    | 88,500    |
| February.....  | 586     | 320     | 396   | 1.38            | 1.44    | 22,000    |
| March.....     | 1,150   | 435     | 796   | 2.77            | 3.19    | 48,900    |
| April.....     | 3,560   | 795     | 1,460 | 5.09            | 5.68    | 86,900    |
| May.....       | 5,640   | 1,810   | 2,560 | 8.92            | 10.28   | 157,000   |
| June.....      | 9,620   | 3,560   | 5,180 | 18.0            | 20.08   | 308,000   |
| July.....      | 6,160   | 2,500   | 4,260 | 14.8            | 17.06   | 262,000   |
| August.....    | 2,820   | 740     | 1,990 | 5.89            | 6.79    | 104,000   |
| September..... | 2,440   | 534     | 939   | 3.27            | 3.65    | 55,900    |
| The year.....  | 13,000  | 309     | 2,030 | 7.07            | 96.07   | 1,470,000 |

## COWLITZ RIVER AT MOSSY ROCK, WASH.

LOCATION.—Staff gage in sec. 1, T. 12 N., R. 2 E., at Harmony Bridge, 1 mile north of Mossy Rock and 2½ miles above Tilton River.

DRAINAGE AREA.—1,170 square miles.

RECORDS AVAILABLE.—January 1912 to September 1917 (incomplete); March 1926 to July 1932; March to September 1933.

DISCHARGE.—Maximum during period Mar. 1 to Sept. 30, 23,400 second-feet June 9 (gage height, 14.3 feet); minimum, 1,420 second-feet Sept. 11 (gage height, 2.75 feet).

1912–17, 1926–33: Maximum, 30,300 second-feet Jan. 7, 8, 1914 (gage height, 18.0 feet); minimum, 630 second-feet Nov. 21–24, Dec. 3, 5–8, 1929.

Flood of November 1906 reached a stage corresponding to about 29.4 feet on present gage (discharge, about 51,000 second-feet).

REMARKS.—Records fair. Discharge estimated Mar. 1–10. No diversions above station.

*Discharge, in second-feet, 1932–33*

| Day | Mar.  | Apr.   | May    | June   | July   | Aug.  | Sept. |
|-----|-------|--------|--------|--------|--------|-------|-------|
| 1   | 3,000 | 4,990  | 9,080  | 11,700 | 9,020  | 4,240 | 1,890 |
| 2   |       | 4,830  | 8,570  | 10,500 | 9,020  | 4,240 | 1,750 |
| 3   |       | 5,470  | 8,060  | 11,700 | 9,200  | 4,240 | 1,750 |
| 4   |       | 5,790  | 7,390  | 13,900 | 8,840  | 4,070 | 1,750 |
| 5   |       | 5,790  | 7,230  | 14,500 | 8,660  | 4,580 | 1,820 |
| 6   | 3,000 | 5,630  | 6,750  | 13,900 | 9,200  | 4,750 | 2,030 |
| 7   |       | 5,470  | 6,430  | 12,500 | 9,380  | 4,070 | 2,030 |
| 8   |       | 5,150  | 5,950  | 13,700 | 10,100 | 4,070 | 1,750 |
| 9   |       | 4,830  | 5,630  | 22,700 | 9,380  | 4,070 | 1,680 |
| 10  |       | 4,510  | 5,310  | 19,000 | 8,320  | 3,730 | 1,620 |
| 11  | 4,670 | 4,190  | 5,150  | 15,200 | 7,810  | 3,560 | 1,490 |
| 12  | 5,630 | 4,350  | 5,790  | 14,300 | 8,490  | 3,560 | 1,620 |
| 13  | 6,110 | 4,040  | 6,270  | 18,700 | 8,840  | 3,390 | 1,560 |
| 14  | 5,790 | 4,190  | 7,070  | 21,800 | 8,380  | 3,230 | 1,620 |
| 15  | 5,470 | 4,350  | 7,390  | 22,700 | 9,740  | 3,230 | 1,750 |
| 16  | 5,470 | 4,510  | 7,070  | 21,600 | 10,500 | 3,070 | 2,030 |
| 17  | 5,470 | 4,350  | 6,910  | 18,300 | 8,840  | 3,070 | 2,170 |
| 18  | 5,310 | 4,190  | 6,910  | 14,900 | 8,490  | 3,070 | 1,890 |
| 19  | 4,150 | 4,040  | 6,750  | 12,500 | 7,300  | 2,910 | 1,820 |
| 20  | 5,470 | 4,040  | 6,750  | 11,300 | 6,960  | 2,750 | 1,750 |
| 21  | 5,470 | 4,340  | 6,910  | 11,100 | 6,280  | 2,450 | 2,030 |
| 22  | 5,310 | 4,830  | 7,070  | 10,900 | 5,940  | 2,310 | 2,750 |
| 23  | 4,990 | 5,950  | 7,390  | 10,700 | 5,600  | 2,310 | 3,230 |
| 24  | 4,670 | 7,070  | 8,060  | 10,300 | 5,940  | 2,310 | 3,070 |
| 25  | 4,510 | 7,890  | 11,100 | 10,900 | 5,940  | 2,310 | 2,750 |
| 26  | 4,190 | 7,550  | 15,400 | 11,900 | 5,770  | 2,310 | 2,600 |
| 27  | 4,190 | 8,400  | 13,100 | 11,700 | 5,600  | 2,170 | 2,750 |
| 28  | 4,350 | 10,500 | 9,610  | 11,100 | 5,090  | 2,030 | 2,910 |
| 29  | 4,350 | 11,300 | 12,100 | 10,500 | 4,750  | 2,030 | 4,580 |
| 30  | 4,510 | 10,300 | 14,900 | 9,560  | 5,430  | 2,170 | 4,070 |
| 31  | 5,150 | -----  | 14,300 | -----  | 4,580  | 2,030 | ----- |

| Month      | Maximum | Minimum | Mean   | Per square mile | Run-off |           |
|------------|---------|---------|--------|-----------------|---------|-----------|
|            |         |         |        |                 | Inches  | Acre-feet |
| March      | 6,110   | -----   | 4,390  | 3.75            | 4.32    | 270,000   |
| April      | 11,300  | 4,040   | 5,760  | 4.92            | 5.49    | 343,000   |
| May        | 15,400  | 5,150   | 8,270  | 7.07            | 8.15    | 508,000   |
| June       | 22,700  | 9,560   | 14,100 | 12.1            | 13.50   | 839,000   |
| July       | 10,500  | 4,580   | 7,690  | 6.57            | 7.57    | 473,000   |
| August     | 4,750   | 2,030   | 3,170  | 2.71            | 3.12    | 195,000   |
| September  | 4,580   | 1,490   | 2,220  | 1.90            | 2.12    | 132,000   |
| The period | -----   | -----   | -----  | -----           | -----   | 2,760,000 |

## COWLITZ RIVER NEAR CASTLE ROCK, WASH.

LOCATION.—Staff gage in sec. 34, T. 10 N., R. 2 W., 2,000 feet below mouth of Toutle River, 2 miles above Castle Rock, and 16 miles above mouth.

DRAINAGE AREA.—2,210 square miles.

RECORDS AVAILABLE.—December 1926 to September 1933.

DISCHARGE.—Maximum during year, 53,000 second-feet Nov. 14 (gage height, 11.80 feet); minimum, 1,430 second-feet Oct. 9–11; minimum gage height, 2.25 feet Sept. 13, 14.

1926–33: Maximum, 74,000 second-feet Nov. 25, 1927 (gage height, 13.95 feet); minimum, 1,230 second-feet Nov. 23, 1929.

REMARKS.—Records good. No diversions.

*Discharge, in second-feet, 1932–33*

| Day     | Oct.  | Nov.   | Dec.   | Jan.   | Feb.   | Mar.   | Apr.   | May    | June   | July   | Aug.  | Sept. |
|---------|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|-------|-------|
| 1.....  | 1,580 | 5,660  | 22,400 | 15,200 | 8,550  | 10,100 | 12,500 | 13,800 | 16,300 | 12,100 | 5,340 | 3,070 |
| 2.....  | 1,580 | 11,900 | 24,300 | 21,700 | 7,380  | 11,700 | 10,900 | 13,800 | 13,800 | 11,700 | 5,050 | 3,070 |
| 3.....  | 1,580 | 14,300 | 44,100 | 16,300 | 6,640  | 11,300 | 10,900 | 13,000 | 14,300 | 11,700 | 5,050 | 2,920 |
| 4.....  | 1,580 | 11,400 | 32,900 | 15,200 | 6,300  | 10,100 | 11,700 | 12,500 | 16,800 | 11,700 | 5,050 | 2,920 |
| 5.....  | 1,580 | 12,400 | 24,900 | 19,800 | 6,300  | 8,940  | 11,300 | 12,100 | 18,500 | 11,300 | 7,380 | 2,920 |
| 6.....  | 1,580 | 27,900 | 19,200 | 28,900 | 6,300  | 9,330  | 10,500 | 11,300 | 17,900 | 11,700 | 6,640 | 3,070 |
| 7.....  | 1,580 | 22,600 | 16,300 | 25,600 | 5,650  | 15,200 | 10,100 | 10,900 | 16,300 | 12,100 | 5,340 | 3,070 |
| 8.....  | 1,500 | 22,000 | 13,400 | 40,600 | 5,650  | 13,400 | 9,720  | 10,500 | 19,800 | 12,100 | 5,050 | 3,070 |
| 9.....  | 1,430 | 22,600 | 11,700 | 47,800 | 4,780  | 11,700 | 8,940  | 9,720  | 25,000 | 12,100 | 5,050 | 2,920 |
| 10..... | 1,430 | 17,600 | 10,900 | 44,800 | 4,530  | 11,700 | 8,550  | 9,330  | 31,600 | 11,300 | 4,780 | 2,920 |
| 11..... | 1,430 | 13,800 | 10,100 | 30,200 | 5,050  | 14,800 | 7,770  | 8,940  | 22,400 | 10,100 | 4,530 | 2,920 |
| 12..... | 1,740 | 11,400 | 8,940  | 23,000 | 5,340  | 18,500 | 8,160  | 8,940  | 19,800 | 10,100 | 4,300 | 2,920 |
| 13..... | 2,000 | 35,800 | 8,550  | 17,900 | 4,780  | 17,400 | 7,770  | 9,720  | 23,600 | 11,300 | 4,300 | 2,640 |
| 14..... | 2,280 | 52,200 | 7,770  | 16,800 | 4,530  | 15,200 | 7,380  | 10,500 | 28,900 | 11,300 | 4,080 | 2,640 |
| 15..... | 2,910 | 41,300 | 7,000  | 14,800 | 4,780  | 13,400 | 7,770  | 11,300 | 30,200 | 12,100 | 4,080 | 3,070 |
| 16..... | 3,870 | 39,900 | 7,000  | 13,400 | 4,780  | 13,000 | 8,160  | 11,700 | 28,900 | 12,500 | 3,880 | 3,220 |
| 17..... | 3,380 | 42,700 | 6,640  | 11,700 | 4,780  | 13,400 | 7,770  | 11,300 | 24,900 | 11,700 | 3,880 | 3,380 |
| 18..... | 3,140 | 43,400 | 6,640  | 10,900 | 4,780  | 12,500 | 7,380  | 10,900 | 26,200 | 10,100 | 3,700 | 3,220 |
| 19..... | 2,690 | 34,300 | 16,300 | 10,100 | 4,780  | 11,700 | 7,000  | 10,900 | 19,200 | 9,330  | 3,700 | 3,070 |
| 20..... | 2,380 | 25,600 | 17,900 | 9,330  | 5,050  | 12,500 | 7,000  | 10,500 | 14,300 | 8,940  | 3,540 | 3,070 |
| 21..... | 2,280 | 22,400 | 16,300 | 8,940  | 7,770  | 12,500 | 7,380  | 10,500 | 13,800 | 8,160  | 3,380 | 3,540 |
| 22..... | 3,380 | 21,700 | 13,000 | 8,550  | 13,400 | 12,100 | 8,160  | 10,900 | 13,800 | 7,770  | 3,220 | 5,340 |
| 23..... | 4,120 | 17,900 | 17,400 | 8,160  | 13,000 | 10,900 | 9,330  | 11,300 | 13,800 | 7,380  | 3,070 | 7,000 |
| 24..... | 3,870 | 15,200 | 15,200 | 8,160  | 10,500 | 10,100 | 10,900 | 11,700 | 13,400 | 7,380  | 3,070 | 6,640 |
| 25..... | 3,380 | 13,800 | 23,000 | 8,160  | 8,940  | 9,330  | 11,700 | 15,200 | 13,800 | 7,380  | 3,070 | 5,650 |
| 26..... | 3,620 | 12,500 | 21,100 | 7,770  | 10,100 | 8,940  | 11,700 | 21,100 | 14,800 | 7,380  | 3,070 | 4,780 |
| 27..... | 4,680 | 11,300 | 19,800 | 11,300 | 10,900 | 8,160  | 11,700 | 19,800 | 14,800 | 7,000  | 3,070 | 4,780 |
| 28..... | 4,990 | 10,900 | 18,500 | 9,720  | 10,900 | 8,940  | 11,700 | 16,300 | 14,300 | 6,640  | 3,070 | 5,050 |
| 29..... | 4,390 | 14,300 | 16,800 | 9,330  | -----  | 10,100 | 15,200 | 16,300 | 13,800 | 5,970  | 3,070 | 7,380 |
| 30..... | 4,390 | 22,400 | 15,200 | 8,550  | -----  | 11,700 | 15,200 | 19,200 | 12,500 | 6,300  | 3,070 | 6,640 |
| 31..... | 4,390 | -----  | 14,300 | 8,160  | -----  | 13,800 | -----  | 19,800 | -----  | 5,970  | 3,220 | ----- |

| Month          | Maximum | Minimum | Mean   | Per square mile | Run-off |           |
|----------------|---------|---------|--------|-----------------|---------|-----------|
|                |         |         |        |                 | Inches  | Acre-feet |
| October.....   | 4,990   | 1,430   | 2,730  | 1.24            | 1.43    | 168,000   |
| November.....  | 52,200  | 5,660   | 22,400 | 10.1            | 11.27   | 1,330,000 |
| December.....  | 44,100  | 6,640   | 16,700 | 7.56            | 8.72    | 1,030,000 |
| January.....   | 47,800  | 7,770   | 17,100 | 7.74            | 8.92    | 1,050,000 |
| February.....  | 13,400  | 4,530   | 7,010  | 3.17            | 3.30    | 389,000   |
| March.....     | 18,500  | 8,160   | 12,000 | 5.43            | 6.26    | 738,000   |
| April.....     | 15,200  | 7,000   | 9,810  | 4.44            | 4.95    | 584,000   |
| May.....       | 21,100  | 8,940   | 12,700 | 5.75            | 6.63    | 781,000   |
| June.....      | 35,000  | 12,500  | 19,200 | 8.69            | 9.70    | 1,140,000 |
| July.....      | 12,500  | 5,970   | 9,780  | 4.42            | 5.10    | 600,000   |
| August.....    | 7,380   | 3,070   | 4,160  | 1.88            | 2.17    | 256,000   |
| September..... | 7,380   | 2,640   | 3,890  | 1.76            | 1.96    | 231,000   |
| The year.....  | 52,200  | 1,430   | 11,500 | 5.20            | 70.41   | 8,300,000 |

## CLEAR FORK OF COWLITZ RIVER NEAR PACKWOOD, WASH.

LOCATION.—Water-stage recorder in NE¼ sec. 29, T. 14 N., R. 10 E., three-quarters of a mile above mouth and 7 miles northeast of Packwood.

DRAINAGE AREA.—56 square miles.

RECORDS AVAILABLE.—August 1907 to September 1917; August 1930 to September 1933.

DISCHARGE.—Maximum during year, 2,830 second-feet Nov. 13 (gage height, 7.44 feet); minimum, 59 second-feet Oct. 9, 10 (gage height, 2.39 feet).

1907-17, 1930-33: Maximum, that of Nov. 13, 1932; minimum (estimated), 35 second-feet Oct. 20, 1931.

REMARKS.—Records excellent except those estimated Dec. 11-13, Feb. 9-12, which are fair. No regulation. A small diversion a few hundred feet above gage to accommodate fish hatchery.

*Discharge, in second-feet, 1932-33*

| Day     | Oct. | Nov.  | Dec.  | Jan.  | Feb.  | Mar. | Apr.  | May   | June  | July | Aug. | Sept. |
|---------|------|-------|-------|-------|-------|------|-------|-------|-------|------|------|-------|
| 1.....  | 63   | 168   | 541   | 141   | 105   | 96   | 138   | 400   | 580   | 580  | 284  | 125   |
| 2.....  | 63   | 260   | 1,510 | 138   | 102   | 96   | 140   | 355   | 570   | 620  | 284  | 120   |
| 3.....  | 63   | 197   | 1,140 | 125   | 96    | 94   | 169   | 334   | 771   | 605  | 279  | 118   |
| 4.....  | 63   | 171   | 685   | 153   | 92    | 92   | 188   | 319   | 940   | 585  | 275  | 115   |
| 5.....  | 62   | 499   | 496   | 266   | 96    | 91   | 186   | 307   | 908   | 610  | 360  | 118   |
| 6.....  | 61   | 610   | 410   | 302   | 91    | 110  | 182   | 284   | 842   | 652  | 299  | 138   |
| 7.....  | 61   | 380   | 346   | 502   | 90    | 141  | 176   | 263   | 784   | 703  | 279  | 124   |
| 8.....  | 60   | 593   | 282   | 1,070 | 80    | 129  | 161   | 244   | 1,230 | 721  | 276  | 112   |
| 9.....  | 59   | 508   | 257   | 727   | 80    | 125  | 149   | 232   | 1,240 | 595  | 260  | 108   |
| 10..... | 59   | 363   | 242   | 454   | 80    | 124  | 140   | 224   | 875   | 546  | 242  | 107   |
| 11..... | 62   | 282   | 200   | 331   | 80    | 129  | 141   | 226   | 703   | 595  | 237  | 107   |
| 12..... | 76   | 642   |       | 276   |       | 159  | 132   | 257   | 893   | 685  | 229  | 105   |
| 13..... | 80   | 1,970 | 244   | 84    | 163   | 129  | 293   | 1,350 | 685   | 216  | 102  | 102   |
| 14..... | 157  | 1,070 | 184   | 226   | 85    | 149  | 134   | 334   | 1,500 | 721  | 212  | 123   |
| 15..... | 184  | 655   | 176   | 216   | 84    | 143  | 145   | 340   | 1,420 | 771  | 209  | 141   |
| 16..... | 144  | 1,320 | 165   | 200   | 80    | 143  | 145   | 340   | 1,210 | 727  | 212  | 145   |
| 17..... | 114  | 1,540 | 157   | 191   | 78    | 141  | 143   | 337   | 940   | 570  | 200  | 141   |
| 18..... | 97   | 1,130 | 155   | 178   | 78    | 38   | 140   | 331   | 764   | 492  | 195  | 145   |
| 19..... | 87   | 572   | 167   | 176   | 76    | 136  | 134   | 319   | 691   | 500  | 191  | 131   |
| 20..... | 88   | 310   | 157   | 163   | 78    | 147  | 141   | 331   | 663   | 450  | 171  | 140   |
| 21..... | 106  | 287   | 147   | 159   | 82    | 145  | 159   | 340   | 697   | 410  | 157  | 182   |
| 22..... | 144  | 310   | 145   | 147   | 94    | 140  | 191   | 352   | 715   | 394  | 149  | 224   |
| 23..... | 122  | 293   | 145   | 141   | 91    | 131  | 255   | 371   | 691   | 410  | 147  | 198   |
| 24..... | 107  | 274   | 140   | 140   | 84    | 125  | 313   | 428   | 641   | 442  | 145  | 169   |
| 25..... | 131  | 263   | 143   | 132   | 91    | 120  | 340   | 724   | 709   | 435  | 143  | 147   |
| 26..... | 254  | 268   | 184   | 127   | 115   | 113  | 322   | 875   | 778   | 400  | 138  | 171   |
| 27..... | 207  | 282   | 171   | 124   | 108   | 112  | 384   | 652   | 752   | 368  | 140  | 222   |
| 28..... | 155  | 279   | 153   | 120   | 104   | 122  | 532   | 590   | 721   | 319  | 138  | 400   |
| 29..... | 132  | 510   | 149   | 117   | ----- | 125  | 570   | 776   | 674   | 352  | 129  | 335   |
| 30..... | 114  | 475   | 145   | 113   | ----- | 140  | 475   | 940   | 615   | 328  | 141  | 237   |
| 31..... | 122  | ----- | 143   | 112   | ----- | 143  | ----- | 727   | ----- | 290  | 138  | ----- |

| Month          | Maximum | Minimum | Mean | Per square mile | Run-off |           |
|----------------|---------|---------|------|-----------------|---------|-----------|
|                |         |         |      |                 | Inches  | Acre-feet |
| October.....   | 254     | 59      | 106  | 1.89            | 2.18    | 6,520     |
| November.....  | 1,970   | 168     | 549  | 9.80            | 10.93   | 32,700    |
| December.....  | 1,510   | 140     | 301  | 5.38            | 6.20    | 18,500    |
| January.....   | 1,070   | 112     | 242  | 4.32            | 4.98    | 14,900    |
| February.....  | 115     | 76      | 88.7 | 1.68            | 1.64    | 4,930     |
| March.....     | 163     | 91      | 128  | 2.29            | 2.64    | 7,870     |
| April.....     | 570     | 129     | 218  | 3.89            | 4.34    | 13,000    |
| May.....       | 940     | 224     | 414  | 7.39            | 8.52    | 25,500    |
| June.....      | 1,500   | 570     | 862  | 15.4            | 17.18   | 51,300    |
| July.....      | 771     | 290     | 534  | 9.54            | 11.00   | 32,800    |
| August.....    | 360     | 129     | 209  | 3.73            | 4.30    | 12,900    |
| September..... | 400     | 102     | 158  | 2.82            | 3.15    | 9,400     |
| The year.....  | 1,970   | 59      | 318  | 5.68            | 77.06   | 230,000   |

## LAKE CREEK NEAR PACKWOOD, WASH.

LOCATION.—In sec. 21, T. 13 N., R. 10 E., 500 feet below outlet of Packwood Lake and 6 miles east of Packwood.

DRAINAGE AREA.—18.8 square miles.

RECORDS AVAILABLE.—September 1911 to September 1924; September 1930 to September 1933.

DISCHARGE.—Maximum during year, 815 second-feet Nov. 17 (gage height, 4.62 feet); minimum, 44 second-feet Oct. 4-11; minimum gage height, 1.65 feet Oct. 11.

1911-24, 1930-33: Maximum stage recorded, 6.0 feet (former datum) Dec. 18, 1917 (discharge not determined); minimum discharge, 29 second-feet Nov. 8, 1930 (gage height, 1.50 feet). Average, 16 years (1911-24, 1930-33), 103 second-feet.

REMARKS.—Records good except those estimated for Nov. 4, 5, Jan. 18 to Feb. 12, Aug. 28 to Sept. 4, which are fair. No diversions; natural regulation in Packwood Lake.

## Discharge, in second-feet, 1932-33

| Day     | Oct. | Nov. | Dec. | Jan. | Feb. | Mar. | Apr. | May | June | July | Aug. | Sept. |
|---------|------|------|------|------|------|------|------|-----|------|------|------|-------|
| 1-----  | 46   | 75   | 175  | 72   |      | 53   | 51   | 114 | 244  | 240  | 143  |       |
| 2-----  | 46   | 88   | 254  | 79   |      | 51   | 51   | 114 | 226  | 240  | 141  |       |
| 3-----  | 46   | 92   | 334  | 73   |      | 51   | 51   | 113 | 234  | 240  | 137  |       |
| 4-----  | 44   | 80   | 297  | 80   | 50   | 50   | 51   | 111 | 257  | 230  | 137  |       |
| 5-----  | 44   | 120  | 257  | 90   | 50   | 50   | 52   | 111 | 275  | 225  | 159  | 60    |
| 6-----  | 44   | 148  | 210  | 96   |      | 50   | 52   | 106 | 281  | 228  | 165  | 67    |
| 7-----  | 44   | 152  | 168  | 99   |      | 52   | 53   | 100 | 275  | 240  | 155  | 69    |
| 8-----  | 44   | 168  | 132  | 128  |      | 52   | 54   | 98  | 311  | 250  | 145  | 66    |
| 9-----  | 44   | 184  | 111  | 155  |      | 51   | 53   | 91  | 382  | 250  | 151  | 63    |
| 10----- | 44   | 166  | 104  | 152  | 45   | 51   | 52   | 87  | 354  | 248  | 139  | 60    |
| 11----- | 44   | 144  | 95   | 136  |      | 51   | 54   | 83  | 314  | 232  | 133  | 59    |
| 12----- | 45   | 141  | 90   | 118  |      | 52   | 55   | 82  | 297  | 245  | 126  | 57    |
| 13----- | 47   | 279  | 83   | 108  | 51   | 52   | 54   | 83  | 348  | 253  | 124  | 55    |
| 14----- | 54   | 351  | 79   | 104  | 51   | 52   | 54   | 91  | 450  | 271  | 122  | 59    |
| 15----- | 62   | 317  | 75   | 99   | 51   | 52   | 55   | 96  | 522  | 290  | 120  | 76    |
| 16----- | 69   | 434  | 71   | 92   | 50   | 51   | 55   | 102 | 485  | 320  | 126  | 90    |
| 17----- | 68   | 770  | 69   | 83   | 50   | 52   | 55   | 96  | 414  | 306  | 126  | 87    |
| 18----- | 62   | 640  | 69   |      | 50   | 52   | 55   | 96  | 357  | 271  | 118  | 86    |
| 19----- | 59   | 450  | 78   |      | 50   | 51   | 55   | 98  | 305  | 250  | 115  | 82    |
| 20----- | 57   | 351  | 79   | 70   | 50   | 53   | 55   | 98  | 265  | 230  | 106  | 78    |
| 21----- | 60   | 294  | 74   |      | 53   | 55   | 55   | 98  | 247  | 207  | 96   | 82    |
| 22----- | 68   | 244  | 70   |      | 55   | 54   | 56   | 102 | 241  | 193  | 86   | 91    |
| 23----- | 68   | 203  | 71   |      | 55   | 53   | 60   | 106 | 239  | 184  | 81   | 90    |
| 24----- | 74   | 170  | 70   |      | 54   | 52   | 63   | 113 | 230  | 191  | 77   | 86    |
| 25----- | 63   | 146  | 71   | 60   | 53   | 51   | 69   | 148 | 238  | 198  | 75   | 77    |
| 26----- | 78   | 128  | 79   |      | 54   | 51   | 72   | 216 | 250  | 200  | 73   | 74    |
| 27----- | 87   | 121  | 80   |      | 54   | 50   | 76   | 231 | 255  | 195  | 68   | 77    |
| 28----- | 83   | 118  | 79   |      | 54   | 50   | 86   | 221 | 250  | 180  |      | 90    |
| 29----- | 78   | 142  | 78   |      |      | 50   | 99   | 231 | 248  | 170  |      | 118   |
| 30----- | 74   | 170  | 72   | 55   |      | 51   | 111  | 265 | 248  | 174  | 70   | 113   |
| 31----- | 72   |      | 72   |      |      | 52   |      | 267 |      | 159  |      |       |

| Month          | Maximum | Minimum | Mean | Per square mile | Run-off |           |
|----------------|---------|---------|------|-----------------|---------|-----------|
|                |         |         |      |                 | Inches  | Acre-feet |
| October-----   | 87      | 44      | 58.6 | 3.12            | 3.60    | 3,600     |
| November-----  | 770     | 75      | 230  | 12.2            | 13.61   | 13,700    |
| December-----  | 334     | 69      | 118  | 6.28            | 7.24    | 7,260     |
| January-----   | 155     |         | 85.0 | 4.52            | 5.21    | 5,230     |
| February-----  | 55      |         | 50.2 | 2.67            | 2.78    | 2,790     |
| March-----     | 55      | 50      | 51.5 | 2.74            | 3.16    | 3,170     |
| April-----     | 111     | 51      | 60.5 | 3.22            | 3.59    | 3,600     |
| May-----       | 267     | 82      | 128  | 6.81            | 7.85    | 7,870     |
| June-----      | 522     | 226     | 301  | 16.0            | 17.85   | 17,900    |
| July-----      | 320     | 159     | 229  | 12.2            | 14.07   | 14,100    |
| August-----    | 165     |         | 114  | 6.06            | 6.99    | 7,010     |
| September----- | 118     | 55      | 75.1 | 3.99            | 4.45    | 4,470     |
| The year-----  | 770     | 44      | 125  | 6.65            | 90.40   | 90,700    |

## CISPUS RIVER NEAR RANDLE, WASH.

LOCATION.—Water-stage recorder in NW¼ sec. 18, T. 11 N., R. 8 E. (unsurveyed), 500 feet above suspension bridge at Tower Rock ranger station and 8 miles southeast of Randle.

DRAINAGE AREA.—323 square miles.

RECORDS AVAILABLE.—October 1910 to February 1912; September 1929 to September 1933.

DISCHARGE.—Maximum during year, 8,080 second-feet June 9 (gage height, 7.64 feet); minimum, 285 second-feet Oct. 9 (gage height, 2.24 feet).

1910-12, 1929-33: Maximum, that of June 9, 1933; minimum, 242 second-feet Dec. 3-5, 1929 (gage height, 2.02 feet).

REMARKS.—Records excellent except those estimated, Sept. 25-30, which are fair. No diversions or regulation.

*Discharge, in second-feet, 1932-33*

| Day     | Oct. | Nov.  | Dec.  | Jan.  | Feb.  | Mar.  | Apr.  | May   | June  | July  | Aug.  | Sept. |
|---------|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 1-----  | 327  | 941   | 2,970 | 1,070 | 708   | 652   | 1,190 | 2,820 | 3,540 | 2,600 | 1,060 | 562   |
| 2-----  | 327  | 1,780 | 3,620 | 1,050 | 694   | 659   | 1,240 | 2,740 | 3,450 | 2,670 | 1,050 | 538   |
| 3-----  | 331  | 1,520 | 3,960 | 972   | 666   | 680   | 1,560 | 2,520 | 4,050 | 2,600 | 1,040 | 520   |
| 4-----  | 311  | 1,270 | 3,290 | 956   | 659   | 638   | 1,610 | 2,370 | 4,500 | 2,520 | 1,050 | 526   |
| 5-----  | 307  | 2,810 | 2,820 | 1,120 | 659   | 632   | 1,560 | 2,220 | 4,500 | 2,520 | 1,230 | 544   |
| 6-----  | 319  | 4,230 | 2,370 | 1,390 | 645   | 694   | 1,560 | 2,080 | 4,320 | 2,600 | 1,120 | 638   |
| 7-----  | 303  | 2,780 | 2,020 | 1,560 | 606   | 910   | 1,500 | 1,950 | 3,880 | 2,670 | 1,030 | 574   |
| 8-----  | 300  | 2,940 | 1,660 | 2,970 | 600   | 858   | 1,340 | 1,780 | 5,330 | 2,740 | 1,010 | 532   |
| 9-----  | 296  | 2,860 | 1,500 | 3,290 | 526   | 828   | 1,190 | 1,720 | 7,450 | 2,520 | 996   | 520   |
| 10----- | 296  | 2,310 | 1,440 | 2,670 | 593   | 820   | 1,040 | 1,660 | 5,450 | 2,300 | 948   | 514   |
| 11----- | 323  | 1,900 | 1,290 | 2,220 | 606   | 972   | 1,000 | 1,720 | 4,500 | 2,150 | 932   | 514   |
| 12----- | 423  | 1,780 | 1,240 | 1,890 | 580   | 1,340 | 956   | 2,080 | 4,500 | 2,370 | 918   | 509   |
| 13----- | 406  | 5,000 | 1,170 | 1,660 | 556   | 1,840 | 910   | 2,220 | 6,240 | 2,300 | 895   | 498   |
| 14----- | 565  | 5,070 | 1,120 | 1,610 | 556   | 1,250 | 1,070 | 2,600 | 6,840 | 2,440 | 872   | 520   |
| 15----- | 582  | 3,960 | 1,070 | 1,440 | 556   | 1,190 | 1,140 | 2,440 | 6,640 | 2,520 | 850   | 580   |
| 16----- | 542  | 4,880 | 1,020 | 1,290 | 544   | 1,280 | 1,140 | 2,300 | 6,040 | 2,440 | 858   | 568   |
| 17----- | 497  | 6,440 | 980   | 1,190 | 532   | 1,270 | 1,050 | 2,220 | 4,880 | 2,150 | 850   | 526   |
| 18----- | 428  | 5,840 | 956   | 1,160 | 532   | 1,200 | 980   | 2,300 | 4,050 | 1,890 | 812   | 520   |
| 19----- | 390  | 4,230 | 1,190 | 1,090 | 526   | 1,150 | 918   | 2,220 | 3,620 | 1,780 | 805   | 514   |
| 20----- | 373  | 3,290 | 1,120 | 1,040 | 526   | 1,200 | 1,040 | 2,300 | 3,370 | 1,660 | 760   | 498   |
| 21----- | 381  | 2,900 | 1,080 | 996   | 556   | 1,170 | 1,070 | 2,370 | 3,370 | 1,560 | 701   | 532   |
| 22----- | 497  | 2,520 | 1,050 | 940   | 580   | 1,100 | 1,330 | 2,440 | 3,290 | 1,500 | 666   | 673   |
| 23----- | 484  | 2,150 | 1,080 | 925   | 580   | 1,040 | 2,020 | 2,520 | 3,210 | 1,440 | 666   | 842   |
| 24----- | 452  | 1,950 | 1,020 | 895   | 562   | 988   | 2,300 | 2,970 | 3,130 | 1,500 | 659   | 768   |
| 25----- | 458  | 1,720 | 1,000 | 850   | 556   | 932   | 2,440 | 4,050 | 3,370 | 1,500 | 645   |       |
| 26----- | 750  | 1,610 | 1,240 | 828   | 722   | 910   | 2,300 | 4,410 | 3,540 | 1,390 | 619   |       |
| 27----- | 792  | 1,610 | 1,250 | 820   | 708   | 932   | 2,900 | 3,700 | 3,370 | 1,340 | 606   |       |
| 28----- | 682  | 1,560 | 1,170 | 782   | 687   | 1,090 | 3,540 | 3,620 | 3,130 | 1,200 | 626   |       |
| 29----- | 645  | 2,660 | 1,160 | 760   | ----- | 1,120 | 3,450 | 4,230 | 2,900 | 1,210 | 619   |       |
| 30----- | 610  | 3,540 | 1,100 | 745   | ----- | 1,160 | 3,050 | 4,880 | 2,740 | 1,220 | 626   |       |
| 31----- | 652  | ----- | 1,080 | 745   | ----- | 1,230 | ----- | 4,140 | ----- | 1,100 | 600   |       |

| Month          | Maximum | Minimum | Mean  | Per square mile | Run-off |           |
|----------------|---------|---------|-------|-----------------|---------|-----------|
|                |         |         |       |                 | Inches  | Acre-feet |
| October-----   | 792     | 296     | 453   | 1.40            | 1.61    | 27,900    |
| November-----  | 6,440   | 941     | 2,940 | 9.10            | 10.15   | 175,000   |
| December-----  | 3,960   | 956     | 1,580 | 4.89            | 5.64    | 97,200    |
| January-----   | 3,290   | 745     | 1,320 | 4.09            | 4.72    | 81,200    |
| February-----  | 722     | 526     | 601   | 1.86            | 1.94    | 33,400    |
| March-----     | 1,340   | 632     | 1,010 | 3.13            | 3.61    | 62,100    |
| April-----     | 3,540   | 910     | 1,610 | 4.98            | 5.56    | 95,800    |
| May-----       | 4,880   | 1,660   | 2,700 | 8.36            | 9.64    | 166,000   |
| June-----      | 7,450   | 2,740   | 4,320 | 13.4            | 14.95   | 257,000   |
| July-----      | 2,740   | 1,100   | 2,010 | 6.22            | 7.17    | 124,000   |
| August-----    | 1,230   | 600     | 843   | 2.61            | 3.01    | 51,800    |
| September----- | -----   | 498     | 611   | 1.89            | 2.11    | 36,400    |
| The year-----  | 7,450   | 296     | 1,670 | 5.17            | 70.11   | 1,210,000 |

## NORTH FORK OF TOUTLE RIVER AT ST. HELEN, WASH.

LOCATION.—Water-stage recorder in SE¼ sec. 15, T. 10 N., R. 2 E., at highway crossing three-quarters of a mile west of St. Helen. Zero of gage is 878.03 feet above mean sea level.

DRAINAGE AREA.—120 square miles.

RECORDS AVAILABLE.—September to October 1909; September 1929 to September 1933 (discontinued).

DISCHARGE.—Maximum during year, 4,600 second-feet Dec. 2 (gage height, 5.64 feet); minimum, 202 second-feet Oct. 9, 10 (gage height, 1.63 feet).

1909, 1929–33: Maximum, 6,450 second-feet Mar. 31, 1931 (gage height, 6.64 feet); minimum, 153 second-feet Oct. 19, 1931 (gage height, 1.39 feet).

REMARKS.—Records good. Discharge estimated Dec. 7–19, Sept. 16–30. No diversions or regulation.

*Discharge, in second-feet, 1932–33*

| Day     | Oct. | Nov.  | Dec.  | Jan.  | Feb.  | Mar. | Apr.  | May   | June  | July  | Aug. | Sept. |
|---------|------|-------|-------|-------|-------|------|-------|-------|-------|-------|------|-------|
| 1.....  | 206  | 722   | 1,540 | 1,110 | 543   | 599  | 848   | 1,000 | 1,030 | 1,000 | 494  | 306   |
| 2.....  | 206  | 1,230 | 3,400 | 1,220 | 522   | 662  | 788   | 1,060 | 1,010 | 976   | 487  | 296   |
| 3.....  | 210  | 1,020 | 3,060 | 968   | 501   | 669  | 856   | 992   | 1,130 | 952   | 494  | 287   |
| 4.....  | 210  | 868   | 2,000 | 936   | 494   | 606  | 856   | 952   | 1,220 | 920   | 557  | 283   |
| 5.....  | 210  | 1,600 | 1,640 | 1,380 | 508   | 578  | 795   | 912   | 1,240 | 904   | 735  | 306   |
| 6.....  | 210  | 2,610 | 1,280 | 1,810 | 501   | 849  | 750   | 872   | 1,190 | 928   | 571  | 379   |
| 7.....  | 210  | 1,580 | 1,700 | 480   | 1,140 | 728  | 904   | 1,170 | 944   | 529   | 332  | 329   |
| 8.....  | 206  | 1,920 | 2,970 | 466   | 920   | 676  | 864   | 2,320 | 960   | 494   | 301  | 301   |
| 9.....  | 202  | 1,580 | 3,260 | 431   | 802   | 641  | 818   | 3,520 | 912   | 480   | 296  | 292   |
| 10..... | 202  | 1,230 | 2,550 | 445   | 802   | 606  | 765   | 2,340 | 936   | 459   | 287  | 287   |
| 11..... | 218  | 1,020 | 1,810 | 459   | 1,080 | 620  | 750   | 1,810 | 840   | 445   | 287  | 287   |
| 12..... | 262  | 980   | 1,420 | 459   | 1,540 | 620  | 758   | 1,810 | 856   | 424   | 283  | 283   |
| 13..... | 248  | 2,700 | 1,220 | 431   | 1,280 | 585  | 758   | 2,130 | 864   | 417   | 279  | 279   |
| 14..... | 336  | 2,680 | 1,220 | 410   | 1,050 | 599  | 780   | 2,340 | 912   | 404   | 292  | 292   |
| 15..... | 358  | 2,380 | 1,060 | 417   | 936   | 627  | 848   | 2,200 | 936   | 398   | 332  | 332   |
| 16..... | 358  | 3,140 | 904   | 410   | 968   | 634  | 856   | 1,930 | 920   | 404   | 350  | 350   |
| 17..... | 336  | 3,310 | 780   | 398   | 912   | 613  | 840   | 1,700 | 840   | 398   | 338  | 338   |
| 18..... | 305  | 2,480 | 735   | 398   | 840   | 585  | 840   | 1,400 | 780   | 373   | 350  | 350   |
| 19..... | 270  | 1,810 | 683   | 404   | 795   | 564  | 802   | 1,240 | 742   | 367   | 327  | 327   |
| 20..... | 262  | 1,450 | 1,080 | 655   | 424   | 872  | 564   | 795   | 1,140 | 720   | 354  | 354   |
| 21..... | 274  | 1,480 | 960   | 648   | 543   | 825  | 578   | 772   | 1,110 | 683   | 343  | 343   |
| 22..... | 464  | 1,310 | 992   | 641   | 720   | 772  | 641   | 772   | 1,070 | 669   | 338  | 338   |
| 23..... | 416  | 1,140 | 1,090 | 641   | 676   | 712  | 728   | 810   | 1,060 | 655   | 338  | 338   |
| 24..... | 364  | 1,020 | 952   | 620   | 592   | 669  | 765   | 904   | 1,060 | 655   | 327  | 327   |
| 25..... | 369  | 920   | 904   | 585   | 571   | 634  | 765   | 1,250 | 1,180 | 641   | 322  | 322   |
| 26..... | 476  | 840   | 1,450 | 599   | 690   | 599  | 758   | 1,370 | 1,190 | 613   | 317  | 317   |
| 27..... | 476  | 795   | 1,400 | 634   | 592   | 832  | 1,150 | 1,150 | 592   | 312   | 312  | 312   |
| 28..... | 446  | 780   | 1,320 | 571   | 620   | 648  | 976   | 1,040 | 1,130 | 557   | 306  | 306   |
| 29..... | 434  | 1,430 | 1,200 | 564   | ----- | 690  | 984   | 1,180 | 1,090 | 550   | 306  | 306   |
| 30..... | 398  | 1,640 | 1,100 | 536   | ----- | 931  | 952   | 1,280 | 1,050 | 536   | 354  | 354   |
| 31..... | 500  | ----- | 1,050 | 557   | ----- | 976  | ----- | 1,150 | ----- | 508   | 338  | 338   |

| Month          | Maximum | Minimum | Mean  | Per square mile | Run-off |           |
|----------------|---------|---------|-------|-----------------|---------|-----------|
|                |         |         |       |                 | Inches  | Acre-feet |
| October.....   | 500     | 202     | 311   | 2.59            | 2.99    | 19,100    |
| November.....  | 3,310   | 722     | 1,590 | 13.2            | 14.73   | 94,600    |
| December.....  | 3,400   | -----   | 1,160 | 9.67            | 11.15   | 71,300    |
| January.....   | 3,260   | 536     | 1,130 | 9.42            | 10.86   | 69,500    |
| February.....  | 720     | 398     | 505   | 4.21            | 4.38    | 28,000    |
| March.....     | 1,540   | 578     | 837   | 6.98            | 8.05    | 51,500    |
| April.....     | 984     | 564     | 718   | 5.98            | 6.67    | 42,700    |
| May.....       | 1,370   | 750     | 930   | 7.75            | 8.94    | 57,200    |
| June.....      | 3,520   | 1,010   | 1,500 | 12.5            | 13.95   | 89,300    |
| July.....      | 1,000   | 508     | 790   | 6.58            | 7.59    | 48,600    |
| August.....    | 735     | 306     | 416   | 3.47            | 4.00    | 25,600    |
| September..... | -----   | 279     | 443   | 3.69            | 4.12    | 26,400    |
| The year.....  | 3,520   | 202     | 861   | 7.18            | 97.43   | 624,000   |

## TOUTLE RIVER NEAR SILVER LAKE, WASH.

LOCATION.—Water-stage recorder in SE¼ sec. 19, T. 10 N., R. 1 E., under highway bridge half a mile below junction of North and South Forks, 5 miles northeast of Silver Lake, and 9 miles northeast of Castle Rock.

DRAINAGE AREA.—472 square miles.

RECORDS AVAILABLE.—October 1919 to December 1923; September 1929 to September 1933. September 1909 to August 1912 at site 2 miles downstream.

DISCHARGE.—Maximum during year, 13,300 second-feet Dec. 2 (gage height, 10.77 feet); minimum, 325 second-feet Oct. 10 (gage height, 1.79 feet).

1910-12, 1920-23, 1929-33: Maximum, 35,600 second-feet Mar. 2, 1910 (gage height, 11.0 feet at former site); minimum, 240 second-feet Nov. 21, 1929.

REMARKS.—Records good. No diversions or regulation.

*Discharge, in second-feet, 1929-33*

| Day     | Sept. | Oct. | Nov.  | Dec.  | Jan.  | Feb.  | Mar.  | Apr.  | May   | June  | July | Aug. | Sept. |
|---------|-------|------|-------|-------|-------|-------|-------|-------|-------|-------|------|------|-------|
| 1929-30 |       |      |       |       |       |       |       |       |       |       |      |      |       |
| 1.....  |       | 415  | 305   | 280   | 2,730 | 3,190 | 2,060 | 2,130 | 1,770 | 1,810 | 779  | 405  | 305   |
| 2.....  |       | 420  | 305   | 270   | 2,850 | 3,410 | 1,910 | 1,980 | 1,700 | 2,450 | 761  | 395  | 295   |
| 3.....  |       | 420  | 300   | 265   | 2,450 | 3,250 | 1,760 | 1,910 | 1,740 | 2,210 | 725  | 390  | 295   |
| 4.....  |       | 430  | 300   | 260   | 2,690 | 3,640 | 1,640 | 2,060 | 1,620 | 2,130 | 713  | 385  | 290   |
| 5.....  |       | 485  | 285   | 255   | 2,530 | 4,980 | 1,550 | 1,980 | 1,470 | 1,910 | 695  | 385  | 290   |
| 6.....  |       | 468  | 345   | 265   | 2,130 | 3,980 | 1,490 | 1,830 | 1,510 | 1,780 | 689  | 380  | 295   |
| 7.....  |       | 452  | 310   | 265   | 1,810 | 6,790 | 1,420 | 1,910 | 1,560 | 1,760 | 671  | 380  | 290   |
| 8.....  |       | 390  | 300   | 320   | 1,640 | 6,180 | 1,420 | 2,130 | 1,460 | 1,640 | 653  | 385  | 285   |
| 9.....  |       | 551  | 295   | 1,240 | 1,460 | 4,320 | 1,380 | 1,980 | 1,360 | 1,510 | 629  | 390  | 285   |
| 10..... |       | 468  | 318   | 2,530 | 1,310 | 5,050 | 1,300 | 1,710 | 1,280 | 1,440 | 617  | 390  | 285   |
| 11..... |       | 345  | 340   | 1,430 | 1,180 | 4,700 | 1,280 | 1,550 | 1,220 | 1,370 | 605  | 380  | 415   |
| 12..... |       | 385  | 315   | 1,060 | 1,090 | 3,890 | 1,240 | 1,450 | 1,140 | 1,300 | 593  | 370  | 365   |
| 13..... |       | 355  | 295   | 2,020 | 1,050 | 4,980 | 1,170 | 1,470 | 1,120 | 1,240 | 593  | 365  | 335   |
| 14..... |       | 325  | 290   | 8,360 | 1,020 | 6,060 | 1,140 | 2,440 | 1,200 | 1,130 | 587  | 360  | 375   |
| 15..... |       | 315  | 280   | 3,960 | 1,000 | 4,980 | 1,130 | 2,450 | 1,270 | 1,080 | 557  | 350  | 355   |
| 16..... |       | 300  | 275   | 3,250 | 958   | 4,500 | 1,120 | 2,130 | 1,260 | 1,060 | 539  | 360  | 325   |
| 17..... |       | 400  | 305   | 2,450 | 899   | 4,060 | 1,070 | 1,840 | 1,300 | 1,040 | 527  | 340  | 315   |
| 18..... |       | 360  | 295   | 2,210 | 920   | 3,810 | 1,020 | 1,690 | 1,270 | 995   | 515  | 330  | 305   |
| 19..... |       | 370  | 280   | 2,610 | 935   | 5,620 | 1,020 | 1,560 | 1,320 | 965   | 503  | 325  | 290   |
| 20..... |       | 320  | 270   | 2,450 | 818   | 6,200 | 1,100 | 1,470 | 3,730 | 965   | 491  | 320  | 280   |
| 21..... |       | 310  | 255   | 2,130 | 773   | 5,110 | 2,660 | 1,520 | 4,320 | 935   | 480  | 315  | 280   |
| 22..... |       | 300  | 265   | 2,450 | 798   | 4,500 | 4,060 | 1,760 | 3,980 | 899   | 480  | 315  | 275   |
| 23..... |       | 295  | 260   | 3,980 | 850   | 3,980 | 3,410 | 1,670 | 3,250 | 864   | 468  | 315  | 270   |
| 24..... |       | 285  | 260   | 3,170 | 837   | 3,410 | 3,980 | 1,640 | 2,850 | 824   | 468  | 310  | 275   |
| 25..... | 375   | 280  | 340   | 3,330 | 798   | 3,090 | 3,730 | 1,580 | 2,610 | 804   | 446  | 310  | 285   |
| 26..... | 400   | 300  | 400   | 2,930 | 804   | 2,770 | 3,410 | 1,580 | 2,210 | 824   | 436  | 305  | 295   |
| 27..... | 370   | 340  | 345   | 2,450 | 761   | 2,530 | 3,090 | 1,800 | 1,980 | 844   | 430  | 300  | 305   |
| 28..... | 381   | 380  | 315   | 2,060 | 743   | 2,290 | 2,930 | 2,290 | 1,840 | 988   | 425  | 300  | 360   |
| 29..... | 392   | 330  | 295   | 1,840 | 920   | ----- | 2,850 | 2,370 | 1,840 | 878   | 420  | 305  | 315   |
| 30..... | 404   | 320  | 285   | 1,910 | 980   | ----- | 2,610 | 2,060 | 1,710 | 804   | 415  | 315  | 295   |
| 31..... |       | 295  | ----- | 1,910 | 1,320 | ----- | 2,370 | ----- | 1,670 | ----- | 410  | 315  | ----- |

Discharge, in second-feet, of Toutle River near Silver Lake, Wash., 1929-33—Con.

| Day     | Oct.  | Nov.  | Dec.  | Jan.  | Feb.  | Mar.   | Apr.   | May   | June  | July  | Aug. | Sept. |
|---------|-------|-------|-------|-------|-------|--------|--------|-------|-------|-------|------|-------|
| 1930-31 |       |       |       |       |       |        |        |       |       |       |      |       |
| 1       | 285   | 463   | 928   | 885   | 2,210 | 1,810  | 15,000 | 1,980 | 1,000 | 1,240 | 463  | 325   |
| 2       | 285   | 441   | 950   | 1,010 | 2,060 | 1,770  | 8,520  | 2,060 | 972   | 1,150 | 452  | 325   |
| 3       | 285   | 415   | 920   | 1,190 | 1,910 | 1,760  | 5,870  | 1,910 | 920   | 1,090 | 436  | 330   |
| 4       | 280   | 400   | 899   | 1,490 | 1,770 | 1,690  | 4,500  | 1,770 | 878   | 1,030 | 420  | 325   |
| 5       | 275   | 385   | 871   | 2,210 | 1,660 | 1,570  | 4,060  | 1,650 | 857   | 988   | 415  | 335   |
| 6       | 492   | 375   | 830   | 2,210 | 1,530 | 1,460  | 3,810  | 1,740 | 844   | 942   | 410  | 531   |
| 7       | 1,260 | 365   | 798   | 1,730 | 1,380 | 1,400  | 5,950  | 1,910 | 844   | 906   | 405  | 616   |
| 8       | 677   | 370   | 761   | 1,450 | 1,280 | 1,320  | 5,700  | 1,640 | 837   | 864   | 400  | 468   |
| 9       | 617   | 581   | 773   | 1,490 | 1,200 | 1,450  | 4,700  | 1,490 | 830   | 844   | 395  | 405   |
| 10      | 497   | 611   | 779   | 1,700 | 1,150 | 1,690  | 4,060  | 1,400 | 878   | 830   | 385  | 400   |
| 11      | 430   | 509   | 989   | 2,770 | 1,110 | 1,910  | 3,570  | 1,330 | 871   | 804   | 375  | 380   |
| 12      | 395   | 898   | 1,070 | 2,610 | 1,060 | 1,910  | 3,570  | 1,410 | 818   | 773   | 365  | 380   |
| 13      | 370   | 934   | 1,650 | 2,290 | 1,020 | 1,710  | 3,170  | 1,470 | 792   | 761   | 355  | 385   |
| 14      | 468   | 755   | 1,500 | 2,130 | 995   | 1,680  | 3,170  | 1,510 | 850   | 743   | 355  | 395   |
| 15      | 468   | 1,110 | 1,310 | 2,060 | 1,000 | 1,660  | 2,930  | 1,400 | 1,130 | 731   | 355  | 370   |
| 16      | 425   | 1,450 | 1,340 | 2,610 | 1,060 | 1,710  | 2,690  | 1,430 | 1,440 | 713   | 355  | 350   |
| 17      | 539   | 1,330 | 1,380 | 2,850 | 1,590 | 1,700  | 2,530  | 1,670 | 1,260 | 695   | 355  | 345   |
| 18      | 545   | 1,060 | 1,380 | 2,450 | 4,440 | 3,740  | 2,290  | 1,690 | 1,110 | 677   | 355  | 576   |
| 19      | 463   | 1,020 | 1,340 | 2,130 | 4,480 | 4,230  | 2,210  | 1,400 | 1,100 | 653   | 360  | 632   |
| 20      | 425   | 1,060 | 1,250 | 1,910 | 3,330 | 3,810  | 2,060  | 1,280 | 972   | 629   | 345  | 463   |
| 21      | 395   | 1,160 | 1,180 | 1,710 | 2,770 | 4,060  | 1,910  | 1,200 | 906   | 605   | 340  | 420   |
| 22      | 380   | 1,170 | 1,130 | 2,030 | 2,370 | 3,650  | 1,780  | 1,130 | 1,050 | 581   | 340  | 385   |
| 23      | 375   | 1,200 | 1,160 | 4,650 | 2,130 | 2,930  | 1,690  | 1,100 | 1,060 | 569   | 335  | 365   |
| 24      | 458   | 1,210 | 1,120 | 4,380 | 1,980 | 2,610  | 1,620  | 1,080 | 1,210 | 563   | 340  | 345   |
| 25      | 593   | 1,230 | 1,080 | 3,570 | 1,910 | 2,370  | 1,560  | 1,090 | 1,240 | 545   | 335  | 335   |
| 26      | 545   | 1,200 | 1,040 | 4,060 | 1,910 | 2,130  | 1,530  | 1,080 | 2,640 | 533   | 360  | 325   |
| 27      | 811   | 1,140 | 995   | 3,570 | 1,910 | 1,910  | 1,530  | 1,060 | 2,290 | 521   | 370  | 320   |
| 28      | 647   | 1,080 | 942   | 3,250 | 1,840 | 1,840  | 1,660  | 1,020 | 1,810 | 503   | 350  | 325   |
| 29      | 557   | 1,030 | 920   | 2,690 | 1,980 | 1,980  | 1,810  | 1,000 | 1,550 | 491   | 340  | 335   |
| 30      | 503   | 972   | 892   | 2,450 | 2,610 | 2,610  | 1,910  | 1,000 | 1,400 | 480   | 330  | 360   |
| 31      | 497   | ----- | 878   | 2,210 | ----- | 14,200 | -----  | 1,020 | ----- | 468   | 325  | ----- |
| 1931-32 |       |       |       |       |       |        |        |       |       |       |      |       |
| 1       | 340   | 1,650 | 1,230 | 2,210 | 1,370 | 4,790  | 4,500  | 3,010 | 1,980 | 1,450 | 665  | 491   |
| 2       | 325   | 1,700 | 1,200 | 1,980 | 1,300 | 4,320  | 4,410  | 3,250 | 1,980 | 1,380 | 665  | 485   |
| 3       | 315   | 1,410 | 1,220 | 1,780 | 1,220 | 3,730  | 4,600  | 3,010 | 2,130 | 1,570 | 641  | 463   |
| 4       | 335   | 1,220 | 1,170 | 1,830 | 1,190 | 3,490  | 4,320  | 2,690 | 2,210 | 1,740 | 629  | 446   |
| 5       | 668   | 1,110 | 1,130 | 1,910 | 1,130 | 9,020  | 4,600  | 2,610 | 2,210 | 1,400 | 623  | 441   |
| 6       | 509   | 1,100 | 1,110 | 2,060 | 1,090 | 11,400 | 4,060  | 2,450 | 1,980 | 1,200 | 611  | 436   |
| 7       | 430   | 3,100 | 2,090 | 1,980 | 1,100 | 6,630  | 3,890  | 2,450 | 1,830 | 1,100 | 593  | 436   |
| 8       | 400   | 3,170 | 1,980 | 1,910 | 1,220 | 4,980  | 3,570  | 2,370 | 1,710 | 1,070 | 581  | 430   |
| 9       | 370   | 3,730 | 1,640 | 2,450 | 1,350 | 4,060  | 3,250  | 2,370 | 1,830 | 1,040 | 605  | 420   |
| 10      | 350   | 3,410 | 1,560 | 2,690 | 1,770 | 3,570  | 3,090  | 2,610 | 2,210 | 1,310 | 671  | 420   |
| 11      | 340   | 2,610 | 1,440 | 5,560 | 1,710 | 3,170  | 3,010  | 2,610 | 2,530 | 1,310 | 617  | 415   |
| 12      | 330   | 2,210 | 1,320 | 6,490 | 1,660 | 2,850  | 3,090  | 2,530 | 2,850 | 1,130 | 653  | 410   |
| 13      | 320   | 2,370 | 1,270 | 4,500 | 1,550 | 2,690  | 3,170  | 2,610 | 3,010 | 1,090 | 611  | 405   |
| 14      | 315   | 2,690 | 1,180 | 3,650 | 1,380 | 2,770  | 3,570  | 2,610 | 3,090 | 1,320 | 557  | 400   |
| 15      | 300   | 2,370 | 1,120 | 3,090 | 1,310 | 2,770  | 3,330  | 2,370 | 2,930 | 1,200 | 545  | 395   |
| 16      | 295   | 2,370 | 1,150 | 2,690 | 1,210 | 2,690  | 3,410  | 2,210 | 2,450 | 1,110 | 539  | 390   |
| 17      | 300   | 3,250 | 4,050 | 2,770 | 1,150 | 4,140  | 3,810  | 2,130 | 2,060 | 1,050 | 527  | 400   |
| 18      | 300   | 3,250 | 6,970 | 8,230 | 1,110 | 6,360  | 4,500  | 2,290 | 1,840 | 995   | 503  | 405   |
| 19      | 295   | 4,700 | 6,040 | 7,150 | 1,080 | 7,490  | 5,530  | 2,450 | 1,760 | 958   | 497  | 420   |
| 20      | 300   | 4,370 | 5,530 | 5,350 | 1,310 | 6,040  | 4,980  | 2,850 | 1,710 | 928   | 509  | 599   |
| 21      | 320   | 3,250 | 4,600 | 4,140 | 2,210 | 4,790  | 4,140  | 2,850 | 1,910 | 906   | 497  | 521   |
| 22      | 1,040 | 2,610 | 3,730 | 3,570 | 1,980 | 4,060  | 3,650  | 2,610 | 2,060 | 899   | 527  | 400   |
| 23      | 1,890 | 2,290 | 3,250 | 3,090 | 1,770 | 3,810  | 3,250  | 2,450 | 2,060 | 885   | 497  | 420   |
| 24      | 1,450 | 1,980 | 3,730 | 2,770 | 2,370 | 5,240  | 3,090  | 2,290 | 1,800 | 837   | 468  | 410   |
| 25      | 2,720 | 1,980 | 3,490 | 2,530 | 2,890 | 6,360  | 3,010  | 2,130 | 1,660 | 811   | 458  | 405   |
| 26      | 2,530 | 1,770 | 3,410 | 2,290 | 9,870 | 5,530  | 2,850  | 2,060 | 1,610 | 798   | 452  | 390   |
| 27      | 2,290 | 1,560 | 3,980 | 2,130 | 9,540 | 4,700  | 2,930  | 1,840 | 1,620 | 767   | 463  | 380   |
| 28      | 4,590 | 1,440 | 3,490 | 1,910 | 7,220 | 5,870  | 2,930  | 1,770 | 1,610 | 743   | 452  | 370   |
| 29      | 3,900 | 1,350 | 2,930 | 1,760 | 5,700 | 5,870  | 2,770  | 1,840 | 1,620 | 725   | 452  | 365   |
| 30      | 2,690 | 1,270 | 2,450 | 1,650 | ----- | 5,530  | 2,770  | 1,980 | 1,530 | 701   | 521  | 355   |
| 31      | 2,060 | ----- | 2,370 | 1,510 | ----- | 4,790  | -----  | 2,060 | ----- | 677   | 521  | ----- |

*Discharge, in second-feet, of Toutle River near Silver Lake, Wash., 1929-33—Con.*

| Day     | Oct.  | Nov.  | Dec.  | Jan.   | Feb.  | Mar.  | Apr.  | May   | June  | July  | Aug.  | Sept. |
|---------|-------|-------|-------|--------|-------|-------|-------|-------|-------|-------|-------|-------|
| 1932-33 |       |       |       |        |       |       |       |       |       |       |       |       |
| 1       | 355   | 1,880 | 5,170 | 3,810  | 1,980 | 2,610 | 3,570 | 2,850 | 2,770 | 2,450 | 988   | 635   |
| 2       | 355   | 4,230 | 9,690 | 4,790  | 1,840 | 2,850 | 3,170 | 3,250 | 2,610 | 2,370 | 972   | 593   |
| 3       | 355   | 3,730 | 9,700 | 3,650  | 1,730 | 2,930 | 2,930 | 2,930 | 2,770 | 2,290 | 980   | 581   |
| 4       | 350   | 2,930 | 6,040 | 3,890  | 1,620 | 2,690 | 2,770 | 2,770 | 2,930 | 2,210 | 1,180 | 557   |
| 5       | 340   | 4,740 | 4,790 | 5,940  | 1,690 | 2,450 | 2,690 | 2,690 | 2,930 | 2,130 | 2,130 | 575   |
| 6       | 340   | 8,120 | 3,730 | 7,220  | 1,780 | 3,560 | 2,530 | 2,610 | 2,850 | 2,290 | 1,360 | 894   |
| 7       | 335   | 5,200 | 3,090 | 6,360  | 1,610 | 5,350 | 2,450 | 2,610 | 2,690 | 2,290 | 1,130 | 773   |
| 8       | 330   | 5,870 | 2,930 | 9,480  | 1,530 | 4,060 | 2,290 | 2,610 | 5,480 | 2,370 | 1,060 | 677   |
| 9       | 330   | 5,170 | 2,770 | 10,800 | 1,270 | 3,170 | 2,130 | 2,530 | 9,440 | 2,210 | 1,010 | 623   |
| 10      | 325   | 3,570 | 2,530 | 9,060  | 1,350 | 3,010 | 1,980 | 2,370 | 6,260 | 2,060 | 965   | 587   |
| 11      | 345   | 3,010 | 2,290 | 6,680  | 1,400 | 4,600 | 1,910 | 2,210 | 4,700 | 1,910 | 920   | 569   |
| 12      | 503   | 3,010 | 2,130 | 5,170  | 1,450 | 6,200 | 2,060 | 2,210 | 4,500 | 2,060 | 885   | 551   |
| 13      | 474   | 9,010 | 1,980 | 4,410  | 1,290 | 5,530 | 1,840 | 2,130 | 5,350 | 2,060 | 844   | 539   |
| 14      | 678   | 9,460 | 1,840 | 4,140  | 1,240 | 4,410 | 1,840 | 2,210 | 5,700 | 2,210 | 830   | 593   |
| 15      | 795   | 7,510 | 1,710 | 3,490  | 1,240 | 3,730 | 1,980 | 2,450 | 5,350 | 2,290 | 798   | 864   |
| 16      | 878   | 8,900 | 1,660 | 3,010  | 1,220 | 3,730 | 1,980 | 2,530 | 4,700 | 2,290 | 785   | 857   |
| 17      | 798   | 8,900 | 1,570 | 3,010  | 1,200 | 3,570 | 1,910 | 2,530 | 3,980 | 1,980 | 779   | 767   |
| 18      | 731   | 6,870 | 1,720 | 2,690  | 1,220 | 3,250 | 1,800 | 2,530 | 3,410 | 1,740 | 743   | 773   |
| 19      | 623   | 5,170 | 4,560 | 2,530  | 1,250 | 3,010 | 1,790 | 2,450 | 3,010 | 1,610 | 719   | 737   |
| 20      | 563   | 4,230 | 4,120 | 2,290  | 1,370 | 3,490 | 1,790 | 2,370 | 2,850 | 1,530 | 707   | 859   |
| 21      | 569   | 4,320 | 4,410 | 2,210  | 2,260 | 3,490 | 1,710 | 2,290 | 2,770 | 1,450 | 671   | 1,300 |
| 22      | 1,320 | 3,890 | 3,860 | 2,060  | 3,810 | 3,330 | 1,840 | 2,210 | 2,690 | 1,380 | 653   | 2,540 |
| 23      | 1,230 | 3,250 | 4,790 | 2,060  | 3,170 | 3,010 | 2,130 | 2,450 | 2,610 | 1,360 | 635   | 2,450 |
| 24      | 988   | 3,170 | 4,060 | 2,060  | 2,610 | 2,770 | 2,210 | 2,610 | 2,610 | 1,370 | 623   | 2,290 |
| 25      | 913   | 3,010 | 3,570 | 1,980  | 2,370 | 2,530 | 2,290 | 3,570 | 3,010 | 1,360 | 605   | 1,730 |
| 26      | 1,220 | 2,850 | 5,880 | 1,980  | 2,850 | 2,370 | 2,210 | 4,140 | 3,090 | 1,290 | 593   | 1,470 |
| 27      | 1,290 | 2,610 | 5,530 | 2,530  | 2,690 | 2,210 | 2,370 | 3,570 | 2,850 | 1,220 | 581   | 1,400 |
| 28      | 1,190 | 2,450 | 4,980 | 2,210  | 2,690 | 2,370 | 2,690 | 3,090 | 2,770 | 1,130 | 581   | 1,400 |
| 29      | 1,080 | 4,230 | 4,600 | 2,060  | ----- | 2,770 | 2,850 | 3,250 | 2,770 | 1,080 | 581   | 1,580 |
| 30      | 1,010 | 5,530 | 4,060 | 1,980  | ----- | 3,750 | 2,770 | 3,570 | 2,610 | 1,080 | 763   | 1,440 |
| 31      | 1,170 | ----- | 3,650 | 1,980  | ----- | 4,230 | ----- | 3,250 | ----- | 1,010 | 725   | ----- |

*Discharge, in second-feet, of Toutle River near Silver Lake, Wash., 1929-33—Con.*

| Month                | Maximum | Minimum | Mean  | Per square mile | Run-off |           |
|----------------------|---------|---------|-------|-----------------|---------|-----------|
|                      |         |         |       |                 | Inches  | Acre-feet |
| 1929                 |         |         |       |                 |         |           |
| September 25-30..... | 404     | 370     | 387   | 0.820           | 0.92    | 5,470     |
| 1929-30              |         |         |       |                 |         |           |
| October.....         | 551     | 280     | 368   | .780            | .90     | 22,600    |
| November.....        | 400     | 255     | 301   | .638            | .71     | 17,900    |
| December.....        | 8,360   | 255     | 2,060 | 4.36            | 5.03    | 127,000   |
| January.....         | 2,850   | 743     | 1,320 | 2.80            | 3.23    | 81,200    |
| February.....        | 6,790   | 2,290   | 4,330 | 9.17            | 9.55    | 240,000   |
| March.....           | 4,060   | 1,020   | 2,010 | 4.26            | 4.91    | 124,000   |
| April.....           | 2,450   | 1,450   | 1,860 | 3.94            | 4.40    | 111,000   |
| May.....             | 4,320   | 1,120   | 1,890 | 4.00            | 4.61    | 116,000   |
| June.....            | 2,450   | 804     | 1,280 | 2.71            | 3.02    | 76,200    |
| July.....            | 779     | 410     | 558   | 1.18            | 1.36    | 34,300    |
| August.....          | 405     | 300     | 348   | .737            | .85     | 21,400    |
| September.....       | 415     | 270     | 308   | .653            | .73     | 18,300    |
| The year.....        | 8,360   | 255     | 1,370 | 2.90            | 39.30   | 990,000   |
| 1930-31              |         |         |       |                 |         |           |
| October.....         | 1,260   | 275     | 492   | 1.04            | 1.20    | 30,300    |
| November.....        | 1,450   | 365     | 864   | 1.83            | 2.04    | 51,400    |
| December.....        | 1,650   | 761     | 1,070 | 2.27            | 2.62    | 65,800    |
| January.....         | 4,650   | 885     | 2,380 | 5.04            | 5.81    | 146,000   |
| February.....        | 4,480   | 995     | 1,890 | 4.00            | 4.16    | 105,000   |
| March.....           | 14,200  | 1,320   | 2,590 | 5.49            | 6.33    | 159,000   |
| April.....           | 15,000  | 1,530   | 3,570 | 7.56            | 8.44    | 212,000   |
| May.....             | 2,060   | 1,000   | 1,420 | 3.01            | 3.47    | 87,300    |
| June.....            | 2,640   | 792     | 1,150 | 2.44            | 2.72    | 68,400    |
| July.....            | 1,240   | 468     | 739   | 1.57            | 1.81    | 45,400    |
| August.....          | 463     | 325     | 372   | .788            | .91     | 22,900    |
| September.....       | 632     | 320     | 395   | .837            | .93     | 23,500    |
| The year.....        | 15,000  | 275     | 1,410 | 2.99            | 40.44   | 1,020,000 |
| 1931-32              |         |         |       |                 |         |           |
| October.....         | 4,590   | 295     | 1,050 | 2.22            | 2.56    | 64,600    |
| November.....        | 4,700   | 1,100   | 2,380 | 5.04            | 5.62    | 142,000   |
| December.....        | 6,970   | 1,110   | 2,640 | 5.59            | 6.44    | 162,000   |
| January.....         | 8,230   | 1,510   | 3,150 | 6.67            | 7.69    | 194,000   |
| February.....        | 9,870   | 1,080   | 2,410 | 5.11            | 5.51    | 139,000   |
| March.....           | 11,400  | 2,690   | 4,950 | 10.5            | 12.11   | 304,000   |
| April.....           | 5,530   | 2,770   | 3,670 | 7.78            | 8.68    | 218,000   |
| May.....             | 3,250   | 1,770   | 2,430 | 5.15            | 5.94    | 149,000   |
| June.....            | 3,090   | 1,530   | 2,060 | 4.36            | 4.86    | 123,000   |
| July.....            | 1,740   | 677     | 1,070 | 2.27            | 2.62    | 65,800    |
| August.....          | 671     | 452     | 553   | 1.17            | 1.35    | 34,000    |
| September.....       | 599     | 355     | 426   | .903            | 1.01    | 25,300    |
| The year.....        | 11,400  | 295     | 2,230 | 4.72            | 64.39   | 1,620,000 |
| 1932-33              |         |         |       |                 |         |           |
| October.....         | 1,320   | 325     | 703   | 1.49            | 1.72    | 43,200    |
| November.....        | 9,460   | 1,880   | 4,890 | 10.4            | 11.60   | 291,000   |
| December.....        | 9,700   | 1,570   | 3,980 | 8.43            | 9.72    | 245,000   |
| January.....         | 10,800  | 1,980   | 4,050 | 8.58            | 9.89    | 249,000   |
| February.....        | 3,810   | 1,200   | 1,850 | 3.92            | 4.08    | 103,000   |
| March.....           | 6,200   | 2,210   | 3,450 | 7.31            | 8.43    | 212,000   |
| April.....           | 3,570   | 1,710   | 2,280 | 4.83            | 5.39    | 136,000   |
| May.....             | 4,140   | 2,130   | 2,740 | 5.81            | 6.70    | 168,000   |
| June.....            | 9,440   | 2,610   | 3,740 | 7.92            | 8.84    | 223,000   |
| July.....            | 2,450   | 1,010   | 1,810 | 3.83            | 4.42    | 111,000   |
| August.....          | 2,130   | 581     | 864   | 1.83            | 2.11    | 53,100    |
| September.....       | 2,540   | 539     | 1,040 | 2.20            | 2.46    | 61,900    |
| The year.....        | 10,800  | 325     | 2,620 | 5.55            | 75.36   | 1,900,000 |

NOTE.—Records for years ending Sept. 30, 1930-32, supersede those published in Water-Supply Papers 709, 724, and 739.

## YOUNGS RIVER BASIN

## YOUNGS RIVER NEAR ASTORIA, OREG.

LOCATION.—Water-stage recorder in SE¼ sec. 27, T. 7 N., R. 9 W., 3 miles southwest of Olney and 9 miles south of Astoria.

DRAINAGE AREA.—30 square miles.

RECORDS AVAILABLE.—August 1927 to September 1933; March 1916 to September 1917 (stage only), at site 2 miles upstream.

DISCHARGE.—Maximum during year, 2,810 second-feet Dec. 2 (gage height, 5.68 feet); minimum, 5 second-feet Oct. 3–10.

1927–33: Maximum, 5,840 second-feet Mar. 31, 1931 (gage height, 6.3 feet); minimum, 4 second-feet Aug. 31, Sept., 2, 1931 (gage height, 0.92 foot).

REMARKS.—Records poor. No diversions or regulation above station. Gage-height record furnished by city engineer of Astoria.

*Discharge, in second-feet, 1932–33*

| Day | Oct. | Nov.  | Dec.  | Jan.  | Feb.  | Mar.  | Apr. | May | June | July | Aug. | Sept. |
|-----|------|-------|-------|-------|-------|-------|------|-----|------|------|------|-------|
| 1   | 6    | 298   | 1,270 | 1,110 | 450   | 385   | 350  | 98  | 63   | 35   | 12   | 10    |
| 2   | 6    | 714   | 2,060 | 1,450 | 355   | 492   | 259  | 94  | 60   | 33   | 12   | 9     |
| 3   | 5    | 408   | 776   | 821   | 284   | 559   | 217  | 91  | 56   | 30   | 12   | 8     |
| 4   | 5    | 325   | 440   | 803   | 245   | 420   | 173  | 115 | 52   | 27   | 13   | • 8   |
| 5   | 5    | 1,380 | 302   | 960   | 242   | 336   | 147  | 149 | 51   | 25   | 14   | • 8   |
| 6   | 5    | 996   | 237   | 758   | 237   | 668   | 131  | 164 | 51   | 24   | 14   | 18    |
| 7   | 5    | 486   | 199   | 758   | 208   | 700   | 137  | 504 | 54   | 24   | 13   | 16    |
| 8   | 5    | 774   | 169   | 950   | 186   | 462   | 147  | 480 | 445  | 24   | 12   | • 13  |
| 9   | 5    | 414   | 850   | 850   | 336   | 135   | 302  | 400 | 23   | 12   | 12   | • 10  |
| 10  | 5    | 272   | 684   | 684   | 415   | 121   | 224  | 242 | 22   | 12   | 8    |       |
| 11  | 11   | 198   | • 124 | 492   |       | 910   | 123  | 179 | 184  |      | 11   | 8     |
| 12  | 23   | 208   |       | 385   |       | 1,010 | 127  | 149 | 144  |      | 10   | 8     |
| 13  | 14   | 1,600 |       | 294   |       | 545   | 110  | 127 | 118  |      | 10   | 7     |
| 14  | 47   | 786   |       | 355   |       | 385   | 106  | 127 | 100  |      | 10   | 10    |
| 15  | 69   | 1,010 | 78    | 288   |       | 314   | 102  | 127 | 88   | • 18 | 10   | 25    |
| 16  | 73   | 901   | 80    | 245   |       | 341   | 110  | 114 | 78   |      | 9    | 26    |
| 17  | 59   | 680   | 76    | 212   |       | 284   | 97   | 109 | 69   |      | 9    | 23    |
| 18  | 38   | 414   | 144   | 192   | • 415 | 253   | 89   | 100 | 63   |      | 9    | 24    |
| 19  | 29   | 307   | 1,070 | 169   |       | 234   | 85   | 91  | 58   | 16   | 9    | 27    |
| 20  | 24   | 229   | 740   | 162   |       | 270   | 81   | 87  | 54   | 16   | 9    | 48    |
| 21  | 32   | 335   | 628   | 169   |       | 242   | 79   | 80  | 50   | 15   | 8    | 117   |
| 22  | 127  | 265   | 778   | 206   |       | 217   | 73   | 82  | 47   | 15   | 8    | 135   |
| 23  | 119  | 210   | 794   | 274   |       | 189   | 69   | 94  | 44   | 14   | 8    | 115   |
| 24  | 83   | 172   | 716   | 538   |       | 192   | 65   | 131 | 42   | 14   | 8    | 89    |
| 25  | 64   | 148   | 644   | 385   |       | 184   | 64   | 106 | 42   | 14   | 8    | 80    |
| 26  | 71   | 129   | 1,430 | 435   |       | 167   | 60   | 105 | 40   | 14   | 7    | 83    |
| 27  | 69   | 127   | 724   | 644   |       | 177   | 57   | 92  | 37   | 14   | 7    | 140   |
| 28  | 62   | 139   | 580   | 486   | 350   | 298   | 57   | 85  | 36   | 13   | 7    | 132   |
| 29  | 64   | 365   | 566   | 580   |       | 390   | 57   | 79  | 35   | 14   | 9    | 94    |
| 30  | 63   | 479   | 425   | 435   |       | 767   | 66   | 74  | 35   | 14   | 11   | 73    |
| 31  | 132  |       | 450   | 510   |       | 524   |      | 68  |      | 13   | 10   |       |

| Month     | Maximum | Minimum | Mean | Per square mile | Run-off |           |
|-----------|---------|---------|------|-----------------|---------|-----------|
|           |         |         |      |                 | Inches  | Acre-feet |
| October   | 132     | 5       | 42.7 | 1.42            | 1.64    | 2,630     |
| November  | 1,600   | 127     | 492  | 16.4            | 18.30   | 29,300    |
| December  | 2,060   | 76      | 520  | 17.3            | 19.94   | 32,000    |
| January   | 1,450   | 162     | 535  | 17.8            | 20.52   | 32,900    |
| February  |         |         | 373  | 12.4            | 12.91   | 20,700    |
| March     | 1,010   | 167     | 409  | 13.6            | 15.68   | 25,100    |
| April     | 350     | 157     | 116  | 3.87            | 4.32    | 6,900     |
| May       | 504     | 68      | 143  | 4.77            | 5.50    | 8,790     |
| June      | 445     | 35      | 94.6 | 3.15            | 3.51    | 5,630     |
| July      | 35      | 13      | 19.3 | .643            | .74     | 1,190     |
| August    | 14      | 7       | 10.1 | .337            | .39     | 621       |
| September | 140     | 7       | 45.7 | 1.52            | 1.70    | 2,720     |
| The year  | 2,060   | 5       | 233  | 7.77            | 105.15  | 168,000   |

• Estimated.

## STREAMS BETWEEN COLUMBIA RIVER AND KLAMATH RIVER

## WILSON RIVER BASIN

## WILSON RIVER NEAR TILLAMOOK, OREG.

LOCATION.—Staff gage in NW¼ sec. 18, T. 1 S., R. 8 W., 1 mile above North Fork and 7 miles east of Tillamook.

DRAINAGE AREA.—162 square miles.

RECORDS AVAILABLE.—July 1931 to September 1933. December 1914 to November 1916 (incomplete) at station three-quarters of a mile downstream.

DISCHARGE.—Maximum during year, 12,900 second-feet Dec. 19 (gage height, 11.16 feet); minimum, 62 second-feet Oct. 6, 9, 10 (gage height, 0.38 foot).

1914-16, 1931-33: Maximum, 16,700 second-feet Jan. 18, 1932 (gage height, 13.84 feet); minimum, that of Oct. 6, 9, 10, 1932.

Maximum stage known, about 20.8 feet at former gage in February 1916.

REMARKS.—Records excellent except those estimated, Oct. 2, June 15, Aug. 25-29, which are good. No diversions or regulation above gage.

*Discharge, in second-feet, 1932-33*

| Day     | Oct. | Nov.   | Dec.    | Jan.   | Feb.   | Mar.   | Apr.   | May    | June   | July | Aug. | Sept.  |
|---------|------|--------|---------|--------|--------|--------|--------|--------|--------|------|------|--------|
| 1.....  | 65   | 2, 180 | 5, 670  | 4, 270 | 1, 730 | 2, 440 | 2, 880 | 1, 120 | 760    | 338  | 138  | 100    |
| 2.....  | 66   | 3, 550 | 10, 000 | 8, 150 | 1, 340 | 2, 770 | 2, 660 | 1, 250 | 690    | 315  | 135  | 95     |
| 3.....  | 66   | 2, 620 | 6, 060  | 5, 150 | 1, 160 | 2, 660 | 2, 440 | 1, 160 | 690    | 295  | 145  | 95     |
| 4.....  | 65   | 2, 070 | 3, 670  | 5, 540 | 1, 070 | 2, 440 | 2, 130 | 1, 250 | 660    | 275  | 151  | 96     |
| 5.....  | 64   | 5, 800 | 2, 620  | 8, 900 | 1, 250 | 2, 030 | 2, 030 | 1, 530 | 630    | 275  | 163  | 95     |
| 6.....  | 62   | 6, 060 | 1, 870  | 7, 160 | 1, 250 | 3, 100 | 1, 530 | 1, 430 | 630    | 258  | 140  | 145    |
| 7.....  | 65   | 3, 310 | 1, 470  | 5, 280 | 1, 120 | 4, 150 | 1, 430 | 2, 030 | 600    | 258  | 138  | 151    |
| 8.....  | 65   | 3, 550 | 1, 190  | 6, 190 | 990    | 3, 100 | 1, 340 | 2, 550 | 3, 210 | 258  | 135  | 125    |
| 9.....  | 62   | 2, 730 | 1, 060  | 5, 540 | 870    | 2, 330 | 1, 070 | 2, 330 | 2, 990 | 240  | 130  | 105    |
| 10..... | 62   | 1, 870 | 920     | 4, 890 | 795    | 2, 550 | 990    | 1, 930 | 2, 030 | 233  | 125  | 100    |
| 11..... | 64   | 1, 370 | 840     | 3, 430 | 870    | 4, 890 | 1, 030 | 1, 730 | 1, 630 | 226  | 120  | 95     |
| 12..... | 120  | 1, 280 | 730     | 2, 550 | 1, 250 | 6, 600 | 990    | 1, 530 | 1, 250 | 219  | 120  | 91     |
| 13..... | 115  | 7, 710 | 662     | 2, 030 | 1, 120 | 4, 760 | 950    | 1, 340 | 1, 120 | 212  | 120  | 91     |
| 14..... | 365  | 5, 150 | 600     | 2, 030 | 1, 030 | 3, 320 | 1, 030 | 1, 250 | 990    | 205  | 115  | 95     |
| 15..... | 410  | 6, 590 | 570     | 1, 730 | 1, 250 | 2, 770 | 1, 070 | 1, 250 | 892    | 202  | 115  | 169    |
| 16..... | 300  | 7, 010 | 515     | 1, 430 | 1, 120 | 2, 880 | 1, 160 | 1, 250 | 795    | 196  | 115  | 208    |
| 17..... | 320  | 4, 510 | 515     | 1, 250 | 1, 120 | 2, 770 | 950    | 1, 250 | 725    | 193  | 110  | 178    |
| 18..... | 238  | 3, 070 | 1, 190  | 1, 160 | 1, 120 | 2, 440 | 870    | 1, 250 | 660    | 190  | 110  | 240    |
| 19..... | 186  | 2, 290 | 10, 000 | 990    | 1, 250 | 2, 230 | 795    | 1, 160 | 600    | 187  | 108  | 199    |
| 20..... | 156  | 1, 770 | 6, 190  | 910    | 1, 430 | 2, 660 | 795    | 1, 070 | 540    | 181  | 110  | 360    |
| 21..... | 130  | 1, 770 | 4, 890  | 870    | 3, 320 | 2, 440 | 870    | 990    | 510    | 175  | 105  | 510    |
| 22..... | 320  | 1, 770 | 4, 630  | 870    | 7, 580 | 2, 030 | 1, 030 | 990    | 482    | 172  | 100  | 1, 160 |
| 23..... | 435  | 1, 470 | 4, 630  | 870    | 5, 150 | 1, 730 | 1, 010 | 1, 250 | 455    | 169  | 100  | 870    |
| 24..... | 320  | 1, 140 | 4, 630  | 950    | 3, 550 | 1, 630 | 990    | 1, 730 | 455    | 157  | 105  | 1, 120 |
| 25..... | 280  | 1, 060 | 4, 150  | 870    | 2, 880 | 1, 430 | 950    | 1, 730 | 430    | 151  | 100  | 1, 070 |
| 26..... | 245  | 880    | 7, 860  | 1, 030 | 4, 510 | 1, 250 | 950    | 1, 430 | 405    | 148  | 90   | 795    |
| 27..... | 217  | 802    | 5, 280  | 1, 430 | 3, 430 | 1, 340 | 990    | 1, 250 | 382    | 145  | 90   | 760    |
| 28..... | 210  | 802    | 4, 150  | 1, 250 | 2, 880 | 2, 880 | 1, 070 | 1, 120 | 360    | 145  | 100  | 660    |
| 29..... | 231  | 2, 290 | 3, 430  | 1, 250 | -----  | 2, 990 | 1, 030 | 1, 070 | 360    | 157  | 102  | 1, 250 |
| 30..... | 280  | 2, 730 | 2, 990  | 1, 120 | -----  | 4, 760 | 910    | 1, 030 | 338    | 145  | 105  | 870    |
| 31..... | 515  | -----  | 2, 770  | 1, 430 | -----  | 4, 270 | -----  | 870    | -----  | 140  | 105  | -----  |

| Month          | Maximum | Minimum | Mean   | Per square mile | Run-off |             |
|----------------|---------|---------|--------|-----------------|---------|-------------|
|                |         |         |        |                 | Inches  | Acre-feet   |
| October.....   | 515     | 62      | 197    | 1. 22           | 1. 41   | 12, 100     |
| November.....  | 7, 710  | 802     | 2, 970 | 18. 3           | 20. 42  | 177, 000    |
| December.....  | 10, 000 | 515     | 3, 410 | 21. 0           | 24. 21  | 210, 000    |
| January.....   | 8, 900  | 870     | 2, 920 | 18. 0           | 20. 75  | 180, 000    |
| February.....  | 7, 580  | 795     | 2, 020 | 12. 5           | 13. 02  | 112, 000    |
| March.....     | 6, 600  | 1, 250  | 2, 890 | 17. 8           | 20. 52  | 178, 000    |
| April.....     | 2, 880  | 795     | 1, 260 | 7. 78           | 8. 68   | 75, 000     |
| May.....       | 2, 550  | 870     | 1, 390 | 8. 58           | 9. 89   | 85, 500     |
| June.....      | 3, 210  | 338     | 876    | 5. 41           | 6. 04   | 52, 100     |
| July.....      | 338     | 140     | 208    | 1. 28           | 1. 48   | 12, 800     |
| August.....    | 163     | 90      | 118    | . 728           | . 84    | 7, 260      |
| September..... | 1, 250  | 91      | 397    | 2. 45           | 2. 73   | 23, 600     |
| The year.....  | 10, 000 | 62      | 1, 550 | 9. 57           | 129. 99 | 1, 130, 000 |

## TRASK RIVER BASIN

## TRASK RIVER NEAR TILLAMOOK, OREG.

LOCATION.—Water-stage recorder in NW¼ sec. 30, T. 1 S., R. 8 W., half a mile above Gold Creek and 6 miles east of Tillamook.

DRAINAGE AREA.—152 square miles.

RECORDS AVAILABLE.—July 1931 to September 1933.

DISCHARGE.—Maximum during year, 10,200 second-feet Dec. 2 (gage height, 8.55 feet); minimum, 64 second-feet Oct. 3–10 (gage height, 1.50 foot).

1931–33: Maximum, 12,500 second-feet Jan. 18, 1932; minimum, that of Oct. 3–10, 1932.

Maximum stage known, about 17 feet, probably occurred during floods of November 1921 or Mar. 31, 1931 (discharge, about 30,000 second-feet).

REMARKS.—Records excellent. Discharge estimated Oct. 10–12. No diversions or regulation above station.

*Discharge, in second-feet, 1932–33*

| Day | Oct. | Nov.  | Dec.  | Jan.  | Feb.  | Mar.  | Apr.  | May   | June  | July | Aug. | Sept. |
|-----|------|-------|-------|-------|-------|-------|-------|-------|-------|------|------|-------|
| 1   | 67   | 958   | 4,000 | 3,610 | 1,750 | 2,060 | 2,520 | 859   | 578   | 299  | 140  | 103   |
| 2   | 67   | 1,780 | 9,110 | 8,970 | 1,480 | 2,380 | 2,060 | 887   | 555   | 299  | 135  | 101   |
| 3   | 64   | 1,780 | 5,520 | 5,360 | 1,280 | 2,660 | 1,990 | 852   | 515   | 279  | 140  | 95    |
| 4   | 64   | 1,390 | 3,110 | 4,850 | 1,110 | 2,250 | 1,640 | 930   | 485   | 275  | 148  | 97    |
| 5   | 64   | 2,410 | 2,170 | 6,760 | 1,110 | 1,870 | 1,380 | 1,070 | 460   | 268  | 155  | 107   |
| 6   | 64   | 3,250 | 1,630 | 6,220 | 1,110 | 2,730 | 1,240 | 1,200 | 436   | 254  | 142  | 160   |
| 7   | 64   | 2,060 | 1,300 | 4,350 | 1,030 | 3,710 | 1,150 | 1,870 | 427   | 247  | 135  | 148   |
| 8   | 64   | 2,720 | 1,100 | 5,360 | 938   | 2,880 | 1,070 | 2,380 | 1,520 | 236  | 130  | 111   |
| 9   | 64   | 2,000 | 958   | 5,020 | 812   | 2,250 | 960   | 2,250 | 1,930 | 233  | 125  | 103   |
| 10  | 64   | 1,480 | 860   | 4,350 | 767   | 2,250 | 887   | 1,750 | 1,480 | 230  | 125  | 99    |
| 11  | 66   | 1,220 | 770   | 3,180 | 832   | 4,190 | 960   | 1,430 | 1,150 | 219  | 121  | 97    |
| 12  | 110  | 1,100 | 710   | 2,380 | 1,200 | 5,190 | 938   | 1,200 | 952   | 216  | 119  | 95    |
| 13  | 108  | 3,740 | 669   | 1,870 | 1,110 | 3,950 | 901   | 1,030 | 838   | 216  | 117  | 95    |
| 14  | 273  | 3,740 | 614   | 1,810 | 1,030 | 2,880 | 901   | 990   | 748   | 202  | 117  | 103   |
| 15  | 265  | 3,960 | 586   | 1,530 | 1,200 | 2,380 | 952   | 982   | 679   | 193  | 117  | 175   |
| 16  | 265  | 4,710 | 576   | 1,280 | 1,110 | 2,660 | 922   | 952   | 616   | 187  | 117  | 181   |
| 17  | 285  | 3,740 | 545   | 1,200 | 1,070 | 2,450 | 838   | 975   | 556   | 181  | 113  | 158   |
| 18  | 184  | 2,590 | 912   | 1,030 | 1,110 | 2,180 | 780   | 915   | 530   | 181  | 109  | 196   |
| 19  | 147  | 2,000 | 5,860 | 922   | 1,240 | 2,060 | 728   | 873   | 495   | 181  | 109  | 202   |
| 20  | 128  | 1,530 | 4,870 | 859   | 1,480 | 2,320 | 715   | 812   | 460   | 175  | 109  | 196   |
| 21  | 124  | 1,440 | 4,410 | 826   | 3,020 | 2,120 | 728   | 748   | 436   | 170  | 105  | 236   |
| 22  | 344  | 1,220 | 3,670 | 806   | 5,530 | 1,750 | 767   | 806   | 418   | 168  | 105  | 500   |
| 23  | 362  | 1,060 | 3,960 | 845   | 5,020 | 1,530 | 774   | 887   | 396   | 165  | 101  | 709   |
| 24  | 269  | 958   | 3,530 | 915   | 3,320 | 1,380 | 741   | 982   | 386   | 160  | 105  | 655   |
| 25  | 221  | 892   | 3,530 | 859   | 2,590 | 1,280 | 728   | 945   | 386   | 158  | 103  | 793   |
| 26  | 191  | 800   | 6,210 | 982   | 3,100 | 1,200 | 703   | 859   | 360   | 155  | 87   | 589   |
| 27  | 170  | 770   | 4,560 | 1,580 | 2,730 | 1,280 | 703   | 774   | 343   | 150  | 91   | 490   |
| 28  | 167  | 740   | 3,810 | 1,330 | 2,380 | 1,870 | 722   | 709   | 335   | 150  | 97   | 409   |
| 29  | 156  | 1,780 | 3,460 | 1,280 | ----- | 2,450 | 715   | 691   | 323   | 155  | 101  | 679   |
| 30  | 144  | 2,000 | 2,780 | 1,150 | ----- | 3,710 | 703   | 650   | 311   | 155  | 105  | 572   |
| 31  | 269  | ----- | 2,470 | 1,480 | ----- | 3,550 | ----- | 606   | ----- | 145  | 103  | ----- |

| Month     | Maximum | Minimum | Mean  | Per square mile | Run-off |           |
|-----------|---------|---------|-------|-----------------|---------|-----------|
|           |         |         |       |                 | Inches  | Acre-feet |
| October   | 362     | 64      | 158   | 1.04            | 1.20    | 9,720     |
| November  | 4,710   | 740     | 1,990 | 13.1            | 14.62   | 118,000   |
| December  | 9,110   | 545     | 2,850 | 18.8            | 21.67   | 175,000   |
| January   | 8,970   | 806     | 2,680 | 17.6            | 20.29   | 165,000   |
| February  | 5,530   | 767     | 1,800 | 11.8            | 12.29   | 100,000   |
| March     | 5,190   | 1,200   | 2,500 | 16.4            | 18.91   | 154,000   |
| April     | 2,520   | 703     | 1,030 | 6.78            | 7.56    | 61,300    |
| May       | 2,380   | 606     | 1,060 | 6.97            | 8.04    | 65,200    |
| June      | 1,930   | 311     | 636   | 4.18            | 4.66    | 37,800    |
| July      | 299     | 145     | 203   | 1.34            | 1.54    | 12,500    |
| August    | 155     | 87      | 117   | .770            | .89     | 7,190     |
| September | 793     | 95      | 275   | 1.81            | 2.02    | 16,400    |
| The year  | 9,110   | 64      | 1,270 | 8.36            | 113.69  | 922,000   |

## NESTUCCA RIVER BASIN

## NESTUCCA RIVER NEAR McMinnville, OREG.

LOCATION.—Water-stage recorder in SW¼ sec. 8, T. 3 S., R. 6 W., half a mile below dam at outlet of Meadow Lake and 13 miles northwest of McMinnville.

DRAINAGE AREA.—12 square miles.

RECORDS AVAILABLE.—October 1928 to September 1933.

DISCHARGE.—Maximum during year, 720 second-feet Dec. 2 (gage height, 3.73 feet); minimum, 1.6 second-feet Oct. 6, 7 (gage height, 0.40 foot).

1928-33: Maximum, 1,600 second-feet Mar. 31, 1931 (gage height, 4.84 feet); minimum, 1.0 second-foot Oct. 11, 1929.

REMARKS.—Records good. No diversions above gage. Flow regulated to a small extent by dam at outlet of Meadow Lake.

*Discharge, in second-feet, 1932-33*

| Day     | Oct. | Nov.  | Dec. | Jan. | Feb.  | Mar. | Apr.  | May | June  | July | Aug. | Sept. |
|---------|------|-------|------|------|-------|------|-------|-----|-------|------|------|-------|
| 1.....  | 1.8  | 10    | 256  | 133  | 53    | 86   | 160   | 74  | 35    | 15   | 5.7  | 3.8   |
| 2.....  | 1.7  | 26    | 654  | 450  | 49    | 96   | 125   | 76  | 33    | 15   | 5.5  | 3.8   |
| 3.....  | 1.7  | 43    | 360  | 232  | 45    | 102  | 118   | 69  | 30    | 14   | 5.5  | 3.8   |
| 4.....  | 1.7  | 45    | 171  | 247  | 43    | 90   | 112   | 70  | 29    | 14   | 5.7  | 3.7   |
| 5.....  | 1.7  | 68    | 110  | 390  | 41    | 82   | 101   | 76  | 27    | 13   | 5.9  | 4.1   |
| 6.....  | 1.6  | 122   | 84   | 380  | 40    | 91   | 96    | 78  | 26    | 12   | 6.1  | 4.7   |
| 7.....  | 1.6  | 82    | 71   | 235  | 39    | 122  | 91    | 106 | 26    | 12   | 6.1  | 5.0   |
| 8.....  | 1.7  | 81    | 57   | 217  | 38    | 108  | 84    | 142 | 47    | 11   | 5.9  | 5.0   |
| 9.....  | 1.7  | 70    | 48   | 220  | 36    | 93   | 77    | 165 | 89    | 11   | 5.7  | 4.7   |
| 10..... | 1.7  | 54    | 43   | 208  | 35    | 100  | 71    | 125 | 72    | 14   | 5.5  | 4.6   |
| 11..... | 1.7  | 43    | 38   | 158  | 38    | 185  | 69    | 104 | 67    | 16   | 5.2  | 4.2   |
| 12..... | 1.8  | 36    | 36   | 122  | 50    | 279  | 71    | 86  | 55    | 14   | 5.0  | 4.1   |
| 13..... | 2.0  | 91    | 33   | 98   | 48    | 217  | 68    | 76  | 47    | 13   | 4.8  | 3.8   |
| 14..... | 2.3  | 229   | 31   | 97   | 45    | 152  | 68    | 69  | 32    | 12   | 4.7  | 4.0   |
| 15..... | 2.7  | 213   | 29   | 88   | 50    | 125  | 71    | 65  | 38    | 10   | 4.4  | 4.6   |
| 16..... | 3.1  | 224   | 28   | 76   | 50    | 152  | 72    | 62  | 38    | 10   | 4.2  | 4.8   |
| 17..... | 3.5  | 141   | 27   | 69   | 49    | 138  | 67    | 64  | 33    | 9.5  | 4.1  | 5.0   |
| 18..... | 3.6  | 96    | 43   | 66   | 48    | 129  | 63    | 60  | 30    | 9.0  | 4.1  | 5.3   |
| 19..... | 3.4  | 75    | 504  | 59   | 47    | 118  | 59    | 57  | 28    | 8.6  | 4.0  | 5.2   |
| 20..... | 3.4  | 61    | 385  | 54   | 54    | 129  | 58    | 54  | 26    | 8.6  | 3.8  | 5.2   |
| 21..... | 3.3  | 53    | 272  | 52   | 106   | 122  | 59    | 50  | 22    | 7.9  | 3.8  | 5.7   |
| 22..... | 3.9  | 47    | 217  | 50   | 247   | 104  | 61    | 49  | 18    | 7.7  | 3.7  | 9.0   |
| 23..... | 4.9  | 40    | 256  | 43   | 223   | 91   | 64    | 55  | 20    | 7.4  | 3.5  | 11    |
| 24..... | 5.0  | 36    | 211  | 47   | 138   | 84   | 64    | 56  | 20    | 7.2  | 3.5  | 14    |
| 25..... | 4.7  | 31    | 200  | 45   | 110   | 78   | 64    | 53  | 20    | 7.0  | 3.5  | 16    |
| 26..... | 4.6  | 27    | 355  | 46   | 124   | 75   | 63    | 50  | 19    | 6.8  | 3.4  | 15    |
| 27..... | 4.3  | 25    | 276  | 62   | 110   | 88   | 62    | 46  | 18    | 6.4  | 3.3  | 14    |
| 28..... | 3.9  | 25    | 223  | 56   | 96    | 131  | 63    | 43  | 17    | 6.2  | 3.3  | 14    |
| 29..... | 3.9  | 72    | 185  | 50   | ----- | 167  | 61    | 40  | 17    | 6.1  | 3.4  | 14    |
| 30..... | 3.9  | 124   | 140  | 46   | ----- | 229  | 59    | 38  | 16    | 6.1  | 3.7  | 13    |
| 31..... | 5.0  | ----- | 125  | 47   | ----- | 238  | ----- | 36  | ----- | 6.1  | 3.8  | ----- |

| Month          | Maximum | Minimum | Mean | Per square mile | Run-off |           |
|----------------|---------|---------|------|-----------------|---------|-----------|
|                |         |         |      |                 | Inches  | Acre-feet |
| October.....   | 5.0     | 1.6     | 2.96 | 0.247           | 0.28    | 182       |
| November.....  | 229     | 10      | 76.3 | 6.36            | 7.10    | 4,540     |
| December.....  | 654     | 27      | 176  | 14.7            | 16.95   | 10,800    |
| January.....   | 450     | 45      | 135  | 11.2            | 12.91   | 8,300     |
| February.....  | 247     | 35      | 73.3 | 6.11            | 6.36    | 4,070     |
| March.....     | 279     | 75      | 129  | 10.7            | 12.34   | 7,930     |
| April.....     | 160     | 58      | 77.4 | 6.45            | 7.20    | 4,610     |
| May.....       | 165     | 36      | 70.8 | 5.90            | 6.80    | 4,350     |
| June.....      | 89      | 16      | 33.5 | 2.79            | 3.11    | 1,990     |
| July.....      | 16      | 6.1     | 10.2 | .850            | .98     | 627       |
| August.....    | 6.1     | 3.3     | 4.54 | .378            | .44     | 279       |
| September..... | 16      | 3.7     | 7.17 | .597            | .67     | 427       |
| The year.....  | 654     | 1.6     | 66.6 | 5.55            | 75.14   | 48,100    |

## SILETZ RIVER BASIN

## SILETZ RIVER AT SILETZ, OREG.

LOCATION.—Wire-weight gage in SW¼ sec. 9, T. 10 S., R. 10 W., at highway bridge three-quarters of a mile southwest of Siletz.

DRAINAGE AREA.—204 square miles.

RECORDS AVAILABLE.—November 1905 to May 1912; January 1924 to September 1933.

DISCHARGE.—Maximum during year, 19,800 second-feet Jan. 2 (gage height, 17.86 feet); minimum, 69 second-feet Oct. 5-8 (gage height, 0.87 foot).

1905-12, 1924-33: Maximum, 34,600 second-feet Nov. 22, 1909; minimum, 51 second-feet Dec. 6, 7, 1929. Average, 13 years (1906-11, 1925-33), 1,760 second-feet.

Maximum discharge known, 40,800 second-feet Nov. 20, 1921 (revised gage height, 31.6 feet at present gage).

REMARKS.—Records good, except those for November to June, which are fair. Discharge estimated Nov. 18. No diversions for irrigation above station. Flow regulated slightly at low and medium stages by operation of logging pond at Valsetz.

*Discharge, in second-feet, 1932-33*

| Day     | Oct. | Nov.  | Dec.   | Jan.   | Feb.  | Mar.  | Apr.   | May   | June  | July | Aug. | Sept. |
|---------|------|-------|--------|--------|-------|-------|--------|-------|-------|------|------|-------|
| 1.....  | 70   | 3,050 | 4,910  | 4,050  | 4,530 | 3,810 | 4,170. | 1,700 | 1,030 | 440  | 145  | 119   |
| 2.....  | 70   | 4,910 | 12,200 | 19,800 | 3,590 | 5,300 | 3,150  | 1,630 | 970   | 420  | 145  | 103   |
| 3.....  | 70   | 4,290 | 8,160  | 9,140  | 2,190 | 5,690 | 2,750  | 1,560 | 910   | 400  | 145  | 100   |
| 4.....  | 70   | 2,650 | 5,300  | 7,180  | 2,370 | 4,910 | 2,550  | 1,780 | 910   | 400  | 225  | 100   |
| 5.....  | 69   | 3,810 | 3,590  | 8,300  | 3,050 | 4,050 | 2,020  | 2,550 | 860   | 360  | 170  | 103   |
| 6.....  | 69   | 4,530 | 2,370  | 9,280  | 1,940 | 3,150 | 1,780  | 3,590 | 810   | 325  | 160  | 325   |
| 7.....  | 69   | 3,150 | 1,860  | 5,950  | 1,860 | 5,430 | 1,630  | 5,560 | 810   | 308  | 150  | 325   |
| 8.....  | 69   | 2,950 | 1,630  | 4,650  | 1,700 | 3,810 | 1,560  | 6,620 | 2,460 | 290  | 145  | 170   |
| 9.....  | 70   | 2,460 | 1,420  | 5,560  | 1,700 | 3,050 | 1,420  | 7,460 | 7,460 | 290  | 141  | 145   |
| 10..... | 70   | 2,100 | 1,210  | 4,780  | 1,420 | 2,550 | 1,280  | 5,040 | 4,410 | 272  | 136  | 123   |
| 11..... | 70   | 1,860 | 1,090  | 3,810  | 1,630 | 5,560 | 1,210  | 3,590 | 3,480 | 255  | 127  | 123   |
| 12..... | 103  | 1,490 | 1,030  | 3,150  | 3,150 | 8,160 | 1,090  | 2,750 | 2,370 | 255  | 123  | 113   |
| 13..... | 170  | 3,930 | 910    | 2,460  | 2,850 | 5,820 | 1,090  | 2,280 | 1,860 | 255  | 123  | 103   |
| 14..... | 615  | 3,590 | 860    | 2,460  | 2,650 | 4,170 | 1,090  | 1,940 | 1,630 | 240  | 123  | 103   |
| 15..... | 615  | 4,650 | 810    | 2,190  | 3,260 | 3,260 | 1,090  | 2,280 | 1,420 | 240  | 119  | 710   |
| 16..... | 380  | 7,740 | 760    | 1,780  | 3,150 | 3,050 | 1,150  | 2,020 | 1,210 | 240  | 115  | 342   |
| 17..... | 525  | 6,080 | 760    | 1,560  | 3,050 | 2,850 | 1,030  | 1,420 | 1,090 | 225  | 115  | 308   |
| 18..... | 325  | 4,300 | 860    | 1,490  | 2,750 | 2,650 | 910    | 1,700 | 970   | 225  | 115  | 325   |
| 19..... | 255  | 3,050 | 17,000 | 1,420  | 2,850 | 2,950 | 860    | 2,020 | 910   | 225  | 115  | 308   |
| 20..... | 210  | 2,850 | 7,320  | 1,280  | 2,950 | 3,050 | 860    | 1,860 | 860   | 225  | 115  | 440   |
| 21..... | 182  | 1,860 | 7,180  | 1,350  | 4,530 | 2,650 | 860    | 1,700 | 790   | 210  | 111  | 760   |
| 22..... | 660  | 1,630 | 7,180  | 1,420  | 7,320 | 2,460 | 860    | 1,630 | 615   | 195  | 107  | 1,630 |
| 23..... | 660  | 1,420 | 7,460  | 1,700  | 8,160 | 2,100 | 860    | 2,020 | 615   | 195  | 107  | 1,030 |
| 24..... | 660  | 1,210 | 5,950  | 2,020  | 5,690 | 1,860 | 860    | 2,650 | 615   | 182  | 103  | 970   |
| 25..... | 570  | 1,090 | 6,480  | 2,020  | 4,170 | 1,780 | 970    | 2,650 | 615   | 170  | 100  | 970   |
| 26..... | 460  | 1,090 | 14,000 | 2,190  | 4,050 | 1,630 | 910    | 2,190 | 615   | 160  | 100  | 1,090 |
| 27..... | 400  | 970   | 8,720  | 7,880  | 4,050 | 1,700 | 910    | 1,940 | 570   | 160  | 100  | 970   |
| 28..... | 342  | 860   | 6,760  | 5,170  | 4,780 | 2,550 | 910    | 1,700 | 525   | 155  | 100  | 910   |
| 29..... | 342  | 3,150 | 6,080  | 4,170  | ----- | 3,930 | 910    | 1,560 | 480   | 155  | 123  | 1,090 |
| 30..... | 325  | 3,590 | 4,780  | 3,260  | ----- | 5,560 | 1,090  | 1,420 | 480   | 155  | 170  | 1,030 |
| 31..... | 860  | ----- | 4,530  | 3,930  | ----- | 5,950 | -----  | 1,150 | ----- | 145  | 123  | ----- |

| Month          | Maximum | Minimum | Mean  | Per square mile | Run-off |           |
|----------------|---------|---------|-------|-----------------|---------|-----------|
|                |         |         |       |                 | Inches  | Acre-feet |
| October.....   | 860     | 69      | 304   | 1.49            | 1.72    | 18,700    |
| November.....  | 7,740   | 860     | 3,010 | 14.8            | 16.51   | 179,000   |
| December.....  | 17,000  | 760     | 4,940 | 24.2            | 27.90   | 304,000   |
| January.....   | 19,800  | 1,280   | 4,370 | 21.4            | 24.67   | 269,000   |
| February.....  | 8,160   | 1,420   | 3,410 | 16.7            | 17.39   | 189,000   |
| March.....     | 8,160   | 1,630   | 3,720 | 18.2            | 20.98   | 229,000   |
| April.....     | 4,170   | 860     | 1,390 | 6.81            | 7.60    | 82,700    |
| May.....       | 7,460   | 1,150   | 2,580 | 12.6            | 14.53   | 159,000   |
| June.....      | 7,460   | 480     | 1,410 | 6.91            | 7.71    | 83,900    |
| July.....      | 440     | 145     | 251   | 1.23            | 1.42    | 15,400    |
| August.....    | 225     | 100     | 129   | .632            | .73     | 7,930     |
| September..... | 1,630   | 100     | 498   | 2.44            | 2.72    | 29,600    |
| The year.....  | 19,800  | 69      | 2,160 | 10.6            | 143.88  | 1,570,000 |

## SIUSLAW RIVER BASIN

SIUSLAW RIVER ABOVE WILDCAT CREEK, AT AUSTA, OREG.

LOCATION.—Water-stage recorder in SE¼ sec. 16, T. 18 S., R. 8 W., a quarter of a mile above Wildcat Creek and Austa.

DRAINAGE AREA.—267 square miles.

RECORDS AVAILABLE.—September 1931 to September 1933.

DISCHARGE.—Maximum during year, 10,800 second-feet Jan. 2 (gage height, 13.90 feet); minimum, 26 second-feet Oct. 10, 11 (gage height, 1.13 feet).

1931-33: Maximum that of Jan. 2, 1933; minimum, 22 second-feet Sept. 4, 5, 1931 (gage height, 107 feet).

REMARKS.—Records good. No diversions or regulation above gage.

*Discharge, in second-feet, 1932-33*

| Day     | Oct. | Nov.  | Dec.  | Jan.  | Feb.  | Mar.  | Apr.  | May   | June  | July | Aug. | Sept. |
|---------|------|-------|-------|-------|-------|-------|-------|-------|-------|------|------|-------|
| 1.....  | 29   | 56    | 535   | 2,090 | 3,230 | 2,650 | 1,500 | 310   | 330   | 215  | 82   | 60    |
| 2.....  | 29   | 114   | 710   | 9,100 | 2,650 | 2,490 | 1,230 | 352   | 310   | 215  | 82   | 56    |
| 3.....  | 28   | 177   | 610   | 8,100 | 2,090 | 2,410 | 1,050 | 330   | 290   | 208  | 80   | 56    |
| 4.....  | 28   | 250   | 465   | 4,880 | 1,710 | 2,250 | 930   | 420   | 330   | 198  | 82   | 55    |
| 5.....  | 28   | 465   | 398   | 2,890 | 1,500 | 1,850 | 815   | 660   | 290   | 180  | 96   | 54    |
| 6.....  | 28   | 930   | 330   | 2,570 | 1,290 | 1,570 | 710   | 870   | 290   | 174  | 92   | 75    |
| 7.....  | 27   | 465   | 290   | 2,010 | 1,230 | 1,360 | 710   | 990   | 270   | 162  | 88   | 92    |
| 8.....  | 27   | 488   | 250   | 1,570 | 1,110 | 1,230 | 660   | 2,890 | 375   | 156  | 80   | 77    |
| 9.....  | 27   | 510   | 215   | 1,360 | 990   | 1,110 | 660   | 3,230 | 2,330 | 153  | 80   | 66    |
| 10..... | 26   | 330   | 201   | 1,290 | 930   | 1,050 | 610   | 1,570 | 1,710 | 150  | 78   | 60    |
| 11..... | 26   | 232   | 150   | 1,170 | 930   | 1,290 | 560   | 1,170 | 1,170 | 147  | 77   | 59    |
| 12..... | 28   | 174   |       | 990   | 1,640 | 1,850 | 535   | 930   | 870   | 147  | 74   | 56    |
| 13..... | 30   | 232   |       | 930   | 1,930 | 1,710 | 510   | 870   | 710   | 145  | 72   | 54    |
| 14..... | 74   | 660   |       | 930   | 1,640 | 1,430 | 488   | 660   | 560   | 134  | 67   | 52    |
| 15..... | 70   | 760   |       | 930   | 4,880 | 1,230 | 465   | 660   | 510   | 126  | 66   | 61    |
| 16..... | 67   | 1,360 | 310   | 930   | 4,680 | 1,170 | 465   | 585   | 442   | 123  | 64   | 67    |
| 17..... | 86   | 815   |       | 930   | 3,050 | 1,170 | 442   | 660   | 420   | 123  | 64   | 64    |
| 18..... | 67   | 535   |       | 930   | 2,330 | 1,110 | 442   | 660   | 398   | 123  | 64   | 80    |
| 19..... | 61   | 375   |       | 930   | 2,170 | 1,050 | 420   | 660   | 352   | 118  | 61   | 74    |
| 20..... | 51   | 290   |       | 870   | 1,850 | 990   | 398   | 610   | 330   | 114  | 61   | 72    |
| 21..... | 59   | 250   | 4,400 | 870   | 2,170 | 930   | 375   | 560   | 330   | 112  | 61   | 80    |
| 22..... | 59   | 215   | 2,410 | 1,110 | 2,410 | 870   | 375   | 510   | 290   | 102  | 63   | 98    |
| 23..... | 84   | 187   | 4,880 | 1,290 | 3,140 | 815   | 352   | 585   | 290   | 100  | 59   | 96    |
| 24..... | 82   | 168   | 3,860 | 1,430 | 2,650 | 760   | 352   | 560   | 270   | 100  | 59   | 98    |
| 25..... | 70   | 156   | 3,590 | 1,780 | 2,090 | 710   | 330   | 510   | 270   | 100  | 58   | 100   |
| 26..... | 64   | 139   | 5,080 | 2,570 | 1,780 | 660   | 330   | 510   | 250   | 100  | 56   | 92    |
| 27..... | 54   | 136   | 4,130 | 7,220 | 1,640 | 710   | 330   | 465   | 250   | 98   | 54   | 90    |
| 28..... | 60   | 145   | 2,410 | 5,180 | 2,570 | 1,050 | 290   | 420   | 232   | 96   | 54   | 80    |
| 29..... | 44   | 232   | 2,250 | 3,320 | ----- | 1,360 | 290   | 398   | 232   | 90   | 54   | 82    |
| 30..... | 42   | 465   | 1,850 | 2,970 | ----- | 1,500 | 290   | 352   | 215   | 88   | 61   | 77    |
| 31..... | 40   | ----- | 1,640 | 3,140 | ----- | 1,850 | ----- | 330   | ----- | 84   | 61   | ----- |

| Month          | Maximum | Minimum | Mean  | Per square mile | Run-off |           |
|----------------|---------|---------|-------|-----------------|---------|-----------|
|                |         |         |       |                 | Inches  | Acre-feet |
| October.....   | 86      | 26      | 48.2  | 0.181           | 0.21    | 2,960     |
| November.....  | 1,360   | 56      | 377   | 1.41            | 1.57    | 22,400    |
| December.....  | 5,080   | -----   | 1,570 | 5.88            | 6.78    | 96,500    |
| January.....   | 9,100   | 870     | 2,460 | 9.21            | 10.62   | 151,000   |
| February.....  | 4,880   | 930     | 2,150 | 8.05            | 8.38    | 119,000   |
| March.....     | 2,650   | 660     | 1,360 | 5.09            | 5.87    | 83,600    |
| April.....     | 1,500   | 290     | 564   | 2.11            | 2.35    | 33,600    |
| May.....       | 3,230   | 310     | 783   | 2.93            | 3.38    | 48,100    |
| June.....      | 2,330   | 215     | 497   | 1.86            | 2.08    | 29,600    |
| July.....      | 215     | 84      | 135   | .505            | .58     | 8,300     |
| August.....    | 96      | 54      | 69.4  | .260            | .30     | 4,270     |
| September..... | 100     | 52      | 72.8  | .273            | .30     | 4,330     |
| The year.....  | 9,100   | 26      | 835   | 3.13            | 42.42   | 604,000   |

## LAKE CREEK AT TRIANGLE LAKE, OREG.

LOCATION.—Water-stage recorder in NW¼ sec. 29, T. 16 S., R. 7 W., 500 feet below outlet of Triangle Lake.

DRAINAGE AREA.—50 square miles.

RECORDS AVAILABLE.—August 1931 to September 1933.

DISCHARGE.—Maximum during year, 2,670 second-feet Jan. 3 (gage height, 6.59 feet); minimum, 8 second-feet Oct. 3-12; minimum gage height, 0.47 foot Oct. 8-11.

1931-33: Maximum, that of Jan. 3, 1933; minimum, 8 second-feet Aug. 27 to Sept. 8, Oct. 3-12, 1931.

REMARKS.—Records excellent except those estimated, Mar. 2-13, 15-28, Mar. 30 to Apr. 12, which are fair. No diversions above gage. Flow regulated by natural storage in Triangle Lake.

## Discharge, in second-feet, 1932-33

| Day | Oct. | Nov. | Dec.  | Jan.  | Feb.  | Mar. | Apr. | May | June | July | Aug. | Sept. |
|-----|------|------|-------|-------|-------|------|------|-----|------|------|------|-------|
| 1   | 9    | 22   | 186   | 652   | 565   | 902  |      | 112 | 141  | 76   | 30   | 21    |
| 2   | 9    | 32   | 197   | 1,735 | 585   |      |      | 125 | 134  | 74   | 29   | 21    |
| 3   | 8    | 53   | 210   | 2,210 | 525   |      |      | 130 | 128  | 71   | 28   | 20    |
| 4   | 8    | 68   | 210   | 1,430 | 445   |      |      | 138 | 126  | 68   | 29   | 20    |
| 5   | 8    | 79   | 190   | 1,070 | 390   |      |      | 163 | 121  | 66   | 29   | 20    |
| 6   | 8    | 149  | 165   | 902   | 358   |      |      | 203 | 112  | 63   | 30   | 22    |
| 7   | 8    | 214  | 143   | 825   | 332   | 692  | 258  | 287 | 109  | 61   | 29   | 24    |
| 8   | 8    | 184  | 128   | 700   | 323   |      |      | 525 | 136  | 59   | 28   | 25    |
| 9   | 8    | 177  | 110   | 585   | 314   |      |      | 775 | 257  | 56   | 27   | 25    |
| 10  | 8    | 169  | 97    | 525   | 293   |      |      | 750 | 386  | 54   | 26   | 24    |
| 11  | 8    | 136  | 88    | 457   | 293   |      |      | 565 | 344  | 53   | 25   | 23    |
| 12  | 8    | 110  | 80    | 397   | 380   |      |      | 422 | 270  | 52   | 25   | 22    |
| 13  | 10   | 102  | 75    | 348   | 525   |      | 182  | 338 | 226  | 51   | 24   | 21    |
| 14  | 14   | 117  | 71    | 320   | 545   | 700  | 173  | 284 | 197  | 48   | 24   | 21    |
| 15  | 17   | 153  | 67    | 308   | 602   |      | 165  | 257 | 175  | 47   | 23   | 22    |
| 16  | 19   | 249  | 65    | 284   | 750   |      | 165  | 244 | 157  | 44   | 22   | 22    |
| 17  | 21   | 308  | 66    | 254   | 750   |      | 163  | 249 | 143  | 43   | 22   | 23    |
| 18  | 21   | 244  | 163   | 246   | 675   |      | 157  | 259 | 134  | 42   | 21   | 24    |
| 19  | 21   | 188  | 365   | 236   | 585   |      | 147  | 254 | 126  | 41   | 21   | 24    |
| 20  | 19   | 153  | 902   | 224   | 545   |      | 140  | 244 | 119  | 40   | 21   | 25    |
| 21  | 19   | 130  | 1,100 | 224   | 585   | 362  | 136  | 224 | 110  | 39   | 20   | 27    |
| 22  | 21   | 112  | 958   | 229   | 700   |      | 130  | 214 | 105  | 38   | 20   | 30    |
| 23  | 23   | 97   | 1,010 | 246   | 875   |      | 126  | 226 | 100  | 37   | 20   | 33    |
| 24  | 27   | 88   | 1,130 | 293   | 1,010 |      | 121  | 239 | 97   | 35   | 20   | 35    |
| 25  | 26   | 80   | 1,010 | 282   | 902   |      | 121  | 231 | 95   | 35   | 19   | 37    |
| 26  | 24   | 74   | 985   | 276   | 750   |      | 119  | 219 | 92   | 34   | 19   | 39    |
| 27  | 22   | 70   | 1,040 | 675   | 725   |      | 116  | 201 | 89   | 33   | 19   | 38    |
| 28  | 21   | 71   | 1,010 | 930   | 800   |      | 110  | 188 | 83   | 32   | 19   | 37    |
| 29  | 20   | 84   | 875   | 775   |       | 320  | 107  | 173 | 80   | 32   | 20   | 36    |
| 30  | 19   | 136  | 725   | 602   |       | 360  | 105  | 161 | 80   | 31   | 21   | 35    |
| 31  | 19   |      | 630   | 545   |       | 470  |      | 149 |      | 30   | 21   |       |

| Month     | Maximum | Minimum | Mean | Per square mile | Run-off |           |
|-----------|---------|---------|------|-----------------|---------|-----------|
|           |         |         |      |                 | Inches  | Acre-feet |
| October   | 27      | 8       | 15.5 | 0.310           | 0.36    | 953       |
| November  | 308     | 22      | 128  | 2.56            | 2.86    | 7,620     |
| December  | 1,130   | 65      | 453  | 9.06            | 10.44   | 27,900    |
| January   | 2,210   | 224     | 606  | 12.1            | 13.95   | 37,300    |
| February  | 1,010   | 293     | 576  | 11.5            | 11.98   | 32,000    |
| March     |         |         | 520  | 10.4            | 11.99   | 32,000    |
| April     |         | 105     | 186  | 3.72            | 4.15    | 11,100    |
| May       | 775     | 112     | 276  | 5.52            | 6.36    | 17,000    |
| June      | 386     | 80      | 149  | 2.98            | 3.32    | 8,870     |
| July      | 76      | 30      | 47.9 | .958            | 1.10    | 2,950     |
| August    | 30      | 19      | 23.6 | .472            | .54     | 1,450     |
| September | 39      | 20      | 26.5 | .530            | .59     | 1,580     |
| The year  | 2,210   | 8       | 249  | 4.98            | 67.64   | 181,000   |

## UMPQUA RIVER BASIN

## UMPQUA RIVER NEAR ELKTON, OREG.

LOCATION.—Staff gage in sec. 8, T. 23 S., R. 7 W., 4 miles south of Elkton. Zero of gage is approximately 95 feet above mean sea level by U.S. Geological Survey river profile.

DRAINAGE AREA.—3,680 square miles.

RECORDS AVAILABLE.—October 1905 to September 1933, incomplete prior to November 1908.

DISCHARGE.—Maximum during year (estimated), 101,000 second-feet Jan. 3 (gage height, about 28 feet); minimum, 850 second-feet Oct. 11–15 (gage height, 1.10 feet).

1905–33: Maximum, 172,000 second-feet Feb. 21, 1927 (gage height, 41.0 feet, present datum); minimum, 640 second-feet July 18, 1926 (gage height, 0.71 foot, present datum). Average, 28 years (1905–33), 7,090 second-feet.

REMARKS.—Records good. Some diversions for irrigation in South Umpqua River Basin, but low-water flow probably only slightly affected. No regulation.

*Discharge, in second-feet, 1932–33*

| Day | Oct.  | Nov.   | Dec.   | Jan.   | Feb.   | Mar.   | Apr.   | May    | June   | July  | Aug.  | Sept. |
|-----|-------|--------|--------|--------|--------|--------|--------|--------|--------|-------|-------|-------|
| 1   | 922   | 994    | 10,400 | 15,500 | 17,500 | 13,000 | 12,700 | 9,040  | 10,100 | 3,740 | 1,470 | 1,110 |
| 2   | 877   | 1,080  | 7,600  | 45,300 | 16,500 | 15,500 | 11,800 | 8,300  | 9,040  | 3,740 | 1,420 | 1,110 |
| 3   | 877   | 1,160  | 6,330  | 84,600 | 13,000 | 19,200 | 20,600 | 8,540  | 8,300  | 3,600 | 1,420 | 1,110 |
| 4   | 868   | 1,470  | 5,740  | 36,600 | 10,700 | 21,800 | 17,800 | 9,040  | 8,060  | 3,460 | 1,420 | 1,100 |
| 5   | 868   | 1,840  | 5,010  | 19,500 | 9,040  | 15,800 | 14,800 | 10,700 | 7,830  | 3,320 | 1,420 | 1,100 |
| 6   | 868   | 2,060  | 4,180  | 15,800 | 10,700 | 13,900 | 13,300 | 12,100 | 7,830  | 3,190 | 1,370 | 1,090 |
| 7   | 868   | 7,380  | 3,600  | 18,500 | 12,100 | 12,700 | 11,800 | 12,100 | 7,600  | 3,190 | 1,370 | 1,080 |
| 8   | 868   | 4,340  | 3,190  | 14,800 | 10,400 | 13,300 | 10,400 | 13,600 | 7,600  | 3,060 | 1,370 | 1,100 |
| 9   | 868   | 3,460  | 2,930  | 12,100 | 9,040  | 13,600 | 8,790  | 20,600 | 12,400 | 2,930 | 1,370 | 1,120 |
| 10  | 868   | 3,060  | 2,480  | 11,200 | 7,830  | 12,100 | 7,600  | 17,500 | 22,100 | 2,860 | 1,320 | 1,100 |
| 11  | 850   | 2,800  | 2,180  | 10,700 | 7,160  | 11,800 | 7,830  | 13,900 | 16,500 | 2,800 | 1,320 | 1,080 |
| 12  | 850   | 2,540  | 1,950  | 9,040  | 7,380  | 14,200 | 6,950  | 11,500 | 12,700 | 2,600 | 1,320 | 1,080 |
| 13  | 850   | 2,300  | 2,180  | 7,830  | 8,060  | 22,900 | 6,950  | 10,700 | 11,800 | 2,480 | 1,320 | 1,070 |
| 14  | 850   | 2,000  | 2,360  | 7,160  | 9,040  | 17,800 | 8,540  | 9,820  | 11,200 | 2,420 | 1,270 | 1,050 |
| 15  | 850   | 2,600  | 2,480  | 9,300  | 11,200 | 15,200 | 9,560  | 9,560  | 10,400 | 2,300 | 1,270 | 1,080 |
| 16  | 976   | 6,740  | 2,240  | 9,040  | 31,700 | 12,700 | 10,100 | 9,300  | 9,820  | 2,180 | 1,220 | 1,110 |
| 17  | 1,270 | 12,100 | 2,180  | 7,830  | 26,900 | 11,500 | 9,040  | 9,040  | 8,540  | 2,120 | 1,220 | 1,150 |
| 18  | 1,470 | 11,500 | 2,300  | 7,160  | 18,500 | 13,900 | 7,830  | 8,790  | 7,380  | 2,060 | 1,200 | 1,190 |
| 19  | 1,370 | 6,330  | 3,460  | 7,380  | 15,800 | 10,700 | 6,950  | 8,790  | 6,330  | 2,000 | 1,180 | 1,220 |
| 20  | 1,270 | 4,500  | 14,200 | 6,530  | 13,000 | 10,400 | 6,130  | 8,060  | 5,740  | 1,950 | 1,160 | 1,220 |
| 21  | 1,160 | 3,600  | 15,500 | 6,330  | 12,100 | 14,200 | 6,330  | 7,600  | 5,370  | 1,900 | 1,150 | 1,180 |
| 22  | 1,140 | 3,060  | 10,400 | 6,740  | 12,100 | 12,700 | 6,950  | 7,160  | 5,190  | 1,840 | 1,150 | 1,130 |
| 23  | 1,100 | 2,670  | 13,600 | 6,530  | 13,000 | 11,500 | 8,540  | 7,380  | 4,840  | 1,780 | 1,140 | 1,160 |
| 24  | 2,130 | 2,360  | 27,300 | 6,740  | 16,500 | 9,040  | 9,820  | 9,560  | 4,670  | 1,680 | 1,140 | 1,270 |
| 25  | 1,780 | 2,180  | 21,000 | 8,540  | 14,800 | 7,600  | 10,400 | 10,700 | 4,670  | 1,680 | 1,130 | 1,320 |
| 26  | 1,470 | 1,950  | 18,500 | 11,500 | 12,700 | 6,950  | 10,400 | 11,800 | 4,500  | 1,620 | 1,120 | 1,320 |
| 27  | 1,220 | 1,840  | 32,900 | 32,100 | 12,400 | 6,530  | 9,560  | 10,900 | 4,340  | 1,570 | 1,120 | 1,270 |
| 28  | 1,140 | 1,780  | 28,500 | 31,300 | 12,400 | 7,380  | 10,900 | 9,820  | 4,180  | 1,570 | 1,120 | 1,270 |
| 29  | 1,080 | 1,840  | 23,300 | 18,800 | -----  | 12,400 | 11,800 | 9,560  | 4,180  | 1,520 | 1,120 | 1,220 |
| 30  | 1,050 | 4,340  | 18,100 | 17,100 | -----  | 12,100 | 10,700 | 9,820  | 4,080  | 1,520 | 1,120 | 1,190 |
| 31  | 1,010 | -----  | 16,500 | 14,200 | -----  | 13,600 | -----  | 10,900 | -----  | 1,520 | 1,110 | ----- |

| Month     | Maximum | Minimum | Mean   | Per square mile | Run-off |           |
|-----------|---------|---------|--------|-----------------|---------|-----------|
|           |         |         |        |                 | Inches  | Acre-feet |
| October   | 2,120   | 850     | 1,080  | 0.293           | 0.34    | 66,400    |
| November  | 12,100  | 994     | 3,530  | .959            | 1.07    | 210,000   |
| December  | 32,900  | 1,950   | 10,100 | 2.74            | 3.16    | 621,000   |
| January   | 84,600  | 6,330   | 16,600 | 4.51            | 5.20    | 1,020,000 |
| February  | 31,700  | 7,160   | 13,300 | 3.61            | 3.76    | 739,000   |
| March     | 22,900  | 6,530   | 13,100 | 3.56            | 4.10    | 806,000   |
| April     | 20,600  | 6,130   | 10,200 | 2.77            | 3.09    | 607,000   |
| May       | 20,600  | 7,160   | 10,500 | 2.85            | 3.29    | 646,000   |
| June      | 22,100  | 4,030   | 8,240  | 2.24            | 2.50    | 490,000   |
| July      | 3,740   | 1,520   | 2,390  | .649            | .75     | 147,000   |
| August    | 1,470   | 1,110   | 1,250  | .340            | .39     | 76,900    |
| September | 1,320   | 1,050   | 1,150  | .312            | .35     | 68,400    |
| The year  | 84,600  | 850     | 7,590  | 2.06            | 28.00   | 5,500,000 |

## COW CREEK NEAR AZALEA, OREG.

LOCATION.—Staff gage in sec. 33, T. 31 S., R. 4 W., 4 miles northeast of Azalea.  
RECORDS AVAILABLE.—April 1926 to September 1933 (incomplete).

DISCHARGE.—Maximum during year (estimated), 4,000 second-feet Jan. 2 (gage height, 7.8 feet); minimum, 9 second-feet Oct. 1-6 (gage height, 1.63 feet).  
1926-33: Maximum, that of Jan. 2, 1933; minimum, 4 second-feet Sept. 9-19, 1929, Aug. 26-28, 1931.

REMARKS.—Records good except those for October and November, which are fair, and those above 400 second-feet, which are poor. Minor diversions for irrigation above station. Records furnished by State engineer.

## Discharge, in second-feet, 1932-33

| Day | Oct. | Nov.  | Dec. | Jan.  | Feb.  | Mar. | Apr.  | May | June  | July | Aug. | Sept. |
|-----|------|-------|------|-------|-------|------|-------|-----|-------|------|------|-------|
| 1   | 9    | 10    | 248  | 201   | 75    | 334  | 248   | 195 | 92    | 26   | 12   | 10    |
| 2   | 9    | 41    | 70   | 4,000 | 75    | 810  | 232   | 192 | 83    | 24   | 11   | 10    |
| 3   | 9    | 22    | 39   | 600   | 72    | 500  | 410   | 201 | 78    | 22   | 12   | 10    |
| 4   | 9    | 21    | 37   | 282   | 69    | 410  | 370   | 216 | 75    | 23   | 12   | 10    |
| 5   | 9    | 33    | 35   | 216   | 90    | 265  | 299   | 201 | 70    | 25   | 12   | 10    |
| 6   | 9    | 44    | 33   | 172   | 144   | 299  | 282   | 189 | 70    | 28   | 11   | 10    |
| 7   | 10   | 41    | 30   | 154   | 132   | 316  | 265   | 216 | 64    | 20   | 11   | 11    |
| 8   | 10   | 45    | 30   | 122   | 114   | 282  | 201   | 299 | 64    | 21   | 11   | 11    |
| 9   | 10   | 42    | 28   | 114   | 105   | 265  | 162   | 299 | 62    | 21   | 10   | 11    |
| 10  | 10   | 38    | 25   | 107   | 99    | 248  | 156   | 232 | 61    | 20   | 10   | 10    |
| 11  | 10   | 35    | 24   | 94    | 90    | 282  | 151   | 216 | 56    | 20   | 10   | 10    |
| 12  | 10   | 33    | 23   | 87    | 103   | 525  | 146   | 201 | 54    | 19   | 10   | 10    |
| 13  | 10   | 23    | 23   | 73    | 132   | 410  | 146   | 189 | 51    | 17   | 11   | 10    |
| 14  | 11   | 23    | 22   | 72    | 146   | 282  | 175   | 189 | 48    | 16   | 11   | 10    |
| 15  | 12   | 32    | 22   | 70    | 316   | 265  | 201   | 195 | 46    | 16   | 10   | 12    |
| 16  | 12   | 39    | 23   | 64    | 265   | 334  | 189   | 156 | 44    | 16   | 10   | 12    |
| 17  | 11   | 33    | 23   | 60    | 232   | 299  | 162   | 146 | 44    | 16   | 10   | 12    |
| 18  | 12   | 30    | 24   | 58    | 216   | 248  | 146   | 134 | 42    | 15   | 10   | 12    |
| 19  | 12   | 29    | 755  | 58    | 201   | 248  | 136   | 127 | 41    | 15   | 10   | 12    |
| 20  | 12   | 24    | 162  | 56    | 189   | 232  | 132   | 118 | 38    | 15   | 11   | 12    |
| 21  | 14   | 21    | 101  | 54    | 172   | 216  | 136   | 118 | 38    | 14   | 10   | 12    |
| 22  | 17   | 21    | 80   | 54    | 178   | 201  | 162   | 114 | 35    | 14   | 10   | 12    |
| 23  | 14   | 20    | 334  | 54    | 282   | 184  | 186   | 118 | 34    | 14   | 10   | 13    |
| 24  | 12   | 19    | 232  | 49    | 216   | 178  | 201   | 129 | 33    | 14   | 10   | 14    |
| 25  | 11   | 19    | 216  | 46    | 189   | 172  | 186   | 141 | 33    | 14   | 10   | 14    |
| 26  | 11   | 17    | 500  | 46    | 184   | 189  | 172   | 127 | 33    | 14   | 10   | 12    |
| 27  | 11   | 16    | 334  | 232   | 189   | 265  | 186   | 122 | 30    | 13   | 10   | 12    |
| 28  | 10   | 30    | 248  | 122   | 316   | 265  | 201   | 118 | 28    | 12   | 10   | 11    |
| 29  | 10   | 156   | 265  | 105   | ----- | 232  | 195   | 118 | 28    | 12   | 10   | 11    |
| 30  | 10   | 432   | 232  | 80    | ----- | 248  | 189   | 107 | 26    | 12   | 10   | 12    |
| 31  | 10   | ----- | 216  | 77    | ----- | 248  | ----- | 97  | ----- | 12   | 10   | ----- |

| Month     | Maximum | Minimum | Mean | Run-off in acre-feet |
|-----------|---------|---------|------|----------------------|
| October   | 17      | 9       | 10.8 | 664                  |
| November  | 432     | 10      | 46.3 | 2,760                |
| December  | 755     | 22      | 143  | 8,790                |
| January   | 4,000   | 46      | 244  | 15,000               |
| February  | 316     | 69      | 164  | 9,110                |
| March     | 810     | 172     | 298  | 18,300               |
| April     | 410     | 132     | 201  | 12,000               |
| May       | 299     | 97      | 168  | 10,300               |
| June      | 92      | 26      | 50.0 | 2,980                |
| July      | 28      | 12      | 17.4 | 1,070                |
| August    | 12      | 10      | 10.5 | 646                  |
| September | 14      | 10      | 11.3 | 672                  |
| The year  | 4,000   | 9       | 114  | 82,300               |

## NORTH UMPQUA RIVER BELOW LAKE CREEK, OREG.

LOCATION.—Water-stage recorder in NW¼ sec. 13, T. 26 S., R. 5 E., 200 yards below mouth of Lake Creek and 30 miles southwest of Crescent. Zero of gage is about 4,090 feet above mean sea level by U.S. Geological Survey river profile.

DRAINAGE AREA.—175 square miles.

RECORDS AVAILABLE.—October 1927 to September 1933.

DISCHARGE.—Maximum during year, 1,190 second-feet June 9 (gage height, 2.34 feet); minimum, 263 second-feet Dec. 9 (gage height, 0.76 foot).

1927-33: Maximum, that of June 9, 1933; minimum, 206 second-feet Dec. 9, 1931.

REMARKS.—Records good for October, November, August, September; others fair. No diversions or regulation above station.

*Discharge, in second-feet, 1932-33*

| Day | Oct. | Nov.  | Dec. | Jan. | Feb.  | Mar. | Apr.  | May | June  | July | Aug. | Sept. |
|-----|------|-------|------|------|-------|------|-------|-----|-------|------|------|-------|
| 1   | 312  | 300   | 308  | 342  | 359   | 333  | 337   | 447 | 796   | 580  | 410  | 368   |
| 2   | 312  | 304   | 312  | 350  | 354   | 337  | 346   | 431 | 796   | 568  | 410  | 368   |
| 3   | 316  | 300   | 312  | 372  | 350   | 337  | 354   | 415 | 804   | 568  | 405  | 368   |
| 4   | 308  | 300   | 316  | 368  | 350   | 333  | 354   | 415 | 812   | 556  | 401  | 363   |
| 5   | 308  | 320   | 316  | 363  | 350   | 329  | 350   | 405 | 812   | 544  | 410  | 363   |
| 6   | 308  | 354   | 312  | 368  | 342   | 329  | 354   | 391 | 812   | 538  | 410  | 363   |
| 7   | 308  | 312   | 320  | 354  | 320   | 329  | 354   | 391 | 788   | 532  | 410  | 363   |
| 8   | 308  | 312   | 283  | 350  | 342   | 329  | 350   | 391 | 900   | 520  | 405  | 363   |
| 9   | 308  | 312   | 267  | 350  | 304   | 329  | 346   | 386 | 1,100 | 503  | 405  | 359   |
| 10  | 308  | 304   | 275  | 350  | 316   | 329  | 342   | 382 | 1,100 | 497  | 405  | 368   |
| 11  | 304  | 308   | 279  | 342  | 368   | 337  | 342   | 382 | 1,000 | 474  | 401  | 372   |
| 12  | 300  | 304   | 283  | 342  | 354   | 346  | 346   | 386 | 988   | 480  | 401  | 372   |
| 13  | 304  | 304   | 287  | 342  | 346   | 342  | 346   | 396 | 1,060 | 480  | 401  | 372   |
| 14  | 312  | 308   | 295  | 342  | 337   | 342  | 359   | 396 | 1,020 | 474  | 396  | 382   |
| 15  | 308  | 329   | 304  | 346  | 350   | 342  | 363   | 405 | 1,060 | 474  | 396  | 386   |
| 16  | 320  | 372   | 316  | 337  | 350   | 342  | 363   | 401 | 1,000 | 474  | 396  | 382   |
| 17  | 312  | 354   | 316  | 300  | 350   | 342  | 359   | 415 | 956   | 474  | 396  | 377   |
| 18  | 312  | 333   | 316  | 337  | 350   | 333  | 354   | 410 | 868   | 469  | 386  | 366   |
| 19  | 312  | 320   | 324  | 346  | 350   | 329  | 354   | 415 | 828   | 463  | 386  | 382   |
| 20  | 308  | 316   | 324  | 320  | 346   | 346  | 342   | 421 | 773   | 458  | 386  | 382   |
| 21  | 300  | 316   | 320  | 350  | 346   | 342  | 359   | 431 | 752   | 452  | 382  | 386   |
| 22  | 329  | 312   | 324  | 350  | 342   | 337  | 372   | 447 | 710   | 447  | 382  | 382   |
| 23  | 324  | 312   | 329  | 350  | 342   | 333  | 391   | 463 | 689   | 442  | 377  | 377   |
| 24  | 324  | 312   | 329  | 354  | 337   | 333  | 386   | 492 | 661   | 442  | 377  | 377   |
| 25  | 316  | 308   | 329  | 354  | 333   | 333  | 377   | 538 | 675   | 436  | 377  | 377   |
| 26  | 312  | 304   | 333  | 359  | 333   | 329  | 382   | 586 | 668   | 431  | 372  | 377   |
| 27  | 308  | 300   | 342  | 368  | 333   | 333  | 405   | 604 | 647   | 431  | 368  | 372   |
| 28  | 304  | 308   | 342  | 368  | 333   | 342  | 442   | 634 | 628   | 426  | 368  | 368   |
| 29  | 300  | 308   | 346  | 372  | ----- | 337  | 474   | 682 | 604   | 421  | 372  | 363   |
| 30  | 300  | 308   | 337  | 368  | ----- | 337  | 458   | 759 | 586   | 415  | 372  | 363   |
| 31  | 300  | ----- | 337  | 368  | ----- | 337  | ----- | 804 | ----- | 415  | 372  | ----- |

| Month     | Maximum | Minimum | Mean | Per square mile | Run-off |           |
|-----------|---------|---------|------|-----------------|---------|-----------|
|           |         |         |      |                 | Inches  | Acre-feet |
| October   | 329     | 300     | 310  | 1.77            | 2.04    | 19,100    |
| November  | 372     | 300     | 315  | 1.80            | 2.01    | 18,700    |
| December  | 346     | 267     | 314  | 1.79            | 2.06    | 19,300    |
| January   | 372     | 300     | 351  | 2.01            | 2.32    | 21,600    |
| February  | 368     | 304     | 342  | 1.95            | 2.03    | 19,000    |
| March     | 346     | 329     | 336  | 1.92            | 2.21    | 20,700    |
| April     | 474     | 337     | 369  | 2.11            | 2.35    | 22,000    |
| May       | 804     | 382     | 468  | 2.67            | 3.08    | 28,800    |
| June      | 1,100   | 586     | 830  | 4.74            | 5.29    | 49,400    |
| July      | 580     | 415     | 480  | 2.74            | 3.16    | 29,500    |
| August    | 410     | 368     | 391  | 2.23            | 2.57    | 24,000    |
| September | 386     | 359     | 373  | 2.13            | 2.38    | 22,200    |
| The year  | 1,100   | 267     | 406  | 2.32            | 31.50   | 294,000   |

## NORTH UMPQUA RIVER AT TOKETEE FALLS, OREG.

LOCATION.—Water-stage recorder in T. 26 S., R. 3 E. (unsurveyed), an eighth of a mile below mouth of Clearwater River, half a mile above Toketee Falls, and 30 miles east of Hoaglin. Zero of gage is about 2,373 feet above mean sea level.

DRAINAGE AREA.—337 square miles.

RECORDS AVAILABLE.—February 1908 to July 1909, December 1914 to November 1917 (incomplete), July 1924 to September 1933.

DISCHARGE.—Maximum during year, 3,330 second-feet June 9 (gage height, 4.32 feet); minimum, 598 second-feet Oct. 29, 30 (gage height, 0.88 foot).

1908-9, 1914-17, 1924-33: Maximum, 3,600 second-feet (revised) Feb. 20, 1927 (gage height, 4.65 feet); minimum recorded, 475 second-feet Nov. 27-29, Dec. 12, 14, 1931.

REMARKS.—Records good October to February; fair March to September. No diversions or regulation above station.

## Discharge, in second-feet, 1932-33

| Day | Oct. | Nov.  | Dec. | Jan. | Feb.  | Mar.  | Apr.  | May   | June  | July  | Aug. | Sept. |
|-----|------|-------|------|------|-------|-------|-------|-------|-------|-------|------|-------|
| 1   | 640  | 604   | 754  | 754  | 716   | 728   | 940   | 1,490 | 2,010 | 1,370 | 975  | 814   |
| 2   | 634  | 658   | 835  | 856  | 709   | 748   | 1,040 | 1,410 | 1,970 | 1,370 | 940  | 814   |
| 3   | 634  | 628   | 835  | 828  | 702   | 754   | 1,180 | 1,330 | 1,970 | 1,370 | 940  | 807   |
| 4   | 634  | 622   | 794  | 800  | 702   | 742   | 1,260 | 1,370 | 1,970 | 1,330 | 940  | 800   |
| 5   | 628  | 754   | 774  | 814  | 702   | 742   | 1,220 | 1,330 | 1,930 | 1,330 | 940  | 800   |
| 6   | 628  | 940   | 742  | 905  | 702   | 748   | 1,220 | 1,260 | 1,930 | 1,290 | 940  | 821   |
| 7   | 628  | 716   | 742  | 870  | 670   | 787   | 1,180 | 1,220 | 1,850 | 1,290 | 905  | 807   |
| 8   | 628  | 768   | 664  | 849  | 702   | 794   | 1,120 | 1,220 | 2,340 | 1,260 | 905  | 794   |
| 9   | 622  | 787   | 628  | 842  | 664   | 800   | 1,040 | 1,180 | 3,240 | 1,220 | 905  | 787   |
| 10  | 622  | 696   | 634  | 821  | 664   | 814   | 1,010 | 1,150 | 2,880 | 1,180 | 905  | 794   |
| 11  | 616  | 683   | 628  | 794  | 722   | 842   | 975   | 1,120 | 2,520 | 1,150 | 905  | 807   |
| 12  | 610  | 664   | 658  | 787  | 716   | 1,010 | 975   | 1,120 | 2,520 | 1,150 | 905  | 800   |
| 13  | 616  | 670   | 658  | 780  | 690   | 975   | 1,010 | 1,150 | 2,520 | 1,150 | 870  | 794   |
| 14  | 658  | 722   | 658  | 787  | 683   | 905   | 1,080 | 1,180 | 2,520 | 1,120 | 870  | 828   |
| 15  | 652  | 905   | 658  | 787  | 735   | 870   | 1,180 | 1,260 | 2,520 | 1,120 | 870  | 835   |
| 16  | 690  | 1,180 | 670  | 774  | 722   | 905   | 1,180 | 1,260 | 2,340 | 1,120 | 870  | 807   |
| 17  | 664  | 1,040 | 676  | 722  | 709   | 905   | 1,150 | 1,290 | 2,170 | 1,080 | 863  | 800   |
| 18  | 640  | 905   | 676  | 754  | 716   | 870   | 1,080 | 1,260 | 1,970 | 1,040 | 856  | 835   |
| 19  | 628  | 821   | 722  | 754  | 702   | 863   | 1,040 | 1,260 | 1,850 | 1,040 | 849  | 807   |
| 20  | 622  | 780   | 690  | 722  | 702   | 975   | 1,040 | 1,260 | 1,810 | 1,040 | 849  | 814   |
| 21  | 610  | 754   | 683  | 748  | 702   | 975   | 1,080 | 1,260 | 1,730 | 1,040 | 849  | 821   |
| 22  | 716  | 728   | 683  | 735  | 709   | 940   | 1,180 | 1,290 | 1,690 | 1,080 | 842  | 814   |
| 23  | 664  | 709   | 696  | 428  | 716   | 905   | 1,330 | 1,410 | 1,650 | 1,010 | 842  | 814   |
| 24  | 646  | 696   | 690  | 735  | 702   | 849   | 1,450 | 1,530 | 1,610 | 1,010 | 835  | 828   |
| 25  | 634  | 683   | 690  | 728  | 696   | 828   | 1,490 | 1,730 | 1,690 | 1,010 | 828  | 814   |
| 26  | 628  | 676   | 735  | 742  | 709   | 807   | 1,450 | 1,810 | 1,610 | 1,010 | 828  | 807   |
| 27  | 616  | 676   | 821  | 748  | 702   | 814   | 1,570 | 1,770 | 1,610 | 1,010 | 828  | 800   |
| 28  | 604  | 735   | 814  | 728  | 716   | 905   | 1,730 | 1,850 | 1,530 | 975   | 821  | 794   |
| 29  | 598  | 754   | 800  | 735  | ----- | 905   | 1,770 | 2,010 | 1,490 | 975   | 814  | 787   |
| 30  | 598  | 768   | 794  | 722  | ----- | 905   | 1,610 | 2,170 | 1,410 | 975   | 814  | 780   |
| 31  | 604  | ----- | 774  | 735  | ----- | 940   | ----- | 2,090 | ----- | 975   | 814  | ----- |

| Month     | Maximum | Minimum | Mean  | Per square mile | Run-off |           |
|-----------|---------|---------|-------|-----------------|---------|-----------|
|           |         |         |       |                 | Inches  | Acre-feet |
| October   | 716     | 598     | 633   | 1.88            | 2.17    | 38,900    |
| November  | 1,180   | 604     | 757   | 2.25            | 2.51    | 45,000    |
| December  | 835     | 628     | 719   | 2.13            | 2.46    | 44,200    |
| January   | 905     | 722     | 777   | 2.31            | 2.66    | 47,800    |
| February  | 735     | 664     | 703   | 2.09            | 2.18    | 39,000    |
| March     | 1,010   | 728     | 856   | 2.54            | 2.93    | 52,600    |
| April     | 1,770   | 940     | 1,220 | 3.62            | 4.04    | 72,600    |
| May       | 2,170   | 1,120   | 1,420 | 4.21            | 4.85    | 87,300    |
| June      | 3,240   | 1,410   | 2,030 | 6.02            | 6.72    | 121,000   |
| July      | 1,370   | 975     | 1,130 | 3.35            | 3.86    | 69,500    |
| August    | 975     | 814     | 875   | 2.60            | 3.00    | 53,800    |
| September | 835     | 780     | 807   | 2.39            | 2.67    | 48,000    |
| The year  | 3,240   | 598     | 994   | 2.95            | 40.05   | 720,000   |

## NORTH UMPQUA RIVER ABOVE ROCK CREEK, NEAR GLIDE, OREG.

LOCATION.—Water-stage recorder in NW¼ sec. 12, T. 26 S., R. 3 W., half a mile above mouth of Rock Creek and 5 miles northeast of Glide. Zero of gage is about 770 feet above mean sea level by U.S. Geological Survey river profile.

DRAINAGE AREA.—886 square miles.

RECORDS AVAILABLE.—June 1924 to September 1933.

DISCHARGE.—Maximum during year, 15,300 second-feet June 9 (gage height, 10.20 feet); minimum, 673 second-feet Oct. 12, 13 (gage height, 2.27 feet). 1924-33: Maximum, 61,000 second-feet Feb. 20, 1927 (gage height, 20.18 feet); minimum, 521 second-feet Oct. 16, 1931 (gage height, 1.86 feet).

REMARKS.—Records good. Discharge estimated June 30 to July 7. No irrigation diversions or regulation above station.

*Discharge, in second-feet, 1932-33*

| Day     | Oct.  | Nov.  | Dec.  | Jan.  | Feb.  | Mar.  | Apr.  | May   | June   | July  | Aug.  | Sept. |
|---------|-------|-------|-------|-------|-------|-------|-------|-------|--------|-------|-------|-------|
| 1.....  | 745   | 745   | 2,050 | 3,400 | 2,640 | 4,160 | 4,320 | 4,000 | 5,000  |       | 1,140 | 910   |
| 2.....  | 745   | 1,060 | 2,200 | 8,960 | 2,200 | 8,760 | 4,650 | 3,920 | 4,820  |       | 1,100 | 910   |
| 3.....  | 722   | 1,320 | 2,460 | 6,120 | 1,950 | 4,820 | 6,950 | 3,760 | 4,820  |       | 1,100 | 910   |
| 4.....  | 722   | 1,030 | 2,000 | 3,760 | 1,860 | 3,690 | 6,530 | 4,650 | 4,820  |       | 1,100 | 910   |
| 5.....  | 722   | 1,360 | 1,720 | 3,470 | 2,050 | 3,060 | 5,180 | 5,000 | 4,820  | 2,260 | 1,100 | 910   |
| 6.....  | 722   | 5,000 | 1,520 | 6,120 | 2,300 | 3,130 | 5,180 | 4,820 | 4,650  |       | 1,100 | 970   |
| 7.....  | 722   | 2,150 | 1,400 | 5,180 | 2,250 | 4,160 | 4,650 | 4,650 | 4,480  |       | 1,100 | 940   |
| 8.....  | 700   | 1,600 | 1,320 | 4,000 | 2,050 | 4,480 | 3,840 | 5,180 | 5,610  | 2,000 | 1,060 | 910   |
| 9.....  | 700   | 2,940 | 1,030 | 3,620 | 1,860 | 3,760 | 3,260 | 5,360 | 13,300 | 1,900 | 1,060 | 910   |
| 10..... | 700   | 1,760 | 1,030 | 3,690 | 1,680 | 3,690 | 2,880 | 4,480 | 9,910  | 1,810 | 1,060 | 880   |
| 11..... | 700   | 1,360 | 1,060 | 3,130 | 1,720 | 4,000 | 2,700 | 3,840 | 7,380  | 1,720 | 1,030 | 880   |
| 12..... | 700   | 1,140 | 1,060 | 2,700 | 1,860 | 6,740 | 3,060 | 3,760 | 6,950  | 1,680 | 1,030 | 880   |
| 13..... | 700   | 1,100 | 1,170 | 2,520 | 2,300 | 5,920 | 3,260 | 3,760 | 7,160  | 1,440 | 1,030 | 880   |
| 14..... | 745   | 1,760 | 1,170 | 2,880 | 2,100 | 4,480 | 3,920 | 3,920 | 6,740  | 1,600 | 1,000 | 910   |
| 15..... | 795   | 2,810 | 1,170 | 2,940 | 3,470 | 3,920 | 4,820 | 3,920 | 6,320  | 1,560 | 1,000 | 1,030 |
| 16..... | 850   | 6,740 | 1,240 | 2,460 | 5,180 | 4,320 | 4,320 | 3,760 | 5,730  | 1,560 | 1,000 | 940   |
| 17..... | 1,060 | 4,480 | 1,170 | 2,150 | 3,400 | 4,820 | 3,620 | 3,840 | 4,820  | 1,480 | 1,000 | 910   |
| 18..... | 880   | 2,940 | 1,140 | 2,000 | 2,820 | 4,000 | 3,060 | 3,840 | 4,160  | 1,440 | 1,000 | 970   |
| 19..... | 795   | 2,100 | 3,260 | 1,900 | 2,360 | 3,760 | 2,700 | 3,690 | 3,760  | 1,400 | 970   | 940   |
| 20..... | 745   | 1,680 | 3,470 | 1,720 | 2,200 | 5,000 | 2,820 | 3,540 | 3,540  | 1,360 | 970   | 910   |
| 21..... | 745   | 1,480 | 2,410 | 1,680 | 2,460 | 5,000 | 3,400 | 3,400 | 3,330  | 1,360 | 970   | 970   |
| 22..... | 910   | 1,360 | 1,900 | 1,600 | 2,880 | 3,840 | 4,160 | 3,400 | 3,200  | 1,320 | 970   | 940   |
| 23..... | 1,200 | 1,240 | 3,130 | 1,600 | 3,540 | 3,130 | 5,000 | 4,480 | 3,130  | 1,280 | 940   | 970   |
| 24..... | 940   | 1,170 | 2,760 | 1,600 | 3,470 | 2,760 | 5,360 | 5,180 | 3,000  | 1,280 | 940   | 1,000 |
| 25..... | 822   | 1,100 | 2,640 | 1,600 | 2,760 | 2,520 | 5,360 | 5,730 | 3,130  | 1,240 | 940   | 1,000 |
| 26..... | 795   | 1,030 | 5,180 | 1,560 | 2,940 | 2,460 | 4,480 | 5,730 | 3,130  | 1,240 | 910   | 970   |
| 27..... | 770   | 1,030 | 6,530 | 2,300 | 3,200 | 2,460 | 5,180 | 5,000 | 3,000  | 1,200 | 910   | 940   |
| 28..... | 770   | 1,200 | 6,120 | 2,100 | 3,000 | 3,920 | 6,120 | 5,000 | 2,880  | 1,200 | 910   | 880   |
| 29..... | 745   | 1,520 | 4,320 | 1,900 | ----- | 4,160 | 5,730 | 5,920 | 2,640  | 1,170 | 910   | 880   |
| 30..... | 745   | 2,300 | 4,480 | 1,760 | ----- | 4,160 | 4,650 | 6,320 | 2,520  | 1,170 | 910   | 880   |
| 31..... | 722   | ----- | 3,690 | 2,050 | ----- | 5,360 | ----- | 5,730 | -----  | 1,140 | 910   | ----- |

| Month          | Maximum | Minimum | Mean  | Per square mile | Run-off |           |
|----------------|---------|---------|-------|-----------------|---------|-----------|
|                |         |         |       |                 | Inches  | Acre-feet |
| October.....   | 1,200   | 700     | 785   | 0.886           | 1.02    | 48,300    |
| November.....  | 6,740   | 745     | 1,950 | 2.20            | 2.46    | 116,000   |
| December.....  | 6,530   | 1,030   | 2,450 | 2.77            | 3.19    | 151,000   |
| January.....   | 8,960   | 1,560   | 2,980 | 3.36            | 3.87    | 183,000   |
| February.....  | 5,180   | 1,680   | 2,590 | 2.92            | 3.04    | 144,000   |
| March.....     | 6,740   | 2,460   | 4,050 | 4.57            | 5.27    | 249,000   |
| April.....     | 6,950   | 2,700   | 4,370 | 4.93            | 5.50    | 260,000   |
| May.....       | 6,320   | 3,400   | 4,500 | 5.08            | 5.86    | 277,000   |
| June.....      | 13,300  | 2,520   | 4,960 | 5.60            | 6.25    | 295,000   |
| July.....      | -----   | 1,140   | 1,630 | 1.84            | 2.12    | 100,000   |
| August.....    | 1,140   | 910     | 1,010 | 1.14            | 1.31    | 62,100    |
| September..... | 1,030   | 880     | 928   | 1.05            | 1.17    | 55,200    |
| The year.....  | 13,300  | 700     | 2,680 | 3.02            | 41.06   | 1,940,000 |

## NORTH UMIQUA RIVER NEAR GLIDE, OREG.

LOCATION.—Staff gage in SW¼ sec. 13, T. 26 S., R. 4 W., 1 mile west of Glide. Zero of gage is about 645 feet above mean sea level by U.S. Geological Survey river profile.

DRAINAGE AREA.—1,210 square miles.

RECORDS AVAILABLE.—September 1915 to May 1920, October 1921 to October 1922, October 1927 to September 1933.

DISCHARGE.—Maximum during year, 28,400 second-feet Jan. 2 (gage height, 10.94 feet); minimum (estimated), 740 second-feet Oct. 10-13.

1915-20, 1921-22, 1927-33: Maximum, 59,500 second-feet Mar. 19, 1932; minimum, 552 second-feet Aug. 27-30, Sept. 27, 1931. Average, partly estimated from records of discharge near Oak Grove and Winchester, 22 years (1905-8, 1909-18, 1923-33), 3,260 second-feet.

Maximum stage known, 22.6 feet, present datum, Nov. 22, 1909 (estimated discharge, 90,000 second-feet).

REMARKS.—Records fair. No diversions or regulation above gage.

## Discharge, in second-feet, 1932-33

| Day | Oct.  | Nov.    | Dec.    | Jan.   | Feb.  | Mar.  | Apr.  | May   | June     | July  | Aug.    | Sept. |
|-----|-------|---------|---------|--------|-------|-------|-------|-------|----------|-------|---------|-------|
| 1   |       | 950     | 3,230   | 10,200 | 4,900 | 6,430 | 6,200 | 5,750 | 5,750    | 2,590 | 1,220   | 950   |
| 2   |       | 1,160   | 3,930   | 23,500 | 3,930 | 5,750 | 7,660 | 5,310 | 5,530    | 2,590 | 1,220   | 950   |
| 3   |       | 2,030   | 3,930   | 10,800 | 3,400 | 7,150 | 9,600 | 4,900 | 5,750    | 2,440 | 1,160   | * 950 |
| 4   |       | * 1,600 | 3,570   | 6,200  | 3,060 | 5,750 | 7,920 | 6,430 | 5,530    | 2,440 | 1,220   | * 950 |
| 5   |       | 4,500   | 3,060   | 5,970  | 3,400 | 4,500 | 6,430 | 7,150 | 5,530    | 2,440 | 1,220   | 950   |
| 6   |       | 9,310   | 2,590   | 9,310  | 3,750 | 4,900 | 6,430 | 6,670 | 5,530    | 2,300 | 1,220   | 1,000 |
| 7   | * 760 | 5,310   | 2,160   | 7,400  | 3,570 | 5,970 | 6,200 | 6,670 | 5,100    | 1,600 | 1,160   | 1,050 |
| 8   |       | 2,740   | 1,770   | 6,670  | 3,060 | 6,200 | 5,310 | 7,660 | 6,910    | 2,160 | 1,160   | 950   |
| 9   |       | * 4,555 | 1,400   | 5,970  | 2,740 | 5,970 | 4,310 | 7,150 | * 20,000 | 2,030 | 1,100   | 1,050 |
| 10  |       | * 2,700 |         | 5,530  | 2,440 | 5,750 | 3,750 | 6,200 | * 15,000 | 2,030 | 1,100   | 950   |
| 11  |       | * 1,800 |         | 4,700  | 2,590 | 5,530 | 3,750 | 5,530 | * 11,000 | 1,900 | 1,050   | 1,050 |
| 12  |       | * 1,500 |         | 3,930  | 2,900 | 8,460 | 3,930 | 5,100 | 8,740    | 1,900 | 1,050   | 1,050 |
| 13  | 740   | 1,460   | * 1,550 | 3,750  | 3,570 | 8,190 | 4,310 | 4,900 |          | 1,770 | 1,050   | 1,050 |
| 14  | 801   | 2,300   |         | 4,120  | 3,400 | 6,910 | 5,310 | 5,100 |          | 1,770 | 1,050   | 1,100 |
| 15  | 855   | 3,400   |         | 4,120  | 6,200 | 5,530 | 6,200 | 5,100 | * 8,440  | 1,770 | 1,050   | 1,100 |
| 16  | 1,000 | 10,200  |         | 3,750  | 9,020 | 5,970 | 5,530 | 4,900 |          | 1,770 | * 1,050 | 1,050 |
| 17  | 1,400 | 7,920   |         | 3,400  | 5,530 | 6,430 | 4,700 | 4,900 |          | 1,640 | 1,050   | 1,050 |
| 18  | 1,050 | 4,900   | 1,520   | 2,900  | 4,500 | 5,530 | 3,930 | 5,100 | 6,430    | 1,680 | 1,100   | 1,050 |
| 19  | 855   | 2,740   | 4,700   | 2,740  | 3,750 | 6,200 | 3,750 | 4,700 | 5,310    | 1,620 | 1,100   | 1,050 |
| 20  | 819   | 2,160   | 5,310   | 2,590  | 3,750 | 7,150 | 4,310 | 4,700 | 4,310    | 1,620 | 1,050   | 1,050 |
| 21  | 801   | 2,030   | 3,570   | 2,300  | 3,930 | 6,910 | 6,200 | 4,500 | * 4,000  | 1,460 | 1,000   | 1,050 |
| 22  | 1,220 | 2,030   | 5,100   | 2,300  | 4,310 | 5,530 | 5,970 | 4,500 | * 3,700  | 1,460 | 1,000   | 1,050 |
| 23  | 1,770 | 1,770   | 5,970   | 2,300  | 5,310 | 4,500 | 6,670 | 5,750 | 3,570    | 1,460 | 1,000   | 1,100 |
| 24  | 1,400 | 1,640   | * 5,300 | 2,300  | 4,900 | 3,750 | 6,670 | 7,400 | 3,400    | 1,460 | 1,000   | 1,160 |
| 25  | 1,050 | 1,520   | * 5,000 | 2,590  | 4,120 | 3,570 | 5,970 | 7,400 | 3,400    | 1,340 | * 1,000 | 1,160 |
| 26  | 1,000 | 1,400   | 11,400  | 2,590  | 4,500 | 4,500 | 6,430 | 6,910 | 3,400    | 1,340 | 950     | 1,050 |
| 27  |       | 1,340   | 10,800  | 3,230  | 4,900 | 6,200 | 7,660 | 6,910 | 3,400    | 1,280 | 950     | 1,000 |
| 28  |       | 1,900   | 10,200  | 3,400  | 5,100 | 5,970 | 7,400 | 6,670 | 3,060    | 1,280 | 950     | 950   |
| 29  | * 930 | 2,590   | 7,920   | 3,230  | ----- | 5,530 | 6,670 | 7,400 | 2,900    | 1,280 | 1,000   | 950   |
| 30  |       | 2,740   | 7,150   | 3,930  | ----- | 5,530 | 6,200 | 7,920 | 2,740    | 1,280 | 1,000   | 950   |
| 31  |       | -----   | 5,970   | 4,310  | ----- | 7,660 | ----- | 6,910 | -----    | 1,280 | 1,000   | ----- |

| Month     | Maximum | Minimum | Mean  | Per square mile | Run-off |           |
|-----------|---------|---------|-------|-----------------|---------|-----------|
|           |         |         |       |                 | Inches  | Acre-feet |
| October   | 1,770   | -----   | 920   | 0.760           | 0.88    | 56,000    |
| November  | 10,200  | 950     | 3,070 | 2.54            | 2.83    | 183,000   |
| December  | 11,400  | -----   | 4,130 | 3.41            | 3.93    | 254,000   |
| January   | 23,500  | 2,300   | 5,160 | 4.26            | 4.91    | 317,000   |
| February  | 9,020   | 2,440   | 4,160 | 3.44            | 3.58    | 231,000   |
| March     | 8,460   | 3,570   | 5,930 | 4.90            | 5.65    | 365,000   |
| April     | 9,600   | 3,750   | 5,850 | 4.83            | 5.39    | 348,000   |
| May       | 7,920   | 4,500   | 6,000 | 4.96            | 5.72    | 369,000   |
| June      | 20,000  | 2,740   | 6,410 | 5.30            | 5.91    | 381,000   |
| July      | 2,590   | 1,280   | 1,780 | 1.47            | 1.70    | 109,000   |
| August    | 1,220   | 950     | 1,070 | .884            | 1.02    | 65,800    |
| September | 1,160   | 950     | 1,020 | .843            | .94     | 60,700    |
| The year  | 23,500  | -----   | 3,790 | 3.13            | 42.46   | 2,740,000 |

\* Estimated.

## LAKE CREEK AT DIAMOND LAKE, NEAR FORT KLAMATH, OREG.

LOCATION.—Staff gage in SW¼ sec. 30, T. 27 S., R. 6 E., 50 yards below outlet of Diamond Lake and 35 miles north of Fort Klamath. Zero of gage is about 5,180 feet above mean sea level by U.S. Geological Survey river profile.

DRAINAGE AREA.—57 square miles.

RECORDS AVAILABLE.—May 1922 to September 1925, October 1926 to September 1933; incomplete prior to 1927.

DISCHARGE.—Maximum recorded during year, 131 second-feet Jan. 1, 8, June 18 (maximum gage height, 1.82 feet Jan. 1); minimum, 24 second-feet Oct. 12 (gage height, 0.93 foot).

1922-25, 1926-33: Maximum, 146 second-feet June 1, 1925 (gage height, 2.13 feet at a former gage); no flow Aug. 25-27, 1931.

REMARKS.—Records fair. Gage not read on days when discharge is not given. Monthly mean discharge October to June is mean of days when gage was read. Flow regulated by operation of fish racks at lake outlet and at times by collection of moss on racks. No diversions for irrigation above station.

*Discharge, in second-feet, 1932-33*

| Day | Oct. | Nov. | Dec. | Jan. | Feb. | Mar. | Apr. | May | June | July | Aug. | Sept. |
|-----|------|------|------|------|------|------|------|-----|------|------|------|-------|
| 1   |      |      |      | 131  |      |      | 77   |     |      | 80   | 39   | 35    |
| 2   | 35   |      |      |      |      |      |      |     |      | 85   | 39   | 34    |
| 3   |      |      |      |      |      |      |      |     |      |      | 38   | 34    |
| 4   |      |      | 82   |      |      |      |      |     | 63   |      | 41   | 34    |
| 5   |      |      |      |      | 115  | 108  |      |     |      | 80   | 50   | 34    |
| 6   |      | 54   |      |      |      |      |      |     |      |      | 49   | 32    |
| 7   |      |      |      |      |      |      |      | 47  |      |      | 49   | 31    |
| 8   |      |      |      | 131  |      |      |      |     |      | 74   | 47   | 31    |
| 9   | 28   |      |      |      |      |      | 77   |     |      | 55   | 47   | 34    |
| 10  |      |      |      |      |      |      |      |     |      | 52   | 46   | 43    |
| 11  |      |      | 79   |      |      |      |      |     | 108  | 51   | 45   | 43    |
| 12  | 24   |      |      |      | 115  | 100  |      |     |      | 50   | 45   | 43    |
| 13  |      | 56   |      |      |      |      |      |     |      | 48   | 44   | 42    |
| 14  |      |      |      |      |      |      |      | 46  |      | 47   | 43   | 41    |
| 15  |      |      |      | 115  |      |      |      |     |      | 52   | 42   | 41    |
| 16  | 32   |      |      |      |      |      | 74   |     |      | 58   | 41   | 40    |
| 17  |      |      |      |      |      |      |      |     |      | 56   | 41   | 39    |
| 18  |      |      | 79   |      |      |      |      |     | 131  | 56   | 40   | 39    |
| 19  |      |      |      |      | 115  | 100  |      |     |      | 56   | 39   | 37    |
| 20  |      | 82   |      |      |      |      |      |     |      | 54   | 37   | 36    |
| 21  |      |      |      |      |      |      |      | 47  |      | 54   | 35   | 39    |
| 22  |      |      |      | 115  |      |      |      |     |      | 51   | 35   | 36    |
| 23  | 47   |      |      |      |      |      | 61   |     |      | 49   | 37   | 34    |
| 24  |      |      |      |      |      |      |      |     |      | 47   | 35   | 34    |
| 25  |      |      | 79   |      |      |      |      |     | 47   | 47   | 35   | 34    |
| 26  |      |      |      |      | 108  | 82   |      |     |      | 45   | 35   | 31    |
| 27  |      | 77   |      |      |      |      |      |     |      | 45   | 35   | 32    |
| 28  |      |      |      |      |      |      |      | 49  |      | 43   | 39   | 31    |
| 29  |      |      | 115  | 115  |      |      |      |     |      | 42   | 37   | 29    |
| 30  | 34   |      |      |      |      |      | 34   |     |      | 41   | 37   | 29    |
| 31  |      |      |      |      |      |      |      |     |      | 40   | 35   |       |

| Month     | Maximum | Minimum | Mean | Per square mile | Run-off |            |
|-----------|---------|---------|------|-----------------|---------|------------|
|           |         |         |      |                 | Inches  | Acres-feet |
| October   |         |         | 33.3 | 0.584           | 0.67    | 2,050      |
| November  |         |         | 67.2 | 1.18            | 1.32    | 4,000      |
| December  |         |         | 86.8 | 1.52            | 1.75    | 5,340      |
| January   |         |         | 121  | 2.12            | 2.44    | 7,440      |
| February  |         |         | 113  | 1.98            | 2.06    | 6,280      |
| March     |         |         | 97.5 | 1.71            | 1.97    | 6,000      |
| April     |         |         | 64.6 | 1.13            | 1.26    | 3,840      |
| May       |         |         | 47.2 | .828            | .95     | 2,900      |
| June      |         |         | 87.2 | 1.53            | 1.71    | 5,190      |
| July      |         | 40      | 57.4 | 1.01            | 1.16    | 3,530      |
| August    | 50      | 35      | 40.5 | .711            | .82     | 2,490      |
| September | 43      | 29      | 35.7 | .626            | .70     | 2,120      |
| The year  |         |         | 70.7 | 1.24            | 16.81   | 51,200     |

## CLEARWATER RIVER ABOVE TRAP CREEK, OREG.

LOCATION.—Water-stage recorder in SE¼ sec. 1, T. 27 S., R. 4 E., 150 yards above mouth of Trap Creek and 40 miles east of Glide. Zero of gage is about 3,760 feet above mean sea level by U.S. Geological Survey river profile.

DRAINAGE AREA.—40 square miles.

RECORDS AVAILABLE.—October 1927 to September 1933.

DISCHARGE.—Maximum during year, 380 second-feet June 9 (gage height, 2.02 feet); minimum, 113 second-feet Mar. 9 (gage height, 0.55 foot).

1927-33: Maximum, that of June 9, 1933; minimum, 91 second-feet Nov.

4-6, 27, Dec. 12, 29, 1931, Jan. 3, 1932.

REMARKS.—Records good except those estimated and those for Mar. 20 to Apr. 29, which are fair. No diversions or regulation above station.

## Discharge, in second-feet, 1932-33

| Day | Oct. | Dec.  | Mar.  | Apr.  | May   | June  | July | Aug. | Sept. |
|-----|------|-------|-------|-------|-------|-------|------|------|-------|
| 1   | 121  |       |       | 118   |       | 256   | 200  | 159  | 144   |
| 2   | 121  |       |       | 119   |       | 256   | 202  | 157  | 144   |
| 3   |      |       | • 115 | 124   | • 174 | 256   | 204  | 157  | 144   |
| 4   |      |       |       | 127   |       | 256   | 200  | 157  | 144   |
| 5   |      |       |       | 131   |       | 256   | 198  | 157  | 144   |
| 6   |      |       | 115   | 134   | 164   | 246   | 198  | 156  | 146   |
| 7   |      | • 120 | 115   | 132   | 162   | 246   | 198  | 154  | 144   |
| 8   |      |       | 115   | 131   | 161   | 276   | 197  | 154  | 144   |
| 9   |      |       | 115   | 129   | 157   | 358   | 193  | 152  | 144   |
| 10  |      |       | 116   | 127   | 154   | 358   | 187  | 152  | 142   |
| 11  |      |       | 118   | 127   | 152   | 327   | 185  | 152  | 142   |
| 12  |      |       | 119   | 127   | 154   | 338   | 187  | 151  | 142   |
| 13  | 119  |       | 118   | 127   | 156   | 348   | 185  | 151  | 142   |
| 14  | 121  |       | 118   | 131   | 157   | 348   | 185  | 151  | 147   |
| 15  | 124  |       | 118   | 135   | 162   | 338   | 184  | 151  | 146   |
| 16  | 121  |       |       |       |       |       |      |      |       |
| 17  | 126  | 123   | 119   | 139   | 162   | 316   | 182  | 149  | 142   |
| 18  | 124  | 123   | 118   | 139   | 162   | 286   | 176  | 149  | 144   |
| 19  | 123  | 123   | 118   | 137   | 161   | 266   | 176  | 149  | 147   |
| 20  | 123  | 124   | 118   | 135   | 159   | 246   | 175  | 149  | 142   |
| 21  | 123  | 123   | 118   | 135   | 162   | 246   | 173  | 147  | 146   |
| 22  | 123  | 121   | 118   | 137   | 164   | 236   | 171  | 147  | 146   |
| 23  | 132  | 121   | 116   | 139   | 164   | 236   | 169  | 147  | 144   |
| 24  | 124  | 123   | 116   | 146   | 169   | 227   | 168  | 147  | 144   |
| 25  | 124  | 121   | 118   | 154   | 178   | 227   | 168  | 147  | 146   |
| 26  |      | 121   | 118   | 162   | 193   | 236   | 168  | 146  | 144   |
| 27  |      | 123   | 118   | 164   | 212   | 227   | 166  | 146  | 142   |
| 28  |      | 124   | 116   | 169   | 212   | 225   | 164  | 146  | 142   |
| 29  |      | 123   | 118   | 184   | 221   | 216   | 163  | 146  | 140   |
| 30  |      | • 123 | 118   | 193   | 246   | 208   | 161  | 146  | 140   |
| 31  |      | • 123 | 118   | • 190 | 266   | 204   | 161  | 146  | 140   |
|     |      | • 123 | 118   | ----- | 266   | ----- | 159  | 144  | ----- |

| Month     | Maximum | Minimum | Mean  | Per square mile | Run-off |            |
|-----------|---------|---------|-------|-----------------|---------|------------|
|           |         |         |       |                 | Inches  | Acres-foot |
| October   | 132     |         | 122   | 3.05            | 3.52    | 7,500      |
| November  |         |         | • 135 | 3.38            | 3.77    | 8,030      |
| December  |         |         | 123   | 3.08            | 3.55    | 7,560      |
| January   |         |         | • 125 | 3.12            | 3.60    | 7,690      |
| February  |         |         | • 117 | 2.92            | 3.04    | 6,500      |
| March     | 119     |         | 117   | 2.92            | 3.37    | 7,190      |
| April     | 193     | 118     | 141   | 3.52            | 3.93    | 8,390      |
| May       | 276     | 152     | 179   | 4.48            | 5.16    | 11,000     |
| June      | 358     | 204     | 269   | 6.72            | 7.50    | 16,000     |
| July      | 204     | 159     | 181   | 4.52            | 5.21    | 11,100     |
| August    | 159     | 144     | 150   | 3.75            | 4.32    | 9,220      |
| September | 147     | 140     | 144   | 3.60            | 4.02    | 8,570      |
| The year  | 358     | -----   | 150   | 3.75            | 50.99   | 109,000    |

• Estimated.

## COQUILLE RIVER BASIN

## SOUTH FORK OF COQUILLE RIVER AT POWERS, OREG.

LOCATION.—Wire gage in NW¼ sec. 13, T. 31 S., R. 12 W., at bridge at Powers.  
DRAINAGE AREA.—169 square miles.

RECORDS AVAILABLE.—September 1916 to September 1926; October 1928 to September 1933. Prior to 1928 at station half a mile upstream.

DISCHARGE.—Maximum during year, 18,000 second-feet Jan. 2 (gage height, 15.0 feet); minimum, 13 second-feet Oct. 4-13 (gage height, 0.52 foot).

1916-26, 1928-33: Maximum, 25,300 second-feet Oct. 31, 1924 (gage height, 17.5 feet at former gage); minimum, 13 second-feet Nov. 30 to Dec. 3, 1929, Oct. 4-13, 1932. Average, 14 years (1916-26, 1929-33), 688 second-feet.

REMARKS.—Records fair. No diversions or regulation above gage.

*Discharge, in second-feet, 1932-33*

| Day | Oct. | Nov.  | Dec.  | Jan.   | Feb.  | Mar.  | Apr.  | May   | June  | July | Aug. | Sept. |
|-----|------|-------|-------|--------|-------|-------|-------|-------|-------|------|------|-------|
| 1   | 15   | 27    | 1,770 | 1,500  | 1,660 | 2,430 | 1,660 | 1,220 | 522   | 138  | 48   | 31    |
| 2   | 15   | 288   | 1,160 | 11,300 | 1,400 | 3,100 | 1,520 | 1,460 | 478   | 124  | 48   | 31    |
| 3   | 15   | 238   | 825   | 6,420  | 1,100 | 3,430 | 1,730 | 1,400 | 455   | 124  | 52   | 29    |
| 4   | 13   | 142   | 620   | 2,800  | 1,040 | 2,180 | 1,660 | 1,590 | 370   | 120  | 50   | 28    |
| 5   | 13   | 452   | 498   | 1,870  | 1,280 | 1,660 | 1,280 | 1,660 | 330   | 115  | 48   | 28    |
| 6   | 13   | 1,560 | 385   | 1,730  | 1,340 | 1,590 | 1,160 | 1,660 | 330   | 111  | 48   | 36    |
| 7   | 13   | 720   | 345   | 1,340  | 1,100 | 1,460 | 1,040 | 2,800 | 330   | 102  | 48   | 39    |
| 8   | 13   | 365   | 305   | 1,160  | 1,040 | 1,220 | 1,040 | 5,140 | 455   | 98   | 45   | 36    |
| 9   | 13   | 570   | 270   | 940    | 790   | 1,280 | 940   | 3,430 | 2,800 | 94   | 45   | 35    |
| 10  | 13   | 365   | 238   | 890    | 840   | 1,340 | 790   | 2,340 | 1,460 | 90   | 42   | 34    |
| 11  | 13   | 270   | 238   | 790    | 940   | 2,180 | 890   | 1,590 | 1,100 | 83   | 42   | 31    |
| 12  | 13   | 142   | 238   | 790    | 1,520 | 6,880 | 990   | 1,400 | 840   | 83   | 41   | 31    |
| 13  | 13   | 147   | 254   | 740    | 1,400 | 3,760 | 940   | 1,840 | 590   | 90   | 39   | 31    |
| 14  | 21   | 207   | 222   | 740    | 1,220 | 2,430 | 990   | 1,580 | 500   | 86   | 39   | 31    |
| 15  | 62   | 305   | 222   | 740    | 5,700 | 1,660 | 1,040 | 1,220 | 500   | 79   | 36   | 32    |
| 16  | 62   | 1,260 | 192   | 690    | 3,430 | 3,210 | 990   | 1,040 | 410   | 75   | 36   | 32    |
| 17  | 65   | 720   | 178   | 690    | 2,430 | 2,700 | 990   | 1,400 | 370   | 72   | 35   | 32    |
| 18  | 55   | 520   | 270   | 790    | 1,730 | 1,800 | 690   | 1,520 | 310   | 72   | 28   | 48    |
| 19  | 39   | 365   | 4,610 | 790    | 1,400 | 1,520 | 590   | 1,540 | 280   | 72   | 28   | 55    |
| 20  | 32   | 325   | 2,960 | 790    | 1,280 | 1,660 | 590   | 1,220 | 272   | 72   | 28   | 61    |
| 21  | 27   | 270   | 2,000 | 740    | 1,460 | 1,460 | 640   | 1,100 | 272   | 68   | 26   | 133   |
| 22  | 39   | 207   | 1,700 | 790    | 1,340 | 1,280 | 640   | 1,040 | 222   | 65   | 31   | 90    |
| 23  | 124  | 178   | 4,200 | 990    | 1,800 | 990   | 640   | 1,520 | 192   | 61   | 31   | 109   |
| 24  | 74   | 152   | 2,080 | 1,660  | 1,590 | 890   | 740   | 1,520 | 207   | 58   | 31   | 94    |
| 25  | 50   | 142   | 2,660 | 1,400  | 1,460 | 1,100 | 840   | 1,220 | 238   | 55   | 31   | 88    |
| 26  | 42   | 133   | 4,610 | 5,700  | 1,460 | 990   | 740   | 1,160 | 192   | 55   | 31   | 70    |
| 27  | 37   | 128   | 3,390 | 6,120  | 1,340 | 3,760 | 690   | 840   | 164   | 55   | 29   | 72    |
| 28  | 34   | 305   | 2,360 | 2,610  | 1,940 | 3,760 | 740   | 790   | 164   | 52   | 28   | 65    |
| 29  | 29   | 3,610 | 2,000 | 2,340  | ----- | 2,520 | 740   | 740   | 164   | 52   | 31   | 65    |
| 30  | 27   | 4,080 | 1,560 | 1,730  | ----- | 2,610 | 790   | 640   | 154   | 50   | 31   | 58    |
| 31  | 27   | ----- | 1,630 | 1,660  | ----- | 2,610 | ----- | 590   | ----- | 48   | 31   | ----- |

| Month     | Maximum | Minimum | Mean  | Per square mile | Run-off |           |
|-----------|---------|---------|-------|-----------------|---------|-----------|
|           |         |         |       |                 | Inches  | Acre-feet |
| October   | 124     | 13      | 32.9  | 0.195           | 0.22    | 2,020     |
| November  | 4,080   | 27      | 606   | 3.59            | 4.00    | 36,100    |
| December  | 4,610   | 178     | 1,420 | 8.40            | 9.68    | 87,300    |
| January   | 11,300  | 690     | 2,040 | 12.1            | 13.95   | 125,000   |
| February  | 5,700   | 790     | 1,610 | 9.53            | 9.92    | 89,400    |
| March     | 6,880   | 890     | 2,240 | 13.3            | 15.33   | 138,000   |
| April     | 1,730   | 590     | 951   | 5.63            | 6.28    | 56,600    |
| May       | 5,140   | 590     | 1,520 | 8.99            | 10.36   | 93,500    |
| June      | 2,800   | 154     | 489   | 2.89            | 3.22    | 29,100    |
| July      | 138     | 48      | 81.3  | .481            | .55     | 5,000     |
| August    | 52      | 26      | 37.3  | .221            | .25     | 2,290     |
| September | 133     | 28      | 51.8  | .307            | .34     | 3,080     |
| The year  | 11,300  | 13      | 922   | 5.46            | 74.10   | 667,000   |

## MIDDLE FORK OF COQUILLE RIVER NEAR MYRTLE POINT, OREG.

LOCATION.—Water-stage recorder in S½ sec. 26, T. 29 S., R. 12 W., a third of a mile below mouth of Indian Creek and ¾ miles southeast of Myrtle Point. Zero of gage is 41.20 feet above mean sea level by general adjustment of 1929.

DRAINAGE AREA.—305 square miles.

RECORDS AVAILABLE.—October 1930 to September 1933.

DISCHARGE.—Maximum during year, 23,600 second-feet Jan. 2 (gage height, 22.5 feet); minimum, 10 second-foot Oct. 1-4, 13.

1930-33: Maximum, that of Jan. 2, 1933; minimum, 1 second-foot July 16, 17, 1931.

Maximum stage known, 25.8 feet, probably Oct. 31, 1924.

REMARKS.—Records good except those above 10,000 second-feet and those estimated, Dec. 9-14, 26-31, Feb. 27, which are fair. Flow regulated completely during low-water periods and to some extent at all times by logging ponds above gage. No diversions above gage.

*Discharge, in second-feet, 1932-33*

| Day     | Oct. | Nov.  | Dec.  | Jan.   | Feb.  | Mar.  | Apr.  | May   | June  | July | Aug. | Sept. |
|---------|------|-------|-------|--------|-------|-------|-------|-------|-------|------|------|-------|
| 1.....  | 10   | 25    | 1,450 | 2,190  | 3,820 | 1,880 | 1,420 | 616   | 319   | 130  | 42   | 23    |
| 2.....  | 10   | 30    | 820   | 14,500 | 2,070 | 2,250 | 1,270 | 764   | 299   | 124  | 40   | 23    |
| 3.....  | 10   | 87    | 570   | 10,900 | 1,880 | 4,150 | 984   | 1,330 | 280   | 123  | 35   | 22    |
| 4.....  | 10   | 74    | 433   | 3,980  | 1,500 | 2,740 | 942   | 1,230 | 261   | 113  | 109  | 22    |
| 5.....  | 24   | 62    | 369   | 2,190  | 1,550 | 1,940 | 806   | 1,590 | 244   | 105  | 97   | 22    |
| 6.....  | 39   | 772   | 309   | 1,710  | 1,710 | 1,550 | 696   | 2,260 | 235   | 53   | 28   | 23    |
| 7.....  | 34   | 262   | 270   | 1,450  | 1,400 | 1,400 | 620   | 2,530 | 244   | 53   | 26   | 26    |
| 8.....  | 26   | 293   | 252   | 1,160  | 1,210 | 1,260 | 644   | 7,380 | 304   | 60   | 26   | 26    |
| 9.....  | 18   | 380   | }     | 1,010  | 1,120 | 1,120 | 759   | 6,340 | 1,000 | 68   | 27   | 22    |
| 10..... | 13   | 261   |       | 985    | 930   | 914   | 545   | 3,000 | 820   | 87   | 29   | 21    |
| 11..... | 12   | 185   | }     | 840    | 893   | 1,300 | 1,110 | 1,940 | 605   | 87   | 29   | 19    |
| 12..... | 11   | 140   |       | 745    | 1,000 | 5,370 | 1,040 | 1,450 | 350   | 82   | 29   | 18    |
| 13..... | 10   | 114   | }     | 710    | 1,210 | 3,420 | 1,040 | 1,210 | 496   | 81   | 26   | 18    |
| 14..... | 11   | 108   |       | 728    | 1,120 | 2,120 | 822   | 985   | 223   | 78   | 25   | 98    |
| 15..... | 11   | 138   | 140   | 985    | 3,020 | 1,600 | 770   | 876   | 418   | 76   | 26   | 35    |
| 16..... | 11   | 966   | 147   | 1,030  | 5,780 | 1,510 | 744   | 786   | 289   | 71   | 25   | 22    |
| 17..... | 12   | 710   | 141   | 880    | 5,110 | 1,670 | 632   | 835   | 261   | 68   | 26   | 24    |
| 18..... | 18   | 411   | 140   | 920    | 2,600 | 1,580 | 584   | 870   | 244   | 66   | 27   | 60    |
| 19..... | 21   | 299   | 990   | 1,260  | 2,460 | 1,300 | 503   | 810   | 226   | 64   | 26   | 66    |
| 20..... | 21   | 147   | 1,730 | 1,080  | 2,000 | 1,300 | 402   | 700   | 210   | 60   | 26   | 35    |
| 21..... | 20   | 271   | 1,740 | 985    | 1,940 | 1,260 | 485   | 664   | 198   | 59   | 26   | 33    |
| 22..... | 20   | 196   | 1,310 | 1,030  | 1,940 | 1,080 | 351   | 476   | 188   | 59   | 26   | 38    |
| 23..... | 25   | 154   | 5,880 | 1,260  | 2,190 | 880   | 490   | 717   | 173   | 56   | 25   | 85    |
| 24..... | 35   | 60    | 3,620 | 2,020  | 2,530 | 710   | 334   | 529   | 170   | 55   | 24   | 78    |
| 25..... | 35   | 60    | 4,730 | 2,460  | 2,060 | 817   | 516   | 606   | 166   | 54   | 24   | 68    |
| 26..... | 32   | 53    | }     | 3,540  | 1,880 | 706   | 384   | 529   | 162   | 52   | 24   | 64    |
| 27..... | 30   | 77    |       | 11,600 | 1,550 | 748   | 490   | 462   | 152   | 50   | 24   | 58    |
| 28..... | 32   | 307   | }     | 4,800  | 1,660 | 1,480 | 342   | 411   | 148   | 48   | 23   | 66    |
| 29..... | 40   | 1,150 |       | 3,620  | ----- | 1,310 | 506   | 390   | 148   | 46   | 24   | 30    |
| 30..... | 45   | 2,900 | }     | 3,330  | ----- | 1,310 | 442   | 359   | 131   | 44   | 24   | 29    |
| 31..... | 59   | ----- |       | 3,060  | ----- | 1,610 | ----- | 329   | ----- | 43   | 24   | ----- |

| Month          | Maximum | Minimum | Mean  | Per square mile | Run-off |           |
|----------------|---------|---------|-------|-----------------|---------|-----------|
|                |         |         |       |                 | Inches  | Acre-feet |
| October.....   | 59      | 10      | 22.7  | 0.074           | 0.09    | 1,400     |
| November.....  | 2,900   | 25      | 356   | 1.17            | 1.30    | 21,200    |
| December.....  | 5,880   | -----   | 921   | 3.02            | 3.48    | 56,600    |
| January.....   | 14,500  | 710     | 2,800 | 9.18            | 10.60   | 172,000   |
| February.....  | 5,780   | 893     | 2,100 | 6.89            | 7.18    | 117,000   |
| March.....     | 5,370   | 706     | 1,690 | 5.54            | 6.39    | 104,000   |
| April.....     | 1,420   | 334     | 689   | 2.26            | 2.52    | 41,000    |
| May.....       | 7,380   | 329     | 1,390 | 4.56            | 5.26    | 85,500    |
| June.....      | 1,000   | 131     | 299   | .980            | 1.09    | 17,800    |
| July.....      | 130     | 43      | 71.5  | .234            | .27     | 4,400     |
| August.....    | 109     | 23      | 32.0  | .105            | .12     | 1,970     |
| September..... | 98      | 18      | 39.1  | .128            | .14     | 2,330     |
| The year.....  | 14,500  | 10      | 863   | 2.83            | 38.44   | 625,000   |

## NORTH FORK OF COQUILLE RIVER NEAR MYRTLE POINT, OREG.

LOCATION.—Water-stage recorder in NW¼ sec. 36, T. 28 S., R. 12 W., a quarter of a mile below junction with East Fork and 4¼ miles northeast of Myrtle Point. Zero of gage is 12.22 feet above mean sea level.

DRAINAGE AREA.—276 square miles.

RECORDS AVAILABLE.—October 1928 to September 1933. Prior to October 1930, at site 3½ miles downstream.

DISCHARGE.—Maximum during year, 10,400 second-feet Jan. 3 (gage height, 35.7 feet); minimum, 20 second-feet Oct. 1-8, 11, 12 (gage height, 1.60 feet). 1928-33: Maximum, that of Jan. 3, 1933; minimum, 17 second-feet Sept. 5, 1930.

Maximum stage known, 41.2 feet, during winter of 1909-10.

REMARKS.—Records fair. No diversions above gage. Flow regulated by operation of logging ponds above station.

*Discharge, in second-feet, 1932-33*

| Day     | Oct. | Nov.  | Dec.  | Jan.  | Feb.  | Mar.  | Apr.  | May   | June  | July | Aug. | Sept. |
|---------|------|-------|-------|-------|-------|-------|-------|-------|-------|------|------|-------|
| 1.....  | 20   | 44    | 1,020 | 3,430 | 4,910 | 2,970 | 1,770 | 499   | 566   | 290  | 98   | 57    |
| 2.....  | 20   | 63    | 827   | 7,700 | 3,660 | 2,810 | 1,430 | 869   | 515   | 276  | 96   | 54    |
| 3.....  | 20   | 311   | 934   | 9,320 | 2,570 | 3,910 | 1,220 | 1,100 | 483   | 269  | 103  | 52    |
| 4.....  | 20   | 198   | 746   | 6,500 | 2,020 | 3,300 | 1,070 | 1,190 | 467   | 256  | 121  | 51    |
| 5.....  | 20   | 156   | 600   | 4,050 | 1,900 | 2,450 | 934   | 1,970 | 437   | 242  | 135  | 52    |
| 6.....  | 20   | 1,290 | 515   | 3,600 | 1,850 | 1,950 | 827   | 3,030 | 407   | 230  | 116  | 64    |
| 7.....  | 20   | 709   | 452   | 2,970 | 1,600 | 1,750 | 765   | 2,840 | 392   | 223  | 101  | 120   |
| 8.....  | 20   | 392   | 407   | 2,310 | 1,340 | 1,580 | 806   | 5,120 | 956   | 216  | 95   | 116   |
| 9.....  | 21   | 912   | 354   | 1,970 | 1,260 | 1,380 | 934   | 6,280 | 5,720 | 204  | 91   | 81    |
| 10..... | 21   | 566   | 283   | 1,770 | 1,070 | 1,240 | 848   | 4,260 | 4,730 | 198  | 89   | 67    |
| 11..... | 20   | 362   | 318   | 1,530 | 1,050 | 1,360 | 1,120 | 2,750 | 2,690 | 192  | 87   | 59    |
| 12..... | 20   | 283   | 318   | 1,540 | 1,530 | 4,260 | 1,260 | 1,920 | 1,800 | 186  | 84   | 55    |
| 13..... | 22   | 236   | 318   | 1,170 | 1,970 | 4,370 | 1,100 | 1,500 | 1,360 | 180  | 81   | 53    |
| 14..... | 28   | 332   | 297   | 1,140 | 1,650 | 2,840 | 934   | 1,240 | 1,070 | 174  | 78   | 54    |
| 15..... | 84   | 422   | 290   | 1,410 | 3,200 | 2,020 | 827   | 1,140 | 912   | 168  | 75   | 71    |
| 16..... | 93   | 2,000 | 276   | 1,360 | 6,900 | 1,920 | 806   | 1,050 | 785   | 162  | 72   | 128   |
| 17..... | 87   | 1,800 | 276   | 1,220 | 4,620 | 2,000 | 765   | 1,260 | 689   | 151  | 71   | 118   |
| 18..... | 95   | 890   | 276   | 1,240 | 3,400 | 1,900 | 671   | 1,550 | 635   | 146  | 70   | 140   |
| 19..... | 73   | 600   | 1,030 | 1,600 | 3,030 | 1,650 | 617   | 1,360 | 583   | 146  | 68   | 168   |
| 20..... | 56   | 437   | 2,450 | 1,430 | 2,480 | 1,550 | 583   | 1,190 | 532   | 139  | 66   | 122   |
| 21..... | 52   | 407   | 3,260 | 1,460 | 2,480 | 1,480 | 549   | 1,020 | 483   | 132  | 64   | 180   |
| 22..... | 70   | 377   | 2,180 | 1,550 | 2,510 | 1,410 | 515   | 934   | 452   | 129  | 62   | 174   |
| 23..... | 392  | 318   | 3,760 | 1,800 | 2,600 | 1,170 | 483   | 1,220 | 422   | 105  | 60   | 210   |
| 24..... | 198  | 283   | 4,190 | 2,150 | 2,970 | 1,020 | 467   | 1,240 | 407   | 126  | 59   | 180   |
| 25..... | 110  | 249   | 5,490 | 2,900 | 2,540 | 956   | 515   | 1,120 | 392   | 121  | 57   | 186   |
| 26..... | 79   | 230   | 6,210 | 3,260 | 2,180 | 869   | 515   | 1,020 | 377   | 120  | 57   | 168   |
| 27..... | 64   | 210   | 7,560 | 8,080 | 2,200 | 934   | 452   | 890   | 347   | 116  | 57   | 174   |
| 28..... | 56   | 249   | 5,940 | 6,510 | 2,630 | 1,550 | 422   | 785   | 340   | 111  | 59   | 151   |
| 29..... | 50   | 543   | 4,550 | 4,830 | ----- | 1,700 | 437   | 708   | 318   | 108  | 58   | 156   |
| 30..... | 43   | 1,550 | 3,500 | 4,330 | ----- | 1,650 | 483   | 653   | 311   | 106  | 59   | 168   |
| 31..... | 43   | ----- | 3,100 | 3,940 | ----- | 2,050 | ----- | 600   | ----- | 102  | 60   | ----- |

| Month          | Maximum | Minimum | Mean  | Per square mile | Run-off |            |
|----------------|---------|---------|-------|-----------------|---------|------------|
|                |         |         |       |                 | Inches  | Acres-feet |
| October.....   | 392     | 20      | 62.5  | 0.226           | 0.26    | 3,840      |
| November.....  | 2,000   | 44      | 547   | 1.98            | 2.21    | 32,500     |
| December.....  | 7,560   | 276     | 1,990 | 7.21            | 8.31    | 122,000    |
| January.....   | 9,320   | 1,140   | 3,160 | 11.4            | 13.14   | 194,000    |
| February.....  | 6,900   | 1,050   | 2,580 | 9.35            | 9.74    | 143,000    |
| March.....     | 4,370   | 869     | 2,000 | 7.25            | 8.36    | 123,000    |
| April.....     | 1,770   | 422     | 804   | 2.91            | 3.25    | 47,800     |
| May.....       | 6,280   | 499     | 1,690 | 6.12            | 7.06    | 104,000    |
| June.....      | 5,720   | 311     | 986   | 3.57            | 3.98    | 58,700     |
| July.....      | 290     | 102     | 172   | .623            | .72     | 10,600     |
| August.....    | 135     | 57      | 79.0  | .286            | .33     | 4,860      |
| September..... | 210     | 51      | 114   | .413            | .46     | 6,780      |
| The year.....  | 9,320   | 20      | 1,180 | 4.28            | 57.82   | 851,000    |

## ROGUE RIVER BASIN

## ROGUE RIVER ABOVE BYBEE CREEK, OREG.

LOCATION.—Water-stage recorder in NE¼ sec. 26, T. 30 S., R. 3 E., 500 feet above Bybee Creek and 2 miles northeast of Union Creek.

DRAINAGE AREA.—118 square miles.

RECORDS AVAILABLE.—January 1930 to September 1933.

DISCHARGE.—Maximum during year, 4,460 second-feet June 9 (gage height, 7.68 feet); minimum recorded, 226 second-feet Dec. 9 (probably less at times when stage was affected by ice).

1930–33: Maximum, that of June 9, 1933; minimum, 186 second-feet Nov. 16, 1931 (gage height, 0.23 foot).

REMARKS.—Records good except those for Dec. 10 to Feb. 17, June 9–15, which are fair. No diversions or regulation above station. Gage-height record furnished by California-Oregon Power Co.

*Discharge, in second-feet, 1932–33*

| Day | Oct. | Nov. | Dec. | Jan. | Feb. | Mar.  | Apr.  | May   | June  | July | Aug. | Sept. |
|-----|------|------|------|------|------|-------|-------|-------|-------|------|------|-------|
| 1   | 262  | 268  | 450  | 315  | 310  | 282   | 435   | 915   | 1,460 | 848  | 405  | 354   |
| 2   | 260  | 315  | 450  |      | 310  | 288   | 480   | 848   | 1,460 | 848  | 405  | 351   |
| 3   | 262  | 300  | 465  |      | 305  | 288   | 602   | 740   | 1,520 | 825  | 405  | 351   |
| 4   | 262  | 290  | 420  |      | 305  | 280   | 700   | 740   | 1,520 | 780  | 405  | 345   |
| 5   | 262  | 375  | 405  |      | 305  | 280   | 660   | 720   | 1,520 | 760  | 405  | 351   |
| 6   | 258  | 760  | 390  |      | 288  | 285   | 660   | 640   | 1,460 | 740  | 405  | 375   |
| 7   | 260  | 405  | 375  |      | 285  | 298   | 660   | 602   | 1,410 | 720  | 390  | 354   |
| 8   | 260  | 390  | 342  |      | 280  | 298   | 602   | 585   | 2,180 | 700  | 390  | 345   |
| 9   | 255  | 465  | 240  | 312  | 270  | 298   | 550   | 550   | 4,060 | 680  | 390  | 336   |
| 10  | 255  | 357  |      |      | 250  | 308   | 498   | 532   | 2,820 | 640  | 375  | 330   |
| 11  | 255  | 325  |      |      | 290  | 312   | 480   | 532   | 2,330 | 602  | 360  | 328   |
| 12  | 255  | 310  |      |      | 312  | 405   | 480   | 550   | 2,330 | 602  | 375  | 322   |
| 13  | 262  | 312  |      |      | 285  | 390   | 498   | 602   | 2,400 | 585  | 360  | 320   |
| 14  | 302  | 354  |      |      | 282  | 360   | 532   | 640   | 2,400 | 568  | 360  | 328   |
| 15  | 292  | 461  |      |      | 270  | 357   | 660   | 700   | 2,260 | 550  | 360  | 360   |
| 16  | 322  | 870  |      | 300  | 280  | 375   | 660   | 700   | 2,000 | 532  | 360  | 333   |
| 17  | 308  | 660  |      |      | 290  | 375   | 602   | 680   | 1,700 | 515  | 360  | 325   |
| 18  | 285  | 498  |      |      | 292  | 360   | 550   | 640   | 1,460 | 498  | 360  | 360   |
| 19  | 275  | 435  |      |      | 280  | 360   | 532   | 620   | 1,360 | 480  | 360  | 336   |
| 20  | 270  | 390  | 287  |      | 280  | 390   | 550   | 640   | 1,260 | 480  | 360  | 342   |
| 21  | 270  | 375  |      | 297  | 280  | 420   | 585   | 680   | 1,240 | 465  | 360  | 375   |
| 22  | 318  | 360  |      |      | 278  | 405   | 680   | 700   | 1,180 | 465  | 360  | 351   |
| 23  | 300  | 336  |      |      | 280  | 390   | 870   | 915   | 1,140 | 450  | 360  | 348   |
| 24  | 288  | 328  |      |      | 275  | 375   | 960   | 1,060 | 1,110 | 450  | 360  | 375   |
| 25  | 278  | 320  |      |      | 272  | 360   | 1,010 | 1,210 | 1,210 | 435  | 360  | 360   |
| 26  | 278  | 318  |      | 288  | 280  | 360   | 915   | 1,260 | 1,140 | 435  | 360  | 357   |
| 27  | 275  | 320  |      |      | 278  | 360   | 1,060 | 1,210 | 1,080 | 420  | 360  | 342   |
| 28  | 270  | 450  |      |      | 285  | 420   | 1,260 | 1,310 | 1,040 | 420  | 360  | 333   |
| 29  | 268  | 465  |      | 310  | 420  | 1,310 | 1,640 | 938   | 420   | 360  | 330  | 330   |
| 30  | 268  | 498  |      |      | 420  | 1,060 | 1,760 | 892   | 420   | 360  | 328  | 328   |
| 31  | 268  |      | 320  |      | 435  |       | 1,640 |       | 420   | 357  |      |       |

| Month     | Maximum | Minimum | Mean  | Per square mile | Run-off |           |
|-----------|---------|---------|-------|-----------------|---------|-----------|
|           |         |         |       |                 | Inches  | Acre-feet |
| October   | 322     | 255     | 274   | 2.32            | 2.68    | 16,800    |
| November  | 870     | 268     | 410   | 3.47            | 3.87    | 24,400    |
| December  | 465     |         | 319   | 2.70            | 3.11    | 19,600    |
| January   |         |         | 306   | 2.59            | 2.99    | 18,800    |
| February  | 310     | 250     | 286   | 2.42            | 2.52    | 15,900    |
| March     | 435     | 280     | 353   | 2.99            | 3.45    | 21,700    |
| April     | 1,310   | 435     | 703   | 5.96            | 6.65    | 41,800    |
| May       | 1,760   | 532     | 857   | 7.26            | 8.37    | 52,700    |
| June      | 4,060   | 892     | 1,660 | 14.1            | 15.73   | 98,800    |
| July      | 848     | 420     | 573   | 4.86            | 5.60    | 35,200    |
| August    | 405     | 357     | 372   | 3.15            | 3.63    | 22,900    |
| September | 375     | 320     | 345   | 2.92            | 3.26    | 20,500    |
| The year  | 4,060   |         | 538   | 4.56            | 61.86   | 389,000   |

\* Estimated.

## ROGUE RIVER ABOVE PROSPECT, OREG.

LOCATION.—Water-stage recorder in NE¼ sec. 19, T. 32 S., R. 3 E., 1½ miles above intake of diversion of California Oregon Power Co., 3 miles above Mill Creek, and 2 miles northwest of Prospect.

DRAINAGE AREA.—332 square miles.

RECORDS AVAILABLE.—July 1907 to February 1912, incomplete; October 1923 to September 1933.

DISCHARGE.—Maximum during year, 6,680 second-feet June 9 (gage height, 6.30 feet); minimum recorded, 285 second-feet Dec. 9 (gage height, 1.30 feet); probably less than 285 second-feet at times when stage was affected by ice and discharge estimated.

1907-12, 1923-33: Maximum, about 9,300 second-feet Nov. 22, 1909 (gage height, about 7.0 feet); minimum, 200 second-feet Nov. 20, 1931 (gage height, 1.07 feet). Average, 11 years (1910-11, 1923-33), 680 second-feet.

REMARKS.—Records good except those estimated, which are fair. Stage-discharge relation affected by ice Dec. 16-18, Jan. 6-11, 18-24, Feb. 8-11. No diversions or regulation above station. Gage-height record furnished by California Oregon Power Co.

*Discharge, in second-feet, 1932-33*

| Day | Oct. | Nov.  | Dec.  | Jan.  | Feb.  | Mar. | Apr.  | May   | June  | July  | Aug. | Sept. |
|-----|------|-------|-------|-------|-------|------|-------|-------|-------|-------|------|-------|
| 1   | 330  | 338   | * 720 | 455   | 415   | 397  | 818   | 1,680 | 2,560 | 1,140 | 505  | 415   |
| 2   | 330  | 406   | 682   | 450   | 410   | 420  | 944   | 1,560 | 2,560 | 1,090 | 495  | 415   |
| 3   | 330  | 388   | 702   | 445   | 415   | 440  | 1,360 | 1,390 | 2,630 | 1,090 | 490  | 410   |
| 4   | 325  | 370   | 636   | 445   | 406   | 430  | 1,560 | 1,390 | 2,630 | 1,040 | 485  | 410   |
| 5   | 325  | 475   | 588   | 435   | 406   | 425  | 1,390 | 1,340 | 2,560 | 1,010 | 485  | 415   |
| 6   | 325  | 1,140 | 542   |       | 402   | 430  | 1,340 | 1,180 | 2,560 | 984   | 480  | 450   |
| 7   | 325  | 582   | 520   |       | 284   | 460  | 1,340 | 1,140 | 2,420 | 960   | 480  | 430   |
| 8   | 325  | 495   | 475   |       | * 375 | 480  | 1,140 | 1,090 | 3,200 | 936   | 475  | 425   |
| 9   | 325  | 643   | 309   |       | * 360 | 485  | 962   | 1,020 | 6,080 | 896   | 470  | 420   |
| 10  | 325  | 490   |       | * 447 | * 330 | 505  | 904   | 960   | 4,520 | 848   | 465  | 415   |
| 11  | 325  | 440   |       |       | * 380 | 526  | 864   | 944   | 3,680 | 802   | 460  | 410   |
| 12  | 325  | 420   |       | 445   | 415   | 825  | 872   | 962   | 3,680 | 788   | 455  | 410   |
| 13  | 334  | 415   |       | 445   | 397   | 818  | 904   | 1,140 | 3,750 | 765   | 455  | 406   |
| 14  | 392  | 470   | * 345 | 450   | 384   | 723  | 1,040 | 1,230 | 3,600 | 737   | 450  | 410   |
| 15  | 370  | 542   |       | 465   | 374   | 669  | 1,340 | 1,280 | 3,450 | 716   | 550  | 465   |
| 16  | 420  | 1,280 |       | 455   | 397   | 695  | 1,280 | 1,340 | 3,080 | 695   | 445  | 430   |
| 17  | 410  | 984   |       | 370   | 402   | 716  | 1,140 | 1,280 | 2,630 | 662   | 445  | 420   |
| 18  | 361  | 730   |       | * 390 | 410   | 676  | 992   | 1,230 | 2,210 | 643   | 445  | 465   |
| 19  | 348  | 618   | 532   | 410   | 397   | 656  | 928   | 1,140 | 2,000 | 630   | 445  | 435   |
| 20  | 343  | 548   | 475   |       | 392   | 737  | 952   | 1,180 | 1,870 | 612   | 440  | 430   |
| 21  | 338  | 515   | 455   |       | 397   | 825  | 1,080 | 1,230 | 1,800 | 600   | 440  | 485   |
| 22  | 406  | 500   | 435   | * 413 | 397   | 751  | 1,340 | 1,230 | 1,680 | 588   | 435  | 445   |
| 23  | 406  | 465   | 425   |       | * 388 | 688  | 1,740 | 1,620 | 1,620 | 576   | 435  | 450   |
| 24  | 370  | 445   | 415   |       | 379   | 636  | 2,000 | 2,000 | 1,500 | 564   | 430  | 470   |
| 25  | 361  | 430   | 415   | 397   | 379   | 612  | 2,070 | 2,280 | 1,680 | 554   | 425  | 465   |
| 26  | 356  |       | 420   | 392   | 392   | 588  | 1,800 | 2,420 | 1,560 | 542   | 420  | 455   |
| 27  | 352  |       | 455   | 392   | 388   | 582  | 2,070 | 2,280 | 1,500 | * 534 | 420  | 440   |
| 28  | 343  | * 595 | 505   | 415   | 397   | 709  | 2,560 | 2,420 | 1,440 | 526   | 420  | 430   |
| 29  | 343  |       | 480   | 410   |       | 737  | 2,630 | 2,020 | 1,280 | 520   | 420  | 420   |
| 30  | 343  |       | 475   | 410   |       | 751  | 2,000 | 3,220 | 1,180 | 515   | 425  | 410   |
| 31  | 338  |       | 460   | 415   |       | 825  |       | 2,920 |       | 510   | 420  |       |

| Month     | Maximum | Minimum | Mean  | Per square mile | Run-off |           |
|-----------|---------|---------|-------|-----------------|---------|-----------|
|           |         |         |       |                 | Inches  | Acre-feet |
| October   | 420     | 325     | 350   | 1.05            | 1.21    | 21,500    |
| November  | 1,280   | 338     | 570   | 1.72            | 1.92    | 33,900    |
| December  | 720     |         | 459   | 1.38            | 1.59    | 28,200    |
| January   | 465     | 370     | 427   | 1.29            | 1.49    | 26,300    |
| February  | 415     | 330     | 392   | 1.18            | 1.23    | 21,800    |
| March     | 825     | 397     | 620   | 1.87            | 2.16    | 38,100    |
| April     | 2,630   | 818     | 1,380 | 4.16            | 4.64    | 82,100    |
| May       | 3,220   | 944     | 1,580 | 4.76            | 5.49    | 97,200    |
| June      | 6,080   | 1,180   | 2,560 | 7.71            | 8.60    | 152,000   |
| July      | 1,140   | 510     | 744   | 2.24            | 2.58    | 45,700    |
| August    | 505     | 420     | 452   | 1.36            | 1.57    | 27,800    |
| September | 485     | 406     | 432   | 1.30            | 1.45    | 25,700    |
| The year  | 6,080   |         | 830   | 2.50            | 33.93   | 600,000   |

\* Estimated.

## ROGUE RIVER BELOW SOUTH FORK OF ROGUE RIVER, NEAR PROSPECT, OREG.

LOCATION.—Water-stage recorder in NW¼ sec. 16, T. 33 S., R. 2 E., at bridge 6 miles southwest of Prospect.

DRAINAGE AREA.—643 square miles.

RECORDS AVAILABLE.—April 1929 to September 1933.

DISCHARGE.—Maximum during year, about 9,820 second-feet June 9 (gage height, about 7.3 feet); minimum not determined.

1929-33: Maximum, about 12,600 second-feet Mar. 19, 1932 (gage height, 8.7 feet); minimum not determined.

REMARKS.—Records good except those estimated and those for July 23 to Aug. 18, which are fair. Minor irrigation diversions above station. Considerable diurnal fluctuation owing to operation of power plant 4 miles upstream. Gage-height record furnished by California Oregon Power Co.

## Discharge, in second-feet, 1932-33

| Day | Oct.  | Nov.    | Dec.    | Jan.  | Feb.  | Mar.  | Apr.  | May   | June    | July  | Aug.  | Sept. |
|-----|-------|---------|---------|-------|-------|-------|-------|-------|---------|-------|-------|-------|
| 1   | 854   | 854     | 1,420   | 1,100 | 979   | 1,100 | 1,870 | 3,310 | 4,720   | 2,680 | 1,300 | 1,100 |
| 2   | 854   | 965     | 1,380   | 1,380 | 993   | 1,140 | 2,070 | 3,120 | 4,720   | 2,560 | 1,380 | 1,040 |
| 3   | 854   | 965     | 1,380   | 1,300 | 888   | 1,260 | 2,740 | 2,800 | 4,720   | 2,560 | 1,340 | 1,040 |
| 4   | 860   | 916     | 1,300   | 1,180 | 944   | 1,140 | 3,120 | 2,920 | 4,570   | 2,500 | 1,340 | 1,040 |
| 5   | 860   | 1,060   | 1,260   | 1,180 | 951   | 1,180 | 2,860 | 2,860 | 4,570   | 2,450 | 1,260 | 1,060 |
| 6   | 854   | 1,970   | 1,180   | 1,220 | 972   | 1,180 | 2,860 | 2,620 | 4,570   | 2,400 | 1,260 | 1,070 |
| 7   | 854   | 1,380   | 1,140   | 1,220 | 937   | 1,260 | 2,860 | 2,620 | 4,420   | 2,340 | 1,260 | 1,050 |
| 8   | 860   | 1,140   | 1,100   | 1,220 | 951   | 1,220 | 2,500 | 2,500 | 5,240   | 2,230 | 1,260 | 1,050 |
| 9   | 854   | 1,420   | * 950   | 1,180 | 923   | 1,260 | 2,230 | 2,400 | 9,130   | 2,120 | 1,260 | 1,030 |
| 10  | 867   | 1,180   | 800     | 1,180 | 860   | 1,300 | 2,020 | 2,280 |         | 2,070 | 1,260 | 1,040 |
| 11  | 860   | 1,070   |         | 1,100 | 1,020 | 1,380 | 1,970 | 2,230 | * 6,970 | 1,970 | 1,220 | 1,000 |
| 12  | 848   | 1,010   |         | 1,040 | 1,000 | 1,970 | 1,970 | 2,280 |         | 1,920 | 1,220 | 1,000 |
| 13  | 848   | 979     |         | 1,070 | 965   | 1,970 | 1,970 | 2,400 |         | 1,870 | 1,220 | 1,030 |
| 14  | 881   | 1,070   | * 790   | 1,070 | 937   | 1,780 | 2,230 | 2,560 |         | 1,870 | 1,220 | 1,010 |
| 15  | 951   | 1,100   |         | 1,060 | 993   | 1,680 | 2,680 | 2,620 |         | 1,780 | 1,220 | 1,100 |
| 16  | 1,010 | 2,340   |         | 1,100 | 1,040 | 1,680 | 2,680 | 2,680 | 5,620   | 1,730 | 1,180 | 1,060 |
| 17  | 1,060 | * 2,200 | 1,100   | 979   | 1,020 | 1,780 | 2,450 | 2,680 | 4,870   | 1,680 | 1,220 | 1,050 |
| 18  | 1,010 | * 1,700 | 1,060   | 1,040 | 1,010 | 1,640 | 2,180 | 2,620 | 4,420   | 1,640 | 1,180 | 1,100 |
| 19  | 958   | 1,380   | 1,180   | 1,040 | 972   | 1,640 | 2,070 | 2,400 | 4,000   | 1,600 | 1,140 | 1,080 |
| 20  | 930   | 1,260   | 1,100   | 1,010 | 965   | 1,780 | 2,070 | 2,450 | 3,720   | 1,600 | 1,070 | 1,060 |
| 21  | 909   | 1,180   | 1,040   | 1,040 | 993   | 1,870 | 2,230 | 2,500 | 3,580   | 1,550 | 1,140 | 1,100 |
| 22  | 937   | 1,100   | 1,040   | 1,020 | 993   | 1,780 | 2,620 | 2,500 | 3,440   | 1,550 | 1,050 | 1,070 |
| 23  | 930   | 1,070   | 1,040   | 1,040 | 993   | 1,640 | 3,180 | 3,050 | 3,440   | 1,460 | 1,100 | 1,070 |
| 24  | 930   | 1,040   | 944     | 1,010 | 1,040 | 1,550 | 3,580 | 3,580 | 3,240   | 1,460 | 1,070 | 1,100 |
| 25  | 874   | 1,010   | 944     | 979   | 979   | 1,500 | 3,720 | 4,000 | 3,310   | 1,460 | 1,070 | 1,100 |
| 26  | 867   | 1,020   | 1,070   | 972   | 979   | 1,460 | 3,310 | 4,280 | 3,440   | 1,460 | 1,070 | 1,100 |
| 27  | 874   | 1,010   | 1,180   | 979   | 1,000 | 1,420 | 3,720 | 4,140 | 3,240   | 1,420 | 1,070 | 1,060 |
| 28  | 860   | 1,340   | * 1,200 | 972   | 1,060 | 1,680 | 4,420 | 4,280 | 3,310   | 1,380 | 1,100 | 1,050 |
| 29  | 854   | 1,380   | * 1,200 | 965   |       | 1,730 | 4,720 | 5,020 | 3,050   | 1,340 | 1,020 | 1,020 |
| 30  | 830   | 1,550   | * 1,170 | 965   |       | 1,780 | 3,860 | 5,620 | 2,800   | 1,340 | 1,060 | 1,010 |
| 31  | 854   |         | 1,140   | 951   |       | 1,870 |       | 5,170 |         | 1,380 | 1,050 |       |

| Month     | Maximum | Minimum | Mean  | Per square mile | Run-off |           |
|-----------|---------|---------|-------|-----------------|---------|-----------|
|           |         |         |       |                 | Inches  | Acre-feet |
| October   | 1,060   | 830     | 892   | 1.39            | 1.60    | 54,800    |
| November  | 2,340   | 854     | 1,260 | 1.96            | 2.19    | 75,000    |
| December  | 1,420   |         | 1,070 | 1.66            | 1.91    | 65,800    |
| January   | 1,380   | 951     | 1,080 | 1.68            | 1.94    | 66,400    |
| February  | 1,060   | 860     | 977   | 1.52            | 1.58    | 54,300    |
| March     | 1,970   | 1,100   | 1,540 | 2.40            | 2.77    | 94,700    |
| April     | 4,720   | 1,870   | 2,760 | 4.29            | 4.79    | 164,000   |
| May       | 5,620   | 2,230   | 3,110 | 4.84            | 5.58    | 191,000   |
| June      | 9,130   | 2,800   | 4,800 | 7.47            | 8.33    | 286,000   |
| July      | 2,680   | 1,340   | 1,850 | 2.88            | 3.32    | 114,000   |
| August    | 1,380   | 1,020   | 1,180 | 1.84            | 2.12    | 72,600    |
| September | 1,100   | 1,000   | 1,060 | 1.65            | 1.84    | 63,100    |
| The year  | 9,130   |         | 1,800 | 2.80            | 37.97   | 1,300,000 |

\* Estimated.

## ROGUE RIVER AT RAYGOLD, NEAR CENTRAL POINT, OREG.

LOCATION.—Water-stage recorder in sec. 18, T. 36 S., R. 2 W., at Raygold, just below dam and powder house of California Oregon Power Co., half a mile below Bear Creek, and 6 miles northwest of Central Point.

DRAINAGE AREA.—2,020 square miles.

RECORDS AVAILABLE.—August 1905 to September 1933.

DISCHARGE.—Maximum during year, 17,800 second-feet Jan. 2 (gage height, 8.45 feet); minimum, 614 second-feet Oct. 29, Dec. 9 (gage height, 0.09 foot).

1905-33: Maximum, 91,500 second-feet Feb. 21, 1927 (gage height, 24.8 feet); minimum stage indeterminate, as water goes below intake pipe of well during low stages, which are usually of short duration. Average, 28 years (1905-33), 2,760 second-feet.

REMARKS.—Records good. Numerous diversions for irrigation above station. Diurnal fluctuation owing to operation of power plant immediately above station. Gage-height record furnished by California Oregon Power Co.

*Discharge, in second-feet, 1932-33*

| Day     | Oct.   | Nov.  | Dec.  | Jan.  | Feb.  | Mar.  | Apr.  | May   | June  | July  | Aug.  | Sept. |
|---------|--------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 1.....  | 935    | 1,070 | 2,250 | 2,760 | 3,040 | 3,790 | 3,790 | 5,160 | 6,140 | 3,040 | 1,430 | 1,200 |
| 2.....  | 935    | 1,200 | 2,010 | 7,550 | 2,500 | 3,890 | 4,030 | 4,980 | 5,940 | 2,830 | 1,430 | 1,200 |
| 3.....  | 912    | 1,290 | 2,010 | 8,620 | 2,130 | 5,940 | 5,160 | 4,620 | 6,140 | 2,830 | 1,430 | 1,160 |
| 4.....  | 920    | 1,200 | 1,840 | 3,790 | 2,130 | 4,030 | 5,940 | 4,980 | 5,740 | 2,760 | 1,380 | 1,160 |
| 5.....  | 928    | 1,290 | 1,080 | 2,530 | 2,250 | 3,480 | 5,350 | 5,100 | 5,540 | 2,700 | 1,380 | 1,200 |
| 6.....  | 920    | 2,020 | 1,630 | 2,700 | 2,440 | 3,400 | 5,160 | 5,160 | 5,540 | 2,560 | 1,380 | 1,200 |
| 7.....  | 935    | 2,190 | 1,530 | 2,700 | 2,370 | 3,630 | 5,160 | 5,350 | 5,350 | 2,500 | 1,380 | 1,240 |
| 8.....  | 966    | 1,580 | 1,480 | 2,440 | 2,130 | 3,710 | 4,620 | 5,350 | 5,540 | 2,440 | 1,380 | 1,160 |
| 9.....  | 982    | 1,630 | 1,260 | 2,250 | 2,010 | 3,560 | 3,950 | 5,160 | 8,960 | 2,310 | 1,340 | 1,200 |
| 10..... | 1,010  | 1,630 | 950   | 2,070 | 1,790 | 3,630 | 3,560 | 4,620 | 9,450 | 2,250 | 1,340 | 1,200 |
| 11..... | 990    | 1,430 | 990   | 1,960 | 1,840 | 3,710 | 3,330 | 4,280 | 7,450 | 2,250 | 1,340 | 1,200 |
| 12..... | 982    | 1,340 |       | 1,790 | 2,010 | 5,470 | 3,260 | 4,280 | 7,220 | 2,190 | 1,290 | 1,160 |
| 13..... | 990    | 1,200 |       | 1,840 | 2,500 | 5,740 | 3,330 | 4,280 | 7,220 | 2,130 | 1,290 | 1,160 |
| 14..... | 1,010  | 1,340 |       | 1,900 | 2,130 | 4,620 | 3,560 | 4,280 | 7,220 | 2,070 | 1,290 | 1,200 |
| 15..... | 1,200  | 1,380 |       | 1,960 | 3,270 | 4,110 | 4,200 | 4,450 | 7,000 | 1,960 | 1,290 | 1,200 |
| 16..... | 1,200  | 2,180 | 990   | 1,960 | 6,360 | 4,200 | 4,280 | 4,450 | 6,560 | 1,900 | 1,240 | 1,240 |
| 17..... | 1,430  | 2,760 |       | 1,790 | 3,710 | 4,620 | 4,110 | 4,450 | 5,740 | 1,840 | 1,290 | 1,200 |
| 18..... | 1,200  | 2,190 |       | 1,680 | 3,110 | 4,030 | 3,710 | 4,800 | 5,160 | 1,790 | 1,240 | 1,240 |
| 19..... | 1,110  | 1,840 |       | 1,680 | 2,760 | 3,790 | 3,400 | 4,200 | 4,620 | 1,740 | 1,240 | 1,290 |
| 20..... | 1,070  | 1,630 |       | 1,630 | 2,560 | 4,110 | 3,260 | 3,950 | 4,450 | 1,680 | 1,240 | 1,200 |
| 21..... | 21,070 | 1,480 | 1,900 | 1,580 | 2,630 | 4,450 | 3,400 | 3,950 | 4,110 | 1,680 | 1,200 | 1,340 |
| 22..... | 1,110  | 1,430 | 1,680 | 1,580 | 2,700 | 4,030 | 3,790 | 4,110 | 3,950 | 1,630 | 1,240 | 1,290 |
| 23..... | 1,200  | 1,380 | 3,260 | 1,630 | 2,900 | 3,560 | 4,450 | 4,450 | 3,790 | 1,630 | 1,200 | 1,290 |
| 24..... | 1,160  | 1,290 | 2,630 | 1,740 | 2,830 | 3,260 | 5,160 | 4,980 | 3,630 | 1,630 | 1,200 | 1,340 |
| 25..... | 1,110  | 1,240 | 2,560 | 1,900 | 2,560 | 3,040 | 5,350 | 5,540 | 3,630 | 1,580 | 1,200 | 1,380 |
| 26..... | 1,110  | 1,240 | 4,120 | 1,790 | 2,560 | 2,900 | 5,160 | 5,740 | 3,790 | 1,530 | 1,160 | 1,340 |
| 27..... | 1,070  | 1,290 | 4,280 | 3,360 | 2,630 | 2,760 | 5,160 | 5,740 | 3,560 | 1,530 | 1,200 | 1,340 |
| 28..... | 1,070  | 1,630 | 3,870 | 2,760 | 3,140 | 3,480 | 5,940 | 5,540 | 3,630 | 1,480 | 1,200 | 1,240 |
| 29..... | 1,070  | 2,130 | 3,400 | 2,310 | ----- | 3,710 | 6,350 | 6,140 | 3,400 | 1,480 | 1,200 | 1,240 |
| 30..... | 1,070  | 2,500 | 3,110 | 2,250 | ----- | 3,560 | 5,940 | 6,780 | 3,180 | 1,430 | 1,200 | 1,240 |
| 31..... | 1,030  | ----- | 2,700 | 2,970 | ----- | 3,850 | ----- | 6,780 | ----- | 1,480 | 1,200 | ----- |

| Month          | Maximum | Minimum | Mean  | Run-off in acre-feet |
|----------------|---------|---------|-------|----------------------|
| October.....   | 1,430   | 912     | 1,050 | 64,600               |
| November.....  | 2,760   | 1,070   | 1,600 | 95,200               |
| December.....  | 4,280   | -----   | 2,070 | 127,000              |
| January.....   | 8,620   | 1,580   | 2,570 | 158,000              |
| February.....  | 6,360   | 1,790   | 2,680 | 149,000              |
| March.....     | 5,940   | 2,760   | 3,940 | 242,000              |
| April.....     | 6,350   | 3,260   | 4,460 | 265,000              |
| May.....       | 6,780   | 3,950   | 4,960 | 305,000              |
| June.....      | 9,450   | 3,180   | 5,460 | 325,000              |
| July.....      | 3,040   | 1,430   | 2,030 | 125,000              |
| August.....    | 1,430   | 1,160   | 1,280 | 78,700               |
| September..... | 1,380   | 1,160   | 1,240 | 73,800               |
| The year.....  | 9,450   | 912     | 2,770 | 2,010,000            |

## MILL CREEK NEAR PROSPECT, OREG.

LOCATION.—Staff gage in SE¼ sec. 29, T. 32 S., R. 3 E., at power canal crossing a third of a mile northeast of Prospect. Zero of gage is about 2,587 feet above mean sea level.

DRAINAGE AREA.—32 square miles.

RECORDS AVAILABLE.—August to October 1910; May 1925 to September 1933.

DISCHARGE.—Maximum recorded during year, 154 second-feet June 18 (gage height, 2.24 feet); minimum, 29 second-feet Oct. 7.

1910, 1925-33: Maximum, 200 second-feet Feb. 20, 1927; minimum, 24 second-feet Sept. 4-25, Oct. 2-16, 1931.

REMARKS.—Records fair. Gage read once a week. A ditch above station diverts 1 or 2 second-feet for use at Prospect; no regulation. Gage-height record furnished by California Oregon Power Co.

## Discharge, in second-feet, 1932-33

| Day | Oct. | Nov. | Dec. | Jan. | Feb. | Mar. | Apr. | May | June | July | Aug. | Sept. |
|-----|------|------|------|------|------|------|------|-----|------|------|------|-------|
| 1   |      |      |      |      |      |      |      |     |      |      |      | 38    |
| 2   |      |      | 42   |      | 35   | 42   |      |     | 144  |      |      |       |
| 3   |      |      |      |      |      |      |      |     |      |      | 43   |       |
| 4   |      | 30   |      |      |      |      |      | 120 |      |      |      |       |
| 5   |      |      |      |      |      |      |      |     |      |      |      |       |
| 6   |      |      |      | 45   |      |      | 88   | 111 |      | 93   |      |       |
| 7   | 29   |      |      |      |      |      |      |     |      |      |      | 38    |
| 8   |      |      |      |      |      |      |      |     | 149  |      |      |       |
| 9   |      |      |      |      | 34   | 45   |      |     |      |      |      |       |
| 10  |      |      |      |      |      |      |      |     |      |      |      |       |
| 11  |      | 32   |      |      |      |      |      | 93  |      |      | 41   |       |
| 12  |      |      |      |      |      |      |      |     |      |      |      |       |
| 13  |      |      |      | 39   |      |      | 77   |     |      |      |      | 37    |
| 14  | 35   |      |      |      |      |      |      |     |      |      |      | 39    |
| 15  |      |      |      |      |      |      |      |     |      |      |      |       |
| 16  |      |      |      | 42   |      |      |      |     | 149  |      |      |       |
| 17  |      |      |      |      | 38   | 57   |      |     |      |      |      |       |
| 18  |      | 42   |      |      |      | 54   |      | 106 | 154  |      | 39   |       |
| 19  |      |      |      |      |      |      |      |     | 149  |      |      |       |
| 20  |      |      |      | 38   |      |      |      |     |      |      |      |       |
| 21  | 30   |      |      |      |      |      | 84   |     |      | 55   |      |       |
| 22  |      |      |      |      |      |      |      |     |      |      |      | 39    |
| 23  |      |      | 39   |      |      |      |      |     | 139  |      |      |       |
| 24  |      |      |      |      | 35   | 54   |      |     |      |      |      |       |
| 25  |      | 33   |      |      |      |      |      |     |      |      | 38   |       |
| 26  |      |      |      |      |      |      |      | 134 |      |      |      |       |
| 27  |      |      |      | 38   |      |      |      |     |      |      |      |       |
| 28  | 30   |      |      |      |      |      | 129  |     |      | 48   |      |       |
| 29  |      |      |      |      |      |      |      |     |      |      |      | 38    |
| 30  |      |      | 42   |      |      |      |      |     | 120  |      |      |       |
| 31  |      |      |      |      |      | 63   |      |     |      |      |      |       |

| Month     | Mean | Per square mile | Run-off |           |
|-----------|------|-----------------|---------|-----------|
|           |      |                 | Inches  | Acre-feet |
| October   | 31.0 | 0.969           | 1.12    | 1,910     |
| November  | 39.5 | 1.23            | 1.37    | 2,350     |
| December  | 35.7 | 1.12            | 1.29    | 2,200     |
| January   | 40.4 | 1.26            | 1.45    | 2,480     |
| February  | 35.5 | 1.11            | 1.16    | 1,970     |
| March     | 52.5 | 1.64            | 1.89    | 3,230     |
| April     | 86.9 | 2.72            | 3.04    | 5,170     |
| May       | 127  | 3.97            | 4.58    | 7,810     |
| June      | 143  | 4.47            | 4.99    | 8,510     |
| July      | 69.9 | 2.18            | 2.51    | 4,300     |
| August    | 40.2 | 1.26            | 1.45    | 2,470     |
| September | 38.2 | 1.19            | 1.33    | 2,270     |
| The year  | 61.7 | 1.93            | 26.18   | 44,700    |

NOTE.—No record on days omitted. Monthly mean discharge is mean of days for which records are published, except those for November, December, April, May, and July, which are estimated by comparison with Rogue River above Prospect.

## SOUTH FORK OF ROGUE RIVER ABOVE IMNAHA CREEK, NEAR PROSPECT, OREG.

LOCATION.—Water-stage recorder in NE¼ sec. 18, T. 33 S., R. 4 E., 300 yards about Imnaha Creek, 400 yards above South Fork diversion dam, and 6 miles southeast of Prospect.

DRAINAGE AREA.—52 square miles.

RECORDS AVAILABLE.—October 1931 to September 1933.

DISCHARGE.—Maximum during year, 930 second-feet June 9 (gage height, 4.21 feet); minimum recorded, 46 second-feet Feb. 8 (probably less at times when stage was affected by ice).

1931-33: Maximum, 1,100 second-feet Mar. 19, 1932 (gage height, 4.47 feet); minimum, 27 second-feet Oct. 1-21, 1931; minimum gage height, 0.81 foot Oct. 4, 9-21, 1931.

REMARKS.—Records good except those for December to February, which are poor. Discharge estimated Dec. 8-21, 23-26, Jan. 13-20, Feb. 7, 9, 10. No diversion or regulation above station. Gage-height record furnished by California Oregon Power Co.

*Discharge, in second-feet, 1931-32*

| Day | Oct. | Nov. | Dec. | Jan. | Feb. | Mar. | Apr. | May | June | July | Aug. | Sept. |
|-----|------|------|------|------|------|------|------|-----|------|------|------|-------|
| 1   | 48   | 48   | 95   | 66   | 51   | 51   | 98   | 315 | 560  | 250  | 107  | 79    |
| 2   | 48   | 58   | 94   | 66   | 51   | 51   | 113  | 280 | 540  | 240  | 106  | 77    |
| 3   | 48   | 53   | 94   | 63   | 50   | 52   | 142  | 260 | 520  | 240  | 104  | 77    |
| 4   | 48   | 53   | 88   | 62   | 50   | 51   | 162  | 290 | 502  | 231  | 106  | 76    |
| 5   | 47   | 71   | 81   | 61   | 50   | 50   | 165  | 270 | 502  | 231  | 106  | 76    |
| 6   | 48   | 175  | 76   | 71   | 49   | 50   | 173  | 240 | 502  | 222  | 104  | 84    |
| 7   | 48   | 124  | 72   | 71   | 48   | 56   | 173  | 231 | 485  | 213  | 102  | 80    |
| 8   | 48   | 94   |      | 66   | 48   | 56   | 159  | 213 | 540  | 209  | 101  | 77    |
| 9   | 48   | 138  |      | 63   | 47   | 53   | 146  | 204 | 755  | 199  | 100  | 76    |
| 10  | 48   | 102  |      | 61   | 47   | 56   | 138  | 193 | 755  | 186  | 98   | 74    |
| 11  | 48   | 87   |      | 58   | 51   | 58   | 136  | 190 | 650  | 176  | 97   | 74    |
| 12  | 48   | 76   |      | 55   | 49   | 73   | 142  | 199 | 675  | 170  | 95   | 73    |
| 13  | 48   | 72   |      |      | 49   | 72   | 146  | 213 | 700  | 164  | 95   | 73    |
| 14  | 58   | 73   |      |      | 49   | 71   | 162  | 222 | 700  | 159  | 94   | 73    |
| 15  | 56   | 81   | 56   |      | 50   | 71   | 193  | 231 | 675  | 154  | 93   | 76    |
| 16  | 76   | 240  |      | 53   | 49   | 71   | 192  | 231 | 605  | 149  | 90   | 73    |
| 17  | 63   | 211  |      |      | 49   | 73   | 176  | 240 | 520  | 143  | 88   | 72    |
| 18  | 57   | 149  |      |      | 49   | 72   | 162  | 231 | 435  | 138  | 88   | 87    |
| 19  | 52   | 119  |      |      | 49   | 73   | 154  | 222 | 405  | 132  | 87   | 76    |
| 20  | 50   | 101  |      |      | 49   | 84   | 154  | 222 | 390  | 130  | 87   | 76    |
| 21  | 49   | 91   |      | 53   | 48   | 91   | 167  | 231 | 378  | 126  | 86   | 77    |
| 22  | 65   | 86   | 66   | 53   | 48   | 84   | 193  | 240 | 352  | 124  | 83   | 74    |
| 23  | 61   | 80   | 70   | 53   | 45   | 81   | 231  | 290 | 340  | 122  | 83   | 73    |
| 24  | 56   | 76   | 64   | 53   | 47   | 80   | 280  | 328 | 328  | 119  | 81   | 83    |
| 25  | 53   | 74   | 62   | 52   | 47   | 79   | 302  | 378 | 352  | 116  | 81   | 83    |
| 26  | 52   | 73   | 63   | 54   | 47   | 77   | 280  | 420 | 340  | 114  | 80   | 76    |
| 27  | 51   | 72   | 67   | 56   | 47   | 77   | 328  | 420 | 328  | 113  | 79   | 72    |
| 28  | 50   | 104  | 74   | 53   | 49   | 83   | 378  | 450 | 315  | 112  | 79   | 69    |
| 29  | 49   | 101  | 69   | 53   |      | 83   | 420  | 560 | 280  | 110  | 79   | 68    |
| 30  | 48   | 101  | 71   | 52   |      | 83   | 352  | 650 | 260  | 108  | 81   | 67    |
| 31  | 48   |      | 68   | 52   |      | 94   |      | 605 |      | 107  | 80   |       |

| Month     | Maximum | Minimum | Mean | Per square mile | Run-off |           |
|-----------|---------|---------|------|-----------------|---------|-----------|
|           |         |         |      |                 | Inches  | Acre-feet |
| October   | 76      | 47      | 52.2 | 1.00            | 1.15    | 3,210     |
| November  | 240     | 48      | 99.4 | 1.91            | 2.13    | 5,910     |
| December  | 95      |         | 66.4 | 1.28            | 1.48    | 4,080     |
| January   | 71      |         | 57.2 | 1.10            | 1.27    | 3,520     |
| February  | 51      | 47      | 48.8 | .938            | .98     | 2,710     |
| March     | 94      | 50      | 69.5 | 1.34            | 1.54    | 4,270     |
| April     | 420     | 98      | 201  | 3.87            | 4.32    | 12,000    |
| May       | 650     | 190     | 299  | 5.75            | 6.63    | 18,400    |
| June      | 755     | 260     | 490  | 9.42            | 10.51   | 29,200    |
| July      | 250     | 107     | 162  | 3.12            | 3.60    | 9,960     |
| August    | 107     | 79      | 91.6 | 1.76            | 2.03    | 5,630     |
| September | 87      | 67      | 75.7 | 1.46            | 1.63    | 4,500     |
| The year  | 755     | 47      | 143  | 2.75            | 37.27   | 103,000   |

## IMNAHA CREEK NEAR PROSPECT, OREG.

LOCATION.—Staff gage in NE¼ sec. 18, T. 33 S., R 4 E., 400 yards above mouth and 6 miles southeast of Prospect.

DRAINAGE AREA.—26 square miles.

RECORDS AVAILABLE.—September 1931 to September 1933.

DISCHARGE.—Maximum recorded during year, 176 second-feet June 15 (gage height, 1.86 feet); minimum, 16 second-feet Oct. 7, 13 (gage height, 0.57 foot); discharge June 9 probably greater than 176 second-feet.

1931-33: Maximum, 237 second-feet Mar. 19, 1932 (gage height, 2.10 feet); minimum, 11 second-feet Dec. 14, 1931 (gage height, 0.46 foot).

REMARKS.—Records fair. Gage read only once a week. No diversions or regulation above station. Gage-height record furnished by California Oregon Power Co.

*Discharge, in second-feet, 1932-33*

| Day | Oct. | Nov. | Dec. | Jan. | Feb. | Mar. | Apr. | May | June | July | Aug. | Sept. |
|-----|------|------|------|------|------|------|------|-----|------|------|------|-------|
| 1   |      |      | 23   |      |      |      |      |     | 145  |      |      |       |
| 2   |      |      |      |      | 19   | 20   |      |     |      |      | 33   |       |
| 3   |      | 19   |      |      |      |      |      |     |      |      |      |       |
| 4   |      |      |      |      |      |      |      | 119 |      |      |      |       |
| 5   |      |      |      | 21   |      |      |      |     |      | 63   |      |       |
| 6   |      |      |      |      |      |      | 58   |     |      |      |      | 26    |
| 7   | 16   |      |      |      |      |      |      |     |      |      |      |       |
| 8   |      |      | 21   |      |      |      |      | 91  | 125  |      |      |       |
| 9   |      |      |      |      | 18   | 20   |      |     |      |      | 30   |       |
| 10  |      | 20   |      |      |      |      |      |     |      |      |      |       |
| 11  |      |      |      |      |      |      |      | 82  |      |      |      |       |
| 12  |      |      |      | 21   |      |      |      |     |      | 52   |      |       |
| 13  | 16   |      |      |      |      |      | 57   |     |      |      |      | 25    |
| 14  |      |      |      |      |      |      |      |     |      |      |      | 24    |
| 15  |      |      | 19   |      |      |      |      |     | 176  |      |      |       |
| 16  |      |      |      |      | 18   | 28   |      |     |      |      | 28   |       |
| 17  |      | 23   |      | 20   |      |      |      |     | 147  |      |      |       |
| 18  |      |      |      |      |      |      |      | 85  |      |      |      |       |
| 19  |      |      |      | 20   |      |      |      |     | 113  | 45   |      |       |
| 20  | 18   |      |      |      |      |      | 62   |     |      |      |      | 26    |
| 21  |      |      |      |      |      |      |      |     |      |      |      |       |
| 22  |      |      | 19   |      |      | 33   |      |     | 99   |      |      |       |
| 23  |      |      |      |      | 18   | 33   |      |     |      |      | 26   |       |
| 24  |      | 20   |      |      |      |      |      |     |      |      |      |       |
| 25  |      |      |      |      |      |      |      | 98  |      |      |      |       |
| 26  |      |      |      | 19   |      |      |      |     |      | 38   |      |       |
| 27  | 18   |      |      |      |      |      | 104  |     |      |      |      | 26    |
| 28  |      |      |      |      |      |      |      |     | 80   |      |      |       |
| 29  |      |      |      |      |      |      |      |     |      |      |      |       |
| 30  |      |      | 22   |      |      | 33   |      |     |      |      | 26   |       |
| 31  |      |      |      |      |      |      |      |     |      |      |      |       |

| Month     | Mean | Per square mile | Run-off |            |
|-----------|------|-----------------|---------|------------|
|           |      |                 | Inches  | Acree-feet |
| October   | 17.0 | 0.654           | 0.75    | 1,050      |
| November  | 20.5 | .788            | .88     | 1,220      |
| December  | 20.8 | .800            | .92     | 1,280      |
| January   | 20.2 | .777            | .90     | 1,240      |
| February  | 18.2 | .700            | .73     | 1,010      |
| March     | 27.8 | 1.07            | 1.23    | 1,710      |
| April     | 70.2 | 2.70            | 3.01    | 4,180      |
| May       | 95.0 | 3.65            | 4.21    | 5,840      |
| June      | 126  | 4.85            | 5.41    | 7,500      |
| July      | 49.5 | 1.90            | 2.19    | 3,040      |
| August    | 28.6 | 1.10            | 1.27    | 1,760      |
| September | 25.4 | .977            | 1.09    | 1,510      |
| The year  | 43.3 | 1.67            | 22.59   | 31,300     |

NOTE.—No record on days omitted. Monthly mean discharge is mean of days for which records are published.

## SOUTH FORK OF ROGUE RIVER POWER CANAL NEAR PROSPECT, OREG.

LOCATION.—Water-stage recorder in E½ sec. 12, T. 33 S., R. 3 E., 1 mile below head gate at diversion dam and 5 miles southeast of Prospect. Zero of gage is about 3,357 feet above mean sea level.

RECORDS AVAILABLE.—April 1932 to September 1933.

DISCHARGE.—Maximum during year, 175 second-feet May 31, June 17 (gage height, 3.18 feet); no flow at times.

1932-33: Maximum, that of May 31, June 17, 1933.

REMARKS.—Records excellent except those for January, February, and March, which are fair. This canal, completed in March 1932, diverts water from South Fork of Rogue River 200 feet below mouth of Imnaha Creek for use at power plant located in W½ sec. 1, T. 33 S., R. 3 E., from which water may be wasted into Middle Fork of Rogue River or mingled with other diversions in main power canal. (See p. 145.) Gage-height record furnished by California Oregon Power Co.

*Discharge, in second-feet, of South Fork of Rogue River power canal near Prospect, Oreg., 1932-33*

| Day     | Oct. | Nov.  | Dec. | Jan. | Feb.  | Mar. | Apr.  | May | June  | July | Aug. | Sept. |
|---------|------|-------|------|------|-------|------|-------|-----|-------|------|------|-------|
| 1.....  | 46   | 55    | 102  | 80   | 63    | 67   | 2.9   | 155 | 5.0   | 155  | 119  | 85    |
| 2.....  | 50   | 65    | 103  | 83   | 63    | 67   | 2.9   | 150 | 11    | 155  | 119  | 84    |
| 3.....  | 50   | 60    | 103  | 81   | 62    | 67   | 3.0   | 150 | 79    | 155  | 119  | 83    |
| 4.....  | 50   | 61    | 95   | 80   | 62    | 65   | 3.2   | 150 | 67    | 155  | 119  | 83    |
| 5.....  | 53   | 73    | 91   | 79   | 62    | 64   | 3.3   | 150 | 129   | 155  | 119  | 83    |
| 6.....  | 53   | 106   | 86   | 90   | 63    | 65   | 3.3   | 150 | 160   | 155  | 114  | 92    |
| 7.....  | 54   | 124   | 84   | 87   | 61    | 71   | 3.5   | 150 | 155   | 155  | 114  | 87    |
| 8.....  | 54   | 99    | 76   | 84   | 62    | 70   | 3.5   | 146 | 160   | 155  | 114  | 84    |
| 9.....  | 54   | 137   | 0    | 82   | 58    | 69   | 3.3   | 146 | 160   | 150  | 110  | 82    |
| 10..... | 54   | 108   | 0    | 80   | 58    | 72   | 35    | 75  | 155   | 150  | 109  | 81    |
| 11..... | 54   | 91    | 0    | 79   | 62    | 74   | 61    | 4.3 | 155   | 150  | 107  | 81    |
| 12..... | 53   | 82    | 0    | 77   | 62    | 88   | 61    | 4.3 | 150   | 150  | 106  | 80    |
| 13..... | 54   | 79    | 0    | 77   | 61    | 41   | 37    | 4.3 | 155   | 150  | 104  | 79    |
| 14..... | 60   | 82    | 0    | 77   | 60    | 3.2  | 46    | 4.3 | 155   | 150  | 104  | 82    |
| 15..... | 61   | 88    | 0    | 77   | 63    | 3.3  | 79    | 4.2 | 160   | 150  | 103  | 86    |
| 16..... | 70   | 150   | 0    | 77   | 63    | 3.5  | 80    | 4.2 | 35    | 150  | 101  | 82    |
| 17..... | 67   | 146   | 0    | 72   | 62    | 3.5  | 133   | 4.2 | 109   | 150  | 101  | 82    |
| 18..... | 63   | 137   | 0    | 62   | 62    | 3.5  | 136   | 45  | 170   | 146  | 99   | 96    |
| 19..... | 59   | 119   | 60   | 62   | 62    | 3.5  | 102   | 48  | 165   | 146  | 99   | 84    |
| 20..... | 57   | 104   | 74   | 62   | 62    | 3.5  | 150   | 30  | 165   | 146  | 98   | 85    |
| 21..... | 56   | 96    | 73   | 62   | 63    | 3.6  | 155   | 30  | 160   | 146  | 96   | 87    |
| 22..... | 67   | 91    | 73   | 63   | 63    | 17   | 155   | 30  | 160   | 146  | 95   | 83    |
| 23..... | 66   | 86    | 76   | 64   | 63    | 3.2  | 160   | 31  | 160   | 146  | 93   | 83    |
| 24..... | 61   | 82    | 74   | 65   | 62    | 2.9  | 160   | 32  | 160   | 137  | 91   | 93    |
| 25..... | 59   | 79    | 76   | 66   | 62    | 2.9  | 160   | 30  | 160   | 128  | 91   | 92    |
| 26..... | 58   | 77    | 79   | 68   | 63    | 2.9  | 160   | 29  | 160   | 124  | 90   | 86    |
| 27..... | 57   | 77    | 89   | 65   | 62    | 2.9  | 160   | 29  | 160   | 124  | 87   | 82    |
| 28..... | 55   | 114   | 94   | 64   | 66    | 2.9  | 165   | 29  | 160   | 124  | 87   | 79    |
| 29..... | 55   | 109   | 87   | 65   | ----- | 2.9  | 160   | 30  | 155   | 124  | 88   | 78    |
| 30..... | 54   | 109   | 86   | 64   | ----- | 2.9  | 155   | 76  | 155   | 103  | 88   | 77    |
| 31..... | 55   | ----- | 86   | 65   | ----- | 2.9  | ----- | 102 | ----- | 124  | 87   | ----- |

| Month          | Maximum | Minimum | Mean | Run-off in acre-feet |
|----------------|---------|---------|------|----------------------|
| October.....   | 70      | 46      | 56.7 | 3,490                |
| November.....  | 150     | 55      | 96.2 | 5,720                |
| December.....  | 103     | 0       | 37.0 | 3,500                |
| January.....   | 90      | 62      | 72.9 | 4,450                |
| February.....  | 66      | 58      | 62.0 | 3,440                |
| March.....     | 88      | 2.9     | 30.7 | 1,890                |
| April.....     | 165     | 2.9     | 84.6 | 5,030                |
| May.....       | 155     | 4.2     | 65.3 | 4,020                |
| June.....      | 170     | 5.0     | 136  | 8,090                |
| July.....      | 155     | 103     | 144  | 8,550                |
| August.....    | 119     | 87      | 102  | 6,270                |
| September..... | 96      | 77      | 84.0 | 5,000                |
| The year.....  | 170     | 0       | 82.6 | 59,800               |

## MIDDLE FORK OF ROGUE RIVER NEAR PROSPECT, OREG.

LOCATION.—Water-stage recorder in NE¼ sec. 1, T. 33 S., R. 3 E., 1,000 feet below diversion dam and intake of Middle Fork of Rogue River power canal and 4½ miles southeast of Prospect.

DRAINAGE AREA.—57 square miles.

RECORDS AVAILABLE.—May 1925 to September 1933.

DISCHARGE.—Maximum combined discharge of river and canal during year, 771 second-feet June 9 (river gage height, 2.63 feet); minimum, 104 second-feet Oct. 5, 12.

1925-33: Maximum, 1,300 second-feet Mar. 19, 1932 (gage height, 3.55 feet); minimum, 72 second-feet Aug. 24 to Sept. 5, 1931.

REMARKS.—Records good except those for Dec. 10-12, which are fair. Discharge of river or canal estimated Dec. 10-14, 16. Flow regulated since Nov. 19, 1931, by operation of head gates at diversion dam of power canal which diverts water around station; practically no storage above diversion dam. Gage-height record furnished by California Oregon Power Co.

Combined discharge, in second-feet, of Middle Fork of Rogue River and Middle Fork power canal near Prospect, Oreg., 1932-33

| Day | Oct. | Nov.  | Dec. | Jan. | Feb.  | Mar. | Apr.  | May | June  | July | Aug. | Sept. |
|-----|------|-------|------|------|-------|------|-------|-----|-------|------|------|-------|
| 1   | 106  | 106   | 160  | 128  | 117   | 121  | 214   | 344 | 468   | 294  | 172  | 135   |
| 2   | 106  | 120   | 167  | 143  | 114   | 126  | 237   | 310 | 454   | 301  | 167  | 135   |
| 3   | 105  | 113   | 165  | 133  | 112   | 126  | 282   | 283 | 458   | 306  | 164  | 135   |
| 4   | 105  | 113   | 153  | 128  | 113   | 126  | 324   | 295 | 450   | 302  | 166  | 134   |
| 5   | 104  | 142   | 147  | 128  | 114   | 126  | 322   | 280 | 450   | 300  | 165  | 134   |
| 6   | 107  | 254   | 142  | 149  | 116   | 126  | 327   | 264 | 450   | 300  | 160  | 142   |
| 7   | 107  | 149   | 138  | 138  | 113   | 134  | 314   | 254 | 442   | 291  | 160  | 135   |
| 8   | 107  | 155   | 132  | 133  | 115   | 136  | 284   | 246 | 535   | 288  | 160  | 135   |
| 9   | 106  | 183   | 113  | 128  | 113   | 142  | 256   | 238 | 680   | 277  | 155  | 135   |
| 10  | 105  | 143   | 110  | 128  | 112   | 143  | 240   | 223 | 622   | 264  | 154  | 134   |
| 11  | 105  | 127   | 105  | 123  | 114   | 144  | 237   | 223 | 572   | 251  | 154  | 129   |
| 12  | 104  | 123   | 108  | 123  | 114   | 186  | 232   | 228 | 596   | 249  | 150  | 129   |
| 13  | 105  | 123   | 110  | 123  | 113   | 191  | 232   | 235 | 620   | 243  | 150  | 129   |
| 14  | 125  | 132   | 115  | 128  | 111   | 187  | 249   | 244 | 615   | 239  | 150  | 130   |
| 15  | 114  | 158   | 124  | 128  | 117   | 180  | 287   | 255 | 600   | 234  | 145  | 136   |
| 16  | 142  | 371   | 125  | 123  | 120   | 185  | 297   | 259 | 545   | 227  | 144  | 129   |
| 17  | 119  | 255   | 126  | 123  | 118   | 182  | 282   | 266 | 462   | 217  | 145  | 130   |
| 18  | 110  | 191   | 128  | 123  | 118   | 179  | 258   | 255 | 415   | 205  | 144  | 153   |
| 19  | 110  | 164   | 143  | 123  | 116   | 180  | 241   | 244 | 392   | 200  | 145  | 135   |
| 20  | 109  | 149   | 124  | 119  | 115   | 202  | 235   | 244 | 384   | 199  | 145  | 136   |
| 21  | 108  | 142   | 117  | 119  | 116   | 209  | 245   | 251 | 370   | 198  | 139  | 136   |
| 22  | 127  | 136   | 119  | 121  | 116   | 198  | 276   | 255 | 366   | 185  | 139  | 130   |
| 23  | 115  | 133   | 128  | 123  | 117   | 192  | 325   | 291 | 352   | 182  | 140  | 137   |
| 24  | 110  | 127   | 123  | 122  | 114   | 185  | 362   | 329 | 352   | 188  | 139  | 150   |
| 25  | 109  | 127   | 123  | 118  | 114   | 182  | 380   | 380 | 379   | 186  | 139  | 139   |
| 26  | 110  | 127   | 138  | 120  | 116   | 174  | 362   | 407 | 370   | 184  | 139  | 137   |
| 27  | 107  | 134   | 156  | 121  | 115   | 173  | 394   | 396 | 387   | 184  | 139  | 131   |
| 28  | 106  | 198   | 143  | 118  | 121   | 192  | 421   | 422 | 390   | 182  | 139  | 130   |
| 29  | 106  | 178   | 133  | 118  | ----- | 194  | 484   | 500 | 330   | 179  | 139  | 130   |
| 30  | 106  | 175   | 133  | 117  | ----- | 200  | 394   | 552 | 304   | 178  | 139  | 126   |
| 31  | 105  | ----- | 128  | 120  | ----- | 210  | ----- | 517 | ----- | 173  | 135  | ----- |

| Month     | Maximum | Minimum | Mean | Per square mile | Run-off |           |
|-----------|---------|---------|------|-----------------|---------|-----------|
|           |         |         |      |                 | Inches  | Acre-feet |
| October   | 142     | 104     | 110  | 1.93            | 2.22    | 6,760     |
| November  | 371     | 106     | 158  | 2.77            | 3.09    | 9,400     |
| December  | 167     | 105     | 131  | 2.30            | 2.65    | 8,060     |
| January   | 149     | 117     | 125  | 2.19            | 2.52    | 7,690     |
| February  | 120     | 111     | 115  | 2.02            | 2.10    | 6,390     |
| March     | 210     | 121     | 169  | 2.96            | 3.41    | 10,400    |
| April     | 484     | 214     | 300  | 5.26            | 5.87    | 17,900    |
| May       | 552     | 223     | 306  | 5.37            | 6.19    | 18,800    |
| June      | 680     | 304     | 460  | 8.07            | 9.00    | 27,400    |
| July      | 306     | 173     | 232  | 4.07            | 4.69    | 14,300    |
| August    | 172     | 135     | 149  | 2.61            | 3.01    | 9,160     |
| September | 153     | 126     | 135  | 2.37            | 2.64    | 8,030     |
| The year  | 680     | 104     | 199  | 3.49            | 47.39   | 144,000   |

## MIDDLE FORK OF ROGUE RIVER POWER CANAL NEAR PROSPECT, OREG.

LOCATION.—Water-stage recorder in NE¼ sec. 1, T. 33 S., R. 3 E., 1,000 feet below head gate at diversion dam and 4½ miles southeast of Prospect. Zero of gage is about 2,632 feet above mean sea level.

RECORDS AVAILABLE.—November 1931 to September 1933.

DISCHARGE.—Maximum during year, 182 second-feet Mar. 24 (gage height, 3.25 feet); no flow at times.

1932-33: Maximum, 188 second-feet Mar. 10, 11, 1932 (gage height, 3.34 feet).

REMARKS.—Records excellent except those estimated, Dec. 10-14, 16, which are fair. This canal, completed in November 1931, diverts water from Middle Fork of Rogue River into main power canal to supplement flow of Rogue River above Prospect diversion dam. Gage-height record furnished by California Oregon Power Co.

*Discharge, in second-feet, 1932-33*

| Day | Oct. | Nov. | Dec. | Jan. | Feb. | Mar. | Apr. | May | June | July | Aug. | Sept. |
|-----|------|------|------|------|------|------|------|-----|------|------|------|-------|
| 1   | 99   | 102  | 152  | 127  | 112  | 118  | 172  | 104 | 114  | 1    | 167  | 127   |
| 2   | 99   | 113  | 157  | 142  | 109  | 122  | 172  | 104 | 114  | 1    | 162  | 127   |
| 3   | 98   | 109  | 157  | 132  | 107  | 122  | 172  | 104 | 114  | 6    | 157  | 127   |
| 4   | 100  | 107  | 147  | 127  | 106  | 122  | 172  | 104 | 114  | 12   | 157  | 127   |
| 5   | 100  | 122  | 142  | 127  | 104  | 122  | 167  | 104 | 114  | 10   | 157  | 127   |
| 6   | 100  | 118  | 137  | 147  | 104  | 122  | 157  | 104 | 114  | 10   | 152  | 132   |
| 7   | 102  | 127  | 132  | 137  | 107  | 127  | 152  | 104 | 114  | 9    | 152  | 127   |
| 8   | 102  | 137  | 115  | 132  | 110  | 132  | 152  | 104 | 114  | 9    | 152  | 127   |
| 9   | 101  | 152  | 90   | 127  | 108  | 137  | 152  | 100 | 56   | 9    | 147  | 127   |
| 10  | 100  | 137  |      | 127  | 108  | 137  | 152  | 103 | 12   | 111  | 147  | 127   |
| 11  | 99   | 122  |      | 122  | 112  | 132  | 152  | 134 | 12   | 157  | 147  | 122   |
| 12  | 98   | 118  | 84   | 122  | 112  | 122  | 152  | 157 | 11   | 157  | 142  | 122   |
| 13  | 98   | 118  |      | 122  | 111  | 152  | 152  | 157 | 10   | 157  | 142  | 122   |
| 14  | 111  | 127  |      | 127  | 109  | 167  | 152  | 72  | 10   | 157  | 142  | 122   |
| 15  | 109  | 132  | 98   | 127  | 114  | 162  | 157  | 1   | 10   | 157  | 137  | 127   |
| 16  | 122  | 147  | 106  | 122  | 116  | 162  | 157  | 1   | 10   | 157  | 137  | 122   |
| 17  | 114  | 157  | 113  | 122  | 114  | 162  | 144  | 1   | 10   | 157  | 137  | 122   |
| 18  | 105  | 157  | 127  | 122  | 114  | 162  | 103  | 1   | 12   | 152  | 137  | 137   |
| 19  | 104  | 152  | 142  | 122  | 112  | 162  | 103  | 0   | 12   | 152  | 137  | 127   |
| 20  | 103  | 142  | 70   | 118  | 111  | 162  | 103  | 0   | 12   | 160  | 137  | 127   |
| 21  | 102  | 137  | 35   | 114  | 112  | 162  | 103  | 0   | 12   | 167  | 132  | 127   |
| 22  | 117  | 132  | 118  | 114  | 112  | 157  | 103  | 7   | 12   | 135  | 132  | 122   |
| 23  | 111  | 127  | 127  | 118  | 113  | 157  | 104  | 1   | 12   | 147  | 132  | 127   |
| 24  | 105  | 122  | 122  | 118  | 140  | 162  | 104  | 1   | 12   | 172  | 132  | 132   |
| 25  | 101  | 122  | 122  | 115  | 110  | 167  | 104  | 34  | 12   | 172  | 132  | 127   |
| 26  | 103  | 122  | 137  | 116  | 112  | 162  | 104  | 114 | 12   | 172  | 132  | 127   |
| 27  | 101  | 127  | 152  | 116  | 111  | 162  | 104  | 114 | 11   | 172  | 132  | 122   |
| 28  | 109  | 152  | 142  | 114  | 116  | 172  | 50   | 114 | 10   | 172  | 132  | 122   |
| 29  | 101  | 157  | 132  | 113  |      | 172  | 48   | 115 | 10   | 172  | 132  | 122   |
| 30  | 100  | 162  | 132  | 112  |      | 172  | 101  | 113 | 8    | 172  | 132  | 118   |
| 31  | 101  |      | 127  | 114  |      | 172  |      | 114 |      | 167  | 127  |       |

| Month     | Maximum | Minimum | Mean | Run-off in acre-feet |
|-----------|---------|---------|------|----------------------|
| October   | 122     | 98      | 103  | 6,330                |
| November  | 162     | 102     | 132  | 7,860                |
| December  | 157     | 35      | 118  | 7,260                |
| January   | 147     | 112     | 123  | 7,560                |
| February  | 116     | 104     | 111  | 6,160                |
| March     | 172     | 118     | 149  | 9,160                |
| April     | 172     | 48      | 131  | 7,800                |
| May       | 157     | 0       | 73.7 | 4,520                |
| June      | 114     | 8       | 40.0 | 2,380                |
| July      | 172     | 1       | 115  | 7,070                |
| August    | 167     | 127     | 142  | 8,730                |
| September | 137     | 118     | 126  | 7,500                |
| The year  | 172     | 0       | 114  | 82,300               |

## RED BLANKET CREEK NEAR PROSPECT, OREG.

LOCATION.—Staff gage in NE¼ sec. 23, T. 32 S., R. 3 E., 3 miles northeast of Prospect. From October 1928 to March 1932 gage was 120 feet downstream.

DRAINAGE AREA.—40 square miles.

RECORDS AVAILABLE.—May 1925 to September 1933. Prior to October 1928, in NE¼ sec. 24, T. 32 S., R. 3 E.

DISCHARGE.—Maximum recorded during year, 580 second-feet June 9 (gage height from high-water mark, 2.2 feet); minimum, 57 second-feet Oct. 7 (gage height, 0.38 foot).

1925-33: Maximum, 1,200 second-feet Mar. 11, 1928; minimum, 34 second-feet Sept. 3, 4, 25, Oct. 9, 16, 1931.

REMARKS.—Records fair. One irrigation diversion above station. Gage read only once a week. Gage-height record furnished by California Oregon Power Co.

*Discharge, in second-feet, 1932-33*

| Day | Oct. | Nov. | Dec. | Jan. | Feb. | Mar. | Apr. | May | June | July | Aug. | Sept. |
|-----|------|------|------|------|------|------|------|-----|------|------|------|-------|
| 1.  |      |      |      |      |      |      |      |     |      |      |      | 72    |
| 2.  |      |      | 85   |      |      |      |      |     | 272  |      |      |       |
| 3.  |      |      |      |      | 63   | 70   |      |     |      |      |      |       |
| 4.  |      | 63   |      |      |      |      |      |     |      |      | 90   |       |
| 5.  |      |      |      |      |      |      |      | 165 |      |      |      |       |
| 6.  |      |      |      | 81   |      |      |      |     |      |      |      |       |
| 7.  | 57   |      |      |      |      |      | 170  | 148 |      | 195  |      |       |
| 8.  |      |      |      |      |      |      |      |     |      |      |      | 71    |
| 9.  |      |      |      |      | 60   | 76   |      |     | 512  |      |      |       |
| 10. |      |      |      |      |      |      |      |     |      |      |      |       |
| 11. |      | 70   |      |      |      |      |      | 127 |      |      | 85   |       |
| 12. |      |      |      | 71   |      |      |      |     |      |      |      | 71    |
| 13. |      |      |      |      |      |      | 131  |     |      | 160  |      |       |
| 14. | 66   |      |      |      |      |      |      |     |      |      |      | 72    |
| 15. |      |      |      |      |      |      |      |     |      |      |      |       |
| 16. |      |      | 60   |      |      |      |      |     | 365  |      |      |       |
| 17. |      |      |      |      | 66   | 96   |      |     |      |      |      |       |
| 18. |      | 100  |      | 72   |      |      |      |     | 308  |      | 78   |       |
| 19. |      |      |      |      |      |      |      | 143 |      |      |      |       |
| 20. |      |      |      | 68   |      |      |      |     |      |      |      |       |
| 21. | 61   |      |      |      |      | 106  | 127  |     |      | 118  |      |       |
| 22. |      |      | 68   |      |      |      |      |     |      |      |      | 71    |
| 23. |      |      |      |      |      |      |      |     | 255  |      |      |       |
| 24. |      |      |      |      | 63   | 93   |      |     |      |      |      |       |
| 25. |      | 69   |      |      |      |      |      |     |      |      | 76   |       |
| 26. |      |      |      |      |      |      |      | 238 |      |      |      |       |
| 27. |      |      |      | 67   |      |      |      |     |      |      |      |       |
| 28. | 62   |      |      |      |      |      | 238  |     |      | 98   |      |       |
| 29. |      |      |      |      |      |      |      |     |      |      |      |       |
| 30. |      |      | 71   |      |      |      |      |     | 220  |      |      | 68    |
| 31. |      |      |      |      |      | 102  |      |     |      |      |      |       |

| Month          | Mean | Per square mile | Run-off |           |
|----------------|------|-----------------|---------|-----------|
|                |      |                 | Inches  | Acre-feet |
| October.....   | 61.5 | 1.54            | 1.78    | 3,780     |
| November.....  | 87.3 | 2.18            | 2.43    | 5,190     |
| December.....  | 66.4 | 1.66            | 1.91    | 4,080     |
| January.....   | 71.8 | 1.80            | 2.08    | 4,410     |
| February.....  | 63.0 | 1.58            | 1.64    | 3,500     |
| March.....     | 85.3 | 2.13            | 2.46    | 5,240     |
| April.....     | 153  | 3.82            | 4.26    | 9,100     |
| May.....       | 184  | 4.60            | 5.30    | 11,300    |
| June.....      | 296  | 7.40            | 8.26    | 17,600    |
| July.....      | 151  | 3.78            | 4.36    | 9,280     |
| August.....    | 82.2 | 2.06            | 2.38    | 5,050     |
| September..... | 70.8 | 1.77            | 1.98    | 4,210     |
| The year.....  | 114  | 2.85            | 38.84   | 82,700    |

NOTE.—No record on days omitted. Monthly mean discharge is mean of days for which records are published, except those for November, December, and March to July, which are estimated by comparison with Rogue River above Prospect.

## RED BLANKET CREEK POWER CANAL NEAR PROSPECT, OREG.

LOCATION.—Water-stage recorder in SE¼ sec. 27, T. 32 S., R. 3 E., 200 yards below head gate at diversion dam and 2 miles east of Prospect. Zero of gage is 2,612 feet above mean sea level.

RECORDS AVAILABLE.—November 1931 to September 1933.

DISCHARGE.—Maximum during year, 116 second-feet Nov. 6 (gage height, 3.38 feet); minimum, 3 second-feet July 1.

1931-33: Maximum, that of Nov. 6, 1932; no flow part of Sept. 24, 25, 1932.

REMARKS.—Records excellent except those estimated, Dec. 9, 12-15, which are good. This canal, completed in October 1932, diverts water from Red Blanket Creek into main power canal to supplement flow of Rogue River above Prospect diversion dam. Gage-height record furnished by California Oregon Power Co.

*Discharge, in second-feet, 1932-33*

| Day | Oct. | Nov.  | Dec. | Jan. | Feb.  | Mar. | Apr.  | May | June  | July | Aug. | Sept. |
|-----|------|-------|------|------|-------|------|-------|-----|-------|------|------|-------|
| 1   | 54   | 61    | 89   | 75   | 66    | 75   | 95    | 64  | 70    | 23   | 92   | 74    |
| 2   | 54   | 75    | 89   | 86   | 65    | 76   | 95    | 64  | 70    | 56   | 89   | 73    |
| 3   | 54   | 68    | 89   | 86   | 64    | 77   | 95    | 64  | 69    | 56   | 89   | 72    |
| 4   | 54   | 66    | 86   | 80   | 65    | 76   | 95    | 65  | 69    | 56   | 89   | 72    |
| 5   | 54   | 83    | 83   | 80   | 66    | 75   | 95    | 65  | 67    | 56   | 89   | 72    |
| 6   | 55   | 92    | 77   | 86   | 66    | 76   | 95    | 65  | 65    | 56   | 86   | 75    |
| 7   | 55   | 86    | 77   | 86   | 65    | 80   | 95    | 65  | 64    | 56   | 86   | 73    |
| 8   | 56   | 80    | 72   | 83   | 66    | 83   | 95    | 65  | 64    | 56   | 86   | 72    |
| 9   | 55   | 95    | 75   | 80   | 61    | 83   | 95    | 65  | 63    | 56   | 86   | 71    |
| 10  | 53   | 80    | 58   | 80   | 66    | 86   | 95    | 64  | 60    | 56   | 83   | 70    |
| 11  | 53   | 73    | 53   | 77   | 66    | 89   | 95    | 64  | 58    | 54   | 83   | 70    |
| 12  | 52   | 70    | 4    | 76   | 67    | 95   | 92    | 64  | 58    | 55   | 83   | 70    |
| 13  | 51   | 70    | 4    | 76   | 66    | 92   | 92    | 70  | 57    | 56   | 83   | 70    |
| 14  | 58   | 76    | 4    | 77   | 64    | 95   | 95    | 83  | 56    | 46   | 80   | 72    |
| 15  | 57   | 80    | 4    | 77   | 70    | 95   | 92    | 83  | 56    | 54   | 80   | 73    |
| 16  | 72   | 98    | 4    | 76   | 70    | 95   | 95    | 83  | 58    | 54   | 80   | 69    |
| 17  | 72   | 87    | 37   | 72   | 68    | 92   | 78    | 83  | 58    | 65   | 80   | 70    |
| 18  | 63   | 95    | 71   | 76   | 69    | 92   | 50    | 83  | 57    | 95   | 77   | 76    |
| 19  | 61   | 92    | 80   | 74   | 67    | 92   | 64    | 83  | 56    | 86   | 77   | 69    |
| 20  | 61   | 86    | 75   | 70   | 67    | 92   | 64    | 83  | 57    | 86   | 77   | 70    |
| 21  | 59   | 83    | 71   | 72   | 68    | 92   | 64    | 83  | 56    | 86   | 77   | 73    |
| 22  | 76   | 80    | 69   | 70   | 67    | 95   | 64    | 83  | 56    | 76   | 76   | 70    |
| 23  | 68   | 75    | 76   | 70   | 69    | 92   | 64    | 71  | 56    | 92   | 76   | 72    |
| 24  | 64   | 73    | 72   | 71   | 67    | 92   | 64    | 72  | 56    | 98   | 75   | 77    |
| 25  | 63   | 71    | 72   | 70   | 67    | 92   | 63    | 72  | 56    | 102  | 75   | 73    |
| 26  | 63   | 71    | 80   | 70   | 69    | 92   | 63    | 72  | 56    | 102  | 75   | 71    |
| 27  | 63   | 72    | 86   | 70   | 67    | 92   | 64    | 72  | 56    | 98   | 74   | 69    |
| 28  | 63   | 92    | 89   | 67   | 72    | 95   | 64    | 72  | 56    | 95   | 75   | 68    |
| 29  | 63   | 92    | 83   | 68   | ----- | 95   | 64    | 72  | 56    | 95   | 75   | 67    |
| 30  | 62   | 92    | 80   | 67   | ----- | 95   | 64    | 72  | 41    | 92   | 75   | 67    |
| 31  | 61   | ----- | 77   | 69   | ----- | 95   | ----- | 72  | ----- | 92   | 75   | ----- |

| Month     | Maximum | Minimum | Mean | Run-off in acre-feet |
|-----------|---------|---------|------|----------------------|
| October   | 76      | 51      | 59.6 | 3,660                |
| November  | 98      | 61      | 80.5 | 4,790                |
| December  | 89      | 4       | 64.1 | 3,940                |
| January   | 86      | 67      | 75.4 | 4,640                |
| February  | 72      | 61      | 66.8 | 3,710                |
| March     | 95      | 75      | 88.5 | 5,440                |
| April     | 95      | 50      | 80.2 | 4,770                |
| May       | 83      | 64      | 72.2 | 4,440                |
| June      | 70      | 41      | 59.2 | 3,520                |
| July      | 102     | 23      | 71.2 | 4,380                |
| August    | 92      | 74      | 80.7 | 4,960                |
| September | 77      | 67      | 71.3 | 4,240                |
| The year  | 102     | 4       | 72.5 | 52,500               |

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**LOCATION.**—Water-stage recorder in SW¼ sec. 28, T. 32 S., R. 3 E., 0.8 mile below outlet of Red Blanket Creek power canal, 1 mile east of Prospect, and 1.6 miles above diversion dam on Rogue River. Zero of gage is 2,599.0 feet above mean sea level by general adjustment of 1929.

**DISCHARGE.**—Maximum during year, 403 second-feet July 24; maximum gage height, 4.03 feet Apr. 17; minimum, 25 second-feet July 22 (gage height, 0.90 foot).

REMARKS.—Records good except those estimated, Dec. 10-16, Feb. 10, 11, which are fair. This canal, completed in November 1931, carries water diverted from South and Middle Forks of Rogue River and Red Blanket Creek into Rogue River above Prospect diversion dam. Gage-height record furnished by California Oregon Power Co.

| Day | Oct. | Nov. | Dec. | Jan. | Feb. | Mar. | Apr. | May | June | July | Aug. | Sept. |
|-----|------|------|------|------|------|------|------|-----|------|------|------|-------|
| 1   | 206  | 220  | 345  | 284  | 241  | 261  | 263  | 320 | 194  | 42   | 377  | 286   |
| 2   | 206  | 251  | 354  | 318  | 241  | 269  | 263  | 305 | 199  | 161  | 368  | 286   |
| 3   | 206  | 236  | 354  | 309  | 241  | 269  | 270  | 328 | 266  | 217  | 368  | 286   |
| 4   | 206  | 236  | 336  | 292  | 241  | 261  | 263  | 328 | 261  | 232  | 359  | 286   |
| 5   | 206  | 284  | 327  | 292  | 241  | 261  | 263  | 328 | 311  | 224  | 359  | 286   |
| 6   | 206  | 318  | 309  | 327  | 233  | 261  | 263  | 320 | 336  | 224  | 359  | 302   |
| 7   | 213  | 336  | 300  | 318  | 233  | 269  | 256  | 320 | 336  | 224  | 351  | 286   |
| 8   | 213  | 318  | 273  | 300  | 241  | 276  | 256  | 320 | 336  | 224  | 351  | 286   |
| 9   | 213  | 372  | 172  | 292  | 233  | 276  | 256  | 312 | 283  | 224  | 343  | 286   |
| 10  | 206  | 318  | 292  | 292  | 236  | 284  | 283  | 247 | 233  | 308  | 343  | 278   |
| 11  | 206  | 284  | 284  | 240  | 284  | 312  | 193  | 226 | 351  | 335  | 278  | 286   |
| 12  | 206  | 267  | 275  | 241  | 293  | 312  | 212  | 226 | 351  | 327  | 278  | 286   |
| 13  | 206  | 267  | 275  | 241  | 269  | 286  | 219  | 219 | 351  | 335  | 281  | 286   |
| 14  | 236  | 284  | 284  | 241  | 253  | 292  | 164  | 219 | 342  | 327  | 278  | 286   |
| 15  | 228  | 300  | 284  | 249  | 246  | 327  | 87   | 219 | 351  | 327  | 286  | 286   |
| 16  | 267  | 381  | 275  | 251  | 246  | 327  | 89   | 96  | 351  | 319  | 278  | 286   |
| 17  | 259  | 381  | 150  | 267  | 243  | 246  | 347  | 89  | 166  | 358  | 319  | 278   |
| 18  | 236  | 381  | 206  | 270  | 243  | 243  | 206  | 89  | 230  | 385  | 319  | 310   |
| 19  | 228  | 372  | 284  | 262  | 236  | 246  | 273  | 86  | 223  | 377  | 319  | 286   |
| 20  | 220  | 336  | 219  | 254  | 236  | 246  | 320  | 87  | 223  | 377  | 319  | 286   |
| 21  | 220  | 318  | 182  | 262  | 243  | 253  | 320  | 86  | 223  | 385  | 319  | 294   |
| 22  | 267  | 300  | 267  | 254  | 243  | 261  | 320  | 87  | 223  | 322  | 310  | 286   |
| 23  | 251  | 284  | 284  | 254  | 243  | 253  | 320  | 75  | 216  | 368  | 310  | 286   |
| 24  | 236  | 275  | 275  | 262  | 236  | 253  | 320  | 75  | 223  | 385  | 302  | 310   |
| 25  | 228  | 267  | 275  | 254  | 236  | 261  | 320  | 118 | 216  | 395  | 302  | 302   |
| 26  | 220  | 267  | 309  | 262  | 243  | 250  | 320  | 226 | 216  | 377  | 294  | 294   |
| 27  | 220  | 267  | 336  | 262  | 243  | 258  | 320  | 226 | 216  | 377  | 294  | 286   |
| 28  | 220  | 363  | 336  | 254  | 258  | 266  | 271  | 226 | 216  | 377  | 294  | 270   |
| 29  | 220  | 354  | 309  | 254  | 266  | 267  | 226  | 216 | 377  | 294  | 270  | 270   |
| 30  | 220  | 363  | 300  | 246  | 266  | 320  | 271  | 164 | 363  | 294  | 270  | 270   |
| 31  | 220  | 292  | 254  | 266  | 266  | 283  | 283  | 377 | 294  | 270  | 270  | 270   |

| Month          | Maximum | Minimum | Mean | Run-off in<br>acre-feet |
|----------------|---------|---------|------|-------------------------|
| October.....   | 267     | 206     | 222  | 13, 600                 |
| November.....  | 381     | 220     | 307  | 18, 300                 |
| December.....  | 354     | -----   | 244  | 15, 000                 |
| January.....   | 327     | 246     | 277  | 17, 000                 |
| February.....  | 258     | 233     | 241  | 13, 400                 |
| March.....     | 293     | 243     | 262  | 16, 100                 |
| April.....     | 347     | 256     | 294  | 17, 500                 |
| May.....       | 328     | 75      | 205  | 12, 600                 |
| June.....      | 336     | 96      | 231  | 13, 700                 |
| July.....      | 385     | 42      | 315  | 19, 400                 |
| August.....    | 377     | 294     | 327  | 20, 100                 |
| September..... | 310     | 270     | 286  | 17, 000                 |
| The year.....  | 385     | 42      | 268  | 194, 000                |

## SOUTH FORK OF BIG BUTTE CREEK NEAR BUTTE FALLS, OREG.

LOCATION.—Water-stage recorder in SW¼ sec. 11, T. 35 S., R. 2 E., just below Ginger Creek and 1 mile east of Butte Falls.

RECORDS AVAILABLE.—September 1910 to October 1911; August to October 1915; October 1917 to September 1922; March 1925 to September 1933. At station at Butte Falls; August 1922 to March 1925.

DISCHARGE.—Maximum during year, 536 second-feet Mar. 12 (gage height, 1.73 feet); minimum, 63 second-feet Oct. 13 (gage height, 0.49 foot).

1910-11, 1915, 1917-33: Maximum, 2,470 second-feet Feb. 20, 1927 (gage height, 4.05 feet); minimum, 39 second-feet Oct. 14, 1931 (gage height, 0.32 foot). Average, 14 years (1910-11, 1917-22, 1925-33), 161 second-feet.

REMARKS.—Records fair. Diversions above station for irrigation and Medford municipal supply. Records furnished by State engineer.

*Discharge, in second-feet, 1932-33*

| Day | Oct. | Nov.  | Dec.  | Jan.  | Feb.  | Mar. | Apr. | May | June | July  | Aug. | Sept. |
|-----|------|-------|-------|-------|-------|------|------|-----|------|-------|------|-------|
| 1   | 71   | 76    |       | * 115 | 107   | 264  | 304  | 296 | 288  | 141   | 94   |       |
| 2   | 69   | 86    |       | * 200 | 102   | 300  | 309  | 284 | 317  | 138   | 94   |       |
| 3   | 71   |       | * 105 | * 275 | 102   | 351  | 359  | 264 | 300  | 135   | 94   | * 80  |
| 4   | 71   |       |       | 208   | 99    | 296  | 382  | 309 | 284  | 132   | 91   |       |
| 5   |      |       |       | 180   | 104   | 280  | 368  | 351 | 272  | 129   | 94   | 78    |
| 6   |      | * 98  |       | 91    | * 180 | 104  | 284  | 359 | 268  | 126   | 91   | 78    |
| 7   | * 71 |       |       | 91    | * 160 | 99   | 313  | 346 | 268  | 124   | 89   |       |
| 8   |      |       |       | 91    | * 150 | 102  | 313  | 317 | 405  | 272   | 126  | 89    |
| 9   |      | 109   |       | 78    | * 146 | 102  | 313  | 280 | 396  | 292   | 124  | 86    |
| 10  |      |       |       | 144   | 94    | 321  | 257  | 359 | 304  | 121   | 86   | * 79  |
| 11  | 71   |       |       | * 136 | 107   | 355  | 261  | 351 | 280  | 118   | 86   |       |
| 12  | 67   | * 100 |       | * 126 | 107   | 504  | 257  | 338 | 273  | 115   | 86   | 80    |
| 13  | 67   |       |       | * 124 | 109   | 470  | 249  | 321 | 268  | 112   | 86   |       |
| 14  | 69   |       | * 74  | * 124 | 102   | 409  | 253  | 321 | 264  | 112   | 84   |       |
| 15  | 69   | 99    |       | 124   | 129   | 373  | 276  | 329 | 257  | 109   | 84   | * 80  |
| 16  | 80   |       |       | 118   | 219   | 382  | 292  | 329 | 245  | * 107 | 84   |       |
| 17  | 89   |       |       | 107   | 208   | 373  | 292  | 355 | 230  | * 107 | 82   |       |
| 18  | 82   |       |       | 107   | 194   | 355  | 272  | 351 | 204  | 107   | 82   |       |
| 19  | 82   | * 103 |       | 102   | 173   | 342  | 257  | 325 | 194  | 107   | 80   | 80    |
| 20  | 78   |       | 102   | 96    | 163   | 364  | 241  | 317 | 184  | 104   | 78   | 82    |
| 21  | 80   |       | 96    | 104   | 173   | 377  | 238  | 313 | 180  | 107   | 78   |       |
| 22  | 186  | 86    | * 94  | 104   | 167   | 355  | 245  | 313 | 170  | 107   | 80   |       |
| 23  | 84   | 86    | 94    | 104   | 176   | 317  | 268  | 321 | 160  | 107   |      | * 82  |
| 24  | * 83 | 84    | * 94  | 104   | 167   | 288  | 292  | 304 | 157  | 107   |      |       |
| 25  | * 82 | 84    | * 94  | 104   | 160   | 272  | 325  | 317 | 157  | 94    | * 80 |       |
| 26  | 82   | 86    | * 140 | 102   | 180   | 264  | 300  | 321 | 157  | 94    |      | 82    |
| 27  |      | 86    | 180   | 102   | 184   | 257  | 300  | 317 | 154  | 94    |      | * 82  |
| 28  |      | 132   | * 176 | 102   | 215   | 288  | 325  | 313 | 151  | 94    |      | * 81  |
| 29  | * 80 | * 135 | * 165 | 99    |       | 288  | 355  | 334 | 147  | 94    | 80   | * 80  |
| 30  |      | * 134 | * 154 | 96    |       | 284  | 325  | 351 | 144  | 91    | 82   | * 79  |
| 31  |      |       | * 135 | 99    |       | 313  |      | 346 |      | 94    | 82   |       |

| Month     | Maximum | Minimum | Mean | Run-off in acre-feet |
|-----------|---------|---------|------|----------------------|
| October   | 89      | 67      | 76.1 | 4,680                |
| November  | 135     | 76      | 99.6 | 5,930                |
| December  | 180     |         | 101  | 6,210                |
| January   | 275     | 96      | 130  | 7,990                |
| February  | 219     | 94      | 141  | 7,830                |
| March     | 504     | 257     | 331  | 20,400               |
| April     | 382     | 238     | 297  | 17,700               |
| May       | 405     | 264     | 333  | 20,500               |
| June      | 317     | 144     | 228  | 13,600               |
| July      | 141     | 91      | 112  | 6,890                |
| August    | 94      | 78      | 84.6 | 5,200                |
| September |         |         | 80.2 | 4,770                |
| The year  | 504     |         | 168  | 122,000              |

\* Estimated.

## SOUTH FORK OF LITTLE BUTTE CREEK NEAR LAKECREEK, OREG.

LOCATION.—Water-stage recorder in SE¼ sec. 29, T. 36 S., R. 2 E., a quarter of a mile above intake of Rogue River Valley Canal and 1½ miles southeast of Lakecreek.

RECORDS AVAILABLE.—April 1921 to September 1933. At station in sec. 11, T. 37 S., R. 2 E., 5 miles above Lakecreek November 1910 to April 1913.

DISCHARGE.—Maximum during year, 505 second-feet May 5 (gage height, 2.90 feet); minimum (estimated), 8 second-feet Dec. 11–13 (stage affected by ice). 1910–13, 1921–33: Maximum (estimated), 3,000 second-feet Dec. 30, 1924 (gage height, 5.25 feet; minimum, 2 second-feet Aug. 10, 1931 (gage height, 0.97 foot). Average, 12 years (1921–33), 87.3 second-feet.

REMARKS.—Records good except those estimated, Nov. 17–20, Dec. 11–17, Feb. 10, which are fair. Stage-discharge relation affected by ice Dec. 9, 10, 11–17, Feb. 10. Diversions for irrigation above station. Records furnished by State engineer.

## Discharge, in second-feet, 1932–33

| Day     | Oct. | Nov.  | Dec. | Jan. | Feb.  | Mar. | Apr.  | May | June  | July | Aug. | Sept. |
|---------|------|-------|------|------|-------|------|-------|-----|-------|------|------|-------|
| 1.....  | 14   | 16    | 57   | 81   | 64    | 108  | 179   | 344 | 424   | 74   | 24   | 18    |
| 2.....  | 15   | 21    | 57   | 167  | 50    | 127  | 208   | 326 | 397   | 66   | 23   | 18    |
| 3.....  | 16   | 22    | 43   | 195  | 46    | 173  | 267   | 314 | 374   | 62   | 23   | 19    |
| 4.....  | 15   | 20    | 37   | 108  | 46    | 124  | 286   | 424 | 349   | 60   | 23   | 20    |
| 5.....  | 14   | 22    | 35   | 87   | 49    | 104  | 275   | 465 | 336   | 56   | 23   | 20    |
| 6.....  | 15   | 49    | 28   | 85   | 54    | 106  | 282   | 434 | 324   | 52   | 24   | 22    |
| 7.....  | 16   | 39    | 26   | 72   | 48    | 141  | 260   | 406 | 316   | 51   | 22   | 21    |
| 8.....  | 16   | 27    | 26   | 59   | 43    | 132  | 214   | 370 | 316   | 52   | 20   | 21    |
| 9.....  | 16   | 39    | 16   | 54   | 39    | 121  | 195   | 344 | 320   | 51   | 19   | 20    |
| 10..... | 16   | 27    | 10   | 49   | 38    | 124  | 173   | 304 | 304   | 46   | 20   | 20    |
| 11..... | 15   | 23    | 9    | 43   | 37    | 132  | 173   | 289 | 289   | 41   | 19   | 20    |
| 12..... | 15   | 21    |      | 39   | 40    | 214  | 195   | 285 | 285   | 38   | 19   | 20    |
| 13..... | 16   | 20    |      | 36   | 43    | 179  | 198   | 285 | 281   | 37   | 18   | 20    |
| 14..... | 18   | 21    |      | 37   | 36    | 152  | 218   | 289 | 266   | 37   | 18   | 20    |
| 15..... | 18   | 28    |      | 37   | 89    | 135  | 245   | 292 | 289   | 36   | 17   | 20    |
| 16..... | 22   | 49    | 18   | 35   | 176   | 146  | 238   | 296 | 226   | 36   | 17   | 20    |
| 17..... | 25   | 52    |      | 34   | 98    | 155  | 211   | 353 | 206   | 34   | 16   | 20    |
| 18..... | 21   | 36    |      | 32   | 85    | 138  | 198   | 336 | 182   | 31   | 16   | 21    |
| 19..... | 19   | 30    | 70   | 28   | 70    | 135  | 195   | 296 | 163   | 32   | 17   | 20    |
| 20..... | 18   | 26    | 43   | 28   | 64    | 161  | 195   | 281 | 146   | 31   | 17   | 20    |
| 21..... | 17   | 25    | 30   | 27   | 63    | 173  | 205   | 292 | 131   | 31   | 18   | 21    |
| 22..... | 21   | 24    | 26   | 26   | 61    | 155  | 221   | 328 | 123   | 30   | 18   | 20    |
| 23..... | 24   | 23    | 57   | 25   | 72    | 138  | 256   | 332 | 108   | 28   | 18   | 20    |
| 24..... | 21   | 22    | 46   | 26   | 66    | 124  | 290   | 336 | 103   | 25   | 18   | 24    |
| 25..... | 20   | 21    | 63   | 25   | 59    | 114  | 331   | 366 | 108   | 24   | 18   | 24    |
| 26..... | 19   | 20    | 141  | 27   | 64    | 106  | 310   | 388 | 108   | 23   | 17   | 21    |
| 27..... | 19   | 22    | 135  | 50   | 63    | 108  | 344   | 383 | 96    | 24   | 18   | 21    |
| 28..... | 19   | 64    | 111  | 40   | 81    | 141  | 392   | 392 | 105   | 24   | 18   | 21    |
| 29..... | 18   | 76    | 135  | 37   | ----- | 129  | 432   | 420 | 89    | 23   | 18   | 20    |
| 30..... | 18   | 83    | 118  | 37   | ----- | 132  | 374   | 458 | 80    | 24   | 19   | 20    |
| 31..... | 16   | ----- | 101  | 72   | ----- | 173  | ----- | 454 | ----- | 22   | 18   | ----- |

| Month          | Maximum | Minimum | Mean | Run-off in acre-feet |
|----------------|---------|---------|------|----------------------|
| October.....   | 25      | 14      | 17.8 | 1,090                |
| November.....  | 83      | 16      | 32.3 | 1,920                |
| December.....  | 141     | -----   | 48.1 | 2,960                |
| January.....   | 195     | 25      | 54.8 | 3,370                |
| February.....  | 176     | 36      | 62.3 | 3,460                |
| March.....     | 214     | 104     | 139  | 8,550                |
| April.....     | 432     | 173     | 252  | 15,000               |
| May.....       | 465     | 281     | 351  | 21,600               |
| June.....      | 424     | 80      | 228  | 13,600               |
| July.....      | 74      | 22      | 38.7 | 2,380                |
| August.....    | 24      | 16      | 19.1 | 1,170                |
| September..... | 24      | 18      | 20.4 | 1,210                |
| The year.....  | 465     | -----   | 105  | 76,300               |

## FISH LAKE RESERVOIR NEAR LAKECREEK, OREG.

LOCATION.—Staff gage in SW¼ sec. 3, T. 37 S., R. 4 E., at reservoir outlet 18 miles east of Lakecreek. Gage graduated to read elevation above sea level, irrigation district datum.

DRAINAGE AREA.—17 square miles.

RECORDS AVAILABLE.—December 1915 to September 1933.

EXTREMES.—Maximum contents during year, 7,535 acre-feet June 26 (elevation, 4,826.02 feet); minimum, 1,564 acre-feet Oct. 11 (elevation, 4,808.49 feet). 1915-33: Maximum contents, that of June 26, 1933; minimum contents, practically zero.

REMARKS.—Records good. Water is diverted during summer from Fourmile Lake in Klamath River Basin through Cascade canal into Fish Lake. Permanent dam at outlet of Fish Lake completed in fall of 1915; storage began in November 1915. Records furnished by State engineer.

*Stage and contents, 1932-33*

| Date          | Gage height (feet) | Contents (acre-feet) | Change in contents during month (acre-feet) | Date          | Gage height (feet) | Contents (acre-feet) | Change in contents during month (acre-feet) |
|---------------|--------------------|----------------------|---------------------------------------------|---------------|--------------------|----------------------|---------------------------------------------|
| Sept. 30..... | -----              | 1,672                | -----                                       | May 31.....   | 4,822.40           | 6,112                | +1,052                                      |
| Oct. 31.....  | 4,811.11           | 2,305                | +633                                        | June 30.....  | 4,826.00           | 7,527                | +1,415                                      |
| Nov. 30.....  | 4,814.19           | 3,251                | +946                                        | July 31.....  | 4,819.61           | 5,082                | -2,445                                      |
| Dec. 31.....  | 4,816.23           | 3,915                | +664                                        | Aug. 31.....  | 4,811.78           | 2,506                | -2,576                                      |
| Jan. 31.....  | 4,817.47           | 4,335                | +420                                        | Sept. 30..... | -----              | * 2,851              | +345                                        |
| Feb. 28.....  | 4,818.01           | 4,522                | +187                                        |               |                    |                      |                                             |
| Mar. 31.....  | 4,818.25           | 4,606                | +84                                         |               |                    |                      |                                             |
| Apr. 30.....  | 4,819.55           | 5,060                | +454                                        | The year....  | -----              | -----                | +1,179                                      |

\* Estimated.

## NORTH FORK OF LITTLE BUTTE CREEK AT FISH LAKE, NEAR LAKECREEK, OREG.

LOCATION.—Water-stage recorder in  $S\frac{1}{2}$  sec. 4, T. 37 S., R. 4 E., half a mile below outlet of Fish Lake, 18 miles east of Lakecreek. Prior to Oct. 29, 1932, gage was a quarter of a mile upstream, above several small springs.

DRAINAGE AREA.—18 square miles.

RECORDS AVAILABLE.—October 1914 to September 1933; incomplete prior to 1917.

DISCHARGE.—Maximum during year, 125 second-feet Aug. 9, 17 (gage height, 1.69 feet); minimum, probably less than 1 second-foot at times, Oct. 16–28.

1914–33: Maximum, 158 second-feet July 10, 1930; practically no flow at times.

REMARKS.—Records good except those estimated, Oct. 1–28, which are fair. Flow regulated by storage in Fish Lake Reservoir. Beginning in Oct. 1923, Cascade Canal has diverted water from Fourmile Lake in Klamath River Basin into Fish Lake Basin; no diversions from creek above station. Records furnished by State engineer.

## Discharge, in second-feet, 1932–33

| Day     | Oct. | Nov.  | Dec. | Jan. | Feb.  | Mar. | Apr.  | May | June  | July | Aug. | Sept. |
|---------|------|-------|------|------|-------|------|-------|-----|-------|------|------|-------|
| 1.....  | 28   | 4     | 9    | 13   | 15    | 17   | 19    | 28  | 39    | 57   | 116  | 68    |
| 2.....  |      | 4     | 9    | 13   | 15    | 17   | 19    | 28  | 39    | 55   | 112  | 65    |
| 3.....  |      | 4     | 9    | 13   | 16    | 17   | 19    | 28  | 39    | 54   | 112  | 60    |
| 4.....  |      | 4     | 9    | 14   | 16    | 17   | 20    | 29  | 40    | 53   | 110  | 59    |
| 5.....  |      | 4     | 10   | 14   | 16    | 17   | 20    | 29  | 40    | 52   | 106  | 59    |
| 6.....  | 18   | 5     | 10   | 14   | 16    | 17   | 20    | 29  | 40    | 66   | 106  | 52    |
| 7.....  |      | 4     | 10   | 14   | 16    | 17   | 20    | 29  | 40    | 75   | 106  | 49    |
| 8.....  |      | 5     | 10   | 14   | 16    | 17   | 20    | 29  | 40    | 82   | 110  | 48    |
| 9.....  |      | 5     | 10   | 14   | 16    | 17   | 20    | 29  | 41    | 84   | 119  | 40    |
| 10..... |      | 5     | 10   | 14   | 16    | 17   | 20    | 29  | 41    | 79   | 123  | 33    |
| 11..... | 2    | 5     | 10   | 14   | 16    | 17   | 21    | 29  | 41    | 79   | 119  | 33    |
| 12..... |      | 5     | 10   | 14   | 16    | 18   | 21    | 30  | 41    | 88   | 116  | 33    |
| 13..... |      | 5     | 10   | 14   | 16    | 18   | 21    | 31  | 41    | 102  | 116  | 33    |
| 14..... |      | 5     | 10   | 14   | 16    | 18   | 22    | 31  | 41    | 108  | 118  | 33    |
| 15..... |      | 6     | 10   | 14   | 16    | 18   | 22    | 31  | 41    | 110  | 121  | 33    |
| 16..... | 3    | 7     | 10   | 14   | 16    | 18   | 22    | 31  | 41    | 108  | 121  | 33    |
| 17..... |      | 7     | 10   | 14   | 16    | 18   | 22    | 31  | 41    | 110  | 123  | 33    |
| 18..... |      | 7     | 11   | 14   | 16    | 18   | 22    | 31  | 41    | 118  | 121  | 33    |
| 19..... |      | 7     | 11   | 14   | 16    | 18   | 23    | 32  | 41    | 123  | 119  | 21    |
| 20..... |      | 7     | 12   | 14   | 16    | 18   | 23    | 32  | 41    | 123  | 118  | 8     |
| 21..... | 3    | 7     | 12   | 14   | 16    | 18   | 23    | 33  | 41    | 121  | 114  | 7     |
| 22..... |      | 7     | 12   | 14   | 16    | 18   | 23    | 33  | 41    | 116  | 100  | 7     |
| 23..... |      | 7     | 12   | 14   | 17    | 18   | 24    | 33  | 45    | 112  | 98   | 8     |
| 24..... |      | 7     | 12   | 14   | 17    | 18   | 26    | 34  | 57    | 103  | 97   | 8     |
| 25..... |      | 8     | 12   | 14   | 17    | 18   | 26    | 35  | 57    | 100  | 92   | 9     |
| 26..... | 3    | 8     | 12   | 14   | 17    | 18   | 27    | 36  | 57    | 112  | 86   | 9     |
| 27..... |      | 8     | 12   | 14   | 17    | 18   | 27    | 37  | 57    | 119  | 86   | 9     |
| 28..... |      | 9     | 12   | 14   | 17    | 18   | 28    | 38  | 57    | 119  | 81   | 9     |
| 29..... |      | 9     | 13   | 15   | ----- | 18   | 29    | 38  | 57    | 121  | 78   | 9     |
| 30..... |      | 9     | 13   | 15   | ----- | 18   | 28    | 38  | 57    | 119  | 78   | 10    |
| 31..... | 3    | ----- | 13   | 15   | ----- | 19   | ----- | 39  | ----- | 119  | 74   | ----- |

| Month          | Maximum | Minimum | Mean | Run-off in acre-feet |
|----------------|---------|---------|------|----------------------|
| October.....   | -----   | -----   | 12.4 | 762                  |
| November.....  | 9       | 4       | 6.1  | 363                  |
| December.....  | 13      | 9       | 10.8 | 664                  |
| January.....   | 15      | 13      | 14.0 | 861                  |
| February.....  | 17      | 15      | 16.1 | 894                  |
| March.....     | 19      | 17      | 17.7 | 1,090                |
| April.....     | 29      | 19      | 22.6 | 1,340                |
| May.....       | 39      | 28      | 31.9 | 1,960                |
| June.....      | 57      | 39      | 44.5 | 2,650                |
| July.....      | 123     | 52      | 96.4 | 5,930                |
| August.....    | 123     | 74      | 106  | 6,520                |
| September..... | 68      | 7       | 30.4 | 1,810                |
| The year.....  | 123     | -----   | 34.3 | 24,800               |

## NORTH FORK OF LITTLE BUTTE CREEK ABOVE MEDFORD INTAKE, NEAR LAKECREEK, OREG.

LOCATION.—Water-stage recorder in SW¼ sec. 25, T. 36 S., R. 2 E., 300 yards above diversion to former city of Medford water-supply pipe line, which has been used since 1927 for irrigation, and 4½ miles east of Lakecreek.

RECORDS AVAILABLE.—September 1911 to March 1913, May 1922 to September 1928, October 1931 to September 1933; incomplete prior to 1931.

DISCHARGE.—Maximum during year, 166 second-feet July 19 (gage height, 2.28 feet); minimum (estimated), 18 second-feet Dec. 12, 13.

1911-13, 1922-28, 1931-33: Maximum (estimated), 680 second-feet Dec. 30, 1924 (gage height, 3.30 feet); minimum (estimated), 11 second-feet Oct. 29 to Nov. 8, 1931.

REMARKS.—Records good except those estimated, Dec. 9-23, Feb. 9, 10, which are fair. Flow regulated by storage in Fish Lake Reservoir. Small irrigation diversions above station.

*Discharge, in second-feet, 1932-33*

| Day     | Oct. | Nov. | Dec. | Jan. | Feb.  | Mar. | Apr.  | May | June  | July | Aug. | Sept. |
|---------|------|------|------|------|-------|------|-------|-----|-------|------|------|-------|
| 1.....  | 55   | 26   | 28   | 44   | 41    | 56   | 67    | 87  | 97    | 82   | 144  | 95    |
| 2.....  | 55   | 29   | 28   | 69   | 40    | 65   | 71    | 89  | 97    | 82   | 138  | 95    |
| 3.....  | 55   | 28   | 26   | 67   | 38    | 69   | 82    | 96  | 94    | 82   | 138  | 88    |
| 4.....  | 56   | 28   | 27   | 48   | 38    | 60   | 82    | 131 | 92    | 80   | 138  | 88    |
| 5.....  | 58   | 29   | 27   | 47   | 43    | 58   | 78    | 125 | 89    | 76   | 138  | 85    |
| 6.....  | 60   | 41   | 27   | 47   | 44    | 58   | 78    | 119 | 87    | 87   | 134  | 82    |
| 7.....  | 60   | 30   | 27   | 44   | 41    | 67   | 73    | 122 | 87    | 107  | 134  | 71    |
| 8.....  | 60   | 32   | 25   | 40   | 41    | 65   | 69    | 116 | 89    | 110  | 134  | 71    |
| 9.....  | 58   | 32   | 40   | 40   | 41    | 65   | 65    | 105 | 92    | 119  | 144  | 69    |
| 10..... | 53   | 30   | 40   | 40   | 41    | 65   | 64    | 100 | 92    | 119  | 147  | 55    |
| 11..... | 50   | 29   | 38   | 41   | 71    | 65   | 97    | 87  | 87    | 113  | 147  | 55    |
| 12..... | 45   | 29   | 38   | 43   | 91    | 64   | 92    | 87  | 87    | 125  | 144  | 54    |
| 13..... | 45   | 29   | 38   | 41   | 78    | 64   | 87    | 84  | 84    | 140  | 138  | 54    |
| 14..... | 44   | 32   | 41   | 40   | 69    | 64   | 84    | 84  | 84    | 140  | 138  | 55    |
| 15..... | 35   | 34   | 23   | 38   | 62    | 67   | 67    | 84  | 84    | 146  | 144  | 55    |
| 16..... | 32   | 47   | 37   | 69   | 71    | 65   | 87    | 82  | 140   | 144  | 144  | 55    |
| 17..... | 27   | 37   | 37   | 55   | 71    | 65   | 105   | 80  | 140   | 150  | 154  | 54    |
| 18..... | 25   | 33   | 36   | 55   | 71    | 67   | 97    | 78  | 143   | 154  | 154  | 55    |
| 19..... | 24   | 32   | 35   | 50   | 69    | 73   | 87    | 76  | 156   | 154  | 154  | 50    |
| 20..... | 24   | 32   | 35   | 48   | 80    | 71   | 84    | 74  | 153   | 150  | 150  | 31    |
| 21..... | 24   | 31   | 35   | 48   | 78    | 71   | 89    | 74  | 153   | 144  | 144  | 29    |
| 22..... | 29   | 31   | 25   | 35   | 48    | 71   | 102   | 72  | 143   | 125  | 125  | 29    |
| 23..... | 25   | 31   | 30   | 35   | 53    | 67   | 73    | 100 | 72    | 134  | 125  | 30    |
| 24..... | 25   | 30   | 33   | 35   | 50    | 64   | 76    | 97  | 89    | 128  | 125  | 33    |
| 25..... | 25   | 30   | 44   | 35   | 48    | 62   | 94    | 97  | 89    | 125  | 122  | 31    |
| 26..... | 26   | 28   | 64   | 35   | 51    | 60   | 84    | 97  | 87    | 137  | 117  | 31    |
| 27..... | 25   | 29   | 60   | 37   | 50    | 60   | 82    | 94  | 87    | 150  | 117  | 31    |
| 28..... | 25   | 32   | 51   | 36   | 55    | 64   | 82    | 97  | 84    | 150  | 108  | 32    |
| 29..... | 25   | 32   | 64   | 36   | ----- | 64   | 96    | 100 | 84    | 150  | 106  | 32    |
| 30..... | 25   | 31   | 55   | 35   | ----- | 65   | 89    | 102 | 82    | 153  | 106  | 32    |
| 31..... | 25   | 47   | 44   | 44   | ----- | 71   | ----- | 100 | ----- | 153  | 103  | ----- |

| Month          | Maximum | Minimum | Mean | Run-off in acre-feet |
|----------------|---------|---------|------|----------------------|
| October.....   | 60      | 24      | 38.7 | 2,380                |
| November.....  | 47      | 26      | 31.5 | 1,870                |
| December.....  | 64      | -----   | 31.8 | 1,960                |
| January.....   | 69      | 35      | 40.5 | 2,490                |
| February.....  | 69      | 38      | 47.0 | 2,610                |
| March.....     | 91      | 56      | 67.5 | 4,150                |
| April.....     | 96      | 64      | 73.7 | 4,390                |
| May.....       | 131     | 84      | 99.0 | 6,090                |
| June.....      | 97      | 72      | 85.1 | 5,060                |
| July.....      | 156     | 76      | 126  | 7,750                |
| August.....    | 154     | 103     | 134  | 8,240                |
| September..... | 95      | 29      | 54.2 | 3,230                |
| The year.....  | 156     | -----   | 69.4 | 50,200               |

DIVERSIONS FROM LITTLE BUTTE CREEK NEAR LAKECREEK, OREG.

Hanley South and Hanley North Canals divert from North Fork of Little Butte Creek in SE¼ sec. 26, T. 36 S., R. 2 E.; water used to irrigate land on both sides of Little Butte Creek near Lakecreek. Rogue River Valley Canal diverts from South Fork of Little Butte Creek in SE¼ sec. 29, T. 36 S., R. 2 E., and from North Fork of Little Butte Creek in NE¼ sec. 20, T. 36 S., R. 2 E.; water used for irrigation of about 15,000 acres of land, chiefly in Bear Creek Basin, on both sides of creek below Phoenix. Eagle Point Canal diverts from Little Butte Creek in SE¼ sec. 31, T. 35 S., R. 1 E.; water used for irrigation of lands near Eagle Point. There are many other smaller diversions from Little Butte Creek and tributaries.

Records are available from April 1929 to September 1933; records of some of the canals published separately prior to 1929. Records furnished by State engineer.

*Diversions, in acre-feet, from Little Butte Creek near Lakecreek, Oreg., June to September 1933*

| Month           | Hanley<br>South<br>Canal | Hanley<br>North<br>Canal | Rogue<br>River<br>Valley<br>Canal<br>below<br>junction<br>of intakes | Eagle<br>Point<br>Canal |
|-----------------|--------------------------|--------------------------|----------------------------------------------------------------------|-------------------------|
| June.....       | • 205                    | • 282                    | 7,020                                                                | 1,150                   |
| July.....       | 682                      | 572                      | 7,810                                                                | 1,080                   |
| August.....     | 528                      | 556                      | 6,820                                                                | 1,080                   |
| September.....  | 493                      | 577                      | 2,480                                                                | 774                     |
| The period..... | 1,910                    | 1,990                    | 24,100                                                               | 4,080                   |

• June 23-30; no record June 1-22, but probably some flow.

NOTE.—Probably some flow in canals for months for which no record is given.

## EMIGRANT GAP RESERVOIR NEAR ASHLAND, OREG.

LOCATION.—Staff gage in SE¼ sec. 20, T. 39 S., R. 2 E., at Emigrant Gap Dam of Talent Irrigation District, 6 miles southeast of Ashland. Gage graduated to read sea-level elevation.

RECORDS AVAILABLE.—December 1924 to September 1933.

EXTREMES.—Maximum contents during year, 8,412 acre-feet Apr. 4 (elevation, 2,173.8 feet); no storage from Oct. 15 until some time in December.

1924-33: Maximum contents, 8,748 acre-feet Feb. 20, 1927 (elevation, 2,175.2 feet); no storage at times.

REMARKS.—Records fair. Emigrant Gap Reservoir was completed in 1924 by Talent Irrigation District to provide water for lands under East and Talent laterals in vicinity of Talent. Natural flow into reservoir may be augmented by water stored in Hyatt Prairie Reservoir and released through Keene Creek Canal in Klamath River Basin, records of which are published in Water-Supply Paper 751. Records furnished by State engineer.

*Monthly stage and contents, 1932-33*

| Date          | Gage height (feet) | Contents (acre-feet) | Change in contents during month (acre-feet) | Date          | Gage height (feet) | Contents (acre-feet) | Change in contents during month (acre-feet) |
|---------------|--------------------|----------------------|---------------------------------------------|---------------|--------------------|----------------------|---------------------------------------------|
| Sept. 30..... | -----              | • 250                | -----                                       | May 31.....   | 2,173.0            | 8,224                | 0                                           |
| Oct. 31.....  | -----              | • 0                  | -250                                        | June 30.....  | 2,165.5            | 6,606                | -1,618                                      |
| Nov. 30.....  | -----              | • 0                  | 0                                           | July 31.....  | -----              | • 3,325              | -3,281                                      |
| Dec. 31.....  | -----              | • 850                | +850                                        | Aug. 31.....  | -----              | • 654                | -2,671                                      |
| Jan. 31.....  | -----              | • 1,440              | +590                                        | Sept. 30..... | -----              | • 510                | -144                                        |
| Feb. 28.....  | -----              | • 2,752              | +1,312                                      |               |                    |                      |                                             |
| Mar. 31.....  | 2,170.4            | 7,635                | +4,883                                      | The year..... | -----              | -----                | +260                                        |
| Apr. 30.....  | -----              | • 8,224              | +579                                        |               |                    |                      |                                             |

• Interpolated or estimated.

## EMIGRANT CREEK NEAR ASHLAND, OREG.

LOCATION.—Water-stage recorder in SE¼ sec. 20, T. 39 S., R. 2 E., 500 feet below Emigrant Gap Reservoir Dam and 6 miles southeast of Ashland.

RECORDS AVAILABLE.—January 1920 to May 1924 (incomplete); October 1924 to September 1933.

DISCHARGE.—Maximum during year (estimated), 1,000 second-feet Apr. 4; no flow at times.

1920-33: Maximum, 5,260 second-feet Feb. 20, 1927; no flow at times.

REMARKS.—Records good except those estimated, Apr. 16, 17, Apr. 26-28, which are fair. Practically all flow November to March stored at Emigrant Gap Reservoir. Diversions for irrigation above station; principal canals are Ashland lateral and East lateral. Keene Creek Canal diverts water into Emigrant Creek from Klamath River Basin. Flow regulated since December 1924 by storage in Emigrant Gap Reservoir. Records furnished by State engineer.

## Discharge, in second-feet, 1932-33

| Day     | Oct. | Jan.  | Apr. | May | June | July | Aug. | Sept. |
|---------|------|-------|------|-----|------|------|------|-------|
| 1.....  |      |       | 0.9  | 27  | 21   | 1.1  | 29   | 8.3   |
| 2.....  |      |       | .9   | 31  | 2.3  | 1.1  | 29   | 8.3   |
| 3.....  |      |       | 9.3  | 57  | 2.5  | 1.1  | 29   | 8.3   |
| 4.....  | 11   |       | 112  | 70  | 2.7  | 1.0  | 30   | 8.3   |
| 5.....  | 12   |       | 90   | 48  | 2.7  | 1.1  | 30   | 8.3   |
| 6.....  | 12   |       | 82   | 91  | 2.9  | 3.8  | 30   | 8.7   |
| 7.....  | 12   |       | 76   | 85  | 2.9  | 7.1  | 29   | 5.9   |
| 8.....  | 12   |       | 66   | 87  | 2.9  | 10   | 28   | 3.2   |
| 9.....  | 12   |       | 57   | 92  | 2.7  | 10   | 30   | 3.3   |
| 10..... | 12   |       | 15   | 50  | 2.6  | 11   | 32   | 3.2   |
| 11..... | 12   |       | 7.3  | 86  | 2.6  | 10   | 34   | 3.2   |
| 12..... | 12   |       | 19   | 70  | 2.5  | 15   | 34   | 3.2   |
| 13..... | 12   | a 0.3 | 51   | 66  | 2.1  | 21   | 34   | 3.3   |
| 14..... | 12   |       | 53   | 50  | 2.1  | 24   | 34   | 3.3   |
| 15..... | 13   |       | 38   | 43  | 2.5  | 24   | 33   | 3.3   |
| 16..... | 13   |       | 35   | 55  | 2.1  | 25   | 32   | 3.5   |
| 17..... | 14   |       | 33   | 66  | 2.0  | 25   | 31   | 2.3   |
| 18..... |      |       | 30   | 74  | 1.8  | 27   | 30   | 1.6   |
| 19..... |      |       | 31   | 56  | 1.6  | 28   | 31   | .3    |
| 20..... |      |       | 50   | 34  | 1.6  | 24   | 30   | .1    |
| 21..... |      |       | 44   | 24  | 1.9  | 27   | 30   | .1    |
| 22..... |      |       | 54   | 53  | 6.4  | 29   | 29   | 0     |
| 23..... |      |       | 54   | 40  | 4.7  | 34   | 17   | 0     |
| 24..... |      |       | 72   | 38  | 4.2  | 32   | 10   | 0     |
| 25..... |      |       | 63   | 42  | 5.9  | 30   | 11   | 0     |
| 26..... |      |       | 65   | 53  | 9.0  | 29   | 11   | 0     |
| 27..... |      |       | 68   | 55  | 7.4  | 30   | 8.7  | 0     |
| 28..... |      |       | 70   | 48  | 1.1  | 30   | 9.0  | 0     |
| 29..... |      |       | 72   | 39  | 1.1  | 30   | 8.3  | 0     |
| 30..... |      |       | 70   | 13  | 1.1  | 30   | 8.3  | 0     |
| 31..... |      |       |      | 20  |      | 29   | 8.3  |       |

| Month           | Maximum | Minimum | Mean | Run-off in<br>acre-feet |
|-----------------|---------|---------|------|-------------------------|
| April.....      | 112     | 0.9     | 49.6 | 2,950                   |
| May.....        | 92      | 13      | 53.6 | 3,300                   |
| June.....       | 21      | 1.1     | 3.63 | 216                     |
| July.....       | 34      | 1.0     | 19.4 | 1,190                   |
| August.....     | 34      | 8.3     | 24.8 | 1,520                   |
| September.....  | 8.7     | 0       | 3.00 | 179                     |
| The period..... |         |         |      | 9,360                   |

• Discharge measurement.

## BEAR CREEK AT MEDFORD, OREG.

LOCATION.—Water-stage recorder in NW¼ sec. 30, T. 37 S., R. 1 W., just above Main Street Bridge in Medford.

RECORDS AVAILABLE.—March 1915 to September 1933; incomplete prior to April 1927.

DISCHARGE.—Maximum during year, 375 second-feet Apr. 5 (gage height, 2.73 feet); minimum, 3.8 second-feet Oct. 2 (gage height, 0.28 foot).

1915-33: Maximum, 10,200 second-feet Feb. 20, 1927 (gage height, 10.15 feet); practically dry at times. Average, 12 years (1920-26, 1927-33), 61.7 second-feet.

REMARKS.—Records fair except those estimated, November to March, June 26 to July 7, which are poor. Diversions for irrigation above station. Flow partly regulated since December 1924 by storage in Emigrant Gap Reservoir. Record furnished by State engineer.

## Discharge, in second-feet, 1932-33

| Day       | Oct. | Nov. | Dec. | Jan. | Feb. | Mar.  | Apr.    | May     | June | July                 | Aug. | Sept. |
|-----------|------|------|------|------|------|-------|---------|---------|------|----------------------|------|-------|
| 1         | 5.0  | 15   | 32   | 35   | 64   | 83    | 100     | 194     | 97   |                      | 13   | 13    |
| 2         | 3.9  | 18   | 28   |      | 54   | 97    | 114     | 137     | 70   |                      | 16   | 12    |
| 3         | 4.8  | 19   | 26   |      | 47   | 165   | 154     | 154     | 62   |                      | 15   | 11    |
| 4         | 6.3  | 19   | 25   |      | 45   | 104   | 217     | 217     | 61   | a 18                 | 14   | 12    |
| 5         | 7.1  | 19   | 24   | a 67 | 50   | 102   | 245     | 251     | 58   |                      | 14   | 13    |
| 6         | 8.5  | 22   | 22   |      | 62   | 93    | 228     | 209     | 45   |                      | 17   | 20    |
| 7         | 10   |      |      |      | 58   | 120   | 214     | 254     | 35   |                      | 21   | 21    |
| 8         | 10   |      |      |      | 51   | 118   | 186     | 242     | 36   | 14                   | 18   | 20    |
| 9         | 12   |      |      | 41   | 45   | 108   | 160     | 251     | 41   | 15                   | 14   | 18    |
| 10        | 13   |      |      | 39   | 35   | 108   | 130     | 209     | 58   | 17                   | 13   | 17    |
| 11        | 14   |      |      | 37   | 41   | 110   | 90      | 201     | 65   | 18                   | 13   | 18    |
| 12        | 12   |      | a 11 | 36   | 41   | 212   | 102     | 228     | 66   | 17                   | 12   | 15    |
| 13        | 12   |      |      | 34   | 42   | 169   | 120     | 212     | 62   | 15                   | 11   | 12    |
| 14        | 10   | a 20 |      | 35   | 38   | 122   | 154     | 184     | 47   | 14                   | 11   | 10    |
| 15        | 10   |      |      | 37   | 44   | 99    | 130     | 172     | 52   | 13                   | 11   | a 12  |
| 16        | a 16 |      |      | 35   | 110  | 106   | 137     | 169     | 52   | 13                   | 11   | a 14  |
| 17        | 23   |      |      | 32   | 81   | 126   | 163     | 186     | 53   | 12                   | 10   | a 17  |
| 18        | 21   |      |      | 32   | 62   | 108   | 141     | 217     | 58   | 13                   | 10   | a 19  |
| 19        | 15   |      | 32   | 33   | 53   | 104   | 118     | 184     | 48   | 12                   | 10   | 21    |
| 20        | 12   |      | 39   | 30   | 53   | 124   | 120     | 158     | 41   | 12                   | a 11 | 29    |
| 21        | 12   | 14   | 30   | 32   | 53   |       | 126     | 132     | 37   | 11                   | 12   | 35    |
| 22        | 13   | 14   | 27   | 30   | 55   |       | 141     | 154     | 34   | 11                   | 12   | 28    |
| 23        | 14   | 15   | 40   | 32   | 60   |       | 139     | 154     | 30   | 11                   | 11   | 22    |
| 24        | 17   | 14   | 40   | 36   | 56   |       | 152     | 143     | 26   | 10                   | 11   | 26    |
| 25        |      | 14   | 32   | 39   | 50   | a 105 | 167     | 149     | 32   | 11                   | 11   | 24    |
| 26        |      | 14   | 34   | 44   | 55   |       | 179     | 160     |      | a 12                 | 10   | 18    |
| 27        | a 15 | 15   | 41   | 177  | 54   |       | 168     | 152     |      | a 12                 | 11   | 13    |
| 28        |      | 20   | 37   | 83   | 56   |       | 164     | 141     | a 25 | a 13                 | 11   | 12    |
| 29        |      | 34   | 36   | 67   |      |       | 174     | 147     |      | 14                   | a 12 | 10    |
| 30        |      | 41   | 35   | 58   |      |       | 189     | 132     |      | 14                   | 13   | 9.6   |
| 31        | 14   |      | 35   | 58   |      | 100   |         | 112     |      | 13                   | 13   |       |
| Month     |      |      |      |      |      |       | Maximum | Minimum | Mean | Run-off in acre-feet |      |       |
| October   |      |      |      |      |      |       | 23      | 3.9     | 12.4 | 762                  |      |       |
| November  |      |      |      |      |      |       | 41      |         | 19.6 | 1,170                |      |       |
| December  |      |      |      |      |      |       | 41      |         | 24.1 | 1,480                |      |       |
| January   |      |      |      |      |      |       | 177     | 30      | 51.0 | 3,140                |      |       |
| February  |      |      |      |      |      |       | 110     | 35      | 54.1 | 3,000                |      |       |
| March     |      |      |      |      |      |       | 212     | 83      | 114  | 7,010                |      |       |
| April     |      |      |      |      |      |       | 245     | 90      | 153  | 9,100                |      |       |
| May       |      |      |      |      |      |       | 254     | 112     | 181  | 11,100               |      |       |
| June      |      |      |      |      |      |       | 97      |         | 46.4 | 2,760                |      |       |
| July      |      |      |      |      |      |       |         | 10      | 14.3 | 879                  |      |       |
| August    |      |      |      |      |      |       | 21      | 10      | 12.6 | 775                  |      |       |
| September |      |      |      |      |      |       | 35      | 9.6     | 17.4 | 1,040                |      |       |
| The year  |      |      |      |      |      |       | 254     | 3.9     | 56.3 | 42,200               |      |       |

• Estimated.

DIVERSIONS IN BEAR CREEK BASIN, OREG.

Ashland lateral of Talent Irrigation District diverts from Sampson Creek in SW $\frac{1}{4}$  sec. 26, T. 39 S., R. 2 E., for irrigation of lands near Ashland; most of flow is contributed by Keene Creek Canal, which diverts from Keene Creek in Klamath River Basin. East lateral of Talent Irrigation District diverts from Emigrant Gap Reservoir in SE $\frac{1}{4}$  sec. 20, T. 39 S., R. 2 E., for irrigation of lands chiefly on the east side of Bear Creek Valley above Medford. Talent lateral of Talent Irrigation District diverts from Bear Creek in SW $\frac{1}{4}$  sec. 33, T. 38 S., R. 1 E., for irrigation of lands near Talent. Phoenix Canal diverts from Bear Creek in NW $\frac{1}{4}$  sec. 23, T. 38 S., R. 1 W., to supplement flow of Medford Irrigation District Canal for irrigation of lands west of Bear Creek. Bear Creek Canal diverts from Bear Creek at Medford for irrigation of lands west of Bear Creek near Central Point. Numerous smaller diversions from Bear Creek and tributaries.

Records are available from April 1929 to September 1933; records for some of the canals published separately prior to 1929.

Records for Ashland, East, and Talent laterals good; others poor. Discharge partly estimated for all canals. Records furnished by State engineer.

*Diversions, in acre-feet, 1932-33*

| Month           | Ashland lateral | East lateral | Talent lateral   | Phoenix Canal | Bear Creek Canal |
|-----------------|-----------------|--------------|------------------|---------------|------------------|
| April.....      | * 25            | 797          | <sup>b</sup> 136 | * 79          | -----            |
| May.....        | 58              | 1, 040       | 612              | 812           | * 107            |
| June.....       | 660             | 2, 330       | 1, 970           | 1, 370        | 156              |
| July.....       | 1, 080          | 3, 140       | 2, 150           | 719           | 603              |
| August.....     | 990             | 3, 400       | 1, 940           | 732           | 769              |
| September.....  | 424             | 786          | 649              | 530           | 505              |
| The period..... | 3, 240          | 11, 500      | 7, 460           | 4, 240        | 2, 170           |

\* Apr. 28-30; no record Apr. 1-27.

<sup>b</sup> Apr. 25-30; no record Apr. 1-24.

\* May 15-31; no record May 1-14.

NOTE.—Probably little or no flow during months omitted.

## WEST FORK OF ASHLAND CREEK NEAR ASHLAND, OREG.

LOCATION.—Water-stage recorder in sec. 32, T. 39 S., R. 1 E., about three-quarters of a mile above confluence with East Fork and 4 miles south of Ashland.

DRAINAGE AREA.—9.4 square miles.

RECORDS AVAILABLE.—September 1924 to January 1933 (discontinued).

DISCHARGE.—Maximum recorded during year, 26 second-feet Nov. 29 (gage height, 1.22 feet); minimum, 2.2 second-feet Oct. 2, 3 (gage height, 0.44 foot).

1924-33: Maximum, 281 second-feet Feb. 20, 1927 (gage height, 3.15 feet); minimum, 1.3 second-feet Aug. 29, 1931 (gage height, 0.38 foot).

REMARKS.—Records good except those for November and December, which are fair. Discharge estimated Dec. 9-16, Jan. 17, 18, 29-31. No diversions or regulation above station. Records furnished by State engineer.

*Discharge, in second-feet, 1932-33*

| Day     | Oct. | Nov. | Dec. | Jan. | Day     | Oct. | Nov.  | Dec. | Jan. |
|---------|------|------|------|------|---------|------|-------|------|------|
| 1.....  | 2.4  | 2.9  | 4.9  | 3.7  | 16..... | 4.3  | 4.0   | 2.7  | 4.3  |
| 2.....  | 2.4  | 3.7  | 4.3  | 3.9  | 17..... | 3.5  | 3.4   | 2.8  | 4.2  |
| 3.....  | 2.4  | 2.8  | 4.0  | 4.0  | 18..... | 3.2  | 3.1   | 2.7  | 4.1  |
| 4.....  | 2.4  | 2.8  | 3.7  | 3.9  | 19..... | 3.1  | 2.9   | 3.2  | 4.0  |
| 5.....  | 2.4  | 3.2  | 3.5  | 4.3  | 20..... | 2.9  | 2.8   | 2.8  | 4.0  |
| 6.....  | 2.8  | 7.1  | 3.2  | 4.5  | 21..... | 2.9  | 2.8   | 2.8  | 3.9  |
| 7.....  | 2.7  | 3.7  | 3.2  | 4.5  | 22..... | 4.0  | 2.5   | 2.7  | 3.9  |
| 8.....  | 2.5  | 3.7  | 3.1  | 4.5  | 23..... | 3.5  | 2.5   | 2.7  | 3.9  |
| 9.....  | 2.5  | 5.1  | 4.5  | 4.5  | 24..... | 3.4  | 2.5   | 2.7  | 4.0  |
| 10..... | 2.5  | 3.4  | 4.5  | 4.5  | 25..... | 3.2  | 2.5   | 2.8  | 3.9  |
| 11..... | 2.4  | 2.9  | 2.7  | 4.3  | 26..... | 3.1  | 2.5   | 3.5  | 3.9  |
| 12..... | 2.4  | 2.9  | 4.2  | 4.2  | 27..... | 3.1  | 3.2   | 3.5  | 3.9  |
| 13..... | 2.4  | 2.8  | 4.2  | 4.2  | 28..... | 2.9  | 10    | 3.5  | 3.9  |
| 14..... | 2.5  | 2.9  | 4.3  | 4.3  | 29..... | 2.9  | 12    | 3.5  | 3.9  |
| 15..... | 2.9  | 3.1  | 4.5  | 4.5  | 30..... | 2.9  | 7.3   | 3.5  | 3.9  |
|         |      |      |      |      | 31..... | 2.9  | ----- | 3.5  | 3.9  |

| Month           | Maximum | Minimum | Mean  | Run-off in<br>acre-feet |
|-----------------|---------|---------|-------|-------------------------|
| October.....    | 4.3     | 2.4     | 2.88  | 177                     |
| November.....   | 12      | 2.5     | 3.90  | 232                     |
| December.....   | 4.9     | -----   | 3.15  | 194                     |
| January.....    | 4.5     | 3.7     | 4.11  | 253                     |
| The period..... | -----   | -----   | ----- | 856                     |

NOTE.—Results of discharge measurements May 13, gage height 0.92 foot, discharge 11.8 second-feet; June 21, gage height 1.25 feet, discharge 29.1 second-feet.

## EAST FORK OF ASHLAND CREEK NEAR ASHLAND, OREG.

LOCATION.—Water-stage recorder in sec. 28, T. 39 S., R. 1 E., a quarter of a mile above confluence with West Fork, 100 yards above diversion for power plant, and 3½ miles south of Ashland.

DRAINAGE AREA.—7.8 square miles.

RECORDS AVAILABLE.—September 1924 to June 1933 (discontinued).

DISCHARGE.—Maximum recorded during year, 19 second-foot Nov. 29 (gage height, 1.18 feet); minimum, 1.7 second-foot Oct. 2, 3 (gage height, 0.60 foot).

1924-33: Maximum, 292 second-foot Feb. 20, 1927 (gage height, 3.5 feet); minimum, 1.0 second-foot Aug. 29 to Sept. 4, Oct. 9-14, 1931.

REMARKS.—Records good. No records February to April. Discharge estimated Dec. 9-16, Jan. 17, 18, 20, 30, 31. No regulation or diversions above station. Records furnished by State engineer.

## Discharge, in second-feet, 1932-33

| Day     | Oct. | Nov. | Dec. | Jan. | Day     | Oct. | Nov. | Dec. | Jan. |
|---------|------|------|------|------|---------|------|------|------|------|
| 1.....  | 2.0  | 2.8  | 4.6  | 3.3  | 16..... | 3.6  | 4.0  | 2.8  | 3.0  |
| 2.....  | 1.8  | 3.4  | 4.3  | 3.3  | 17..... | 3.1  | 3.6  | 3.1  | 3.0  |
| 3.....  | 2.0  | 2.7  | 4.1  | 3.4  | 18..... | 2.7  | 3.3  | 3.0  | 3.0  |
| 4.....  | 2.0  | 3.0  | 4.0  | 3.4  | 19..... | 2.7  | 3.1  | 3.3  | 3.1  |
| 5.....  | 2.1  | 4.1  | 3.8  | 3.4  | 20..... | 2.5  | 3.1  | 3.0  | 3.1  |
| 6.....  | 2.3  | 6.3  | 3.4  | 3.6  | 21..... | 2.5  | 3.1  | 3.0  | 3.1  |
| 7.....  | 2.3  | 4.3  | 3.4  | 3.4  | 22..... | 3.3  | 3.1  | 3.0  | 3.0  |
| 8.....  | 2.1  | 4.0  | 2.7  | 3.4  | 23..... | 2.8  | 3.1  | 3.0  | 3.0  |
| 9.....  | 2.1  | 5.7  | 3.3  | 3.3  | 24..... | 2.7  | 3.1  | 2.8  | 3.1  |
| 10..... | 2.1  | 3.8  | 3.3  | 3.3  | 25..... | 2.7  | 3.1  | 2.8  | 3.1  |
| 11..... | 2.1  | 3.4  | 2.8  | 3.1  | 26..... | 2.8  | 3.1  | 3.1  | 3.1  |
| 12..... | 2.0  | 3.4  |      | 3.1  | 27..... | 2.7  | 3.8  | 3.6  | 3.1  |
| 13..... | 2.1  | 3.4  |      | 3.1  | 28..... | 2.5  | 9.2  | 3.6  | 3.1  |
| 14..... | 2.3  | 3.3  |      | 3.1  | 29..... | 2.5  | 8.9  | 3.6  | 3.1  |
| 15..... | 2.5  | 3.4  |      | 3.0  | 30..... | 2.7  | 6.1  | 3.4  | 3.1  |
|         |      |      |      |      | 31..... | 2.8  |      | 3.3  | 3.1  |

| Month           | Maximum | Minimum | Mean | Run-off in acre-feet |
|-----------------|---------|---------|------|----------------------|
| October.....    | 3.6     | 1.8     | 2.46 | 151                  |
| November.....   | 9.2     | 2.7     | 4.02 | 239                  |
| December.....   | 4.6     |         | 3.24 | 199                  |
| January.....    | 3.6     | 3.0     | 3.17 | 195                  |
| The period..... |         |         |      | 784                  |

NOTE.—Results of discharge measurements May 13, gage height 0.98 foot, discharge 9.8 second-foot; June 21, gage height 1.34 foot, discharge 27.4 feet.

## APPLEGATE RIVER NEAR RUCH, OREG.

LOCATION.—Water-stage recorder in sec. 15, T. 39 S., R. 3 W., at Cameron Bridge, 1½ miles above mouth of Little Applegate River and 4½ miles south of Ruch. RECORDS AVAILABLE.—June 1911 to September 1914, September 1925 to September 1933 (incomplete).

DISCHARGE.—Maximum during year, 2,260 second-feet May 30, June 9 (gage height, 4.02 feet); minimum, 18 second-feet Oct. 3, 6–14 (gage height, 0.43 foot).

1911–14, 1925–33: Maximum (estimated), 20,000 second-feet Feb. 20, 1927 (gage height, 16.0 feet); minimum, 7 second-feet Sept. 2, 1929 (gage height, 0.26 foot). Average, 10 years (1911–14, 1925–26, 1927–33), 293 second-feet.

REMARKS.—Records good except those estimated, Dec. 9–20, which are poor. Diversions for irrigation above station. Records furnished by State engineer.

*Discharge, in second-feet, 1932–33*

| Day | Oct. | Nov. | Dec. | Jan. | Feb.  | Mar.  | Apr.  | May   | June  | July | Aug. | Sept. |
|-----|------|------|------|------|-------|-------|-------|-------|-------|------|------|-------|
| 1   | 19   | 34   | 328  | 155  | 170   | 382   | 616   | 882   | 1,400 | 466  | 96   | 38    |
| 2   | 19   | 59   | 230  | 444  | 164   | 396   | 674   | 763   | 1,300 | 440  | 103  | 42    |
| 3   | 19   | 66   | 209  | 596  | 161   | 583   | 952   | 622   | 1,220 | 425  | 91   | 44    |
| 4   | 20   | 54   | 176  | 338  | 161   | 450   | 1,040 | 694   | 1,170 | 405  | 89   | 40    |
| 5   | 20   | 116  | 149  | 264  | 167   | 382   | 928   | 654   | 1,300 | 382  | 87   | 36    |
| 6   | 18   | 295  | 126  | 237  | 186   | 364   | 920   | 602   | 1,350 | 386  | 87   | 36    |
| 7   | 19   | 183  | 113  | 212  | 196   | 396   | 890   | 602   | 1,350 | 351  | 81   | 38    |
| 8   | 18   | 106  | 101  | 199  | 192   | 396   | 756   | 590   | 1,450 | 328  | 78   | 38    |
| 9   | 18   | 101  | 183  | 186  | 378   | 654   | 558   | 2,050 | 307   | 78   | 40   | 40    |
| 10  | 18   | 94   | 176  | 173  | 405   | 576   | 540   | 1,900 | 287   | 74   | 40   | 40    |
| 11  | 18   | 76   | 161  | 173  | 405   | 540   | 540   | 1,750 | 271   | 74   | 41   | 41    |
| 12  | 18   | 70   | 155  | 170  | 830   | 564   | 570   | 1,850 | 264   | 76   | 40   | 40    |
| 13  | 18   | 63   | 152  | 164  | 770   | 576   | 628   | 1,850 | 245   | 66   | 35   | 35    |
| 14  | 20   | 59   | 155  | 152  | 622   | 674   | 714   | 1,850 | 234   | 66   | 38   | 38    |
| 15  | 30   | 61   | 120  | 155  | 161   | 540   | 898   | 735   | 1,700 | 220  | 63   | 36    |
| 16  | 34   | 87   | 149  | 248  | 668   | 838   | 756   | 1,400 | 209   | 59   | 33   | 33    |
| 17  | 38   | 99   | 135  | 241  | 628   | 714   | 700   | 1,170 | 199   | 55   | 31   | 31    |
| 18  | 36   | 81   | 143  | 223  | 546   | 609   | 628   | 992   | 192   | 52   | 31   | 31    |
| 19  | 35   | 70   | 135  | 199  | 499   | 534   | 576   | 920   | 180   | 52   | 31   | 31    |
| 20  | 34   | 61   | 121  | 189  | 522   | 522   | 558   | 882   | 170   | 52   | 31   | 31    |
| 21  | 32   | 61   | 164  | 126  | 189   | 540   | 590   | 564   | 845   | 161  | 50   | 46    |
| 22  | 32   | 57   | 137  | 118  | 189   | 499   | 770   | 570   | 792   | 155  | 50   | 40    |
| 23  | 57   | 54   | 275  | 118  | 202   | 455   | 1,000 | 785   | 749   | 140  | 47   | 36    |
| 24  | 46   | 52   | 192  | 124  | 206   | 415   | 1,170 | 1,000 | 714   | 135  | 44   | 40    |
| 25  | 42   | 52   | 155  | 132  | 196   | 382   | 1,120 | 1,260 | 707   | 129  | 42   | 42    |
| 26  | 41   | 48   | 149  | 136  | 196   | 351   | 890   | 1,220 | 700   | 126  | 42   | 41    |
| 27  | 40   | 50   | 183  | 287  | 199   | 510   | 1,040 | 1,220 | 688   | 121  | 41   | 38    |
| 28  | 36   | 318  | 192  | 226  | 260   | 992   | 1,400 | 1,400 | 590   | 111  | 42   | 35    |
| 29  | 36   | 390  | 173  | 206  | 600   | 1,380 | 1,680 | 1,680 | 346   | 166  | 47   | 35    |
| 30  | 34   | 583  | 167  | 183  | 680   | 984   | 1,850 | 499   | 103   | 50   | 33   | 33    |
| 31  | 34   | 164  | 176  | 674  | 1,600 | 101   | 40    | 40    | 40    | 40   | 40   | 40    |

| Month     | Maximum | Minimum | Mean  | Run-off in acre-feet |
|-----------|---------|---------|-------|----------------------|
| October   | 57      | 18      | 29.0  | 1,780                |
| November  | 890     | 34      | 133   | 7,910                |
| December  | 328     | 156     | 156   | 9,590                |
| January   | 596     | 118     | 197   | 12,100               |
| February  | 260     | 152     | 190   | 10,600               |
| March     | 992     | 351     | 531   | 32,600               |
| April     | 1,400   | 522     | 826   | 49,200               |
| May       | 1,850   | 540     | 846   | 52,000               |
| June      | 2,050   | 499     | 1,190 | 70,800               |
| July      | 466     | 101     | 236   | 14,500               |
| August    | 103     | 40      | 63.7  | 3,920                |
| September | 46      | 31      | 37.5  | 2,230                |
| The year  | 2,050   | 18      | 369   | 267,000              |

## ILLINOIS RIVER AT KERBY, OREG.

LOCATION.—Staff-gage in SW¼ sec. 4, T. 39 S., R. 8 W., at Kerby.

DRAINAGE AREA.—363 square miles.

RECORDS AVAILABLE.—March 1926 to September 1933.

DISCHARGE.—Maximum during year 17,600 second-feet Jan. 2 (gage height, 11.3 feet); minimum, 23 second-feet Oct. 1–4 (gage height, 0.22 foot).

1926–33: Maximum (estimated), 50,000 second-feet Feb. 20, 1927 (gage height, 19.6 feet at former gage); minimum, 15 second-feet Aug. 18–31, Sept. 1–3, 7, 8, 1931.

REMARKS.—Records good except those for Nov., 29 to Jan. 27, which are poor. Diversions for irrigation above station. Records furnished by State engineer.

## Discharge, in second-feet, 1932–33

| Day | Oct. | Nov.   | Dec.  | Jan.  | Feb.  | Mar.  | Apr.  | May   | June  | July | Aug. | Sept. |
|-----|------|--------|-------|-------|-------|-------|-------|-------|-------|------|------|-------|
| 1   | 23   | 59     | 2,710 | 1,660 | 2,200 | 1,790 | 2,200 | 1,520 | 1,700 | 595  | 127  | 51    |
| 2   | 23   | 77     | 1,750 | 9,960 | 1,700 | 4,760 | 2,200 | 1,520 | 1,520 | 520  | 120  | 51    |
| 3   | 23   | 355    | 1,310 | 8,420 | 1,440 | 2,890 | 2,740 | 1,610 | 1,360 | 520  | 120  | 49    |
| 4   | 23   | 265    | 920   | 3,460 | 1,280 | 2,890 | 2,890 | 2,200 | 1,360 | 486  | 120  | 51    |
| 5   | 24   | 1,170  | 780   | 2,360 | 1,210 | 2,090 | 2,320 | 1,990 | 1,280 | 424  | 112  | 49    |
| 6   | 24   | 3,640  | 660   | 1,980 | 1,280 | 1,890 | 2,090 | 1,790 | 1,280 | 396  | 112  | 51    |
| 7   | 24   | 970    | 585   | 1,660 | 1,210 | 2,200 | 2,090 | 2,890 | 1,280 | 370  | 105  | 52    |
| 8   | 24   | 620    | 550   | 1,380 | 1,140 | 1,990 | 1,700 | 3,560 | 2,320 | 345  | 98   | 51    |
| 9   | 24   | 515    | 480   | 1,210 | 1,070 | 1,790 | 1,360 | 3,210 | 3,210 | 321  | 85   | 49    |
| 10  | 24   | 480    | 415   | 1,060 | 930   | 2,090 | 1,210 | 2,450 | 2,200 | 321  | 79   | 49    |
| 11  | 24   | 415    | 385   | 930   | 1,360 | 1,990 | 1,210 | 2,200 | 1,990 | 298  | 79   | 49    |
| 12  | 24   | 370    | 370   | 870   | 2,090 | 5,660 | 1,210 | 2,090 | 1,890 | 275  | 73   | 49    |
| 13  | 26   | 325    | 370   | 700   | 3,050 | 3,380 | 1,210 | 2,090 | 1,700 | 275  | 68   | 49    |
| 14  | 31   | 445    | 355   | 700   | 1,520 | 2,450 | 1,280 | 1,890 | 1,520 | 253  | 63   | 51    |
| 15  | 34   | 445    | 325   | 650   | 5,900 | 2,090 | 1,520 | 1,890 | 1,360 | 232  | 61   | 51    |
| 16  | 40   | 970    | 355   | 600   | 5,660 | 4,550 | 1,360 | 1,700 | 1,210 | 222  | 59   | 51    |
| 17  | 45   | 655    | 370   | 575   | 3,210 | 2,320 | 1,210 | 2,090 | 1,070 | 212  | 58   | 51    |
| 18  | 41   | 515    | 480   | 650   | 2,320 | 2,450 | 1,070 | 1,790 | 1,000 | 212  | 58   | 52    |
| 19  | 39   | 445    | 8,530 | 575   | 1,790 | 2,090 | 930   | 1,700 | 1,000 | 202  | 58   | 52    |
| 20  | 40   | 385    | 3,570 | 530   | 1,610 | 2,090 | 930   | 1,700 | 860   | 193  | 59   | 54    |
| 21  | 42   | 355    | 2,470 | 530   | 1,610 | 1,990 | 1,070 | 1,610 | 797   | 184  | 58   | 54    |
| 22  | 46   | 325    | 1,660 | 530   | 1,520 | 1,700 | 1,140 | 1,520 | 797   | 175  | 54   | 61    |
| 23  | 104  | 295    | 7,170 | 530   | 1,890 | 1,440 | 1,360 | 3,940 | 739   | 175  | 52   | 68    |
| 24  | 74   | 380    | 2,970 | 750   | 1,610 | 1,280 | 1,280 | 2,890 | 739   | 166  | 50   | 79    |
| 25  | 65   | 252    | 2,840 | 600   | 1,440 | 1,440 | 1,210 | 2,450 | 739   | 158  | 51   | 92    |
| 26  | 59   | 240    | 3,260 | 1,060 | 1,360 | 1,280 | 1,210 | 2,090 | 686   | 158  | 50   | 85    |
| 27  | 59   | 252    | 3,260 | 5,270 | 1,360 | 4,980 | 1,210 | 1,890 | 686   | 150  | 49   | 92    |
| 28  | 56   | 2,650  | 2,470 | 6,400 | 1,610 | 7,700 | 1,280 | 1,890 | 686   | 142  | 51   | 85    |
| 29  | 52   | 10,200 | 1,940 | 2,320 | ----- | 4,760 | 1,520 | 2,090 | 638   | 134  | 51   | 85    |
| 30  | 54   | 5,900  | 1,570 | 1,790 | ----- | 3,210 | 1,360 | 2,090 | 595   | 134  | 51   | 79    |
| 31  | 54   | -----  | 1,660 | 2,200 | ----- | 2,590 | ----- | 1,790 | ----- | 127  | 49   | ----- |

| Month     | Maximum | Minimum | Mean  | Run-off in acre-feet |
|-----------|---------|---------|-------|----------------------|
| October   | 104     | 23      | 40.2  | 2,470                |
| November  | 10,200  | 59      | 1,130 | 67,200               |
| December  | 8,530   | 325     | 1,820 | 112,000              |
| January   | 9,960   | 530     | 2,000 | 123,000              |
| February  | 5,900   | 930     | 1,940 | 108,000              |
| March     | 7,700   | 1,280   | 2,770 | 170,000              |
| April     | 2,890   | 930     | 1,510 | 89,800               |
| May       | 3,940   | 1,520   | 2,140 | 132,000              |
| June      | 3,210   | 595     | 1,270 | 75,600               |
| July      | 595     | 127     | 270   | 16,600               |
| August    | 127     | 49      | 73.6  | 4,530                |
| September | 92      | 49      | 59.7  | 3,550                |
| The year  | 10,200  | 23      | 1,250 | 905,000              |

## MISCELLANEOUS DISCHARGE MEASUREMENTS

In addition to the records of stream flow obtained at gaging stations and reported in the preceding pages, measurements of flow are made at a number of other points, as shown by the following table:

*Miscellaneous discharge measurements in Pacific slope basin in Oregon and in lower Columbia River Basin during the year ending Sept. 30, 1933*

## Columbia River Basin, Oreg.

| Date     | Stream              | Tributary to or diverting from  | Locality                                              | Gage height        | Discharge |
|----------|---------------------|---------------------------------|-------------------------------------------------------|--------------------|-----------|
| Sept. 30 | Columbia Slough.... | Side channel of Columbia River. | Interstate bridge north of Portland, 6:00-7:45 a.m.   | <sup>a</sup> —42.4 | 15,700    |
| 30       | do.....             | do.....                         | Interstate bridge north of Portland, 8:05-10:00 a.m.  | <sup>a</sup> —42.8 | 16,000    |
| 30       | do.....             | do.....                         | Interstate bridge north of Portland, 10:15-11:50 a.m. | <sup>a</sup> —43.3 | 15,500    |
| 30       | do.....             | do.....                         | Interstate bridge north of Portland, 12:45-2:35 p.m.  | <sup>a</sup> —43.3 | 13,200    |
| 30       | do.....             | do.....                         | Interstate bridge north of Portland, 3:15-5:05 p.m.   | <sup>a</sup> —42.4 | 12,200    |

## Deschutes River Basin, Oreg.

|         |                    |                    |                             |  |                  |
|---------|--------------------|--------------------|-----------------------------|--|------------------|
| June 5  | Trapper Creek..... | Odell Lake.....    | 800 feet above mouth.....   |  | 94               |
| Aug. 23 | Mill Creek.....    | Warm Springs River | Outlet of Olallie Lake..... |  | <sup>b</sup> 0.1 |

## Hood River Basin, Oreg.

|         |                                        |                            |                                                         |      |                |
|---------|----------------------------------------|----------------------------|---------------------------------------------------------|------|----------------|
| Aug. 18 | East Fork of Hood River.               | Hood River.....            | Sec. 17, T. 2 S., R. 10 E., above Cold Spring Creek.    |      | 138            |
| 19      | do.....                                | do.....                    | NE¼ sec. 8, T. 2 S., R. 10 E., above Polallie Creek.    |      | 197            |
| 21      | do.....                                | do.....                    | NW¼ sec. 21, T. 1 S., R. 10 E., ¼ mile below Dog River. |      | 200            |
| 21      | do.....                                | do.....                    | Bridge near Parkdale, below Mount Hood Canal intake.    |      | 58             |
| 21      | do.....                                | do.....                    | SE¼ sec. 17, T. 1 N., R. 10 E., below Baldwin Creek.    |      | 89             |
| 19      | Cold Spring Creek ..                   | East Fork of Hood River.   | NE¼ sec. 19, T. 2 S., R. 10 E., below forks.            |      | 47.8           |
| 19      | Polallie Creek.....                    | do.....                    | Mouth, sec. 5, T. 2 S., R. 10 E.                        |      | <sup>b</sup> 7 |
| 19      | Glacier Ditch.....                     | Polallie Creek.....        | NE¼ sec. 7, T. 2 S., R. 10 E., at intake.               |      | 11.6           |
| 21      | Dog River.....                         | East Fork of Hood River.   | SE¼ sec. 20, T. 1 S., R. 10 E., at mouth.               |      | 5.8            |
| 23      | East Fork Irrigation District Canal.   | do.....                    | SW¼ sec. 34, T. 1 N., R. 10 E., near intake.            | 3.12 | 145            |
| 23      | Mt. Hood Canal.....                    | do.....                    | NE¼ sec. 5, T. 1 S., R. 10 E., near intake.             | 1.77 | 11.7           |
| 22      | Middle Fork of Hood River.             | Hood River.....            | 300 feet below Eliot Branch.                            |      | 54             |
| 22      | do.....                                | do.....                    | SE¼ sec. 24, T. 1 N., R. 9 E., above Tony Creek.        |      | 72             |
| 23      | Middle Fork Irrigation District Canal. | Eliot Branch.....          | Unsurveyed sec. 26, T. 1 S., R. 9 E.                    | 2.69 | 62             |
| 22      | Tony Creek.....                        | Middle Fork of Hood River. | SE¼ sec. 24, T. 1 N., R. 9 E., at mouth.                |      | 13.2           |
| 17      | West Fork of Hood River.               | Hood River.....            | 1 mile below mouth of Ladd Creek.                       |      | 108            |
| 15      | do.....                                | do.....                    | NE¼ sec. 28, T. 1 N., R. 9 E., above Lake Branch.       |      | 132            |
| 23      | Dee Irrigation District Canal.         | West Fork of Hood River.   | NE¼ sec. 22, T. 1 N., R. 9 E.                           | 2.35 | 17.4           |
| June 22 | Lake Branch.....                       | do.....                    | Outlet of Lost Lake near Dee                            |      | 43.9           |
| Aug. 17 | do.....                                | do.....                    | Outlet of Lost Lake temporarily dammed.                 |      | 0              |
| 17      | do.....                                | do.....                    | NE¼ sec. 30, T. 1 N., R. 9 E., below Divers Creek.      |      | 57             |

<sup>a</sup> Distance from point on sidewalk to water surface; changes in stage and discharge due to tidal effect.

<sup>b</sup> Estimated.

*Miscellaneous discharge measurements in Pacific slope basin in Oregon and in lower Columbia River Basin during the year ending Sept. 30, 1933—Continued*

## Hood River Basin, Oreg.—Continued

| Date    | Stream                                          | Tributary to or diverting from            | Locality                                                        | Gage height | Discharge       |
|---------|-------------------------------------------------|-------------------------------------------|-----------------------------------------------------------------|-------------|-----------------|
|         |                                                 |                                           |                                                                 | <i>Feet</i> | <i>Sec.-ft.</i> |
| Aug. 15 | Lake Branch.....                                | West Fork of Hood River.                  | NE $\frac{1}{4}$ sec. 28, T. 1 N., R. 9 E., at mouth.           | -----       | 72              |
| 17      | Divers Creek.....                               | Lake Branch.....                          | NE $\frac{1}{4}$ sec. 30, T. 1 N., R. 9 E., at mouth.           | -----       | 12.6            |
| 24      | Hood River Irrigation District High Line Ditch. | Green Point and Dead Point Creeks         | SE $\frac{1}{4}$ sec. 24, T. 2 N., R. 9 E.                      | -----       | 4.2             |
| 24      | Hood River Irrigation District Low Line Ditch.  | Green Point, Dead Point and Ditch Creeks. | NW $\frac{1}{4}$ sec. 20, T. 2 N., R. 10 E., below Ditch Creek. | -----       | 23.2            |
| 24      | Farmers Ditch.....                              | Hood River.....                           | SW $\frac{1}{4}$ sec. 20, T. 2 N., R. 10 E., below Ditch Creek. | 2.61        | 71              |

## Phelps Creek Basin, Oreg.

|         |                   |                     |                                                                         |       |     |
|---------|-------------------|---------------------|-------------------------------------------------------------------------|-------|-----|
| Aug. 14 | Phelps Creek..... | Columbia River..... | SE $\frac{1}{4}$ sec. 27, T. 3 N., R. 10 E., above Wah-Gwin-Gwin Falls. | ----- | 3.0 |
|---------|-------------------|---------------------|-------------------------------------------------------------------------|-------|-----|

## Willamette River Basin, Oreg.

|          |                      |                      |                                                                                        |       |      |
|----------|----------------------|----------------------|----------------------------------------------------------------------------------------|-------|------|
| Oct. 6   | North Santiam River. | Santiam River.....   | NE $\frac{1}{4}$ sec. 20, T. 10 S., R. 7 E., 600 feet below mouth of Whitewater Creek. | ----- | 361  |
| 6        | Boulder Creek.....   | North Santiam River. | NW $\frac{1}{4}$ sec. 16, T. 10 S., R. 6 E., near highway bridge at mouth.             | ----- | 2.8  |
| 6        | French Creek.....    | Breitenbush River..  | SE $\frac{1}{4}$ sec. 35, T. 9 S., R. 5 E., a quarter of a mile above mouth.           | ----- | 7.5  |
| Aug. 18  | Mill Creek.....      | Willamette River...  | Mouth, below gage on Willamette River at Salem.                                        | ----- | 41.0 |
| Sept. 13 | Yamhill River.....   | ....do.....          | Former gaging station at Lafayette.                                                    | 3.96  | 94   |
| 13       | South Yamhill River. | Yamhill River.....   | Sec. 6, T. 5 S., R. 4 W., below Salt Creek.                                            | ----- | 53   |
| Oct. 3   | North Yamhill River. | ....do.....          | Below splash dam at Carlton..                                                          | ----- | 8.4  |
| Sept. 14 | Tualatin River.....  | Willamette River...  | Half a mile below Gales Creek, near Forest Grove.                                      | ----- | 42.3 |
| 14       | Gales Creek.....     | Tualatin River.....  | Sec. 7, T. 1 S., R. 3 W., at mouth.                                                    | 2.35  | 19.6 |
| Aug. 26  | Crater Creek.....    | Oak Grove Fork....   | Sec. 11, T. 5 S., R. 8 $\frac{1}{2}$ E., at outlet of Little Crater Lake.              | 0.50  | 3.4  |

## Umpqua River Basin, Oreg.

|          |                 |                     |                                  |      |    |
|----------|-----------------|---------------------|----------------------------------|------|----|
| Sept. 11 | Fish Creek..... | North Umpqua River. | Above Camas Creek, near Hoaglin. | 0.96 | 67 |
|----------|-----------------|---------------------|----------------------------------|------|----|



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