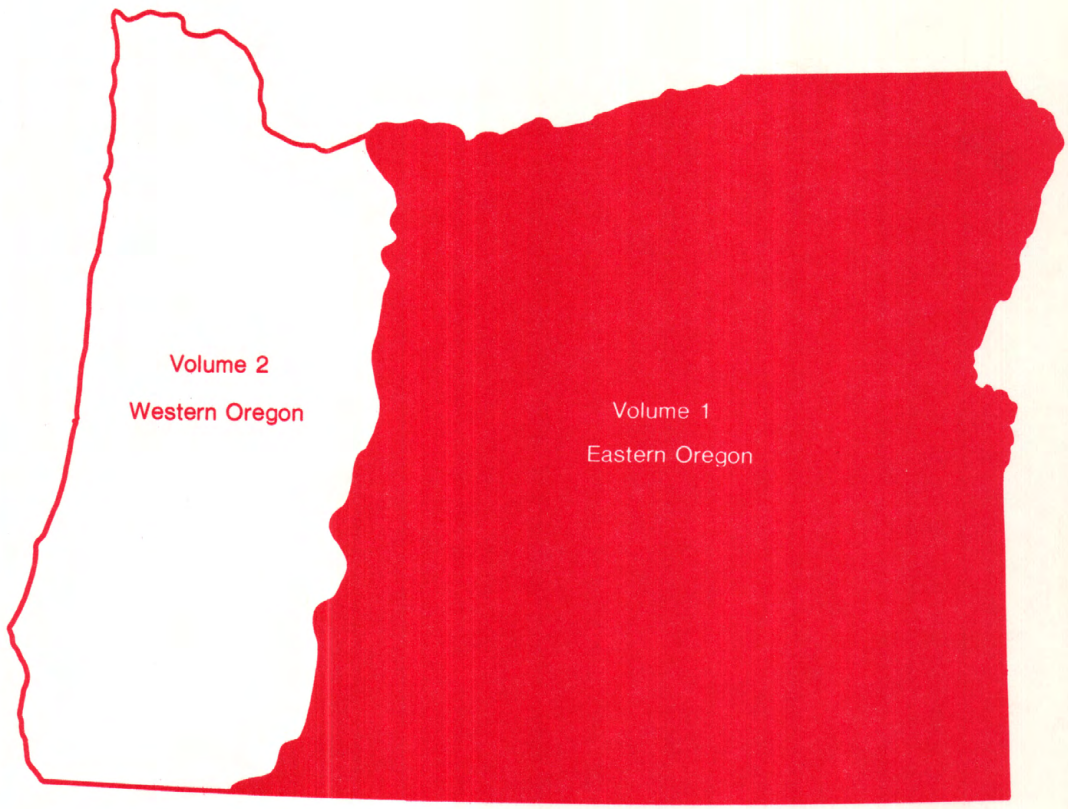
Water Resources Data Oregon Water Year 1987

Volume 1. Eastern Oregon



U.S. GEOLOGICAL SURVEY WATER-DATA REPORT OR-87-1
Prepared in cooperation with the Oregon Water Resources Department and with other agencies

CALENDAR FOR WATER YEAR 1987

1986

OCTOBER

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1987

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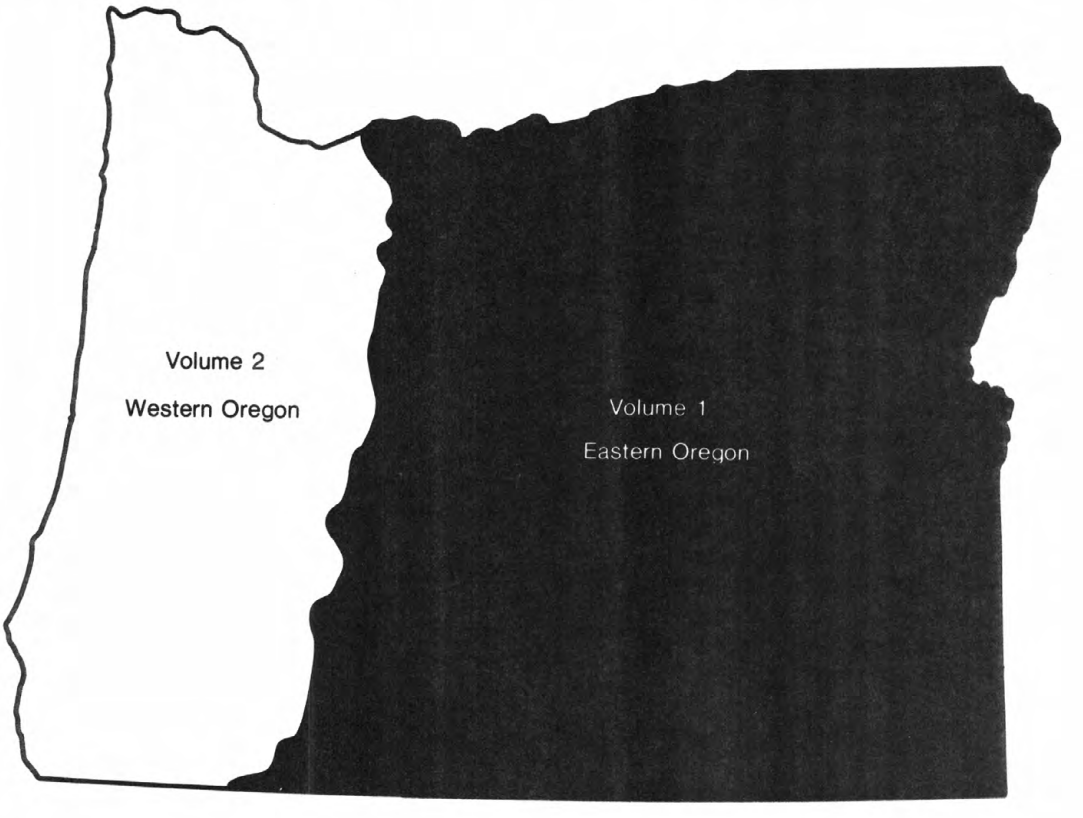
Water Resources Data Oregon Water Year 1987

Volume 1. Eastern Oregon

by C.W. Alexander, P.R. Boucher, R.L. Moffatt, and M.L. Smith



U.S. GEOLOGICAL SURVEY WATER-DATA REPORT OR-87-1
Prepared in cooperation with the Oregon Water Resources Department and with other agencies

UNITED STATES DEPARTMENT OF THE INTERIOR

MANUEL LUJAN, JR., Secretary

GEOLOGICAL SURVEY

Dallas L. Peck, Director

For additional information write to:

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Portland, Oregon 97216

1989

PREFACE

This volume of the annual Oregon hydrologic data report is one of a series of annual reports that document hydrologic data gathered from the U.S. Geological Survey's surface- and ground-water data-collection networks in each State, Puerto Rico, and the Trust Territories. These records of streamflow, ground-water levels, and quality of water provide the hydrologic information needed by State, local and Federal agencies, and the private sector for developing and managing our Nation's land and water resources. Hydrologic data for Oregon are contained in two volumes as follows:

Volume 1: Eastern Oregon
Volume 2: Western Oregon

The report is the culmination of a concerted effort by dedicated personnel of the U.S. Geological Survey who collected, compiled, analyzed, verified, and organized the data, and who edited and assembled the reports. In addition to the authors, who had primary responsibility for assuring that the information contained herein is accurate, complete, and adheres to Geological Survey policy and established guidelines, the following individuals contributed significantly to the collection, processing, and tabulation of the data:

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This report was prepared in cooperation with the State of Oregon and with other agencies under the general supervision of Marvin O. Fretwell, State Chief, Oregon Office, and T. John Conomos, Regional Hydrologist, Western Region.

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Water Resources Data for the 1987 water year for Oregon consist of records of stage, discharge, and water quality of streams; and stage, contents, and water quality of lakes and reservoirs. This report, in two volumes, contains discharge records for 264 gaging stations; stage only records for 8 gaging stations; stage and contents for 39 lakes and reservoirs; water quality for 69 stations, and water quality for 3 precipitation stations. Also included are 5 crest-stage, partial-record stations. Additional water data were collected at various sites, not part of the systematic data collection program, and are published as miscellaneous measurements. These data represent that part of the National Water Data System operated by the U.S. Geological Survey and cooperating State and Federal agencies in Oregon.

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ILLUSTRATIONS

TABLES

NOTE.--Data for chemical quality of precipitation and miscellaneous sites are published in separate sections of the data report. See references at the end of this list of page numbers for these sections.

Letter after station name designates type of data: (d) discharge; (e) elevation; (g) gage height; (v) contents; (c) chemical, including periodic biological, microbiological, sediment, pesticide, and radiochemical where applicable; (s) daily suspended sediment; (t) water temperature; and (k) specific conductance.

WATER RESOURCES DATA FOR OREGON 1987

INTRODUCTION

The Water Resources Division of the U.S. Geological Survey, in cooperation with state agencies, obtains a large amount of data pertaining to the water resources of Oregon each water year. These data, accumulated during many water years, constitute a valuable data base for developing an improved understanding of the water resources of the State. To make these data readily available to interested parties outside the Geological Survey, the data are published annually in this report series entitled "Water Resources Data - Oregon."

This report includes records on surface water in the State. Specifically, it contains: (1) Discharge records for 264 stream-gaging stations, stage only records for 8 gaging stations, 211 partial-record or miscellaneous streamflow stations, and 5 crest-stage, partial-record streamflow stations; (2) stage and content records for 39 lakes and reservoirs; and (3) water-quality records for 63 streamflow-gaging stations and 6 ungaged streamsites.

This series of annual reports for Oregon began with the 1961 water year with a report that contained only data relating to the quantities of surface water. For the 1964 water year, a similar report was introduced that contained only data relating to water quality. Beginning with the 1975 water year, the report format was changed to present, in one or two volumes, data on quantities of surface water, quality of surface and ground water, and ground-water levels. In 1981, the annual report was divided into two volumes: Volume 1 described the activities for Western Oregon, while Volume 2 described the activities for Eastern Oregon. Beginning with the 1985 water year, presentation of ground-water levels in this report was discontinued.

Prior to introduction of this series and for several water years concurrent with it, water-resources data for Oregon were published in U.S. Geological Survey Water-Supply Papers. Data on stream discharge and stage and on lake or reservoir contents and stage, through September 1960, were published annually under the title "Surface-Water Supply of the United States, Parts 10, 11, 13, and 14." For the 1961 through 1970 water years, the data were published in two 5-year reports. Data on chemical quality, temperature, and suspended sediment for the 1941 through 1970 water years were published annually under the title "Quality of Surface Waters of the United States," and water levels for the 1935 through 1974 water years were published under the title "Ground-Water Levels in the United States." These Water-Supply Papers may be consulted in the libraries of the principal cities of the United States and may be purchased from Distribution Branch, Text Products Section, U.S. Geological Survey, 604 South Pickett Street, Alexandria, VA 22304.

Publications similar to this report are published annually by the Geological Survey for all states. These official Survey reports have an identification number consisting of the two-letter State abbreviation, the last two digits of the water year, and the volume number. For example, this report is identified as "U.S. Geological Survey Water-Data Report OR-87-1" and "U.S. Geological Survey Water-Data Report OR-87-2." For archiving and general distribution, the reports for 1971-74 water years also are identified as water-data reports. These water-data reports are for sale in paper copy or in microfiche by the National Technical Information Service, U.S. Department of Commerce, Springfield, VA 22161.

Additional information, including current prices, for ordering specific reports may be obtained from the Office Chief at the address given on back of title page or by telephone (503) 231-2009.

COOPERATION

The U.S. Geological Survey and organizations of the State of Oregon have had cooperative agreements for the systematic collection of surface-water records since 1905. Organizations that supplied data are acknowledged in station descriptions. Organizations that assisted in collecting data through cooperative agreements with the Survey are:

State of Oregon Water Resources Department, William F. Young, Director.
State of Oregon Department of Fish and Wildlife, John R. Donaldson, Director
Coos Bay-North Bend Water Board, P. Matson, General Manager.
Eugene Water and Electric Board, Jean Reeder, General Manager.
Douglas County, John Youngquist, Coordinator.
City of McMinnville, Robin R. Morecroft, General Manager.
City of Portland, Bureau of Water Works, Edward Tenny, Administrator.
The Confederated Tribes of the Umatilla Indian Reservation, E. H. Patawa, Chairman, Board of Trustees.
The Confederated Tribes of the Warm Springs Indian Reservation, D. McClelland, Control Manager.

Assistance in the form of funds or services was provided by the Forest Service, U.S. Department of Agriculture; Corps of Engineers, U.S. Army; Bonneville Power Administration, U.S. Department of Energy; Bureau of Land Management, Bureau of Reclamation, Fish and Wildlife Service, National Park Service, U.S. Department of the Interior in collection of records for stage and discharge stations and water-quality stations published in this report.

The following organizations aided in collecting records for stations under Federal Energy Regulatory Commission licenses: Eugene Water & Electric Board; Pacific Power & Light Co.; Portland General Electric Co.; Middle Fork Irrigation District; Idaho Power Co., Idaho.

SUMMARY OF HYDROLOGIC CONDITIONS

Surface Water

The hydrology of Oregon is influenced by five mountain ranges with the Cascade Range providing a natural division between western and eastern Oregon. These ranges divide the state into drainage basins and greatly affect the distribution of precipitation. Hydrologic patterns are generally uniform from drainage basin to drainage basin throughout western Oregon; whereas in eastern Oregon, hydrologic patterns vary widely between drainage basins.

Western Oregon, which composes about one-third of the total area of the state, has a climate characterized by moderate temperatures, wet winters, and dry summers. About 80 percent of the precipitation occurs between October and March. Annual precipitation ranges from about 20 inches per year in the lower elevations in the southern part of the area to about 200 inches per year in the Coast and Cascade Ranges. In general, streamflow characteristics are similar, with most of the runoff and flooding on both large and small streams being caused by winter rains. Major floods have occurred when winter rains combine with melting snow.

Eastern Oregon has more complex hydrologic patterns than western Oregon. Precipitation is less than 10 inches per year in the semiarid regions, such as parts of the north-central area, the closed basin in south-central Oregon, and southeastern Oregon. The northeastern part of the state receives as much as 80 inches of precipitation per year, much of it occurring as snowfall. On large streams, flooding can result from winter rains and (or) seasonal snowmelt; in smaller drainage basins, flooding can result from winter rains, seasonal snowmelt, and convection storms.

Surface-water Conditions

Precipitation for the 1987 water year was about 80 percent of normal across the State, and ranged between 70 and 90 percent of normal. Precipitation during September was the farthest below normal for a month, amounting to about 10 percent of normal across the State. Monthly precipitation was the farthest above normal throughout the State during July, with several areas reporting in excess of 500 percent of normal.

Precipitation for the three-month period ending December 31, 1986 was generally below average. Averages ranged from a high of 76 percent in the Willamette area to a low of 32 percent in the Lake County-Goose Lake area.

Conditions moderated during the three-month ending June 30 was about normal for western Oregon and about 60 percent of normal in eastern Oregon.

Precipitation for the three-month period ending June 30 was about normal for western Oregon and about 60 percent of normal in eastern Oregon.

During the last quarter of the water year, new precipitation records at several locations were established. July was the wettest in 111 years in Roseburg and 84 years in Bend. The monthly total for Bend amounted to nearly one third of the annual average precipitation.

Snowpack accumulation began in November. As of January 1, 1987, the mountain snowpack, as reported by the Soil Conservation Service, was well below normal. The snowpack increased at less-than-normal rates through the winter. By May 1 most of the snowpack below 5,500 feet was gone and high elevation snowpack levels were below normal.

The preceding summary of conditions was compiled from monthly reports prepared by the National Weather Service, Soil Conservation Service, Corps of Engineers, and State of Oregon Climatologist Office.

The annual mean runoff in both western and eastern Oregon during the 1987 water year was below normal. Monthly mean discharges are compared with long-term medians (1951-80), at four representative sites throughout the State in figures 1a and 1b. The monthly mean flows were significantly less than normal during spring and summer at both western and eastern sites.

No significant flooding occurred in Oregon during the 1987 water year. Peak flows at gaging stations in western Oregon occurred February 1, 2, while peaks in eastern Oregon occurred in March and April. Recurrence intervals ranged from one to three years. Peak discharges for some representative gaging stations are shown in Table 1.

Table 1.--Comparison of peak discharge for the 1987 water year with peak discharge for the period of record at long-term stations

Station number	Station name	Drainage area (mi^2)	Peak discharge 1987 water year Date	Peak discharge 1987 water year ft^3/s	Exceedance probability	Peak discharge period of record Date	Peak discharge period of record ft^3/s
10396000	Donner und Blitzen River near Frenchglenn	a200	Apr. 30	717	.83	Apr. 26, 1978	4,270
11502500	Williamson River below Sprague River, near Chiloquin	a3,000	Mar. 16	1,970	.80	Dec. 26, 1964	16,100
13181000	Owyhee River near Rome	a8,000	Mar. 7	3,900	---	Feb. 19, 1986	41,400
13214000	Malheur River near Drewsey	a910	Mar. 13	1,510	.67	Dec. 23, 1964	12,000
13331500	Minam River at Minam	a240	Apr. 30	2,600	.74	June 16, 1974	6,260
14048000	John Day River at McDonald Ferry	a7,580	Mar. 15	11,900	.50	Dec. 24, 1964	42,800
14137000	Sandy River near Marmot	262	Jan. 31	8,110	.85	Dec. 22, 1964	61,400
14178000	North Santiam River below Boulder Creek, near Detroit	216	Nov. 27	5,890	.69	Dec. 22, 1964	26,700
14301000	Nehalem River near Foss	667	Mar. 3	31,700	.32	Jan. 20, 1972	46,900
14321000	Umpqua River near Elkton	3,683	Feb. 2	71,600	.74	Dec. 23, 1964	265,000
14325000	South Fork Coquille River at Powers	169	Feb. 2	13,100	.65	Dec. 22, 1964	48,900

a Approximately.

NOTE.--Exceedance probability refers to the probability that an event will exceed a specific magnitude in a given time period. A flow of 200 ft^3/s with an exceedance probability of 0.5 means that there is a 50 percent chance that the flow will exceed 200 ft^3/s in any one year.

SPECIAL NETWORKS AND PROGRAMS

Hydrologic Bench-Mark Network is a network of more than 50 sites in small drainage basins around the country whose purpose is to provide consistent data on the hydrology, including water quality, and related factors in representative undeveloped watersheds nationwide, and to provide analyses on a continuing basis to compare and contrast conditions observed in basins more obviously affected by the activities of man.

National Stream Quality Accounting Network (NASQAN) is a nationwide data-collection network designed by the U.S. Geological Survey to meet many of the information needs of government agencies and other groups involved in national or regional water-quality planning and management. The several hundred sites in NASQAN are generally located at the downstream ends of hydrologic accounting units designated by the U.S. Geological Survey Office of Water Data Coordination in consultation with the Water Resources Council. The objective of NASQAN is to obtain information on the quality and quantity of water moving within and from the United States through a systematic and uniform process of data collection, summarization, analysis, and reporting. The design of the network is intended to provide data for (1) description of the areal variability of water quality in the Nation's rivers through analysis of data from this and other programs, (2) detection of changes or trends with time in the pattern of occurrence of water-quality characteristics, and (3) a nationally consistent data base useful for water-quality assessment and hydrologic research.

The National Trends Network (NTN) is a 150 station network for sampling atmospheric deposition in the United States. The purpose of the network is to determine the variability, both in location and in time, of the composition of atmospheric deposition, which includes snow, rain, dust particles, aerosols, and gases. The core from which the NTN was built was the already-existing deposition-monitoring network of the National Atmospheric Deposition Program (NADP).

Radiochemical program is a network of regularly sampled water-quality stations where samples are collected to be analyzed for radioisotopes. The streams that are sampled represent major drainage basins in the conterminous United States.

Tritium network is a network of stations which has been established to provide baseline information on the occurrence of tritium in the Nation's surface waters. In addition to the surface-water stations in the network, tritium data are also obtained at a number of precipitation stations. The purpose of the precipitation stations is to provide an estimate sufficient for hydrologic studies of the tritium input to the United States.

EXPLANATION OF THE RECORDS

The surface-water records published in this report are for the 1987 water year that began October 1, 1986, and ended September 30, 1987. A calendar of the water year is provided on the inside of the front cover. The records contain streamflow data, stage and content data for lakes and reservoirs, and water-quality data for surface water. The following sections of the introductory text are presented to provide users with a more detailed explanation of how the hydrologic data published in this report were collected, analyzed, computed, and arranged for presentation.

Station Identification Numbers

Each data station in this report is assigned a unique identification number. This number is unique in that it applies specifically to a given station and to no other. The number usually is assigned when a station is first established and is retained for that station indefinitely. The two systems used by the U.S. Geological Survey to assign identification numbers for surface-water stations are based on geographic location. The "downstream order" system is used for regular surface-water stations and the "latitude-longitude" system is used for surface-water stations where only miscellaneous measurements are made. Basin designation is based on the Hydrologic Unit Map for Oregon prepared in cooperation with the U.S. Water Resources Council (1974).

Downstream Order System

Since October 1, 1950, the order of listing hydrologic-station records in Survey reports is in a downstream direction along the main stream. All stations on a tributary entering upstream from a mainstream station are listed before that station. A station on a tributary that enters between two mainstream stations is listed between them. A similar order is followed in listing stations on first rank, second rank, and other ranks of tributaries. The rank of any tributary with respect to the stream to which it is immediately tributary is indicated by an indention in the "List of Stations" in the front of this report. Each indention represents one rank. This downstream order and system of indention show which stations are on tributaries between any two stations and the rank of the tributary on which each station is situated.

The station-identification number is assigned according to downstream order. In assigning station numbers, no distinction is made between partial-record stations and other stations; therefore, the station number for a partial-record station indicates downstream-order position in a list made up of both types of stations. Gaps are left in the series of numbers to allow for new stations that may be established; hence, the numbers are not consecutive. The complete eight-digit number for each station, such as 14105700, which appears just to the left of the station name, includes the two-digit Part number "14" plus the six-digit downstream-order number "105700." The Part number designates the major river basin; for example, part "14" refers to the Pacific slope basins in Oregon and lower Columbia River basin.

Records of Stage and Water Discharge

Records of stage and water discharge may be complete or partial. Complete records of discharge are those obtained using a continuous stage-recording device through which either instantaneous or mean daily discharges may be computed for any time, or any period of time, during the period of record. Complete records of lake or reservoir content, similarly, are those for which stage or content may be computed or estimated with reasonable accuracy for any time, or period of time. They may be obtained using a continuous stage-recording device, but need not be. Because daily mean discharges and end-of-day contents commonly are published for such stations, they are referred to as "daily stations."

By contrast, partial records are obtained through discrete measurements without using a continuous stage-recording device and pertain only to a few flow characteristics, or perhaps only one. The nature of the partial record is indicated by table titles such as "Crest-stage partial records," or "Low-flow partial records." Records of miscellaneous discharge measurements or of measurements from special studies, such as low-flow seepage studies, may be considered as partial records, but they are presented separately in this report.

Data Collection and Computation

The data obtained at a complete-record gaging station on a stream or canal consist of a continuous record of stage, individual measurements of discharge throughout a range of stages, and notations regarding factors that may affect the relations between stage and discharge. These data, together with supplemental information, such as weather records, are used to compute daily discharges. The data obtained at a complete-record gaging station on a lake or reservoir consist of a record of stage and of notations regarding factors that may affect the relation between stage and lake content. These data are used with stage-area and stage-capacity curves or tables to compute water-surface areas and lake storage.

Continuous records of stage are obtained with analog recorders that trace continuous graphs of stage or with digital recorders that punch stage values on paper tapes at selected time intervals. Measurements of discharge are made with current meters using methods adapted by the Geological Survey that are described in standard textbooks, in Water-Supply Paper 2175, and in U.S. Geological Survey Techniques of Water-Resources Investigations (TWRI), Book 3, Chapter A6.

In computing discharge records, results of individual measurements are plotted against the corresponding stages, and stage-discharge relation curves are then constructed. From these curves, rating tables indicating the approximate discharge for any stage within the range of the measurements are prepared. If it is necessary to define extremes of discharge outside the range of the current-meter measurements, the curves are extended using: (1) logarithmic plotting; (2) velocity-area studies; (3) results of indirect measurements of peak discharge, such as slope-area or contracted-opening measurements, and computations of flow-over-dams or weirs; or (4) step-backwater techniques.

Daily mean discharges are computed by applying the daily mean stages (gage heights) to the stage-discharge curves or tables. If the stage-discharge relation is subject to change because of frequent or continual change in the physical features that form the control, the daily mean discharge is determined by the shifting-control method, in which correction factors based on the individual discharge measurements and notes of the personnel making the measurements are applied to the gage heights before the discharges are determined from the curves or tables. This shifting-control method also is used if the stage-discharge relation is changed temporarily because of aquatic growth or debris on the control. For some stations, formation of ice in the winter may so obscure the stage-discharge relations that daily mean discharges must be estimated from other information such as temperature and precipitation records, notes of observations, and records for other stations in the same or nearby basins for comparable periods.

At some stream-gaging stations the stage-discharge relation is affected by the backwater from reservoirs, tributary streams, or other sources. This necessitates the use of the slope method in which the slope or fall in a reach of the stream is a factor in computing discharge. The slope or fall is obtained by means of an auxiliary gage set at some distance from the base gage. At some stations an acoustic velocity meter (AVM) is used instead of the slope method. The AVM measures both water-surface elevation and velocity from which discharge can be computed directly.

In computing records of lake or reservoir contents, it is necessary to have information available from surveys, curves, or tables that define the relation of stage to content. The application of stage to the stage-content curves or tables gives the contents from which daily, monthly, or yearly changes then are determined. If the stage-content relation changes because of deposition of sediment in a lake or reservoir, periodic resurveys may be necessary to redefine the relation. Discharges over lake or reservoir spillways are computed from stage-discharge relations much as other stream discharges are computed.

For some gaging stations there are periods when no gage-height record is obtained, or the validity of the recorded gage height is so questionable that it cannot be used to compute daily discharge or contents. This happens when the recorder stops or otherwise fails to operate properly, intakes are plugged, the float is frozen in the well, or for various other reasons. For such periods, the daily discharges are estimated from the recorded range in stage, previous or following record, discharge measurements, weather records, and comparison with other station records from the same or nearby basins. Likewise, daily contents may be estimated from operator's logs, previous or following record, inflow-outflow studies, and other information. Information explaining how estimated daily-discharge values are identified in station records is included in the next two sections, "Data Presentation" (REMARKS paragraph) and "Identifying Estimated Daily Discharge."

Data Presentation

The records published for each gaging station consist of two parts, the manuscript or station description and the data table for the current water year. The manuscript provides, under various headings, descriptive information, such as station location; period of record; average discharge; historical extremes; record accuracy; and other remarks pertinent to station operation and regulation. The following information, as appropriate, is provided with each continuous record of discharge or lake content. Comments to follow clarify information presented under the various headings of the station description.

LOCATION.--Information on locations is obtained from the most accurate maps available. The location of the gage with respect to the cultural and physical features in the vicinity and with respect to the reference place mentioned in the station name is given. River mileages are based on information developed by the Hydraulics and Hydrology Committee of the Pacific Northwest River Basins Commission.

DRAINAGE AREA.--Drainage areas are measured using the most accurate maps available. Because the type of maps available varies from one drainage basin to another, the accuracy of drainage areas likewise varies. Drainage areas are updated as better maps become available.

PERIOD OF RECORD.--This indicates the period for which there are published records for the station or for an equivalent station. An equivalent station is one that was in operation at a time that the present station was not, and whose location was such that records from it can reasonably be considered equivalent with records from the present station.

REVISED RECORDS.--Published records, because of new information, occasionally are found to be incorrect, and revisions are printed in later reports. Listed under this heading are all the reports in which revisions have been published for the station and the water years to which the revisions apply. If a revision did not include daily, monthly, or annual figures of discharge, that fact is noted after the year dates as follows: "(M)" means the instantaneous maximum discharge was revised; "(m)" the instantaneous minimum was revised; and "(P)" the peak discharges were revised. If the drainage area has been revised, the report in which the most recently revised figure was first published is given.

GAGE.--The type of gage in current use, the datum of the current gage referred to National Geodetic Vertical Datum of 1929 (see "DEFINITION OF TERMS"), and a condensed history of the types, locations, and datums of previous gages are given under this heading.

REMARKS.--All periods of estimated daily-discharge record will either be identified by date in this paragraph of the station description for

water-discharge stations or flagged in the daily-discharge table. (See next section, "Identifying Estimated Daily Discharge.") If a remarks statement is used to identify estimated record, the paragraph will begin with this information presented as the first entry. The paragraph is also used to present information relative to the accuracy of the records, special methods of computation, conditions that affect natural flow at the station and, possibly, other pertinent items. For reservoir stations, information is given on the dam forming the reservoir, the capacity, outlet works and spillway, and purpose and use of the reservoir.

COOPERATION.--Records provided by a cooperating organization or obtained for the Geological Survey by a cooperating organization are identified here.

AVERAGE DISCHARGE.--The discharge value given is the arithmetic mean of the water-year mean discharges. It is computed only for stations having at least 5 water years of complete record, and only water years of complete record are included in the computation. It is not computed for stations where diversions, storage, or other water-use practices cause the value to be meaningless. If water developments significantly altering flow at a station are put into use after the station has been in operation for a period of years, a new average is computed as soon as 5 water years of record have accumulated following the development.

EXTREMES FOR PERIOD OF RECORD.--Extremes may include maximum and minimum stages and maximum and minimum discharges or content. Unless otherwise qualified, the maximum discharge or content is the instantaneous maximum corresponding to the highest stage that occurred. The highest stage may have been obtained from a graphic or digital recorder, a crest-stage gage, or by direct observation of a nonrecording gage. If the maximum stage did not occur on the same day as the maximum discharge or content, it is given separately. Similarly, the minimum is the instantaneous minimum discharge, unless otherwise qualified, and was determined and is reported in the same manner as the maximum.

EXTREMES OUTSIDE PERIOD OF RECORD.--Included here is information concerning major floods or unusually low flows that occurred outside the stated period of record. The information may or may not have been obtained by the U.S. Geological Survey.

EXTREMES FOR CURRENT YEAR.--Extremes given here are similar to those for the period of record, except the peak discharge listing may include secondary peaks. For stations meeting certain criteria, all peak discharges and stages occurring during the water year and greater than a selected base discharge are presented under this heading. The peaks greater than the base discharge, excluding the highest one, are referred to as secondary peaks. Peak discharges are not published for canals, ditches, drains, or streams for which the peaks are subject to substantial control by man. The time of occurrence for peaks is expressed in 24-hour local standard time. For example, 12:30 a.m. is 0030, and 1:30 p.m. is 1330. The minimum for the current water year appears below the table of peak data.

REVISIONS.--If a critical error in published records is discovered, a revision is included in the first report published following discovery of the error.

Although rare, occasionally the records of a discontinued gaging station may need revision. Because, for these stations, there would be no current or, possibly, future station manuscript published to document the revision in a "Revised Records" entry, users of data for these stations who obtained the record from previously published data reports may wish to contact the Oregon office to determine if the published records were ever revised after the station was discontinued. Of course, if the data were obtained by computer retrieval, the

data would be current and there would be no need to check because any published revision of data is always accompanied by revision of the corresponding data in computer storage.

Manuscript information for lake or reservoir stations differs from that for stream stations in the nature of the "Remarks" and in the inclusion of a skeleton stage-capacity table when daily contents are given.

The daily table for stream-gaging stations gives mean discharge for each day and is followed by monthly and yearly summaries. In the monthly summary below the daily table, the line headed "TOTAL" gives the sum of the daily figures. The line headed "MEAN" gives the average flow in cubic feet per second during the month. The lines headed "MAX" and "MIN" give the maximum and minimum daily discharges, respectively, for the month. Discharge for the month also is usually expressed in cubic feet per second per square mile (line headed "CFSM"), or in inches (line headed "IN."), or in acre-feet (line headed "AC-FT"). Figures for cubic feet per second per square mile and runoff in inches are omitted if there is extensive regulation or diversion or if the drainage area includes large noncontributing areas. In the yearly summary below the monthly summary, the figures shown are the appropriate discharges for the calendar and water years. At some stations monthly and (or) yearly observed discharges are adjusted for reservoir storage or diversion, or diversions or reservoir contents are given. These figures are identified by a symbol and corresponding footnote.

Data collected at partial-record stations follow the information for continuous-record sites. Data for partial-record discharge stations are presented in two tables. The first is a table of annual maximum stage and discharge at crest-stage stations, and the second is a table of discharge measurements at low-flow partial-record stations. The tables of partial-record stations are followed by a listing of discharge measurements made at sites other than continuous-record or partial-record stations. These measurements are generally made in times of drought or flood to give better areal coverage to those events. Those measurements and others collected for some special reason are called measurements at miscellaneous sites.

Identifying Estimated Daily Discharge

Estimated daily-discharge values published in the water-discharge tables of annual state data reports are identified either by flagging individual daily values with the letter symbol "e" and printing a table footnote, "e Estimated," or by listing the dates of the estimated record in the REMARKS paragraph of the station description.

Accuracy of the Records

The accuracy of streamflow records depends primarily on: (1) The stability of the stage-discharge relation or, if the control is unstable, the frequency of discharge measurements, and (2) the accuracy of measurements of stage, measurements of discharge, and interpretation of records.

The accuracy attributed to the records is indicated under the "REMARKS" paragraph. "Excellent" means that about 95 percent of the daily discharges are within 5 percent of the true; "good," within 10 percent; and "fair," within 15 percent. Records that do not meet the criteria mentioned, are rated "poor." Different accuracies may be attributed to different parts of a given record. Daily mean discharges in this report are given to the nearest hundredth of a cubic foot per second for values less than 1 ft^3/s; the nearest tenth between 1.0 and 10 ft^3/s; whole numbers between 10 and 1,000 ft^3/s; and 3 significant figures for more than 1,000 ft^3/s. The number of significant figures used is based solely on the magnitude of the discharge value. The same rounding rules apply to discharges listed for partial-record stations and miscellaneous sites.

Discharge at many stations, as indicated by the monthly mean, may not reflect natural runoff because of the effects of diversion, consumption, regulation by storage, increase or decrease in evaporation, or other factors. For such stations, figures of cubic feet per second per square mile and of runoff, in inches, are not published unless satisfactory adjustments can be made for diversions, changes in contents of reservoirs, or other changes incident to use and control. Evaporation from a reservoir is not included in the adjustments for changes in reservoir contents, unless it is so stated. Even at those stations where adjustments are made, large errors in computed runoff may occur if adjustments or losses are large in comparison with the observed discharge.

Other Records Available

Monthly records for several ungaged sites are given in a separate section following the gaged sites. The accuracy of records for ungaged sites is generally lower than that for gaged sites, depending on the precision of the computation method and the accuracy of data used in the computations. For most gaging stations, unpublished, detailed information, on file in the Oregon office, includes discharge measurements, gage-height records, and rating tables. Many gaging-station records in Oregon through 1982 have been analyzed to determine several statistical summaries: (1) The number of days in each year that the daily discharge was between selected limits (duration tables); (2) the lowest mean discharge for selected numbers of consecutive days in each year; and (3) the highest mean discharge for selected numbers of consecutive days in each year.

Other Federal and State agencies have collected discharge data at other sites in Oregon during the current water year. Although these records have not been published by the U.S. Geological Survey, the National Water Data Exchange, NAWDEX, Water Resources Division, U.S. Geological Survey, National Center, Reston, VA 22092, maintains an index of these sites and will furnish information about them.

Records of Surface-Water Quality

Records of surface-water quality ordinarily are obtained at or near stream-gaging stations because interpretation of records of surface-water quality nearly always requires corresponding discharge data. Records of surface-water quality in this report may involve a variety of types of data and measurement frequencies.

Classification of Records

Water-quality data for surface-water sites are grouped into one of three classifications. A continuing-record station is a site where data are collected on a regularly scheduled basis. Frequency may be one or more times daily, weekly, monthly, or quarterly. A partial-record station is a site where limited water-quality data are collected systematically over a period of years. Frequency of sampling is usually less than quarterly. A miscellaneous sampling site is a location other than a continuing or partial-record station, where random samples are collected to give better areal coverage to define water-quality conditions in the river basin.

A careful distinction needs to be made between "continuing records" as used in this report and "continuous recordings," which refers to a continuous graph or a series of discrete values punched at short intervals on a paper tape. Some records of water quality, such as temperature and specific conductance, may be obtained through continuous recordings; however, because of costs, most data are obtained only monthly or less frequently.

Arrangement of Records

Water-quality records collected at a surface-water daily record station are published immediately following that record, regardless of the frequency of sample collection. Station number and name are the same for both records. Where a surface-water daily record station is not available or where the water quality differs significantly from that at the nearby surface-water station, the continuing water-quality record is published with its own station number and name in the regular downstream-order sequence. Water-quality data for partial-record stations and for miscellaneous sampling sites appear in separate tables following the table of discharge measurements at miscellaneous sites.

On-site Measurements and Sample Collection

In obtaining water-quality data, it is important that the data obtained represent the in situ quality of the water. To assure this, certain measurements, such as water temperature, pH, and dissolved oxygen, need to be made onsite when the samples are taken. To assure that measurements made in the laboratory also represent the in situ water, carefully prescribed procedures need to be followed in collecting the samples, treating the samples to prevent changes in quality pending analysis, and shipping the samples to the laboratory. Procedures for onsite measurements and for collecting, treating, and shipping samples are given in publications on "Techniques of Water-Resources Investigations," (TWRI), Book 1, Chap. D2; Book 3, Chap. C2; Book 5, Chap. A1, A3, and A4. All of these references are listed under "PUBLICATIONS ON TECHNIQUES OF WATER-RESOURCES INVESTIGATIONS" in this report. Also, detailed information on collecting, treating, and shipping samples may be obtained from the Geological Survey Oregon office.

One sample can define adequately the water quality at a given time if the mixture of solutes throughout the stream cross section is homogeneous. However, the concentration of solutes at different locations in the cross section may vary widely with different rates of water discharge, depending on the source of material and the turbulence and mixing of the stream. Some streams must be sampled through several vertical sections to obtain a representative sample needed for an accurate mean concentration and for use in calculating load. All samples obtained for the National Stream Quality Accounting Network (see "DEFINITION OF TERMS") are obtained from at least several verticals. Whether samples are obtained from the centroid of flow or from several verticals, depends on flow conditions and other factors which must be evaluated by the collector.

Chemical-quality data published in this report are considered to be the most representative values available for the stations listed. The values reported represent water-quality conditions at the time of sampling as much as possible, consistent with available sampling techniques and methods of analysis. In the rare case where an apparent inconsistency exists between a reported pH value and the relative abundance of carbon dioxide species (carbonate and bicarbonate), the inconsistency is the result of a slight uptake of carbon dioxide from the air by the sample between measurement of pH in the field and determination of carbonate and bicarbonate in the laboratory.

For chemical-quality stations equipped with digital monitors, the records consist of daily maximum, minimum, and mean values for each constituent measured and are based upon hourly punches beginning at 0100 hours and ending at 2400 hours for the day of record. More detailed records (hourly values) may be obtained from the U.S. Geological Survey office whose address is given on the back of the title page of this report.

Water Temperature

Water temperatures are measured at most of the water-quality stations. In addition, water temperatures are taken at time of discharge measurements for water-discharge stations. For stations where water temperatures are taken manually once or twice daily, the water temperatures are taken at about the same time each day. Large streams have a small diurnal temperature change; shallow streams may have a daily range of several degrees and may follow closely the changes in air temperature. Some streams may be affected by waste-heat discharges.

At stations where recording instruments are used, either mean temperatures or maximum and minimum temperatures for each day are published. Water temperatures measured at the time of water-discharge measurements are on file in the Oregon office.

Sediment

Suspended-sediment concentrations are determined from samples collected by one of the standard sampling techniques discussed in TWRI, Book 3, Chapter C2, "Field methods for measurement of fluvial sediment." Samples are obtained using standard depth- or point-integrating samplers, or by means of an approved pumping sampler. Mean concentrations for the sampled cross section are in turn determined from these samples.

During periods of rapidly changing flow or rapidly changing suspended-sediment concentration, samples may have been collected more frequently (twice daily or, in some instances, hourly). The published sediment discharges for days of rapidly changing flow or concentration were computed by the subdivided-day method (time discharge weighted average). Therefore, for those days when the published sediment discharge value differs from the value computed as the product of discharge times mean concentration times 0.0027, the reader can assume that the sediment discharge for that day was computed by the subdivided-day method. For periods when no samples were collected, daily discharges of suspended sediment were estimated on the basis of water discharge, sediment concentrations observed immediately before and after the periods, and suspended-sediment loads for other periods of similar discharge.

At other stations, suspended-sediment samples were collected periodically. Although data collected periodically may represent conditions only at the time of observations, such data are useful in establishing seasonal relations between quality and streamflow and in predicting long-term sediment-discharge characteristics of the stream.

In addition to the records of suspended-sediment discharge, periodic measurements of particle-size distributions for the suspended-sediment, bed-load, and bed-material samples are included for stations where samples were obtained to measure this parameter.

Laboratory Measurements

Sediment samples, samples for biochemical-oxygen demand (BOD), samples for identification of biological populations, samples for indicator bacteria, and daily samples for specific conductance are analyzed locally. All other samples are analyzed in the Geological Survey laboratory in Arvada, Colorado. Methods used in analyzing sediment samples and computing sediment records are given in TWRI, Book 5, Chap. C1. Methods used by the Geological Survey laboratory are given in TWRI, Book 1, Chap. D2; Book 3, Chap. C2; Book 5, Chap. A1, A3, and A4.

Data Presentation

For continuing-record stations, information pertinent to the history of station operation is provided in descriptive headings preceding the tabular data. These descriptive headings give details regarding location, drainage area, period of record, type of data available, instrumentation, general remarks, cooperation, and extremes for parameters currently measured daily. Tables of chemical, physical, biological, radiochemical data, and so forth, obtained at a frequency less than daily are presented first. Tables of "daily values" of specific conductance, pH, water temperature, dissolved oxygen, and suspended sediment then follow in sequence.

In the descriptive headings, if the location is identical to that of the discharge gaging station, neither the LOCATION nor the DRAINAGE AREA statements are repeated. The following information, as appropriate, is provided with each continuous-record station. Comments that follow clarify information presented under the various headings of the station description.

LOCATION.--See Data Presentation under "Records of Stage and Water Discharge;" same comments apply.

DRAINAGE AREA.--See Data Presentation under "Records of Stage and Water Discharge;" same comments apply.

PERIOD OF RECORD.--This indicates the periods for which there are published water-quality records for the station. The periods are shown separately for records of parameters measured daily or continuously and those measured less than daily. For those measured daily or continuously, periods of record are given for the parameters individually.

INSTRUMENTATION.--Information on instrumentation is given only if a water-quality monitor, sediment pumping sampler, or other sampling device is in operation at a station.

REMARKS.--Remarks provide added information pertinent to the collection, analysis, or computation of the records.

COOPERATION.--Records provided by a cooperating organization or obtained for the Geological Survey by a cooperating organization are identified here.

EXTREMES.--Maximums and minimums are given only for parameters measured daily or more frequently. None are given for parameters measured weekly or less frequently, because the true maximums or minimums may not have been sampled. Extremes, when given, are provided for both the period of record and for the current water year.

REVISIONS.--If errors in published water-quality records are discovered after publication, appropriate updates are made to the Water-Quality File in the U.S. Geological Survey's computerized data system, WATSTORE, and subsequently by monthly transfer of update transactions to the U.S. Environmental Protection Agency's STORET system. Because the usual volume of updates makes it impractical to document individual changes in the State data-report series or elsewhere, potential users of U.S. Geological Survey water-quality data are encouraged to obtain all required data from the appropriate computer file.

The surface-water-quality records for partial-record stations and miscellaneous sampling sites are published in separate tables following the table of discharge measurements at miscellaneous sites. No descriptive statements are given for these records. Each station is published with its own station number and name in the regular downstream-order sequence.

Remark Codes

The following remark codes may appear with the water-quality data in this report:

PRINTED OUTPUT	REMARK
E	Estimated value
<	Actual value is known to be less than the value shown
K	Results based on colony count outside the acceptance range (non-ideal colony count)

ACCESS TO WATSTORE DATA

The National WATer Data STOrage and REtrieval System (WATSTORE) was established for handling water data collected through the activities of the U.S. Geological Survey and to provide for more effective and efficient means of releasing the data to the public. The system is operated and maintained on the central computer facilities of the Survey at its National Center in Reston, Virginia.

WATSTORE can provide a variety of useful products ranging from simple data tables to complex statistical analyses. A minimal fee, plus the actual computer cost incurred in producing a desired product, is charged to the requester. Information about the availability of specific types of data, the acquisition of data or products, and user charges can be obtained locally from each of the Water Resources Division's District offices (see address given on the back of the title page).

General inquiries about WATSTORE may be directed to:

Chief Hydrologist
U.S. Geological Survey
437 National Center
Reston, Virginia 22092

DEFINITION OF TERMS

Terms related to streamflow, water-quality, and other hydrologic data, as used in this report, are defined below. See also table for converting English units to International System (SI) Units on the inside of the back cover.

Acre-foot (AC-FT, acre-ft) is the quantity of water required to cover 1 acre to a depth of 1 foot and is equal to 43,560 cubic feet or about 326,000 gallons or 1,233 cubic meters.

Adenosine triphosphate (ATP) is an organic, phosphate-rich, compound important in the transfer of energy in organisms. Its central role in living cells makes it an excellent indicator of the presence of living material in water. A measure of ATP therefore provides a sensitive and rapid estimate of biomass. ATP is reported in micrograms per liter of the original water sample.

Algae are mostly aquatic single-celled, colonial, or multicelled plants, containing chlorophyll and lacking roots, stems, and leaves.

Algal growth potential (AGP) is the maximum algal dry weight biomass that can be produced in a natural water sample under standardized laboratory conditions. The growth potential is the algal biomass present at stationary phase and is expressed as milligrams dry weight of algae produced per liter of sample.

Aquifer is a geologic formation, group of formations, or part of a formation that contains sufficient saturated permeable material to yield significant quantities of water to wells and springs.

Artesian means confined and is used to describe a well in which the water level stands above the top of the aquifer tapped by the well. A flowing artesian well is one in which the water level is above the land surface.

Bacteria are microscopic unicellular organisms, typically spherical, rodlike, or spiral and threadlike in shape, often clumped into colonies. Some bacteria cause disease, while others perform an essential role in nature in the recycling of materials; for example, by decomposing organic matter into a form available for reuse by plants.

Total coliform bacteria are a particular group of bacteria that are used as indicators of possible sewage pollution. They are characterized as aerobic or facultative anaerobic, gram-negative, nonspore-forming, rod-shaped bacteria which ferment lactose with gas formation within 48 hours at 35°C. In the laboratory these bacteria are defined as all the organisms that produce colonies with a golden-green metallic sheen within 24 hours when incubated at 35°C plus or minus 1.0°C on M-Endo medium (nutrient medium for bacterial growth). Their concentrations are expressed as number of colonies per 100 milliliters (mL) of sample.

Fecal coliform bacteria are bacteria that are present in the intestine or feces of warmblooded animals. They are often used as indicators of the sanitary quality of the water. In the laboratory they are defined as all organisms that produce blue colonies within 24 hours when incubated at 44.5°C plus or minus 0.2°C on M-FC medium (nutrient medium for bacterial growth). Their concentrations are expressed as number of colonies per 100 mL of sample.

Fecal streptococcal bacteria are bacteria found also in the intestine of warmblooded animals. Their presence in water is considered to verify fecal pollution. They are characterized as gram-positive, cocci bacteria which are capable of growth in brain-heart infusion broth. In the laboratory they are defined as all the organisms which produce red or pink colonies within 48 hours at 35°C plus or minus 1.0°C on KF-streptococcus medium (nutrient medium for bacterial growth). Their concentrations are expressed as number of colonies per 100 mL of sample.

Base flow. See Base runoff.

Base runoff refers to sustained or fair weather runoff. In most streams, base runoff is composed largely of ground-water effluent. The term base flow is often used in the same sense as base runoff. However, the distinction is the same as that between streamflow and runoff. When the concept in the terms base flow and base runoff is that of the natural flow in a stream, base runoff is the logical term.

Bed material is the sediment mixture of which a streambed, lake, pond, reservoir, or estuary bottom is composed.

Biochemical oxygen demand (BOD) is a measure of the quantity of dissolved oxygen, in milligrams per liter, necessary for the decomposition of organic matter by micro-organisms, such as bacteria.

Biomass is the amount of living matter present at any given time, expressed as the mass per unit area or volume of habitat.

Ash mass is the mass or amount of residue present after the residue from the dry mass determination has been ashed in a muffle furnance at a temperature of 500°C for 1 hour. The ash mass values of zooplankton and phytoplankton are expressed in grams per cubic meter (g/m^3), and periphyton and benthic organisms in grams per square meter (g/m^2).

Dry mass refers to the mass of residue present after drying in an oven at 105°C for zooplankton and periphyton, until the mass remains unchanged. This mass represents the total organic matter, ash and sediment, in the sample. Dry-mass values are expressed in the same units as ash mass.

Organic mass or volatile mass of the living substance is the difference between the dry mass and the ash mass and represents the actual mass of the living matter. The organic mass is expressed in the same units as for ash and dry mass.

Wet mass is the mass of living matter plus contained water.

Bottom material: See Bed material.

Cells/volume refers to the number of cells of any organism which is counted by using a microscope and grid or counting cell. Many planktonic organisms are multicelled and are counted according to the number of contained cells per sample, usually milliliters (mL) or liters (L).

Chemical oxygen demand (COD) is a measure of the chemically oxidizable material in the water, and furnishes an approximation of the amount of organic and reducing material present. The determined value may correlate with natural water color or with carbonaceous organic pollution from sewage or industrial wastes.

Chlorophyll refers to the green pigments of plants. Chlorophyll a and b are the two most common green pigments in plants.

Color unit is produced by one milligram per liter of platinum in the form of the chloroplatinate ion. Color is expressed in units of the platinum-cobalt scale.

Contents is the volume of water in a reservoir or lake. Unless otherwise indicated, volume is computed on the basis of a level pool and does not include bank storage.

Control designates a feature downstream from the gage that determines the stage-discharge relation at the gage. This feature may be a natural constriction of the channel, an artificial structure, or a uniform cross section over a long reach of the channel.

Control structure as used in this report is a structure on a stream or canal that is used to regulate the flow or stage of the stream or to prevent the intrusion of salt water.

Cubic foot per second (ft^3/s) is the rate of discharge representing a volume of 1 cubic foot passing a given point during 1 second and is equivalent to 7.48 gallons per second or 448.8 gallons per minute or 0.02832 cubic meters per second.

Cubic foot per second-day [$(ft^3/s)/d$] is the volume of water represented by a flow of 1 cubic foot per second for 24 hours. It is equivalent to 86,400 cubic feet, approximately 1.9835 acre-feet, about 646,000 gallons, or 2,445 cubic meters.

Cubic feet per second per square mile [$(ft^3/s)/mi^2$] is the average number of cubic feet of water flowing per second from each square mile of area drained, assuming that the runoff is distributed uniformly in time and area.

Discharge is the volume of water (or more broadly, volume of fluid plus suspended sediment) that passes a given point within a given period of time.

Mean discharge (MEAN) is the arithmetic mean of individual daily mean discharges during a specific period.

Instantaneous discharge is the discharge at a particular instant of time.

Dissolved refers to that material in a representative water sample which passes through a 0.45-um membrane filter. This is a convenient operational definition used by Federal agencies that collect water data. Determinations of "dissolved" constituents are made on subsamples of the filtrate.

Dissolved-solids concentration of water is determined either analytically by the "residue-on-evaporation" method, or mathematically by totaling the concentrations of individual constituents reported in a comprehensive chemical analysis. During the analytical determination of dissolved solids, the bicarbonate (generally a major dissolved component of water) is converted to carbonate. Therefore, in the mathematical calculation of dissolved-solids concentration, the bicarbonate value, in milligrams per liter, is multiplied by 0.492 to reflect the change.

Drainage area of a stream at a specified location is that area, measured in a horizontal plane, enclosed by a topographic divide from which direct surface runoff from precipitation normally drains by gravity into the stream above the specified point. Figures of drainage area given herein include all closed basins, or noncontributing areas, within the area unless otherwise noted.

Drainage basin is a part of the surface of the earth that is occupied by a drainage system, which consists of a surface stream or a body of impounded surface water together with all tributary surface streams and bodies of impounded surface water.

Gage height (G.H.) is the water-surface elevation referred to some arbitrary gage datum. Gage height is often used interchangeably with the more general term "stage," although gage height is more appropriate when used with a reading on a gage.

Gaging station is a particular site on a stream, canal, lake, or reservoir where systematic observations of hydrologic data are obtained.

Hardness of water is a physical-chemical characteristic that is commonly recognized by the increased quantity of soap required to produce lather. It is computed as the sum of equivalents of polyvalent cations and is expressed as the equivalent concentration of calcium carbonate (CaCO3).

Hydrologic Bench-Mark Network is a network of more than 50 sites in small drainage basins around the country whose purpose is to provide consistent data on the hydrology, including water quality, and related factors in representative undeveloped watersheds nationwide, and to provide analyses on a continuing basis to compare and contrast conditions observed in basins more obviously affected by the activities of man.

Hydrologic unit is a geographic area representing part or all of a surface drainage basin or distinct hydrologic feature as delineated by the Office of Water Data Coordination on the State Hydrologic Unit Maps; each hydrologic unit is identified by an eight-digit number.

Land-surface datum (lsd) is a datum plane that is approximately at land surface at each ground-water observation well.

Measuring point (MP) is an arbitrary permanent reference point from which the distance to the water surface in a well is measured to obtain the water level.

Metamorphic stage refers to the stage of development that an organism exhibits during its transformation from an immature form to an adult form. This developmental process exists for most insects, and the degree of difference from the immature stage to the adult form varies from relatively slight to pronounced, with many intermediates. Examples of metamorphic stages of insects are egg-larva-adult or egg-nymph-adult.

Methylene blue active substances (MBAS) are apparent detergents. The determination depends on the formation of a blue color when methylene blue dye reacts with synthetic anionic detergent compounds.

Micrograms per gram (ug/g) is a unit expressing the concentration of a chemical constituent as the mass (micrograms) of the element per unit mass (gram) of material analyzed.

Micrograms per liter (UG/L, ug/L) is a unit expressing the concentration of chemical constituents in solution as mass (micrograms) of solute per unit volume (liter) of water. One thousand micrograms per liter is equivalent to one milligram per liter.

Milligrams per liter (MG/L, mg/L) is a unit for expressing the concentration of chemical constituents in solution. Milligrams per liter represents the mass of solute per unit volume (liter) of water. Concentration of suspended sediment also is expressed in mg/L and is based on the mass of dry sediment per liter of water-sediment mixture.

National Geodetic Vertical Datum of 1929 (NGVD of 1929) is a geodetic datum derived from a general adjustment of the first order level nets of both the United States and Canada. It was formerly called "Sea Level Datum of 1929" or "mean sea level" in this series of reports. Although the datum was derived from the average sea level over a period of many years at 26 tide stations along the Atlantic, Gulf of Mexico, and Pacific Coasts, it does not necessarily represent local mean sea level at any particular place.

National Stream Quality Accounting Network (NASQAN) is a nationwide data-collection network designed by the U.S. Geological Survey to meet many of the information needs of government agencies and other groups involved in national or regional water-quality planning and management. The several hundred sites in NASQAN are generally located at the downstream ends of hydrologic accounting units designated by the U.S. Geological Survey Office of Water Data Coordination in consultation with the Water Resources Council. The objective of NASQAN is to obtain information on the quality and quantity of water moving within and from the United States through a systematic and uniform process of data collection, summarization, analysis, and reporting. The design of the network is intended to provide data for (1) description of the areal variability of water quality in the Nation's rivers through analysis of data from this and other programs, (2) detection of changes or trends with time in the pattern of occurrence of water-quality characteristics, and (3) a nationally consistent data base useful for water-quality assessment and hydrologic research.

National Trends Network (NTN) is a 150-station network for sampling atmospheric deposition in the United States. The purpose of the network is to determine the variability, both in location and in time, of the composition of atmospheric deposition, which includes snow, rain, dust particles, aerosols, and gases. The core from which the NTN was built was the already-existing deposition-monitoring network of the National Atmospheric Deposition Program (NADP).

Organism is any living entity.

Organism count/area refers to the number of organisms collected and enumerated in a sample and adjusted to the number per unit area habitat, usually square meter (m^2), acre, or hectare. Periphyton, benthic organisms, and macrophytes are expressed in these terms.

Organism count/volume refers to the number of organisms collected and enumerated in a sample and adjusted to the number per sample volume usually milliliter (mL) or liter (L). Numbers of planktonic organisms can be expressed in these terms.

Total organism count is the total number of organisms collected and enumerated in any particular sample.

Parameter Code is a 5-digit number used in the U.S. Geological Survey computerized data system, WATSTORE, to uniquely identify a specific constituent. The codes used in WATSTORE are the same as those used in the U.S. Environmental Protection Agency data system, STORET. The Environmental Protection Agency assigns and approves all requests for new codes.

Partial-record station is a particular site where limited streamflow and (or) water-quality data are collected systematically over a period of years for use in hydrologic analyses.

Particle size is the diameter, in millimeters (mm), of a particle determined by either sieve or sedimentation methods. Sedimentation methods (pipet, bottom-withdrawal tube, visual-accumulation tube) determine fall diameter of particles in either distilled water (chemically dispersed) or in native water (the river water at the time and point of sampling).

Particle-size classification used in this report agrees with the recommendation made by the American Geophysical Union Subcommittee on Sediment Terminology. The classification is as follows:

Classification	Size (mm)	Method of analysis
Clay.....	0.00024 - 0.004	Sedimentation
Silt.....	.004 - .062	Sedimentation
Sand.....	.062 - 2.0	Sedimentation or sieve
Gravel.....	2.0 - 64.0	Sieve

The particle-size distributions given in this report are not necessarily representative of all particles in transport in the stream. Most of the organic matter is removed and the sample is subjected to mechanical and chemical dispersion before analysis in distilled water. Chemical dispersion is not used for native-water analysis.

Percent composition is a unit for expressing the ratio of a particular part of a sample or population to the total sample or population in terms of types, numbers, mass, or volume.

Periphyton is the assemblage of microorganisms attached to and living upon submerged solid surfaces. While primarily consisting of algae, they also include bacteria, fungi, protozoa, rotifers, and other small organisms.

Pesticides are chemical compounds used to control undesirable organisms. Major categories of pesticides include insecticides, miticides, fungicides, herbicides, and rodenticides.

Picocurie (PC, pCi) is one trillionth (1 x 10E-12) of the amount of radioactivity represented by a curie (Ci). A curie is the amount of radioactivity that yields 3.7 x 10E+10 radioactive disintegrations per second. A picocurie yields 2.22 disintegrations per minute (dpm).

Plankton is the community of suspended, floating, or weakly swimming organisms that live in the open water of lakes and rivers.

Phytoplankton is the plant part of the plankton. They are usually microscopic and their movement is subject to the water currents. Phytoplankton growth is dependent upon solar radiation and nutrient substances. Because they are able to incorporate as well as release materials to the surrounding water, the phytoplankton have a profound effect upon the quality of the water. They are the primary food producers in the aquatic environment, and are commonly known as algae.

Blue-green algae are a group of phytoplankton organisms having a blue pigment, in addition to the green pigment called chlorophyll. Blue-green algae often cause nuisance conditions in water.

Diatoms are the unicellular or colonial algae having a siliceous shell. Their concentrations are expressed as number of cells per milliliter (cells/mL) of sample.

Green algae have chlorophyll pigments similar in color to those of higher green plants. Some forms produce algae mats or floating "moss" in lakes. Their concentrations are expressed as number of cells per milliliter (cells/mL) of sample.

Zooplankton is the animal part of the plankton. Zooplankton are capable of extensive movements within the water column and are often large enough to be seen with the unaided eye. Zooplankton are secondary consumers feeding upon bacteria, phytoplankton, and detritus. Because they are the grazers in the aquatic environment, the zooplankton are a vital part of the aquatic food web. The zooplankton community is dominated by small crustaceans and rotifers.

Primary productivity is a measure of the rate at which new organic matter is formed and accumulated through photosynthetic and chemosynthetic activity of producer organisms (chiefly, green plants). The rate of primary production is estimated by measuring the amount of oxygen released (oxygen method) or the amount of carbon assimilated by the plants (carbon method).

Milligrams of carbon per area or volume per unit time [mg C/(m^2 ,time)] for periphyton and macrophytes and [mg C/(m^3 ,time)] for phytoplankton are units for expressing primary productivity. They define the amount of carbon dioxide consumed as measured by radioactive carbon (carbon 14). The carbon 14 method is of greater sensitivity than the oxygen light and dark bottle method, and is preferred for use in unenriched waters. Unit time may be either the hour or day, depending on the incubation period.

Milligrams of oxygen per area or volume per unit time [mg 02/(m^2 ,time)] for periphyton and macrophytes and [mg 02/(m^3 ,time)] for phytoplankton are units for expressing primary productivity. They define production and respiration rates as estimated from changes in the measured dissolved-oxygen concentration. The oxygen light and dark bottle method is preferred if the rate of primary production is sufficient for accurate measurements to be made within 24 hours. Unit time may be either the hour or day, depending on the incubation period.

Radiochemical program is a network of regularly sampled water-quality stations where samples are collected to be analyzed for radioisotopes. The streams that are sampled represent major drainage basins in the conterminous United States.

Recoverable from bottom material is the amount of a given constituent that is in solution after a representative sample of bottom material has been digested by a method (usually using an acid or mixture of acids) that results in dissolution of readily soluble substances. Complete dissolution of all bottom material is not achieved by the digestion treatment and thus the determination represents less than the total amount (that is, less than 95 percent) of the constituent in the sample. To achieve comparability of analytical data, equivalent digestion procedures would be required of all laboratories performing such analyses because different digestion procedures are likely to produce different analytical results.

Return period is the average time interval between occurrences of a hydrological event of a given or greater magnitude, usually expressed in years. May also be called recurrence interval.

Runoff in inches (IN, in) shows the depth to which the drainage area would be covered if all the runoff for a given time period were uniformly distributed on it.

Sediment is solid material that originates mostly from disintegrated rocks and is transported by, suspended in, or deposited from water; it includes chemical and biochemical precipitates and decomposed organic material such as humus. The quantity, characteristics, and cause of the occurrence of sediment in streams are influenced by environmental factors. Some major factors are degree of slope, length of slope, soil characteristics, land usage, and quantity and intensity of precipitation.

Bed load is the sediment that is transported in a stream by rolling, sliding, or skipping along the bed very close to the bed surface. In this report, bed load is considered to consist of particles in transit within 0.25 ft of the streambed.

Bed load discharge (tons per day) is the quantity of bed load measured by dry weight that moves past a section as bed load in a given time.

Suspended sediment is the sediment that at any given time is maintained in suspension by the upward components of turbulent currents or that exists in suspension as a colloid.

Suspended-sediment concentration is the velocity-weighted concentration of suspended sediment in the sampled zone (from the water surface to a point approximately 0.3 ft above the bed) expressed as milligrams of dry sediment per liter of water-sediment mixture (mg/L).

Mean concentration is the time-weighted concentration of suspended sediment passing a stream section during a 24-hour day.

Suspended-sediment discharge (tons/day) is the rate at which dry mass of sediment passes a section of a stream or is the quantity of sediment, as measured by dry mass or volume, that passes a section in a given time. It is calculated in units of tons per day as follows: concentration (mg/L) x discharge (ft^3/s) x 0.0027.

Suspended-sediment load is a general term that refers to material in suspension. It is not synonymous with either discharge or concentration.

Total-sediment discharge (tons/day) is the sum of the suspended-sediment discharge and the bed-load discharge. It is the total quantity of sediment, as measured by dry mass or volume, that passes a section during a given time.

Total-sediment load or total load is a term which refers to the total sediment (bed load plus suspended-sediment load) that is in transport. It is not synonymous with total-sediment discharge.

Seven-day 10-year low flow (7 Q10) is the discharge at the 10-year recurrence interval taken from a frequency curve of annual values of the lowest mean discharge for 7 consecutive days (the 7-day low flow).

Sodium-adsorption-ratio (SAR) is the expression of relative activity of sodium ions in exchange reactions within soil and is an index of sodium or alkali hazard to the soil. Waters range in respect to sodium hazard from those which can be used for irrigation on almost all soils to those which are generally unsatisfactory for irrigation.

Solute is any substance that is dissolved in water.

Specific conductance is a measure of the ability of a water to conduct an electrical current. It is expressed in microsiemens per centimeter at 25°C. Specific conductance is related to the type and concentration of ions in solution and can be used for approximating the dissolved-solids content of the water. Commonly, the concentration of dissolved solids (in milligrams per liter) is about 65 percent of the specific conductance (in microsiemens). This relation is not constant from stream to stream, and it may vary in the same source with changes in the composition of the water.

Stage-discharge relation is the relation between gage height (stage) and the volume of water, per unit of time, flowing in a channel.

Streamflow is the discharge that occurs in a natural channel. Although the term "discharge" can be applied to the flow of a canal, the word "streamflow" uniquely describes the discharge in a surface stream course. The term "streamflow" is more general than "runoff" as streamflow may be applied to discharge whether or not it is affected by diversion or regulation.

Substrate is the physical surface upon which an organism lives.

Natural substrate refers to any naturally occurring emersed or submersed solid surface, such as a rock or tree, upon which an organism lives.

Artificial substrate is a device which is purposely placed in a stream or lake for colonization of organisms. The artificial substrate simplifies the community structure by standardizing the substrate from which each sample is taken. Examples of artificial substrates are basket samplers (made of wire cages filled with clean streamside rocks) and multiplate samplers (made of hardboard) for benthic organism collection, and plexiglass strips for periphyton.

Surface area of a lake is that area outlined on the latest U.S.G.S. topographic map as the boundary of the lake and measured by a planimeter in acres. In localities not covered by topographic maps, the areas are computed from the best maps available at the time planimetered. All areas shown are those for the stage when the planimetered map was made.

Surficial bed material is the part (0.1 to 0.2 ft) of the bed material that is sampled using U.S. Series Bed-Material Samplers.

Suspended (as used in tables of chemical analyses) refers to the amount (concentration) of undissolved material in a water-sediment mixture. It is associated with the material retained on a 0.45-um filter.

Suspended, recoverable is the amount of a given constituent that is in solution after the part of a representative water-suspended sediment sample that is retained on a 0.45-um membrane filter has been digested by a method (usually using a dilute acid solution) that results in dissolution of only readily soluble substances. Complete dissolution of all the particulate matter is not achieved by the digestion treatment and thus the determination represents something less than the "total" amount (that is, less than 95 percent) of the constituent present in the sample. To achieve comparability of analytical data, equivalent digestion procedures are required of all laboratories performing such analyses because different digestion procedures are likely to produce different analytical results.

Determinations of "suspended, recoverable" constituents are made either by analyzing portions of the material collected on the filter or, more commonly, by difference, based on determinations of (1) dissolved and (2) total recoverable concentrations of the constituent.

Suspended, total is the total amount of a given constituent in the part of a representative water-suspended sediment sample that is retained on a 0.45-um membrane filter. This term is used only when the analytical procedure assures measurement of at least 95 percent of the constituent determined. A knowledge of the expected form of the constituent in the sample, as well as the analytical methodology used, is required to determine when the results should be reported as "suspended, total."

Determinations of "suspended, total" constituents are made either by analyzing portions of the material collected on the filter or, more commonly, by difference, based on determinations of (1) dissolved and (2) total concentrations of the constituent.

Taxonomy is the division of biology concerned with the classification and naming of organisms. The classificiation of organisms is based upon a hierarchial scheme beginning with Kingdom and ending with Species at the base. The higher the classification level, the fewer features the organisms have in common. For example, the taxonomy of a particular mayfly, Hexagenia limbata, is the following:

Kingdom	Animal
Phylum	Arthropoda
Class	Insecta
Order	Ephemeroptera
Family	Ephemeridae
Genus	Hexagenia
Species	Hexagenia limbata

Thermograph is an instrument that continuously records variations of temperature on a chart. The more general term "temperature recorder" is used in the table headings and refers to any instrument that records temperature whether on a chart, a tape, or any other medium.

Time-weighted average is computed by multiplying the number of days in the sampling period by the concentrations of individual constituents for the corresponding period and dividing the sum of the products by the total number of days. A time-weighted average represents the composition of water that would be contained in a vessel or reservoir that had received equal quantities of water from the stream each day for the year.

Tons per acre-foot indicates the dry mass of dissolved solids in 1 acre-foot of water. It is computed by multiplying the concentration of the constituent, in milligrams per liter, by 0.00136.

Tons per day (T/DAY) is the quantity of a substance in solution or suspension that passes a stream section during a 24-hour period.

Total is the total amount of a given constituent in a representative water-suspended sediment sample, regardless of the constituent's physical or chemical form. This term is used only when the analytical procedure assures measurement of at least 95 percent of the constituent present in both the dissolved and suspended phases of the sample. A knowledge of the expected form of the constituent in the sample, as well as the analytical methodology used, is required to judge when the results should be reported as "total." (Note that the word "total" does double duty here, indicating both that the sample consists of a water-suspended sediment mixture and that the analytical method determined all of the constituent in the sample.)

Total discharge is the total quantity of any individual constituent, as measured by dry mass or volume, that passes through a stream cross section per unit of time. This term needs to be qualified, such as "total sediment discharge," "total chloride discharge," and so on.

Total, recoverable is the amount of a given constituent that is in solution after a representative water-suspended sediment sample has been digested by a method (usually using a dilute acid solution) that results in dissolution of only readily soluble substances. Complete dissolution of all particulate matter is not achieved by the digestion treatment, and thus the determination represents something less than the "total" amount (that is, less than 95 percent) of the constituent present in the dissolved and suspended phases of the sample. To achieve comparability of analytical data, equivalent digestion procedures are required of all laboratories performing such analyses, because different digestion procedures are likely to produce different analytical results.

Tritium Network is a network of stations which has been established to provide baseline information on the occurrence of tritium in the Nation's surface waters. In addition to the surface-water stations in the network, tritium data are also obtained at a number of precipitation stations. The purpose of the precipitation stations is to provide an estimate sufficient for hydrologic studies of the tritium input to the United States.

Water year in Geological Survey reports dealing with surface-water supply is the 12-month period, October 1 through September 30. The water year is designated by the calendar year in which it ends and which includes 9 of the 12 months. Thus, the year ending September 30, 1980, is called the "1980 water year."

WDR is used as an abbreviation for "Water-Data Report" in the REVISED RECORDS paragraph to refer to State annual hydrologic-data reports (WRD was used as an abbreviation for "Water-Resources Data" in reports published prior to 1976).

Weighted average is used in this report to indicate discharge-weighted average. It is computed by multiplying the discharge for a sampling period by the concentrations of individual constituents for the corresponding period and dividing the sum of the products by the sum of the discharges. A discharge-weighted average approximates the composition of water that would be found in a reservoir containing all the water passing a given location during the water year after thorough mixing in the reservoir.

WSP is used as an abbreviation for "Water-Supply Paper" in references to previously published reports.

PUBLICATIONS ON TECHNIQUES OF WATER-RESOURCES INVESTIGATIONS

The U.S. Geological Survey publishes a series of manuals describing procedures for planning and conducting specialized work in water-resources investigations. The material is grouped under major subject headings called books and is further divided into sections and chapters. For example, Section A of Book 3 (Applications of Hydraulics) pertains to surface water. The chapter, the unit of publication, is limited to a narrow field of subject matter. This format permits flexibility in revision and publication as the need arises.

The reports listed below are for sale by the U.S. Geological Survey, Books and Open-File Reports Section, Federal Center, Box 25425, Denver, Colorado 80225 (authorized agent of the Superintendent of Documents, Government Printing Office). Prepayment is required. Remittance should be sent by check or money order payable to the U.S. Geological Survey. Prices are not included because they are subject to change. Current prices can be obtained by writing to the above address. When ordering or inquiring about prices for any of these publications, please give the title, book number, chapter number, and "U.S. Geological Survey Techniques of Water-Resources Investigations."

1-D1. WATER TEMPERATURE--INFLUENTIAL FACTORS, FIELD MEASUREMENT, AND DATA PRESENTATION, by H. H. Stevens, Jr., J. F. Ficke, and G. F. Smoot: USGS--TWRI Book 1, Chapter D1. 1975. 65 pages.

1-D2. GUIDELINES FOR COLLECTION AND FIELD ANALYSIS OF GROUND-WATER SAMPLES FOR SELECTED UNSTABLE CONSTITUENTS, by W. W. Wood: USGS--TWRI book 1, Chapter D2. 1976. 24 pages.

2-D1. APPLICATION OF SURFACE GEOPHYSICS TO GROUND-WATER INVESTIGATIONS, by A. A. R. Zohdy, G. P. Eaton, and D. R. Mabey: USGS--TWRI Book 2, Chapter D1. 1974. 116 pages.

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3-A4. MEASUREMENT OF PEAK DISCHARGE AT WIDTH CONTRACTIONS BY INDIRECT METHODS, by H. F. Matthai: USGS--TWRI Book 3, Chapter A4. 1967. 44 pages.

3-A5. MEASUREMENT OF PEAK DISCHARGE AT DAMS BY INDIRECT METHODS, by Harry Hulsing: USGS--TWRI Book 3, Chapter A5. 1967. 29 pages.

3-A6. GENERAL PROCEDURE FOR GAGING STREAMS, by R. W. Carter and Jacob Davidian: USGS--TWRI Book 3, Chapter A6. 1968. 13 pages.

3-A7. STAGE MEASUREMENTS AT GAGING STATIONS, by T. J. Buchanan and W. P. Somers: USGS--TWRI Book 3, Chapter A7. 1968. 28 pages.

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3-A10. DISCHARGE RATINGS AT GAGING STATIONS, by E. J. Kennedy: USGS--TWRI Book 3, Chapter A10. 1984. 59 pages.

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PUBLICATIONS ON TECHNIQUES OF WATER-RESOURCES INVESTIGATIONS--Continued

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3-A13. COMPUTATION OF CONTINUOUS RECORDS OF STREAMFLOW, by E. J. Kennedy: USGS--TWRI Book 3, Chapter A13. 1983. 53 pages.
3-A14. USE OF FLUMES IN MEASURING DISCHARGE, by F. A. Kilpatrick and V. R. Schneider: USGS--TWRI Book 3, Chapter A14. 1983. 46 pages.
3-A15. COMPUTATION OF WATER-SURFACE PROFILES IN OPEN CHANNELS, by Jacob Davidian: USGS--TWRI Book 3, Chapter A15. 1984. 48 pages.
3-A16. MEASUREMENT OF DISCHARGE USING TRACERS, by F. A. Kilpatrick and E. D. Cobb: USGS--TWRI Book 3, Chapter A16. 1985. 52 pages.
3-A17. ACOUSTIC VELOCITY METER SYSTEMS, by Antonius Laenen: USGS--TWRI Book 3, Chapter A17. 1985. 38 pages.
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3-B2. INTRODUCTION TO GROUND-WATER HYDRAULICS, A PROGRAMED TEXT FOR SELF-INSTRUCTION, by G. D. Bennett: USGS--TWRI Book 3, Chapter B2. 1976. 172 pages.
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3-C3. COMPUTATION OF FLUVIAL-SEDIMENT DISCHARGE, by George Porterfield: USGS--TWRI Book 3, Chapter C3. 1972. 66 pages.
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4-D1. COMPUTATION OF RATE AND VOLUME OF STREAM DEPLETION BY WELLS, by C. T. Jenkins: USGS--TWRI Book 4, Chapter D1. 1970. 17 pages.
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5-A4. METHODS FOR COLLECTION AND ANALYSIS OF AQUATIC BIOLOGICAL AND MICROBIOLOGICAL SAMPLES, edited by P. E. Greeson, T. A. Ehlke, G. A. Irwin, B. W. Lium, and K. V. Slack: USGS--TWRI Book 5, Chapter A4. 1977. 332 pages.

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5-A6. QUALITY ASSURANCE PRACTICES FOR THE CHEMICAL AND BIOLOGICAL ANALYSES OF WATER AND FLUVIAL SEDIMENTS, by L. C. Friedman and D. E. Erdmann: USGS--TWRI Book 5, Chapter A6. 1982. 181 pages.

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8-A1. METHODS OF MEASURING WATER LEVELS IN DEEP WELLS, by M. S. Garber and F. C. Koopman: USGS--TWRI Book 8, Chapter A1. 1968. 23 pages.

8-A2. INSTALLATION AND SERVICE MANUAL FOR U.S. GEOLOGICAL SURVEY MANOMETERS, by J. D. Craig: USGS--TWRI Book 8, Chapter A2. 1983. 57 pages.

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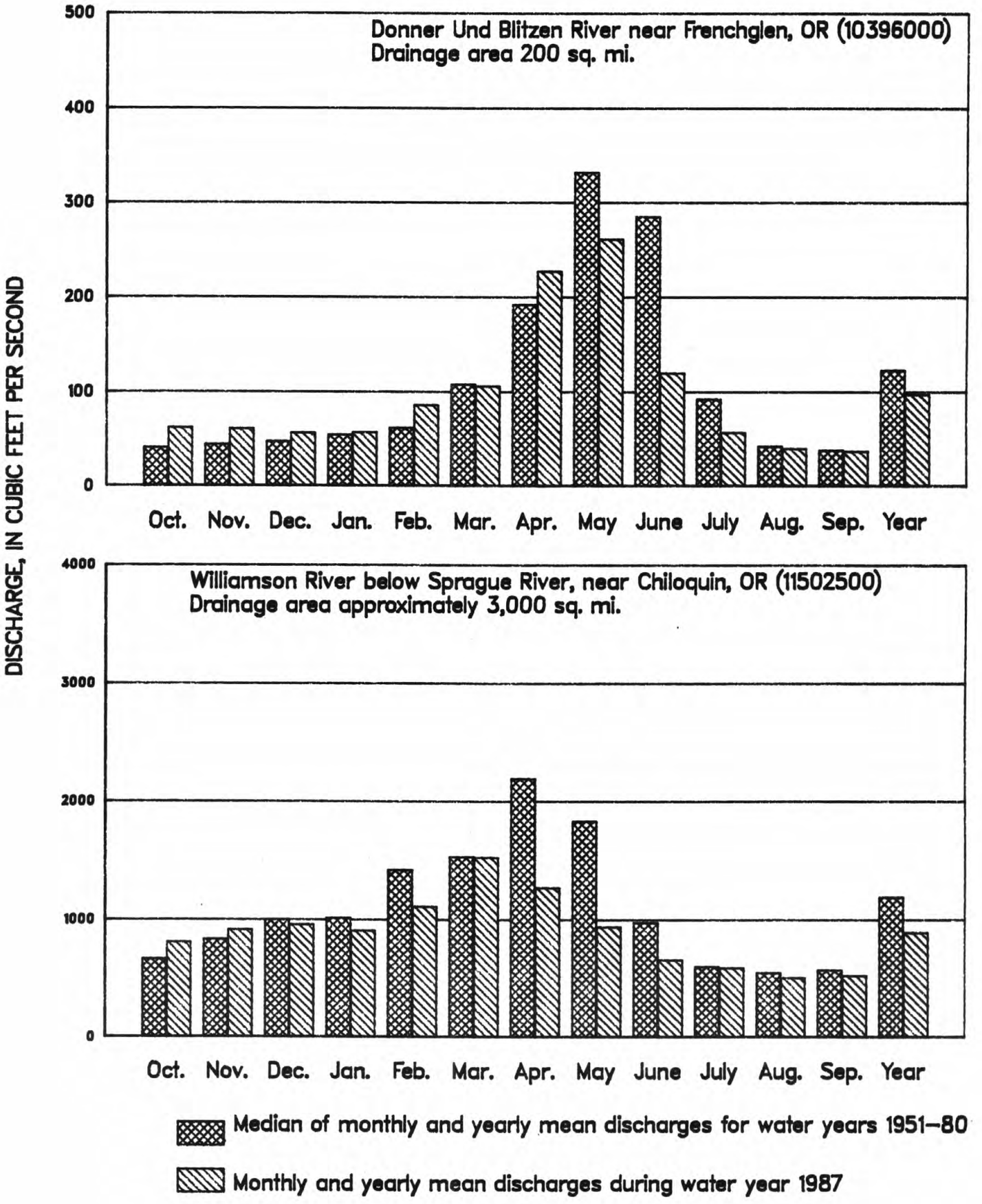

Figure 1a.--Discharge during 1987 water year compared with median discharge for period 1951-80 for two representative gaging stations in Eastern Oregon.

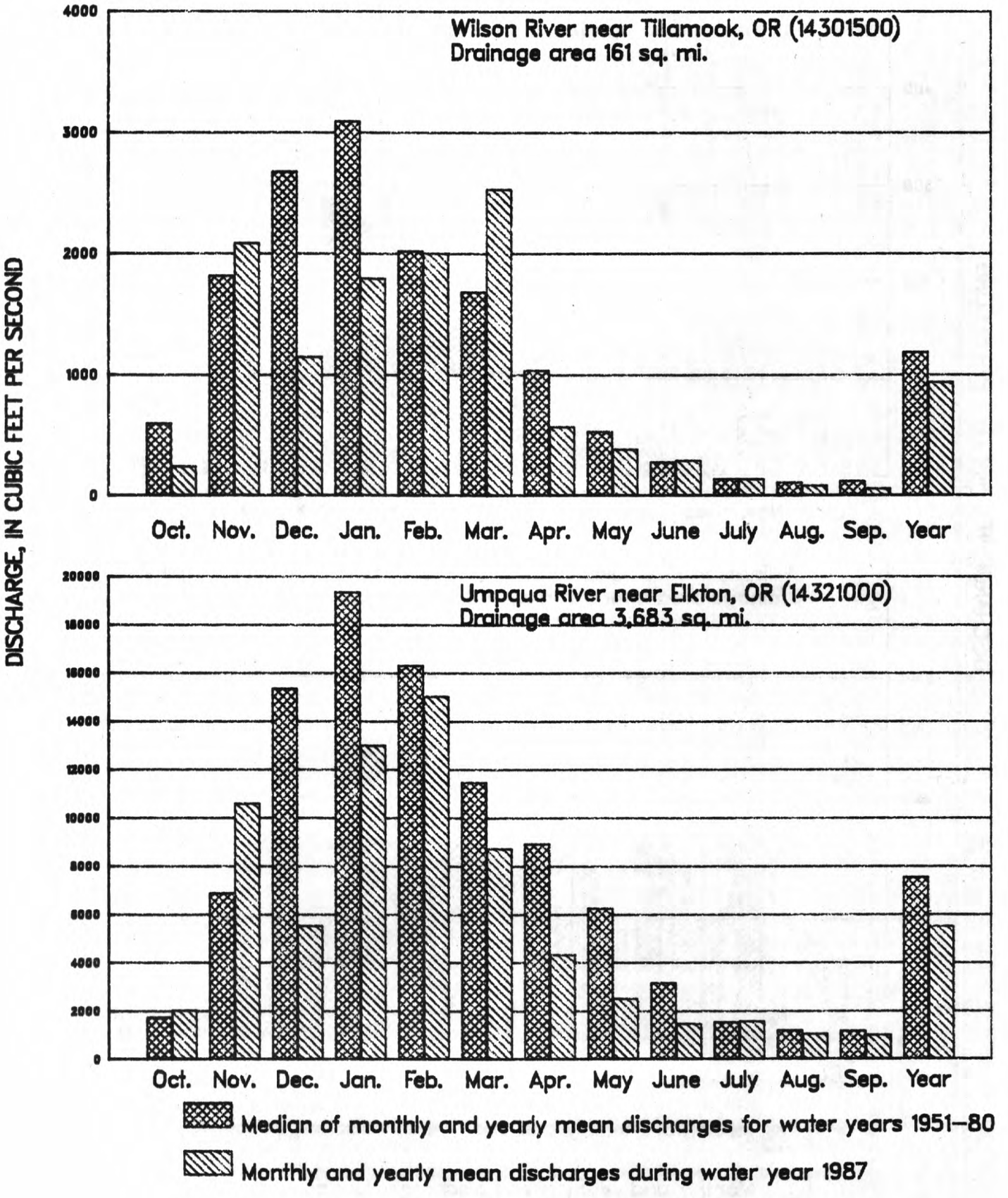

Figure 1b.--Discharge during 1987 water year compared with median discharge for period 1951-80 for two representative gaging stations in Western Oregon.

REMARK CODES.--The following remark codes may appear with the water-quality data in this section:

PRINTED OUTPUT	REMARK
E	Estimated value
<	Actual value is known to be less than the value shown
K	Results based on colony count outside the acceptance range (non-ideal colony count)
M	Presence of material verified but not quantified

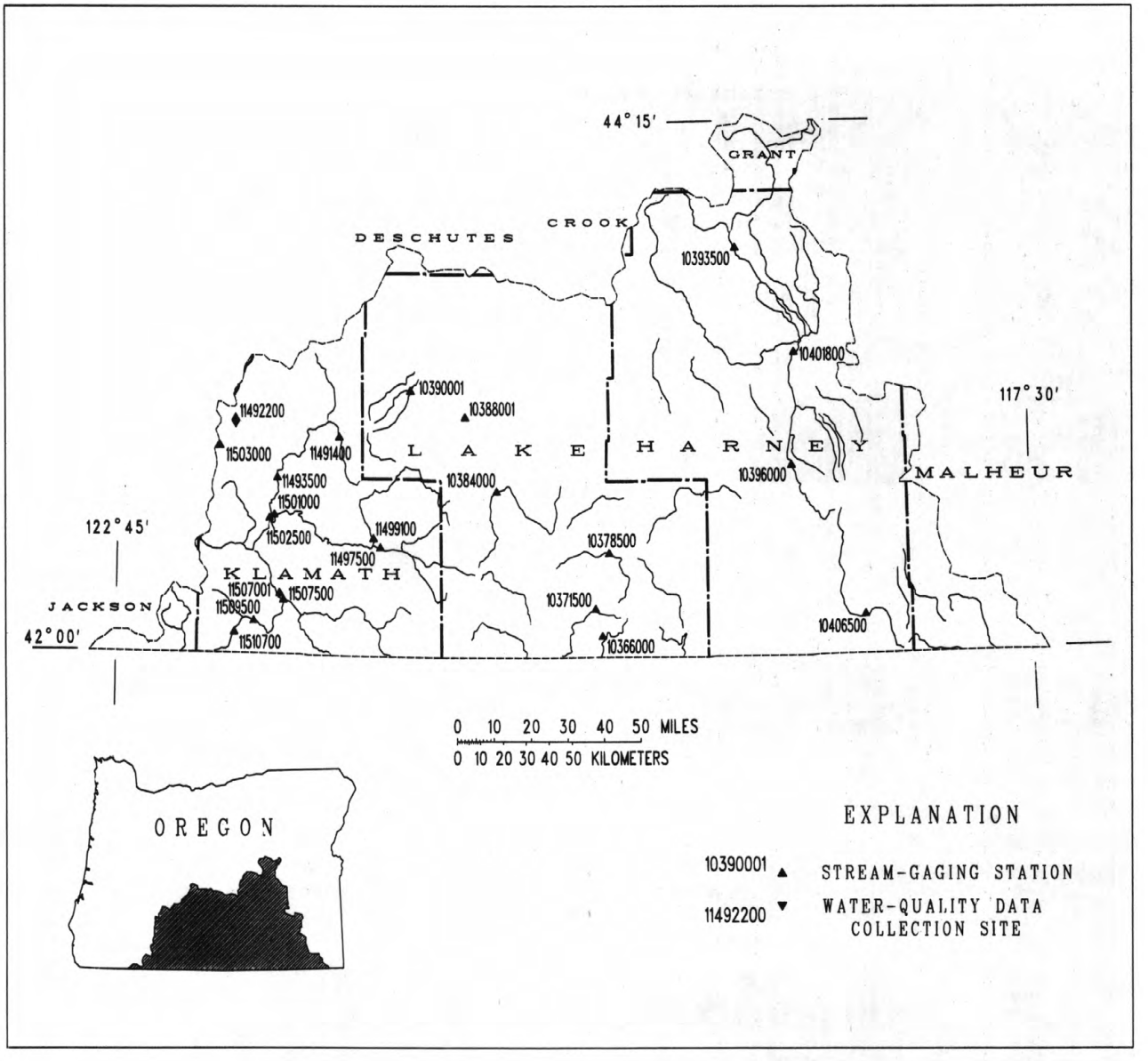

Figure 2.--Location of surface-water and water-quality stations in the Oregon Closed Basins and the Klamath River basin.

THE GREAT BASIN

WARNER LAKES BASIN

10366000 TWENTYMILE CREEK NEAR ADEL, OR

LOCATION.--Lat 42°04'20", long 119°57'42", in SW 1/4 NW 1/4 sec.25, T.40 S., R.23 E., Lake County, Hydrologic Unit 17120007, on left bank 1.5 mi downstream from Twelvemile Creek and 8 mi southwest of Adel.

DRAINAGE AREA.--194 mi^2, including 46 mi^2 in Cowhead Lake area.

PERIOD OF RECORD.-- March 1910 to July 1916, December 1917 to September 1919, and March 1921 to June 1922 (published as "near Warner Lake"), September 1940 to November 1944, March 1945 to current year.

REVISED RECORDS.--WSP 1090: 1945. WSP 1514: 1951-53, 1954(M), WDR OR-86-1: 1963(P), 1965(P), 1969-72(P), 1974(P), 1980(P), 1982(P), 1983(P).

GAGE.--Water-stage recorder and concrete control. Datum of gage is 4,560.83 ft above National Geodetic Vertical Datum of 1929. Prior to Sept. 21, 1940, nonrecording gage or water-stage recorder at sites within 1 mi downstream at various datums. Sept. 21, 1940, to Nov. 30, 1944, water-stage recorder at site 1.8 mi upstream at different datums. Mar. 12, 1945, to June 28, 1952, water-stage recorder at site 70 ft upstream at datum 0.88 ft higher.

REMARKS.--Estimated daily discharges: Nov. 29, 30, Jan. 5-23, Feb. 3, July 13-29. Records good except for estimated daily discharges and records for July to September, which are poor. Some regulation by pumpage from Cowhead Lake. Diversions in Oregon for irrigation upstream from station; considerable diversions for irrigation in Cowhead Lake area in California.

AVERAGE DISCHARGE.--52 years (water years 1911-15, 1919, 1941-44, 1946-87), 54.1 ft^3/s, 39,200 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 10,400 ft^3/s Feb. 18, 1986, gage height, 16.94 ft, on basis of slope-area measurement; no flow at times.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 510 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Mar. 13	0100	*1,650	*8.10	No other peak greater than base discharge.			

Minimum discharge, 0.03 ft^3/s Jan. 21, result of freezeup.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	6.4	7.2	5.1	8.2	7.1	13	45	87	17	9.8	3.5	2.6
2	6.2	7.0	6.4	7.2	6.9	14	37	70	16	9.3	3.4	2.3
3	5.8	6.6	7.0	8.6	6.5	44	35	63	16	7.8	3.2	2.7
4	5.8	6.6	6.8	7.9	6.1	111	76	64	12	6.7	2.7	2.7
5	5.7	6.6	7.7	6.5	6.7	149	36	69	10	5.0	2.9	3.2
6	6.0	6.8	7.2	6.0	6.6	176	28	74	11	4.0	2.9	3.4
7	5.6	6.5	7.0	5.4	7.5	96	27	76	14	3.9	3.0	3.1
8	5.5	6.3	5.6	4.5	8.0	59	24	80	25	3.2	2.8	3.3
9	5.6	6.3	5.8	4.5	8.4	33	21	79	18	3.3	2.8	3.6
10	5.4	6.9	4.8	4.5	10	24	19	80	18	3.2	2.6	3.3
11	5.4	6.7	5.4	4.5	14	20	28	74	16	3.1	2.5	3.5
12	5.3	6.7	6.7	5.0	14	204	27	70	15	3.3	2.7	3.7
13	5.2	6.7	6.6	5.4	164	630	21	69	13	3.2	2.5	3.5
14	5.4	6.6	7.9	5.4	66	173	19	64	13	2.8	2.3	3.4
15	6.1	6.5	7.1	5.4	36	119	17	62	13	2.5	2.7	4.1
16	5.8	6.5	6.9	5.4	23	139	21	59	15	2.3	2.7	4.5
17	5.9	6.6	6.1	5.4	18	160	27	56	15	2.9	3.1	3.3
18	5.9	6.1	6.4	5.4	19	249	33	50	16	3.5	3.1	2.2
19	6.0	6.8	7.7	5.4	15	118	30	44	14	4.5	2.9	2.2
20	5.8	6.8	7.3	5.4	14	90	28	37	12	3.5	2.8	2.1
21	5.8	7.6	7.1	5.4	13	58	29	35	12	4.0	3.0	2.1
22	5.7	7.8	7.1	5.4	13	40	33	33	12	4.5	3.0	2.1
23	5.8	7.4	7.2	5.4	13	48	40	31	12	4.0	2.9	2.1
24	5.7	6.4	5.9	5.8	11	56	40	26	9.6	3.7	3.4	2.9
25	5.8	6.3	5.3	6.2	13	33	47	27	9.2	3.2	3.0	2.9
26	6.2	5.1	7.0	7.6	10	39	55	33	8.9	3.0	2.8	2.9
27	6.5	5.8	6.8	9.1	13	42	70	30	8.7	2.7	2.9	3.4
28	7.1	6.0	5.3	11	13	31	83	26	8.7	2.4	2.7	3.5
29	6.8	5.5	5.7	8.7	---	25	94	23	8.7	2.6	2.9	3.5
30	7.3	4.5	6.7	8.0	---	26	108	21	9.0	3.0	2.6	3.4
31	7.9	---	7.8	7.2	---	43	---	19	---	3.2	2.5	---
TOTAL	185.4	195.2	203.4	195.8	555.8	3062	1198	1631	397.8	124.1	88.8	91.5
MEAN	5.98	6.51	6.56	6.32	19.8	98.8	39.9	52.6	13.3	4.00	2.86	3.05
MAX	7.9	7.8	7.9	11	164	630	108	87	25	9.8	3.5	4.5
MIN	5.2	4.5	4.8	4.5	6.1	13	17	19	8.7	2.3	2.3	2.1
AC-FT	368	387	403	388	1100	6070	2380	3240	789	246	176	181

CAL YR 1986 TOTAL 41215.8 MEAN 113 MAX 9000 MIN 3.0 AC-FT 81750
WTR YR 1987 TOTAL 7928.8 MEAN 21.7 MAX 630 MIN 2.1 AC-FT 15730

10371500 DEEP CREEK ABOVE ADEL, OR

LOCATION.-- Lat 42°11'21", long 120°00'02", in SW 1/4 NW 1/4 sec.15, T.39 S., R.23 E., Lake County, Hydrologic Unit 17120007, on left bank 700 ft downstream from Drake Creek and 5 mi west of Adel.

DRAINAGE AREA.--249 mi^2.

PERIOD OF RECORD.--September 1922 to September 1923, October 1929 to current year. Monthly discharge only October 1929 to September 1932, published in WSP 1314.

REVISED RECORDS.--WDR OR-83-1: 1979(M), 1980(M,P), 1982(M,P).

GAGE.--Water-stage recorder. Datum of gage is 4,980.34 ft above National Geodetic Vertical Datum of 1929 (State Highway Department bench mark). Sept. 8 to Dec. 20, 1922, nonrecording gage. Dec. 21, 1922, to Sept. 30, 1923, and Oct. 11, 1929, to Dec. 23, 1964, water-stage recorder at site 700 ft downstream at different datums. Jan. 20 to Sept. 30, 1965, nonrecording gage at site 2,000 ft downstream at different datum.

REMARKS.--Estimated daily discharges: Nov. 29, 30; Dec. 1, 2, 9, 15; Jan. 5-24; Feb. 4, 24-27. Records good except for estimated daily discharges, which are poor. No regulation. Diversions for irrigation upstream from station.

AVERAGE DISCHARGE.--59 years, 134 ft^3/s, 97,080 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 9,420 ft^3/s Dec. 23, 1964, gage height, 10.64 ft, from floodmark, from rating curve extended above 1,100 ft^3/s on basis of slope-area measurement of peak flow at gage height 7.3 ft; minimum discharge, 1.7 ft^3/s July 20, 27-29, 1934.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 600 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Apr. 11	0300	*568	*2.99				

Minimum discharge, 6.5 ft^3/s several days in August.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	43	37	27	25	34	39	157	457	64	16	9.7	8.1
2	37	33	29	19	32	41	200	375	59	15	9.4	8.0
3	35	31	30	22	31	63	235	288	57	15	8.9	7.4
4	34	31	39	25	31	103	234	264	57	15	8.3	7.5
5	34	30	34	22	29	175	206	253	57	14	7.8	7.7
6	34	28	31	22	31	228	212	251	55	14	7.4	7.9
7	32	29	30	23	33	196	237	248	56	13	7.4	7.9
8	31	25	27	24	33	184	274	262	128	12	7.6	8.1
9	30	31	25	26	34	140	285	268	92	12	7.4	8.2
10	29	34	25	28	40	128	299	268	74	12	7.3	8.3
11	29	29	28	31	61	105	415	238	60	12	7.1	8.6
12	28	31	31	34	59	161	286	214	57	11	7.1	8.7
13	28	31	31	34	125	350	257	211	55	11	7.0	8.6
14	33	31	30	34	99	240	249	193	52	10	7.8	8.3
15	29	28	30	34	74	170	282	180	49	8.9	8.1	11
16	28	31	30	34	57	147	315	172	47	8.4	8.1	11
17	28	29	35	34	52	144	340	160	52	12	8.1	14
18	28	29	40	34	49	178	320	147	68	20	8.0	14
19	28	34	29	34	39	143	247	129	57	24	7.7	13
20	28	33	28	34	49	127	223	112	54	20	7.3	13
21	28	51	26	37	42	119	229	102	53	17	7.3	13
22	28	43	27	43	40	104	266	86	50	25	7.5	13
23	28	40	25	50	36	117	276	88	48	24	7.6	12
24	28	37	24	50	35	116	254	92	44	20	7.5	12
25	28	31	40	52	34	100	262	106	41	17	7.6	12
26	28	34	28	54	33	110	269	153	34	15	7.6	13
27	33	35	25	74	35	92	301	131	26	14	7.5	13
28	38	30	32	80	37	86	347	106	21	13	7.3	13
29	32	28	28	53	---	84	417	86	19	11	7.4	13
30	62	25	34	43	---	87	485	72	17	11	7.3	13
31	44	---	35	37	---	115	---	68	---	10	8.2	---
TOTAL	1003	969	933	1146	1284	4192	8379	5780	1603	452.3	240.3	316.3
MEAN	32.4	32.3	30.1	37.0	45.9	135	279	186	53.4	14.6	7.75	10.5
MAX	62	51	40	80	125	350	485	457	128	25	9.7	14
MIN	28	25	24	19	29	39	157	68	17	8.4	7.0	7.4
AC-FT	1990	1920	1850	2270	2550	8310	16620	11460	3180	897	477	627

CAL YR 1986 TOTAL 71508 MEAN 196 MAX 3340 MIN 15 AC-FT 141800
WTR YR 1987 TOTAL 26297.9 MEAN 72.0 MAX 485 MIN 7.0 AC-FT 52160

10378500 HONEY CREEK NEAR PLUSH, OR

LOCATION.--Lat 42°25'33", long 119°55'23", in SW 1/4 SW 1/4 sec.20, T.36 S., R.24 E., Lake County, Hydrologic Unit 17120007, on right bank 700 ft upstream from mouth of canyon, 1.4 mi northwest of Plush, and 4 mi downstream from Twelvemile Creek.

DRAINAGE AREA.--170 mi^2, approximately.

PERIOD OF RECORD.--May 1909 to September 1914 (prior to January 1910, gage heights only), March to May 1915, March to September 1921, March to June 1922, May 1930 to current year. Monthly discharge only May 1930 to September 1949, published in WSP 1314.

REVISED RECORDS.--WSP 1564: 1911-12. WSP 1714: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 4,552.80 ft above National Geodetic Vertical Datum of 1929. Dec. 24, 1964, to Sept. 30, 1965, nonrecording gage at site 100 ft downstream at different datums. See WSP 1927 for history of changes prior to Dec. 24, 1964.

REMARKS.--Estimated daily discharges: Nov. 29, 30, Dec. 8, 9, 16, Jan. 5 to Mar. 9. Records good except for estimated daily discharges and discharges for July 2 to Sept. 30, which are poor. Slight regulation by five small reservoirs, combined capacity, 870 acre-ft. Diversions for irrigation upstream from station.

AVERAGE DISCHARGE.--61 years (water years 1911-14, 1931-87), 31.0 ft^3/s, 22,460 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maxiumum discharge, 11,000 ft^3/s Dec. 23, 1964, gage height, 13.4 ft, from floodmark, from rating curve extended above 250 ft^3/s on basis of slope-area measurements at gage height 10.46 ft and of peak flow; no flow at times.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 200 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Apr. 18	0200	*115	*3.33				

Minimum discharge, 0.08 ft^3/s Aug. 12.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	5.2	7.3	5.1	6.8	5.7	5.2	11	70	13	4.6	1.4	.73
2	4.9	6.9	6.8	5.9	5.3	6.0	18	61	14	7.9	2.7	.82
3	4.3	6.4	7.6	6.6	4.9	8.0	23	46	12	6.0	3.8	.88
4	3.9	6.2	7.9	7.2	4.6	13	30	39	9.8	4.4	3.5	.90
5	3.7	6.1	8.6	7.0	4.5	19	25	34	9.5	3.7	3.1	.79
6	3.6	5.8	8.5	6.0	4.8	21	25	28	9.7	3.3	2.9	2.0
7	3.7	5.8	7.9	4.7	5.0	18	39	27	13	2.9	1.8	1.3
8	3.7	6.3	7.0	4.2	5.3	15	52	26	32	2.5	.58	.83
9	3.5	6.0	6.5	4.0	6.0	13	55	25	22	2.2	.31	1.1
10	3.4	6.8	5.8	4.3	7.0	13	55	27	18	2.0	.22	.73
11	3.5	7.1	6.8	4.7	8.0	13	68	26	15	2.4	.18	.53
12	3.7	6.6	8.0	5.0	9.0	17	53	25	10	3.5	.16	.38
13	3.9	6.6	8.3	5.4	15	32	48	24	7.8	3.4	.23	.26
14	3.9	7.3	8.1	5.4	11	30	54	22	6.3	1.9	.22	.17
15	3.9	7.2	6.3	5.4	9.5	27	66	23	7.8	1.0	.21	.30
16	4.1	6.9	6.5	5.4	8.5	24	74	30	11	.75	.19	.26
17	5.6	7.0	6.3	5.4	8.0	19	89	24	18	.88	.21	.18
18	5.2	7.0	7.1	5.4	7.0	20	89	19	23	3.0	.31	.18
19	4.8	7.0	8.5	5.4	5.8	19	60	14	15	5.3	.37	.18
20	4.8	7.9	7.9	5.4	5.7	18	52	13	10	4.8	.29	.16
21	4.7	9.2	6.8	5.4	5.6	19	49	12	8.3	4.2	1.2	.18
22	4.6	11	7.1	5.4	5.6	15	58	13	7.4	4.2	1.4	.22
23	4.5	9.4	6.7	6.0	4.6	16	58	16	6.6	4.2	1.3	.23
24	4.0	8.5	5.6	6.0	4.5	16	54	17	5.8	3.6	1.3	.24
25	4.8	8.1	5.8	6.0	4.5	14	53	18	5.0	3.0	1.1	.27
26	4.6	8.1	7.0	6.0	4.0	14	51	31	4.3	2.6	.88	.28
27	4.1	7.8	6.4	7.0	4.4	10	48	27	3.9	2.1	.83	.33
28	4.7	6.3	4.9	8.6	4.8	7.5	47	20	4.0	1.4	.57	.32
29	5.2	5.5	5.9	7.5	---	6.1	54	14	4.3	1.1	.47	.29
30	7.3	4.8	5.2	6.5	---	6.7	71	10	4.6	.72	.52	.27
31	8.6	---	6.3	6.0	---	8.4	---	11	---	.62	.45	---
TOTAL	140.4	212.9	213.2	180.0	178.6	482.9	1529	792	331.1	94.17	32.70	15.31
MEAN	4.53	7.10	6.88	5.81	6.38	15.6	51.0	25.5	11.0	3.04	1.05	.51
MAX	8.6	11	8.6	8.6	15	32	89	70	32	7.9	3.8	2.0
MIN	3.4	4.8	4.9	4.0	4.0	5.2	11	10	3.9	.62	.16	.16
AC-FT	278	422	423	357	354	958	3030	1570	657	187	65	30

CAL YR 1986 TOTAL 16561.85 MEAN 45.4 MAX 738 MIN .14 AC-FT 32850
WTR YR 1987 TOTAL 4202.28 MEAN 11.5 MAX 89 MIN .16 AC-FT 8340

ABERT LAKE BASIN

10384000 CHEWAUCAN RIVER NEAR PAISLEY, OR

LOCATION.--Lat 42°41'05", long 120°34'08", in SW 1/4 NW 1/4 sec.26, T.33 S., R.18 E., Lake County, Hydrologic Unit 17120006, on left bank 1.2 mi downstream from Mill Creek and 1.4 mi southwest of Paisley.

DRAINAGE AREA.--275 mi^2.

PERIOD OF RECORD.--April 1912 to September 1921, May 1924 to current year. Published as "above Conn ditch, near Paisley" April to September 1912 and May 1924 to September 1955, as "above Mill Creek, near Paisley" October 1912 to December 1913, and as "at Chewaucan Land & Cattle Co.'s gage, near Paisley" January to September 1914.

REVISED RECORDS.--WSP 860: Drainage area. WSP 1927: 1957-59.

GAGE.--Water-stage recorder. Datum of gage is 4,430 ft above National Geodetic Vertical Datum of 1929 (river-profile survey). See WSP 1734 for history of changes prior to Oct. 6, 1956.

REMARKS.--Estimated daily discharges: Nov. 29, Dec. 1-31, Jan. 1, 5-23, Feb. 4, 6-9, 25-28. Records good except for estimated daily discharges, which are poor. No regulation. Diversions for irrigation upstream from station.

AVERAGE DISCHARGE.--72 years, 148 ft^3/s, 107,200 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 6,490 ft^3/s Dec. 22, 1964, gage height, 8.35 ft, from rating curve extended above 900 ft^3/s on basis of slope-area measurement of peak flow; no flow for part of each day Dec. 7, 1927, Dec. 12, 1932, result of freezeup.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 500 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Apr. 30	1900	*438	*2.65				

Minimum discharge, 18 ft^3/s Nov. 30.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	64	55	32	40	131	57	125	392	95	52	34	23
2	57	52	32	47	89	62	154	348	84	57	34	27
3	53	50	35	54	71	75	183	303	74	54	33	26
4	51	50	40	57	66	121	185	281	72	48	32	26
5	51	49	45	50	61	154	177	265	69	42	31	26
6	50	48	43	45	60	164	184	260	65	40	30	26
7	49	49	42	40	60	128	196	262	72	39	29	26
8	48	45	33	40	60	119	222	265	122	38	28	26
9	46	49	33	40	60	105	239	280	92	36	28	27
10	45	52	33	40	71	99	263	267	85	35	26	27
11	44	47	33	50	96	98	328	250	74	35	26	27
12	44	49	35	55	90	134	269	237	64	34	26	28
13	44	48	43	60	127	234	263	225	59	34	26	27
14	43	49	40	60	123	171	282	212	57	31	27	26
15	43	49	35	60	88	146	306	203	74	29	29	27
16	43	48	35	60	68	128	336	195	97	25	28	28
17	43	48	35	60	68	120	374	183	108	34	27	28
18	44	48	35	70	63	131	374	167	94	66	26	28
19	44	50	35	70	49	106	313	154	75	104	25	28
20	44	50	35	70	59	99	291	143	65	71	24	28
21	44	56	35	80	58	108	294	135	62	58	23	27
22	44	56	35	100	58	89	310	128	57	83	23	26
23	44	53	35	130	47	101	323	128	53	70	24	26
24	44	49	35	162	43	97	317	128	50	59	26	26
25	44	47	35	162	42	89	301	140	47	52	25	27
26	44	47	35	176	40	92	310	138	45	47	24	27
27	49	57	35	247	45	81	319	129	47	43	24	28
28	58	47	35	274	50	83	333	112	46	39	23	28
29	50	40	35	203	---	84	342	104	46	36	23	28
30	67	32	35	181	---	91	399	100	57	35	23	27
31	63	---	35	179	---	104	---	103	---	34	23	---
TOTAL	1501	1469	1114	2962	1943	3470	8312	6237	2107	1460	830	805
MEAN	48.4	49.0	35.9	95.5	69.4	112	277	201	70.2	47.1	26.8	26.8
MAX	67	57	45	274	131	234	399	392	122	104	34	28
MIN	43	32	32	40	40	57	125	100	45	25	23	23
AC-FT	2980	2910	2210	5880	3850	6880	16490	12370	4180	2900	1650	1600

CAL YR 1986 TOTAL 74204 MEAN 203 MAX 1610 MIN 29 AC-FT 147200
WTR YR 1987 TOTAL 32210 MEAN 88.2 MAX 399 MIN 23 AC-FT 63890

10388001 ANA RIVER NEAR SUMMER LAKE, OR

LOCATION.--Lat 42°59'42" (revised), long 120°44'54" (revised), in SE 1/4 sec.6, T.30 S., R.17 E., Lake County, Hydrologic Unit 17120005, on left bank 300 ft downstream from diversion dam and 2.0 mi northeast of town of Summer Lake.

DRAINAGE AREA.--Indeterminate; Ana River Springs, source of the stream located three-quarters of a mile upstream from station, are flooded by pondage behind diversion dam.

PERIOD OF RECORD.--October 1929 to September 1939 (river only); June to September 1928, April 1931 to July 1938, and April 1940 to September 1942 (irrigation season records for Summer Lake Canal only); June 1951 to current year. Prior to June 1951 monthly discharge only, published in WSP 1314.

GAGE.--Water-stage recorder. Elevation of gage is 4,160 ft from plans of Ana River diversion dam. Oct. 1, 1929, to Sept. 30, 1939, at site 80 ft downstream at different datum.

REMARKS.--No estimated daily discharges. Records excellent except those for June and July, which are good. All records presented herein include flow in Summer Lake Canal which diverts 300 ft upstream from station for irrigation of lands along west side of Summer Lake. Flow regulated by gates at diversion dam.

AVERAGE DISCHARGE.--39 years (water years 1931-32, 1936, 1952-87), 90.8 ft^3/s, 65,780 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 188 ft^3/s Dec. 22, 1964, gage height, 2.81 ft, no flow in canal; minimum discharge, 1.0 ft^3/s Jan. 21, 22, 1970; minimum daily, 3.0 ft^3/s Oct. 31, 1970.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 127 ft^3/s Oct. 2, gage height, 2.43 ft; minimum daily discharge, 57 ft^3/s May 1.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	100	95	95	94	90	89	89	57	86	85	84	88
2	111	95	95	93	90	90	89	77	86	84	84	88
3	124	95	95	93	90	90	89	80	86	83	84	88
4	119	95	95	92	90	90	90	80	85	82	85	88
5	98	95	95	92	90	90	90	82	84	83	85	89
6	98	95	95	92	90	90	89	79	81	83	85	89
7	97	95	95	92	90	90	88	80	84	83	86	88
8	97	95	94	91	90	90	88	80	85	83	86	82
9	97	95	94	91	91	90	88	80	86	83	86	81
10	96	95	94	91	90	89	89	80	84	83	84	86
11	95	95	94	91	91	89	88	80	83	84	85	90
12	94	95	93	91	91	89	88	81	84	84	86	91
13	94	95	93	91	91	89	88	81	84	88	86	86
14	96	94	93	91	90	89	87	81	86	90	84	82
15	97	94	93	92	90	89	83	81	88	86	84	85
16	97	94	93	90	90	89	85	80	89	83	85	85
17	96	94	93	90	90	90	86	81	88	80	86	86
18	95	94	93	90	90	90	86	81	87	82	86	86
19	95	94	93	90	90	90	87	81	87	82	85	83
20	95	94	93	90	90	90	81	81	87	86	84	87
21	95	94	93	90	89	89	78	82	88	88	84	87
22	95	94	93	90	89	90	79	82	83	90	86	87
23	95	94	93	90	89	89	77	82	81	88	91	87
24	95	94	92	90	89	89	77	82	83	87	90	86
25	95	94	92	90	82	89	77	83	86	84	88	85
26	95	94	92	90	89	89	77	83	84	87	87	85
27	95	95	92	90	89	89	77	82	84	86	88	84
28	95	95	92	90	89	89	75	83	84	85	87	84
29	95	94	93	90	---	89	72	84	87	85	87	84
30	95	94	93	90	---	89	62	81	85	85	87	83
31	95	---	94	90	---	89	---	83	---	84	88	---
TOTAL	3036	2835	2897	2817	2509	2772	2499	2490	2555	2626	2663	2580
MEAN	97.9	94.5	93.5	90.9	89.6	89.4	83.3	80.3	85.2	84.7	85.9	86.0
MAX	124	95	95	94	91	90	90	84	89	90	91	91
MIN	94	94	92	90	82	89	62	57	81	80	84	81
AC-FT	6020	5620	5750	5590	4980	5500	4960	4940	5070	5210	5280	5120

CAL YR 1986 TOTAL 32731 MEAN 89.7 MAX 124 MIN 56 AC-FT 64920
WTR YR 1987 TOTAL 32279 MEAN 88.4 MAX 124 MIN 57 AC-FT 64030

10390001 SILVER CREEK NEAR SILVER LAKE, OR

LOCATION.--Lat 43°06'50", long 121°03'59" in NE 1/4 SW 1/4 sec.28, T.28 S., R.14 E., Lake County, Hydrologic Unit 17120005, on right bank 1.5 mi downstream from diversion dam of Silver Lake Irrigation District, 1.5 mi southwest of town of Silver Lake, and 3 mi upstream from Bridge Creek.

DRAINAGE AREA.--180 mi^2, approximately.

PERIOD OF RECORD.--January 1905 to March 1907, January 1909 to September 1927, February to December 1928, February 1929 to current year.

REVISED RECORDS.--WSP 1564: 1906, 1910, 1921(M). WSP 1734: Drainage area.

GAGE.--Water-stage recorder. Concrete control since Sept. 15, 1932. Datum of gage is 4,361.22 ft above National Geodetic Vertical Datum of 1929. Prior to May 24, 1932, nonrecording gage or water-stage recorder at practically same location at datum 1.00 ft higher, or nonrecording gage at diversion dam outlet 1.5 mi upstream at different datum.

REMARKS.--Estimated daily discharges: Nov. 30, Dec. 1, 10, Dec. 12 to Feb. 9, Feb. 13-17, 26. Records good except for estimated daily discharges, which are fair. Flow regulated by reservoir, capacity, 800 acre-ft, 1.5 mi upstream from station and by Thompson Valley Reservoir, capacity, 17,400 acre-ft, 11 mi upstream from station. Records given herein include flow in Silver Lake Irrigation District Canal which diverts 1.5 mi upstream from station. No record of diversion October 1943 to September 1965.

AVERAGE DISCHARGE.--75 years (water years 1906, 1910-27, 1930-41, 1944-87), 31.7 ft^3/s, 22,970 acre-ft/yr, including diversion by Silver Lake Irrigation District Canal.

EXTREMES FOR PERIOD OF RECORD.--Creek only, maximum discharge, 1,800 ft^3/s Mar. 20, 1907, gage height, 10.08 ft, present datum, from rating curve extended above 700 ft^3/s; maximum gage height, 10.3 ft Dec. 22, 1964; no flow at times in 1931-32, 1934, 1937.

Combined flow, maximum discharge, 1,800 ft^3/s Mar. 20, 1907, gage height, 10.08 ft, present datum, from rating curve extended above 700 ft^3/s; maximum gage height, 10.3 ft Dec. 22, 1964; no flow at times in 1931-32, 1934, 1937.

EXTREMES FOR CURRENT YEAR.--Creek only, maximum discharge, 36 ft^3/s May 14, gage height, 2.17 ft; maximum gage height, 3.02 ft Jan. 17, backwater from ice; minimum discharge, 5.0 ft^3/s Apr. 11, gage height, 1.60 ft.

Combined flow, maximum daily discharge, 71 ft^3/s May 24, 25, June 15-17; minimum daily discharge, 9.3 ft^3/s Dec. 4.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	16	14	11	13	17	13	17	56	67	46	35	45
2	16	14	11	13	17	14	18	55	69	47	35	44
3	16	14	10	13	17	15	18	52	68	48	32	43
4	16	13	9.3	13	16	24	17	51	67	46	32	46
5	16	13	10	14	15	25	16	50	67	47	34	47
6	16	13	10	14	15	24	15	51	68	47	34	46
7	16	13	10	14	15	19	15	52	67	46	33	46
8	16	13	9.9	14	15	18	15	53	69	46	33	45
9	16	12	9.9	13	15	17	16	53	68	46	33	46
10	16	11	9.8	13	14	17	14	53	70	48	37	44
11	16	11	9.8	13	14	18	13	51	67	48	37	44
12	16	11	11	13	14	21	14	50	68	48	37	43
13	15	11	11	13	17	29	14	49	67	49	37	42
14	15	10	11	13	20	24	18	59	67	45	41	42
15	14	10	11	13	18	24	20	64	71	43	41	42
16	14	10	11	14	15	24	19	64	71	43	41	42
17	14	10	11	14	15	22	22	66	71	47	41	42
18	14	10	11	14	14	23	23	65	57	49	41	43
19	14	10	11	14	15	21	23	67	48	46	41	43
20	14	10	12	14	14	19	23	68	47	45	40	42
21	14	10	12	14	14	20	24	68	46	45	40	41
22	14	10	13	14	15	19	22	69	44	52	36	40
23	14	10	13	14	14	19	22	70	45	50	41	40
24	14	11	13	14	14	18	28	71	46	41	45	40
25	14	10	12	15	13	17	33	71	47	41	45	40
26	14	10	13	16	14	17	33	70	48	42	45	40
27	14	11	13	15	14	16	31	70	46	41	45	40
28	14	11	13	15	14	16	37	68	47	40	45	40
29	14	11	12	15	---	16	44	67	46	40	45	40
30	14	11	13	16	---	16	46	67	46	41	44	41
31	14	---	13	16	---	16	---	67	---	37	45	---
TOTAL	460	338	350.7	433	424	601	670	1887	1775	1400	1211	1279
MEAN	14.8	11.3	11.3	14.0	15.1	19.4	22.3	60.9	59.2	45.2	39.1	42.6
MAX	16	14	13	16	20	29	46	71	71	52	45	47
MIN	14	10	9.3	13	13	13	13	49	44	37	32	40
AC-FT	912	670	696	859	841	1190	1330	3740	3520	2780	2400	2540

CAL YR 1986 TOTAL 19005.7 MEAN 52.1 MAX 527 MIN 9.3 AC-FT 37700
WTR YR 1987 TOTAL 10828.7 MEAN 29.7 MAX 71 MIN 9.3 AC-FT 21480

10393500 SILVIES RIVER NEAR BURNS, OR

LOCATION.-- Lat 43°42'55", long 119°10'35", in NW 1/4 NW 1/4 sec.31, T.21 S., R.30 E., Harney County, Hydrologic Unit 17120002, on left bank 5 mi downstream from Emigrant Creek and 11 mi northwest of Burns.

DRAINAGE AREA.--934 mi^2.

PERIOD OF RECORD.--May 1903 to July 1906, December 1908 to December 1912, March 1913 to September 1917 (irrigation seasons only), March 1918 to October 1920, March 1921 to July 1922 (irrigation seasons only), October 1922 to current year.

GAGE.--Water-stage recorder. Datum of gage is 4,195 ft above National Geodetic Vertical Datum of 1929 (river-profile survey). See WSP 1734 for history of changes prior to Oct. 4, 1951.

REMARKS.--Estimated daily discharges: Nov. 23-25, Nov. 29 to Feb. 11, Feb. 27. Records good except those for estimated daily discharges, which are poor. No regulation. Diversions for irrigation upstream from station during periods of high flow only.

AVERAGE DISCHARGE.--74 years (water years 1904-5, 1910-12, 1918-21, 1923-87), 181 ft^3/s, 131,100 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 4,960 ft^3/s Apr. 6, 1952, gage height, 15.2 ft; no flow July 19 to Sept. 22, 1934.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 539 ft^3/s Mar. 13, gage height, 4.64 ft; minimum discharge, many days during September.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	43	48	40	40	70	85	232	278	73	33	23	15
2	42	47	40	40	60	84	282	302	68	33	22	15
3	40	47	40	40	50	99	326	296	64	33	22	14
4	40	46	45	40	50	190	363	284	60	32	21	14
5	39	46	55	40	50	269	380	256	61	32	20	14
6	38	45	55	35	50	340	375	218	53	32	19	15
7	38	46	50	30	50	355	388	192	48	31	20	15
8	37	47	42	25	50	405	424	170	56	30	20	14
9	37	48	38	25	60	359	436	155	71	29	19	14
10	36	47	35	25	80	322	431	136	62	27	18	14
11	36	42	32	25	100	282	442	130	50	27	17	14
12	36	57	35	25	131	292	433	123	46	26	16	14
13	39	53	35	25	200	490	415	119	43	25	17	14
14	36	54	35	25	332	485	404	112	40	23	18	14
15	37	55	33	25	336	487	392	98	44	22	18	14
16	36	56	33	25	301	456	382	97	95	20	18	14
17	37	56	33	25	267	404	377	91	98	19	18	14
18	37	56	35	25	212	402	367	85	81	20	18	15
19	38	57	35	25	178	359	343	76	71	22	17	15
20	38	59	36	25	145	342	321	71	61	24	17	15
21	39	60	37	25	129	318	307	68	55	24	16	15
22	38	62	37	25	121	291	293	67	53	33	16	15
23	39	55	35	30	111	274	284	63	52	46	16	15
24	39	50	35	35	100	262	270	63	48	37	18	14
25	39	48	35	37	93	246	250	74	44	35	16	15
26	39	47	35	37	90	244	223	69	41	35	16	14
27	40	65	35	54	90	225	221	68	38	32	16	15
28	42	59	35	45	87	215	204	77	35	30	16	15
29	43	50	35	45	---	204	189	75	34	27	15	15
30	45	40	35	45	---	202	218	71	35	26	15	15
31	49	---	35	45	---	207	---	70	---	24	15	---
TOTAL	1212	1548	1171	1013	3593	9195	9972	4054	1680	889	553	435
MEAN	39.1	51.6	37.8	32.7	128	297	332	131	56.0	28.7	17.8	14.5
MAX	49	65	55	54	336	490	442	302	98	46	23	15
MIN	36	40	32	25	50	84	189	63	34	19	15	14
AC-FT	2400	3070	2320	2010	7130	18240	19780	8040	3330	1760	1100	863

CAL YR 1986 TOTAL 105250 MEAN 288 MAX 2950 MIN 19 AC-FT 208800
WTR YR 1987 TOTAL 35315 MEAN 96.8 MAX 490 MIN 14 AC-FT 70050

10396000 DONNER UND BLITZEN RIVER NEAR FRENCHGLEN, OR

LOCATION.--Lat 42°47'28", long 118°52'00", in NW 1/4 NW 1/4 sec.20, T.32 S., R.32-1/2 E., Harney County, Hydrologic Unit 17120003, Bureau of Land Management land, on left bank 1.5 mi upstream from upper diversions for Malheur National Wildlife Refuge, 2.0 mi downstream from Fish Creek, and 3.5 mi southeast of Frenchglen.

DRAINAGE AREA.--200 mi^2, approximately.

PERIOD OF RECORD.--March 1911 to September 1913, March 1914 to September 1916, April 1917 to September 1921, August to November 1929, April to September 1930, December 1937 to current year. Monthly discharge only for some periods, published in WSP 1314. Published as "near Diamond" 1911-21. Records of discharge for January 1909 to September 1910 (published in WSP 270, 290, and 370, for a nonequivalent site as "near Diamond") have been found to be unreliable and should not be used.

REVISED RECORDS.--WSP 330: Drainage area (former site). WSP 860: Drainage area (present site). WSP 1564: 1938-39(M), 1942-43(M), 1948(M), 1951(P), 1952-53. WSP 1714: Drainage area. See also PERIOD OF RECORD.

GAGE.--Water-stage recorder and concrete control. Datum of gage is 4,254 ft above National Geodetic Vertical Datum of 1929 (levels by Fish and Wildlife Service). Prior to December 1937, nonrecording gage at several sites within 2 mi downstream at different datums. Dec. 6, 1937, to Feb. 14, 1938, nonrecording gage at present site and datum.

REMARKS.--Estimated daily discharges: Jan. 16-19. Records excellent except for period of ice effect Jan. 16-19, which are good. No regulation or diversion upstream from station. Water-quality records for period March 1975 to September 1986 have been collected at this location.

AVERAGE DISCHARGE.--57 years (water years 1912-13, 1915-16, 1918-21, 1939-87), 128 ft^3/s, 92,740 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 4,270 ft^3/s Apr. 26, 1978, gage height, 7.15 ft, from floodmarks, from rating curve extended above 1,900 ft^3/s on basis of slope-area measurement of peak flow; minimum discharge, 4.2 ft^3/s Dec. 9, 1972, result of freezeup.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 650 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Apr. 30	0130	*717	*3.84	No other peak greater than base discharge.			

Minimum discharge, 23 ft^3/s Jan. 7, but may have been less during period of ice effect.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	66	66	62	64	61	53	91	449	141	70	44	36
2	63	62	63	55	64	67	114	346	132	84	43	37
3	62	62	60	57	82	76	135	290	135	71	42	37
4	62	61	58	55	71	76	171	282	154	67	42	37
5	64	60	59	54	63	91	157	311	170	64	41	38
6	65	59	59	52	69	113	144	356	163	62	41	37
7	68	60	56	43	114	104	157	392	163	59	41	37
8	67	59	51	35	114	101	178	391	171	58	41	37
9	64	61	50	36	101	96	182	369	142	56	40	37
10	64	57	50	44	234	82	196	381	133	58	40	36
11	62	61	53	62	161	76	219	349	129	56	40	36
12	61	64	65	74	96	87	170	335	129	54	40	36
13	61	63	61	71	331	119	162	356	116	52	41	37
14	61	62	58	56	103	104	171	333	111	51	43	37
15	60	61	54	52	70	126	198	316	138	49	42	36
16	59	61	58	43	60	95	223	297	185	48	41	38
17	59	61	52	34	56	93	246	255	140	50	40	38
18	59	60	61	34	56	226	212	210	117	58	40	38
19	59	63	66	47	54	128	175	183	106	74	39	38
20	59	61	58	70	49	131	163	161	103	66	39	37
21	59	68	52	69	53	131	168	146	101	60	39	37
22	58	63	57	66	53	116	195	134	93	62	39	36
23	58	62	55	62	51	111	219	127	89	56	39	36
24	58	61	54	59	49	176	219	136	85	53	39	36
25	58	59	52	64	50	179	247	139	81	51	39	36
26	58	58	58	80	45	155	288	198	78	48	38	36
27	64	62	53	69	54	89	372	200	79	47	38	38
28	67	59	42	72	51	75	454	165	78	46	38	38
29	61	60	65	69	---	69	557	165	73	45	37	38
30	68	51	53	62	---	69	627	160	75	44	37	37
31	67	---	56	56	---	75	---	152	---	44	36	---
TOTAL	1921	1827	1751	1766	2415	3289	6810	8084	3610	1763	1239	1108
MEAN	62.0	60.9	56.5	57.0	86.2	106	227	261	120	56.9	40.0	36.9
MAX	68	68	66	80	331	226	627	449	185	84	44	38
MIN	58	51	42	34	45	53	91	127	73	44	36	36
AC-FT	3810	3620	3470	3500	4790	6520	13510	16030	7160	3500	2460	2200

CAL YR 1986 TOTAL 59615 MEAN 163 MAX 1340 MIN 42 AC-FT 118200
WTR YR 1987 TOTAL 35583 MEAN 97.5 MAX 627 MIN 34 AC-FT 70580

10401800 MALHEUR LAKE NEAR VOLTAGE, OR

LOCATION.--Lat 43°16'04", long 118°50'31", in NE 1/4 SE 1/4 sec.35, T.26 S., R.31 E., Harney County, Hydrologic Unit 17120001, at Malheur National Wildlife Refuge Headquarters, near Voltage.

DRAINAGE AREA.--2,150 mi^2, approximately.

PERIOD OF RECORD.--March 1972 to September 1980, March 1983 to current year. Published as "at break in Cole Island Dike" (station 10401830) 1972-78.

GAGE.--Water-stage recorder. Datum of gage is National Geodetic Vertical Datum (NGVD) of 1929. Prior to Aug. 21, 1984, at various sites within 6 mi of present site, at different datums.

REMARKS.--Elevations for Dec. 1, 4, 10 provided by U.S. Fish and Wildlife.

EXTREMES FOR PERIOD OF RECORD.--Maximum daily elevation observed, 4,102.60 ft Apr. 24, 1986; minimum recorded, 4,090.60 ft Oct. 2, 3, 16, 1976.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum elevation observed since 1938, 4,095.39 ft, occurred in 1952, from records of Malheur National Wildlife Refuge for staff gage in channel of Donner und Blitzen River; entire bed of lake dry September 1934.

EXTREMES FOR CURRENT YEAR.--Maximum elevation, 4,101.14 ft Mar. 26; minimum, 4,098.74 ft Sept. 25.

ELEVATION (FEET NGVD), WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	4100.71	4100.62	4100.58	4100.63	4100.78	4100.87	4100.86	4100.71	4100.47	4100.17	4099.74	4099.13
2	4100.71	4100.60	---	4100.68	4100.79	4100.85	4100.88	4100.71	4100.44	4100.20	4099.70	4099.13
3	4100.68	4100.60	---	4100.64	4100.79	4100.86	4100.81	4100.71	4100.43	4100.18	4099.68	4099.15
4	4100.66	4100.59	4100.56	4100.68	4100.79	4100.87	4100.88	4100.69	4100.37	4100.14	4099.66	4099.10
5	4100.67	4100.62	---	4100.68	4100.79	4100.85	4100.88	4100.69	4100.38	4100.15	4099.66	4099.08
6	4100.67	4100.64	---	4100.68	4100.80	4100.87	4100.86	4100.68	4100.38	4100.11	4099.65	4099.07
7	4100.67	4100.61	---	4100.68	4100.79	4100.88	4100.84	4100.68	4100.39	4100.09	4099.62	4099.07
8	4100.66	4100.62	---	4100.68	4100.79	4100.85	4100.88	4100.68	4100.39	4100.10	4099.60	4099.05
9	4100.67	4100.63	---	4100.68	4100.80	4100.87	4100.85	4100.66	4100.41	4100.07	4099.58	4099.04
10	4100.70	4100.63	4100.58	4100.68	4100.81	4100.86	4100.83	4100.67	4100.39	4100.05	4099.57	4099.03
11	4100.65	4100.59	---	4100.68	4100.80	4100.87	4100.84	4100.65	4100.36	4100.00	4099.55	4099.02
12	4100.63	4100.58	---	4100.69	4100.81	4100.88	4100.82	4100.64	4100.34	4099.98	4099.55	4099.01
13	4100.63	4100.58	---	4100.69	4100.81	4100.90	4100.80	4100.64	4100.34	4099.97	4099.52	4098.99
14	4100.63	4100.57	---	4100.70	4100.84	4100.91	4100.78	4100.62	4100.37	4099.96	4099.54	4098.97
15	4100.64	4100.57	---	4100.70	4100.84	4101.00	4100.78	4100.58	4100.33	4099.98	4099.49	4098.99
16	4100.62	4100.56	---	4100.70	4100.85	4100.97	4100.78	4100.64	4100.39	4099.99	4099.46	4098.94
17	4100.61	4100.58	4100.60	4100.70	4100.85	4100.94	4100.71	4100.61	4100.38	4099.90	4099.45	4098.93
18	4100.67	4100.55	4100.59	4100.71	4100.87	4100.93	4100.90	4100.62	4100.39	4099.78	4099.44	4098.90
19	4100.62	4100.59	4100.60	4100.71	4100.89	4100.96	4100.76	4100.61	4100.38	4099.86	4099.31	4098.90
20	4100.61	4100.58	4100.60	4100.71	4100.86	4100.94	4100.74	4100.55	4100.34	4099.85	4099.29	4098.89
21	4100.60	4100.61	4100.60	4100.71	4100.86	4100.93	4100.72	4100.48	4100.38	4099.78	4099.28	4098.89
22	4100.61	4100.59	4100.60	4100.71	4100.85	4100.90	4100.68	4100.46	4100.37	4099.77	4099.28	4098.88
23	4100.60	4100.62	4100.61	4100.72	4100.94	4100.93	4100.68	4100.45	4100.34	4099.88	4099.28	4098.87
24	4100.59	4100.61	4100.61	4100.74	4100.97	4100.96	4100.70	4100.45	4100.30	4099.83	4099.26	4098.86
25	4100.60	4100.61	4100.61	4100.76	4100.86	4100.91	4100.70	4100.46	4100.29	4099.82	4099.26	4098.82
26	4100.58	4100.61	4100.61	4100.77	4100.86	4100.97	4100.69	4100.57	4100.28	4099.82	4099.24	4098.84
27	4100.59	4100.56	4100.62	4100.77	4100.86	4100.94	4100.66	4100.47	4100.22	4099.80	4099.21	4098.82
28	4100.61	4100.60	4100.62	4100.77	4100.86	4100.96	4100.64	4100.48	4100.24	4099.78	4099.20	4098.80
29	4100.57	4100.65	4100.62	4100.78	---	4100.86	4100.67	4100.47	4100.23	4099.76	4099.19	4098.79
30	4100.61	4100.59	4100.63	4100.77	---	4100.85	4100.62	4100.37	4100.24	4099.75	4099.19	4098.79
31	4100.62	---	4100.63	4100.78	---	4100.85	---	4100.49	---	4099.74	4099.18	---
MEAN	4100.64	4100.60	---	4100.71	4100.84	4100.90	4100.77	4100.59	4100.35	4099.94	4099.44	4098.96
MAX	4100.71	4100.65	---	4100.78	4100.97	4101.00	4100.90	4100.71	4100.47	4100.20	4099.74	4099.15
MIN	4100.57	4100.55	---	4100.63	4100.78	4100.85	4100.62	4100.37	4100.22	4099.74	4099.18	4098.79

10406500 TROUT CREEK NEAR DENIO, NV

LOCATION.--Lat 42°09'20", long 118°27'14", in NW 1/4 SE 1/4 sec.26, T.39 S., R.36 E., Harney County, Hydrologic Unit 17120009, on right bank 0.4 mi upstream from bridge at mouth of canyon, 5 mi east of Trout Creek Ranch, and 14 mi northeast of Denio.

DRAINAGE AREA.--88 mi^2, approximately.

PERIOD OF RECORD.--March 1911 to March 1912, April 1922 to November 1923, March 1925 to September 1931 (irrigation seasons only), April 1932 to current year. Prior to Oct. 1, 1961, published as "near Denio, Oreg."

REVISED RECORDS.--WSP 1564: 1932, 1933-34(M), 1938(M). WSP 1714: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 4,351.52 ft above National Geodetic Vertical Datum of 1929. Mar. 25, 1911, to Mar. 31, 1912, nonrecording gage at bridge 0.4 mi downstream at different datum. Apr. 28, 1922, to June 14, 1932, water-stage recorder at site 10 ft upstream at datum 0.50 ft higher.

REMARKS.--Estimated daily discharges: Oct. 20 to Nov. 21; Nov. 29, 30; Dec. 1-4, 8-16, 18-27, 29-31; Jan. 1, 2, 6-31; Feb. 2-9, 20-28. Records good except for estimated daily discharges, which are fair. No regulation. Diversions for irrigation upstream from station.

AVERAGE DISCHARGE.--56 years (water years 1923, 1933-87), 16.8 ft^3/s, 12,170 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 470 ft^3/s Aug. 1, 1933, gage height, 5.26 ft, from rating curve extended above 230 ft^3/s; minimum discharge observed, 0.10 ft^3/s Aug. 4, 1930, Aug. 1, Sept. 12, 28, 1934. Probably no flow at times Sept. 1-19, 1931.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage, 6.0 ft, caused by cloudburst, probably occurred in 1924 or 1925.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 50 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Jan. 25	2000	a	*3.01	Apr. 30	1330	*47	2.82

Minimum discharge, 2.6 ft^3/s Dec. 31.

a Backwater from ice.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	8.4	8.6	7.5	7.5	10	9.0	10	27	13	7.3	3.2	3.3
2	8.3	8.0	7.5	8.5	9.0	8.9	11	24	11	7.6	3.3	3.3
3	7.9	7.8	7.5	9.8	8.0	8.9	13	21	11	7.6	3.3	3.3
4	7.6	7.6	7.5	9.8	8.0	9.8	18	20	10	7.3	3.2	3.3
5	7.9	7.5	8.4	9.6	8.0	10	19	18	9.6	6.6	3.3	3.3
6	7.8	7.5	8.6	8.0	8.0	13	19	20	9.2	6.3	3.1	3.3
7	7.5	7.5	8.3	7.0	8.0	14	20	21	13	6.0	3.0	3.3
8	7.5	7.5	7.0	6.0	8.0	12	23	18	13	5.8	3.1	3.4
9	7.4	7.5	6.0	6.0	8.0	11	25	18	11	5.9	3.1	3.4
10	7.3	7.8	6.0	6.0	8.8	11	27	19	9.8	6.0	3.1	3.4
11	7.4	8.0	6.0	6.5	9.0	11	34	19	8.8	5.8	3.1	3.4
12	7.4	8.0	6.0	6.5	8.7	11	31	16	8.2	5.9	3.1	3.4
13	7.2	8.0	6.5	6.5	11	11	29	14	7.5	5.5	3.2	3.4
14	7.2	8.0	7.0	6.5	10	11	29	13	7.0	5.1	3.4	3.6
15	7.3	8.0	7.0	5.0	9.3	9.5	28	13	8.7	4.4	3.6	3.9
16	7.0	8.0	7.0	5.0	8.8	9.4	20	13	11	4.4	3.4	3.9
17	7.0	8.0	5.6	5.0	8.4	9.6	21	15	9.3	4.4	3.3	3.9
18	7.2	8.0	6.5	5.0	9.0	11	25	15	9.1	5.1	4.0	3.8
19	7.4	8.0	6.5	5.0	7.0	10	22	13	9.3	5.5	3.8	3.3
20	7.5	8.0	6.5	5.0	7.0	9.7	22	11	8.8	4.5	3.7	3.4
21	7.5	9.2	7.0	5.4	7.0	9.8	18	10	9.5	4.9	3.7	3.4
22	7.5	7.9	7.5	6.0	7.0	9.6	14	10	9.2	4.9	4.0	3.4
23	7.5	8.2	7.5	6.5	7.0	11	14	10	8.5	5.0	3.8	3.4
24	7.5	7.9	7.5	6.5	6.8	11	13	11	7.9	5.2	3.9	3.3
25	7.5	7.5	7.5	7.0	6.6	10	13	17	7.7	4.6	3.6	3.3
26	7.5	7.1	7.5	8.5	6.6	11	15	35	7.7	4.3	3.6	3.5
27	7.6	8.1	7.5	10	7.0	10	20	24	8.4	4.0	3.6	3.5
28	7.7	7.6	7.2	8.5	8.0	10	19	18	8.3	3.4	3.5	3.5
29	8.0	7.5	6.8	8.5	---	9.9	31	16	7.2	3.4	3.2	3.5
30	8.4	7.5	6.8	8.5	---	10	35	15	7.1	3.4	3.2	3.5
31	9.0	---	6.8	9.0	---	9.2	---	14	---	3.2	3.3	---
TOTAL	235.9	235.8	218.5	218.6	228.0	322.3	638	528	279.8	163.3	105.7	103.6
MEAN	7.61	7.86	7.05	7.05	8.14	10.4	21.3	17.0	9.33	5.27	3.41	3.45
MAX	9.0	9.2	8.6	10	11	14	35	35	13	7.6	4.0	3.9
MIN	7.0	7.1	5.6	5.0	6.6	8.9	10	10	7.0	3.2	3.0	3.3
AC-FT	468	468	433	434	452	639	1270	1050	555	324	210	205

CAL YR 1986 TOTAL 9055.4 MEAN 24.8 MAX 109 MIN 3.5 AC-FT 17960
WTR YR 1987 TOTAL 3277.5 MEAN 8.98 MAX 35 MIN 3.0 AC-FT 6500

WILLIAMSON RIVER BASIN

11491400 WILLIAMSON RIVER BELOW SHEEP CREEK, NEAR LENZ, OR

LOCATION.--Lat 42°54'42", long 121°28'32", in NE 1/4 SW 1/4 sec.1, T.31 S., R.10 E., Klamath County, Hydrologic Unit 18010201, on left bank at Forest Service bridge, 0.1 mi downstream from Sheep Creek and 17 mi east of Lenz.

DRAINAGE AREA.--205 mi^2.

PERIOD OF RECORD.--October 1973 to current year. Prior to October 1979, in reports of Oregon Water Resources Department.

GAGE.--Water-stage recorder. Elevation of gage is 4,550 ft, from topographic map.

REMARKS.--Estimated daily discharges: Jan. 8-23. Records good except for estimated daily discharges, which are fair. Diversions for irrigation upstream from station.

AVERAGE DISCHARGE.--14 years, 73.1 ft^3/s, 52,960 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 246 ft^3/s May 9, 10, 1974, gage height, 3.51 ft; minimum discharge, 16 ft^3/s Dec. 13, 1980, result of freezeup.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 75 ft^3/s Feb. 13, gage height, 1.37 ft; maximum gage height, 2.19 ft Jan. 17, backwater from ice; minimum discharge, 43 ft^3/s Aug. 26, Sept. 14.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	71	66	65	66	67	66	66	60	57	51	52	47
2	70	66	65	65	68	66	66	61	57	54	52	46
3	69	66	66	65	67	66	66	58	56	52	51	47
4	69	66	66	65	66	67	66	58	55	52	50	46
5	68	66	68	65	66	66	66	57	58	51	50	47
6	68	65	68	64	65	67	66	56	59	50	51	47
7	68	66	67	63	65	66	66	57	58	50	51	47
8	67	66	66	60	66	66	66	57	60	50	51	47
9	67	66	66	60	65	66	67	59	59	49	51	47
10	67	66	65	64	67	66	68	59	57	49	50	47
11	66	65	65	64	71	66	68	57	58	48	50	47
12	66	65	66	64	71	68	65	55	59	51	51	47
13	66	65	66	64	74	70	64	56	57	52	51	47
14	66	66	66	64	72	69	64	56	56	51	51	46
15	66	66	64	60	70	70	60	55	58	51	51	47
16	65	65	65	58	69	70	55	55	58	50	50	48
17	66	65	64	58	69	70	54	55	59	54	50	49
18	66	65	65	58	69	70	53	55	59	61	50	49
19	66	65	65	60	68	69	54	54	58	61	49	49
20	65	65	66	62	68	68	55	54	57	57	49	50
21	65	66	65	62	68	68	54	54	56	55	48	49
22	65	66	66	62	67	68	54	54	56	64	47	49
23	65	66	65	62	67	68	52	54	55	64	48	50
24	65	65	65	64	67	67	52	54	54	60	48	49
25	65	65	64	65	66	67	52	58	53	58	47	50
26	65	65	65	67	66	67	52	59	53	56	46	50
27	67	66	65	70	66	66	52	57	54	54	47	50
28	66	66	64	72	66	66	51	56	53	53	47	51
29	66	66	64	69	---	66	52	57	51	53	47	51
30	68	65	64	69	---	66	53	57	51	53	47	51
31	67	---	64	68	---	66	---	57	---	53	47	---
TOTAL	2066	1967	2025	1979	1896	2087	1779	1751	1691	1667	1530	1447
MEAN	66.6	65.6	65.3	63.8	67.7	67.3	59.3	56.5	56.4	53.8	49.4	48.2
MAX	71	66	68	72	74	70	68	61	60	64	52	51
MIN	65	65	64	58	65	66	51	54	51	48	46	46
AC-FT	4100	3900	4020	3930	3760	4140	3530	3470	3350	3310	3030	2870

CAL YR 1986 TOTAL 29822 MEAN 81.7 MAX 173 MIN 57 AC-FT 59150
WTR YR 1987 TOTAL 21885 MEAN 60.0 MAX 74 MIN 46 AC-FT 43410

11492200 CRATER LAKE NEAR CRATER LAKE, OR
(Hydrologic bench-mark station)

LOCATION.--Lat 42°58'45", long 122°04'45", (unsurveyed) Crater Lake National Park and Vicinity Quadrangle, Klamath County, Hydrologic Unit 18010201, at boat harbor at end of trail in Cleetwood Cove and 6 mi northeast of Crater Lake post office.

DRAINAGE AREA.--26.2 mi^2, of which 20.5 mi^2 is lake area at elevation 6,176 ft.

WATER-ELEVATION RECORDS

PERIOD OF RECORD.--October 1961 to current year. 1878 to September 1961 (fragmentary records) available in files of U.S. Geological Survey.

GAGE.--Water-stage recorder. Datum of gage is National Geodetic Vertical Datum of 1929. Prior to September 1961, nonrecording gage and various reference points used near old boat landing at abandoned trail (Eagle Cove) directly across Lake.

REMARKS.--Crater Lake occupies the caldera of prehistoric Mount Mazama. It has no visible inlet or outlet. Over a period of years precipitation and runoff from snowmelt on the walls of the crater are offset by seepage and evaporation. Records of accumulated annual precipitation, collected at the north rim of Crater Lake as part of the operation of this station, are published annually in reports of the National Weather Service.

EXTREMES FOR PERIOD OF RECORD.--Maximum elevation, 6,179.34 ft Mar. 25, 1975; minimum observed, 6,163.2 ft Sept. 10, 1942.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum elevation known, 6,180.5 ft, average of several observations of line of crustose lichens made between 1916 and 1960; that stage may have occurred near the close of the 19th century. The occurrence of living pine trees slightly higher suggests that the lake has not been materially higher for several centuries.

EXTREMES FOR CURRENT YEAR.--Maximum elevation recorded, 6,177.07 ft Mar. 18; minimum recorded, 6,174.95 ft Sept. 30.

ELEVATION (FEET NGVD), WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
INSTANTANEOUS OBSERVATIONS AT 2400

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	6176.97	6176.73	6176.73	6176.66	6176.77	6176.80	6176.90	6176.72	6176.61			---
2	6176.95	6176.72	6176.71	6176.63	6176.93	6176.77	6176.88	6176.73	6176.61			---
3	6176.92	6176.70	6176.70	6176.66	6176.95	6176.83	6176.86	6176.73	6176.58			6175.50
4	6176.90	6176.70	6176.70	6176.68	6176.95	6176.91	6176.86	6176.72	6176.57			6175.47
5	6176.86	6176.66	6176.72	6176.66	6176.93	6176.84	6176.86	6176.71	6176.58			6175.46
6	6176.88	6176.67	6176.72	6176.63	6176.91	6176.86	6176.81	6176.72	6176.56			6175.45
7	6176.88	6176.70	6176.68	6176.63	6176.86	6176.82	6176.82	6176.71	6176.55			6175.42
8	6176.86	6176.68	6176.66	6176.61	6176.86	6176.83	6176.81	6176.70	6176.55			6175.41
9	6176.86	6176.67	6176.64	6176.61	6176.82	6176.79	6176.79	6176.70	6176.54			6175.39
10	6176.83	6176.67	6176.63	6176.59	6176.79	6176.80	6176.88	6176.70	6176.54			6175.38
11	6176.80	6176.65	6176.63	6176.58	6176.79	6176.81	6176.82	6176.68	6176.54			6175.36
12	6176.79	6176.64	6176.58	6176.61	6176.86	6176.95	6176.80	6176.70	6176.54			6175.34
13	6176.77	6176.63	6176.66	6176.61	6176.97	6177.04	6176.79	6176.70	6176.50			6175.32
14	6176.77	6176.61	6176.65	6176.61	6177.00	6177.02	6176.77	6176.70	6176.50			6175.29
15	6176.75	6176.61	6176.61	6176.55	6177.04	6177.02	6176.77	6176.70	6176.50			6175.25
16	6176.71	6176.63	6176.58	6176.52	6177.05	6176.98	6176.77	6176.67	6176.50			6175.23
17	6176.73	6176.56	6176.59	6176.52	6177.04	6177.05	6176.74	6176.66	6176.49			6175.21
18	6176.71	6176.61	6176.56	6176.49	6177.04	6177.04	6176.77	6176.64	6176.47			6175.18
19	6176.67	6176.54	6176.57	6176.48	6177.02	6177.04	6176.75	6176.65	6176.47			6175.16
20	6176.67	6176.63	6176.54	6176.46	6176.99	6176.99	6176.73	6176.61	6176.46			6175.15
21	6176.66	6176.70	6176.56	6176.45	6177.00	6177.00	6176.72	6176.61	6176.45			6175.13
22	6176.64	6176.79	6176.52	6176.45	6176.98	6176.98	6176.71	6176.61	6176.43			6175.13
23	6176.61	6176.74	6176.55	6176.46	6176.99	6177.02	6176.71	6176.59	6176.41			6175.11
24	6176.61	6176.75	6176.55	6176.56	6176.95	6177.00	6176.70	6176.64	6176.41			6175.08
25	6176.57	6176.73	6176.52	6176.79	6176.92	6176.98	6176.70	6176.66	---			6175.05
26	6176.64	6176.75	6176.54	6176.70	6176.91	6176.98	6176.68	6176.65	---			6175.02
27	6176.66	6176.70	6176.54	6176.77	6176.86	6176.95	6176.68	6176.64	---			6175.02
28	6176.63	6176.77	6176.55	6176.71	6176.90	6176.95	6176.67	6176.63	---			6174.99
29	6176.72	6176.75	6176.50	6176.74	---	6176.92	6176.67	6176.63	---			6174.97
30	6176.73	6176.74	6176.50	6176.72	---	6176.91	6176.70	6176.61	---			6174.95
31	6176.75	---	6176.50	6176.83	---	6176.89	---	6176.61	---			---
MAX	6176.97	6176.79	6176.73	6176.83	6177.05	6177.05	6176.90	6176.73	---			---
MIN	6176.57	6176.54	6176.50	6176.45	6176.77	6176.77	6176.67	6176.59	---			---

11492200 CRATER LAKE NEAR CRATER LAKE, OR--Continued
(Hydrologic bench-mark station)

WATER-QUALITY RECORDS

PERIOD OF DAILY RECORD.--
WATER TEMPERATURE: October 1963 to current year.

INSTRUMENTATION.--Temperature recorder since October 1963. Elevation of probe is 6,157 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--Samples were collected at boat harbor at end of trail in Cleetwood Cove and 6 mi northeast of Crater Lake post office. Records represent water temperature at sensor within 0.5°C.

EXTREMES FOR PERIOD OF DAILY RECORD.--
WATER TEMPERATURE: Maximum, 18.5°C Aug. 9, 10, 1978; minimum recorded, 0.5°C on several days in 1969, but may have been as low or lower during period of missing record Oct. 29, 1985 to July 1, 1986.

EXTREMES FOR CURRENT YEAR.--
WATER TEMPERATURE: Maximum, 15.0°C several days in August and September; minimum not determined, occurred during period of missing record between Nov. 6 and May 27.

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM)	PH (STANDARD UNITS)	TEMPERATURE WATER (DEG C)	HARDNESS (MG/L AS CACO3)	HARDNESS NONCARB (MG/L AS CACO3)	CALCIUM DISSOLVED (MG/L AS CA)	MAGNESIUM, DISSOLVED (MG/L AS MG)	SODIUM, DISSOLVED (MG/L AS NA)
OCT 16...	1330	110	7.1	9.0	28	0	6.6	2.7	9.8
APR 14...	1230	108	7.0	3.5	29	0	6.7	2.9	11
MAY 21...	1130	111	6.8	4.5	28	0	6.7	2.6	10
SEP 01...	1000	114	7.7	14.5	27	0	6.4	2.6	10

DATE	POTASSIUM, DISSOLVED (MG/L AS K)	ALKALINITY WAT DIS IT FIELD (MG/L AS CACO3)	BICARBONATE IT-FLD (MG/L AS HCO3)	CARBONATE IT-FLD (MG/L AS CO3)	SULFATE DISSOLVED (MG/L AS SO4)	CHLORIDE, DISSOLVED (MG/L AS CL)	FLUORIDE, DISSOLVED (MG/L AS F)	NITROGEN, AMMONIA DISSOLVED (MG/L AS N)	NITROGEN, NO2+NO3 DISSOLVED (MG/L AS N)	NITROGEN, AMMONIA + ORGANIC TOTAL (MG/L AS N)
OCT 16...	1.8	30	36	0	8.9	9.3	0.1	<0.01	<0.1	0.2
APR 14...	1.7	31	35	0	12	9.6	0.1	0.01	<0.1	0.7
MAY 21...	1.7	30	36	0	9.0	10	0.1	0.02	<0.1	0.7
SEP 01...	1.8	30	36	0	10	10	0.1	0.01	<0.1	<0.2

DATE	PHOSPHOROUS ORTHO, DISSOLVED (MG/L AS P)	PHOSPHOROUS DISSOLVED (MG/L AS P)	PHOSPHOROUS TOTAL (MG/L AS P)	SILICA, DISSOLVED (MG/L AS SIO2)	SOLIDS, RESIDUE AT 180 DEG. C DISSOLVED (MG/L)	SOLIDS, SUM OF CONSTITUENTS, DISSOLVED (MG/L)	TURBIDITY (NTU)
OCT 16...	<0.01	0.02	0.02	17	83	74	0.2
APR 14...	0.01	0.02	0.02	18	71	81	0.3
MAY 21...	0.01	0.01	0.02	18	72	76	0.3
SEP 01...	<0.01	<0.01	0.01	17	70	76	0.2

11492200 CRATER LAKE NEAR CRATER LAKE, OR--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	ALUMINUM, DISSOLVED (UG/L AS AL)	ARSENIC DISSOLVED (UG/L AS AS)	BARIUM, DISSOLVED (UG/L AS BA)	BERYLLIUM, DISSOLVED (UG/L AS BE)	CADMIUM DISSOLVED (UG/L AS CD)	CHROMIUM, DISSOLVED (UG/L AS CR)	COBALT, DISSOLVED (UG/L AS CO)	COPPER, DISSOLVED (UG/L AS CU)	IRON, DISSOLVED (UG/L AS FE)	LEAD, DISSOLVED (UG/L AS PB)
OCT 16...	<10	3	19	<0.5	<1	<1	<3	2	<3	<5
APR 14...	80	3	18	<0.5	<1	1	<3	--	6	--
MAY 21...	--	3	6	<0.5	<1	<1	<3	--	5	--
SEP 01...	<10	3	5	<0.5	<1	2	<3	1	4	<5

DATE	LITHIUM DISSOLVED (UG/L AS LI)	MANGANESE, DISSOLVED (UG/L AS MN)	MERCURY DISSOLVED (UG/L AS HG)	MOLYBDENUM, DISSOLVED (UG/L AS MO)	NICKEL, DISSOLVED (UG/L AS NI)	SELENIUM, DISSOLVED (UG/L AS SE)	SILVER, DISSOLVED (UG/L AS AG)	STRONTIUM, DISSOLVED (UG/L AS SR)	VANADIUM, DISSOLVED (UG/L AS V)	ZINC, DISSOLVED (UG/L AS ZN)
OCT 16...	47	3	0.2	<10	<1	<1	<1	55	<6	<3
APR 14...	50	<1	--	<10	--	<1	--	55	<6	5
MAY 21...	--	3	--	<10	13	<1	<1	57	<6	--
SEP 01...	42	<1	0.1	<10	2	<1	6	53	<6	<3

DATE	GROSS ALPHA, DISSOLVED (UG/L AS U-NAT)	GROSS ALPHA, SUSP. TOTAL (UG/L AS U-NAT)	GROSS BETA, DISSOLVED (PCI/L AS CS-137)	GROSS BETA, DISSOLVED (PCI/L AS SR/YT-90)	GROSS BETA, SUSP. TOTAL (PCI/L AS CS-137)	GROSS BETA, SUSP. TOTAL (PCI/L AS SR/YT-90)	RADIUM 226, DISSOLVED, RADON METHOD (PCI/L)	URANIUM DISSOLVED, EXTRACTION (UG/L)
OCT 16...	0.4	<0.4	2.1	1.8	<0.4	<0.4	0.03	<0.01
APR 14...	--	--	--	--	--	--	--	--
MAY 21...	--	--	--	--	--	--	--	--
SEP 01...	<0.4	<0.4	1.9	1.7	<0.4	<0.4	<0.02	--

11492200 CRATER LAKE NEAR CRATER LAKE, OR--Continued

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		OCTOBER			NOVEMBER			DECEMBER			JANUARY	
1	9.0	9.0	9.0	8.0	7.5	8.0						
2	9.0	8.5	8.5	8.0	7.5	8.0						
3	9.0	8.5	9.0	8.0	7.5	7.5						
4	9.0	8.5	9.0	8.0	7.5	7.5						
5	9.0	8.5	9.0	8.0	7.5	8.0						
6	9.0	9.0	9.0	---	---	---						
7	9.0	8.5	9.0	---	---	---						
8	9.0	9.0	9.0	---	---	---						
9	9.5	9.0	9.0	---	---	---						
10	9.5	9.0	9.5	---	---	---						
11	9.5	9.0	9.0	---	---	---						
12	9.0	8.5	9.0	---	---	---						
13	9.0	8.5	8.5	---	---	---						
14	9.0	9.0	9.0	---	---	---						
15	9.5	9.0	9.0	---	---	---						
16	9.0	9.0	9.0	---	---	---						
17	9.0	8.5	9.0	---	---	---						
18	9.0	8.5	9.0	---	---	---						
19	9.0	8.5	8.5	---	---	---						
20	9.0	8.5	8.5	---	---	---						
21	8.5	8.5	8.5	---	---	---						
22	9.0	8.5	8.5	---	---	---						
23	9.0	8.5	9.0	---	---	---						
24	9.0	8.5	8.5	---	---	---						
25	8.5	8.5	8.5	---	---	---						
26	8.5	8.5	8.5	---	---	---						
27	8.5	8.5	8.5	---	---	---						
28	8.5	8.0	8.5	---	---	---						
29	8.5	8.0	8.0	---	---	---						
30	8.0	8.0	8.0	---	---	---						
31	8.0	7.5	8.0	---	---	---						
MONTH	9.5	7.5	8.5	---	---	---						

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		FEBRUARY			MARCH			APRIL			MAY	
1										---	---	---
2										---	---	---
3										---	---	---
4										---	---	---
5										---	---	---
6										---	---	---
7										---	---	---
8										---	---	---
9										---	---	---
10										---	---	---
11										---	---	---
12										---	---	---
13										---	---	---
14										---	---	---
15										---	---	---
16										---	---	---
17										---	---	---
18										---	---	---
19										---	---	---
20										---	---	---
21										---	---	---
22										---	---	---
23										---	---	---
24										---	---	---
25										---	---	---
26										---	---	---
27										---	---	---
28										6.0	4.0	5.0
29										5.5	5.5	5.5
30										5.5	5.5	5.5
31										5.5	5.0	5.0
MONTH										---	---	---

11492200 CRATER LAKE NEAR CRATER LAKE, OR--Continued

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		JUNE			JULY			AUGUST			SEPTEMBER	
1	5.5	5.0	5.0	11.5	8.5	9.5	12.0	12.0	12.0	15.0	14.0	14.5
2	5.5	5.0	5.5	12.5	11.0	12.0	12.0	12.0	12.0	15.0	14.5	15.0
3	6.0	5.5	5.5	12.0	10.5	11.5	12.5	12.0	12.0	15.0	14.5	15.0
4	6.5	6.0	6.0	12.5	10.5	12.0	12.5	12.0	12.5	15.0	14.5	14.5
5	6.0	5.5	6.0	12.5	11.5	12.0	13.0	12.0	12.5	14.5	14.5	14.5
6	6.0	6.0	6.0	11.5	11.0	11.5	13.5	12.5	13.0	14.5	14.0	14.0
7	6.5	6.0	6.0	11.5	11.0	11.0	13.0	12.5	13.0	14.5	14.5	14.5
8	6.5	6.0	6.0	11.5	10.5	11.0	13.0	12.5	13.0	14.5	14.0	14.5
9	6.5	6.0	6.5	11.5	11.0	11.0	14.0	13.0	13.5	15.0	14.5	14.5
10	7.0	6.0	6.5	11.5	11.0	11.5	14.5	14.0	14.5	15.0	14.5	14.5
11	7.0	6.5	7.0	12.0	11.5	12.0	14.0	13.5	14.0	15.0	14.5	14.5
12	9.0	7.0	8.0	11.5	11.0	11.5	14.0	13.5	14.0	14.5	14.5	14.5
13	8.5	8.0	8.0	12.0	11.5	12.0	13.5	13.0	13.5	15.0	14.5	14.5
14	9.0	8.0	8.5	12.5	11.5	12.0	13.5	13.5	13.5	15.0	14.5	14.5
15	9.5	8.5	9.0	12.5	11.5	12.0	13.5	13.0	13.5	14.5	14.0	14.5
16	9.5	8.5	9.0	13.5	11.0	12.0	13.5	13.0	13.5	14.0	14.0	14.0
17	9.0	8.5	8.5	12.0	10.5	11.0	13.5	13.5	13.5	14.0	13.5	13.5
18	8.5	8.5	8.5	11.0	10.5	10.5	13.5	13.5	13.5	13.5	13.5	13.5
19	8.5	8.0	8.5	11.0	10.5	11.0	13.5	13.0	13.5	14.0	13.5	13.5
20	8.5	8.0	8.5	11.0	10.5	10.5	14.0	13.0	13.5	13.5	13.5	13.5
21	9.5	8.5	9.0	10.5	10.5	10.5	14.0	14.0	14.0	14.0	13.5	13.5
22	8.5	8.0	8.5	10.5	10.0	10.5	14.0	13.5	13.5	14.0	13.5	14.0
23	8.5	8.0	8.5	10.0	10.0	10.0	14.0	13.5	13.5	14.0	14.0	14.0
24	9.0	8.5	9.0	10.5	10.0	10.0	13.5	13.0	13.5	14.0	14.0	14.0
25	9.0	8.5	8.5	11.0	10.0	10.5	13.5	13.5	13.5	14.0	13.5	13.5
26	9.5	9.0	9.5	11.5	11.0	11.0	13.5	13.5	13.5	13.5	13.5	13.5
27	10.0	9.0	9.5	11.5	11.5	11.5	13.5	13.0	13.5	13.5	13.5	13.5
28	10.5	9.5	10.0	12.0	11.5	11.5	14.5	13.5	14.0	13.5	13.5	13.5
29	11.5	9.5	10.5	12.0	11.5	11.5	14.5	14.0	14.0	13.5	13.5	13.5
30	11.0	9.0	10.0	12.0	11.5	12.0	15.0	14.0	14.5	13.5	13.5	13.5
31	---	---	---	12.0	11.5	12.0	15.0	14.5	14.5	---	---	---
MONTH	11.5	5.0	8.0	13.5	8.5	11.0	15.0	12.0	13.5	15.0	13.5	14.0

11493500 WILLIAMSON RIVER NEAR KLAMATH AGENCY, OR

LOCATION.--Lat 42°44'25", long 121°50'00", in NW 1/4 SW 1/4 sec.1, T.33 S., R.7 E., Klamath County, Hydrologic Unit 18010201, on right bank 250 ft downstream from highway bridge, 0.6 mi southwest of railroad station at Kirk, 10 mi upstream from Spring Creek, and 10 mi northeast of Klamath Agency.

DRAINAGE AREA.--1,290 mi^2, approximately.

PERIOD OF RECORD.--March 1908 to January 1909, April 1909 to June 1910, October 1954 to current year. Monthly discharge only June 1910, published in WSP 1315-B.

REVISED RECORDS.--WSP 1565: 1908-9.

GAGE.--Water-stage recorder. Datum of gage is 4,483.16 ft above National Geodetic Vertical Datum of 1929. Mar. 25, 1908, to June 30, 1910, nonrecording gage or water-stage recorder at two sites about 0.5 mi upstream at different datums. Oct. 1, 1954, to Sept. 30, 1955, water-stage recorder at present site at datum 2.05 ft higher.

REMARKS.--Estimated daily discharges: Jan. 13-21, 24-26. Records good. Flow affected by natural storage in Klamath Marsh. Small diversions upstream from station for irrigation in vicinity of marsh.

AVERAGE DISCHARGE.--33 years (water years 1955-87), 212 ft^3/s, 153,600 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge observed, 1,590 ft^3/s Mar. 13, 1910, gage height, 3.7 ft, site and datum then in use, from rating curve extended above 800 ft^3/s; maximum gage height, 5.57 ft Mar. 3, 1958; no flow at times during 1960-74, 1977-81.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 718 ft^3/s Mar. 15-17, gage height, 5.07 ft; minimum discharge, 3.8 ft^3/s Sept. 24.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	43	154	252	238	204	423	545	252	115	41	26	7.8
2	47	157	254	227	207	420	526	249	114	39	25	7.0
3	50	160	255	228	206	427	514	248	109	36	24	7.4
4	55	163	255	233	207	423	504	246	102	31	22	6.9
5	59	166	255	237	210	452	483	243	98	27	20	6.4
6	63	172	257	238	213	509	467	237	97	27	21	5.7
7	66	171	259	233	216	544	454	229	93	28	21	5.7
8	68	172	259	226	220	570	437	225	91	28	21	4.3
9	71	175	259	222	224	582	430	219	90	26	20	4.7
10	77	181	259	217	226	584	416	216	88	25	19	5.0
11	80	185	257	214	238	604	406	207	85	24	19	5.2
12	83	188	255	210	254	648	405	193	82	22	19	5.9
13	85	189	255	200	291	674	397	188	80	16	18	5.6
14	89	189	255	190	306	694	387	186	78	12	19	5.1
15	91	191	255	170	327	713	377	181	75	9.3	18	6.8
16	94	189	252	160	348	716	365	180	76	8.8	17	7.4
17	97	189	248	150	369	708	347	174	76	13	15	7.0
18	102	189	247	150	390	683	345	169	74	15	13	6.9
19	105	194	245	150	404	690	340	163	70	18	12	7.2
20	107	194	244	155	414	684	334	156	67	19	13	7.3
21	110	202	240	160	430	681	326	149	64	19	13	6.6
22	112	211	235	170	430	673	319	145	64	25	13	5.9
23	114	219	238	165	429	668	310	142	62	29	12	5.5
24	116	226	239	170	393	670	302	137	60	29	12	5.1
25	119	231	241	170	396	657	299	134	58	30	11	5.6
26	121	235	242	170	407	648	290	131	55	29	11	6.1
27	128	236	242	180	419	638	281	127	52	26	9.8	6.0
28	133	240	242	189	425	620	273	125	49	25	9.5	5.9
29	136	248	240	193	---	603	265	120	47	26	9.4	6.0
30	142	250	240	197	---	582	254	114	44	25	9.3	6.0
31	149	---	239	199	---	564	---	111	---	26	8.5	---
TOTAL	2912	5866	7715	6011	8803	18752	11398	5596	2315	754.1	500.5	184.0
MEAN	93.9	196	249	194	314	605	380	181	77.2	24.3	16.1	6.13
MAX	149	250	259	238	430	716	545	252	115	41	26	7.8
MIN	43	154	235	150	204	420	254	111	44	8.8	8.5	4.3
AC-FT	5780	11640	15300	11920	17460	37190	22610	11100	4590	1500	993	365

CAL YR 1986 TOTAL 110408.2 MEAN 302 MAX 1220 MIN 2.5 AC-FT 219000
WTR YR 1987 TOTAL 70806.6 MEAN 194 MAX 716 MIN 4.3 AC-FT 140400

11497500 SPRAGUE RIVER NEAR BEATTY, OR

LOCATION.--Lat 42°26'50", long 121°14'15", in NW 1/4 SE 1/4 sec.13, T.36 S., R.12 E., Klamath County, Hydrologic Unit 18010202, on right bank 1.6 mi east of Beatty, and 4.6 mi upstream from Sycan River.

DRAINAGE AREA.--513 mi^2.

PERIOD OF RECORD.--April to September 1912 and November 1912 to September 1913 (fragmentary), October 1913 to September 1915, February to November 1916, March 1917 to June 1918, May 1919 to October 1920, February 1921 to September 1926 (irrigation seasons only), October 1953 to current year. Monthly discharge only October 1913, published in WSP 1315-B. Prior to October 1917, published as "near Yainax."

REVISED RECORDS.--WSP 1315-B: 1917(M).

GAGE.--Water-stage recorder. Datum of gage is 4,305.35 ft above National Geodetic Vertical Datum of 1929. Apr. 19, 1912, to Feb. 19, 1914, nonrecording gage, Feb. 20, 1914, to Sept. 11, 1917, water-stage recorder, and Sept. 12, 1917, to Sept. 30, 1926, nonrecording gage, at site 2 mi upstream at different datum.

REMARKS.--Estimated daily discharges: June 14 to Aug. 29. Records good except those for Apr. 22 to Sept. 23, which are poor. No regulation. Diversions for irrigation upstream from station in the vicinity of Bly.

AVERAGE DISCHARGE.--37 years (water years 1914-15, 1920, 1954-87), 314 ft^3/s, 227,500 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 6,980 ft^3/s Dec. 23, 1964, gage height, 12.19 ft; minimum discharge, 50 ft^3/s Aug. 25, 1981.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 662 ft^3/s Feb. 14, gage height, 4.65 ft; minimum daily discharge, 102 ft^3/s Sept. 30.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	189	168	144	165	168	155	215	481	188	150	110	107
2	179	164	155	167	171	156	242	467	172	150	110	106
3	170	161	156	166	183	167	269	416	159	150	110	109
4	165	159	158	173	183	241	301	360	140	140	110	111
5	163	162	169	163	177	303	294	325	137	140	110	113
6	161	159	170	154	173	324	298	296	131	130	110	115
7	160	160	161	136	179	316	306	286	136	120	110	119
8	160	160	147	125	187	267	323	282	175	120	110	122
9	159	157	143	136	187	244	345	277	189	120	110	112
10	158	161	143	140	200	224	369	267	176	110	110	104
11	155	160	146	150	274	218	425	257	156	110	110	104
12	154	159	156	154	275	245	418	247	137	110	110	104
13	154	160	156	155	420	415	385	243	130	110	110	112
14	152	160	156	150	542	397	397	238	130	110	110	113
15	152	160	148	143	306	397	439	219	150	130	110	114
16	151	159	148	117	248	397	481	220	200	150	110	114
17	148	157	145	143	217	317	503	187	230	170	110	124
18	149	158	147	144	199	309	506	190	210	200	110	129
19	156	159	154	145	183	290	453	177	190	230	110	124
20	154	161	150	137	171	249	409	170	180	220	110	115
21	154	172	146	139	170	235	388	163	180	200	110	110
22	153	171	153	146	167	219	368	160	170	200	110	111
23	151	169	154	148	162	215	367	156	170	200	110	111
24	152	165	150	151	156	230	367	179	160	180	110	105
25	151	161	145	155	147	216	365	197	160	160	110	111
26	151	153	153	214	148	208	353	237	160	150	110	113
27	168	161	155	255	162	200	355	222	150	140	110	108
28	174	165	144	259	158	193	364	205	140	130	110	106
29	165	164	148	216	---	191	361	189	140	120	110	103
30	178	150	148	184	---	190	386	183	140	120	110	102
31	177	---	147	169	---	196	---	209	---	120	109	---
TOTAL	4963	4835	4695	4999	5913	7924	11052	7705	4886	4590	3409	3351
MEAN	160	161	151	161	211	256	368	249	163	148	110	112
MAX	189	172	170	259	542	415	506	481	230	230	110	129
MIN	148	150	143	117	147	155	215	156	130	110	109	102
AC-FT	9840	9590	9310	9920	11730	15720	21920	15280	9690	9100	6760	6650

CAL YR 1986 TOTAL 133431 MEAN 366 MAX 2640 MIN 82 AC-FT 264700
WTR YR 1987 TOTAL 68322 MEAN 187 MAX 542 MIN 102 AC-FT 135500

11499100 SYCAN RIVER BELOW SNAKE CREEK, NEAR BEATTY, OR

LOCATION.--Lat 42°29'10", long 121°16'40", in SW 1/4 SE 1/4 sec.34, T.35 S., R.12 E., Klamath County, Hydrologic Unit 18010202, on left bank 200 ft downstream from Snake Creek and 3.1 mi north of Beatty.

DRAINAGE AREA.--568 mi^2.

PERIOD OF RECORD.--October 1973 to current year. Prior to October 1979, in reports of Oregon Water Resources Department.

GAGE.--Water-stage recorder. Elevation of gage is 4,310 ft, from topographic map.

REMARKS.--Estimated daily discharges: Feb. 4-8, 28. Records good except for estimated daily discharges, which are fair. Diversions for irrigation upstream from station.

AVERAGE DISCHARGE.--14 years, 178 ft^3/s, 129,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 5,550 ft^3/s Feb. 21 or 22, 1982, gage height, 12.22 ft, from floodmarks; minimum discharge, 3.0 ft^3/s Nov. 21, 1977.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 412 ft^3/s Mar. 7, gage height, 4.37 ft; minimum discharge, 20 ft^3/s July 16, 17, Aug. 10.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	37	35	38	47	36	57	95	165	58	34	29	25
2	36	35	40	39	40	65	97	203	57	38	29	25
3	35	36	41	43	42	83	101	222	53	38	27	26
4	34	41	40	41	37	228	100	210	50	34	26	25
5	35	41	46	38	36	369	98	196	47	32	25	26
6	35	40	44	37	36	384	94	179	44	32	23	26
7	35	41	40	32	36	371	93	158	43	31	23	26
8	35	40	36	29	37	323	93	138	47	29	23	26
9	34	40	35	31	43	270	93	125	44	27	23	26
10	34	40	37	33	53	222	95	116	42	25	22	26
11	34	39	38	34	77	188	102	110	39	24	22	26
12	34	38	42	33	63	204	109	103	40	24	23	26
13	35	38	40	33	94	346	118	94	37	25	23	25
14	35	39	37	33	104	331	119	87	38	26	23	26
15	36	39	35	31	153	293	116	84	45	24	22	26
16	36	39	39	31	140	280	117	80	43	21	22	26
17	36	40	36	28	138	287	155	75	47	28	25	27
18	36	40	37	30	124	291	198	72	45	38	24	26
19	35	41	42	31	98	232	238	69	45	41	24	27
20	34	42	39	30	89	186	225	64	43	39	23	27
21	34	46	37	30	79	158	190	62	42	37	24	27
22	34	47	40	30	74	142	175	61	41	42	25	27
23	34	46	41	32	70	134	174	60	39	48	27	27
24	34	46	40	32	64	129	176	62	38	49	27	26
25	32	46	37	34	56	123	173	62	38	47	25	26
26	34	45	42	43	55	114	166	69	37	45	26	26
27	40	45	44	50	55	108	157	71	36	41	25	27
28	36	46	39	45	55	104	150	70	34	38	26	27
29	35	45	40	39	---	101	145	67	34	34	26	27
30	38	35	38	37	---	97	149	65	33	32	26	26
31	37	---	41	36	---	95	---	62	---	30	26	---
TOTAL	1089	1231	1221	1092	1984	6315	4111	3261	1279	1053	764	785
MEAN	35.1	41.0	39.4	35.2	70.9	204	137	105	42.6	34.0	24.6	26.2
MAX	40	47	46	50	153	384	238	222	58	49	29	27
MIN	32	35	35	28	36	57	93	60	33	21	22	25
AC-FT	2160	2440	2420	2170	3940	12530	8150	6470	2540	2090	1520	1560

CAL YR 1986 TOTAL 76578 MEAN 210 MAX 1760 MIN 29 AC-FT 151900
WTR YR 1987 TOTAL 24185 MEAN 66.3 MAX 384 MIN 21 AC-FT 47970

SPRAGUE RIVER BASIN

11501000 SPRAGUE RIVER NEAR CHILOQUIN, OR

LOCATION.--Lat 42°35'05", long 121°50'55", in NE 1/4 NW 1/4 sec.35, T.34 S., R.7 E., Klamath County, Hydrologic Unit 18010202, on right bank 1.0 mi northeast of Chiloquin, 4.6 mi upstream from Modoc Point Canal intake, and at mile 5.4.

DRAINAGE AREA.--1,580 mi^2, approximately.

PERIOD OF RECORD.--July to October 1920, March 1921 to current year. Monthly discharge only July 1920, published in WSP 1315-B. Prior to October 1931, published as "at McCready Ranch, near Chiloquin."

REVISED RECORDS.--WSP 591: 1922(M). WSP 1011: 1943 (M). WSP 1565: 1921-22.

GAGE.--Water-stage recorder. Datum of gage is 4,202.43 ft above National Geodetic Vertical Datum of 1929. Prior to Oct. 1, 1931, nonrecording gage at site 12 mi upstream at different datum.

REMARKS.--Estimated daily discharges: Jan. 8-22. Records good. Minor regulation from irrigation diversions upstream from station.

AVERAGE DISCHARGE.--66 years (water years 1922-87), 589 ft^3/s, 426,700 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 14,900 ft^3/s Dec. 26, 1964, gage height, 10.37 ft; minimum daily discharge, 50 ft^3/s May 26, 1926.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 975 ft^3/s Mar. 15, gage height, 2.78 ft; minimum discharge, 183 ft^3/s Aug. 22.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	407	353	365	368	410	390	459	642	421	267	233	202
2	398	350	345	380	395	384	463	691	424	272	223	211
3	396	341	342	402	401	389	486	759	425	285	218	213
4	385	339	356	395	414	406	513	789	406	301	215	205
5	376	339	366	398	417	460	546	771	388	294	211	205
6	369	339	369	389	412	649	558	725	367	286	207	211
7	362	340	383	371	405	790	551	676	349	282	219	211
8	355	340	379	285	400	851	553	619	333	255	212	214
9	350	341	364	260	404	846	556	568	340	239	201	226
10	334	342	346	280	413	764	573	533	369	241	196	232
11	331	340	324	310	435	691	591	514	363	230	198	225
12	330	344	349	320	485	647	612	500	363	229	207	220
13	328	348	357	320	587	669	657	484	353	223	218	220
14	329	347	361	320	608	735	663	462	344	211	209	223
15	330	349	362	280	737	915	639	451	339	210	195	232
16	329	348	351	230	793	960	649	435	362	210	195	237
17	327	347	347	230	667	926	674	420	374	221	198	233
18	327	345	351	280	579	897	698	413	415	254	209	241
19	327	344	349	340	537	832	739	396	449	282	214	248
20	325	344	352	350	497	802	791	391	441	327	206	259
21	329	357	358	350	455	730	790	387	399	390	197	253
22	329	371	356	340	435	642	737	377	363	440	191	244
23	326	380	355	341	422	602	684	373	350	414	198	239
24	323	379	364	345	414	565	643	371	333	376	203	236
25	315	376	363	356	403	552	631	387	317	387	204	228
26	318	372	358	386	387	551	630	411	306	374	205	223
27	328	366	353	448	380	527	625	430	307	334	202	229
28	336	364	364	555	379	507	623	459	309	303	205	240
29	355	371	365	572	---	493	629	471	292	280	214	229
30	364	374	351	514	---	479	620	452	271	257	211	238
31	351	---	356	444	---	471	---	437	---	242	206	---
TOTAL	10689	10590	11061	11159	13271	20122	18583	15794	10872	8916	6420	6827
MEAN	345	353	357	360	474	649	619	509	362	288	207	228
MAX	407	380	383	572	793	960	791	789	449	440	233	259
MIN	315	339	324	230	379	384	459	371	271	210	191	202
AC-FT	21200	21010	21940	22130	26320	39910	36860	31330	21560	17680	12730	13540

CAL YR 1986 TOTAL 284888 MEAN 781 MAX 4740 MIN 194 AC-FT 565100
WTR YR 1987 TOTAL 144304 MEAN 395 MAX 960 MIN 191 AC-FT 286200

11502500 WILLIAMSON RIVER BELOW SPRAGUE RIVER, NEAR CHILOQUIN, OR

LOCATION.--Lat 42°34'15", long 121°52'35", in NE 1/4 NE 1/4 sec.4, T.35 S., R.7 E., Klamath County, Hydrologic Unit 18010202, on right bank 0.2 mi downstream from Sprague River and 0.8 mi southwest of Chiloquin.

DRAINAGE AREA.--3,000 mi^2, approximately.

PERIOD OF RECORD.--June 1917 to current year.

REVISED RECORDS.--WSP 981: 1938(M). WSP 1565: 1920(M), 1927(M), 1938.

GAGE.--Water-stage recorder. Datum of gage is 4,155.55 ft above National Geodetic Vertical Datum of 1929. Prior to Sept. 1, 1923, at different datum.

REMARKS.--Estimated daily discharges: Jan. 15-17, Mar. 18, 19. Records excellent. Some regulation by diversion dams and logpond operations of Sprague River. Diversions for irrigation upstream from station.

AVERAGE DISCHARGE.--70 years, 1,061 ft^3/s, 768,700 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 16,100 ft^3/s Dec. 26, 1964, gage height, 10.56 ft; minimum discharge, 320 ft^3/s Oct. 14, 1920.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 1,970 ft^3/s Mar. 16, gage height, 3.94 ft; minimum discharge, 479 ft^3/s July 14-16.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	788	883	968	979	968	1120	1280	1170	740	543	545	488
2	789	889	949	969	958	1120	1270	1200	736	555	536	492
3	799	884	944	990	952	1120	1280	1260	734	568	527	494
4	791	881	960	979	959	1140	1290	1310	709	584	525	492
5	785	881	973	980	964	1190	1310	1300	688	573	517	487
6	781	883	975	975	962	1420	1310	1240	666	558	512	493
7	777	886	986	953	964	1610	1290	1200	653	559	521	497
8	776	885	984	874	966	1700	1280	1130	641	538	519	500
9	781	892	972	832	974	1720	1270	1070	640	521	501	512
10	778	894	954	832	985	1640	1280	1020	662	522	494	520
11	785	894	931	898	1020	1570	1290	1000	661	513	493	513
12	781	897	950	905	1070	1560	1300	968	654	513	504	514
13	780	905	960	899	1190	1610	1340	938	639	507	514	514
14	785	906	965	895	1220	1680	1340	911	637	496	505	516
15	795	911	964	800	1360	1830	1310	891	646	487	525	519
16	801	910	953	720	1450	1960	1290	870	674	485	543	531
17	801	907	950	730	1350	1910	1290	846	682	518	520	537
18	804	907	957	866	1270	1850	1300	832	722	554	517	545
19	809	902	955	851	1240	1800	1330	805	766	578	512	552
20	808	904	952	838	1210	1750	1380	789	767	621	505	563
21	815	924	954	840	1190	1670	1370	775	726	713	494	562
22	824	951	950	836	1170	1570	1310	750	672	812	489	551
23	826	955	946	847	1150	1530	1250	733	637	780	495	546
24	826	960	955	855	1120	1480	1200	723	612	731	497	543
25	823	959	957	886	1110	1460	1180	728	594	738	490	536
26	831	958	959	912	1090	1440	1170	748	578	731	490	526
27	835	955	955	975	1100	1410	1160	771	574	677	491	533
28	828	957	963	1080	1110	1380	1140	799	577	634	489	547
29	860	967	964	1100	---	1360	1140	817	561	603	496	544
30	896	973	949	1050	---	1330	1140	782	541	575	494	553
31	878	---	955	991	---	1310	---	768	---	552	491	---
TOTAL	25036	27460	29709	28137	31072	47240	38090	29144	19789	18339	15751	15720
MEAN	808	915	958	908	1110	1524	1270	940	660	592	508	524
MAX	896	973	986	1100	1450	1960	1380	1310	767	812	545	563
MIN	776	881	931	720	952	1120	1140	723	541	485	489	487
AC-FT	49660	54470	58930	55810	61630	93700	75550	57810	39250	36380	31240	31180

CAL YR 1986 TOTAL 515154 MEAN 1411 MAX 5920 MIN 558 AC-FT 1022000
WTR YR 1987 TOTAL 325487 MEAN 892 MAX 1960 MIN 485 AC-FT 645600

11503000 ANNIE SPRING NEAR CRATER LAKE, OR

LOCATION.--Lat 42°52'20", long 122°10'00", unsurveyed, Klamath County, Hydrologic Unit 18010203, in Crater Lake National Park, at highway bridge 0.1 mi downstream from source.

DRAINAGE AREA.--Indeterminate, normal flow is entirely from Annie Spring.

PERIOD OF RECORD.--June 1977 to current year. Discharge measurement and fragmentary gage-height record August to October 1913. Discharge measurements only Oct. 11, 1967, June 26, Sept. 13, 1968.

GAGE.--Water-stage recorder and V-notch sharp-crested weir. Datum of gage is 5,982.65 ft above National Geodetic Vertical Datum of 1929 (National Park Service bench mark).

REMARKS.--No estimated daily discharges. Records good. Fluctuations caused by pumps 0.1 mi upstream. Diversion for domestic use by National Park Service 0.1 mi upstream.

COOPERATION.--Records of diversion by pumping furnished by National Park Service.

AVERAGE DISCHARGE.--10 years, 3.20 ft^3/s, 2,320 acre-ft/yr, adjusted for diversion.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 18 ft^3/s July 6, 1984, gage height, 1.56 ft; minimum discharge, 0.33 ft^3/s Nov. 20, 22, 1977.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 8.2 ft^3/s May 22, gage height, 1.38 ft; minimum discharge, 0.84 ft^3/s Mar. 29, 30, Apr 3.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.2	1.8	1.7	1.5	1.2	1.0	1.0	3.9	5.9	3.7	2.3	1.5
2	2.1	1.8	1.7	1.5	1.2	1.1	.96	4.0	5.9	3.6	2.3	1.5
3	2.1	1.9	1.7	1.5	1.2	1.1	.93	4.1	5.8	3.6	2.3	1.5
4	2.1	1.8	1.7	1.5	1.2	1.1	.97	4.1	5.7	3.5	2.3	1.5
5	2.1	1.8	1.7	1.4	1.2	1.1	.98	4.3	5.7	3.3	2.2	1.5
6	2.1	1.8	1.7	1.4	1.2	1.1	.96	4.4	5.8	3.1	2.2	1.5
7	2.1	1.8	1.7	1.4	1.2	1.0	1.0	4.6	5.5	2.9	2.1	1.5
8	2.1	1.8	1.7	1.4	1.2	1.1	.99	4.9	5.5	2.9	2.1	1.5
9	2.1	1.8	1.7	1.4	1.1	1.1	.99	5.3	5.6	2.8	2.0	1.5
10	2.1	1.8	1.7	1.4	1.1	1.0	1.0	5.8	5.4	2.8	2.1	1.5
11	2.1	1.8	1.7	1.4	1.2	1.0	.99	6.0	5.4	2.8	2.1	1.5
12	2.1	1.8	1.6	1.4	1.1	1.0	1.0	6.4	5.2	2.8	2.0	1.4
13	2.1	1.8	1.6	1.4	1.1	1.0	1.1	6.6	5.2	2.8	2.0	1.5
14	2.0	1.7	1.6	1.4	1.1	1.0	1.2	6.8	5.2	2.7	1.9	1.5
15	2.0	1.7	1.6	1.4	1.1	.99	1.2	7.0	5.2	2.6	2.0	1.5
16	2.0	1.8	1.6	1.4	1.2	.99	1.3	7.5	5.1	2.6	1.9	1.4
17	2.0	1.7	1.6	1.4	1.2	.99	1.4	7.7	5.0	2.6	1.8	1.4
18	2.0	1.7	1.6	1.3	1.2	1.0	1.5	7.9	4.8	2.6	1.8	1.4
19	2.0	1.7	1.6	1.3	1.1	.99	1.6	8.1	4.7	2.6	1.8	1.4
20	2.0	1.7	1.6	1.3	1.1	.97	1.6	8.1	4.6	2.6	1.8	1.4
21	2.0	1.7	1.6	1.3	1.1	.99	1.7	8.1	4.6	2.5	1.7	1.4
22	2.0	1.7	1.5	1.3	1.1	.97	1.8	8.2	4.5	2.5	1.7	1.4
23	1.9	1.7	1.5	1.3	1.1	.95	1.8	7.8	4.4	2.5	1.7	1.4
24	1.9	1.7	1.5	1.3	1.1	.94	2.0	7.6	4.3	2.5	1.7	1.4
25	1.9	1.7	1.5	1.3	1.1	.95	2.2	7.2	4.2	2.5	1.7	1.4
26	1.9	1.7	1.5	1.3	1.1	.95	2.3	7.0	4.1	2.4	1.6	1.4
27	1.9	1.7	1.5	1.3	1.1	.94	2.4	6.9	3.9	2.4	1.6	1.4
28	1.9	1.7	1.5	1.3	1.1	.94	2.7	6.7	3.8	2.4	1.6	1.4
29	1.8	1.7	1.5	1.2	---	.93	3.2	6.6	3.8	2.4	1.6	1.4
30	1.8	1.7	1.5	1.2	---	.93	3.7	6.4	3.8	2.4	1.6	1.4
31	1.8	---	1.5	1.3	---	.97	---	6.0	---	2.3	1.5	---
TOTAL	62.2	52.5	49.7	42.2	32.0	31.09	46.47	196.0	148.6	85.7	59.0	43.4
MEAN	2.01	1.75	1.60	1.36	1.14	1.00	1.55	6.32	4.95	2.76	1.90	1.45
MAX	2.2	1.9	1.7	1.5	1.2	1.1	3.7	8.2	5.9	3.7	2.3	1.5
MIN	1.8	1.7	1.5	1.2	1.1	.93	.93	3.9	3.8	2.3	1.5	1.4
AC-FT	123	104	99	84	63	62	92	389	295	170	117	86
MEAN†	2.02	1.76	1.63	1.39	1.17	1.04	1.59	6.38	5.04	2.86	2.03	1.52
AC-FT†	124	105	100	85.7	65.1	64.2	94.6	392	300	176	125	90.7

CAL YR 1986 TOTAL 1241.6 MEAN 3.40 MAX 16 MIN 1.2 AC-FT 2460 MEAN† 3.45 AC-FT† 2500
WTR YR 1987 TOTAL 848.86 MEAN 2.33 MAX 8.2 MIN .93 AC-FT 1680 MEAN† 2.38 AC-FT† 1720

† Adjusted for diversion by pumping.

11507001 UPPER KLAMATH LAKE NEAR KLAMATH FALLS, OR

LOCATION.--Lat 42°15'00", long 121°48'55", in NW 1/4 SW 1/4 sec.19, T.38 S., R.9 E., Klamath County, Hydrologic Unit 18010203, at southeast end of lake, 1.4 mi upstream from outlet and 2.5 mi northwest of Main Street Bridge at Klamath Falls.

DRAINAGE AREA.--3,810 mi^2, approximately, including 26.2 mi^2 in closed basin of Crater Lake.

PERIOD OF RECORD.--May 1904 to September 1923 (gage heights only), October 1923 to current year. Monthend contents only October 1923 to September 1927, published in WSP 1315-B.

GAGE.--Water-stage recorder. Datum of gage is 4,098.22 ft above National Geodetic Vertical Datum of 1929, or 4,100.00 ft above Bureau of Reclamation datum. Gage readings have been reduced to elevations above Bureau of Reclamation datum. See WSP 1735 for history of changes prior to Nov. 10, 1923. Since Oct. 1, 1974, supplementary water-stage recorders at sites 7 mi north and 21 mi northwest at same datum (water-surface transfer by Pacific Power and Light Co.).

REMARKS.--Reservoir is formed by concrete dam at outlet of natural lake, completed in 1921, replacing a temporary dam built in 1919; controlled storage began Apr. 15, 1919. Capacity, 523,700 acre-ft between elevations 4,136.0 ft and 4,143.3 ft. Dead storage below elevation 4,136.0 ft is 211,300 acre-ft. Stored water may be diverted through "A" Canal for irrigation on land under Klamath project of Bureau of Reclamation, or released to Link River through dam or powerplants at Klamath Falls. Contents given herein represent those above elevation 4,136.0 ft. Prior to Oct. 1,1973, contents given represented those above elevation 4,135.0 ft. Prior to Sept. 30, 1974, contents at end of month obtained by averaging elevations for last 3 days of month and first 3 days of following month to compensate for wind effect. Since Oct. 1, 1974, daily elevations are weighted mean of elevations at base and supplementary gages; contents at end of month are obtained from weighted midnight elevations of base and supplementary gages.

COOPERATION.--Capacity table furnished by Bureau of Reclamation, Klamath Project.

EXTREMES FOR PERIOD OF RECORD.--Maximum elevation, 4,144.98 ft about Apr. 20, 1904, from high-water marks; minimum recorded, 4,135.55 ft Oct. 30, 1944.

EXTREMES FOR CURRENT YEAR.--Maximum daily elevation, 4,142.80 ft May 8; minimum daily, 4,139.34 ft Sept. 30.

Capacity table (elevation, in feet, and contents, in acre-feet)

4,136	0	4,139	193,700	4,142	414,400
4,137	61,300	4,140	262,600	4,143	498,300
4,138	127,000	4,141	335,400	4,143.3	523,700

ELEVATION (FEET NGVD), WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	4140.43	4140.50	4140.79	4140.85	4141.45	4141.90	4142.57	4142.72	4142.22	4141.61	4141.10	4140.04
2	4140.44	4140.49	4140.78	4140.91	4141.48	4141.84	4142.56	4142.72	4142.21	4141.58	4141.07	4140.02
3	4140.42	4140.49	4140.77	4140.94	4141.52	4141.80	4142.60	4142.73	4142.19	4141.59	4141.04	4139.98
4	4140.42	4140.50	4140.74	4141.02	4141.54	4141.72	4142.60	4142.76	4142.12	4141.53	4141.02	4139.94
5	4140.43	4140.53	4140.75	4141.05	4141.56	4141.88	4142.62	4142.77	4142.12	4141.48	4140.99	4139.91
6	4140.43	4140.57	4140.79	4141.08	4141.57	4141.98	4142.62	4142.79	4142.13	4141.45	4140.95	4139.86
7	4140.43	4140.54	4140.77	4141.09	4141.58	4142.02	4142.64	4142.78	4142.10	4141.40	4140.94	4139.82
8	4140.43	4140.52	4140.75	4141.10	4141.61	4142.03	4142.66	4142.80	4142.10	4141.37	4140.88	4139.79
9	4140.43	4140.52	4140.75	4141.10	4141.61	4142.06	4142.67	4142.79	4142.10	4141.30	4140.85	4139.77
10	4140.44	4140.57	4140.72	4141.12	4141.58	4142.05	4142.68	4142.79	4142.09	4141.26	4140.81	4139.74
11	4140.43	4140.56	4140.72	4141.12	4141.59	4142.12	4142.70	4142.78	4142.06	4141.20	4140.77	4139.70
12	4140.40	4140.58	4140.70	4141.14	4141.60	4142.20	4142.70	4142.74	4142.03	4141.16	4140.74	4139.68
13	4140.40	4140.59	4140.68	4141.14	4141.65	4142.29	4142.71	4142.71	4142.03	4141.12	4140.69	4139.67
14	4140.39	4140.60	4140.69	4141.15	4141.68	4142.36	4142.71	4142.70	4142.02	4141.08	4140.66	4139.64
15	4140.37	4140.62	4140.69	4141.16	4141.75	4142.41	4142.72	4142.67	4142.00	4141.04	4140.61	4139.64
16	4140.36	4140.60	4140.69	4141.16	4141.80	4142.44	4142.73	4142.66	4141.99	4141.02	4140.57	4139.62
17	4140.37	4140.61	4140.69	4141.16	4141.83	4142.46	4142.75	4142.63	4142.00	4141.02	4140.56	4139.58
18	4140.38	4140.62	4140.68	4141.17	4141.86	4142.50	4142.78	4142.60	4141.98	4141.00	4140.53	4139.55
19	4140.40	4140.64	4140.70	4141.16	4141.88	4142.52	4142.72	4142.56	4141.95	4141.02	4140.49	4139.54
20	4140.38	4140.64	4140.72	4141.16	4141.88	4142.48	4142.73	4142.51	4141.92	4141.04	4140.45	4139.53
21	4140.38	4140.68	4140.72	4141.18	4141.92	4142.52	4142.73	4142.46	4141.93	4141.04	4140.42	4139.52
22	4140.39	4140.74	4140.71	4141.18	4141.91	4142.53	4142.73	4142.42	4141.91	4141.08	4140.40	4139.51
23	4140.37	4140.75	4140.74	4141.20	4141.97	4142.59	4142.73	4142.41	4141.89	4141.11	4140.35	4139.50
24	4140.38	4140.77	4140.76	4141.24	4141.97	4142.60	4142.74	4142.38	4141.85	4141.12	4140.33	4139.46
25	4140.39	4140.78	4140.76	4141.28	4141.92	4142.59	4142.74	4142.37	4141.82	4141.12	4140.29	4139.44
26	4140.37	4140.77	4140.78	4141.30	4141.89	4142.61	4142.75	4142.34	4141.78	4141.12	4140.26	4139.43
27	4140.42	4140.75	4140.80	4141.33	4141.89	4142.60	4142.71	4142.31	4141.75	4141.12	4140.22	4139.43
28	4140.43	4140.78	4140.80	4141.37	4141.89	4142.60	4142.70	4142.29	4141.71	4141.14	4140.18	4139.39
29	4140.40	4140.80	4140.77	4141.40	---	4142.61	4142.68	4142.26	4141.67	4141.12	4140.16	4139.36
30	4140.44	4140.79	4140.80	4141.43	---	4142.56	4142.65	4142.21	4141.65	4141.12	4140.13	4139.34
31	4140.46	---	4140.81	4141.44	---	4142.57	---	4142.24	---	4141.10	4140.08	---
MEAN	4140.41	4140.63	4140.74	4141.17	4141.73	4142.30	4142.69	4142.58	4141.98	4141.21	4140.60	4139.65
MAX	4140.46	4140.80	4140.81	4141.44	4141.97	4142.61	4142.78	4142.80	4142.22	4141.61	4141.10	4140.04
MIN	4140.36	4140.49	4140.68	4140.85	4141.45	4141.72	4142.56	4142.21	4141.65	4141.00	4140.08	4139.34
(†)	297000	319000	319000	370100	406200	462700	468600	434300	383600	346900	266200	216100
(‡)	+3700	+22000	0	+51100	+36100	+56500	+5900	-34300	-50700	-36700	-80700	-50100

CAL YR 1986 MEAN 4141.61 MAX 4143.10 MIN 4139.95 AC-FT‡ +10300
WTR YR 1987 MEAN 4141.30 MAX 4142.80 MIN 4139.34 AC-FT‡ -77200

† Contents in acre-feet, at 2400, on last day of month.
‡ Change in contents, in acre-feet.

LOST RIVER BASIN

11507500 LINK RIVER AT KLAMATH FALLS, OR

LOCATION.--Lat 42°13'25", long 121°47'35", in SW 1/4 NW 1/4 sec.32, T.38 S., R.9 E., Klamath County, Hydrologic Unit 18010204, on right bank 600 ft upstream from outlet of Keno Canal and 0.4 mi upstream from Main Street Bridge at Klamath Falls.

DRAINAGE AREA.--3,810 mi^2, approximately, including 26.2 mi^2 in closed basin of Crater Lake.

PERIOD OF RECORD.--May 1904 to current year. Records since October 1983 equivalent to earlier records if flow in Keno Canal is added to flow past station.

GAGE.--Water-stage recorder. Datum of gage is 4,083.71 ft above National Geodetic Vertical Datum of 1929, or 4,085.50 ft above mean sea level, datum of Bureau of Reclamation. Prior to Sept. 14, 1912, water-stage recorder or nonrecording gages at several sites within 0.5 mi of present site at various datums. Sept. 14, 1912, to Nov. 23, 1923, at site 600 ft downstream at datum 5.42 ft lower. Nov. 24, 1923, to Nov. 15, 1961, at site on left bank at present datum.

REMARKS.--No estimated daily discharges. Records excellent. Flow regulated since 1919 by Upper Klamath Lake (station 11507001). Large diurnal fluctuation caused by powerplant upstream from station. Water diverted upstream from station by main or "A" Canal of Klamath project. Many other diversions upstream from lake. All records presented herein do not include flow in Keno Canal which, since September 1908, has diverted from Upper Klamath Lake at Link River Dam for power generation, and returns flow to Link River downstream from station.

AVERAGE DISCHARGE.--79 years (water years 1905-83), 1,593 ft^3/s, 1,154,000 acre-ft/yr, not adjusted for "A" Canal.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 9,400 ft^3/s May 12, 1904, gage height at Main Street Bridge, 7.30 ft, datum then in use, from floodmarks; minimum daily discharge, 17 ft^3/s Dec. 13, 1937.

EXTREMES FOR CURRENT YEAR.-- Maximum discharge, 2,220 ft^3/s Mar. 31; minimum, 175 ft^3/s Aug. 10, result of regulation from Upper Klamath Lake, minimum daily, 281 ft^3/s July 22, 24.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	998	1100	1850	612	1480	1450	1950	812	684	676	354	1040
2	848	1160	2050	754	1330	1430	1480	670	901	589	520	1120
3	942	1120	2140	946	1400	1360	1340	667	816	787	598	1080
4	940	1010	2120	795	1440	1420	1290	466	824	830	946	1000
5	941	1020	2050	804	1470	1290	1220	687	845	603	761	1090
6	939	998	1990	831	1580	874	1180	681	730	518	594	1070
7	1030	875	1990	887	1580	849	1150	644	649	612	596	1070
8	1020	1010	1980	1110	1580	844	965	557	619	720	641	1090
9	1060	1150	1980	1110	1580	930	957	537	555	1200	465	1060
10	1160	1190	2120	1130	1580	1000	966	788	557	962	338	1110
11	1170	1070	2020	1270	1570	1000	975	1160	557	772	352	928
12	1170	1070	1830	1240	1570	848	978	1210	559	718	498	845
13	1170	1070	1820	1200	1240	1500	981	1230	599	714	623	844
14	1120	1070	1820	1230	1070	1830	989	1130	901	654	564	940
15	1120	1070	1830	1290	1080	1670	996	758	913	782	517	940
16	1120	1070	1750	1320	1280	1680	1000	635	419	784	515	787
17	1120	1120	1720	1390	1710	1840	1010	606	362	650	515	681
18	1130	1200	1580	1380	1870	1850	1020	734	353	282	473	888
19	1180	1200	1420	1350	1830	1950	1020	867	458	284	547	884
20	1180	1200	1320	1300	1690	1970	1060	862	544	286	592	885
21	1180	1210	1320	1220	1690	1930	762	856	621	285	593	927
22	1180	1210	1370	1160	1570	1980	774	897	734	281	530	975
23	1150	1210	1380	1130	1650	2020	975	938	844	282	515	985
24	1090	1210	1340	1080	1730	1970	1020	827	940	281	585	983
25	1190	1210	1180	1050	1710	2030	902	711	820	283	659	845
26	1190	1490	1200	1050	1800	2030	868	654	1070	285	754	690
27	1190	2070	1310	1070	1690	2020	918	646	1140	287	902	691
28	1190	2040	1310	809	1490	2020	1200	646	1100	291	820	716
29	1120	1980	1220	638	---	2150	1170	645	900	476	796	841
30	1090	1820	1120	1020	---	2010	934	644	737	355	877	934
31	1090	---	1070	1550	---	2110	---	650	---	295	1070	---
TOTAL	34018	37223	51200	33726	43260	49855	32050	23815	21751	16824	19110	27939
MEAN	1097	1241	1652	1088	1545	1608	1068	768	725	543	616	931
MAX	1190	2070	2140	1550	1870	2150	1950	1230	1140	1200	1070	1120
MIN	848	875	1070	612	1070	844	762	466	353	281	338	681
AC-FT	67470	73830	101600	66900	85810	98890	63570	47240	43140	33370	37900	55420

CAL YR 1986 TOTAL 620412 MEAN 1700 MAX 6810 MIN 265 AC-FT 1231000
WTR YR 1987 TOTAL 390771 MEAN 1071 MAX 2150 MIN 281 AC-FT 775100

11509500 KLAMATH RIVER AT KENO, OR

LOCATION.--Lat 42°08'00", long 121°57'40", in NW 1/4 SE 1/4 sec.35, T.39 S., R.7 E., Klamath County, Hydrologic Unit 18010206, on left bank 1.7 mi northwest of Keno and 4.5 mi upstream from Spencer Creek.

DRAINAGE AREA.--3,920 mi^2, approximately (not including Lost River or Lower Klamath Lake basins).

PERIOD OR RECORD.--June 1904 to December 1913, October 1929 to current year. Monthly discharge only October to December 1929, published in WSP 1315-B.

GAGE.--Water-stage recorder. Datum of gage is 3,961 ft above National Geodetic Vertical Datum of 1929 (from river-profile survey). See WSP 1735 for history of changes prior to Nov. 6, 1954.

REMARKS.--No estimated daily discharges. Records excellent. Flow regulated since 1919 by Upper Klamath Lake (station 11507001). Fluctuation by Keno powerplant 0.9 mi upstream. Diversions for irrigation upstream from station.

AVERAGE DISCHARGE.--67 years, 1,705 ft^3/s, 1,235,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 10,300 ft^3/s Feb. 28, 1986, gage height, 12.82 ft, caused by regulation from Keno powerplant 0.9 mi upstream; minimum discharge, 26 ft^3/s Sept. 23, 1956; minimum daily, 60 ft^3/s May 19, 1934.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage, 15.3 ft, from floodmark (original datum), about May 10, 1904, discharge, 9,250 ft^3/s.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 2,620 ft^3/s Mar. 20, 22, gage height, 7.62 ft, caused by regulation from Keno powerplant 0.9 mi upstream; minimum discharge, 260 ft^3/s July 6, 15, 29; minimum daily, 269 ft^3/s July 16, 17.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1420	1400	2100	1370	1890	1940	1910	786	599	455	464	923
2	1460	1400	2250	1170	1890	1940	1390	1200	451	464	463	973
3	1470	1410	2250	1260	2000	1930	1200	904	451	463	460	982
4	1440	1410	2250	1260	2090	1930	1180	810	450	465	460	982
5	1420	1470	2260	1270	2080	1690	1180	588	424	465	457	994
6	1410	1530	2250	1260	2080	1330	1140	461	411	332	470	995
7	1400	1520	2250	1260	1940	1330	951	461	410	271	557	990
8	1400	1520	2250	1300	1930	1320	790	2160	412	271	670	994
9	1450	1520	2250	1380	1930	1320	752	1120	411	273	673	984
10	1520	1520	2240	1420	1930	1320	734	415	408	273	656	982
11	1520	1520	2110	1420	1940	1330	711	315	406	272	700	990
12	1520	1520	1880	1410	1950	1460	711	319	407	271	715	995
13	1520	1520	1830	1410	1960	2010	712	411	406	271	716	985
14	1520	1520	1770	1460	1950	2400	713	608	406	282	714	972
15	1520	1520	1840	1540	1950	2390	711	620	410	286	720	976
16	1520	1500	1890	1560	2150	2450	710	620	410	269	721	985
17	1520	1500	1880	1620	2290	2510	710	619	432	269	719	966
18	1520	1500	1780	1620	2290	2550	713	718	445	451	710	959
19	1520	1500	1560	1570	2300	2580	712	788	444	739	701	968
20	1520	1500	1560	1510	2310	2600	775	788	443	770	701	973
21	1520	1500	1560	1510	2310	2590	810	788	443	771	700	1010
22	1470	1500	1550	1430	2300	2600	806	787	444	781	700	1040
23	1410	1500	1560	1370	2290	2570	806	788	444	781	697	1040
24	1410	1500	1560	1370	2290	2470	837	789	446	775	696	1040
25	1400	1430	1560	1370	2290	2570	860	790	445	773	698	1030
26	1400	1400	1550	1370	2290	2570	859	789	450	765	697	1030
27	1410	2110	1550	1370	2080	2570	857	790	416	766	688	1030
28	1420	2110	1560	1380	1940	2560	855	789	410	561	690	1030
29	1410	2110	1490	1370	---	2560	822	787	435	323	691	1030
30	1400	2110	1400	1590	---	2400	756	789	454	443	802	1040
31	1400	---	1330	1890	---	2170	---	789	---	471	848	---
TOTAL	45240	47070	57120	44090	58640	65960	26673	23386	13023	14822	20354	29888
MEAN	1459	1569	1843	1422	2094	2128	889	754	434	478	657	996
MAX	1520	2110	2260	1890	2310	2600	1910	2160	599	781	848	1040
MIN	1400	1400	1330	1170	1890	1320	710	315	406	269	457	923
AC-FT	89730	93360	113300	87450	116300	130800	52910	46390	25830	29400	40370	59280

CAL YR 1986 TOTAL 737236 MEAN 2020 MAX 9010 MIN 266 AC-FT 1462000
WTR YR 1987 TOTAL 446266 MEAN 1223 MAX 2600 MIN 269 AC-FT 885200

11510700 KLAMATH RIVER BELOW JOHN C. BOYLE POWERPLANT, NEAR KENO, OR

LOCATION.--Lat 42°05'05", long 122°04'20", in SE 1/4 SE 1/4 sec.14, T.40 S., R.6 E., Klamath County, Hydrologic Unit 18010206, on right bank 0.7 mi downstream from John C. Boyle powerplant, 8 mi downstream from Spencer Creek, and 8.5 mi southwest of Keno.

DRAINAGE AREA.--4,080 mi^2, approximately (not including Lost River or Lower Klamath Lake basins).

PERIOD OF RECORD.-- January 1959 to current year. Prior to Oct. 1, 1961, published as "below Big Bend powerplant."

GAGE.--Water-stage recorder. Datum of gage is 3,274.82 ft above National Geodetic Vertical Datum of 1929 (levels by Pacific Power & Light Co.).

REMARKS.--No estimated daily discharges. Records excellent. Flow regulated by Upper Klamath Lake (station 11507001). Large diurnal fluctuation caused by Keno and John C. Boyle powerplants. Diversions for irrigation upstream from station.

AVERAGE DISCHARGE.--28 years, 1,928 ft^3/s, 1,397,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 11,000 ft^3/s Mar. 5, 1972, gage height, 9.33 ft; minimum discharge, 283 ft^3/s Feb. 17, 1968; minimum daily, 317 ft^3/s July 25, 1968.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 2,940 ft^3/s Mar. 23-26, gage height, 5.84 ft; minimum discharge, 383 ft^3/s Apr. 8, 11, May 15, June 4, July 6-8.

REVISIONS.--Revised figures of discharge for the water year 1967, superseding those published in the report for 1967 are given below.

EXTREMES FOR 1967 WATER YEAR.--Maximum discharge, 6,270 ft^3/s May 13, gage height, 7.51 ft; minimum discharge, 318 ft^3/s Nov. 27, gage height, 2.75 ft.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1966 TO SEPTEMBER 1967
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	723	1690	2170	2720	2400	2170	507	3050	3160	378	586	1270
2	717	1710	2140	2710	2410	2170	541	3060	3080	403	553	1440
3	1480	1660	2180	2720	2750	2240	1340	3000	2970	717	561	1440
4	1310	1420	2140	2740	2750	1480	1750	3040	2980	435	515	1450
5	1430	1640	2290	2750	2730	1240	1750	2760	2940	706	373	1440
6	1430	1550	2670	2750	2490	1230	1830	2760	2810	725	376	1450
7	1850	1760	2570	2750	2760	1230	1970	2770	1830	498	590	1460
8	1430	1720	2620	2760	2750	1320	1010	2690	1520	374	755	1450
9	1440	1720	2640	2610	2760	1480	534	2450	1600	377	1010	1450
10	1830	1720	2660	2760	2760	1650	1530	2700	985	487	1150	1440
11	1480	1720	2660	2750	2750	1610	1960	2780	450	622	1120	1450
12	1440	1710	2660	2630	2760	1540	1990	3620	916	383	357	1450
13	1440	1710	2650	2560	2760	1410	1990	5550	749	705	478	1450
14	2050	1710	2680	2720	2760	1400	1810	6060	690	673	1300	1450
15	1380	1690	2660	2650	2760	1520	738	5460	661	374	1170	1450
16	1390	1780	2710	2650	2760	1450	767	4550	784	368	1160	1450
17	2320	1730	2700	2670	2760	2350	1450	4300	374	672	1220	1450
18	1440	1780	2680	2220	2760	4090	2070	3730	370	589	1420	1450
19	1710	1650	2710	2760	2760	1140	2710	3270	651	559	650	1450
20	1600	1860	2710	2760	2750	863	2740	3210	619	537	357	1440
21	1450	1420	2680	2380	2760	1200	2740	3270	606	671	841	1450
22	1720	1680	2730	2450	2760	1200	2750	3240	653	377	982	1390
23	1440	1420	2720	2750	2700	1160	2740	3050	586	370	982	1080
24	2170	720	2660	2750	2630	1200	2710	2740	374	605	979	1010
25	1590	1070	2680	2760	2620	1200	2800	3050	378	652	1030	1190
26	1700	1010	2680	2670	2620	943	2930	3420	596	619	369	1340
27	1700	877	2650	2340	2620	1320	2970	3490	701	544	487	1080
28	1700	1930	2610	2100	2540	1400	3060	3470	631	552	909	1080
29	1690	2130	2660	2570	---	1450	3020	3520	596	369	717	1080
30	1610	2180	2700	2420	---	1400	3050	3490	616	371	546	785
31	1680	---	2690	2390	---	1320	---	3320	---	702	707	---
TOTAL	48340	48367	80360	81220	75390	47376	59757	106870	35876	16414	24250	40265
MEAN	1559	1612	2592	2620	2692	1528	1992	3447	1196	529	782	1342
MAX	2320	2180	2730	2760	2760	4090	3060	6060	3160	725	1420	1460
MIN	717	720	2140	2100	2400	863	507	2450	370	368	357	785
AC-FT	95880	95940	159400	161100	149500	93970	118500	212000	71160	32560	48100	79870

CAL YR 1966 TOTAL 486612 MEAN 1333 MAX 2730 MIN 373 AC-FT 965200
WTR YR 1967 TOTAL 664485 MEAN 1821 MAX 6060 MIN 357 AC-FT 1318000

11510700 KLAMATH RIVER BELOW JOHN C. BOYLE POWERPLANT NEAR KENO, OR--Continued

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1570	1550	2300	1520	2070	2130	2280	1270	1030	392	673	1240
2	1600	1510	2370	1510	2090	2170	1500	1510	389	810	674	1250
3	1620	2020	2660	1510	2500	2220	1500	1320	1080	802	674	1250
4	1630	1500	2450	1510	2310	2180	1500	1010	421	803	675	1250
5	1630	1510	2430	1500	2280	2100	1500	951	891	809	673	1200
6	1630	1580	2660	1500	2270	1570	1500	667	659	409	670	1200
7	1630	2090	2460	1500	2320	1500	1490	762	661	383	905	1200
8	1630	1570	2430	1530	2140	1500	1140	2280	390	482	956	1200
9	1620	1550	2660	1640	2330	1980	1170	1500	894	517	958	1250
10	1620	2080	2410	1650	1940	1500	1070	810	391	513	957	1240
11	1850	1490	2370	1590	2080	1490	932	432	1030	518	910	1230
12	1560	1980	2220	1560	2290	1490	931	991	391	518	953	1230
13	1820	1510	2130	1560	2280	2430	1070	422	760	512	955	1230
14	1550	2020	2030	1550	2140	2670	932	1170	759	510	957	1290
15	2040	1560	1930	1900	2150	2660	1070	429	657	554	863	1300
16	1490	1570	2170	2400	2450	2780	1070	1040	808	513	863	1200
17	1980	2040	2170	2260	2660	2880	1080	849	393	522	968	1190
18	1520	1500	2130	1720	2660	2880	897	1130	1040	633	1000	1200
19	1520	1920	1500	1720	2660	2880	897	967	391	1010	979	1230
20	2080	1500	2010	1720	2410	2880	1180	1020	804	1010	984	1250
21	1530	1950	1570	1710	2420	2880	1180	1010	804	1030	981	1240
22	1550	1570	1940	1650	2660	2880	1180	1060	391	1030	863	1270
23	1550	1520	1500	1600	2660	2500	1040	1010	1080	1130	863	1300
24	1920	2110	2130	1590	2660	2920	1170	939	389	1100	982	1290
25	1480	1490	1500	1600	2650	2920	898	944	1150	1010	983	1300
26	1490	1570	2030	1760	2360	2920	1170	1070	391	1000	983	1280
27	1550	2360	1570	1570	2320	2860	1220	1070	760	1010	984	1290
28	2010	2320	1530	1570	2170	2820	1130	1070	757	951	986	1250
29	1550	2300	2230	1860	---	2820	999	1070	392	859	688	1280
30	1570	2300	1490	1560	---	2720	891	1020	965	674	1130	1300
31	1580	---	1510	2150	---	2600	---	973	---	673	1230	---
TOTAL	51370	53540	64490	51970	65930	74730	35587	31766	20918	22687	27920	37430
MEAN	1657	1785	2080	1676	2355	2411	1186	1025	697	732	901	1248
MAX	2080	2360	2660	2400	2660	2920	2280	2280	1150	1130	1230	1300
MIN	1480	1490	1490	1500	1940	1490	891	422	389	383	670	1190
AC-FT	101900	106200	127900	103100	130800	148200	70590	63010	41490	45000	55380	74240

CAL YR 1986 TOTAL 828168 MEAN 2269 MAX 9630 MIN 394 AC-FT 1643000
WTR YR 1987 TOTAL 538338 MEAN 1475 MAX 2920 MIN 383 AC-FT 1068000

11516530 KLAMATH RIVER BELOW IRON GATE DAM, CA

LOCATION.--Lat 41°55'41", long 122°26'35", in SE 1/4 NE 1/4 sec.17, T.47 N., R.5 W., Siskiyou County, Hydrologic Unit 18010206, on left bank 0.1 mi downstream from Bogus Creek, 0.6 mi downstream from Iron Gate Dam, and 5.9 mi northeast of Hornbrook.

DRAINAGE AREA.--4,630 mi^2, approximately (not including Lost River and Lower Klamath Lake basins).

PERIOD OF RECORD.--October 1960 to current year. Chemical data available October 1961 to September 1981. Water temperature data available October 1962 to September 1980.

GAGE.--Water-stage recorder. Datum of gage is 2,162.44 ft above National Geodetic Vertical Datum of 1929 (levels by Pacific Power and Light Co.).

REMARKS.--No estimated daily discharges. Records excellent. Flow regulated by Upper Klamath Lake (station 11507001), capacity, 523,700 acre-ft, Iron Gate Reservoir, other smaller reservoirs, and diversions upstream from station.

AVERAGE DISCHARGE.--27 years, 2,281 ft^3/s, 1,653,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 29,400 ft^3/s Dec. 22, 1964, gage height, 13.63 ft, from rating curve extended above 15,000 ft^3/s, on basis of slope-area measurement of peak flow; minimum daily discharge, 647 ft^3/s Oct. 30, Nov. 6, 1960; Sept. 24, Oct. 1, 1961.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 3,350 ft^3/s Mar. 18, gage height, 5.46 ft; minimum daily discharge, 720 ft^3/s June 3, 10.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1810	1800	2450	1810	2260	2240	2400	1030	751	761	1010	1330
2	1810	1800	2550	1780	2600	2230	2100	1010	721	745	1020	1320
3	1810	1730	2550	1800	2770	2240	1750	1010	720	740	1010	1320
4	1800	1640	2550	1780	2670	2250	1740	1010	740	737	1010	1320
5	1800	1640	2560	1770	2590	2150	1740	1010	735	737	1010	1320
6	1800	1640	2560	1770	2490	1810	1740	1010	741	738	921	1320
7	1800	1700	2560	1770	2490	1770	1740	1000	730	739	913	1320
8	1800	1750	2550	1760	2480	1770	1630	999	731	745	917	1320
9	1800	1740	2550	1760	2380	1770	1310	1010	725	747	915	1320
10	1800	1750	2550	1760	2270	1770	1310	1010	720	749	917	1320
11	1800	1750	2540	1760	2330	1770	1310	1010	728	743	914	1330
12	1800	1750	2310	1760	2410	1920	1310	1010	728	741	918	1330
13	1800	1740	2220	1760	2630	2630	1310	1010	728	739	917	1330
14	1800	1740	2210	1760	2660	3110	1310	1010	733	732	920	1320
15	1800	1750	2210	1760	2600	2990	1310	1010	743	726	918	1320
16	1800	1750	2200	1760	2660	3080	1310	1010	731	724	921	1340
17	1800	1750	2200	1760	2760	3270	1310	1010	732	734	918	1340
18	1800	1750	2110	1760	2750	3310	1300	1010	800	733	921	1340
19	1800	1750	1770	1760	2740	3300	1300	1010	771	733	917	1340
20	1800	1770	1770	1760	2740	3260	1300	1010	743	732	920	1340
21	1800	1770	1770	1770	2730	3220	1300	1010	764	740	918	1340
22	1800	1780	1770	1760	2720	3200	1310	1020	754	741	921	1340
23	1800	1770	1770	1770	2720	3250	1310	1020	747	736	919	1340
24	1800	1780	1770	1770	2730	3220	1310	1020	744	735	925	1340
25	1800	1780	1770	1780	2740	3100	1300	1020	753	800	924	1340
26	1800	1780	1770	1770	2610	2960	1300	1020	744	1070	926	1340
27	1800	2280	1770	1790	2420	2950	1300	1020	740	1070	924	1340
28	1800	2570	1770	1860	2270	2950	1310	1020	736	1090	927	1340
29	1800	2570	1770	2410	---	2930	1310	1020	734	1070	928	1350
30	1800	2560	1770	2310	---	2890	1310	1020	725	1020	914	1340
31	1800	---	1770	2280	---	2720	---	1020	---	1020	938	---
TOTAL	55830	55330	66440	56630	72220	82030	43590	31409	22192	24867	28991	39950
MEAN	1801	1844	2143	1827	2579	2646	1453	1013	740	802	935	1332
MAX	1810	2570	2560	2410	2770	3310	2400	1030	800	1090	1020	1350
MIN	1800	1640	1770	1760	2260	1770	1300	999	720	724	913	1320
AC-FT	110700	109700	131800	112300	143200	162700	86460	62300	44020	49320	57500	79240

CAL YR 1986 TOTAL 920517 MEAN 2522 MAX 13100 MIN 713 AC-FT 1826000
WTR YR 1987 TOTAL 579479 MEAN 1588 MAX 3310 MIN 720 AC-FT 1149000

12472800 COLUMBIA RIVER BELOW PRIEST RAPIDS DAM, WA

LOCATION.--Lat 46°37'44", long 119°51'49", in SE 1/4 NW 1/4 sec.7, T.13 N., R.24 E., Grant County, Hydrologic Unit 17020016, on left bank 2.6 mi downstream from Priest Rapids Dam, 14.7 mi south of Beverly, and at mile 394.5.

DRAINAGE AREA.--96,000 mi^2, approximately.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--January 1917 to current year. January 1917 to September 1930, at site 3.4 mi downstream, published as "at Vernita." October 1930 to July 27, 1959, at site 46.5 mi upstream, published as "at Trinidad."

REVISED RECORDS.--WSP 1933: Drainage area. WDR WA-82-2: 1965(m), 1971(m).

GAGE.--Water-stage recorder. Datum of gage is National Geodetic Vertical Datum of 1929. Prior to Oct. 1, 1930, nonrecording gages at site 3.4 mi downstream at datum 388.7 ft above National Geodetic Vertical Datum of 1929. Oct. 1, 1930, to July 27, 1959, water-stage recorder at site 46.5 mi upstream at datum 499.3 ft above National Geodetic Vertical Datum of 1929 (river-profile survey).

REMARKS.--No estimated daily discharges. Water-discharge records excellent. Diversions for irrigation of about 500,000 acres upstream from station. Flow regulated by 10 major reservoirs and numerous smaller reservoirs and powerplants. U.S. Geological Survey satellite telemeter at station.

AVERAGE DISCHARGE.--70 years, 119,600 ft^3/s, 86,650,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 692,600 ft^3/s June 12, 1948, gage height, 59.35 ft, site and datum then in use; minimum discharge, 4,120 ft^3/s Feb. 10, 1932, gage height, 11.40 ft, site and datum then in use.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of June 7, 1894, reached a discharge of about 740,000 ft^3/s, based on information obtained at other points.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 232,000 ft^3/s May 11, elevation, 413.54 ft; minimum discharge, 35,500 ft^3/s Nov. 8, elevation, 396.25 ft.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	86200	77700	82000	75600	83500	84500	88300	123000	133000	107000	74200	89400
2	69600	76300	119000	94700	99900	97500	88300	134000	163000	94800	69600	92900
3	68500	85000	110000	92000	97000	97100	98100	111000	141000	73000	91600	105000
4	51800	101000	96200	80400	96800	82800	81000	150000	134000	65800	104000	83900
5	50700	106000	95400	107000	96400	77900	72600	170000	160000	56000	101000	53900
6	79400	112000	90200	120000	89400	81000	98000	155000	166000	87800	104000	47400
7	84500	105000	88700	141000	87100	74700	100000	145000	165000	110000	94900	63500
8	74200	96800	101000	157000	84800	71900	107000	177000	156000	106000	89000	78800
9	95900	113000	130000	161000	98100	71100	93200	164000	177000	106000	81100	75600
10	60700	104000	114000	140000	96800	76400	107000	153000	176000	98300	98400	68000
11	68000	107000	119000	135000	103000	76300	100000	172000	134000	84400	101000	90300
12	78600	106000	124000	134000	105000	76400	76700	179000	108000	68200	87500	100000
13	92700	107000	119000	129000	97600	77700	86200	185000	112000	91200	85800	63200
14	76200	107000	113000	131000	76700	74800	92600	180000	80400	105000	86400	97700
15	85200	108000	121000	158000	76200	70600	102000	183000	105000	111000	76100	90300
16	87700	98900	111000	164000	85200	71400	109000	168000	115000	105000	63200	79600
17	90300	104000	117000	149000	86500	71500	124000	143000	117000	101000	74100	83200
18	84600	102000	101000	139000	106000	72200	99000	161000	105000	87600	80900	87300
19	73000	96800	99900	137000	107000	72000	76500	148000	106000	51400	78100	71300
20	87500	96500	89300	137000	103000	73500	89200	139000	78700	90800	94600	55600
21	85400	81100	91200	155000	90200	73100	101000	151000	59300	98200	99900	87200
22	89900	96700	96900	150000	104000	72500	104000	165000	99400	83600	70900	103000
23	88700	86000	87900	148000	111000	71500	105000	148000	108000	87400	60400	94100
24	91100	91200	90800	134000	119000	93300	92300	125000	103000	82200	91900	66000
25	82300	100000	79400	139000	120000	119000	77100	124000	99000	61300	95800	80300
26	62100	89600	90400	107000	133000	130000	75600	154000	104000	48600	97700	62100
27	65100	105000	96900	103000	114000	89100	79900	167000	84600	80000	77700	57000
28	104000	99100	98900	118000	102000	82700	106000	172000	73100	90800	94600	96100
29	96600	96800	121000	111000	---	74800	131000	174000	94500	94300	80800	92900
30	96300	79600	139000	96100	---	83400	139000	142000	114000	84400	78500	102000
31	96800	---	113000	107000	---	91700	---	148000	---	88000	85200	---
TOTAL	2503600	2935100	3246100	3949800	2769200	2532400	2899600	4810000	3571000	2699100	2668900	2417600
MEAN	80760	97840	104700	127400	98900	81690	96650	155200	119000	87070	86090	80590
MAX	104000	113000	139000	164000	133000	130000	139000	185000	177000	111000	104000	105000
MIN	50700	76300	79400	75600	76200	70600	72600	111000	59300	48600	60400	47400
AC-FT	4966000	5822000	6439000	7834000	5493000	5023000	5751000	9541000	7083000	5354000	5294000	4795000

CAL YR 1986 TOTAL 39743200 MEAN 108900 MAX 197000 MIN 44900 AC-FT 78831000
WTR YR 1987 TOTAL 37002400 MEAN 101400 MAX 185000 MIN 47400 AC-FT 73394000

COLUMBIA RIVER MAIN STEM

12472800 COLUMBIA RIVER BELOW PRIEST RAPIDS DAM, WA--Continued

WATER-QUALITY RECORDS

PERIOD OF DAILY RECORD.--
WATER TEMPERATURE: March 1980 to current year. Temperature records for site "at Vernita Bridge, near Priest Rapids Dam" (station 12472900) for period July 1974 to September 1980 are equivalent.

INSTRUMENTATION.--Temperature recorder since December 1979.

EXTREMES FOR PERIOD OF DAILY RECORD.--
WATER TEMPERATURE: Maximum, 21.5°C Aug. 4, 1985; minimum, 1.0°C Feb. 3-11, 1985.

EXTREMES FOR CURRENT YEAR.--
WATER TEMPERATURE: Maximum, 21.0°C Sept. 10; minimum, 3.0°C Jan. 20-28.

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		OCTOBER			NOVEMBER			DECEMBER			JANUARY	
1	16.0	15.5	16.0	15.5	14.5	14.5	10.0	9.5	10.0	6.5	6.0	6.5
2	16.5	15.5	16.0	14.5	14.5	14.5	10.0	9.5	9.5	6.0	6.0	6.0
3	16.5	15.5	16.0	14.5	14.0	14.5	9.5	9.0	9.5	6.0	6.0	6.0
4	17.0	15.5	16.0	14.5	14.0	14.0	9.5	9.0	9.0	6.5	6.0	6.0
5	17.5	16.0	16.5	14.5	14.0	14.0	9.0	9.0	9.0	6.0	6.0	6.0
6	17.0	16.0	16.5	14.0	13.5	13.5	9.0	8.5	9.0	6.0	6.0	6.0
7	17.0	16.0	16.5	14.0	13.0	13.5	8.5	8.5	8.5	6.0	5.5	6.0
8	17.0	16.0	16.5	14.0	13.0	13.0	8.5	8.5	8.5	5.5	5.5	5.5
9	17.0	16.0	16.5	13.0	12.5	12.5	8.5	8.0	8.0	5.5	5.5	5.5
10	16.5	16.0	16.5	12.5	12.0	12.0	8.0	8.0	8.0	5.5	5.5	5.5
11	16.5	16.0	16.0	12.0	11.5	12.0	8.0	7.5	8.0	5.5	5.0	5.5
12	16.5	15.5	16.0	12.0	11.5	12.0	7.5	7.5	7.5	5.0	5.0	5.0
13	16.0	15.5	16.0	11.5	11.5	11.5	7.5	7.5	7.5	5.0	5.0	5.0
14	16.5	15.5	16.0	11.5	11.0	11.5	7.5	7.5	7.5	5.0	4.5	5.0
15	16.0	15.5	16.0	11.0	11.0	11.0	7.5	7.5	7.5	4.5	4.0	4.5
16	16.5	15.5	16.0	11.5	10.5	11.0	7.5	7.5	7.5	4.0	4.0	4.0
17	16.0	15.5	16.0	11.0	10.5	10.5	7.5	7.5	7.5	4.0	3.5	3.5
18	16.0	15.5	15.5	11.0	10.0	10.5	7.5	7.0	7.5	3.5	3.5	3.5
19	16.5	15.5	15.5	10.5	10.5	10.5	7.5	7.0	7.5	3.5	3.5	3.5
20	16.0	15.0	15.5	11.0	10.5	11.0	7.5	7.5	7.5	3.5	3.0	3.5
21	16.0	15.0	15.5	11.0	10.5	10.5	7.5	7.0	7.0	3.0	3.0	3.0
22	16.0	15.0	15.5	11.0	10.5	11.0	7.0	7.0	7.0	3.0	3.0	3.0
23	16.0	15.0	15.5	11.5	10.5	11.0	7.5	7.0	7.0	3.0	3.0	3.0
24	16.0	15.0	15.5	11.0	10.5	11.0	7.0	7.0	7.0	3.0	3.0	3.0
25	16.0	15.0	15.5	11.0	10.5	10.5	7.0	7.0	7.0	3.0	3.0	3.0
26	16.0	15.0	15.5	10.5	10.0	10.5	7.0	6.5	6.5	3.5	3.0	3.0
27	16.0	15.0	15.5	10.5	10.0	10.5	7.0	6.5	7.0	3.5	3.0	3.0
28	15.5	15.0	15.5	10.5	10.0	10.0	7.0	6.5	7.0	3.5	3.0	3.5
29	15.0	15.0	15.0	10.0	10.0	10.0	6.5	6.5	6.5	3.5	3.5	3.5
30	15.0	14.5	14.5	10.0	10.0	10.0	6.5	6.5	6.5	3.5	3.5	3.5
31	15.0	14.5	15.0	---	---	---	6.5	6.5	6.5	3.5	3.5	3.5
MONTH	17.5	14.5	16.0	15.5	10.0	12.0	10.0	6.5	7.5	6.5	3.0	4.5

12472800 COLUMBIA RIVER BELOW PRIEST RAPIDS DAM, WA--Continued

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		FEBRUARY			MARCH			APRIL			MAY	
1	4.0	3.5	3.5	4.5	4.0	4.0	7.0	6.5	6.5	10.5	9.5	10.0
2	3.5	3.5	3.5	4.5	4.0	4.0	7.0	6.5	6.5	10.0	9.5	10.0
3	3.5	3.5	3.5	4.5	4.5	4.5	7.0	6.5	7.0	10.5	10.0	10.0
4	4.0	3.5	4.0	5.0	4.5	5.0	7.5	7.0	7.0	10.0	10.0	10.0
5	4.0	4.0	4.0	5.0	4.5	5.0	7.5	7.0	7.5	10.0	9.5	10.0
6	4.5	4.0	4.0	5.5	4.5	5.0	7.5	7.0	7.0	10.5	10.0	10.0
7	4.5	4.0	4.0	5.5	5.0	5.0	7.5	7.0	7.5	10.5	10.0	10.5
8	4.5	4.0	4.0	5.5	5.0	5.0	8.0	7.5	7.5	11.0	10.5	10.5
9	4.0	4.0	4.0	5.5	5.0	5.0	8.0	7.5	7.5	11.0	10.5	11.0
10	4.5	4.0	4.0	5.5	5.0	5.0	7.5	7.5	7.5	11.5	11.0	11.0
11	4.0	4.0	4.0	5.5	5.0	5.0	7.5	7.5	7.5	12.0	11.0	11.5
12	4.5	4.0	4.0	5.5	5.0	5.5	8.5	7.5	7.5	12.0	11.5	12.0
13	5.0	4.0	4.5	6.0	5.5	5.5	8.0	7.5	7.5	11.5	11.5	11.5
14	5.0	4.5	5.0	6.0	5.5	5.5	8.5	7.5	8.0	11.5	11.5	11.5
15	5.0	4.5	4.5	6.5	5.5	6.0	8.5	8.0	8.0	12.0	11.5	11.5
16	4.5	4.5	4.5	6.0	5.5	6.0	8.5	8.0	8.0	11.5	11.5	11.5
17	4.5	4.5	4.5	6.5	5.5	6.0	8.5	8.0	8.0	12.0	11.0	11.5
18	4.5	4.0	4.5	6.5	6.0	6.0	8.5	8.0	8.0	11.5	11.0	11.5
19	4.5	4.0	4.5	6.0	5.5	6.0	9.0	8.0	8.5	11.5	11.0	11.0
20	4.5	4.5	4.5	6.5	5.5	6.0	8.5	8.0	8.5	11.0	11.0	11.0
21	4.5	4.5	4.5	6.5	5.5	6.0	9.0	8.0	8.5	11.0	11.0	11.0
22	4.5	4.0	4.5	6.5	6.0	6.0	9.0	8.5	8.5	11.5	11.0	11.0
23	4.5	4.0	4.0	7.0	6.0	6.5	9.0	8.5	8.5	12.0	11.5	11.5
24	4.0	4.0	4.0	6.5	6.0	6.5	9.0	9.0	9.0	12.0	11.5	11.5
25	4.0	3.5	4.0	6.5	6.0	6.0	10.0	9.0	9.0	12.0	11.5	12.0
26	4.0	3.5	4.0	6.5	6.0	6.0	10.0	9.0	9.5	12.5	12.0	12.0
27	4.0	4.0	4.0	6.5	6.0	6.0	10.5	9.0	9.5	12.0	12.0	12.0
28	4.0	4.0	4.0	6.5	6.0	6.0	10.0	9.5	10.0	12.5	12.0	12.5
29	---	---	---	7.0	6.0	6.5	10.0	9.5	10.0	13.0	12.5	12.5
30	---	---	---	6.5	6.0	6.5	10.0	9.5	10.0	13.0	12.5	13.0
31	---	---	---	6.5	6.5	6.5	---	---	---	13.5	12.5	13.0
MONTH	5.0	3.5	4.0	7.0	4.0	5.5	10.5	6.5	8.0	13.5	9.5	11.5
DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		JUNE			JULY			AUGUST			SEPTEMBER	
1	13.0	12.5	13.0	18.5	17.0	17.5	19.0	18.0	18.5	20.5	19.5	20.0
2	13.0	13.0	13.0	17.5	17.5	17.5	19.0	17.5	18.5	20.0	19.5	20.0
3	13.5	13.0	13.0	18.0	17.0	17.5	19.0	18.0	18.5	19.5	19.0	19.5
4	13.5	13.0	13.5	18.0	17.0	17.5	20.0	19.0	19.5	20.0	19.0	19.5
5	14.0	13.5	14.0	18.5	16.5	17.5	20.0	19.0	19.5	20.0	18.5	19.5
6	14.0	14.0	14.0	17.5	16.5	17.0	20.0	19.0	19.5	20.5	19.0	19.5
7	14.0	14.0	14.0	17.5	17.0	17.0	20.0	19.0	19.5	20.5	19.0	20.0
8	14.0	14.0	14.0	17.5	17.0	17.0	20.0	19.0	19.5	20.5	19.5	20.0
9	14.0	14.0	14.0	17.0	16.5	17.0	20.5	19.5	20.0	20.5	19.5	20.0
10	14.0	14.0	14.0	17.0	16.5	17.0	20.0	19.5	19.5	21.0	19.5	20.0
11	14.5	14.0	14.0	18.0	16.5	17.5	20.0	19.0	19.5	20.5	20.0	20.0
12	15.0	14.0	14.5	18.5	17.5	18.0	20.0	19.0	19.5	20.5	20.0	20.0
13	15.0	14.5	15.0	18.5	17.5	18.0	19.5	19.0	19.0	20.5	19.0	19.5
14	16.0	14.5	15.0	18.5	17.5	18.0	19.5	19.0	19.0	20.0	19.0	19.5
15	15.5	15.0	15.5	18.0	17.5	18.0	19.0	18.5	18.5	19.5	18.5	19.0
16	15.5	14.5	15.0	17.5	17.0	17.5	19.5	18.0	18.5	19.0	18.0	18.5
17	15.0	14.5	15.0	17.0	16.5	17.0	18.5	18.0	18.5	19.0	18.5	18.5
18	16.0	15.0	15.5	17.0	16.5	17.0	19.0	18.0	18.5	19.0	18.0	18.5
19	16.0	15.0	15.5	18.0	16.5	17.5	19.5	18.5	19.0	19.0	18.0	18.5
20	16.5	15.5	16.0	18.0	17.0	17.5	19.0	18.5	19.0	19.5	18.0	18.5
21	16.0	15.0	15.5	18.0	17.5	18.0	19.0	18.5	18.5	19.0	18.5	18.5
22	16.0	15.0	16.0	18.0	17.5	17.5	19.5	18.5	19.0	19.0	18.5	18.5
23	16.0	15.5	16.0	18.0	17.5	17.5	19.5	19.0	19.5	19.0	18.5	18.5
24	16.5	15.5	16.0	18.5	17.5	18.0	19.5	19.0	19.0	19.0	18.0	18.5
25	16.5	15.5	16.0	18.5	18.0	18.0	19.5	19.0	19.0	18.5	18.0	18.5
26	17.0	15.5	16.0	19.5	17.5	18.5	19.5	19.0	19.0	18.0	17.0	17.5
27	17.0	16.0	16.5	19.5	18.0	18.5	20.0	19.0	19.5	18.0	16.5	17.5
28	17.5	16.5	17.0	19.0	18.0	18.5	19.5	19.0	19.5	17.5	17.0	17.5
29	17.5	17.0	17.0	19.0	18.0	18.5	19.5	19.0	19.5	18.0	17.0	17.5
30	17.5	17.0	17.5	19.0	18.0	18.5	20.0	19.5	19.5	18.0	17.5	18.0
31	---	---	---	19.0	18.0	18.5	20.5	19.5	19.5	---	---	---
MONTH	17.5	12.5	15.0	19.5	16.5	17.5	20.5	17.5	19.0	21.0	16.5	19.0
YEAR	21.0	3.0	11.5									

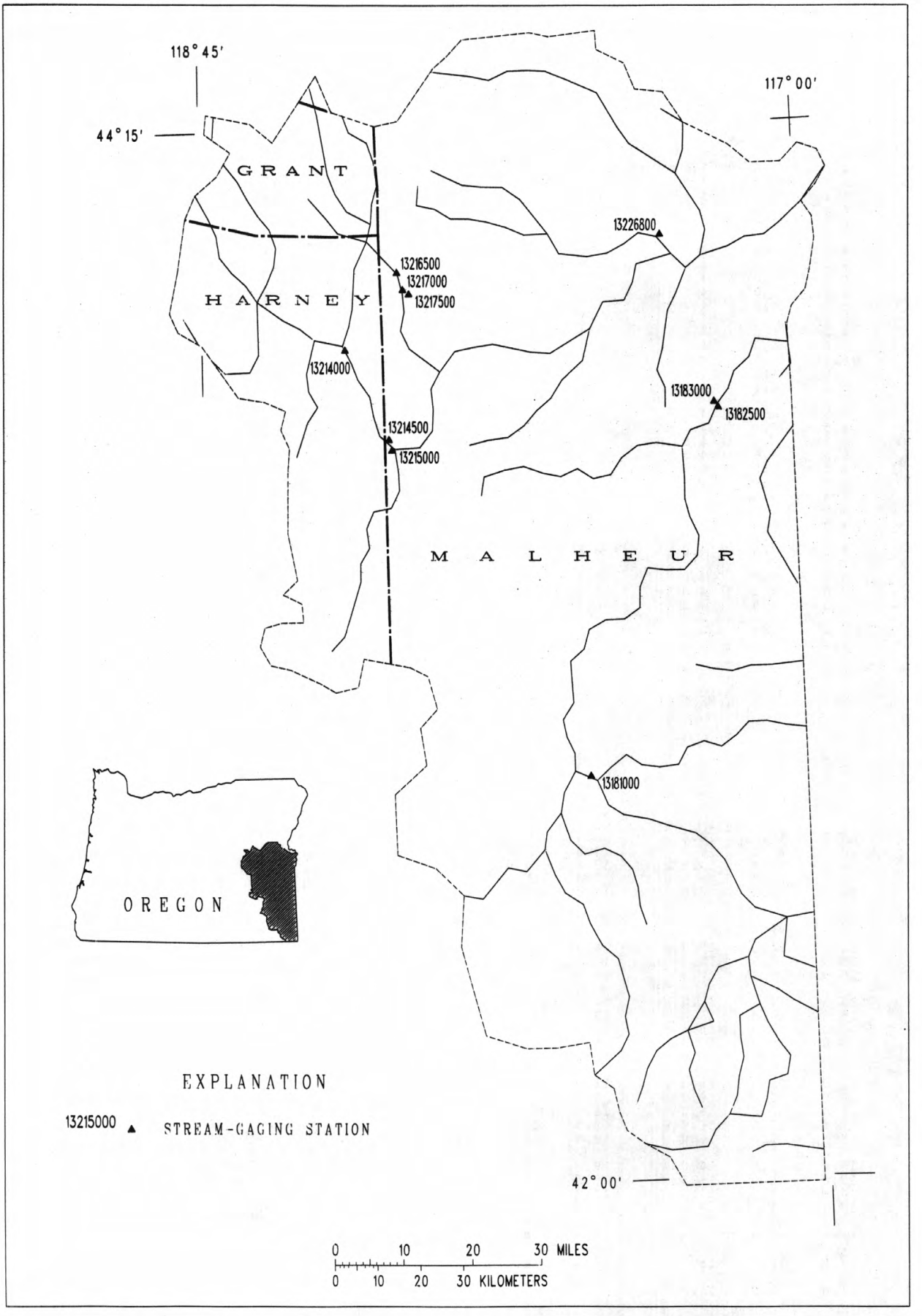

Figure 3.--Location of surface-water and water-quality stations in the Owyhee River, Malheur River, and Bully Creek basins.

13181000 OWYHEE RIVER NEAR ROME, OR

LOCATION.--Lat 42°52'02", long 117°38'52", in SE 1/4 NE 1/4 sec.14, T.31 S., R.41 E., Malheur County, Hydrologic Unit 17050107, on right bank 0.5 mi downstream from Jordan Creek, 2.6 mi north of Rome, and at mile 122.4.

DRAINAGE AREA.--About 8,000 mi^2.

PERIOD OF RECORD.--October 1949 to current year.

GAGE.--Water-stage recorder. Datum of gage is 3,344.20 ft above National Geodetic Vertical Datum of 1929. Prior to Feb 10, 1960, at datum 0.24 ft lower.

REMARKS.--Estimated daily discharges: Nov. 23-27, 30; Dec. 1, 2, 7-12; Jan. 7-20, Mar. 2. Records good except for estimated daily discharges, which are fair. Flow regulated by Antelope Reservoir, capacity, 70,000 acre-ft, increased in 1970, and Wild Horse Reservoir, capacity, 32,690 acre-ft, and numerous small reservoirs. Diversions upstream from station for irrigation.

AVERAGE DISCHARGE.--38 years, 1,021 ft^3/s, 739,700 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 41,400 ft^3/s Feb. 19, 1986, gage height, 19.09 ft; minimum, 42 ft^3/s Aug. 12, 1954, July 28, Aug. 5, 1961, July 31, 1968.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 5,400 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Mar. 7	2400	*3,900	*5.76				

Minimum discharge, 76 ft^3/s Aug. 29-31.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	258	228	200	185	231	228	409	181	577	125	118	81
2	262	226	200	194	240	228	397	181	480	124	110	82
3	253	226	198	206	256	234	497	163	421	121	112	78
4	259	223	193	216	291	247	541	157	377	120	112	78
5	263	222	217	217	288	346	552	161	335	124	104	79
6	258	221	279	217	261	833	543	150	302	113	99	78
7	258	223	250	180	244	2860	516	142	260	109	92	80
8	256	235	230	150	240	3060	510	134	243	131	90	79
9	252	234	210	131	234	1990	495	130	228	137	94	79
10	235	232	200	150	232	1440	474	129	204	133	90	85
11	226	226	200	140	237	1170	476	121	193	129	87	86
12	221	229	185	140	253	974	477	122	202	129	88	86
13	224	235	183	160	274	881	436	122	212	131	87	85
14	231	263	226	170	435	873	416	115	205	134	88	86
15	226	294	227	150	474	843	391	120	224	135	96	87
16	221	246	231	130	558	789	364	120	235	139	96	86
17	219	230	239	130	579	727	343	146	231	135	93	85
18	217	229	227	140	519	730	333	189	236	132	92	86
19	220	230	210	150	452	940	339	155	230	135	90	85
20	220	232	214	160	392	1220	325	177	220	133	87	84
21	222	256	217	162	336	1030	309	247	208	133	96	85
22	226	260	215	178	300	813	307	266	195	129	95	83
23	220	240	217	181	289	683	290	274	182	128	90	85
24	217	225	219	180	281	624	265	276	163	136	87	85
25	218	225	203	182	271	585	249	270	154	142	86	85
26	223	230	209	205	253	576	234	365	151	146	82	86
27	225	250	214	271	245	620	224	689	143	147	81	88
28	225	262	212	333	230	585	214	1420	132	139	82	94
29	224	260	199	298	---	534	202	982	126	133	77	95
30	225	250	202	257	---	464	188	927	125	132	78	94
31	229	---	185	236	---	435	---	753	---	125	78	---
TOTAL	7233	7142	6611	5799	8895	27562	11316	9384	7194	4059	2857	2535
MEAN	233	238	213	187	318	889	377	303	240	131	92.2	84.5
MAX	263	294	279	333	579	3060	552	1420	577	147	118	95
MIN	217	221	183	130	230	228	188	115	125	109	77	78
AC-FT	14350	14170	13110	11500	17640	54670	22450	18610	14270	8050	5670	5030

CAL YR 1986 TOTAL 712453 MEAN 1952 MAX 36500 MIN 156 AC-FT 1413000
WTR YR 1987 TOTAL 100587 MEAN 276 MAX 3060 MIN 77 AC-FT 199500

13182500 LAKE OWYHEE NEAR NYSSA, OR

LOCATION.--Lat 43°38'30", long 117°14'30", in NW 1/4 SE 1/4 sec.20, T.22 S., R.45 E., Malheur County, Hydrologic Unit 17050110, near left abutment on Owyhee Dam on Owyhee River, 21 mi southwest of Nyssa, and at mile 28.5.

DRAINAGE AREA.--11,160 mi^2, approximately.

PERIOD OF RECORD.--October 1932 to current year (month-end contents and change in contents only prior to October 1979). Prior to October 1958, published as Owyhee Reservoir at Owyhee Dam, near Nyssa.

GAGE.--Water-stage recorder. Datum of gage is National Geodetic Vertical Datum of 1929 (levels by Bureau of Reclamation). Prior to Oct. 1, 1965, nonrecording gage at same site and datum.

REMARKS.--Elevations for Nov. 21-23, June 10, June 12 to July 12 furnished by U.S. Bureau of Reclamation. Reservoir is formed by concrete arch-gravity dam, completed in September 1932; storage began Oct. 16, 1932. Capacity, 1,122,000 acre-ft between elevations 2,367.50 ft bottom of sluice gates and 2,670.00 ft top of spillway gate, 715,000 acre-ft between elevations 2,590.20 ft diversion tunnel and 2,670.00 ft. Dead storage below elevation 2,367.50 ft negligible. Figures given herein are contents above elevation 2,367.50 ft. Reservoir generally will not be drawn below elevation 2,590.2 ft, contents, 406,800 acre-ft, which project considers dead storage. Water is released through diversion tunnel to South Canal for irrigation of lands west of Snake River in vicinity of Homedale, Idaho, and to North Canal for irrigation of lands north and west of Owyhee River and through sluice gates to river for Owyhee Canal, which diverts about 18 mi downstream. Additional data available in files of Oregon Water Resources Department.

COOPERATION.--Capacity tables furnished by Bureau of Reclamation.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents observed, 1,140,000 acre-ft Apr. 15, 1952, elevation, 2,671.50 ft; minimum contents observed since full capacity was attained on May 7, 1936, 437,000 acre-ft Oct. 1, 1961, elevation, 2,595.35 ft.

EXTREMES FOR CURRENT YEAR.--Maximum daily contents, 972,100 acre-ft Apr. 3, elevation, 2,657.60 ft; minimum contents, 561,700 acre-ft Sept. 30, elevation, 2,613.55 ft.

Capacity table (elevation, in feet, and total contents, in acre-feet)

2,590	405,700	2,640	787,300
2,600	466,300	2,650	888,300
2,610	535,400	2,660	999,700
2,620	611,900	2,670	1,122,000
2,630	695,800	2,671	1,135,000

ELEVATION (FEET NGVD), WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
OBSERVATION AT 24:00 VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2645.76	2646.03	2647.62	2648.90	2650.92	2653.51	2657.58	2653.56	2647.71	2640.90	2631.19	2621.21
2	2645.67	2646.06	2647.64	2648.90	2650.99	2653.58	2657.58	2653.39	2647.64	2640.53	2630.87	2620.90
3	2645.62	2646.08	2647.69	2648.97	2651.06	2653.62	2657.60	2653.17	2647.51	2640.24	2630.53	2620.60
4	2645.60	2646.14	2647.69	2649.03	2651.12	2653.65	2657.53	2652.96	2647.39	2639.92	2630.19	2620.30
5	2645.56	2646.30	2647.74	2649.12	2651.19	2653.69	2657.51	2652.78	2647.21	2639.56	2629.83	2620.01
6	2645.55	2646.30	2647.76	2649.17	2651.26	2653.74	2657.49	2652.56	2647.01	2639.24	2629.51	2619.74
7	2645.51	2646.35	2647.87	2649.24	2651.33	2653.87	2657.47	2652.35	2646.80	2638.94	2629.17	2619.46
8	2645.51	2646.40	2647.94	2649.31	2651.44	2654.60	2657.37	2652.10	2646.62	2638.60	2628.85	2619.17
9	2645.58	2646.46	2647.96	2649.39	2651.56	2654.96	2657.33	2651.89	2646.40	2638.31	2628.53	2618.89
10	2645.58	2646.49	2648.01	2649.44	2651.60	2655.26	2657.24	2651.65	2646.22	2637.99	2628.17	2618.62
11	2645.56	2646.55	2648.01	2649.49	2651.71	2655.46	2657.17	2651.40	---	2637.71	2627.80	2618.35
12	2645.58	2646.62	2648.05	2649.60	2651.74	2655.62	2657.08	2651.12	2645.81	2637.44	2627.46	2618.06
13	2645.60	---	2648.12	2649.65	2651.94	2655.81	2656.99	2650.87	2645.56	2637.15	2627.12	2617.81
14	2645.62	---	2648.12	2649.69	2652.01	2655.90	2656.87	2650.58	2645.31	2636.83	2626.76	2617.55
15	2645.62	---	2648.12	2649.69	2652.10	2656.03	2656.74	2650.33	2645.12	2636.49	2626.46	2617.24
16	2645.67	---	2648.12	2649.78	2652.22	2656.12	2656.62	2650.10	2644.83	2636.12	2626.12	2616.97
17	2645.74	---	2648.14	2649.81	2652.35	2656.26	2656.42	2649.85	2644.60	2635.81	2625.78	2616.71
18	2645.74	---	2648.17	2649.87	2652.51	2656.42	2656.22	2649.56	2644.37	2635.51	2625.46	2616.47
19	2645.74	---	2648.24	2649.92	2652.62	2656.47	2656.03	2649.28	2644.15	2635.19	2625.17	2616.24
20	2645.46	---	2648.33	2649.99	2652.74	2656.62	2655.87	2649.03	2643.96	2634.90	2624.83	2615.99
21	2645.78	2647.26	2648.37	2650.01	2652.85	2656.76	2655.69	2648.81	2643.71	2634.60	2624.53	2615.76
22	2645.80	2647.31	2648.37	2650.08	2652.92	2656.90	2655.49	2648.55	2643.46	2634.31	2624.24	2615.51
23	2645.81	2647.35	2648.53	2650.15	2653.03	2656.99	2655.28	2648.40	2643.19	2634.01	2623.92	2615.26
24	2645.83	2647.42	2648.55	2650.21	2653.12	2657.12	2655.08	2648.15	2642.96	2633.72	2623.60	2615.03
25	2645.83	2647.42	2648.58	2650.28	2653.21	2657.19	2654.85	2647.94	2642.69	2633.44	2623.33	2614.78
26	2645.87	2647.42	2648.60	2650.37	2653.35	2657.30	2654.62	2647.90	2642.37	2633.15	2623.01	2614.51
27	2645.92	2647.44	2648.60	2650.44	2653.37	2657.37	2654.40	2647.81	2642.08	2632.83	2622.71	2614.26
28	2645.92	2647.53	2648.62	2650.56	2653.44	2657.42	2654.21	2647.76	2641.76	2632.51	2622.40	2614.01
29	2645.96	2647.56	2648.67	2650.62	---	2657.49	2653.96	2647.81	2641.44	2632.21	2622.10	2613.78
30	2645.99	2647.62	2648.67	2650.69	---	2657.53	2653.76	2647.81	2641.17	2631.89	2621.80	2613.56
31	2646.01	---	2648.78	2650.78	---	2657.56	---	2647.78	---	2631.51	2621.51	---
MAX	2646.01	---	2648.78	2650.78	2653.44	2657.56	2657.60	2653.56	---	2640.90	2631.19	2621.21
MIN	2645.46	---	2647.62	2648.90	2650.92	2653.51	2653.76	2647.76	---	2631.51	2621.51	2613.56
(†)	846800	863400	875500	896600	925500	971600	929000	865100	798600	709100	624200	561800
(‡)	+1700	+16600	+12100	+21200	+28800	+46100	-42600	-63900	-66500	-89500	-84900	-62400

CAL YR 1986 AC-FT‡ +45300
WTR YR 1987 AC-FT‡ -283300

† Contents, in acre-feet, at 2400, on last day of month.
‡ Change in contents in acre-feet.

13183000 OWYHEE RIVER BELOW OWYHEE DAM, OR

LOCATION.--Lat 43°39'17", long 117°15'16", in SE 1/4 sec.18, T.22 S., R.45 E.,Malheur County, Hydrologic Unit 17050110, on left bank 0.8 mi downstream from Owyhee Dam, 20 mi southwest of Nyssa, and at mile 27.3.

DRAINAGE AREA.--11,160 mi^2, approximately.

PERIOD OF RECORD.--February 1929 to current year.

REVISED RECORDS.--WSP 983: 1941-42. WSP 1397: 1930, 1933, 1946.

GAGE.--Water-stage recorder. Datum of gage is 2,343.67 ft above National Geodetic Vertical Datum of 1929 (levels by Bureau of Reclamation).

REMARKS.--Estimated daily discharge: Jan. 7-9. Records good. Flow regulated since October 1932 by Lake Owyhee (station 13182500), and by many smaller reservoirs. Diversion of up to 457,000 acre-ft from Lake Owyhee during the year for irrigation of lands downstream from station and outside the basin. Many smaller diversions upstream from Lake Owyhee for irrigation upstream from station.

COOPERATION.--Water-stage recorder inspected by irrigation district employees.

AVERAGE DISCHARGE.--55 years (water years 1933-87), 446 ft^3/s, 323,100 acre-ft/yr, not adjusted for storage or diversion.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 22,900 ft^3/s Apr. 15, 1952, gage height, 15.70 ft; no flow for part of Aug. 8, 9, 1932, when temporary diversion tunnel at Owyhee Dam was closed.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 270 ft^3/s Dec. 1, gage height, 2.20 ft; minimum discharge, 2.7 ft^3/s Jan. 5-7.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	240	232	235	4.0	13	13	256	240	225	232	210	200
2	240	232	235	3.0	13	95	258	240	225	232	210	199
3	240	110	235	2.9	13	238	258	240	225	235	208	195
4	240	27	235	2.9	13	238	260	241	225	235	207	195
5	240	27	235	2.8	13	238	260	243	215	235	207	195
6	240	28	141	2.7	13	238	258	243	220	237	206	195
7	237	28	5.8	2.7	13	238	258	243	220	237	204	195
8	235	28	4.8	5.0	13	238	258	243	220	238	203	195
9	235	28	99	14	13	238	254	241	220	240	203	196
10	184	28	220	14	13	238	255	240	220	240	199	196
11	234	28	228	14	13	240	248	240	224	208	191	197
12	235	28	228	14	12	241	257	236	225	218	196	197
13	235	28	228	19	13	242	255	235	225	220	197	197
14	235	36	228	13	13	241	255	235	219	221	197	197
15	235	25	228	13	13	243	247	235	213	223	197	197
16	235	28	228	13	13	243	250	235	225	222	197	198
17	235	25	228	13	13	243	246	232	221	220	197	200
18	235	24	103	13	13	243	246	232	225	218	197	200
19	235	26	4.5	13	13	243	246	232	225	217	195	200
20	235	28	3.9	13	13	243	246	232	225	217	195	200
21	235	28	3.6	13	13	221	209	232	227	217	195	194
22	235	27	57	13	13	246	243	230	227	217	197	200
23	235	26	224	13	13	246	243	230	227	217	198	200
24	235	138	225	13	13	249	243	230	228	217	198	200
25	235	230	221	13	13	249	241	230	230	215	200	200
26	235	230	198	13	13	251	242	230	232	215	200	200
27	235	233	219	13	13	252	243	227	232	215	200	200
28	235	233	228	13	13	252	239	227	232	212	200	201
29	234	233	228	13	---	252	228	227	232	212	200	202
30	232	233	169	13	---	253	236	227	232	212	200	202
31	232	---	4.8	13	---	255	---	227	---	210	200	---
TOTAL	7258	2655	5130.4	335.0	363	7160	7438	7275	6741	6904	6204	5943
MEAN	234	88.5	165	10.8	13.0	231	248	235	225	223	200	198
MAX	240	233	235	19	13	255	260	243	232	240	210	202
MIN	184	24	3.6	2.7	12	13	209	227	213	208	191	194
AC-FT	14400	5270	10180	664	720	14200	14750	14430	13370	13690	12310	11790
MEAN†	354	368	362	356	532	995	464	368	327	151	152	110
AC-FT†	21780	21870	22280	21860	29520	61170	27620	22620	19440	9310	9330	6550

CAL YR 1986	TOTAL 526478.4	MEAN 1442	MAX 20100	MIN 2.9	AC-FT 1044000	MEAN† 2114	AC-FT† 1530400
WTR YR 1987	TOTAL 63406.4	MEAN 174	MAX 260	MIN 2.7	AC-FT 125800	MEAN† 377	AC-FT† 273400

† Adjusted for diversions from Lake Owyhee and change in lake contents.

13214000 MALHEUR RIVER NEAR DREWSEY, OR

LOCATION.--Lat 43°47'05", long 118°19'50", in NE 1/4 SE 1/4 sec.31, T.20 S., R.36 E., Harney County, Hydrologic Unit 17050116, on left bank 300 ft downstream from bridge on U.S. Highway 20, 0.5 mi downstream from Cottonwood Creek, 3.0 mi southeast of Drewsey, and at mile 129.0.

DRAINAGE AREA.--910 mi^2, approximately.

PERIOD OF RECORD.--June 1920 to September 1921, November, December 1921, March, April 1922, April to September 1923, June 1926 to current year. Monthly discharge only for some periods, published in WSP 1317. March to September 1914 at site 13 mi upstream; records not equivalent owing to inflow from several creeks.

REVISED RECORDS.--WSP 1093: 1927. WSP 1287: Drainage area. WSP 1397: 1921, 1927-31, 1937, drainage area (former site). WSP 1517: 1952. WDR OR-78-1: 1976(P).

GAGE.--Water-stage recorder. Datum of gage is 3,479.13 ft above National Geodetic Vertical Datum of 1929. Prior to Apr. 27, 1923, water-stage recorder or nonrecording gage at site 0.5 mi downstream at different datum. Apr. 27, 1923, to June 6, 1939, water-stage recorder at site 7 mi downstream at different datum.

REMARKS.--Estimated daily discharges: Nov. 23 to Dec. 1, Dec. 23 to Jan. 25, Jan. 29 to Feb. 11, Feb. 22-24, 26, Apr. 2-21. Records good except for estimated daily discharges, which are fair. Slight regulation by small reservoirs upstream from station. Diversions for irrigation upstream from station.

AVERAGE DISCHARGE.--61 years (water years 1927-87), 193 ft^3/s, 139,800 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 12,000 ft^3/s Dec. 23, 1964, gage height, 13.50 ft, from rating curve extended above 4,500 ft^3/s on basis of contracted-opening measurement at gage height 13.20 ft; no flow at times.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 800 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Mar. 13	1300	*1,510	*6.43	No other peak greater than base discharge.			

Minimum discharge, 1.3 ft^3/s Sept. 13-17.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	94	100	60	56	70	101	238	220	49	25	3.3	2.2
2	83	99	52	60	90	105	270	202	48	32	3.3	2.0
3	82	99	57	60	80	129	300	179	48	35	3.4	1.9
4	80	99	63	60	70	212	350	158	56	30	3.7	1.8
5	79	98	77	60	62	270	370	115	61	25	3.5	2.1
6	79	98	93	58	66	483	380	110	62	24	3.5	2.2
7	81	96	80	50	66	418	390	104	63	21	3.1	2.2
8	89	95	68	43	66	333	390	100	50	17	3.5	2.1
9	90	95	73	39	66	330	380	104	33	16	4.2	1.9
10	90	95	66	36	66	283	370	105	34	18	3.6	1.7
11	90	93	49	42	80	258	350	99	43	28	2.5	1.5
12	88	93	47	42	104	394	320	99	53	28	2.7	1.5
13	89	98	56	42	291	1240	310	87	42	22	2.4	1.5
14	91	101	71	45	342	791	300	88	37	26	2.5	1.3
15	95	101	76	48	220	698	300	91	33	14	2.2	1.3
16	98	99	71	42	168	521	310	103	45	6.0	2.2	1.3
17	99	99	60	31	153	401	340	91	55	5.7	2.2	1.4
18	99	99	56	36	144	419	300	83	48	7.4	2.0	1.5
19	98	99	60	45	127	356	260	71	43	24	2.0	14
20	98	99	64	48	117	318	230	69	38	13	2.0	12
21	98	99	66	48	111	282	200	65	36	15	2.0	11
22	97	101	69	48	100	257	166	61	32	17	2.0	11
23	96	90	64	55	96	249	157	57	32	18	2.2	12
24	96	78	60	66	90	248	122	54	29	17	2.2	13
25	96	72	56	100	87	236	123	61	26	11	2.2	13
26	95	72	56	139	84	236	127	76	24	7.0	2.2	12
27	95	98	65	131	80	236	94	70	23	6.3	2.0	12
28	95	90	65	106	93	236	102	56	22	5.2	2.0	16
29	93	75	58	90	---	233	131	55	21	4.1	2.0	16
30	94	65	56	80	---	233	163	53	25	3.5	2.0	16
31	100	---	52	65	---	231	---	51	---	3.3	2.4	---
TOTAL	2847	2795	1966	1871	3189	10737	7843	2937	1211	524.5	81.0	189.4
MEAN	91.8	93.2	63.4	60.4	114	346	261	94.7	40.4	16.9	2.61	6.31
MAX	100	101	93	139	342	1240	390	220	63	35	4.2	16
MIN	79	65	47	31	62	101	94	51	21	3.3	2.0	1.3
AC-FT	5650	5540	3900	3710	6330	21300	15560	5830	2400	1040	161	376

CAL YR 1986 TOTAL 100085.9 MEAN 274 MAX 3050 MIN 1.7 AC-FT 198500
WTR YR 1987 TOTAL 36190.9 MEAN 99.2 MAX 1240 MIN 1.3 AC-FT 71780

13214500 WARMSPRINGS RESERVOIR NEAR RIVERSIDE, OR

LOCATION.--Lat 43°35'07", long 118°12'30", on line between NW 1/4 SW 1/4 and SW 1/4 SW 1/4 sec.8, T.23 S., R.37 E., Malheur County, Hydrologic Unit 17050116, on Bureau of Reclamation lands, near right end of dam on Malheur River, 3 mi northwest of Riverside, 4 mi upstream from South Fork, and at mile 114.0.

DRAINAGE AREA.--1,100 mi^2, approximately.

PERIOD OF RECORD.--January 1920 to October 1929, December 1929 to current year. Prior to Sept. 3, 1980, monthend contents and change in contents only.

GAGE.--Water-stage recorder. Datum of gage is 3,327.0 ft above National Geodetic Vertical Datum of 1929 (levels by Bureau of Reclamation); gage readings have been reduced to elevations NVGD. Prior to May 29, 1964, nonrecording gage read daily or weekly.

REMARKS.--Midnight elevation for May 26 from Bureau of Reclamation files. Reservoir is formed by concrete-arch dam. Storage began in 1919. Capacity, 191,000 acre-ft between elevations 3,327.00 ft, bottom of outlet tunnel, and 3,406.00 ft, top of flashboards. Dead storage, 1,400 acre-ft below elevation 3,327.00 ft not included in records. Water used to irrigate lands on both sides of river between Namorf and Ontario.

COOPERATION.--Capacity table furnished by Bureau of Reclamation.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 196,100 acre-ft Apr. 16, May 13, 1958, elevation, 3,407.10 ft; no contents Sept. 18 to Nov. 1, 1929, Aug. 26 to sometime in November 1935, Sept. 18 to Oct. 11, 1950, sometime in August to Oct. 3, 1977.

EXTREMES FOR CURRENT YEAR.--Maximum contents, 115,600 acre-ft Apr. 8, 9, elevation, 3,387.52 ft; minimum contents, 27 acre-ft Sept. 16, 17, elevation, 3,327.67 ft.

Capacity table (elevation, in feet, and useable contents, in acre-feet)

3,327	0	3,345	10,150	3,380	90,520
3,330	295	3,350	16,930	3,390	124,600
3,335	1,960	3,360	35,400	3,400	164,400
3,340	5,090	3,370	60,140	3,406	191,000

ELEVATION (FEET NGVD), WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
INSTANTANEOUS OBSERVATIONS AT 2400

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3369.46	3370.25	3372.41	3374.17	3376.05	---	3385.92	3384.02	3377.01	3369.54	3357.04	3332.38
2	3369.44	3370.32	3372.44	3374.22	3376.15	---	3386.26	3383.84	3376.95	3369.15	3356.53	3331.70
3	3369.42	3370.38	3372.49	3374.31	3376.21	---	3386.49	3383.64	3376.83	3368.76	3356.02	3330.60
4	3369.40	3370.44	3372.54	3374.36	3376.30	---	3386.73	3383.43	3376.70	3368.37	3355.50	3329.55
5	3369.37	3370.55	3372.61	3374.44	3376.38	---	3386.86	3383.15	3376.53	3367.95	3355.02	3328.88
6	3369.35	3370.61	3372.69	3374.50	3376.46	---	3387.25	3382.86	3376.31	3367.54	---	3328.48
7	3369.32	3370.66	3372.77	3374.50	3376.55	---	3387.43	3382.58	3376.08	3367.15	---	3328.23
8	3369.30	3370.73	3372.83	3374.50	3376.62	---	3387.52	3382.31	3375.85	---	---	3328.05
9	3369.27	3370.80	3372.87	3374.50	3376.70	---	3387.52	3382.03	3375.66	3366.31	---	3327.93
10	3369.24	3370.86	3372.91	3374.55	3376.76	---	3387.43	3381.77	3375.41	3365.93	---	3327.85
11	3369.19	3370.93	3372.95	3374.55	3376.86	---	3387.41	3381.50	3375.16	3365.55	---	3327.79
12	3369.18	3370.96	3373.00	3374.56	3376.95	---	3387.40	3381.24	3374.89	3365.20	---	3327.75
13	3369.15	3371.05	3373.05	3374.79	3377.11	---	3387.38	3380.96	3374.60	3364.85	---	3327.73
14	3369.13	3371.14	3373.13	3374.87	3377.42	---	3387.37	3380.67	3374.29	3364.48	---	3327.71
15	3369.15	3371.21	3373.20	3374.89	3377.62	---	3387.38	3380.35	3374.00	3364.09	---	3327.68
16	3369.20	3371.31	3373.26	3374.89	3377.78	---	3387.39	3380.06	3373.77	3363.64	---	3327.67
17	3369.25	3371.37	3373.30	3374.90	3377.91	---	3387.40	3379.80	3373.58	3363.17	---	3327.67
18	3369.28	3371.46	3373.34	3374.90	3378.00	---	3387.32	3379.50	3373.41	3362.72	---	3327.69
19	3369.32	3371.52	3373.39	3374.92	3378.13	---	3387.12	3379.20	3373.25	3362.28	---	3327.71
20	3369.36	3371.60	3373.43	3374.92	3378.22	---	3386.92	3378.90	3373.02	3361.85	---	3327.86
21	3369.40	3371.69	3373.49	3374.92	3378.30	---	3386.71	3378.63	3372.76	3361.54	---	3328.06
22	3369.46	3371.76	3373.56	3374.92	3378.39	---	---	3378.39	3372.49	3361.23	---	---
23	3369.58	3371.84	3373.60	3374.99	3378.48	---	---	3378.15	3372.24	3360.91	---	---
24	3369.66	3371.94	3373.65	3375.21	---	3385.02	---	3377.91	3371.98	3360.57	---	---
25	3369.74	3371.99	3373.69	3375.40	---	3385.16	---	3377.75	3371.70	3360.18	---	---
26	3369.79	3372.07	3373.79	3375.54	---	3385.27	---	3377.58	3371.39	3359.78	---	---
27	3369.90	3372.14	3373.85	3375.61	---	3385.40	---	3377.44	3371.05	3359.39	---	---
28	3369.96	3372.20	3373.93	3375.73	---	3385.52	---	3377.33	3370.69	3358.96	---	---
29	3370.04	3372.27	3374.01	3375.84	---	3385.59	---	3377.23	3370.31	3358.50	---	---
30	3370.10	3372.34	3374.03	3375.92	---	3385.70	3384.22	3377.16	3369.92	3358.04	---	---
31	3370.16	---	3374.04	3375.99	---	3385.81	---	3377.09	---	3357.55	---	---
MAX	3370.16	3372.34	3374.04	3375.99	---	---	---	3384.02	3377.01	---	---	---
MIN	3369.13	3370.25	3372.41	3374.17	---	---	---	3377.09	3369.92	---	---	---
(†)	60590	66840	71910	77910	a85180	109700	104300	81340	59920	30290	a1380	b171
(‡)	+1900	+6250	+5070	+6000	+7270	+24520	-5400	-22960	-21420	-29630	-28910	-1209

CAL YR 1986 MAX 3404.07 MIN 3368.16 AC-FT‡ +17500
WTR YR 1987 MAX ------- MIN ------- AC-FT‡ -58519

† Contents, in acre-feet, at 2400, on last day of month.
‡ Change in contents, in acre-feet.
a Contents computed from interpolated elevations between times of observed elevations.
b Contents computed from elevations observed at 0800 by Warmsprings Irrigation District personnel.

13215000 MALHEUR RIVER BELOW WARMSPRINGS RESERVOIR, NEAR RIVERSIDE, OR

LOCATION.--Lat 43°34'29", long 118°12'31", on line between NW 1/4 SW 1/4 and SW 1/4 NW 1/4 sec.17, T.23 S., R.37 E., Malheur County, Hydrologic Unit 17050116, on left bank 0.9 mi downstream from Warmsprings Dam, 3.0 mi upstream from South Fork, 4.0 mi northwest of Riverside, and at mile 113.

DRAINAGE AREA.--1,100 mi^2, approximately.

PERIOD OF RECORD.--January 1906 to March 1907 and December 1908 (gage heights only), January 1909 to September 1910, December 1914 to July 1917, March 1919 to current year. Monthly discharge only for some periods, published in WSP 1317. Figures of discharge for January 1906 to March 1907, published in WSP 272 and 370, have been found to be unreliable and should not be used. Published as Middle Fork of Malheur River at Riverside 1906-7, as Middle Fork of Malheur River above South Fork, at Riverside 1909-10, as Malheur River above South Fork, at Riverside in WSP 370, 1906-10, and as Malheur River at Warmsprings reservoir site, near Riverside 1914-17.

REVISED RECORDS.--WSP 833: 1936. WSP 1063: 1942-45. WSP 1397: 1909-10, 1917. WSP 1447: 1955. See also PERIOD OF RECORD.

GAGE.--Water-stage recorder and concrete control. Elevation of gage is 3,305 ft, by barometer. See WSP 1317 or 1737 for history of changes prior to Sept. 29, 1949.

REMARKS.--Estimated daily discharges: Jan. 13-26; Apr. 30 to May 27; Sept. 3-30. Records good except those for May, which are fair. Flow completely regulated since November 1919 by Warmsprings Reservoir (station 13214500). Diversions for irrigation upstream from station.

AVERAGE DISCHARGE.--68 years (water years 1920-87), 193 ft^3/s, 139,800 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge observed, 7,200 ft^3/s Mar. 1, 1910, gage height, 10.7 ft, site and datum then in use, from rating curve extended above 820 ft^3/s; maximum discharge since storage began November 1919, 3,150 ft^3/s Mar. 22, 1984, gage height, 9.70 ft, from floodmark; no flow at times.

EXTREMES FOR CURRENT YEAR.--Maximum recorded discharge, 637 ft^3/s Apr. 27, gage height, 5.26 ft; no flow for many days.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	97	.00	.00	.00	.02	.19	.00	500	109	486	444	67
2	97	.00	.00	.00	.04	.19	.00	465	136	485	447	5.8
3	97	.00	.00	.00	.06	.20	.00	465	197	482	442	4.9
4	97	.00	.00	.00	.06	.21	.00	465	241	476	436	7.0
5	97	.00	.00	.00	.08	.20	.00	515	284	469	432	4.9
6	100	.00	.02	.00	.08	.24	5.8	465	336	464	438	.00
7	102	.00	.01	.00	.08	.23	87	505	355	461	447	.00
8	102	.00	.00	.00	.10	.23	249	490	338	468	443	.00
9	101	.00	.00	.00	.10	.24	413	485	324	456	436	.00
10	101	.00	.00	.00	.11	.20	441	485	358	439	438	.00
11	101	.01	.00	.00	.24	.21	370	485	375	438	433	.00
12	102	.02	.00	.00	.24	.20	344	460	410	433	431	.00
13	102	.02	.00	.00	.35	.21	269	460	429	420	436	.00
14	102	.02	.00	.00	.27	.16	235	500	425	431	427	.00
15	37	.02	.00	.00	.28	.14	195	500	425	452	393	.00
16	.00	.01	.00	.00	.25	.10	177	550	354	476	371	.00
17	.08	.00	.00	.00	.23	.08	267	550	284	471	364	.00
18	.02	.00	.00	.00	.22	.08	395	490	263	493	357	.00
19	.04	.00	.00	.00	.22	.08	477	465	261	490	348	.00
20	.05	.00	.00	.00	.20	.06	516	460	318	472	341	.00
21	.05	.00	.00	.00	.19	.05	516	450	345	465	350	.00
22	.04	.00	.00	.00	.19	.03	515	425	345	396	357	.00
23	.01	.00	.00	.00	.21	.04	515	385	344	356	352	.00
24	.00	.00	.00	.00	.20	.07	512	380	359	381	347	.00
25	.00	.00	.00	.00	.19	.05	511	380	367	409	349	.00
26	.00	.00	.00	.00	.19	.04	553	350	399	413	341	.00
27	.00	.00	.00	.00	.19	.02	576	300	428	407	330	.00
28	.00	.00	.00	.00	.19	.00	617	214	446	420	319	.00
29	.00	.00	.00	.00	---	.00	584	172	470	432	307	.00
30	.03	.00	.00	.00	---	.00	529	126	485	431	277	.00
31	.01	---	.00	.01	---	.00	---	106	---	437	196	---
TOTAL	1435.33	0.10	0.03	0.01	4.78	3.75	9868.80	13048	10210	13809	11829	89.60
MEAN	46.3	.003	.001	.000	.17	.12	329	421	340	445	382	2.99
MAX	102	.02	.02	.01	.35	.24	617	550	485	493	447	67
MIN	.00	.00	.00	.00	.02	.00	.00	106	109	356	196	.00
AC-FT	2850	.2	.06	.02	9.5	7.4	19570	25880	20250	27390	23460	178

CAL YR 1986 TOTAL 98542.96 MEAN 270 MAX 1480 MIN .00 AC-FT 195500
WTR YR 1987 TOTAL 60298.40 MEAN 165 MAX 617 MIN .00 AC-FT 119600

13216500 NORTH FORK MALHEUR RIVER ABOVE BEULAH RESERVOIR, NEAR BEULAH, OR

LOCATION.--Lat 43°56'54", long 118°10'24", in NW 1/4 NE 1/4 sec.4, T.19 S., R.37 E., Malheur County, Hydrologic Unit 17050116, on left bank 1,000 ft upstream from Beulah Reservoir, 3.5 mi northwest of Beulah, and at mile 16.8. Prior to Sept. 24, 1985, at site 800 ft upstream.

DRAINAGE AREA.--355 mi^2.

PERIOD OF RECORD.--January to September 1914 (published as "at Scott's Ranch, near Beulah"), June 1936 to current year. Published as "above Agency Valley Reservoir, near Beulah", June 1936 to September 1968.

REVISED RECORDS.--WSP 1934: 1960(M).

GAGE.--Water-stage recorder. Elevation of gage is 3,320 ft above National Geodetic Vertical Datum of 1929, from topographic map. Jan. 1 to Sept. 30, 1914, nonrecording gage and June 10, 1936, to Oct. 14, 1958, water-stage recorder at site 0.5 mi upstream at different datums. Oct. 15, 1958, to Oct. 8, 1975, water-stage recorder at site 800 ft upstream, datum of gage 3,351.0 ft. Oct. 9, 1975, to Sept. 24, 1985, at site 800 ft upstream, datum of gage 3,349.4 ft.

REMARKS.--Estimated daily discharges: Dec. 2, 8, 9, 11, 15-17, 23-25, 30, 31; Jan. 7-30; Feb. 5, 17-28; Mar. 1 to Apr. 29. Records good except those for estimated daily discharges, which are fair. No regulation. Diversions for irrigation upstream from station.

AVERAGE DISCHARGE.--51 years (water years 1937-87), 138 ft^3/s, 99,980 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 3,970 ft^3/s Dec. 23, 1964, gage height, 9.90 ft, present datum, from floodmark, from rating curve extended above 1,300 ft^3/s, on basis of slope-area measurement of peak flow; maximum gage height, 11.0 ft, present datum, sometime during period Dec. 17-23, 1964 (icejam); minimum discharge, 8.5 ft^3/s Dec. 13, 1967, result of freezeup.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 500 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Jan. 13	1900	a	*3.42	Mar. 13	0530	*359	2.20

Minimum discharge, 21 ft^3/s Dec. 18.

a Backwater from ice.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	67	65	52	61	63	67	120	175	63	44	34	30
2	64	63	54	63	61	64	137	153	60	47	35	31
3	62	63	55	62	59	81	141	139	55	41	33	31
4	62	63	57	59	52	88	164	134	55	40	30	34
5	62	64	74	62	54	139	182	122	55	40	30	36
6	62	66	65	58	50	155	177	105	51	39	31	35
7	62	67	49	54	51	134	187	110	51	34	33	35
8	63	66	47	45	54	128	193	108	57	35	32	34
9	63	66	45	42	54	139	182	117	56	36	32	34
10	62	49	44	46	56	126	179	113	50	39	31	34
11	62	67	42	46	58	128	187	109	49	40	29	35
12	62	78	52	46	55	164	172	102	47	40	28	36
13	62	70	65	52	88	288	157	100	44	38	33	36
14	63	68	66	54	84	237	150	89	43	34	36	38
15	62	67	45	54	76	204	141	89	50	31	37	38
16	62	66	37	44	66	167	155	98	63	33	36	40
17	62	70	32	40	68	150	159	87	58	34	35	41
18	63	69	34	50	64	162	162	80	57	37	34	40
19	63	72	46	54	58	134	148	75	52	39	34	39
20	62	69	53	54	54	122	137	74	48	38	34	38
21	62	72	50	58	50	107	134	71	48	37	34	38
22	62	71	55	64	47	100	132	69	48	45	34	38
23	62	67	58	68	43	107	132	69	45	44	33	38
24	62	66	54	74	39	100	134	70	44	44	36	38
25	62	61	50	82	37	90	134	73	42	42	35	38
26	63	57	51	88	36	90	134	69	41	40	34	39
27	66	70	56	92	52	90	134	66	41	38	34	40
28	65	66	54	82	57	88	134	68	41	38	33	40
29	65	63	44	70	---	84	150	64	45	36	33	40
30	76	48	45	62	---	90	166	62	42	35	32	39
31	69	---	50	61	---	100	---	66	---	35	32	---
TOTAL	1966	1969	1581	1847	1586	3923	4614	2926	1501	1193	1027	1103
MEAN	63.4	65.6	51.0	59.6	56.6	127	154	94.4	50.0	38.5	33.1	36.8
MAX	76	78	74	92	88	288	193	175	63	47	37	41
MIN	62	48	32	40	36	64	120	62	41	31	28	30
AC-FT	3900	3910	3140	3660	3150	7780	9150	5800	2980	2370	2040	2190

CAL YR 1986 TOTAL 61823 MEAN 169 MAX 1540 MIN 32 AC-FT 122600
WTR YR 1987 TOTAL 25236 MEAN 69.1 MAX 288 MIN 28 AC-FT 50060

13217000 BEULAH RESERVOIR AT BEULAH, OR

LOCATION.--Lat 43°54'41", long 118°09'25", in SW 1/4 SE 1/4 sec.15, T.19 S., R.37 E., Malheur County, Hydrologic Unit 17050116, on top of dam near right end of dam on North Fork Malheur River, 0.2 mi northwest of Beulah, and at mile 15.0.

DRAINAGE AREA.--440 mi^2, approximately.

PERIOD OF RECORD.--December 1935 to current year. Prior to October 1968, published as Agency Valley Reservoir at Beulah. Prior to March 1979, monthend contents only.

REVISED RECORDS.--WSP 1397: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 7.49 ft above National Geodetic Vertical Datum of 1929. Prior to Oct. 1, 1978, published as "National Geodetic Vertical Datum of 1929, Bureau of Reclamation construction datum." Prior to Mar. 28, 1979, nonrecording gage at same site and datum.

REMARKS.--Reservoir is formed by earthfill, rock-faced dam. Storage began December 1935. Capacity, 59,920 acre-ft between gage heights 3,263.21 ft, bottom of outlet tunnel, and 3,340.0 ft, top of spillway gates; with gates open the capacity is 32,220 acre-ft. No dead storage. Water is used for irrigation of lands below Juntura, on Vale project, Bureau of Reclamation.

COOPERATION.--Prior to Mar. 28, 1979, daily gage heights furnished by Vale-Oregon Irrigation District. Capacity table furnished by Bureau of Reclamation.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents observed, 62,770 acre-ft May 3, 1941, gage height, 3,341.50 ft; no contents Sept. 17 to Oct. 13, 1950, Aug. 28 to Oct. 4, 1955, Aug. 13 to Oct. 1, 1961, Sept. 21 to Oct. 5, 1968, sometime Aug. 1-31 to Oct. 3, 1977.

EXTREMES FOR CURRENT YEAR.--Maximum contents, 50,100 acre-ft Apr. 21, gage height, 3,334.59 ft; minimum contents observed, 198 acre-ft Sept. 30, gage height, 3,273.07 ft, but may have been less during period of no record Sept. 4-29.

Capacity table (gage height, in feet, and total contents, in acre-feet)

3,273	195	3,290	3,750	3,310	16,950
3,275	310	3,295	6,090	3,320	28,250
3,280	925	3,300	8,980	3,330	42,530
3,285	2,020	3,305	12,520	3,341	61,840

GAGE HEIGHT (FEET ABOVE DATUM), WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
INSTANTANEOUS OBSERVATIONS AT 2400

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3311.90	3313.26	3316.79	3319.88	3322.99	3326.15	3331.97	3333.04	3328.31	3319.35	3308.09	3289.23
2	3311.88	3313.38	3316.90	3319.99	3323.11	3326.24	3332.11	3332.95	3328.19	3318.97	3307.60	3288.09
3	3311.88	3313.49	3316.97	3320.13	3323.22	3326.38	3332.28	3332.88	3328.02	3318.61	3307.13	3286.74
4	3311.90	3313.61	3317.10	3320.22	3323.33	3326.56	3332.45	3332.79	3327.79	3318.22	3306.63	---
5	3311.92	3313.72	3317.24	3320.31	3323.43	3326.79	3332.67	3332.68	3327.56	3317.85	3306.11	---
6	3311.94	3313.84	3317.36	3320.44	3323.53	3327.06	3332.84	3332.54	3327.29	3317.49	3305.59	---
7	3311.95	3313.95	3317.45	3320.51	3323.63	3327.28	3332.99	3332.40	3327.01	3317.11	3305.04	---
8	3311.95	3314.06	3317.53	3320.54	3323.74	3327.47	3333.13	3332.27	3326.74	3316.76	3304.49	---
9	3311.97	3314.18	3317.60	3320.61	3323.84	3327.70	3333.29	3332.13	3326.45	3316.40	3303.95	---
10	3311.95	3314.27	3317.63	3320.68	3323.95	3327.88	3333.43	3332.02	3326.15	3316.04	3303.38	---
11	3311.95	3314.38	3317.69	3320.74	3324.04	3328.06	3333.56	3331.88	3325.86	3315.74	3302.79	---
12	3311.97	3314.54	3317.78	3320.85	3324.19	3328.34	3333.72	3331.70	3325.51	3315.43	3302.28	---
13	3311.97	3314.65	3317.92	3320.94	3324.38	3328.72	3333.85	3331.58	3325.13	3315.11	---	---
14	3311.97	3314.79	3318.04	3321.06	3324.56	3329.10	3333.97	3331.45	3324.72	3314.77	---	---
15	3311.94	3314.90	3318.15	3321.15	3324.70	3329.40	3334.06	3331.29	3324.36	3314.40	---	---
16	3311.86	3315.02	3318.24	3321.22	3324.84	3329.61	3334.18	3331.15	3324.03	3314.03	---	---
17	3311.81	3315.15	3318.31	3321.31	3324.95	3329.85	3334.22	3330.99	3323.72	3313.65	---	---
18	3311.74	3315.29	3318.40	3321.43	3325.06	3330.04	3334.27	3330.79	3323.38	3313.29	---	---
19	3311.70	3315.42	3318.49	3321.53	3325.18	3330.22	3334.40	3330.58	3323.11	3312.95	3298.13	---
20	3311.77	3315.54	3318.61	3321.61	3325.28	3330.38	3334.49	3330.40	3322.85	3312.60	3297.53	---
21	3311.88	3315.68	3318.70	3321.69	3325.38	3330.53	3334.51	3330.22	3322.61	3312.24	3296.94	---
22	3312.01	3315.81	3318.81	3321.81	3325.47	3330.68	3334.45	3330.02	3322.36	3311.94	3296.36	---
23	3312.11	3315.93	3318.93	3321.92	3325.56	3330.83	3334.29	3329.85	3322.11	3311.61	3295.75	---
24	3312.22	3316.04	3319.03	3322.04	3325.65	3330.95	3334.15	3329.63	3321.86	3311.29	3295.16	---
25	3312.35	3316.15	3319.13	3322.20	3325.74	3331.10	3334.02	3329.43	3321.61	3310.94	3294.56	---
26	3312.47	3316.27	3319.24	3322.33	3325.83	3331.19	3333.88	3329.24	3321.31	3310.59	3293.89	---
27	3312.59	3316.40	3319.36	3322.44	3325.92	3331.31	3333.70	3329.09	3320.95	3310.22	3293.22	---
28	3312.72	3316.52	3319.47	3322.54	3326.02	3331.43	3333.49	3328.95	3320.58	3309.85	3292.50	---
29	3312.86	3316.61	3319.56	3322.65	---	3331.54	3333.34	3328.79	3320.18	3309.43	3291.72	---
30	3312.99	3316.70	3319.63	3322.77	---	3331.67	3333.18	3328.63	3319.74	3308.99	3290.91	3273.70
31	3313.11	---	3319.72	3322.88	---	3331.81	---	3328.45	---	3308.56	3290.12	---
MAX	3313.11	3316.70	3319.72	3322.88	3326.02	3331.81	3334.51	3333.04	3328.31	3319.35	---	---
MIN	3311.70	3313.26	3316.79	3319.88	3322.99	3326.15	3331.97	3328.45	3319.74	3308.56	---	---
(†)	20140	24210	27900	32050	36510	45440	47700	40140	27930	15550	3800	232
(‡)	+1240	+4070	+3690	+4150	+4460	+8930	+2260	-7560	-12210	-12380	-11750	-3570

CAL YR 1986	MAX	6518.07	MIN	3311.70	AC-FT‡	-830
WTR YR 1987	MAX	-------	MIN	-------	AC-FT‡	-18670

† Contents, in acre-feet, at 2400, on last day of month.
‡ Change in contents, in acre-feet.

13217500 NORTH FORK MALHEUR RIVER AT BEULAH, OR

LOCATION.--Lat 43°54'28", long 118°09'08", in NW 1/4 NE 1/4 sec.22, T.19 S., R.37 E., Malheur County, Hydrologic Unit 17050116, on left bank at Beulah, 0.3 mi downstream from Agency Valley Dam, 12 mi northwest of Juntura, and at mile 14.5.

DRAINAGE AREA.--440 mi^2, approximately.

PERIOD OF RECORD.--June 1926 to current year. Published as "near Beulah" June 1926 to September 1935.

REVISED RECORDS.--WSP 1397: 1927-32, 1934, drainage area.

GAGE.--Water-stage recorder. Datum of gage is 3,261.20 ft above National Geodetic Vertical Datum of 1929. Prior to Apr. 25, 1926, water-stage recorder at site 1 mi downstream at different datum. Apr. 25, 1936, to Sept. 30, 1949, nonrecording gage at site 20 ft downstream at datum 1.0 ft higher. Oct. 1, 1949, to June 30, 1964, at present site at datum 1.0 ft higher.

REMARKS.--Estimated daily discharges: Oct. 1 to Nov. 17, Nov. 28 to Dec. 17, June 24 to July 9. Records good except for estimated daily discharges, which are poor. Flow regulated since 1935 by Beulah Reservoir (station 13217000). Diversions for irrigation upstream from station.

AVERAGE DISCHARGE.--52 years (water years 1936-87), 148 ft^3/s, 107,200 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 7,000 ft^3/s May 7, 1942, gage height, 9.4 ft, present datum, from floodmark, caused by failure of gates at Agency Valley Dam, from rating curve extended above 1,100 ft^3/s on basis of computation of peak flow over dam; no flow at times.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 362 ft^3/s June 12, gage height, 3.34 ft; minimum discharge, 0.10 ft^3/s Dec. 22.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	75	1.8	1.1	.17	.14	1.4	6.2	284	189	290	254	222
2	60	1.8	1.1	.15	.19	1.4	6.8	230	189	280	265	263
3	61	1.8	1.1	.17	.21	1.6	6.9	232	204	265	256	279
4	58	1.8	1.1	.15	.21	1.6	7.0	233	229	260	260	312
5	59	1.8	1.1	.14	.21	1.6	7.0	233	241	260	262	313
6	60	1.8	1.1	.14	.21	1.6	13	233	255	255	262	303
7	60	1.8	1.1	.14	.21	1.8	20	233	265	250	275	288
8	61	1.8	1.1	.14	.21	1.8	25	233	273	235	273	258
9	60	1.8	1.1	.14	.21	1.8	31	231	278	235	268	179
10	60	1.8	.14	.14	.21	1.8	22	233	278	231	268	39
11	60	1.8	.14	.14	.23	1.8	22	233	283	226	268	35
12	60	1.8	.14	.14	.32	1.8	22	233	310	223	266	36
13	60	1.8	.14	.14	.72	2.1	22	233	318	224	265	36
14	60	1.8	.14	.14	.67	2.1	22	233	316	220	264	37
15	60	1.8	.14	.14	.76	2.1	22	233	313	216	262	39
16	60	1.8	.14	.14	.82	2.1	25	235	311	226	261	39
17	60	1.8	.14	.14	.82	2.1	25	235	291	228	249	40
18	60	1.9	.14	.14	.82	2.1	25	235	294	227	242	40
19	60	1.8	.14	.14	.82	2.5	25	235	264	230	240	40
20	30	1.8	.14	.14	.96	2.7	26	235	216	230	238	40
21	1.8	1.8	.14	.14	.99	2.7	104	236	200	219	229	39
22	1.8	1.8	.13	.14	1.2	2.4	180	238	201	214	222	39
23	1.8	1.8	.14	.14	1.2	2.1	233	238	217	215	220	39
24	1.8	1.8	.14	.14	1.2	2.1	258	238	225	215	218	39
25	1.8	1.8	.14	.14	1.2	2.1	247	238	225	216	216	39
26	1.8	2.1	.14	.14	1.4	2.4	247	238	245	216	225	39
27	1.8	2.1	.14	.14	1.4	2.8	280	207	270	215	222	39
28	1.8	2.1	.14	.14	1.4	2.9	293	209	270	223	227	17
29	1.8	2.1	.14	.14	---	2.9	291	196	305	241	233	.63
30	1.8	2.1	.14	.14	---	4.3	296	189	300	241	231	.30
31	1.8	---	.14	.14	---	5.5	---	189	---	235	216	---
TOTAL	1203.8	55.6	12.97	4.42	18.94	70.0	2809.9	7131	7775	7261	7657	3128.93
MEAN	38.8	1.85	.42	.14	.68	2.26	93.7	230	259	234	247	104
MAX	75	2.1	1.1	.17	1.4	5.5	296	284	318	290	275	313
MIN	1.8	1.8	.13	.14	.14	1.4	6.2	189	189	214	216	.30
AC-FT	2390	110	26	8.8	38	139	5570	14140	15420	14400	15190	6210

CAL YR 1986 TOTAL 67181.99 MEAN 184 MAX 1260 MIN .00 AC-FT 133300
WTR YR 1987 TOTAL 37128.56 MEAN 102 MAX 318 MIN .13 AC-FT 73640

BULLY CREEK BASIN

13226800 BULLY CREEK RESERVOIR NEAR VALE, OR

LOCATION.--Lat 44°00'55", long 117°23'45", in SE 1/4 SW 1/4 sec.12, T.18 S., R.43 E., Malheur County, Hydrologic Unit 17050118, U.S. Bureau of Reclamation land, on top of dam over outlet works near right end of dam on Bully Creek, 8.0 mi northwest of Vale, and at mile 12.5.

DRAINAGE AREA.--547 mi^2.

PERIOD OF RECORD.--February 1963 to current year. Prior to March 1979, monthend contents only.

GAGE.--Water-stage recorder. Datum of gage is National Geodetic Vertical Datum of 1929 (Bureau of Reclamation datum). Prior to Mar. 22, 1979, nonrecording gage at same site and datum.

REMARKS.--Reservoir is formed by earthfill, rock-faced dam. Storage began Feb. 1, 1963. Capacity, 29,980 acre-ft between elevations 2,456.58 ft, outlet works, and 2,516.00 ft, spillway crest. Dead storage, 1,650 acre-ft below elevation 2,456.58 ft. Figures given herein do not include dead storage. Water used for irrigation lands of Vale-Oregon Irrigation District. Bully Creek Reservoir feed canal diverts from Malheur River by way of Vale Oregon canal.

COOPERATION.--Capacity table furnished by Bureau of Reclamation.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents not determined, occurred during period Apr. 4 to May 2, 1969, elevation above 2,516.00 ft, spillway crest; no usable contents at times in 1973, 1977, 1978.

EXTREMES FOR CURRENT YEAR.--Maximum contents, 24,570 acre-ft Apr. 15, elevation, 2,510.23 ft; minimum contents observed, 199 acre-ft Sept. 29, elevation, 2,458.09 ft, but may have been less during period of no record Sept. 6-30.

Capacity table (elevation, in feet, and contents, in acre-feet)

2,458	137	2,480	5,430	2,500	16,290
2,460	465	2,485	7,430	2,505	20,130
2,470	2,401	2,490	9,930	2,510	24,370
2,475	3,770	2,495	12,900	2,520	34,040

ELEVATION (FEET NGVD), WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
INSTANTANEOUS OBSERVATIONS AT 2400

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2488.77	2492.34	2494.02	2495.50	2496.97	2499.81	2509.05	2507.64	2502.27	2494.66	2482.35	2467.18
2	2488.92	2492.41	2494.05	2495.57	2497.03	2499.95	2509.09	2507.49	2502.13	2494.38	2481.81	2466.46
3	2489.07	2492.48	2494.09	2495.64	2497.10	2500.09	2509.14	2507.32	2501.98	2493.98	2481.25	2465.79
4	2489.24	2492.53	2494.14	2495.70	2497.17	2500.25	2509.23	2507.17	2501.92	2493.71	2480.84	2464.97
5	2489.37	2492.61	2494.22	2495.75	2497.23	2500.37	2509.38	2507.01	2501.61	2493.25	---	2464.30
6	2489.56	2492.65	2494.29	2495.81	2497.29	2500.58	2509.48	2506.85	2501.39	2492.89	---	---
7	2489.71	2492.72	2494.33	2495.82	2497.37	2500.93	2509.58	2506.69	2501.15	2492.52	---	---
8	2489.83	2492.76	2494.36	2495.85	2497.43	2501.28	2509.58	2506.52	2500.93	2492.14	---	---
9	2489.96	2492.80	2494.41	2495.88	2497.49	2501.60	2509.60	2506.41	2500.73	2491.78	---	---
10	2490.03	2492.83	2494.39	2495.94	2497.56	2501.96	2509.66	2506.13	2500.44	2491.34	---	---
11	2490.16	2492.92	2494.46	2495.98	2497.61	2502.23	2509.72	2505.92	2500.22	2491.03	---	---
12	2490.28	2492.97	2494.50	2495.99	2497.67	2502.54	2509.86	2505.68	2500.02	2490.73	---	---
13	2490.40	2493.02	2494.54	2496.04	2497.77	2502.81	2510.01	2505.48	2499.63	2490.41	---	---
14	2490.51	2493.08	2494.59	2496.09	2497.97	2503.16	2510.13	2505.29	2499.42	2490.10	---	---
15	2490.64	2493.16	2494.66	2496.09	2498.11	2503.65	2510.17	2505.06	2499.09	2489.83	---	---
16	2490.81	2493.20	2494.71	2496.11	2498.22	2504.24	2510.12	2504.97	2498.72	2489.39	---	---
17	2490.96	2493.24	2494.75	2496.14	2498.28	2504.82	2510.00	2504.62	2498.52	2488.89	---	---
18	2491.17	2493.33	2494.78	2496.18	2498.36	2505.24	2509.80	2504.42	2498.30	2488.55	---	---
19	2491.35	2493.35	2494.86	2496.22	2498.45	2505.75	2509.64	2504.18	2497.91	2488.12	---	---
20	2491.53	2493.45	2494.90	2496.25	2498.53	2506.18	2509.53	2503.95	2497.70	2487.71	2473.63	---
21	2491.69	2493.47	2494.96	2496.29	2498.63	2506.62	2509.44	2503.77	2497.41	2487.38	2473.41	---
22	2491.79	2493.53	2495.01	2496.32	2498.71	2506.99	2509.32	2503.60	2497.21	2486.95	2472.83	---
23	2491.83	2493.58	2495.04	2496.37	2498.92	2507.32	2509.14	2503.42	2496.85	2486.59	2472.29	---
24	2491.88	2493.69	2495.04	2496.43	2499.08	2507.59	2508.96	2503.21	2496.75	2486.21	2471.80	---
25	2491.95	2493.69	2495.14	2496.52	2499.23	2507.84	2508.78	2503.03	2496.53	2485.83	2471.27	---
26	2491.99	2493.75	2495.21	2496.58	2499.39	2508.03	2508.62	2502.89	2496.18	2485.41	2470.83	---
27	2492.02	2493.81	2495.26	2496.65	2499.54	2508.25	2508.46	2502.87	2495.90	2485.03	2470.04	---
28	2492.08	2493.90	2495.30	2496.71	2499.67	2508.43	2508.25	2502.79	2495.60	2484.50	2469.52	---
29	2492.18	2493.92	2495.34	2496.76	---	2508.64	2508.03	2502.72	2495.32	2484.04	2469.00	---
30	2492.23	2493.97	2495.38	2496.82	---	2508.84	2507.81	2502.55	2495.00	2483.44	2468.52	---
31	2492.29	---	2495.42	2496.91	---	2509.00	---	2502.37	---	2482.91	2467.81	---
MAX	2492.29	2493.97	2495.42	2496.91	2499.67	2509.00	2510.17	2507.64	2502.27	2494.66	---	---
MIN	2488.77	2492.34	2494.02	2495.50	2496.97	2499.81	2507.81	2502.37	2495.00	2482.91	---	---
(†)	11240	12260	13170	14140	16060	23490	22470	18060	12900	6540	1900	200
(‡)	+2050	+1020	+910	+970	+1920	+7430	-1020	-4410	-5160	-6360	-4640	-1700

CAL YR 1986 MAX 2515.82 MIN 2486.80 AC-FT‡ +3850
WTR YR 1987 MAX ------- MIN ------- AC-FT‡ -8990

† Contents, in acre-feet, at 2400, on last day of month.
‡ Change in contents, in acre-feet.

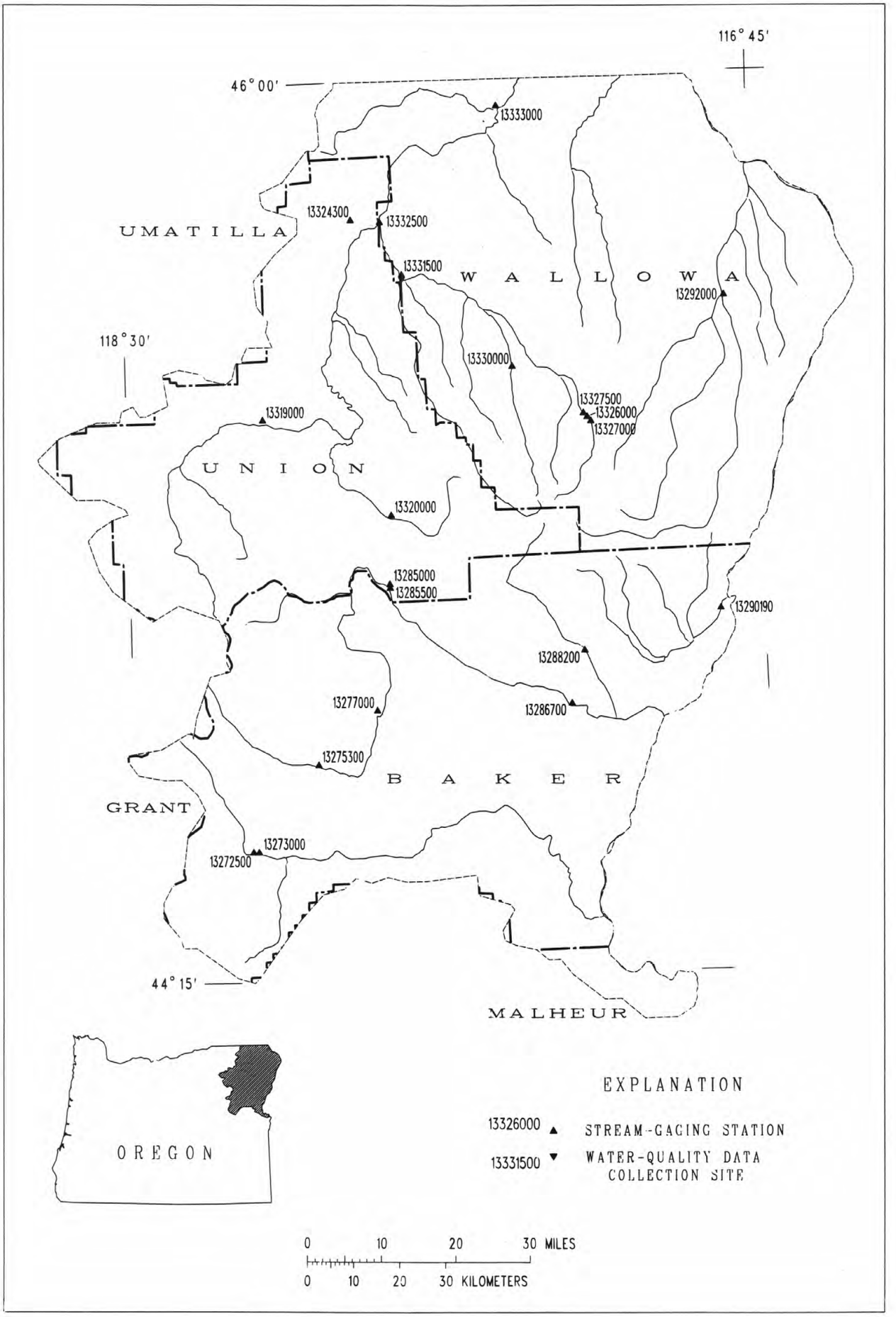

Figure 4.--Location of surface-water and water-quality stations in the Burnt River, Powder River, Imnaha River, Grande Ronde River, and Wallowa River basins.

13272500 UNITY RESERVOIR NEAR UNITY, OR

LOCATION.--Lat 44°30'13", long 118°10'45", in SE1/4SW1/4 sec.21, T.12 S., R.37 E., Baker County, Hydrologic Unit 17050202, at spillway near right end of dam on Burnt River, 4.4 mi north of Unity, and at mile 63.6.

DRAINAGE AREA.--309 mi^2.

PERIOD OF RECORD.--March 1938 to current year. Prior to September 1978, monthend contents only.

GAGE.-- Water-stage recorder. Datum of gage is National Geodetic Vertical Datum of 1929 (Bureau of Reclamation bench mark). Mar. 13, 1938, to Nov. 4, 1941, reference mark or mercury pressure gage and Nov. 5, 1941, to Dec. 10, 1978, nonrecording gage at same site and datum.

REMARKS.--Reservoir is formed by earthfill dam with concrete spillway and outlet works, completed by Bureau of Reclamation in 1937; storage began Feb. 19, 1938. Capacity, 25,200 acre-ft between elevations 3,776.5 ft, bottom of outlet gates, and 3,820.0 ft, top of radial gates on spillway when closed. Dead storage, 600 acre-ft below elevation 3,776.5 ft. Records given herein represent usable contents. Water used for irrigation in the Burnt River Irrigation District near Hereford and Bridgeport.

COOPERATION.--Data for computing capacity table furnished by Bureau of Reclamation.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents observed, 26,770 acre-ft Apr. 8, 1971, elevation, 3,821.62 ft; no contents Sept. 5 to Oct. 4, 1955.

EXTREMES FOR CURRENT YEAR.--Maximum contents, 25,410 acre-ft Apr. 20, elevation, 3,820.21 ft; minimum contents, 2,530 acre-ft Sept. 20, elevation, 3,786.54 ft, but may have been lower during period of no record Sept. 21-30.

Capacity table (elevation, in feet, and usable contents, in acre-feet)

3,785	1,960	3,810	16,680
3,790	4,020	3,815	20,770
3,795	6,610	3,820	25,220
3,800	9,600	3,821	26,150
3,805	12,960		

ELEVATION (FEET NGVD), WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
INSTANTANEOUS OBSERVATIONS AT 2400

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3791.11	3794.54	---	3801.75	3804.76	3807.52	3816.43	3819.70	3812.98	3809.11	3802.90	3793.58
2	3791.18	3794.66	---	3801.83	3804.89	3807.63	3816.72	3819.61	3812.86	3808.93	3802.61	3793.24
3	3791.28	3794.76	---	3801.94	3805.01	3807.77	3717.08	3819.48	3812.72	3808.76	3802.31	3792.87
4	3791.39	3794.86	---	3802.05	3805.08	3807.94	3817.48	3719.29	3812.57	3808.57	3802.04	3792.54
5	3791.47	3795.01	---	3802.15	3805.11	3807.12	3817.91	3819.05	3812.42	3808.38	3801.73	3792.21
6	3791.56	3795.12	---	3802.28	3805.21	3808.36	3718.30	3818.79	3812.24	3808.22	3801.42	3791.89
7	3791.69	3795.29	---	3802.37	3805.30	3808.69	3818.65	3818.48	3812.08	3808.04	3801.10	3791.56
8	3791.78	3795.42	---	3802.42	3805.40	3809.01	3818.98	3818.18	3811.97	3807.86	3800.78	3791.21
9	3791.89	3795.52	---	3802.47	3805.48	3809.34	3819.33	3817.86	3811.84	3807.66	3800.47	3790.84
10	3791.95	3795.63	---	3802.54	3805.58	3809.67	3819.63	3817.55	3811.70	3807.47	3800.11	3790.44
11	3792.02	3795.79	---	3802.63	3805.66	3809.96	3819.86	3817.29	3811.57	3807.25	3799.69	3790.02
12	3792.15	3795.92	---	3802.73	3805.76	3810.39	3819.92	3817.04	3811.42	3806.98	3799.30	3789.63
13	3792.26	3796.06	---	3802.84	3805.90	3811.17	3819.97	3816.80	3811.26	3806.63	3798.97	3789.24
14	3792.36	3796.21	---	3802.91	3806.01	3811.77	3819.99	3816.57	3711.05	3806.30	3798.62	3788.81
15	3792.46	3796.37	3799.93	3803.00	3806.13	3812.29	3820.04	3816.31	3810.89	3806.03	3798.31	3788.37
16	3792.56	3796.52	3800.02	3803.10	3806.26	3812.69	3820.11	3816.07	3810.78	3805.74	3798.01	3787.94
17	3792.65	3796.67	3800.13	3803.16	3806.38	3813.05	3820.11	3815.82	3810.65	3805.52	3797.71	3787.53
18	3792.76	3796.84	3800.85	3803.26	3806.47	3813.40	3820.13	3815.53	3810.54	3805.34	3797.41	3787.11
19	3792.88	3796.99	3800.33	3803.35	3806.57	3813.69	3820.14	3815.30	3810.45	3805.11	3797.13	3786.70
20	3793.01	3797.13	3800.45	3803.45	3806.68	3813.92	3820.18	3815.11	3810.33	3804.96	3796.83	---
21	3793.14	3797.29	3800.53	3803.51	3806.78	3814.13	3820.15	3814.89	3810.19	3804.82	3796.56	---
22	3793.26	3797.44	3800.64	3803.58	3806.88	3814.32	3820.13	3814.68	3810.08	3804.76	3796.31	---
23	3793.37	3797.57	3800.73	3803.66	3806.96	3814.53	3820.11	3814.47	3809.98	3804.63	3796.04	---
24	3793.48	3797.73	3800.84	3803.78	3807.05	3814.74	3820.11	3814.31	3809.89	3804.50	3795.76	---
25	3793.61	---	3800.94	3803.93	3807.16	3814.96	3820.09	3814.12	3809.78	3804.35	3795.48	---
26	3793.74	---	3801.05	3804.06	3807.25	3815.17	3820.08	3813.94	3809.68	3804.20	3795.21	---
27	3793.85	---	3801.16	3804.18	3807.33	3815.41	3820.05	3813.70	3809.57	3804.05	3794.94	---
28	3793.98	---	3801.27	3804.27	3807.43	3815.60	3819.98	3813.54	3809.48	3803.87	3794.68	---
29	3794.14	---	3801.40	3704.37	---	3815.80	3819.90	3813.39	3809.41	3803.66	3794.39	---
30	3794.29	---	3801.47	3804.47	---	3816.01	3819.76	3813.24	3809.28	3803.42	3794.12	---
31	3794.42	---	3801.55	3804.63	---	3816.22	---	3813.11	---	3803.16	3793,92	---
MAX	3794.42	---	---	3804.63	3807.43	3816.22	3820.18	3819.70	3812.98	3809.11	3802.90	---
MIN	3791.11	---	---	3704.37	3804.76	3807.12	3717.08	3719.29	3711.05	3803.16	3793.92	---
(†)	6290	a8570	10600	12700	14720	21840	24990	19170	16130	11670	6020	a1650
(‡)	+1760	+2280	+2030	+2100	+2020	+7120	+3150	-5820	-3040	-4460	-5650	-4370

CAL YR 1986 AC-FT‡ -1530
WTR YR 1987 AC-FT‡ -2880

† Contents, in acre-feet, at 2400, on last day of month.
‡ Change in contents, in acre-feet.
a Interpolated.

13273000 BURNT RIVER NEAR HEREFORD, OR

LOCATION.--Lat 44°30'14", long 118°10'35", in SE 1/4 sec.21, T.12 S., R.37 E., Baker County, Hydrologic Unit 17050202, on left bank 800 ft downstream from Unity Dam, 0.4 mi upstream from Van Cleve ditch, 7 mi west of Hereford, and at mile 63.5.

DRAINAGE AREA.--309 mi^2.

PERIOD OF RECORD.--March to September 1915, April to September 1916, October 1928 to current year. Monthly discharge only for some periods, published in WSP 1317.

REVISED RECORDS.--WSP 903: 1939. WSP 1397: 1916, 1930, 1930(M).

GAGE.--Water-stage recorder. Datum of gage is 3,758.19 ft above National Geodetic Vertical Datum of 1929. Oct. 1, 1943, to Oct. 31, 1966, water-stage recorder at site 450 ft downstream at datum 1.44 ft lower. See WSP 1317 or 1737 for history of changes prior to Oct. 1, 1943.

REMARKS.--Estimated daily discharges: Jan. 27, 28. Records good. Flow regulated since 1938 by Unity Reservoir (station 13272500). Diversions for irrigation upstream from station.

AVERAGE DISCHARGE.--59 years (water years 1929-87), 87.4 ft^3/s, 63,320 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 2,220 ft^3/s Apr. 17, 1943, gage height, 5.91 ft, present datum, from rating curve extended above 1,300 ft^3/s; maximum gage height, 9.07 ft Apr. 8, 1971; no flow at times; minimum discharge before construction of Unity Dam, 1.6 ft^3/s Aug. 31, 1935.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 164 ft^3/s May 7, 8, gage height, 4.06 ft; minimum discharge, 1.6 ft^3/s Mar. 28.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	13	10	12	7.1	6.6	12	2.2	104	76	71	97	83
2	13	10	12	7.3	6.9	13	2.3	103	71	77	102	94
3	13	10	12	7.3	7.7	13	2.4	112	76	76	101	93
4	13	10	12	7.3	8.4	13	2.2	129	80	76	101	92
5	13	10	12	7.7	9.2	14	2.3	139	83	76	101	91
6	13	11	12	7.9	9.5	13	2.3	150	86	76	106	89
7	13	11	12	7.7	10	14	10	160	86	75	113	88
8	13	11	9.4	7.7	10	13	9.4	164	78	75	113	90
9	13	11	6.0	7.7	11	13	5.1	163	75	75	111	99
10	14	11	6.0	7.7	11	14	5.3	154	75	75	114	102
11	14	11	6.0	7.7	11	13	52	143	75	92	130	103
12	14	11	6.2	7.7	12	12	109	136	77	116	129	102
13	14	11	6.2	7.7	12	13	110	134	81	139	117	100
14	14	11	6.0	7.0	12	14	90	133	84	133	110	98
15	14	11	6.1	6.3	13	14	86	133	84	96	103	97
16	14	11	6.1	6.3	13	13	87	133	72	96	100	95
17	14	11	6.4	6.3	13	13	87	127	68	86	99	93
18	14	11	6.6	6.3	13	11	85	120	59	80	98	91
19	11	11	6.6	6.3	13	8.8	85	111	60	80	98	88
20	9.0	11	6.6	6.3	13	8.1	85	110	62	80	90	86
21	9.0	11	6.6	6.3	13	8.2	85	110	62	78	86	84
22	8.9	11	6.6	6.9	13	7.2	76	116	55	57	86	83
23	9.0	11	6.6	7.2	14	6.2	73	119	51	58	85	80
24	9.0	11	6.6	7.3	14	6.0	72	119	50	63	85	78
25	9.4	12	7.0	7.3	13	6.0	72	117	50	63	84	73
26	9.4	12	7.0	7.3	12	3.2	72	104	50	62	84	26
27	9.6	12	7.0	7.0	12	1.9	75	97	44	62	83	7.0
28	9.7	12	7.0	6.0	12	1.8	100	95	33	68	82	6.8
29	9.7	12	7.0	4.9	---	1.7	107	92	34	79	82	6.0
30	10	12	7.0	5.9	---	2.1	113	90	60	85	81	6.0
31	10	---	7.0	6.5	---	2.1	---	79	---	88	80	---
TOTAL	366.7	331	243.6	215.9	318.3	298.3	1764.5	3796	1997	2513	3051	2323.8
MEAN	11.8	11.0	7.86	6.96	11.4	9.62	58.8	122	66.6	81.1	98.4	77.5
MAX	14	12	12	7.9	14	14	113	164	86	139	130	103
MIN	8.9	10	6.0	4.9	6.6	1.7	2.2	79	33	57	80	6.0
AC-FT	727	657	483	428	631	592	3500	7530	3960	4980	6050	4610

CAL YR 1986 TOTAL 39329.3 MEAN 108 MAX 1030 MIN 6.0 AC-FT 78010
WTR YR 1987 TOTAL 17219.1 MEAN 47.2 MAX 164 MIN 1.7 AC-FT 34150

13275300 POWDER RIVER NEAR SUMPTER, OR

LOCATION.--Lat 44°40'20", long 117°59'40", in NE 1/4 NE 1/4 sec.25, T.10 S., R.38 E., Baker County, Hydrologic Unit 17050203, Wallowa Whitman National Forest, on left bank 1,200 ft downstream from Mason Dam, 1.4 mi upstream from California Gulch, 11.4 mi southeast of Sumpter, and at mile 123.2.

DRAINAGE AREA.--168 mi^2, approximately. Prior to Oct. 1, 1970, 170 mi^2 at cableway, 0.5 mi downstream.

PERIOD OF RECORD.--April 1965 to current year.

GAGE.--Water-stage recorder. Datum of gage is 3,898.47 ft above National Geodetic Vertical Datum of 1929 (Bureau of Reclamation bench mark). Prior to July 29, 1965, nonrecording gage at datum 1.03 ft higher.

REMARKS.--Estimated daily discharges: Feb. 2 to Mar. 15. Records good except for estimated daily discharges, which are fair. Flow completely regulated since Oct. 31, 1967, by Phillips Lake, active capacity, 90,540 acre-ft. Many small diversions for irrigation upstream from station.

AVERAGE DISCHARGE.--22 years, 115 ft^3/s, 83,320 acre-ft/yr, not adjusted for storage in Phillips Lake.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge observed, 971 ft^3/s Apr. 30, 1965, gage height, 4.43 ft; no flow Nov. 12, 1967.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum discharge, 1,600 ft^3/s, approximately, Mar. 20, 1910, based on comparison with records for station downstream, near Baker.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 444 ft^3/s May 9, gage height, 3.53 ft; minimum daily discharge, 6.6 ft^3/s Jan. 17-21.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	15	16	15	8.1	13	13	14	316	125	136	196	157
2	15	16	14	8.1	13	13	14	326	108	154	194	141
3	15	16	14	8.1	13	13	15	308	98	157	205	119
4	15	16	14	8.1	13	13	16	316	98	157	238	119
5	15	16	14	8.1	13	13	14	326	98	157	258	120
6	15	16	14	8.1	13	13	15	351	98	156	266	121
7	16	16	14	8.1	13	13	16	391	108	159	253	106
8	16	16	14	8.1	13	13	14	433	143	198	248	86
9	16	16	14	8.1	13	13	14	439	179	216	253	71
10	16	16	14	8.1	13	13	20	425	160	189	252	61
11	16	16	14	8.1	13	13	17	400	149	155	250	73
12	15	16	14	7.9	13	13	17	417	159	144	221	78
13	15	16	14	7.6	13	13	28	394	181	141	212	79
14	15	16	14	7.6	13	13	34	351	194	137	205	79
15	16	16	14	7.3	13	13	34	301	192	137	189	79
16	16	16	14	6.9	13	12	38	268	191	131	222	79
17	16	16	14	6.6	13	13	64	267	180	120	250	79
18	16	15	14	6.6	13	13	76	302	164	116	272	67
19	16	15	14	6.6	13	13	76	295	132	117	272	47
20	16	15	14	6.6	13	13	76	278	100	121	270	39
21	16	15	14	6.6	13	13	82	277	100	142	257	31
22	16	15	14	8.1	13	13	133	257	100	145	192	26
23	16	15	14	9.9	13	13	204	222	100	116	178	31
24	16	15	14	10	13	13	196	215	88	102	200	44
25	16	15	14	10	13	13	174	191	72	109	239	51
26	16	15	14	11	13	13	189	172	91	116	241	50
27	16	15	14	11	13	13	229	157	160	118	213	50
28	16	15	14	11	13	13	272	157	184	125	176	50
29	16	15	14	12	---	14	283	157	166	125	157	42
30	16	15	12	13	---	14	293	143	136	152	161	30
31	16	---	11	13	---	14	---	132	---	184	164	---
TOTAL	487	467	430	268.4	364	405	2667	8984	4054	4432	6904	2205
MEAN	15.7	15.6	13.9	8.66	13.0	13.1	88.9	290	135	143	223	73.5
MAX	16	16	15	13	13	14	293	439	194	216	272	157
MIN	15	15	11	6.6	13	12	14	132	72	102	157	26
AC-FT	966	926	853	532	722	803	5290	17820	8040	8790	13690	4370

CAL YR 1986 TOTAL 42277.0 MEAN 116 MAX 370 MIN 7.7 AC-FT 83860
WTR YR 1987 TOTAL 31667.4 MEAN 86.8 MAX 439 MIN 6.6 AC-FT 62810

13277000 POWDER RIVER AT BAKER, OR

LOCATION.--Lat 44°46'06", long 117°49'50", in SE 1/4 NE 1/4 sec.20, T.9 S., R.40 E., Baker County, Hydrologic Unit 17050203, on right bank 600 ft upstream from Myrtle Street Bridge in Baker, 0.5 mi downstream from Sutton Creek, and at mile 107.6.

DRAINAGE AREA.--351 mi^2.

PERIOD OF RECORD.--May to September 1913, April to July 1914, November 1971 to current year. Monthly discharge only May 1913, April 1914 published in WSP 1317. November 1971 to September 1978 in reports of Oregon Water Resources Department.

REVISED RECORDS.--WSP 1317: 1913.

GAGE.--Water-stage recorder. Datum of gage is 3,441.71 ft above National Geodetic Vertical Datum of 1929. Prior to Oct. 19, 1971, nonrecording gage at site 0.7 mi downstream at different datum.

REMARKS.--Estimated daily discharges: Dec. 10 to Feb. 10. Records excellent except those for periods of ice effect Dec. 10 to Feb. 10, which are poor. Flow regulated since Oct. 31, 1967, by Phillips Lake, active capacity, 90,540 acre-ft. Old Settlers Slough diverts from left bank 0.2 mi upstream for irrigation downstream from station.

AVERAGE DISCHARGE.--15 years, 119 ft^3/s, 86,220 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,120 ft^3/s Jan. 15, 1974, gage height, 5.55 ft; maximum gage height, 5.57 ft Jan. 5, 1984 (ice jam); minimum discharge, 0.7 ft^3/s Oct. 28, 29, 1973.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 379 ft^3/s May 9, gage height, 3.37 ft; minimum discharge, 7.6 ft^3/s Dec. 1, 2, Feb. 24.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	21	20	22	18	24	22	22	245	110	72	171	92
2	20	20	24	16	40	22	22	265	97	81	171	78
3	20	20	26	16	37	24	22	255	76	87	171	59
4	19	20	33	15	35	29	22	241	76	85	211	61
5	19	20	24	15	40	34	21	248	70	85	246	65
6	19	21	23	15	46	46	22	268	68	86	238	67
7	19	22	23	15	50	39	22	309	73	87	217	60
8	19	23	21	15	30	33	22	352	103	115	198	43
9	18	23	26	15	24	31	22	364	145	163	203	43
10	18	25	30	15	22	30	21	361	132	152	202	47
11	18	22	30	15	26	29	25	329	106	112	201	44
12	19	23	30	15	26	30	21	349	106	96	174	49
13	20	23	30	15	30	33	20	335	121	91	157	52
14	20	23	30	14	31	32	25	297	139	84	140	54
15	19	24	29	14	27	33	24	245	141	87	106	54
16	20	25	28	13	26	30	19	198	139	85	131	54
17	20	29	28	13	24	28	17	195	132	77	160	55
18	20	26	27	13	24	33	26	225	121	69	186	50
19	20	25	27	13	23	31	26	226	98	70	184	39
20	20	24	26	13	22	29	35	206	60	74	184	29
21	20	25	25	14	22	28	31	207	54	87	186	27
22	20	24	25	15	23	27	43	194	62	121	136	18
23	20	24	25	18	22	27	116	153	70	84	96	16
24	20	24	26	21	23	27	125	145	66	67	109	19
25	19	24	28	21	25	26	93	136	44	68	137	30
26	19	23	30	21	25	25	98	122	29	76	157	32
27	20	24	30	21	24	24	136	124	87	77	136	33
28	20	24	28	21	24	23	180	125	132	85	107	33
29	20	24	25	23	---	22	202	129	125	90	87	31
30	22	23	22	24	---	22	216	126	89	108	90	23
31	20	---	19	24	---	23	---	112	---	147	98	---
TOTAL	608	697	820	516	795	892	1696	7086	2871	2868	4990	1357
MEAN	19.6	23.2	26.5	16.6	28.4	28.8	56.5	229	95.7	92.5	161	45.2
MAX	22	29	33	24	50	46	216	364	145	163	246	92
MIN	18	20	19	13	22	22	17	112	29	67	87	16
AC-FT	1210	1380	1630	1020	1580	1770	3360	14060	5690	5690	9900	2690

CAL YR 1986 TOTAL 43422 MEAN 119 MAX 489 MIN 17 AC-FT 86130
WTR YR 1987 TOTAL 25196 MEAN 69.0 MAX 364 MIN 13 AC-FT 49980

13285000 THIEF VALLEY RESERVOIR NEAR NORTH POWDER, OR

LOCATION.--Lat 45°00'45", long 117°46'50", in NE 1/4 SW 1/4 sec.26, T.6 S., R.40 E., Baker County, Hydrologic Unit 17050203, Bureau of Reclamation land, on top of right end of dam on Powder River, 7.0 mi east of North Powder, and at mile 70.0.

DRAINAGE AREA.--910 mi^2, approximately.

PERIOD OF RECORD.--October 1979 to current year.

GAGE.--Water-stage recorder. Datum of gage is National Geodetic Vertical Datum of 1929 (Bureau of Reclamation bench mark).

REMARKS.--Reservoir is formed by concrete dam. Storage began in February 1932. Capacity, 17,400 acre-ft between elevations 3,094.00 ft, minimum pool, and 3,133.00 ft, spillway crest. No dead storage. Water used for irrigation of lands of Lower Powder River Irrigation District.

COOPERATION.--Capacity table furnished by Oregon Water Resources Department. Table uncertain below about 3,096 ft, due to siltation.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 18,900 acre-ft July 2, 1982, elevation, 3,134.99 ft; no contents observed Sept. 17, 1987; probably no contents most days during September 1987.

EXTREMES FOR CURRENT YEAR.--Maximum contents, 17,810 acre-ft Feb. 14, elevation, 3,133.55 ft; no contents observed Sept. 17, probably no contents most days during September.

Capacity table (elevation, in feet, and contents, in acre-feet)

3,096	230	3,120	8,950
3,100	966	3,125	11,880
3,105	2,360	3,130	15,210
3,110	4,170	3,135	18,910
3,115	6,370		

ELEVATION (FEET NGVD), WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
INSTANTANEOUS OBSERVATIONS AT 2400

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3112.03	3116.41	3125.57	3131.32	3133.22	3133.30	3133.27	3133.16	3130.01	3126.49	3117.48	---
2	3112.01	3116.64	3125.81	3131.44	3133.30	3133.32	3133.27	3133.17	3130.35	3126.66	3117.09	---
3	3111.96	3116.88	3126.05	3131.55	3133.34	3133.34	3133.25	3133.10	3130.65	3126.58	3116.73	---
4	3111.83	3117.12	3126.30	3131.68	3133.34	3133.43	3133.23	3133.05	3130.76	3126.42	3116.37	---
5	3111.74	3117.40	3126.57	3131.85	3133.32	3133.46	3133.25	3132.92	3130.71	3126.21	3116.06	---
6	3111.63	3117.61	3126.88	3132.01	3133.34	3133.48	3133.27	3132.76	3130.61	3126.00	3115.94	---
7	3111.53	3117.90	3127.13	3132.12	3133.34	3133.48	3133.27	3132.61	3130.52	3125.75	3115.64	---
8	3111.41	3118.19	3127.40	3132.23	3133.33	3133.44	3133.20	3132.53	3130.45	3125.46	3115.29	---
9	3111.29	3118.51	3127.42	3132.32	3133.33	3133.43	3133.20	3132.34	3130.47	3125.10	3114.91	---
10	3111.38	3118.68	3127.53	3132.39	3133.33	3133.41	3133.20	3132.19	3130.44	3124.78	3114.42	---
11	3111.58	3118.96	3127.67	3132.45	3133.36	3133.38	3133.17	3132.07	3130.34	3124.52	3113.79	---
12	3111.86	3119.29	3127.87	3132.55	3133.35	3133.38	3133.16	3131.90	3130.10	3124.28	3113.23	---
13	3111.97	3119.58	3128.07	3132.66	3133.52	3133.40	3133.20	3131.79	3129.85	3123.98	3112.70	---
14	3112.27	3119.86	3128.30	3132.77	3133.51	3133.40	3133.19	3131.82	3129.57	3123.68	3112.14	---
15	3112.47	3120.13	3128.53	3132.85	3133.47	3133.44	3133.14	3131.73	3129.27	3123.35	3111.56	---
16	3112.70	3120.48	3128.68	3132.88	3133.42	3133.42	3133.16	3131.72	3129.02	3122.92	3111.05	---
17	3112.92	3120.85	3128.86	3132.97	3133.41	3133.38	3133.14	3131.74	3128.80	3122.52	3110.45	---
18	3113.17	3121.27	3129.03	3133.09	3133.36	3133.38	3133.12	3131.63	3128.66	3122.16	3109.77	---
19	3113.38	3121.71	3129.21	3133.09	3133.34	3133.38	3133.13	3131.54	3128.65	3121.82	3109.14	---
20	3113.62	3122.11	3129.39	3133.06	3133.32	3133.37	3133.21	3131.44	3128.58	3121.51	3108.42	---
21	3113.89	3122.45	3129.57	3133.06	3133.30	3133.36	3133.20	3131.31	3128.47	3121.12	3107.73	---
22	3114.08	3122.78	3129.69	3133.08	3133.32	3133.33	3133.19	3131.17	3128.28	3120.86	3106.89	---
23	3114.31	3123.17	3129.88	3133.10	3133.28	3133.33	3133.19	3131.04	3128.09	3120.56	3106.11	---
24	3114.54	3123.50	3130.04	3133.12	3133.26	3133.35	3133.19	3130.89	3127.88	3120.29	3105.33	---
25	3114.77	3123.83	3130.25	3133.11	3133.27	3133.35	3133.13	3130.74	3127.62	3119.99	3104.44	---
26	3115.03	3124.10	3130.41	3133.14	3133.26	3133.26	3133.02	3130.55	3127.37	3119.72	3103.52	---
27	3115.18	3124.45	3130.59	3133.22	3133.26	3133.23	3132.92	3130.38	3127.06	3119.38	3102.47	---
28	3115.40	3124.76	3130.77	3133.22	3133.28	3133.22	3132.83	3130.25	3126.74	3119.03	---	---
29	3115.65	3125.03	3130.86	3133.22	---	3133.22	3132.71	3130.12	3126.52	3118.67	---	---
30	3115.88	3125.31	3131.02	3133.19	---	3133.25	3132.93	3129.97	3126.50	3118.28	---	3097.67
31	3116.16	---	3131.15	3133.19	---	3133.27	---	3129.90	---	3117.88	---	---
MAX	3116.16	3125.31	3131.15	3133.22	3133.52	3133.48	3133.27	3133.17	3130.76	3126.66	---	---
MIN	3111.29	3116.41	3125.57	3131.32	3133.22	3133.22	3132.71	3129.90	3126.50	3117.88	---	---
(†)	6940	12070	16040	17540	17610	17600	17350	15140	12830	7810	a410	492
(‡)	+1950	+5130	+3970	+1500	+70	-10	-250	-2210	-2310	-5020	-7400	+82

CAL YR 1986 AC-FT‡ -1520
WTR YR 1987 AC-FT‡ -4498

† Contents, in acre-feet, at 2400, on last day of month.
‡ Change in contents, in acre-feet.
a Interpolated.

13285500 POWDER RIVER BELOW THIEF VALLEY RESERVOIR, NEAR NORTH POWDER, OR

LOCATION.--Lat 45°00'20", long 117°46'50", in NE 1/4 NW 1/4 sec.35, T.6 S., R.40 E., Baker County, Hydrologic Unit 17050203, on right bank 0.6 mi downstream from Thief Valley Reservoir, 7.0 mi east of North Powder, and at mile 69.4.

DRAINAGE AREA.--910 mi^2, approximately.

PERIOD OF RECORD.--March 1909 to June 1912, July to September 1932, August 1978 to current year. Prior to July 1932, published as Powder River near North Powder.

REVISED RECORDS.--WSP 1317: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 3,080.166 ft above National Geodetic Vertical Datum of 1929 (Bureau of Reclamation bench mark). Prior to Aug. 18, 1978, nonrecording gage at site 0.5 mi upstream at different datum.

REMARKS.--No estimated daily discharges. Records good. Flow regulated by Phillips Lake since October 1967, usable capacity, 90,540 acre-ft, by Wolf Creek Reservoir since April 1975, usable capacity, 10,400 acre-ft, and by Thief Valley Reservoir since February 1932, usable capacity, 17,400 acre-ft and by Pilcher Creek Reservoir since April 1984, usable capacity 5,560 acre-ft. Many diversions for irrigation upstream from station.

AVERAGE DISCHARGE.--9 years (water years 1979-87), 268 ft^3/s, 194,200 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge observed, 2,920 ft^3/s Mar. 21, 1910, gage height, 10.0 ft, site and datum then in use, from rating curve extended above 1,000 ft^3/s; maximum gage height, 10.05 ft July 2, 1982; no flow Aug. 9 to Sept. 10, 1910.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 361 ft^3/s Feb. 14, gage height, 6.66 ft; minimum discharge, 4.1 ft^3/s Sept. 8, 9.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	97	33	38	40	105	142	123	156	93	26	92	12
2	97	33	38	40	137	148	118	186	22	60	91	10
3	96	33	38	41	180	151	119	158	22	75	90	9.3
4	95	34	38	41	191	187	118	142	37	75	89	8.6
5	95	34	38	41	185	223	113	144	77	74	63	7.4
6	95	34	39	41	178	261	121	159	78	80	23	6.7
7	95	34	39	41	179	296	121	159	79	90	62	5.9
8	95	34	39	41	177	261	122	157	82	97	80	4.9
9	95	34	39	41	174	233	98	155	89	107	80	4.6
10	62	34	39	41	171	216	98	155	107	107	102	6.1
11	29	34	39	41	182	198	88	153	128	105	111	8.4
12	29	34	39	41	185	186	89	153	125	105	109	10
13	29	35	39	41	249	195	86	150	123	104	108	12
14	29	35	39	41	342	213	78	149	122	103	106	9.8
15	29	35	39	41	294	237	68	147	122	103	104	8.0
16	30	35	39	41	249	229	63	144	121	103	102	6.1
17	30	35	39	41	237	200	54	144	121	102	101	5.9
18	30	35	39	47	219	207	53	142	117	102	99	6.5
19	31	35	39	64	201	214	45	142	110	100	97	8.2
20	31	35	39	69	181	199	49	141	110	100	94	9.1
21	32	36	40	67	175	181	52	140	110	99	92	12
22	32	36	40	67	172	169	51	138	108	99	89	11
23	32	36	40	64	174	161	46	137	108	98	86	7.3
24	33	37	40	70	141	155	50	136	108	98	83	8.7
25	33	37	40	72	142	143	75	133	107	97	80	8.8
26	33	37	40	76	135	150	101	125	107	97	77	7.6
27	33	37	40	84	141	131	99	124	107	96	72	7.6
28	33	38	40	103	144	134	113	121	107	95	67	8.6
29	33	38	40	115	---	118	144	121	75	95	60	9.3
30	33	38	40	107	---	122	140	121	26	94	51	11
31	33	---	40	115	---	123	---	121	---	93	20	---
TOTAL	1579	1055	1215	1815	5240	5783	2695	4453	2848	2879	2580	251.4
MEAN	50.9	35.2	39.2	58.5	187	187	89.8	144	94.9	92.9	83.2	8.38
MAX	97	38	40	115	342	296	144	186	128	107	111	12
MIN	29	33	38	40	105	118	45	121	22	26	20	4.6
AC-FT	3130	2090	2410	3600	10390	11470	5350	8830	5650	5710	5120	499

CAL YR 1986 TOTAL 88343 MEAN 242 MAX 1470 MIN 29 AC-FT 175200
WTR YR 1987 TOTAL 32393.4 MEAN 88.7 MAX 342 MIN 4.6 AC-FT 64250

13286700 POWDER RIVER NEAR RICHLAND, OR

LOCATION.--Lat 44°46'40", long 117°17'30", in SE 1/4 sec.14, T.9 S., R.44 E., Baker County, Hydrologic Unit 17050203, on left bank 0.4 mi upstream from Upper Timber Canyon, 6.0 mi west of Richland, and at mile 20.3.

DRAINAGE AREA.--1,310 mi^2, approximately.

PERIOD OF RECORD.--October 1957 to current year.

GAGE.--Water-stage recorder. Datum of gage is 2,277.42 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--Estimated daily discharges: Dec. 3-5, 10-31, Jan. 3-5, 7-31, Feb. 1-7. Records good except those for period Dec. 3 to Feb. 7, which are poor. Flow regulated by Phillips Lake since October 1967, usable capacity, 90,540 acre-ft, Wolf Creek Reservoir since April 1975, usable capacity, 10, 400 acre-ft, Thief Valley Reservoir since February 1932, usable capacity, 17,400 acre-ft, and Pilcher Creek Reservoir since April 1984, usable capacity, 5,560 acre-ft. Diversions for irrigation upstream and downstream from station.

AVERAGE DISCHARGE.--30 years, 278 ft^3/s, 201,400 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 4,090 ft^3/s Feb. 21, 1982, gage height, 7.50 ft, from floodmark; maximum gage height, 9.29 ft Jan. 15, 1974 (ice jam); minimum discharge, 0.80 ft^3/s Aug. 11, 12, 1966.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 570 ft^3/s Feb. 14, gage height, 2.92 ft; maximum gage height, 3.30 ft Feb. 4 (ice jam); minimum discharge, 3.2 ft^3/s Aug. 31, Sept. 1-3.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	145	62	76	76	190	202	195	51	88	48	46	3.3
2	139	62	76	73	220	200	205	44	83	39	68	3.3
3	136	62	68	70	270	208	214	57	71	38	46	6.0
4	132	62	74	66	290	250	224	53	58	38	43	15
5	131	62	70	70	280	332	235	44	58	31	38	37
6	129	60	81	71	275	448	235	37	54	31	31	25
7	128	64	78	64	270	530	240	38	56	33	28	26
8	131	68	76	54	272	488	240	40	58	31	22	13
9	131	66	75	45	267	432	235	42	63	30	26	29
10	126	61	33	37	269	401	201	41	62	31	34	26
11	110	64	54	46	298	372	187	41	56	38	21	15
12	65	69	80	52	302	378	171	38	66	42	19	12
13	62	68	78	54	376	463	157	39	75	41	28	11
14	63	68	82	52	560	458	141	42	72	40	36	15
15	63	69	78	54	510	444	120	43	73	41	36	13
16	61	70	70	40	427	441	110	46	85	32	36	9.3
17	59	83	62	45	374	400	102	53	93	29	32	8.3
18	60	85	54	48	346	387	97	55	90	33	33	10
19	61	78	66	50	314	369	81	35	89	39	36	27
20	61	76	74	45	286	353	77	31	96	43	36	18
21	57	74	78	42	266	323	69	28	89	44	35	28
22	58	75	84	50	257	296	68	54	98	59	36	17
23	59	81	80	68	253	279	51	54	90	71	34	15
24	59	80	78	84	244	265	44	63	86	39	34	14
25	59	80	74	94	207	250	36	66	81	19	34	15
26	58	82	76	104	198	236	32	58	71	19	33	14
27	60	80	78	120	198	233	34	76	64	44	29	14
28	61	81	76	130	199	214	37	75	61	54	26	14
29	60	80	74	140	---	208	30	124	54	44	14	14
30	63	77	70	150	---	192	37	106	52	50	5.0	14
31	65	---	65	170	---	193	---	89	---	34	3.4	---
TOTAL	2652	2149	2238	2264	8218	10245	3905	1663	2192	1205	978.4	481.2
MEAN	85.5	71.6	72.2	73.0	293	330	130	53.6	73.1	38.9	31.6	16.0
MAX	145	85	84	170	560	530	240	124	98	71	68	37
MIN	57	60	33	37	190	192	30	28	52	19	3.4	3.3
AC-FT	5260	4260	4440	4490	16300	20320	7750	3300	4350	2390	1940	954

CAL YR 1986 TOTAL 111664 MEAN 306 MAX 2400 MIN 17 AC-FT 221500
WTR YR 1987 TOTAL 38190.6 MEAN 105 MAX 560 MIN 3.3 AC-FT 75750

13288200 EAGLE CREEK ABOVE SKULL CREEK, NEAR NEW BRIDGE, OR

LOCATION.--Lat 44°52'50", long 117°15'10", in SE 1/4 sec.7, T.8 S., R.45 E., Baker County, Hydrologic Unit 17050203, Wallowa-Whitman National Forest, on left bank 0.5 mi upstream from Skull Creek, 6.5 mi northwest of New Bridge, and at mile 10.5.

DRAINAGE AREA.--156 mi^2.

PERIOD OF RECORD.--October 1957 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 2,800 ft, from topographic map.

REMARKS.--Estimated daily discharges: Dec. 10-22, Jan. 1, 2, 9-31, Feb. 1-3, May 1-27. Records good except for estimated daily discharges, which are poor. No regulation. Some diversions upstream from station for irrigation and one small interbasin diversion for irrigation supply. All diversions are small compared to flow at station during irrigation season.

AVERAGE DISCHARGE.--30 years, 324 ft^3/s, 234,700 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 5,310 ft^3/s July 12, 1975, gage height, 5.06 ft, from rating curve extended above 2,500 ft^3/s on basis of slope-area measurement of peak flow; maximum gage height, 6.88 ft Jan. 25, 1962 (ice jam); minimum daily discharge, 30 ft^3/s Nov. 28, 1976.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 1,700 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Apr. 30	1700	*2,080	*3.53	No other peak greater than base discharge.			

Minimum daily discharge, 55 ft^3/s Jan. 10, but may have been less during period of ice effect.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	110	103	93	92	80	86	182	1600	408	163	111	72
2	107	100	92	95	82	87	210	1200	361	171	106	72
3	104	99	89	111	84	109	239	1050	350	159	102	71
4	104	98	91	92	85	124	276	1000	361	151	100	71
5	108	97	98	87	84	163	298	1050	403	146	98	71
6	110	97	94	101	84	312	313	1100	424	141	97	71
7	113	100	90	98	86	281	345	1120	408	136	94	69
8	110	97	88	92	86	237	354	1100	429	132	92	69
9	108	99	75	72	86	230	322	1050	408	130	91	74
10	107	83	65	55	87	219	337	1000	372	131	89	74
11	105	98	58	60	90	217	372	940	349	129	87	75
12	103	101	56	65	90	281	320	900	339	124	87	75
13	102	97	75	76	131	364	306	860	332	121	90	73
14	101	98	84	84	129	317	324	820	322	129	91	72
15	99	96	82	70	116	276	370	780	317	130	88	72
16	99	99	78	58	108	253	418	720	304	130	86	73
17	97	101	72	65	104	241	476	680	281	133	84	73
18	97	100	68	72	98	224	437	640	307	134	83	72
19	97	102	65	82	98	205	383	580	275	131	81	70
20	98	99	74	68	93	190	370	520	252	129	79	69
21	97	103	82	65	94	180	396	470	244	129	78	68
22	99	104	90	68	93	173	481	430	229	269	78	66
23	98	102	98	72	91	169	593	400	216	179	83	66
24	97	100	91	77	90	163	632	430	202	152	81	65
25	97	94	89	80	89	159	681	400	183	141	80	65
26	96	95	91	84	87	160	748	430	179	134	79	66
27	100	101	90	88	86	155	920	450	177	128	77	67
28	100	98	85	88	87	150	1090	414	174	124	76	66
29	98	97	93	84	---	144	1230	415	171	118	75	66
30	119	84	88	78	---	146	1780	428	167	114	74	65
31	108	---	90	76	---	152	---	518	---	112	73	---
TOTAL	3188	2942	2574	2455	2618	6167	15203	23495	8944	4350	2690	2098
MEAN	103	98.1	83.0	79.2	93.5	199	507	758	298	140	86.8	69.9
MAX	119	104	98	111	131	364	1780	1600	429	269	111	75
MIN	96	83	56	55	80	86	182	400	167	112	73	65
AC-FT	6320	5840	5110	4870	5190	12230	30160	46600	17740	8630	5340	4160

CAL YR 1986 TOTAL 122234 MEAN 335 MAX 2330 MIN 56 AC-FT 242500
WTR YR 1987 TOTAL 76724 MEAN 210 MAX 1780 MIN 55 AC-FT 152200

BROWNLEE RESERVOIR BASIN

13290190 PINE CREEK NEAR OXBOW, OR

LOCATION.--Lat 44°57'13", long 116°52'21", in NE 1/4 SW 1/4 sec.17, T.7 S., R.48 E., Baker County, Hydrologic Unit 17050201, 1.8 mi south of Oxbow, and at mile 1.9.

DRAINAGE AREA.--230 mi^2, approximately.

PERIOD OF RECORD.--November 1966 to current year.

GAGE.--Water-stage recorder. Datum of gage is 1,850.48 ft above National Geodetic Vertical Datum of 1929 (levels by Idaho Power Co.). Prior to Aug. 24, 1967, nonrecording gage at site 1.7 mi downstream at different datum.

REMARKS.--Estimated daily discharges: Jan. 16-29. Records good. Diversions upstream from station for irrigation of about 19,000 acres (1966 determination).

AVERAGE DISCHARGE.--20 years, 378 ft^3/s, 273,900 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 7,110 ft^3/s Feb. 21, 1968, gage height, 9.82 ft; minimum discharge, 10 ft^3/s Aug. 17-24, 1977, gage height, 2.12 ft.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 2,640 ft^3/s Mar. 6, gage height, 6.37 ft; minimum daily discharge, 19 ft^3/s Sept. 11, 12.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	103	83	101	79	110	171	248	1320	232	34	23	21
2	98	81	100	83	128	177	281	871	196	36	24	21
3	94	80	95	81	146	288	314	645	179	33	24	20
4	92	78	99	82	153	476	352	563	169	31	23	21
5	93	77	107	80	144	743	381	557	149	31	23	20
6	89	75	105	76	142	1770	395	601	144	35	24	21
7	86	80	99	76	144	1550	413	658	140	35	25	21
8	83	84	94	75	144	1020	441	670	153	35	24	21
9	79	84	78	71	146	959	415	637	154	36	22	20
10	76	77	77	69	149	780	389	576	137	39	22	20
11	75	80	90	47	164	744	434	526	107	43	22	19
12	73	87	92	78	175	934	378	514	92	36	22	19
13	73	84	88	89	328	1550	341	513	79	34	24	20
14	72	84	93	88	640	1230	312	482	65	32	30	20
15	74	88	87	86	508	914	330	491	67	29	30	20
16	74	91	83	83	443	722	343	514	68	27	27	20
17	76	133	78	81	414	622	377	459	73	28	26	21
18	74	117	72	87	377	663	379	405	79	32	25	21
19	72	108	84	89	338	547	334	354	109	31	24	21
20	71	103	81	87	297	480	291	312	109	29	24	21
21	71	107	80	81	274	437	266	280	100	29	24	21
22	69	117	76	82	260	397	279	254	88	40	23	21
23	66	124	80	84	246	366	317	238	78	45	22	21
24	65	123	76	89	225	343	385	230	70	36	22	21
25	65	117	76	90	207	316	433	230	56	32	21	21
26	64	108	77	91	196	304	474	211	50	30	20	21
27	71	117	78	101	183	285	541	245	44	29	21	21
28	75	118	75	108	172	270	657	236	41	26	21	22
29	74	112	74	107	---	248	752	215	38	24	21	22
30	97	99	75	102	---	243	1160	209	37	23	20	21
31	90	---	61	104	---	236	---	281	---	22	21	---
TOTAL	2434	2916	2631	2626	6853	19785	12412	14297	3103	1002	724	620
MEAN	78.5	97.2	84.9	84.7	245	638	414	461	103	32.3	23.4	20.7
MAX	103	133	107	108	640	1770	1160	1320	232	45	30	22
MIN	64	75	61	47	110	171	248	209	37	22	20	19
AC-FT	4830	5780	5220	5210	13590	39240	24620	28360	6150	1990	1440	1230

CAL YR 1986 TOTAL 145138 MEAN 398 MAX 3450 MIN 30 AC-FT 287900
WTR YR 1987 TOTAL 69403 MEAN 190 MAX 1770 MIN 19 AC-FT 137700

13292000 IMNAHA RIVER AT IMNAHA, OR

LOCATION.--Lat 45°33'45", long 116°50'00", in SW 1/4 sec.16, T.1 N., R.48 E., Wallowa County, Hydrologic Unit 17060102, on left bank at Imnaha, 0.3 mi downstream from Big Sheep Creek, and at mile 19.3.

DRAINAGE AREA.--622 mi^2.

PERIOD OF RECORD.--June 1928 to current year.

REVISED RECORDS.--WSP 833: 1938. WSP 1397: 1929, 1932(M), 1949. WSP 1737: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 1,941.14 ft above National Geodetic Vertical Datum of 1929. Prior to Aug. 6, 1934, nonrecording gage at site 0.25 mi upstream at different datum. Aug. 6-31, 1934, nonrecording gage at present site and datum.

REMARKS.--No estimated daily discharges. Records good. No regulation. Diversions for irrigation upstream from station. Water is diverted from Big Sheep Creek and tributaries upstream from station for irrigation in Wallowa River basin.

AVERAGE DISCHARGE.--59 years, 519 ft^3/s, 376,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 10,100 ft^3/s Jan. 17, 1974, gage height, 7.86 ft, from rating curve extended above 3,500 ft^3/s; minimum discharge observed, 16 ft^3/s Nov. 22, 1931, result of freezeup; minimum daily, 25 ft^3/s Nov. 22, 23, 1931.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 1,600 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
May 1	0130	*1,600	*4.12	No other peak greater than base discharge.			

Minimum daily discharge, 35 ft^3/s Jan. 10.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	231	187	158	130	141	167	323	1380	577	251	138	98
2	228	173	161	145	143	156	368	1070	510	286	135	95
3	217	174	148	147	143	172	455	884	481	264	128	95
4	208	169	166	135	136	275	545	792	472	240	125	96
5	195	173	196	118	137	378	605	783	485	230	122	99
6	183	175	185	131	133	911	663	826	518	223	122	98
7	181	172	172	140	136	940	715	909	505	212	122	96
8	177	171	164	104	141	712	744	972	554	204	119	94
9	174	168	133	55	144	628	683	963	555	199	117	90
10	171	144	71	66	148	579	648	943	511	220	113	90
11	169	146	82	101	153	563	725	925	468	216	110	90
12	166	182	145	151	155	588	661	899	449	192	111	90
13	164	164	168	166	196	1110	594	897	439	182	113	91
14	161	164	181	136	266	1040	569	858	423	174	141	91
15	159	167	156	122	243	835	620	894	419	167	140	89
16	157	165	144	79	226	720	673	899	429	161	130	91
17	156	172	106	129	213	623	780	841	397	171	123	93
18	154	167	89	146	201	580	811	759	441	196	121	93
19	154	179	149	145	190	521	719	698	449	177	116	93
20	152	173	144	115	177	484	640	613	398	167	110	92
21	151	192	140	104	176	446	606	549	376	165	106	91
22	150	195	156	125	185	431	635	499	360	223	105	89
23	148	191	149	147	177	414	727	467	332	238	104	90
24	147	194	143	151	163	403	798	477	312	186	107	91
25	146	192	140	148	170	377	814	499	293	172	108	91
26	145	176	142	153	164	373	837	514	283	165	106	96
27	154	191	140	153	151	354	869	609	275	155	104	99
28	159	196	119	151	148	348	966	550	266	148	101	96
29	151	192	123	139	---	309	1050	528	262	145	100	96
30	189	173	131	135	---	319	1290	512	267	145	99	94
31	198	---	99	136	---	310	---	670	---	138	99	---
TOTAL	5295	5277	4400	4003	4756	16066	21133	23679	12506	6012	3595	2797
MEAN	171	176	142	129	170	518	704	764	417	194	116	93.2
MAX	231	196	196	166	266	1110	1290	1380	577	286	141	99
MIN	145	144	71	55	133	156	323	467	262	138	99	89
AC-FT	10500	10470	8730	7940	9430	31870	41920	46970	24810	11920	7130	5550

CAL YR 1986 TOTAL 200512 MEAN 549 MAX 2600 MIN 71 AC-FT 397700
WTR YR 1987 TOTAL 109519 MEAN 300 MAX 1380 MIN 55 AC-FT 217200

UPPER GRANDE RONDE RIVER BASIN

13319000 GRANDE RONDE RIVER AT LA GRANDE, OR

LOCATION.--Lat 45°20'47", long 118°07'26", in NW 1/4 SE 1/4 sec.36, T.2 S., R.37 E., Union County, Hydrologic Unit 17060104, on right bank 1.8 mi northwest of La Grande, 5.7 mi downstream from Fivepoint Creek, and at mile 164.0.

DRAINAGE AREA.--678 mi^2.

PERIOD OF RECORD.--October 1903 to September 1915, February 1918 to September 1923, October 1925 to current year. Monthly discharge only for some periods, published in WSP 1317. Published as "at Hilgard" 1903-15.

REVISED RECORDS.--WSP 768: 1933. WSP 1397: 1904-11, 1913, 1915, 1919-20, 1922-23, 1926, 1929-31, 1936-37, 1939, 1942. WSP 1737: Drainage area. WRD Oreg. 1974: 1973(M).

GAGE.--Water-stage recorder. Datum of gage is 2,826.25 ft above National Geodetic Vertical Datum of 1929. Nov. 6, 1903, to Sept. 30, 1915, nonrecording gage at site 5.5 mi upstream at various datums. Feb. 16, 1918, to June 28, 1923, and Oct. 1, 1925, to Nov. 23, 1931, nonrecording gage at site 0.7 mi downstream at various datums. Nov. 24, 1931, to Oct. 8, 1965, water-stage recorder at site 0.3 mi upstream at datum 4.61 ft higher.

REMARKS.--Estimated daily discharges: Dec. 11-15, 19-22, 26, 27, 29, 30, Jan. 2, 3, 10-31, Feb. 1-11. Records good except those for period Dec. 11 to Feb. 11, which are poor. Since 1915, slight regulation by city of La Grande reservoir on Beaver Creek, capacity, about 900 acre-ft. Diversions for irrigation upstream from station. Since 1909, city of La Grande has diverted about 3 ft^3/s from Beaver Creek upstream from station for domestic water supply.

AVERAGE DISCHARGE.--79 years, 389 ft^3/s, 281,800 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 14,100 ft^3/s Jan. 30, 1965, gage height, 11.44 ft, site and datum then in use, from rating curve extended above 7,200 ft^3/s; minimum discharge, 3.9 ft^3/s Aug. 26, 1940.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 2,100 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Mar. 5	2300	*3,040	*7.23	No other peak greater than base discharge.			

Minimum discharge, 20 ft^3/s Sept. 1-4, 8-15.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	80	65	285	66	130	233	549	1110	239	57	33	20
2	67	61	271	66	120	224	718	967	190	67	32	20
3	58	54	240	70	110	525	911	824	166	82	30	20
4	53	51	206	70	100	1200	1130	730	151	64	29	20
5	50	52	215	81	98	2220	1150	676	143	61	28	21
6	48	66	205	80	105	2730	1120	633	130	58	26	21
7	46	82	185	71	140	2050	1120	589	122	53	26	21
8	44	74	170	62	170	1510	1140	539	178	51	26	20
9	43	68	132	51	200	1390	1030	502	216	49	26	20
10	42	53	77	36	230	1330	952	440	162	56	24	20
11	42	41	66	43	290	1290	1040	384	143	57	23	20
12	41	105	80	48	361	1380	947	351	132	50	23	20
13	40	98	95	57	550	1860	831	334	120	45	25	20
14	40	90	90	63	779	1890	781	292	112	43	28	20
15	40	96	86	52	703	1860	817	270	122	39	38	20
16	39	102	81	45	606	1590	885	246	145	36	34	21
17	39	154	79	47	580	1410	977	220	133	38	30	22
18	39	150	58	52	502	1510	988	199	127	43	29	22
19	40	187	68	56	443	1320	866	181	119	44	27	22
20	40	210	78	54	371	1120	743	173	109	43	25	22
21	40	364	84	50	353	955	682	165	115	41	24	22
22	39	376	88	56	358	838	698	156	114	45	24	22
23	39	341	95	70	318	761	793	154	103	78	23	22
24	39	343	85	90	257	715	863	175	94	54	23	21
25	39	371	73	98	242	665	852	190	85	54	23	21
26	39	326	72	105	189	648	825	169	78	62	23	22
27	47	302	67	110	241	606	852	218	71	52	23	23
28	54	329	64	107	252	556	953	238	66	43	22	25
29	52	361	66	100	---	485	1010	180	63	38	22	25
30	70	316	72	100	---	488	1130	164	60	35	21	24
31	75	---	58	96	---	487	---	233	---	35	21	---
TOTAL	1464	5288	3591	2152	8798	35846	27353	11702	3808	1573	811	639
MEAN	47.2	176	116	69.4	314	1156	912	377	127	50.7	26.2	21.3
MAX	80	376	285	110	779	2730	1150	1110	239	82	38	25
MIN	39	41	58	36	98	224	549	154	60	35	21	20
AC-FT	2900	10490	7120	4270	17450	71100	54250	23210	7550	3120	1610	1270

CAL YR 1986 TOTAL 155733 MEAN 427 MAX 6930 MIN 22 AC-FT 308900
WTR YR 1987 TOTAL 103025 MEAN 282 MAX 2730 MIN 20 AC-FT 204400

13320000 CATHERINE CREEK NEAR UNION, OR

LOCATION.--Lat 45°09'20", long 117°46'26", in NW 1/4 SE 1/4 sec.2, T.5 S., R.40 E., Union County, Hydrologic Unit 17060104, on right bank 3.0 mi downstream from Little Catherine Creek, 5.5 mi southeast of Union, and at mile 25.4.

DRAINAGE AREA.--105 mi^2.

PERIOD OF RECORD.--May 1906 to May 1907 (gage heights only), August 1911 to December 1912, March to September 1915, February 1918 to September 1919, October 1925 to current year. Monthly discharge only for some periods, published in WSP 1317.

REVISED RECORDS.--WSP 1397: 1912-13, 1919, 1926, 1928-33, 1937, 1939, 1940(M), 1941-43, 1950.

GAGE.--Water-stage recorder. Datum of gage is 3,081.76 ft above National Geodetic Vertical Datum of 1929 (Oregon State Highway Department bench mark). Prior to Nov. 28, 1938, nonrecording gage at several sites within 1.8 mi of present site at various datums. Nov. 28, 1938, to May 16, 1939, water-stage recorder at site 400 ft downstream at datum 4.29 ft lower.

REMARKS.--Estimated daily discharges: Nov. 11, 12, Dec. 9 to Feb. 2, Feb. 26, 27. Records good except for estimated daily discharges, which are poor. No regulation. Several small diversions for irrigation upstream from station. Since 1937, diversion to Big Creek in Powder River basin provides a small part of the water used for irrigation in that basin.

AVERAGE DISCHARGE.--64 years (water years 1912, 1919, 1926-87), 119 ft^3/s, 86,220 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,740 ft^3/s May 27, 1948, gage height, 4.57 ft; minimum discharge, 6.5 ft^3/s Feb. 4, 1955, result of freezeup; minimum daily, 8 ft^3/s Nov. 7, 1925.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 500 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Apr. 30	1730	*616	*2.87	No other peak greater than base discharge.			

Minimum daily discharge, 18 ft^3/s Jan. 10, but may have been less during period of ice effect Dec. 9 to Feb. 2.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	41	33	42	26	33	37	90	504	119	42	28	19
2	38	31	38	26	34	36	120	416	105	49	27	19
3	35	29	34	27	34	41	151	351	97	42	27	20
4	35	29	42	28	33	53	189	323	93	40	26	20
5	34	30	39	29	31	123	208	324	91	39	26	20
6	33	35	38	27	33	248	217	341	90	38	25	20
7	32	33	34	24	35	225	230	360	88	37	25	19
8	31	33	33	21	37	188	237	357	95	36	24	19
9	30	34	27	19	38	170	216	345	86	37	24	19
10	29	33	20	18	42	161	214	326	79	42	23	19
11	29	31	23	19	46	156	225	303	73	39	23	19
12	29	37	25	21	49	169	200	291	70	35	23	19
13	29	37	29	24	97	221	183	273	67	33	26	19
14	28	38	32	25	108	218	185	253	64	32	28	19
15	28	37	28	22	95	197	208	245	66	30	26	19
16	28	41	26	20	83	176	234	234	68	31	25	20
17	27	46	23	25	74	159	269	217	69	32	24	21
18	27	44	21	26	65	148	268	199	65	33	23	21
19	27	47	28	28	60	133	239	177	67	32	22	19
20	27	46	25	20	55	121	216	160	61	31	22	19
21	27	55	24	23	51	110	217	145	59	30	22	19
22	27	52	26	25	50	102	244	134	55	73	22	19
23	27	49	27	27	47	96	294	124	52	43	22	19
24	27	48	26	27	51	90	321	131	50	36	22	19
25	26	46	25	28	51	84	349	127	48	38	21	19
26	26	47	26	32	46	82	366	126	46	34	21	21
27	35	45	26	35	38	77	405	129	44	31	21	22
28	32	44	25	36	39	74	454	117	43	30	20	21
29	30	44	27	34	---	70	482	112	42	30	20	21
30	42	38	26	32	---	69	535	115	40	29	20	19
31	36	---	25	32	---	74	---	141	---	28	20	---
TOTAL	952	1192	890	806	1455	3908	7766	7400	2092	1132	728	588
MEAN	30.7	39.7	28.7	26.0	52.0	126	259	239	69.7	36.5	23.5	19.6
MAX	42	55	42	36	108	248	535	504	119	73	28	22
MIN	26	29	20	18	31	36	90	112	40	28	20	19
AC-FT	1890	2360	1770	1600	2890	7750	15400	14680	4150	2250	1440	1170

CAL YR 1986 TOTAL 46498 MEAN 127 MAX 655 MIN 20 AC-FT 92230
WTR YR 1987 TOTAL 28909 MEAN 79.2 MAX 535 MIN 18 AC-FT 57340

13324300 LOOKINGGLASS CREEK NEAR LOOKING GLASS, OR

LOCATION.--Lat 45°43'55", long 117°51'50", in NW 1/4 NW 1/4 sec.19, T.3 N., R.40 E., Union County, Hydrologic Unit 17060104, on left bank at Oregon State Fish and Wildlife Service fish hatchery, 310 ft upstream from Jarboe Creek, 2.3 mi northwest of Looking Glass, and at mile 2.3.

DRAINAGE AREA.--78.3 mi^2.

PERIOD OF RECORD.--October 1982 to current year.

GAGE.--Water-stage recorder and crest-stage gage. Elevation of gage is 2,530 ft, from topographic map.

REMARKS.--No estimated daily discharges. Records good. Records include a diversion by the fish hatchery 0.3 mi upstream from station of up to 50 ft^3/s that is returned through the fish ladder to the gage pool.

AVERAGE DISCHARGE.--5 years, 137 ft^3/s 99,260 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,100 ft^3/s May 30, 1984, gage height, 6.52 ft; minimum discharge, 25 ft^3/s Oct. 11, 1983, result of regulation at fish hatchery upstream.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 380 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Apr. 30	1800	*701	*5.85	No other peak greater than base discharge.			

Minimum discharge, 28 ft^3/s Oct. 8.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	58	55	65	52	72	82	126	568	117	59	50	47
2	56	53	62	51	76	85	144	415	102	58	49	45
3	55	52	59	52	74	107	162	353	97	57	48	45
4	53	55	57	52	74	146	183	323	92	57	49	45
5	53	59	60	51	74	165	200	317	89	56	47	45
6	53	62	58	51	74	198	210	323	85	56	47	45
7	54	58	57	52	76	180	223	312	83	55	47	45
8	54	56	55	50	77	165	234	296	92	54	47	45
9	54	55	51	50	79	176	220	290	86	55	47	45
10	54	55	52	50	82	173	228	276	79	60	47	44
11	54	54	53	50	83	174	248	252	78	58	48	45
12	54	55	55	50	85	189	238	240	75	56	46	46
13	55	55	53	51	108	239	226	222	72	54	49	45
14	56	58	53	53	128	231	224	204	70	54	48	45
15	56	57	52	51	121	213	234	192	73	53	49	50
16	57	60	52	53	113	198	252	177	76	53	48	44
17	57	65	51	53	108	186	271	160	74	54	48	45
18	57	66	51	53	101	180	267	147	73	55	47	46
19	57	78	51	51	96	169	243	143	82	55	46	47
20	59	77	51	55	92	158	233	142	74	53	47	46
21	59	93	51	55	90	147	239	128	72	53	46	50
22	59	85	51	53	91	141	261	118	68	55	47	54
23	59	79	51	52	89	138	307	118	66	55	46	52
24	58	78	52	52	86	132	318	114	67	52	45	51
25	59	75	52	53	83	129	308	113	64	56	46	51
26	59	69	52	55	81	128	325	111	64	53	45	50
27	61	79	52	56	80	122	377	112	63	52	46	46
28	58	83	52	57	81	120	433	111	61	54	45	46
29	61	77	52	57	---	116	482	107	60	51	45	50
30	67	69	52	57	---	114	573	106	59	50	46	51
31	62	---	51	62	---	117	---	121	---	50	47	---
TOTAL	1768	1972	1666	1640	2474	4818	7989	6611	2313	1693	1458	1411
MEAN	57.0	65.7	53.7	52.9	88.4	155	266	213	77.1	54.6	47.0	47.0
MAX	67	93	65	62	128	239	573	568	117	60	50	54
MIN	53	52	51	50	72	82	126	106	59	50	45	44
AC-FT	3510	3910	3300	3250	4910	9560	15850	13110	4590	3360	2890	2800

CAL YR 1986 TOTAL 46572 MEAN 128 MAX 602 MIN 51 AC-FT 92380
WTR YR 1987 TOTAL 35813 MEAN 98.1 MAX 573 MIN 44 AC-FT 71040

13326000 WALLOWA LAKE NEAR JOSEPH, OR

LOCATION.--Lat 45°20'10", long 117°13'15", in NW 1/4 sec.5, T.3 S., R.45 E., Wallowa County, Hydrologic Unit 17060105, at spillway near right end of Wallowa Lake dam on Wallowa River, 1.3 mi southeast of Joseph, and at mile 50.2.

DRAINAGE AREA.--50.8 mi^2.

PERIOD OF RECORD.--November 1903 to July 1906 (gage height only), January 1912 to March 1914, May to September 1915 (gage heights and change in contents only), October 1925 to June 1926, December 1926 to current year. Monthend contents only for some periods, published in WSP 1317. November 1903 to March 1905 published as Wallowa River at Joseph. Change in contents for January 1912 to March 1914 and May to September 1915 published with records for Wallowa River at Joseph.

REVISED RECORDS.--WSP 1737: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 4,355.66 ft above National Geodetic Vertical Datum of 1929. Prior to Oct. 1, 1925, nonrecording gage at several sites within 0.5 mi of present site at different datums. Oct. 1, 1925, to June 30, 1926, Dec. 1, 1926, to May 18, 1961, nonrecording gage near left end of dam at same datum.

REMARKS.--Reservoir is formed by concrete dam. Capacity, 42,750 acre-ft between gage heights 0.0 (sill of outlet gates) and 26.8 ft, spillway crest. About 5,300 acre-ft dead storage above outlet gates, because channel is about 3.4 ft above outlet gates. Dead storage below outlet gates not known. Records are based on capacities above outlet gates.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents observed, 47,830 acre-ft June 5-7, 1957, gage height, 29.85 ft; minimum contents observed, 4,790 acre-ft Oct. 10, 1929, gage height, 3.10 ft.

EXTREMES FOR CURRENT YEAR.--Maximum contents observed, 38,180 acre-ft June 26, gage height, 24.04 ft; minimum contents, 11,010 acre-ft part of each day Sept. 28-30, gage height, 7.10 ft.

MONTHEND GAGE-HEIGHT AND CONTENTS AT 2400, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

Date	Gage Height (feet)	Contents (acre-feet)	Change in contents (acre-feet)
Sept.30	9.18	14,260	--
Oct. 31	10.35	16,100	+1,840
Nov. 30	11.34	17,650	+1,550
Dec. 31	12.02	18,730	+1,080
CAL YR 1986	--	--	-2,530
Jan. 31	12.90	20,130	+1,400
Feb. 28	13.56	21,180	+1,050
Mar. 31	14.88	23,290	+2,110
Apr. 30	18.46	29,050	+5,760
May 31	21.90	34,660	+5,610
June 30	a23.77	37,730	+3,070
July 31	17.76	27,920	-9,810
Aug. 31	9.90	15,390	-12,530
Sept.30	7.10	11,010	-4,380
WTR 1987	--	--	-3,250

a Interpolated.

13327500 WALLOWA RIVER AT JOSEPH, OR

LOCATION.--Lat 45°20'15", long 117°13'35", in NW 1/4 sec.5, T.3 S., R.45 E., Wallowa County, Hydrologic Unit 17060105, on left bank 0.2 mi downstream from Wallowa Lake dam, 1.1 mi south of Joseph, and at mile 50.0.

DRAINAGE AREA.--50.9 mi^2.

PERIOD OF RECORD.--November 1903 to August 1907, June 1908 to March 1914, May to September 1915, December 1926 to current year. Monthly discharge only for some periods, published in WSP 1317. Published as "near Joseph" 1911.

REVISED RECORDS.--WSP 1397: 1906. WSP 1737: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 4,326.86 ft above National Geodetic Vertical Datum of 1929. Nov. 12, 1903, to Sept. 25, 1915, nonrecording gage at several sites at lake outlet or near present site at different datums.

REMARKS.--No estimated daily discharges. Records excellent. Monthly discharge adjusted for storage in Wallowa Lake (station 13326000) and diversion from Wallowa Lake by Silver Lake ditch. Silver Lake ditch diverts at Wallowa Lake dam for irrigation northeast of Joseph. City of Joseph diverts less than 1.0 ft^3/s from Wallowa Lake for municipal use.

AVERAGE DISCHARGE.--60 years (water years 1928-87), 134 ft^3/s, 35.75 in/yr, 97,080 acre-ft/yr, adjusted for storage and diversion.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,550 ft^3/s June 10, 1969, gage height, 5.15 ft; no flow at times in some years.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 304 ft^3/s Aug. 7, gage height, 3.09 ft; minimum discharge, 16 ft^3/s Mar. 17-26.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	26	24	25	21	18	18	25	47	129	241	186	177
2	26	23	25	21	18	18	25	53	114	236	223	178
3	26	38	25	20	18	18	25	53	123	212	239	175
4	25	25	25	19	18	18	25	54	133	204	249	172
5	25	24	25	19	18	18	25	87	126	186	252	183
6	25	24	25	19	18	18	25	118	135	172	259	184
7	25	24	24	19	18	19	25	130	140	155	276	181
8	24	24	25	19	18	19	25	134	152	172	273	81
9	25	24	25	19	18	19	25	130	157	189	248	43
10	25	24	25	19	18	19	25	135	168	191	255	42
11	24	24	25	19	18	19	25	162	171	190	244	42
12	24	30	25	19	18	19	25	210	183	202	226	82
13	24	28	25	19	18	19	25	225	210	230	220	98
14	25	28	25	17	18	19	25	225	223	244	216	97
15	25	28	25	17	18	19	25	225	247	245	201	95
16	25	27	25	17	18	19	25	226	249	243	187	94
17	25	27	24	17	18	19	25	227	228	232	182	68
18	25	27	25	17	18	16	25	227	196	246	180	43
19	25	25	24	17	18	16	25	227	174	241	178	39
20	25	25	23	17	18	16	25	221	155	235	176	38
21	25	25	23	17	18	16	25	218	141	233	173	38
22	24	25	22	17	18	16	25	218	142	232	171	35
23	25	25	22	17	18	16	25	222	143	228	169	34
24	25	25	22	17	18	16	26	227	140	210	167	34
25	25	25	22	17	18	16	26	227	131	188	162	34
26	24	25	22	17	18	26	26	234	140	181	160	34
27	24	25	22	17	18	30	26	227	152	173	157	33
28	24	25	22	17	18	30	27	200	181	173	155	33
29	24	25	22	18	---	25	27	165	222	167	163	32
30	24	25	21	18	---	25	27	136	232	164	165	28
31	24	---	21	18	---	25	---	131	---	170	168	---
TOTAL	767	773	736	561	504	606	760	5321	5037	6385	6280	2447
MEAN	24.7	25.8	23.7	18.1	18.0	19.5	25.3	172	168	206	203	81.6
MAX	26	38	25	21	18	30	27	234	249	246	276	184
MIN	24	23	21	17	18	16	25	47	114	155	155	28
AC-FT	1520	1530	1460	1110	1000	1200	1510	10550	9990	12660	12460	4850
MEAN†	56.6	53.9	42.3	41.5	38.7	55.3	125	296	251	125	44.1	24.2
CFSM†	1.11	1.06	0.83	0.81	0.76	1.09	2.46	5.82	4.93	2.46	0.87	0.48
IN.†	1.28	1.18	0.96	0.94	0.79	1.25	2.75	6.70	5.51	2.84	1.00	0.53
AC-FT†	3480	3210	2600	2550	2150	3400	7450	18190	14960	7700	2710	1440

CAL YR 1986 TOTAL 44131 MEAN 121 MAX 744 MIN 21 AC-FT 87530 MEAN† 132 CFSM† 2.59 IN.† 35.17 AC-FT† 95480
WTR YR 1987 TOTAL 30177 MEAN 82.7 MAX 276 MIN 16 AC-FT 59860 MEAN† 96.4 CFSM† 1.89 IN.† 25.72 AC-FT† 69800

† Adjusted for change in contents of Wallowa Lake and diversion by Silver Lake ditch.

13330000 LOSTINE RIVER NEAR LOSTINE, OR

LOCATION.--Lat 45°26'20", long 117°25'35", in NW 1/4 sec.34, T.1 S., R.43 E., Wallowa County, Hydrologic Unit 17060105, on left bank 3.5 mi south of Lostine and at mile 10.0.

DRAINAGE AREA.--70.9 mi^2.

PERIOD OF RECORD.--August 1912 to March 1914, April to September 1915, July 1925 to current year. Monthly discharge only for some periods, published in WSP 1317.

REVISED RECORDS.--WSP 1397: 1913, 1942. WSP 1737: Drainage area.

GAGE.--Water-stage recorder. Elevation of gage is 3,650 ft, by barometer. See WSP 1317 or 1737 for history of changes prior to Dec. 16, 1953. Dec. 16, 1953, to Aug. 23, 1977, at datum 1.04 ft higher.

REMARKS.--Estimated daily discharges: Jan. 9-12, 15, 16, 19-22. Records excellent except those for Jan. 9-22, which are fair. Minam Lake Reservoir, capacity 440 acre-ft, has stored and diverted flow from Minam River since 1917 for irrigation in Lostine River basin. Diversions for irrigation upstream from station.

AVERAGE DISCHARGE.--63 years (water years 1913, 1926-87), 195 ft^3/s, 141,300 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 2,550 ft^3/s June 16, 1974, gage height, 8.59 ft, present datum; minimum discharge, 7.5 ft^3/s Mar. 2, 1966, result of freezeup; minimum daily, 10 ft^3/s Nov. 28-30, 1936.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 1,100 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Apr. 30	1900	*1,210	*6.29	No other peak greater than base discharge.			

Minimum daily discharge, 16 ft^3/s Jan. 10, 16.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	42	40	42	31	31	27	47	860	456	167	58	45
2	41	37	39	31	27	29	54	573	389	186	55	44
3	39	38	33	31	25	47	65	451	368	163	52	44
4	40	37	40	32	24	47	80	431	389	147	50	43
5	43	39	41	30	24	51	84	506	484	137	49	42
6	44	38	39	32	23	70	96	632	521	124	48	40
7	47	39	36	29	24	64	105	762	489	116	46	38
8	44	38	36	20	23	58	116	803	511	110	45	36
9	43	39	20	17	23	57	107	779	488	106	43	35
10	43	27	26	16	24	55	109	773	441	122	43	33
11	41	42	29	20	25	55	130	758	414	113	42	31
12	40	42	34	23	25	56	116	769	418	100	41	29
13	39	39	33	27	30	71	109	777	421	93	42	27
14	38	39	34	27	31	68	114	747	406	89	48	26
15	36	38	28	23	29	64	134	769	417	85	44	25
16	35	39	28	16	28	62	157	764	369	82	42	26
17	35	41	22	27	28	61	192	682	311	81	40	25
18	35	41	22	26	27	61	192	605	320	79	39	25
19	34	44	29	22	27	57	169	512	314	74	37	24
20	34	42	26	18	25	55	160	413	283	69	36	23
21	33	48	27	17	27	52	178	345	273	66	35	23
22	33	44	30	20	28	50	233	309	240	148	35	22
23	33	43	31	25	26	49	316	292	217	105	35	22
24	33	45	30	24	26	49	363	315	196	89	36	21
25	32	41	28	23	27	47	402	337	192	86	34	21
26	32	42	30	23	25	47	458	430	194	81	33	22
27	40	44	29	24	25	44	573	599	198	73	32	23
28	40	43	26	24	26	44	744	491	193	67	31	23
29	37	42	31	23	---	41	859	467	181	65	30	22
30	48	35	31	23	---	43	1080	472	170	63	29	21
31	43	---	25	24	---	44	---	602	---	61	42	---
TOTAL	1197	1206	955	748	733	1625	7542	18025	10263	3147	1272	881
MEAN	38.6	40.2	30.8	24.1	26.2	52.4	251	581	342	102	41.0	29.4
MAX	48	48	42	32	31	71	1080	860	521	186	58	45
MIN	32	27	20	16	23	27	47	292	170	61	29	21
AC-FT	2370	2390	1890	1480	1450	3220	14960	35750	20360	6240	2520	1750

CAL YR 1986 TOTAL 66651 MEAN 183 MAX 1860 MIN 20 AC-FT 132200
WTR YR 1987 TOTAL 47594 MEAN 130 MAX 1080 MIN 16 AC-FT 94400

13331500 MINAM RIVER AT MINAM, OR
(Hydrologic bench-mark station)

LOCATION.--Lat 45°37'12", long 117°43'32", in SW 1/4 SW 1/4 sec.29, T.2 N., R.41 E., Wallowa County, Hydrologic Unit 17060105, on left bank 2.3 mi downstream from Squaw Creek, 0.3 mi west of Minam, and at mile 0.3.

DRAINAGE AREA.--240 mi^2, approximately.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--June 1912 to March 1914, September 1965 to current year. Monthly discharge only for some periods, published in WSP 1317.

GAGE.--Water-stage recorder. Datum of gage is 2,540.48 ft above National Geodetic Vertical Datum of 1929. June 1912 to March 1914, nonrecording gage at approximately same site at different datum.

REMARKS.--Estimated daily discharges: Dec. 11 to Jan. 27. Water-discharge records good except for estimated daily discharges, which are poor. No regulation. Minam Lake, capacity 440 acre-ft, has stored and diverted flow from Minam River since 1917 for irrigation in Lostine River basin.

AVERAGE DISCHARGE.--23 years, 470 ft^3/s, 26.59 in/yr, 340,500 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 6,260 ft^3/s June 16, 1974, gage height, 6.89 ft; maximum gage height, 7.3 ft May 28, 1913, datum then in use; minimum discharge, 10 ft^3/s Dec. 6, 1972, Jan. 10, 1973, result of freezeup.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 1,450 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Apr. 30	2230	*2,600	*4.04	May 8	0030	1,920	3.46

Minimum discharge, 30 ft^3/s Dec. 10, result of freezeup.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	116	98	136	64	320	122	183	2090	823	232	110	53
2	108	91	139	68	397	126	215	1490	715	276	108	52
3	99	87	115	75	339	158	257	1210	652	250	104	51
4	97	86	116	74	284	210	310	1110	637	225	99	52
5	101	89	137	72	235	321	315	1180	677	212	96	51
6	104	105	129	70	196	536	334	1360	739	200	94	51
7	107	99	120	72	186	472	354	1590	728	191	92	49
8	103	96	115	72	184	362	393	1740	725	184	90	48
9	99	94	85	35	178	327	354	1730	709	179	87	48
10	97	72	43	42	177	304	347	1660	637	194	83	47
11	93	79	45	48	180	289	443	1560	575	192	81	47
12	89	119	55	54	185	284	393	1490	546	174	81	45
13	88	103	68	60	219	365	352	1450	536	164	82	45
14	86	103	82	70	289	379	346	1370	518	156	93	44
15	84	104	75	60	249	349	409	1350	512	149	89	44
16	83	105	68	55	200	324	465	1340	512	142	84	44
17	82	123	60	50	188	302	574	1220	454	142	79	45
18	81	115	50	58	176	291	588	1080	445	143	77	45
19	80	132	60	61	166	269	507	959	460	140	72	45
20	79	129	70	62	154	254	448	837	399	133	69	44
21	78	163	66	56	148	236	461	729	371	127	67	43
22	77	168	72	61	150	229	576	650	346	184	65	42
23	76	157	80	66	143	219	782	594	322	191	64	41
24	75	161	78	74	131	210	875	595	302	155	63	41
25	74	170	73	88	132	199	960	641	282	146	62	41
26	74	156	69	110	123	194	1060	678	267	144	60	43
27	86	162	65	150	117	184	1250	822	261	130	59	46
28	99	157	60	191	126	181	1560	731	256	125	58	45
29	89	155	64	230	---	165	1800	713	254	121	56	44
30	107	137	68	243	---	175	2170	723	242	117	55	42
31	110	---	62	229	---	172	---	964	---	112	54	---
TOTAL	2821	3615	2525	2720	5572	8208	19081	35656	14902	5230	2433	1378
MEAN	91.0	120	81.5	87.7	199	265	636	1150	497	169	78.5	45.9
MAX	116	170	139	243	397	536	2170	2090	823	276	110	53
MIN	74	72	43	35	117	122	183	594	242	112	54	41
AC-FT	5600	7170	5010	5400	11050	16280	37850	70720	29560	10370	4830	2730
CFSM	.38	.50	.34	.37	.83	1.10	2.65	4.79	2.07	.70	.33	.19
IN.	.44	.56	.39	.42	.86	1.27	2.96	5.53	2.31	.81	.38	.21

CAL YR 1986 TOTAL 166128 MEAN 455 MAX 3780 MIN 43 AC-FT 329500 CFSM 1.90 IN. 25.75
WTR YR 1987 TOTAL 104141 MEAN 285 MAX 2170 MIN 35 AC-FT 206600 CFSM 1.19 IN. 16.14

13331500 MINAM RIVER AT MINAM, OR--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1966 to current year.

PERIOD OF DAILY RECORD.--
WATER TEMPERATURE: October 1965 to September 1985.

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SPE-CIFIC CON-DUCT-ANCE (US/CM)	PH (STAND-ARD UNITS)	TEMPER-ATURE WATER (DEG C)	OXYGEN, DIS-SOLVED (MG/L)	OXYGEN DIS-SOLVED (PER-CENT SATUR-ATION)	COLI-FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)	STREP-TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML)	HARD-NESS (MG/L AS CACO3)	HARD-NESS NONCARB (MG/L AS CACO3)	CALCIUM DIS-SOLVED (MG/L AS CA)
NOV												
18...	1240	111	57	7.7	2.5	13.6	111	K2	K6	22	0	6.2
MAR												
03...	1200	159	55	7.3	4.0	11.7	98	K6	K12	24	0	6.4
MAY												
05...	1230	1130	30	7.7	9.5	11	105	<1	K9	11	0	3.4
AUG												
26...	1430	60	56	9.2	23.0	8.1	104	K15	--	22	0	6.5

DATE	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG)	SODIUM, DIS-SOLVED (MG/L AS NA)	POTAS-SIUM, DIS-SOLVED (MG/L AS K)	ALKA-LINITY WAT DOS IT FIELD (MG/L AS CACO3)	BICAR-BONATE IT-FLD (MG/L AS HCO3)	CAR-BONATE IT-FLD (MG/L AS CO3)	SULFATE DIS-SOLVED (MG/L AS SO4)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)	FLUO-RIDE, DIS-SOLVED (MG/L AS F)	NITRO-GEN, AMMONIA DIS-SOLVED (MG/L AS N)	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N)
NOV											
18...	1.6	2.4	1.2	26	32	0	2.6	0.6	<0.1	<0.01	<0.1
MAR											
03...	1.9	2.6	1.2	30	36	0	3.6	0.6	<0.1	0.04	<0.1
MAY											
05...	0.7	1.5	0.6	11	13	0	1.6	0.3	<0.1	<0.01	<0.1
AUG											
26...	1.4	2.6	1.6	26	31	1	1.7	0.5	0.1	<0.01	<0.1

DATE	NITRO-GEN, AM-MONIA + ORGANIC TOTAL (MG/L AS N)	PHOS-PHOROUS ORTHO, DIS-SOLVED (MG/L AS P)	PHOS-PHOROUS DIS-SOLVED (MG/L AS P)	PHOS-PHOROUS TOTAL (MG/L AS P)	SILICA, DIS-SOLVED (MG/L AS SIO2)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L)	SOLIDS, DIS-SOLVED (TONS PER DAY)	TUR-BID-ITY (NTU)	SEDI-MENT, SUS-PENDED (MG/L)	SEDI-MENT, DIS-CHARGE, SUS-PENDED (T/DAY)
NOV											
18...	0.6	<0.01	<0.01	0.01	19	54	51	16.2	1.1	1	0.3
MAR											
03...	0.6	0.01	0.02	0.03	24	50	58	21.5	4.4	4	1.7
MAY											
05...	0.2	<0.01	0.01	0.02	13	26	28	79.3	1.6	10	31
AUG											
26...	0.7	<0.01	0.02	0.01	15	39	45	6.32	0.3	2	0.32

K - Results based on colony count outside acceptable range (non-ideal colony count).

13331500 MINAM RIVER AT MINAM, OR--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	ALUMINUM, DISSOLVED (UG/L AS AL)	ARSENIC DISSOLVED (UG/L AS AS)	BARIUM, DISSOLVED (UG/L AS BA)	BERYLLIUM, DISSOLVED (UG/L AS BE)	CADMIUM DISSOLVED (UG/L AS CD)	CHROMIUM, DISSOLVED (UG/L AS CR)	COBALT, DISSOLVED (UG/L AS CO)	COPPER, DISSOLVED (UG/L AS CU)	IRON, DISSOLVED (UG/L AS FE)	LEAD, DISSOLVED (UG/L AS PB)
NOV 18...	40	<1	3	<0.5	1	<1	<3	2	46	8
MAR 03...	--	<1	4	<0.5	1	<1	<3	1	--	<5
MAY 05...	30	<1	3	<0.5	<1	<1	<3	2	20	<5
AUG 26...	10	<1	9	0.7	<1	<1	<3	1	8	<5

DATE	LITHIUM DISSOLVED (UG/L AS LI)	MANGANESE, DISSOLVED (UG/L AS MN)	MERCURY DISSOLVED (UG/L AS HG)	MOLYBDENUM, DISSOLVED (UG/L AS MO)	NICKEL, DISSOLVED (UG/L AS NI)	SELENIUM, DISSOLVED (UG/L AS SE)	SILVER, DISSOLVED (UG/L AS AG)	STRONTIUM, DISSOLVED (UG/L AS SR)	VANADIUM, DISSOLVED (UG/L AS V)	ZINC, DISSOLVED (UG/L AS ZN)
NOV 18...	<4	<1	<0.1	<10	<1	<1	<1	21	<6	6
MAR 03...	<4	<1	--	<10	<1	<1	<1	25	<6	6
MAY 05...	<4	1	<0.1	<10	<1	<1	<1	17	<6	10
AUG 26...	<4	1	<0.1	<10	<1	5	<1	24	<6	<3

DATE	GROSS ALPHA, DISSOLVED (UG/L AS U-NAT)	GROSS ALPHA, SUSP. TOTAL (UG/L AS U-NAT)	GROSS BETA, DISSOLVED (PCI/L AS CS-137)	GROSS BETA, DISSOLVED (PCI/L AS SR/YT-90)	GROSS BETA, SUSP. TOTAL (PCI/L AS CS-137)	GROSS BETA, SUSP. TOTAL (PCI/L AS SR/YT-90)	RADIUM 226, DISSOLVED, RADON METHOD (PCI/L)	URANIUM DISSOLVED, EXTRACTION (UG/L)
NOV 18...	--	--	--	--	--	--	--	--
MAR 03...	--	--	--	--	--	--	--	--
MAY 05...	<0.4	<0.4	0.5	0.5	1.0	1.0	0.01	0.1
AUG 26...	--	--	--	--	--	--	--	--

13332500 GRANDE RONDE RIVER AT RONDOWA, OR

LOCATION.--Lat 45°43'36", long 117°46'59", in SW 1/4 NW 1/4 sec.23, T.3 N., R.40 E., Wallowa County, Hydrologic Unit 17060106, on right bank at Rondowa, 500 ft downstream from Wallowa River, 13 mi northeast of Elgin, and at mile 81.4.

DRAINAGE AREA.--2,555 mi^2.

PERIOD OF RECORD.--October 1926 to current year.

REVISED RECORDS.--WSP 1093: 1928-29, 1932-33, 1936, 1938, 1939(M), 1943. WSP 1397: 1927. WSP 1447: 1927.

GAGE.--Water-stage recorder. Datum of gage is 2,281.87 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--No estimated daily discharges. Records good. Flow slightly regulated by Wallowa Lake (station 13326000) and small reservoirs. Diversions for irrigation upstream from station, chiefly in vicinity of La Grande, Enterprise, and Wallowa; one transbasin diversion from Sheep Creek in Imnaha River basin for irrigation in Wallowa Valley.

AVERAGE DISCHARGE.--61 years, 2,170 ft^3/s, 1,572,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 24,700 ft^3/s Jan. 30, 1965, gage height, 10.93 ft; minimum discharge, 179 ft^3/s Aug. 24, 1977.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 6,200 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Apr. 30	2330	*7,910	*5.62	No other peak greater than base discharge.			

Minimum discharge, 261 ft^3/s Sept. 12.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	684	633	1010	524	1110	1020	1560	7070	2670	600	444	282
2	695	615	988	562	1240	1150	1740	5650	2330	657	433	279
3	671	600	915	597	1040	1620	2040	4780	2120	666	433	287
4	643	596	868	595	1030	2250	2420	4290	2040	612	403	293
5	630	601	888	576	939	3210	2680	4200	2070	619	370	303
6	623	651	893	572	918	4620	2800	4420	2200	606	345	310
7	633	640	858	537	921	4620	2870	4710	2080	582	344	311
8	626	653	822	511	930	4170	2960	4910	2040	546	338	307
9	613	641	724	445	937	4100	2890	4750	2070	529	328	291
10	611	592	590	364	952	3650	2780	4530	1910	605	330	281
11	603	578	589	358	1040	3370	2970	4260	1740	679	317	272
12	585	638	715	451	1120	3300	2870	4020	1620	605	316	267
13	581	657	696	532	1420	3980	2670	3940	1550	583	316	268
14	570	688	740	533	2050	4270	2520	3640	1470	549	338	277
15	566	686	732	486	2100	4110	2560	3550	1490	490	345	289
16	564	687	660	418	1960	3920	2710	3470	1550	440	346	305
17	557	798	607	491	1860	3630	3010	3170	1430	439	360	337
18	556	816	552	523	1710	3500	3150	2860	1500	482	386	339
19	548	868	569	517	1560	3320	2980	2520	1660	510	368	337
20	550	874	623	459	1420	3040	2740	2170	1580	496	366	334
21	550	1000	616	466	1300	2730	2600	1900	1470	494	358	335
22	548	1180	617	487	1280	2470	2710	1720	1400	664	357	334
23	547	1180	660	507	1230	2270	3080	1590	1310	808	362	322
24	542	1160	621	519	1130	2120	3440	1590	1200	664	367	313
25	542	1170	614	532	1050	2000	3620	1760	1110	651	357	308
26	538	1130	613	561	994	1910	3830	1900	993	657	335	319
27	560	1130	600	653	914	1810	4210	2540	915	628	340	323
28	582	1120	569	808	967	1740	5000	2400	860	597	338	325
29	579	1130	540	750	---	1610	5740	2290	781	548	328	344
30	649	1080	589	705	---	1560	6840	2240	672	512	323	344
31	658	---	521	681	---	1530	---	2930	---	467	302	---
TOTAL	18404	24792	21599	16720	35122	88600	93990	105770	47831	17985	10993	9236
MEAN	594	826	697	539	1254	2858	3133	3412	1594	580	355	308
MAX	695	1180	1010	808	2100	4620	6840	7070	2670	808	444	344
MIN	538	578	521	358	914	1020	1560	1590	672	439	302	267
AC-FT	36500	49170	42840	33160	69660	175700	186400	209800	94870	35670	21800	18320

CAL YR 1986 TOTAL 825702 MEAN 2262 MAX 17000 MIN 399 AC-FT 1638000
WTR YR 1987 TOTAL 491042 MEAN 1345 MAX 7070 MIN 267 AC-FT 974000

13333000 GRANDE RONDE RIVER AT TROY, OR

LOCATION.--Lat 45°56'47", long 117°26'54", in NE 1/4 NW 1/4 sec.4, T.5 N., R.43 E., Wallowa County, Hydrologic Unit 17060106, on left bank 500 ft downstream from bridge at Troy, 600 ft downstream from Wenaha River, and at mile 45.2.

DRAINAGE AREA.--3,275 mi^2.

PERIOD OF RECORD.--August 1944 to current year. Monthly discharge only August 1944, published in WSP 1317.

REVISED RECORDS.--WSP 1397: 1946(M), 1948-50.

GAGE.--Water-stage recorder. Datum of gage is 1,585.98 ft above National Geodetic Vertical Datum of 1929. Aug. 17, 1944, to Sept. 30, 1949, nonrecording gage at site 500 ft upstream at datum 10.85 ft lower. Oct. 1, 1949, to Sept. 5, 1963, water-stage recorder at site 500 ft upstream at datum 1.15 ft higher.

REMARKS.--Estimated daily discharges: Dec. 29 to Jan. 26. Records excellent except for estimated daily discharges, which are fair. Flow slightly regulated by Wallowa Lake (station 13326000) and small reservoirs. Diversions for irrigation upstream from station, chiefly in vicinity of La Grande, Enterprise, and Wallowa; one transbasin diversion from Big Sheep Creek and tributaries in Imnaha River basin for irrigation in Wallowa Valley.

AVERAGE DISCHARGE.--43 years, 3,111 ft^3/s, 2,254,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 42,200 ft^3/s Dec. 23, 1964, gage height, 11.25 ft; minimum discharge, 344 ft^3/s Aug. 19-21, 23, 1977.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 9,000 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
May 1	0600	*9,080	*6.31	No other peak greater than base discharge.			

Minimum discharge, 423 ft^3/s Sept. 12-14.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	967	902	1500	790	1320	1420	2400	8560	3330	860	632	458
2	947	881	1430	840	2020	1560	2650	7120	2870	860	611	441
3	937	859	1350	910	1640	1910	3120	6050	2600	907	607	445
4	903	848	1260	860	1600	3430	3690	5430	2470	856	597	456
5	881	859	1260	820	1440	4260	3960	5240	2460	839	561	465
6	871	965	1280	870	1380	6300	4160	5390	2560	839	535	472
7	869	931	1240	840	1380	6790	4240	5640	2500	814	520	476
8	871	944	1200	790	1400	6040	4400	5880	2430	777	517	475
9	859	921	1130	740	1420	5910	4270	5720	2480	750	510	467
10	850	883	985	650	1440	5540	4040	5520	2330	798	491	453
11	850	843	950	570	1540	5120	4360	5230	2130	902	492	442
12	827	902	1030	660	1650	5030	4180	4930	1960	847	486	437
13	821	919	1040	800	1920	6020	3850	4840	1850	802	490	432
14	816	965	1060	790	2940	6500	3630	4500	1770	776	513	435
15	806	982	1060	700	3170	6130	3680	4310	1760	723	529	444
16	806	975	998	620	2890	5750	3860	4220	1860	655	520	459
17	802	1120	916	720	2680	5320	4250	3910	1760	648	522	487
18	793	1140	919	800	2520	5070	4410	3550	1730	685	546	506
19	790	1300	853	800	2280	4790	4140	3190	2030	732	548	506
20	786	1300	926	630	2090	4380	3800	2760	2030	717	531	502
21	790	1500	936	640	1910	3930	3610	2490	1820	700	533	495
22	783	1660	891	700	1840	3590	3700	2240	1720	705	518	498
23	782	1710	916	760	1790	3300	4120	2080	1600	1070	526	494
24	779	1690	932	790	1660	3070	4600	1990	1490	907	528	479
25	779	1720	900	820	1540	2890	4840	2160	1380	853	540	472
26	779	1660	891	860	1460	2800	5000	2270	1260	872	514	481
27	791	1650	881	916	1360	2650	5310	2850	1150	825	505	493
28	823	1770	864	1100	1350	2540	6090	2910	1100	803	505	491
29	822	1720	848	1160	---	2380	6990	2740	1050	765	497	501
30	914	1640	830	1090	---	2280	7890	2660	940	716	486	514
31	938	---	810	1080	---	2280	---	3320	---	662	481	---
TOTAL	26032	36159	32086	25116	51630	128980	129240	129700	58420	24665	16391	14176
MEAN	840	1205	1035	810	1844	4161	4308	4184	1947	796	529	473
MAX	967	1770	1500	1160	3170	6790	7890	8560	3330	1070	632	514
MIN	779	843	810	570	1320	1420	2400	1990	940	648	481	432
AC-FT	51630	71720	63640	49820	102400	255800	256300	257300	115900	48920	32510	28120

CAL YR 1986 TOTAL 1090255 MEAN 2987 MAX 24400 MIN 576 AC-FT 2163000
WTR YR 1987 TOTAL 672595 MEAN 1843 MAX 8560 MIN 432 AC-FT 1334000

13353000 SNAKE RIVER BELOW ICE HARBOR DAM, WA

LOCATION.--Lat 46°14'53", long 118°52'43", in NE 1/4 SE 1/4 ,sec.24, T.9 N., R.31 E., Walla Walla County, Hydrologic Unit 17060110, in powerhouse forebay pier P-1 on south side of Bay 1 at Ice Harbor Dam, 8.0 mi northeast of Burbank, and at mile 9.7.

DRAINAGE AREA.--108,500 mi^2, approximately.

PERIOD OF RECORD.--October 1907 to March 1917 (gage heights only October 1907 to August 1909), March 1962 to current year. Published as "at Burbank" prior to 1911 and as "near Burbank" 1912-17.

REVISED RECORDS.--WSP 1317: Drainage area.

GAGE.--Watt-hour meters on each turbine in Ice Harbor Dam powerhouse. Elevations are National Geodetic Vertical Datum of 1929. Oct. 2, 1907, to Mar. 31, 1917, nonrecording gage at site approximately 2 mi downstream at datum 300 ft higher. Mar. 23, 1962, to Sept. 30, 1968, water-stage recorder 1.0 mi downstream at National Geodetic Vertical Datum of 1929.

REMARKS.--No estimated daily discharges. Records computed from power output, flow over spillway, flow through fish ladder, and lockage records at Ice Harbor Dam. Diversions upstream from station for irrigation of over 4,090,000 acres. Flow regulated by Lake Sacajawea and many upstream storage reservoirs and powerplants. Chemical analyses October 1965 to September 1969, October 1971 to September 1972. For records collected at site 7.5 mi downstream see station 13353200.

COOPERATION.--Records furnished by U.S. Corps of Engineers. Records not reviewed.

AVERAGE DISCHARGE.--32 years (water years 1910-16, 1963-87), 55,810 ft^3/s, 40,430,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 312,000 ft^3/s June 19, 1974; no flow momentarily Aug. 27, 1965 (result of testing at Ice Harbor Dam).

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of May 30, 1948, reached an elevation of 361.9 ft at a site 0.7 mi downstream, from information by U.S. Corps of Engineers.

EXTREMES FOR CURRENT YEAR.--Maximum hourly discharge, 132,000 ft^3/s May 2; maximum forebay elevation, 440.07 ft May 14; minimum hourly discharge, 8,100 ft^3/s Sept. 2; minimum forebay elevation, 437.10 ft Apr. 17.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	28500	33200	41300	29500	27300	14500	21200	93100	41700	17900	13400	12100
2	30800	33100	44300	45200	36400	25600	27500	92600	40800	21300	12900	19800
3	35300	38700	50600	31800	27400	22800	31400	90300	36200	16900	16700	23400
4	28400	36800	49800	22900	29800	36000	31700	74700	32400	12100	12300	8900
5	38900	32600	39100	39100	28600	32600	26700	65400	31600	11900	14500	14200
6	38400	33000	44900	40500	32800	33300	33000	77100	25700	14200	17700	11200
7	33200	33300	37400	37200	24500	37600	36200	86800	27100	15200	20900	22700
8	32600	27000	41200	38000	27200	33400	38100	87000	33900	19000	15500	20000
9	26600	33200	47600	28700	33200	43400	38200	86100	22700	21400	14600	24700
10	45800	39200	37500	26500	36200	42300	39500	60600	29600	22400	12400	30200
11	37600	34700	46600	21900	32600	32700	44800	81800	31400	15400	14600	30600
12	33100	33000	28000	40000	31800	37200	26000	76600	25900	16800	18100	29800
13	27800	33200	27800	26800	41000	26100	45800	85000	22400	25900	14800	28000
14	39300	33900	28300	35400	35000	43700	39100	94900	25800	17500	17900	30300
15	30100	31300	46000	39500	41200	43100	29000	97300	28800	19000	12000	28800
16	35400	31600	40600	30800	43800	41500	32900	72900	26600	14400	11900	15600
17	26900	35100	42400	31200	37400	45000	39400	76400	23600	14100	18300	24700
18	31500	39300	45100	24000	32600	40100	43200	75400	25800	16500	16300	37700
19	37500	43900	38700	28200	27900	52300	40100	49900	33300	11800	13700	19300
20	31600	45300	29200	25000	28700	46700	41100	45600	42600	23200	15200	21900
21	36800	54300	26900	31400	29400	32600	42900	39800	13700	20500	12800	24100
22	29100	43300	43300	28600	21200	32900	42800	39400	24600	19000	18000	22700
23	36700	37800	40800	31800	28000	48400	31500	30900	30800	23300	13800	22500
24	35400	54800	42100	23600	25700	40800	42000	28800	24900	32300	16200	28000
25	35100	41500	30600	18300	29900	25800	55000	48900	24000	25700	20200	29500
26	31500	47900	38600	25300	19400	28200	49600	42600	25600	22900	15300	28700
27	38700	23700	34600	18700	22100	29700	57000	35100	24700	30100	17400	18700
28	37600	26300	16600	26200	27400	38400	64600	31600	13700	23800	25200	27700
29	27100	24900	36300	28500	---	25700	69600	35100	24400	12800	12100	20900
30	36900	34100	33600	29300	---	32300	91600	30400	11600	14000	11900	20900
31	36300	---	32400	27100	---	27600	---	30900	---	21300	15900	---
TOTAL	1050500	1090000	1182200	931000	858500	1092300	1251500	1963000	825900	592600	482500	697600
MEAN	33890	36330	38140	30030	30660	35240	41720	63320	27530	19120	15560	23250
MAX	45800	54800	50600	45200	43800	52300	91600	97300	42600	32300	25200	37700
MIN	26600	23700	16600	18300	19400	14500	21200	28800	11600	11800	11900	8900
AC-FT	2084000	2162000	2345000	1847000	1703000	2167000	2482000	3894000	1638000	1175000	957000	1384000

CAL YR 1986	TOTAL	22920400	MEAN	62800	MAX	214000	MIN	12000	AC-FT	45463000
WTR YR 1987	TOTAL	12017600	MEAN	32920	MAX	97300	MIN	8900	AC-FT	23837000

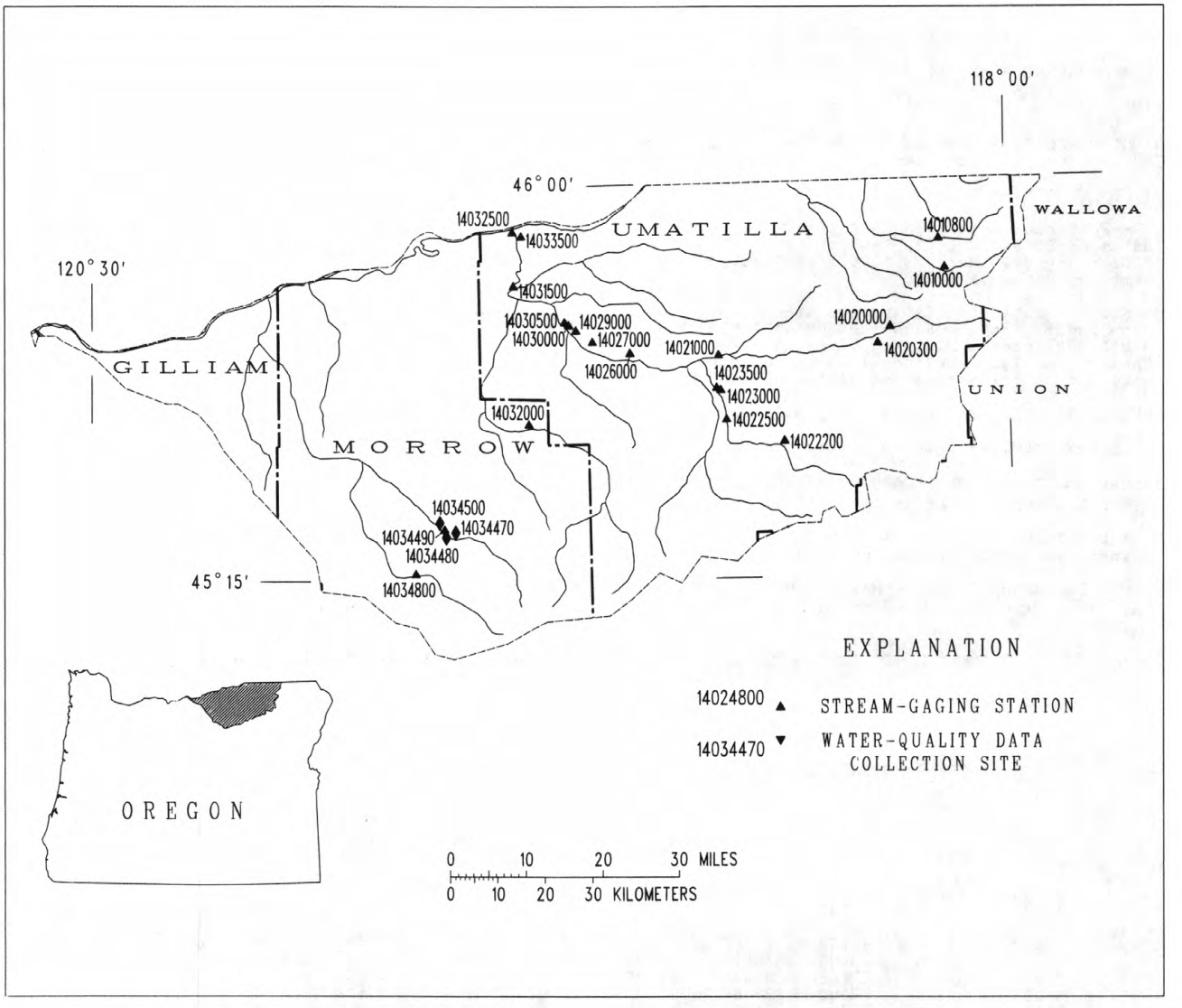

Figure 5.--Location of surface-water and water-quality stations in the Walla Walla River, Umatilla River, and Willow Creek basins.

WALLA WALLA RIVER BASIN

14010000 SOUTH FORK WALLA WALLA RIVER NEAR MILTON-FREEWATER, OR

LOCATION.--Lat 45°49'48", long 118°10'08", in NE 1/4 NE 1/4 sec.15, T.4 N., R.37 E., Umatilla County, Hydrologic Unit 17070102, on right bank 1.0 mi downstream from Elbow Creek, 13 mi southeast of Milton-Freewater, and at mile 59.1.

DRAINAGE AREA.--63 mi^2, approximately.

PERIOD OF RECORD.--February to October 1903, August 1906 to November 1917, May 1931 to current year. Monthly discharge only for some periods, published in WSP 1318. Published as "12 mi above Milton" 1903, as "above Pacific Power & Light Co.'s intake near Milton" 1907-10, and as "near Milton" 1911-17, 1931-85.

REVISED RECORDS.--WSP 964: Drainage area. WSP 1398: 1912, 1940, drainage area at former site.

GAGE.--Water-stage recorder. Elevation of gage is 2,050 ft from river-profile map. Prior to Mar. 23, 1934, water-stage recorder or nonrecording gage at several sites within 1.5 mi of present site at various datums.

REMARKS.--Estimated daily discharges: Oct. 1-6, Jan. 18-24. Records good. No regulation or diversion upstream from station.

AVERAGE DISCHARGE.--66 years (water years 1908-17, 1932-87), 178 ft^3/s, 38.37 in/yr, 129,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 2,530 ft^3/s Jan. 29, 1965, gage height, 5.60 ft; minimum discharge, 72 ft^3/s Feb. 14, 1932.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage about 6 ft Mar. 31, 1931, present site and datum.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 600 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Apr. 30	1700	*422	*2.06				

Minimum discharge, 87 ft^3/s June 24-30, July 3-5.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	120	100	163	111	180	129	154	316	123	89	91	93
2	115	97	151	111	196	135	166	254	115	91	90	93
3	110	96	141	112	182	195	186	231	112	90	90	94
4	105	96	134	111	167	303	196	222	104	89	90	93
5	102	103	140	111	157	315	194	221	100	89	89	93
6	100	110	134	110	151	319	198	221	98	90	91	93
7	100	110	131	109	152	252	204	218	98	90	91	93
8	99	107	129	107	156	226	213	212	102	90	91	94
9	99	104	125	106	158	221	198	204	98	89	91	95
10	99	101	123	106	152	213	207	194	95	98	90	95
11	98	104	122	106	157	206	229	182	93	96	90	95
12	99	106	120	106	156	214	202	183	93	93	93	95
13	98	105	120	106	187	277	189	170	91	90	95	95
14	96	115	117	108	219	264	194	160	92	90	96	95
15	96	116	115	105	210	240	208	156	98	90	95	94
16	95	120	114	103	196	223	224	150	97	91	94	94
17	95	159	114	104	192	214	232	146	94	97	93	94
18	95	155	114	102	184	211	223	141	94	96	93	94
19	94	173	114	100	170	205	199	135	97	97	93	94
20	93	168	111	97	159	196	190	132	93	95	92	94
21	94	199	111	97	151	189	198	128	93	94	92	94
22	94	190	111	98	149	183	214	124	90	100	92	94
23	94	193	109	100	143	176	236	121	89	98	91	94
24	94	205	109	105	139	168	240	123	88	95	92	95
25	94	197	109	110	135	162	235	122	90	99	97	96
26	94	176	109	123	132	161	234	120	89	96	94	99
27	100	177	109	148	130	156	260	127	88	93	94	98
28	96	206	107	172	128	150	291	118	88	93	94	96
29	99	209	106	162	---	145	319	115	88	93	93	96
30	103	183	106	152	---	143	348	126	89	92	93	96
31	101	---	108	151	---	146	---	140	---	91	93	---
TOTAL	3071	4280	3726	3549	4588	6337	6581	5212	2879	2884	2863	2838
MEAN	99.1	143	120	114	164	204	219	168	96.0	93.0	92.4	94.6
MAX	120	209	163	172	219	319	348	316	123	100	97	99
MIN	93	96	106	97	128	129	154	115	88	89	89	93
AC-FT	6090	8490	7390	7040	9100	12570	13050	10340	5710	5720	5680	5630
CFSM	1.57	2.26	1.91	1.82	2.60	3.24	3.48	2.67	1.52	1.48	1.47	1.50
IN.	1.81	2.53	2.20	2.10	2.71	3.74	3.89	3.08	1.70	1.70	1.69	1.68

CAL YR 1986 TOTAL 62588.6 MEAN 171 MAX 1190 MIN 93 AC-FT 124100 CFSM 2.72 IN. 36.96
WTR YR 1987 TOTAL 48808 MEAN 134 MAX 348 MIN 88 AC-FT 96810 CFSM 2.12 IN. 28.82

14010800 NORTH FORK WALLA WALLA RIVER NEAR MILTON-FREEWATER, OR

LOCATION.--Lat 45°53'06", long 118°11'06", in SE 1/4 NW 1/4 sec.28, T.5 N., R.37 E., Umatilla County, Hydrologic Unit 17070102, on right bank 2.8 mi downstream from Little Meadow Canyon, 8.9 mi southeast of Milton-Freewater, and at mile 5.6.

DRAINAGE AREA.--34.4 mi^2.

PERIOD OF RECORD.--October 1969 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 1,940 ft, from topographic map.

REMARKS.--Estimated daily discharges: Jan. 17, 18. Records good. No regulation; one diversion upstream from station.

AVERAGE DISCHARGE.--18 years, 52.9 ft^3/s, 20.88 in/yr, 38,330 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,240 ft^3/s Feb. 23, 1986, gage height, 7.02 ft; minimum discharge, 3.3 ft^3/s Aug. 26-28, 1986.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 300 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Mar. 13	2100	*204	*4.48				

Minimum discharge, 4.8 ft^3/s Sept. 19-23.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	15	12	73	16	67	29	45	87	17	6.5	5.6	5.5
2	13	11	57	17	85	30	52	68	14	7.0	5.5	5.6
3	12	11	48	19	70	43	63	57	13	6.8	5.4	5.7
4	11	10	43	21	56	87	74	50	12	6.5	5.4	5.7
5	11	11	41	21	47	140	81	46	11	6.5	5.4	5.6
6	10	16	37	21	42	177	88	43	10	6.4	5.4	5.3
7	10	19	34	19	42	146	91	40	10	6.2	5.4	5.3
8	10	18	32	16	44	120	96	38	11	6.2	5.3	5.3
9	9.9	18	30	15	45	111	86	35	10	6.3	5.5	5.3
10	9.7	15	27	15	45	103	95	33	9.4	8.5	5.5	5.3
11	9.7	15	26	14	47	100	117	29	9.0	8.1	5.5	5.3
12	9.7	15	24	14	47	104	98	31	8.6	6.7	5.6	5.3
13	9.7	16	24	13	57	177	85	28	8.2	6.3	5.9	5.4
14	9.6	20	23	13	93	194	81	24	8.0	6.0	6.7	5.3
15	9.4	26	22	13	98	175	83	22	9.6	5.9	6.2	5.1
16	9.4	29	22	11	92	148	88	21	9.8	6.0	6.0	5.2
17	9.4	65	21	11	100	138	96	19	8.8	6.7	5.8	5.2
18	9.4	57	20	11	91	136	90	18	8.9	6.9	5.9	5.1
19	9.4	69	20	11	72	126	71	16	9.3	6.7	5.8	5.1
20	9.4	67	18	11	57	116	60	16	8.7	6.2	5.8	5.1
21	9.4	107	17	11	50	110	56	16	8.7	6.0	5.7	5.0
22	9.4	98	17	11	47	100	58	15	8.2	6.8	5.7	5.0
23	9.4	114	17	11	43	89	63	14	7.9	7.2	5.8	5.0
24	9.4	121	17	12	40	76	64	14	7.6	6.4	5.7	5.1
25	9.4	111	16	13	36	67	62	14	7.3	6.6	5.9	5.1
26	9.4	85	17	27	34	61	58	14	7.0	6.5	6.0	5.6
27	11	82	17	49	32	54	58	16	6.9	6.0	5.7	5.5
28	11	127	16	65	31	50	63	14	6.8	5.8	5.7	5.4
29	10	144	16	53	---	46	75	13	6.6	5.7	5.6	5.3
30	12	100	15	44	---	43	85	15	6.5	5.8	5.6	5.3
31	12	---	15	43	---	43	---	24	---	5.6	5.5	---
TOTAL	319.1	1609	822	641	1610	3139	2282	890	279.8	200.8	176.5	159.0
MEAN	10.3	53.6	26.5	20.7	57.5	101	76.1	28.7	9.33	6.48	5.69	5.30
MAX	15	144	73	65	100	194	117	87	17	8.5	6.7	5.7
MIN	9.4	10	15	11	31	29	45	13	6.5	5.6	5.3	5.0
AC-FT	633	3190	1630	1270	3190	6230	4530	1770	555	398	350	315
CFSM	.30	1.56	.77	.60	1.67	2.94	2.21	.83	.27	.19	.17	.15
IN.	.35	1.74	.89	.69	1.74	3.39	2.47	.96	.30	.22	.19	.17

CAL YR 1986 TOTAL 18597.7 MEAN 51.0 MAX 872 MIN 3.4 AC-FT 36890 CFSM 1.48 IN. 20.11
WTR YR 1987 TOTAL 12128.2 MEAN 33.2 MAX 194 MIN 5.0 AC-FT 24060 CFSM .97 IN. 13.12

14020000 UMATILLA RIVER ABOVE MEACHAM CREEK, NEAR GIBBON, OR

LOCATION.--Lat 45°43'11", long 118°19'20", in SE 1/4 SW 1/4 sec.21, T.3 N., R.36 E., Umatilla County, Hydrologic Unit 17070103, Umatilla Indian Reservation, on right bank 0.8 mi downstream from Ryan Creek, 2.2 mi upstream from Meacham Creek, 2.5 mi northeast of Gibbon, and at mile 83.1.

DRAINAGE AREA.--131 mi^2.

PERIOD OF RECORD.--April 1933 to current year.

REVISED RECORDS.--WSP 1935: 1946-48(M), 1950(M), 1953(M), 1956-59(M), drainage area.

GAGE.--Water-stage recorder. Datum of gage is 1,854.81 ft above National Geodetic Vertical Datum of 1929. Prior to June 27, 1939, at site 1 mi downstream at datum 43.94 ft lower.

REMARKS.--Estimated daily discharges: Jan. 16-18, 20-23. Records good. No regulation or diversion upstream from station.

AVERAGE DISCHARGE.--54 years, 227 ft^3/s, 23.53 in/yr, 164,500 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 5,930 ft^3/s Jan. 25, 1975, gage height, 9.18 ft, from rating curve extended above 3,500 ft^3/s; maximum gage height, 9.50 ft Jan. 29, 1965; minimum discharge, 16 ft^3/s Nov. 9, 1965, momentary regulation from unknown source.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 1,400 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Mar. 6	0400	*964	*4.62				

Minimum discharge, 39 ft^3/s several days in August and September.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	60	48	282	77	541	140	197	542	102	50	43	40
2	54	45	229	78	541	150	245	454	88	52	43	40
3	51	44	196	86	405	221	315	386	81	52	43	40
4	49	44	175	96	323	500	376	337	77	50	42	41
5	48	53	172	91	264	776	386	302	74	50	42	40
6	47	94	162	87	245	876	393	273	71	49	42	40
7	47	95	156	81	256	643	412	249	70	48	42	40
8	46	90	153	74	266	507	432	225	77	48	42	40
9	45	87	145	71	263	459	368	202	72	48	41	40
10	45	75	136	70	248	425	377	180	67	54	41	40
11	45	72	129	68	266	397	456	162	65	54	42	40
12	45	88	120	66	264	455	370	155	63	50	42	40
13	45	98	115	64	337	704	321	144	61	48	43	40
14	44	129	110	68	530	661	319	131	60	47	44	40
15	44	147	103	64	502	576	356	125	67	46	44	40
16	44	150	99	62	419	512	387	116	71	46	43	40
17	44	371	93	60	387	493	425	108	66	49	42	40
18	44	327	90	58	362	554	393	102	63	51	42	40
19	43	405	89	58	308	536	321	97	63	51	41	40
20	43	333	85	60	257	485	276	94	60	48	41	40
21	43	468	81	54	227	442	268	91	61	47	41	40
22	43	473	78	52	212	389	297	87	59	53	41	40
23	42	469	78	56	197	339	335	84	57	52	41	40
24	42	482	78	57	181	294	347	86	55	48	41	40
25	42	422	77	61	167	262	339	86	54	52	41	40
26	42	315	79	100	154	247	320	84	53	50	41	42
27	47	298	78	236	147	227	342	94	52	47	40	42
28	44	454	76	344	142	210	372	84	52	46	40	42
29	45	504	75	264	---	194	422	79	51	45	40	41
30	55	375	74	225	---	185	532	84	51	45	40	41
31	50	---	72	260	---	182	---	108	---	44	40	---
TOTAL	1428	7055	3685	3148	8411	13041	10699	5351	1963	1520	1291	1209
MEAN	46.1	235	119	102	300	421	357	173	65.4	49.0	41.6	40.3
MAX	60	504	282	344	541	876	532	542	102	54	44	42
MIN	42	44	72	52	142	140	197	79	51	44	40	40
AC-FT	2830	13990	7310	6240	16680	25870	21220	10610	3890	3010	2560	2400
CFSM	.35	1.80	.91	.78	2.29	3.21	2.72	1.32	.50	.37	.32	.31
IN.	.41	2.00	1.05	.89	2.39	3.70	3.04	1.52	.56	.43	.37	.34

CAL YR 1986 TOTAL 78533 MEAN 215 MAX 3490 MIN 41 AC-FT 155800 CFSM 1.64 IN. 22.30
WTR YR 1987 TOTAL 58801 MEAN 161 MAX 876 MIN 40 AC-FT 116600 CFSM 1.23 IN. 16.70

14020300 MEACHAM CREEK AT GIBBON, OR

LOCATION.--Lat 45°41'20", long 118°21'20", in SE 1/4 SE 1/4 sec.31, T.3. N., R.36 E., Umatilla County, Hydrologic Unit 17070103, on left bank 250 ft downstream from Union Pacific railroad bridge, 0.9 mi southeast of Gibbon, and at mile 1.4.

DRAINAGE AREA.--176 mi^2.

PERIOD OF RECORD.--August 1975 to current year.

GAGE.--Water-stage recorder. Datum of gage is 1,803.05 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--Estimated daily discharges: Oct. 1-4, Sept. 7-30. Records good except for estimated daily discharges, which are poor. No regulation or diversion upstream from station.

AVERAGE DISCHARGE.--12 years, 205 ft^3/s, 15.82 in/yr, 148,500 acre-ft.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 5,750 ft^3/s Feb. 20, 1982, gage height, 6.60 ft, from floodmark, from rating curve extended above 2,600 ft^3/s; minimum discharge, 6.6 ft^3/s Aug. 29, 1984.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of Jan. 25, 1975, reached a stage of 7.21 ft, from floodmark, discharge, about 8,200 ft^3/s.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 1,600 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Mar. 6	0430	*1,530	*4.58				

Minimum daily discharge, 8.7 ft^3/s Aug. 9.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	24	15	340	44	428	129	264	425	49	16	11	9.3
2	23	15	268	46	556	135	351	414	43	17	10	9.3
3	21	15	215	50	500	204	463	370	39	16	10	9.4
4	20	14	179	54	415	591	557	314	36	15	9.7	9.5
5	19	16	162	51	336	1210	549	272	34	15	9.5	9.5
6	18	22	148	49	308	1440	523	233	31	15	9.4	9.4
7	17	28	136	47	358	1100	510	197	30	15	9.0	9.2
8	15	30	128	43	384	847	518	165	33	15	8.8	9.2
9	16	32	119	38	385	718	443	141	31	15	8.7	9.1
10	15	32	107	35	370	666	400	122	28	16	9.1	9.2
11	15	32	98	35	447	639	436	107	26	15	9.5	9.3
12	14	32	90	35	473	722	381	98	25	14	9.6	9.2
13	15	33	86	34	556	1010	311	91	24	14	9.7	9.5
14	14	39	80	37	755	973	280	82	23	13	10	9.2
15	12	53	75	35	682	880	300	76	26	13	9.9	9.3
16	13	77	69	31	555	772	322	69	28	13	9.9	9.4
17	13	219	63	30	499	733	363	63	27	14	9.9	9.4
18	13	229	60	33	463	877	339	57	26	14	9.9	9.4
19	13	257	59	32	401	845	274	53	25	13	9.9	9.2
20	13	264	56	31	329	735	215	50	24	13	9.9	9.2
21	15	387	53	30	279	623	185	48	23	12	9.9	9.2
22	13	447	51	30	254	544	189	45	23	14	9.9	9.4
23	13	457	50	30	233	482	207	43	22	14	9.9	9.4
24	13	509	49	32	200	422	213	44	22	13	9.9	9.4
25	13	509	48	37	173	376	201	44	21	13	11	9.4
26	13	387	48	79	148	351	173	43	20	13	10	9.8
27	14	331	47	184	144	321	172	49	19	11	9.6	9.8
28	12	504	45	332	138	288	193	48	18	12	9.6	9.8
29	14	556	43	304	---	255	229	42	17	12	9.4	9.6
30	16	447	43	249	---	234	362	42	16	12	9.5	9.2
31	16	---	41	250	---	230	---	50	---	11	9.4	---
TOTAL	475	5988	3056	2347	10769	19352	9923	3897	809	428	301.5	281.2
MEAN	15.3	200	98.6	75.7	385	624	331	126	27.0	13.8	9.73	9.37
MAX	24	556	340	332	755	1440	557	425	49	17	11	9.8
MIN	12	14	41	30	138	129	172	42	16	11	8.7	9.1
AC-FT	942	11880	6060	4660	21360	38380	19680	7730	1600	849	598	558
CFSM	.09	1.13	.56	.43	2.19	3.55	1.88	.71	.15	.08	.06	.05
IN.	.10	1.27	.65	.50	2.28	4.09	2.10	.82	.17	.09	.06	.06

CAL YR 1986 TOTAL 74847.4 MEAN 205 MAX 4220 MIN 7.5 AC-FT 148500 CFSM 1.17 IN. 15.82
WTR YR 1987 TOTAL 57626.7 MEAN 158 MAX 1440 MIN 8.7 AC-FT 114300 CFSM .90 IN. 12.18

14021000 UMATILLA RIVER AT PENDLETON, OR

LOCATION.--Lat 45°40'20", long 118°47'30", in NW 1/4 NE 1/4 sec.10, T.2 N., R.32 E., Umatilla County, Hydrologic Unit 17070103, on wingwall 0.3 mi downstream from Main Street bridge at Pendleton, 1.5 mi downstream from Wildhorse Creek, 2.8 mi upstream from McKay Creek, and at mile 55.2.

DRAINAGE AREA.--637 mi^2.

PERIOD OF RECORD.--February 1891 to July 1892, May 1903 to June 1905 (gage heights and discharge measurements only June to December 1904), October 1934 to current year. Monthly discharge only February 1891 to July 1892, published in WSP 1318.

REVISED RECORDS.--WSP 1398: 1904, 1937.

GAGE.--Water-stage recorder. Datum of gage is 1,054.3 ft above National Geodetic Vertical Datum of 1929 (levels by Oregon Department of Transportation). Apr. 24 to Aug. 26, 1959, nonrecording gage and Aug. 27, 1959, to Feb. 4, 1965, water-stage recorder at 8th Street Bridge 0.7 mi upstream at datum of 1,067.01 ft above National Geodetic Vertical Datum of 1929. Feb. 5 to Nov. 18, 1965, nonrecording gage at Main Street Bridge 1,600 ft upstream at different datum. Nov. 19, 1965, to Sept. 30, 1969, water-stage recorder at 8th Street Bridge 0.7 mi upstream at datum of 1,067.60 ft above National Geodetic Vertical Datum of 1929 Nov. 19, 1965, to Mar. 28, 1967, and at datum of 1,064.02 ft above National Geodetic Vertical Datum of 1929 Mar. 29, 1967, to Sept. 30, 1969. See WSP 1738 for history of changes prior to Apr. 24, 1959.

REMARKS.--Estimated daily discharges: Jan. 16-27, Mar. 13-23. Records good except those for discharges between 360 and 3,800 ft^3/s, and estimated daily discharges, which are fair. No regulation. Many diversions for irrigation upstream from station.

AVERAGE DISCHARGE.--53 years (water years 1935-87), 505 ft^3/s, 365,900 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 16,200 ft^3/s Feb. 23, 1986, gage height, 10.16 ft, datum then in use; minimum discharge, 10 ft^3/s July 13-16, 1940.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum discharge, 17,000 ft^3/s Dec. 14, 1882 (date and discharge from data furnished by Corps of Engineers). Flood of May 30, 31, 1906, reached a stage of 11.0 ft, 1934-58 site and datum, but before channel was improved, discharge, 15,500 ft^3/s, estimated by Corps of Engineers.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 3,500 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Mar. 6	0930	*a2,390	*a5.78				

Minimum discharge, 31 ft^3/s Aug. 10-12.

a Maximum recorded.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	94	65	870	196	1310	447	566	1110	148	58	42	35
2	84	64	817	224	1450	440	656	953	144	56	42	35
3	76	63	613	234	1110	538	851	875	130	58	41	35
4	72	62	507	265	952	942	1050	747	121	57	39	37
5	68	83	494	260	859	1700	1090	665	113	56	39	36
6	66	102	467	254	801	2210	1060	600	107	55	39	34
7	62	105	441	245	782	1750	1050	514	102	54	37	33
8	59	106	429	230	781	1360	1080	425	103	56	33	32
9	58	103	393	210	781	1180	1010	341	106	56	33	33
10	57	103	342	195	781	1080	958	288	102	57	31	33
11	56	106	318	190	781	1040	1080	254	100	63	31	33
12	56	110	308	184	781	1030	973	238	96	61	31	33
13	56	124	307	182	819	1600	819	235	91	54	36	35
14	55	143	302	182	1200	1800	727	225	88	46	41	36
15	55	175	291	175	1220	1700	768	217	91	44	43	36
16	54	209	280	150	1130	1600	812	204	96	43	40	39
17	55	566	264	140	1050	1500	878	188	97	46	41	41
18	54	746	252	140	1010	1600	880	172	97	57	41	41
19	55	888	244	140	920	1500	767	162	95	61	38	41
20	56	746	235	140	843	1400	655	155	88	60	36	41
21	56	926	225	140	771	1300	574	152	89	52	37	41
22	56	1020	218	130	701	1200	582	144	87	48	37	41
23	54	984	212	130	681	1100	587	135	83	57	37	39
24	53	984	206	140	608	1060	621	131	80	59	37	40
25	53	984	206	150	557	943	633	131	72	54	37	42
26	53	852	200	180	510	853	605	131	69	53	40	42
27	58	781	200	450	485	795	594	134	66	49	40	42
28	57	984	200	1070	471	756	653	147	65	45	38	43
29	61	1260	192	914	---	698	758	137	62	42	36	43
30	66	1020	188	828	---	632	907	128	60	42	35	43
31	65	---	183	823	---	584	---	140	---	42	35	---
TOTAL	1880	14464	10404	8891	24145	36338	24244	10078	2848	1641	1163	1135
MEAN	60.6	482	336	287	862	1172	808	325	94.9	52.9	37.5	37.8
MAX	94	1260	870	1070	1450	2210	1090	1110	148	63	43	43
MIN	53	62	183	130	471	440	566	128	60	42	31	32
AC-FT	3730	28690	20640	17640	47890	72080	48090	19990	5650	3250	2310	2250

CAL YR 1986 TOTAL 185477 MEAN 508 MAX 11500 MIN 27 AC-FT 367900
WTR YR 1987 TOTAL 137231 MEAN 376 MAX 2210 MIN 31 AC-FT 272200

14022200 NORTH FORK MCKAY CREEK NEAR PILOT ROCK, OR

LOCATION.--Lat 45°30'24", long 118°36'57", in NE 1/4 SE 1/4 sec.1, T.1 S., R.33 E., Umatilla County, Hydrologic Unit 17070103, Umatilla Indian Reservation, on left bank 10 mi northeast of Pilot Rock and at mile 0.5.

DRAINAGE AREA.--48.6 mi^2.

PERIOD OF RECORD.--May 1973 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 1,870 ft, from topographic map.

REMARKS.--Estimated daily discharges: Jan. 16-18, 20-23. Records good except for flows above 300 ft^3/s, estimated daily discharges, and those for the period June 5 to Sept. 30, which are fair. No regulation or diversion upstream from station.

AVERAGE DISCHARGE.--14 years, 44.8 ft^3/s, 32,460 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,980 ft^3/s Jan. 25, 1975, gage height, 8.48 ft, from floodmark, from rating curve extended above 150 ft^3/s on basis of slope-area measurement of peak flow; minimum discharge, 0.22 ft^3/s June 26, 1985 (result of temporary construction upstream).

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 290 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Nov. 17	0430	*399	*3.34	Mar. 17	2000	354	3.15
Feb. 1	1330	335	3.08				

Minimum discharge, 0.44 ft^3/s Aug. 10, 11.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3.7	2.9	86	16	280	39	37	13	4.0	1.3	.88	.64
2	3.3	2.8	68	20	215	42	36	13	3.9	1.5	.91	.66
3	2.9	2.7	56	26	161	63	36	11	3.6	1.4	.88	.71
4	2.6	2.5	47	28	122	88	35	9.5	3.4	1.3	.85	.74
5	2.4	2.6	46	25	100	107	32	8.3	3.2	1.3	.81	.75
6	2.3	3.5	41	23	96	119	30	7.6	3.0	1.2	.79	.75
7	2.2	9.7	39	21	98	103	28	6.9	2.9	1.2	.72	.77
8	2.1	13	38	18	94	89	27	6.5	3.0	1.1	.66	.75
9	2.0	17	35	15	86	79	24	6.0	3.0	1.2	.59	.74
10	2.0	15	31	14	80	72	24	5.5	2.8	1.4	.54	.75
11	2.0	17	27	13	85	67	31	4.9	2.6	1.3	.54	.74
12	1.9	25	24	12	80	88	27	5.1	2.5	1.2	.57	.76
13	1.9	24	24	11	105	135	24	4.8	2.4	1.1	.92	.80
14	1.9	35	23	11	142	160	22	4.4	2.3	1.1	1.1	.79
15	1.9	38	23	9.6	134	284	21	4.0	2.4	.98	.99	.80
16	1.9	58	23	7.5	132	256	19	3.8	2.4	.95	.89	.84
17	1.9	233	21	6.5	157	262	18	3.6	2.4	1.2	.80	.84
18	1.9	118	19	7.4	146	307	17	3.3	2.4	1.3	.73	.78
19	1.9	98	18	8.4	119	250	15	3.2	2.2	1.2	.68	.74
20	1.8	81	16	8.6	97	201	13	3.1	2.1	1.2	.63	.72
21	1.8	93	15	7.4	82	163	12	3.1	2.1	1.1	.60	.70
22	1.7	100	15	7.0	73	131	11	2.9	2.0	1.3	.56	.68
23	1.7	122	15	6.7	67	109	11	3.2	1.9	1.4	.63	.69
24	1.7	110	15	7.8	60	90	9.4	4.0	1.8	1.3	.67	.73
25	1.7	96	14	11	53	79	8.6	4.0	1.7	1.2	.62	.79
26	1.7	73	16	49	46	71	8.0	4.0	1.5	1.1	.59	.97
27	2.0	78	16	114	43	62	7.3	4.0	1.4	1.0	.60	.97
28	1.9	117	16	134	40	54	6.9	4.0	1.4	.94	.60	.91
29	2.0	148	15	97	---	48	6.9	3.9	1.3	.89	.60	.91
30	2.6	114	15	80	---	43	9.3	3.8	1.2	.86	.62	.97
31	2.6	---	14	108	---	39	---	3.9	---	.85	.64	---
TOTAL	65.9	1849.7	871	922.9	2993	3700	606.4	168.3	72.8	36.37	22.21	23.39
MEAN	2.13	61.7	28.1	29.8	107	119	20.2	5.43	2.43	1.17	.72	.78
MAX	3.7	233	86	134	280	307	37	13	4.0	1.5	1.1	.97
MIN	1.7	2.5	14	6.5	40	39	6.9	2.9	1.2	.85	.54	.64
AC-FT	131	3670	1730	1830	5940	7340	1200	334	144	72	44	46

CAL YR 1986 TOTAL 16508.04 MEAN 45.2 MAX 1070 MIN .92 AC-FT 32740
WTR YR 1987 TOTAL 11331.97 MEAN 31.0 MAX 307 MIN .54 AC-FT 22480

14022500 MCKAY CREEK NEAR PILOT ROCK, OR

LOCATION.--Lat 45°32'57", long 118°46'24", in NW 1/4 SE 1/4 sec.23, T.1 N., R.32 E., Umatilla County, Hydrologic Unit 17070103, on left bank 500 ft upstream from county road bridge, 5.5 mi northeast of Pilot Rock, and at mile 8.2.

DRAINAGE AREA.--180 mi^2.

PERIOD OF RECORD.--May to August 1921, October 1926 to June 1928, December 1928 to July 1929, October 1929 to current year. Monthly discharge only for some periods, published in WSP 1318.

REVISED RECORDS.--WSP 1398: 1928-29, 1933, 1940.

GAGE.--Water-stage recorder. Datum of gage is 1,343.60 ft above National Geodetic Vertical Datum of 1929. See WSP 1318 or 1738 for history of changes prior to Apr. 9, 1941. Apr. 9, 1941, to July 24, 1963, at site 1,000 ft downstream at datum 7.92 ft lower.

REMARKS.--Estimated daily discharges: Jan. 15-23. Records good except for estimated daily discharges, which are fair. No regulation. Many small diversions for irrigation upstream from station.

AVERAGE DISCHARGE.--59 years (water years 1927, 1930-87), 103 ft^3/s, 74,620 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 7,400 ft^3/s Jan. 30, 1965, gage height, 8.40 ft; no flow at times.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 840 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Mar. 18	0100	*804	*4.57				

Minimum discharge, 0.48 ft^3/s several days in August and September.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	4.1	2.5	262	40	500	124	116	56	17	2.1	1.0	.57
2	4.1	2.7	218	55	490	124	125	57	16	2.3	1.0	.58
3	3.8	2.3	186	76	397	152	143	51	14	2.5	.96	.59
4	3.4	7.6	161	93	323	251	163	46	13	2.2	.91	.55
5	3.0	14	146	86	267	328	167	41	12	2.4	.91	.53
6	2.8	14	134	77	240	386	158	38	11	2.5	.87	.51
7	2.6	18	123	69	235	350	153	34	11	2.0	.85	.50
8	2.3	30	117	60	226	294	148	28	12	2.1	.81	.50
9	2.3	36	110	48	214	259	121	13	13	2.2	.78	.50
10	2.3	37	98	43	197	237	112	15	11	2.6	.73	.50
11	2.1	35	88	40	205	225	132	15	11	2.6	.74	.50
12	2.1	51	79	37	203	242	120	19	9.2	2.5	.71	.51
13	2.1	58	75	35	225	331	104	21	5.0	1.2	.79	.54
14	2.0	68	72	34	296	355	95	20	4.7	.89	.83	.54
15	2.0	104	70	34	291	639	93	19	5.3	.76	.76	.52
16	2.0	131	68	33	287	678	99	18	5.8	.80	.75	.48
17	2.0	460	62	30	334	624	101	15	7.0	.90	.80	.48
18	2.0	292	57	30	351	749	95	14	8.3	.81	.81	.51
19	2.0	265	54	30	308	634	84	14	8.0	.87	.79	.50
20	2.1	214	49	30	263	515	73	15	6.9	1.0	.77	.55
21	2.4	242	46	30	229	423	66	17	7.2	1.1	.79	.59
22	2.6	223	44	28	205	348	61	16	7.1	1.1	.77	.60
23	2.8	245	42	30	196	295	56	15	6.4	1.3	.76	.60
24	2.9	251	41	31	176	251	52	15	5.4	1.2	.76	.63
25	2.8	248	41	33	160	219	47	17	5.4	1.2	.74	.64
26	2.9	204	40	103	142	195	41	17	4.9	1.2	.72	.66
27	3.2	192	42	290	138	174	37	18	4.3	1.2	.69	.72
28	3.1	273	41	360	130	156	35	19	3.7	1.2	.65	.76
29	3.3	382	40	292	---	138	33	16	2.8	1.1	.56	.81
30	3.1	327	39	246	---	126	38	15	2.5	1.1	.55	.84
31	2.7	---	36	254	---	117	---	17	---	1.1	.54	---
TOTAL	82.9	4429.1	2681	2677	7228	9939	2868	731	250.9	48.03	24.10	17.31
MEAN	2.67	148	86.5	86.4	258	321	95.6	23.6	8.36	1.55	.78	.58
MAX	4.1	460	262	360	500	749	167	57	17	2.6	1.0	.84
MIN	2.0	2.3	36	28	130	117	33	13	2.5	.76	.54	.48
AC-FT	164	8790	5320	5310	14340	19710	5690	1450	498	95	48	34

CAL YR 1986 TOTAL 43364.48 MEAN 119 MAX 3880 MIN .88 AC-FT 86010
WTR YR 1987 TOTAL 30976.34 MEAN 84.9 MAX 749 MIN .48 AC-FT 61440

14023000 MCKAY RESERVOIR NEAR PENDLETON, OR

LOCATION.--Lat 45°36'28", long 118°47'30", in SE 1/4 sec.34, T.2 N., R.32 E., Umatilla County, Hydrologic Unit 17070103, on Bureau of Reclamation land, near right end of McKay Dam on McKay Creek, 4.0 mi south of Pendleton, and at mile 4.9.

DRAINAGE AREA.--186 mi^2.

PERIOD OF RECORD.--December 1927 to current year. Prior to Oct. 1, 1982, monthend contents and change in contents only.

REVISED RECORDS.--WSP 1154: Drainage area. WDR OR-79-1: 1978.

GAGE.--Water-stage recorder. Datum of gage is 0.16 ft above National Geodetic Vertical Datum of 1929. Prior to Nov. 6, 1973, nonrecording gage at same site and datum.

REMARKS.--Reservoir is formed by gravel-fill dam with concrete facing, completed in 1926; storage began in 1927. Usable capacity, 73,830 acre-ft, between gage heights 1,182.0 ft, floor of trashrack structure, and 1,322.0 ft top of spillway gates. Dead storage, about 6 acre-ft included in records. Water is used for irrigation of land along McKay Creek and Umatilla River.

COOPERATION.--Capacity tables furnished by Bureau of Reclamation.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents observed, 73,840 acre-ft June 9, 1950, gage height, 1,322.0 ft; no usable contents Sept. 7, 1966.

EXTREMES FOR CURRENT YEAR.--Maximum contents, 69,880 acre-ft May 2, gage height, 1,318.82 ft; minimum contents, 5,950 acre-ft Sept. 30, gage height, 1,226.80 ft.

Capacity table (gage height, in feet, and contents, in acre-feet)

1,182	6	1,210	1,610	1,260	20,880
1,185	24	1,220	3,720	1,280	33,540
1,190	117	1,230	7,120	1,300	49,840
1,200	565	1,240	11,060	1,322	73,840

GAGE HEIGHT, FEET, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
OBSERVATION AT 24:00 VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	1237.37	1257.92	1266.43	1276.30	1294.23	1315.01	1318.75	1311.00	1293.88	1268.39	1235.34
2	---	1237.37	1258.70	1266.62	1277.80	1294.51	1315.21	1318.78	1310.72	1293.10	1267.38	1234.81
3	---	1237.36	1259.34	1266.87	1278.95	1294.88	1315.43	1318.81	1310.36	1292.32	1266.34	1234.24
4	---	1237.43	1259.92	1267.15	1279.35	1295.44	1315.71	1318.79	1309.97	1291.54	1265.33	---
5	---	1237.48	1260.42	1267.42	1280.55	1296.19	1315.98	1318.76	1309.55	1290.70	1264.22	---
6	---	1237.59	1260.87	1267.68	1281.21	1297.08	1316.23	1318.62	1309.12	1289.94	1263.13	1232.61
7	1236.78	1237.67	1261.29	1267.90	1281.85	1297.86	1316.49	1318.31	1308.72	1289.13	1262.06	---
8	1236.84	1237.81	1261.68	1268.10	1282.48	1298.50	1316.67	1318.00	1308.26	1288.33	1260.90	1231.55
9	1236.86	1237.98	1262.05	1268.28	1283.06	1299.06	1316.88	1317.70	1307.76	1287.56	1259.79	1230.96
10	1236.83	1238.17	1262.36	1268.42	1283.58	1299.55	1317.07	1317.36	1307.25	1286.75	1258.68	1230.27
11	1236.86	1238.34	1262.65	1268.58	1284.13	1300.00	1317.25	1316.98	1306.73	1285.92	1257.52	1229.62
12	1236.87	1238.56	1262.92	1268.71	1284.66	1300.58	1317.40	1316.68	1306.14	1285.13	1256.25	1229.02
13	1236.89	1238.82	1263.20	1268.84	1285.27	1301.30	1317.68	1316.26	1305.55	1284.34	1254.94	1228.41
14	1236.91	1239.14	1263.44	1268.95	1286.05	1302.12	1317.82	1315.91	1304.99	1283.53	1253.53	1227.81
15	1236.91	1239.59	1263.68	1269.04	1286.81	1303.60	1317.96	1315.56	1304.40	1282.64	1252.22	1227.15
16	1236.94	1240.12	1263.89	1269.10	1287.57	1305.13	1318.12	1315.31	1303.85	1281.83	1250.89	1226.97
17	1236.89	1242.29	1264.10	1269.20	1288.43	1306.52	1318.22	1315.10	1303.32	1281.00	1249.61	1226.95
18	1236.95	1243.76	1264.31	1269.32	1289.37	1308.11	1318.27	1314.87	1302.71	1280.17	1248.37	1226.95
19	1236.95	1245.05	1264.49	1269.41	1290.12	1309.42	1318.38	1314.61	1302.03	---	1247.13	1226.95
20	1237.00	1246.03	1264.66	1269.50	1290.74	1310.44	1318.48	1314.35	1301.39	---	1245.83	1226.95
21	1237.04	1247.12	1264.82	1269.58	1291.30	1311.23	1318.57	1314.12	1300.74	1277.81	1244.47	1226.94
22	1237.05	1248.13	1264.97	1269.65	1291.78	1311.89	1318.65	1313.88	1300.12	1276.98	---	1226.92
23	1237.03	1249.22	1265.12	1269.75	1292.24	1312.42	1318.68	1313.56	1299.53	1276.21	1241.59	1226.92
24	1237.09	1250.33	1265.26	1269.85	1292.65	1312.79	1318.73	1313.22	1298.91	1275.42	1240.05	1226.92
25	1237.13	1251.41	1265.42	1269.96	1293.01	1313.19	1318.75	1312.90	1298.26	1274.66	---	1226.90
26	1237.15	1252.28	1265.55	1270.31	1293.32	1313.52	1318.76	1312.60	1297.61	1273.86	---	1226.87
27	1237.20	1253.10	1265.70	1271.22	1293.65	1313.71	1318.76	1312.34	1296.90	1273.06	1236.86	1226.84
28	1237.18	1254.21	1265.85	1272.37	1293.93	1314.16	1318.71	1312.11	1296.13	1272.22	1236.62	1226.82
29	1237.25	1255.69	1265.98	1273.25	---	1314.40	1318.67	1311.86	1295.39	1271.32	1236.37	1226.81
30	1237.28	1256.95	1266.11	1273.97	---	1314.62	1318.58	1311.57	1294.61	1270.38	1236.19	1226.80
31	1237.31	---	1266.26	1274.77	---	1314.82	---	1311.27	---	1269.37	1235.85	---
MAX	---	1256.95	1266.26	1274.77	1293.93	1314.82	1318.76	1318.81	1311.00	---	---	---
MIN	---	1237.36	1257.92	1266.43	1276.30	1294.23	1315.01	1311.27	1294.61	---	---	---
(†)	9940	19190	24530	29950	44410	65190	69600	61250	44990	26440	9360	5950
(‡)	+200	+9250	+5340	+5420	+14460	+20780	+4410	-8350	-16260	-18550	-17080	-3410

CAL YR 1986 AC-FT‡ +5630
WTR YR 1987 AC-FT‡ -3790

† Contents, in acre-feet, at 2400, on last day of month.
‡ Change in contents, in acre-feet.

14023500 MCKAY CREEK NEAR PENDLETON, OR

LOCATION.--Lat 45°36'34", long 118°47'55", in SE 1/4 NW 1/4 sec.34, T.2 N., R.32 E., Umatilla County, Hydrologic Unit 17070103, on right bank 35 ft upstream from diversion dam, 0.2 mi downstream from McKay Dam, 4.5 mi south of Pendleton, and at mile 4.7.

DRAINAGE AREA.--186 mi^2.

PERIOD OF RECORD.--November 1918 to May 1919, October 1919 to September 1923, October 1924 to September 1927, November 1927 to September 1943, April 1944 to October 1947 (irrigation seasons only), March 1948 to current year. Monthly discharge only for some periods, published in WSP 1318.

REVISED RECORDS.--WSP 1154: Drainage area. WSP 1398: 1923.

GAGE.--Water-stage recorder. Concrete control since Mar. 23, 1928. Datum of gage is above 1,163.71 ft above National Geodetic Vertical Datum of 1929 (Bureau of Reclamation bench mark). See WSP 1318 or 1738 for history of changes prior to Nov. 16, 1948.

REMARKS.--Estimated daily discharges: Oct. 2, 4-8, 10-13, 15-31; Nov. 1-12, 17, 18; Jan. 3-5, 8, 9, 11-15, 18-31; Feb. 1-4; Sept. 16-30. Records good except those for Oct. 1 to Mar. 2, Sept. 16-30, which are poor. Flow completely regulated since 1927 by McKay Reservoir (station 14023000). Many diversions for irrigation upstream from station. From 1932 to 1970, records excluded flow in Elder ditch, which diverts water between the gage and the control. Since 1971, records include flow in Elder ditch. During the irrigation season, from 1953 to 1982, Elder ditch diverted a maximum of 1.5 ft^3/s; since 1982, diversion has been less than 1.0 ft^3/s.

AVERAGE DISCHARGE.--50 years (water years 1933-43, 1949-87), 98.5 ft^3/s, 71,360 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge observed, 3,250 ft^3/s Feb. 10, 1921, gage height, 4.4 ft, site and datum then in use, from rating curve extended above 1,200 ft^3/s; no flow at times each year.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 355 ft^3/s June 28-30, July 1, 2; maximum gage height, 1.50 ft Aug. 13; no flow many times during fall and winter months.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.70	.00	.66	.21	.10	.68	6.1	33	182	344	312	95
2	.60	.00	.83	.16	.20	.95	5.3	41	183	339	309	98
3	.29	.00	1.7	.30	.20	.60	5.3	42	210	332	308	100
4	.10	.00	.26	.20	.20	.46	4.2	43	250	331	314	100
5	.00	.00	.33	.10	.10	.50	4.1	45	250	331	326	98
6	.00	.00	.37	.07	.17	.35	4.1	140	249	330	317	98
7	.20	.00	.40	.10	.20	.48	4.4	217	249	329	314	98
8	.05	.00	.40	.30	.29	.83	4.7	211	263	329	313	101
9	.18	.00	.40	.10	.30	.91	4.5	211	274	327	300	105
10	.30	.00	.40	.01	.30	.97	4.5	210	272	327	292	105
11	.05	.00	.40	.20	.30	.80	4.5	210	287	328	311	105
12	.05	.00	.40	.10	.30	.86	4.8	213	308	313	326	104
13	.05	.00	.43	.10	.32	.78	5.4	220	307	315	331	104
14	.17	.12	.40	.20	.31	1.1	5.2	228	306	315	336	103
15	.20	.10	.40	.20	.31	1.2	4.5	230	306	311	318	103
16	.00	.17	.40	.0	.31	1.5	4.9	176	292	310	308	11
17	.00	.20	.46	.0	.38	1.7	34	123	282	311	297	.00
18	.00	.20	.59	.20	.42	1.7	39	133	314	310	288	.00
19	.00	.15	.59	.10	.59	2.2	20	148	333	299	284	.00
20	.00	.29	.59	.10	.44	2.9	15	164	332	290	281	.00
21	.00	.34	.59	.10	.56	3.4	15	164	328	283	291	.00
22	.00	.38	.31	.10	.57	3.6	13	164	302	273	302	.00
23	.00	.40	.20	.10	.39	3.3	12	196	298	272	298	.00
24	.00	.41	.20	.10	.40	3.6	12	213	300	270	303	.00
25	.00	.50	.10	.20	.55	3.6	14	213	300	267	276	.00
26	.00	.65	.18	.20	.60	4.0	26	192	309	263	103	.05
27	.00	.47	.20	.10	.61	4.7	59	160	322	261	87	.05
28	.00	.59	.20	.10	.40	5.2	88	151	340	275	87	.05
29	.00	.58	.20	.10	---	5.3	70	163	352	287	87	.05
30	.00	.59	.20	.10	---	5.3	42	183	351	287	74	.05
31	.00	---	.20	.10	---	5.4	---	182	---	313	82	---
TOTAL	2.94	6.14	12.99	4.05	9.82	68.87	535.5	5019	8651	9472	8175	1528.25
MEAN	.095	.20	.42	.13	.35	2.22	17.8	162	288	306	264	50.9
MAX	.70	.65	1.7	.30	.61	5.4	88	230	352	344	336	105
MIN	.00	.00	.10	.00	.10	.35	4.1	33	182	261	74	.00
AC-FT	5.8	12	26	8.0	19	137	1060	9960	17160	18790	16220	3030

CAL YR 1986 TOTAL 40231.76 MEAN 110 MAX 602 MIN .00 AC-FT 79800
WTR YR 1987 TOTAL 33485.56 MEAN 91.7 MAX 352 MIN .00 AC-FT 66420

14026000 UMATILLA RIVER AT YOAKUM, OR

LOCATION.--Lat 45°40'38", long 119°02'09", in SW 1/4 SW 1/4 sec.2, T.2 N., R.30 E., Umatilla County, Hydrologic Unit 17070103, at left bank on downstream side of highway bridge, 0.5 mi northeast of Yoakum, 2.5 mi downstream from abandoned Furnish Reservoir, 12.0 mi downstream from Birch Creek, and at mile 37.7.

DRAINAGE AREA.--1,280 mi^2, approximately.

PERIOD OF RECORD.--May 1903 to current year. Records published as "above Furnish Reservoir, near Yoakum" October 1916 to September 1934 are equivalent.

REVISED RECORDS.--WSP 794: 1906(M). WSP 1398: 1904-6, 1908-9, 1922-23, 1926, 1936.

GAGE.--Water-stage recorder. Datum of gage is 768.21 ft above National Geodetic Vertical Datum of 1929. See WSP 1318 or 1738 for history of changes prior to Oct. 21, 1948.

REMARKS.--Estimated daily discharges: Oct. 9, 10; Jan. 15-27; Aug. 26-28; Sept. 18-26. Records good. Slight regulation by Furnish Reservoir, capacity 3,900 acre-ft, beginning in 1910 and continuing until 1934 when reservoir filled with silt. Flow regulated to some extent since 1927 by McKay Reservoir (station 14023000). Many diversions for irrigation upstream from station.

AVERAGE DISCHARGE.--84 years, 680 ft^3/s, 492,700 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 20,000 ft^3/s May 30, 1906, gage height, about 15.0 ft, site and datum then in use, from floodmarks, from rating curve extended about 6,600 ft^3/s; minimum discharge, 12 ft^3/s Aug. 10-12, 1908, Aug. 4, 1910.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 3,600 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Mar. 6	1330	*2,780	*4.85				

Minimum daily discharge, 46 ft^3/s Sept. 21-26.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	122	104	999	231	1360	520	610	1100	362	377	318	121
2	110	103	815	312	1680	516	681	1020	348	381	321	119
3	104	102	698	303	1450	623	872	870	335	376	321	124
4	100	100	608	336	1200	1050	1070	755	372	371	321	125
5	94	98	560	332	1010	1910	1130	681	364	366	326	125
6	89	104	535	308	881	2590	1100	665	354	364	329	122
7	87	147	503	208	870	2240	1090	723	348	360	330	120
8	85	165	482	268	904	1770	1120	664	352	358	330	119
9	82	165	461	235	902	1510	1070	614	366	357	323	128
10	81	163	428	231	862	1370	976	558	355	368	313	128
11	80	156	397	219	879	1290	1080	521	358	378	322	127
12	80	155	372	215	950	1300	1010	504	378	358	337	127
13	80	169	357	205	976	1810	864	505	373	347	347	129
14	81	193	351	207	1410	2050	784	487	371	342	362	130
15	81	231	340	200	1480	2190	791	468	382	335	352	129
16	80	284	325	190	1330	1890	828	430	384	335	332	109
17	82	580	308	170	1220	1740	933	343	366	340	328	55
18	81	785	292	160	1190	1950	959	327	381	348	321	52
19	83	824	283	160	1090	1960	811	318	403	345	320	50
20	84	778	271	160	959	1780	692	332	400	330	310	48
21	85	917	255	160	845	1570	618	331	404	327	316	46
22	85	1070	248	150	776	1380	598	319	391	310	325	46
23	86	1150	249	150	764	1220	627	327	367	313	324	46
24	86	1130	245	160	697	1090	656	350	368	316	324	46
25	84	1150	240	170	646	968	658	360	360	304	325	46
26	83	978	237	200	581	890	632	354	358	304	185	46
27	90	811	236	470	559	825	629	330	369	300	140	48
28	89	1030	230	1240	540	756	694	319	373	298	130	51
29	90	1420	223	1030	---	694	761	305	387	319	123	50
30	106	1270	215	829	---	648	837	321	388	310	118	50
31	105	---	211	855	---	615	---	345	---	319	105	---
TOTAL	2755	16332	11974	10064	28011	42715	25181	15546	11117	10556	8978	2662
MEAN	88.9	544	386	325	1000	1378	839	501	371	341	290	88.7
MAX	122	1420	999	1240	1680	2590	1130	1100	404	381	362	130
MIN	80	98	211	150	540	516	598	305	335	298	105	46
AC-FT	5460	32390	23750	19960	55560	84730	49950	30840	22050	20940	17810	5280

CAL YR 1986 TOTAL 264427.4 MEAN 724 MAX 10900 MIN 79 AC-FT 524500
WTR YR 1987 TOTAL 185891 MEAN 509 MAX 2590 MIN 46 AC-FT 368700

14032000 BUTTER CREEK NEAR PINE CITY, OR

LOCATION.--Lat 45°32'48", long 119°18'14", in SE 1/4 SW 1/4 sec.22, T.1 N., R.28 E., Morrow County, Hydrologic Unit 17070103, on right bank 0.3 mi downstream from Mattlock Canyon, 6.0 mi southeast of Pine City, 15 mi southwest of Echo, and at mile 28.4.

DRAINAGE AREA.--291 mi^2.

PERIOD OF RECORD.--April to June 1928, November 1928 to June 1929, October 1929 to September 1930, January 1931 to September 1932, February to June 1933, October 1933 to September 1941, January to June 1942, October 1942 to current year. Prior to October 1945, monthly discharge only, published in WSP 1318.

REVISED RECORDS.--WSP 1218: 1950(M).

GAGE.--Water-stage recorder. Elevation of gage is 1,400 ft, by barometer. Prior to Oct. 1, 1944, at datum 1.1 ft higher and Oct. 1, 1944, to Sept. 6, 1949, at datum 1.0 ft higher.

REMARKS.--Estimated daily discharges: Dec. 11, 12, 28-31, Jan. 10-23, Feb. 27, 28. Records good except for estimated daily discharges, which are fair. No regulation. Several small diversions for irrigation upstream from station. Water is diverted into headwaters of Butter Creek from Fivemile Creek, a tributary of Camas Creek in John Day River basin, for irrigation downstream from station.

AVERAGE DISCHARGE.--55 years (water years 1930, 1932, 1934-41, 1943-87), 28.6 ft^3/s, 20,720 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 3,800 ft^3/s Feb. 21, 1949, gage height, 12.4 ft, present datum, from floodmark, from rating curve extended above 440 ft^3/s on basis of computation of peak flow over dam; no flow at times.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 200 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Feb. 2	0230	212	3.03	Mar. 6	0400	*265	*3.26
Feb. 13	2030	220	3.07	Mar. 18	0630	255	3.22

Minimum discharge, 3.7 ft^3/s July 30, 31, Aug. 1.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	14	14	46	19	109	44	64	54	23	8.8	4.1	5.2
2	16	14	42	24	162	45	70	53	21	8.3	4.4	5.0
3	14	14	41	22	127	168	80	49	19	9.1	4.4	5.1
4	14	14	37	23	100	221	87	43	16	7.8	4.4	5.1
5	13	14	36	22	79	212	87	39	16	7.3	4.3	5.1
6	13	15	39	22	70	234	86	36	14	7.4	4.4	5.1
7	13	20	39	22	81	181	85	33	14	7.1	4.7	5.1
8	12	20	36	20	74	148	88	31	14	6.9	4.6	4.9
9	12	18	34	16	71	139	84	30	12	6.8	4.4	4.7
10	12	17	27	13	64	126	83	27	11	7.3	4.5	4.5
11	12	16	24	14	74	119	88	25	10	5.8	4.5	4.4
12	12	17	25	14	75	127	83	24	11	4.4	4.5	4.4
13	12	19	28	15	140	198	78	24	9.4	4.9	5.4	4.6
14	12	19	27	15	174	181	73	23	10	5.0	6.6	4.8
15	12	20	26	14	125	200	72	25	12	5.4	7.3	5.0
16	12	21	25	14	106	211	74	26	13	5.0	6.3	5.2
17	12	24	23	15	97	217	76	24	13	6.3	5.3	5.5
18	12	27	22	15	91	227	74	23	13	6.8	5.8	5.8
19	12	29	21	15	83	181	68	22	13	7.8	5.8	5.8
20	12	30	22	15	73	154	63	22	12	8.0	5.6	5.4
21	12	35	20	17	69	134	58	22	10	6.9	5.7	5.4
22	12	38	21	17	64	120	57	22	11	7.2	5.8	5.4
23	12	33	20	17	61	110	58	21	12	8.3	5.8	5.4
24	12	32	19	20	52	105	58	21	11	8.6	5.8	5.4
25	12	33	19	29	48	95	56	22	11	7.8	5.7	5.4
26	12	31	19	35	39	87	53	23	9.9	7.3	5.6	5.4
27	13	31	19	47	36	82	50	24	9.4	6.6	5.6	5.4
28	13	39	16	90	40	77	48	25	8.5	5.6	5.3	5.8
29	13	52	16	65	---	67	55	22	8.3	4.4	5.2	6.2
30	14	52	16	51	---	68	49	21	8.9	3.9	5.2	6.0
31	16	---	16	47	---	64	---	22	---	3.7	5.1	---
TOTAL	394	758	821	784	2384	4342	2105	878	376.4	206.5	162.1	156.5
MEAN	12.7	25.3	26.5	25.3	85.1	140	70.2	28.3	12.5	6.66	5.23	5.22
MAX	16	52	46	90	174	234	88	54	23	9.1	7.3	6.2
MIN	12	14	16	13	36	44	48	21	8.3	3.7	4.1	4.4
AC-FT	781	1500	1630	1560	4730	8610	4180	1740	747	410	322	310

CAL YR 1986 TOTAL 17516.8 MEAN 48.0 MAX 1110 MIN 5.4 AC-FT 34740
WTR YR 1987 TOTAL 13367.5 MEAN 36.6 MAX 234 MIN 3.7 AC-FT 26510

PRINCIPAL DIVERSIONS FROM UMATILLA RIVER BETWEEN YOAKUM AND UMATILLA GAGING STATIONS, OR

The following canals divert water from Umatilla River between Yoakum and Umatilla, in Umatilla County, Hydrologic Unit 17070103:

14027000 FURNISH CANAL NEAR ECHO diverts from right bank of Umatilla River in SW 1/4 SW 1/4 sec. 31, T.3 N., R.30 E., for irrigation in vicinity of Stanfield. Records available March 1921 to September 1987 (discontinued) (prior to October 1929 and March 1935 to September 1937 irrigation seasons only). Monthly figures only for irrigation seasons 1921-25, published in WSP 1318.

14029000 UMATILLA PROJECT FEED CANAL NEAR ECHO diverts from right bank of Umatilla River in SW 1/4 sec.22, T.3 N., R.29 E., and delivers water to Cold Springs Reservoir (Bureau of Reclamation), capacity, 52,380 acre-ft. Records available October 1920 to September 1987 (discontinued) (incomplete 1928, 1943-44).

14030000 ALLEN CANAL AT ECHO diverts from right bank of Western Land Canal, 0.5 mi downstream from headgate of that canal in SW 1/4 sec.16, T.3 N., R.29 E., for irrigation west of Echo. Records available May 1921 to September 1987 (discontinued) (irrigation seasons only in most years). Monthly figures only October to December 1923, published in WSP 1318. Published as Western Land & Irrigation Co.'s canal at Echo 1921-39.

14030500 WESTERN LAND CANAL NEAR ECHO diverts from left bank of Umatilla River in NE 1/4 sec.21, T.3 N., R.29 E., for irrigation west of Echo and Stanfield and during non-irrigation seasons since 1978, ground-water recharge near Ordnance. Gage is 1 mi downstream from intake. Records available May 1921 to September 1987 (discontinued) (irrigation seasons only in many years). Published as Western Land & Irrigation Co.'s canal at Echo 1921-39.

14031500 MAXWELL CANAL NEAR HERMISTON diverts from right bank of Umatilla River in SW 1/4 sec.28, T.4 N., R.28 E., for irrigation near Hermiston; at times it receives water from Cold Springs Reservoir. Records available March 1921 to September 1987 (discontinued) (irrigation seasons only in most years). REVISIONS (WATER YEARS).--WSP 1398: 1921.

14032500 WEST DIVISION MAIN CANAL NEAR UMATILLA diverts from left bank of Umatilla River in SW 1/4 sec.28, T.5 N., R.28 E., for irrigation near Irrigon and Boardman. Records of monthly figures April 1921 to September 1987 (discontinued) (incomplete October 1925 to March 1927). Published as "Main canal, west division Umatilla project" 1921, 1923. REVISIONS (WATER YEARS).--WSP 1398: 1923.

Water diverted by all of these canals is used for irrigation of lands on both sides of Umatilla River near and below Echo, except that diverted by West Division main canal which is applied to land along Columbia River in vicinity of Irrigon.

Several small canals also divert water between Yoakum and Umatilla, but no records for these were obtained.

DIVERSIONS, IN ACRE-FEET, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

MONTH	FURNISH CANAL	UMATILLA PROJECT FEED CANAL	ALLEN CANAL	WESTERN LAND CANAL	MAXWELL CANAL	WEST DIVISION MAIN CANAL	TOTAL
OCTOBER	8.3	0	307	3,050	0	732	4,100
NOVEMBER	0	0	243	2,840	0	0	3,080
DECEMBER	0	11,760	0	3,350	0	0	15,110
JANUARY	0	4,790	0	0	0	0	4,790
FEBRUARY	0	11,930	0	3,190	0	0	15,120
MARCH	14	13,370	60	5,390	0	524	19,360
APRIL	5,240	10,240	1,320	11,010	1,840	5,350	35,000
MAY	5,160	2,700	804	12,180	2,660	6,760	30,260
JUNE	6,870	0	732	12,130	2,180	5,800	27,730
JULY	7,020	0	736	11,670	2,350	6,590	28,370
AUGUST	6,210	0	807	10,200	2,030	5,680	24,930
SEPTEMBER	3,170	0	767	875	978	3,680	9,470
WTR YR 1987	33,690	54,780	5,780	75,880	12,040	35,110	217,300

NOTE.--No gage-height record for months of little or no flow and short periods at other times.

14033500 UMATILLA RIVER NEAR UMATILLA, OR

LOCATION.--Lat 45°54'11", long 119°19'33", in SW 1/4 NW 1/4 sec.21, T.5 N., R.28 E., Umatilla County, Hydrologic Unit 17070103, on left bank 1.6 mi downstream from West Division main canal of Umatilla project, 1.2 mi southeast of Umatilla, and at mile 2.1.

DRAINAGE AREA.--2,290 mi^2, approximately.

PERIOD OF RECORD.--October 1903 to current year.

REVISED RECORDS.--WSP 794: Drainage area. WSP 1398: 1909, 1911, 1914, 1928, 1935.

GAGE.--Water-stage recorder. Datum of gage is 330.47 ft above National Geodetic Vertical Datum of 1929. Oct. 21, 1903, to Jan. 25, 1931, nonrecording gage.

REMARKS.--Estimated daily discharges: Jan. 16-22. Records good except for estimated daily discharges, and those below 100 ft^3/s, which are poor. Some regulation since 1927 by McKay Reservoir (station 14023000). Many diversions upstream from station for irrigation of lands upstream and downstream from station; Brownell Canal diverts downstream from station. Diversions since 1908 to Cold Springs Reservoir, an off-channel reservoir, capacity, 52,380 acre-ft.

AVERAGE DISCHARGE.--60 years (water years 1928-87), 463 ft^3/s, 335,400 acre-ft/yr. Water years prior to 1928 not included in computation of average discharge owing to increased regulation and diversion since 1927.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 19,800 ft^3/s Jan. 30, 1965, gage height, 10.75 ft; no flow at times.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 3,100 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Mar. 6	2000	*3,140	*5.18	No other peak greater than base discharge.			

Minimum discharge, 0.40 ft^3/s several days in September.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	149	162	1150	117	1220	411	272	463	47	1.5	.76	.50
2	159	158	930	152	1880	399	345	670	42	2.8	.84	.46
3	145	158	752	237	1640	451	410	555	32	2.6	.77	.48
4	139	158	607	233	1380	868	626	422	23	2.4	.78	.53
5	134	162	545	248	1090	1720	719	285	9.4	13	.64	.52
6	122	159	521	230	904	2700	650	203	8.0	7.4	.63	.49
7	123	170	475	209	786	2650	564	132	9.2	1.9	.63	.45
8	114	214	435	190	822	1920	513	107	8.9	15	.92	.46
9	117	232	392	171	839	1550	522	211	7.8	8.4	.80	.45
10	117	230	365	189	814	1310	423	195	7.8	7.3	.68	.45
11	110	230	318	223	770	1180	410	130	7.7	37	.66	.47
12	109	225	285	242	855	1130	461	116	5.1	58	.76	.48
13	107	229	261	265	871	1490	334	143	4.2	26	.93	.51
14	112	251	242	206	1180	1940	241	160	3.8	5.6	1.1	.50
15	123	283	226	158	1490	2280	200	144	3.5	1.5	1.0	.52
16	129	349	217	140	1380	1910	222	134	3.8	1.4	4.5	.52
17	125	465	201	140	1190	1770	233	101	8.3	1.6	2.9	.84
18	123	912	184	140	1160	1870	304	51	11	27	6.1	.83
19	126	885	169	140	1110	1930	265	37	6.9	71	16	.78
20	123	972	157	150	963	1790	178	32	4.2	51	4.9	.81
21	116	951	149	170	819	1530	132	50	6.8	7.4	4.4	.74
22	119	1190	141	220	716	1270	118	89	20	2.4	.97	.70
23	119	1310	128	287	693	1080	74	63	22	1.9	4.6	.69
24	123	1310	114	305	670	924	87	43	15	1.0	2.9	.69
25	129	1330	105	351	577	787	61	38	8.8	2.4	.74	.64
26	125	1230	101	518	478	660	57	82	1.5	1.4	.70	.60
27	131	1050	97	1120	433	596	42	100	2.0	1.0	.64	.62
28	136	1100	92	1430	441	520	22	76	1.8	.72	.58	.71
29	113	1550	91	1410	---	449	41	65	1.9	.70	.52	.73
30	121	1540	95	1120	---	383	92	52	1.6	.63	.52	.68
31	141	---	106	888	---	275	---	45	---	.58	.51	---
TOTAL	3879	19165	9651	11599	27171	39743	8618	4994	335.0	362.53	63.38	17.85
MEAN	125	639	311	374	970	1282	287	161	11.2	11.7	2.04	.59
MAX	159	1550	1150	1430	1880	2700	719	670	47	71	16	.84
MIN	107	158	91	117	433	275	22	32	1.5	.58	.51	.45
AC-FT	7690	38010	19140	23010	53890	78830	17090	9910	664	719	126	35

CAL YR 1986 TOTAL 196167.53 MEAN 537 MAX 12000 MIN .79 AC-FT 389100
WTR YR 1987 TOTAL 125598.76 MEAN 344 MAX 2700 MIN .45 AC-FT 249100

14034470 WILLOW CREEK ABOVE WILLOW CREEK LAKE, NEAR HEPPNER, OR

LOCATION.--Lat 45°20'27", long 119°30'53", in NE 1/4 NE 1/4 sec.1, T.3 S., R.26 E., Morrow County, Hydrologic Unit 17070104, on right bank 1.5 mi southeast of Heppner, 1.7 mi upstream from Willow Creek dam, and at mile 54.1.

DRAINAGE AREA--67.6 mi^2.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1982 to current year.

GAGE.--Water-stage recorder and crest-stage gage. Datum of gage is 2,085.41 ft above National Geodetic Vertical Datum of 1929 (levels by Corps of Engineers).

REMARKS.--Estimated daily discharges: Dec. 12-14, 26-30, Jan. 9-23, Feb. 24-27, Apr. 2-6. Records good except for estimated daily discharges, which are poor. Many diversions for irrigation upstream from station. Part of flow of Ditch Creek (John Day River basin) is diverted to Willow Creek upstream from station.

AVERAGE DISCHARGE.--5 years, 27.7 ft^3/s, 20,070 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 445 ft^3/s Mar. 4, 1983, gage height, 6.93 ft; minimum discharge, 0.20 ft^3/s Sept. 11, 12, 29, 30, 1987.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 140 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Mar. 6	0800	145	5.71	Mar. 16	0800	*180	*5.90

Minimum discharge, 0.20 ft^3/s Sept. 11, 12, 29, 30.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	5.3	6.3	44	13	53	25	49	53	7.8	3.6	.95	.39
2	4.8	5.5	38	13	54	28	52	51	8.0	4.2	.96	.39
3	4.1	5.2	33	13	49	54	58	46	6.9	3.2	.85	.49
4	4.0	4.9	29	14	42	88	64	41	7.7	3.5	.74	.60
5	3.7	5.4	28	14	36	108	60	30	7.8	2.3	.70	.66
6	3.4	7.5	27	14	32	133	58	26	6.7	3.3	.71	.54
7	3.4	9.4	24	12	32	112	55	23	6.7	3.6	.67	.57
8	3.2	8.5	25	10	32	95	55	21	7.4	3.2	.59	.50
9	3.2	8.0	20	7.5	32	82	56	19	7.0	2.1	.51	.48
10	3.2	6.0	19	6.5	31	74	58	13	6.5	2.8	.45	.24
11	3.3	8.2	18	5.0	33	69	66	12	6.0	2.3	.50	.21
12	3.3	11	15	5.5	33	73	60	13	5.3	1.8	.53	.29
13	3.2	9.5	17	5.8	55	130	56	13	4.9	1.5	.53	.38
14	3.2	11	17	6.0	58	137	51	12	4.6	1.5	.56	.31
15	3.1	13	17	5.5	51	158	52	10	5.5	1.3	.62	.38
16	3.2	14	14	5.2	45	157	54	10	6.6	1.4	.69	.42
17	3.1	31	13	5.5	42	144	59	9.6	5.9	1.9	.80	.52
18	3.2	32	13	6.5	39	150	65	10	6.5	1.5	.86	.55
19	3.3	35	14	6.0	36	126	59	10	6.6	2.5	.71	.48
20	3.5	32	13	5.6	34	112	53	7.8	4.7	2.7	.69	.33
21	3.6	42	12	6.2	33	98	48	8.7	4.9	2.6	.70	.30
22	3.6	34	12	6.5	31	89	46	9.3	5.1	2.2	.70	.33
23	3.6	32	12	7.5	28	80	49	8.0	3.4	2.9	.70	.32
24	3.4	32	12	9.5	25	75	45	7.6	3.1	2.7	.70	.46
25	2.2	32	12	15	22	72	44	9.3	3.1	2.4	.70	.36
26	2.4	28	11	22	21	65	43	11	2.5	2.2	.73	.28
27	4.2	29	10	33	23	61	41	11	1.8	1.8	.70	.26
28	4.2	41	9.0	39	25	56	45	9.8	1.1	1.4	.67	.23
29	4.4	52	9.5	34	---	53	51	9.0	1.1	1.3	.66	.22
30	6.8	50	8.4	30	---	49	46	11	1.3	1.1	.55	.20
31	6.3	---	8.2	34	---	50	---	8.9	---	.96	.42	---
TOTAL	115.4	635.4	554.1	410.3	1027	2803	1598	534.0	156.5	71.76	20.85	11.69
MEAN	3.72	21.2	17.9	13.2	36.7	90.4	53.3	17.2	5.22	2.31	.67	.39
MAX	6.8	52	44	39	58	158	66	53	8.0	4.2	.96	.66
MIN	2.2	4.9	8.2	5.0	21	25	41	7.6	1.1	.96	.42	.20
AC-FT	229	1260	1100	814	2040	5560	3170	1060	310	142	41	23

CAL YR 1986 TOTAL 8205.35 MEAN 22.5 MAX 300 MIN .28 AC-FT 16280
WTR YR 1987 TOTAL 7938.00 MEAN 21.7 MAX 158 MIN .20 AC-FT 15750

14034470 WILLOW CREEK ABOVE WILLOW CREEK LAKE, NEAR HEPPNER, OR--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--May 1985 to September 1987 (discontinued).

REMARKS.--Local identifier 452027119305300 Willow Creek site.

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	TIME	SAMPLING DEPTH (M)	SPECIFIC CONDUCTANCE (US/CM)	PH (STANDARD UNITS)	TEMPERATURE WATER (DEG C)	OXYGEN, DISSOLVED (MG/L)	ALKALINITY, CARBONATE IT-FLD (MG/L - CAC03)	TURBIDITY (NTU)
OCT								
22...	1610	0.0	404	8.2	12.0	11.0	--	1.5
29...	1715	0.0	419	8.0	10.0	9.8	216	0.8
NOV								
04...	1700	0.0	383	8.0	9.0	10.3	--	--
18...	1427	0.0	212	7.9	7.5	11.0	--	--

DATE	TIME	SAMPLING DEPTH (M)	HARDNESS (MG/L AS CACO3)	HARDNESS NONCARB FLD MG/L AS CACO3	CALCIUM DISSOLVED (MG/L AS CA)	MAGNESIUM, DISSOLVED (MG/L AS MG)	SODIUM, DISSOLVED (MG/L AS NA)	POTASSIUM, DISSOLVED (MG/L AS K)
OCT								
29...	1715	0.0	170	0	42	15	25	4.0

DATE	BICARBONATE IT-FLD (MG/L AS HCO3)	CARBONATE IT-FLD (MG/L AS CO3)	SULFATE DISSOLVED (MG/L AS SO4)	CHLORIDE, DISSOLVED (MG/L AS CL)	FLUORIDE, DISSOLVED (MG/L AS F)	SILICA, DISSOLVED (MG/L AS SIO2)	SOLIDS, RESIDUE AT 180 DEG. C DISSOLVED (MG/L)	SOLIDS, SUM OF CONSTITUENTS, DISSOLVED (MG/L)
OCT								
29...	263	0	12	13	0.3	39	274	280

WILLOW CREEK BASIN

14034480 BALM FORK NEAR HEPPNER, OR

LOCATION.--Lat 45°19'56", long 119°32'24", in NW 1/4 SE 1/4 sec.2, T.3 S., R.26 E., Morrow County, Hydrologic Unit 17070104, on right bank, 0.7 mi upstream from bridge on Willow Creek Road, 1.0 mi southeast of Heppner, 1.2 mi upstream from Willow Creek dam, and at mile 1.1.

DRAINAGE AREA.--26.3 mi^2.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--May 1982 to current year.

REVISED RECORDS.--WDR OR-83-1: Drainage area.

GAGE.--Water-stage recorder. Concrete control since Aug. 24, 1982. Datum of gage is 2,101.52 ft above National Geodetic Vertical Datum of 1929 (Corps of Engineers bench mark).

REMARKS.--Estimated daily discharges: Dec. 11, 12, 25-30, Jan. 16-22. Records good. Diversion for irrigation of about 170 acres upstream from station.

AVERAGE DISCHARGE.--5 years, 4.02 ft^3/s, 2,910 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 190 ft^3/s Mar. 4, 1983, gage height, 4.90 ft, from rating curve extended above 82 ft^3/s on basis of slope-area measurement of peak flow; no flow for part of each day Sept. 8, 9, 1982.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum discharge, about 36,000 ft^3/s June 14, 1903, result of slope-area measurement (see WSP 96).

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 60 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Mar. 15	0030	*29	*3.81				

Minimum discharge, 0.18 ft^3/s on several days in August and September.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.88	1.1	6.2	2.8	11	5.2	8.8	2.7	1.5	.30	.25	.38
2	.84	1.1	5.6	3.0	12	6.5	7.0	2.4	1.5	.36	.23	.36
3	.79	1.1	5.1	3.1	11	15	6.8	2.5	1.6	.30	.24	.36
4	.77	1.1	4.7	3.3	9.3	12	6.7	2.5	1.8	.29	.25	.36
5	.78	1.1	4.8	3.3	8.0	9.9	6.3	2.1	1.6	.33	.26	.33
6	.79	1.1	4.7	3.3	7.3	11	5.5	1.8	1.2	.33	.31	.22
7	.80	1.2	4.6	3.2	6.8	13	5.3	1.7	1.1	.30	.49	.22
8	.79	1.2	4.6	2.9	6.3	12	5.0	1.7	1.1	.30	.27	.21
9	.81	1.2	4.4	2.7	5.8	12	5.0	1.5	1.1	.31	.22	.19
10	.80	1.2	3.9	2.7	5.4	11	5.0	1.7	1.1	.32	.21	.19
11	.81	1.2	3.7	2.8	5.5	9.5	5.3	1.9	1.1	.55	.20	.28
12	.81	1.2	3.3	2.7	5.4	9.5	4.9	2.0	1.1	.60	.21	.32
13	.83	1.2	3.6	2.6	5.6	15	4.7	1.9	1.1	.50	.23	.21
14	.80	1.4	3.8	2.6	5.5	17	4.4	1.6	.95	.34	.31	.20
15	.81	1.5	3.6	2.2	5.4	24	4.2	1.6	.90	.53	.24	.19
16	.81	1.8	3.4	1.9	5.3	22	3.9	1.5	.86	.51	.22	.20
17	.81	5.6	3.4	1.8	5.2	23	3.6	1.5	.83	.40	.22	.20
18	.81	5.9	3.2	1.9	5.4	22	3.3	1.6	.96	.26	.21	.29
19	.81	5.2	3.1	1.9	5.6	20	3.0	1.5	1.2	.26	.20	.36
20	.81	4.4	2.9	1.7	5.6	19	2.0	1.4	1.0	.25	.30	.34
21	.81	4.9	2.8	1.9	6.3	19	1.0	1.4	.66	.32	.39	.33
22	.81	4.4	2.8	2.0	6.5	18	1.4	1.6	.59	.31	.21	.34
23	.81	4.2	2.8	2.1	5.7	17	2.1	1.7	.60	.32	.21	.31
24	.81	4.1	2.7	2.4	5.3	18	2.1	1.5	.57	.36	.22	.22
25	.77	4.2	2.5	3.7	5.0	18	2.1	1.5	.46	.33	.20	.21
26	.78	4.0	2.5	7.3	4.5	17	2.1	1.6	.39	.55	.19	.37
27	.84	4.2	2.4	13	5.3	16	2.3	1.8	.37	.46	.20	.24
28	.81	5.3	2.1	11	5.2	14	2.1	1.9	.39	.25	.21	.23
29	.88	7.0	2.2	8.6	---	12	2.1	1.6	.41	.23	.21	.35
30	.96	7.2	2.3	7.4	---	11	2.4	1.5	.39	.22	.19	.39
31	1.1	---	2.4	7.5	---	11	---	1.5	---	.23	.23	---
TOTAL	25.54	90.3	110.1	119.3	181.2	459.6	120.4	54.7	28.43	10.92	7.53	8.40
MEAN	.82	3.01	3.55	3.85	6.47	14.8	4.01	1.76	.95	.35	.24	.28
MAX	1.1	7.2	6.2	13	12	24	8.8	2.7	1.8	.60	.49	.39
MIN	.77	1.1	2.1	1.7	4.5	5.2	1.0	1.4	.37	.22	.19	.19
AC-FT	51	179	218	237	359	912	239	108	56	22	15	17

CAL YR 1986 TOTAL 1403.55 MEAN 3.85 MAX 80 MIN .19 AC-FT 2780
WTR YR 1987 TOTAL 1216.42 MEAN 3.33 MAX 24 MIN .19 AC-FT 2410

14034480 BALM FORK NEAR HEPPNER, OR--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--May 1985 to September 1987 (discontinued).

REMARKS.--Local identifier 452013119324000.

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	TIME	SAMPLING DEPTH (M)	SPECIFIC CONDUCTANCE (US/CM)	PH (STANDARD UNITS)	TEMPERATURE WATER (DEG C)	OXYGEN, DISSOLVED (MG/L)	ALKALINITY, CARBONATE IT-FLD (MG/L - CAC03)	TURBIDITY (NTU)
OCT								
22...	1530	0.0	584	8.70	12.0	11.2	--	4.3
29...	1755	0.0	566	8.20	9.5	9.3	238	3.4
NOV								
04...	1725	0.0	560	8.30	8.5	10.0	--	--
18...	1510	0.0	291	8.10	8.5	10.5	--	--

DATE	TIME	SAMPLING DEPTH (M)	HARDNESS TOTAL (MG/L AS CACO3)	HARDNESS NONCARB WH WAT TOT FLD MG/L AS CACO3	CALCIUM DISSOLVED (MG/L AS CA)	MAGNESIUM, DISSOLVED (MG/L AS MG)	SODIUM, DISSOLVED (MG/L AS NA)	POTASSIUM, DISSOLVED (MG/L AS K)
OCT								
29...	1755	0.0	200	0	48	19	44	6.2

DATE	BICARBONATE IT-FLD (MG/L AS HCO3)	CARBONATE IT-FLD (MG/L AS CO3)	SULFATE DISSOLVED (MG/L AS SO4)	CHLORIDE, DISSOLVED (MG/L AS CL)	FLUORIDE, DISSOLVED (MG/L AS F)	SILICA, DISSOLVED (MG/L AS SIO2)	SOLIDS, RESIDUE AT 180 DEG. C DISSOLVED (MG/L)	SOLIDS, SUM OF CONSTITUENTS, DISSOLVED (MG/L)
OCT								
29...	290	0	33	26	0.6	41	372	360

14034490 WILLOW CREEK LAKE AT HEPPNER, OR

LOCATION.--Lat 45°20'50", long 119°32'37", in NW 1/4 SE 1/4 sec.35, T.2 S., R.26 E., Morrow County, Hydrologic Unit 17070104, U.S. Corps of Engineers land, on top left side of spillway on dam on Willow Creek, 2,000 ft upstream from Court Street bridge and at mile 52.4.

DRAINAGE AREA.--96.6 mi^2.

WATER-ELEVATION RECORDS

PERIOD OF RECORD.--February 1983 to current year.

GAGE.--Water-stage recorder. Datum of gage is National Geodetic Vertical Datum of 1929 (levels by Corps of Engineers). Prior to Dec. 22, 1983, nonrecording gage at nearby site at present datum.

REMARKS.--Lake is formed behind roller-compacted, concrete dam; storage began Feb. 16, 1983. Capacity, 14,020 acre-ft between elevations 2,000.0 ft, sill of outlet gates, and 2,113.5 ft, crest of spillway. Average minimum lake elevation 2,047.0 ft, storing 2,540 acre-ft. Dead storage, 73 acre-ft below elevation 2,000.0 ft. Reservoir used for flood control. Figures given herein represent total contents.

COOPERATION.--Capacity table furnished by Corps of Engineers.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 5,550 acre-ft Feb. 24, 25, 1986, elevation, 2,071.87 ft; no usable contents at times.

EXTREMES FOR CURRENT YEAR.--Maximum contents, 4,500 acre-ft Mar. 18, elevation, 2,064.31 ft; minimum contents, 3,780 acre-ft Sept. 30, elevation, 2,058.57 ft.

Capacity table (elevation, in feet, and total contents, in acre-feet)

2,050	2,840	2,065	4,590
2,055	3,370	2,070	5,280
2,060	3,950	2,075	6,020

ELEVATION (FEET NGVD), WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
INSTANTANEOUS OBSERVATIONS AT 2400

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2058.80	2059.31	2062.86	2061.94	2063.20	2062.16	2062.98	2063.27	2063.05	2062.36	2061.73	2060.12
2	2058.83	2059.36	2062.75	2062.04	2063.40	2062.27	2063.13	2063.33	2063.04	2062.33	2061.69	2060.05
3	2058.85	2059.39	2062.57	2062.06	2063.39	2062.50	2063.33	2063.32	2063.02	2062.33	2061.64	2060.00
4	2058.87	2059.43	2062.35	2062.13	2063.19	2062.94	2063.63	2063.22	2063.02	2062.33	2061.58	2059.95
5	2058.88	2059.49	2062.27	2062.21	2063.02	2063.20	2063.91	2063.00	2062.98	2062.32	2061.53	2059.90
6	2058.89	2059.56	2062.21	2062.28	2062.85	2063.32	2063.96	2062.86	2062.95	2062.32	2061.47	2059.85
7	2058.90	2059.68	2062.13	2062.32	2062.69	2063.24	2063.84	2062.78	2062.90	2062.32	2061.44	2059.80
8	2058.91	2059.79	2062.17	2062.34	2062.51	2062.95	2063.72	2062.69	2062.92	2062.32	2061.39	2059.74
9	2058.91	2059.88	2062.25	2062.33	2062.43	2062.62	2063.62	2062.57	2062.97	2062.32	2061.33	2059.69
10	2058.91	2059.95	2062.29	2062.34	2062.39	2062.46	2063.53	2062.37	2063.01	2062.31	2061.26	2059.62
11	2058.91	2060.05	2062.33	2062.37	2062.39	2062.42	2063.53	2062.26	2063.05	2062.31	2061.21	2059.57
12	2058.92	2060.18	2062.40	2062.40	2062.40	2062.55	2063.44	2062.22	2063.07	2062.29	2061.15	2059.52
13	2058.92	2060.30	2062.44	2062.43	2062.65	2063.06	2063.30	2062.19	2063.10	2062.28	2061.12	2059.46
14	2058.92	2060.39	2062.48	2062.41	2062.99	2063.21	2063.12	2062.16	2063.11	2062.26	2061.06	2059.40
15	2058.92	2060.40	2062.49	2062.35	2063.20	2063.80	2063.05	2062.12	2063.13	2062.18	2060.98	2059.34
16	2058.94	2060.88	2062.48	2062.36	2063.33	2064.20	2063.08	2062.06	2063.16	2062.17	2060.93	2059.28
17	2058.94	2061.41	2062.46	2062.45	2063.37	2064.23	2063.18	2062.00	2063.18	2062.16	2060.89	2059.23
18	2058.94	2061.84	2062.43	2062.60	2063.27	2064.11	2063.27	2062.01	2063.17	2062.16	2060.84	2059.18
19	2058.94	2062.15	2062.41	2062.69	2063.13	2063.68	2063.31	2062.01	2063.16	2062.15	2060.79	2059.14
20	2058.96	2062.29	2062.36	2062.79	2062.95	2063.05	2063.25	2062.04	2063.12	2062.14	2060.73	2059.09
21	2058.97	2062.51	2062.31	2062.88	2062.77	2062.15	2063.12	2062.14	2063.07	2062.12	2060.69	2059.04
22	2058.98	2062.46	2062.27	2062.95	2062.60	2061.69	2062.96	2062.28	2063.04	2062.10	2060.63	2059.08
23	2058.99	2062.42	2062.22	2063.00	2062.49	2061.85	2062.92	2062.39	2062.97	2062.09	2060.59	2059.02
24	2059.00	2062.34	2062.15	2063.09	2062.41	2062.00	2062.95	2062.51	2062.90	2062.07	2060.54	2058.96
25	2059.00	2062.34	2062.09	2063.27	2062.30	2062.07	2062.95	2062.63	2062.84	2062.04	2060.48	2058.90
26	2059.02	2062.35	2062.03	2063.41	2062.17	2062.15	2062.94	2062.79	2062.77	2062.02	2060.44	2058.82
27	2059.04	2062.32	2061.96	2063.53	2062.18	2062.38	2062.92	2062.93	2062.68	2061.98	2060.38	2058.76
28	2059.07	2062.46	2061.89	2063.53	2062.17	2062.49	2062.94	2063.01	2062.60	2061.93	2060.33	2058.70
29	2059.12	2062.73	2061.85	2063.40	---	2062.51	2063.07	2063.02	2062.51	2061.89	2060.28	2058.62
30	2059.19	2062.90	2061.86	2063.14	---	2062.59	2063.12	2063.04	2062.43	2061.83	2060.23	2058.57
31	2059.25	---	2061.83	2063.06	---	2062.77	---	2063.06	---	2061.78	2060.18	---
MAX	2059.25	2062.90	2062.86	2063.53	2063.40	2064.23	2063.96	2063.33	2063.18	2062.36	2061.73	2060.12
MIN	2058.80	2059.31	2061.83	2061.94	2062.17	2061.69	2062.92	2062.00	2062.43	2061.78	2060.18	2058.57
(†)	3860	4310	4180	4330	4220	4300	4340	4330	4250	4170	3970	3780
(‡)	+60	+450	-130	+150	-110	+80	+40	-10	-80	-80	-200	-190

CAL YR 1986 MAX 2071.87 MIN 2058.64 AC-FT‡ 0
WTR YR 1987 MAX 2064.23 MIN 2058.57 AC-FT‡ -20

† Contents, in acre-feet, at 2400, on last day of month.
‡ Change in contents, in acre-feet.

14034490 WILLOW CREEK LAKE AT HEPPNER, OR--Continued

WATER QUALITY RECORDS

LOCATION.--Lat 45°20'37", long 119°32'10", in SE 1/4 SE 1/4 sec.35, T.2 S., R.26 E., Morrow County, Hydrologic Unit 17070104, U.S. Corps of Engineer's land, 0.4 mi southeast of outlet structure on Willow Creek Dam, 200 ft northeast of boat launch, and 1.0 mi southeast of Heppner.

PERIOD OF RECORD.--June 1984 to September 1987 (discontinued).

REMARKS.--Local identifier 452037119321000 Willow Creek Lake Site 2.

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	TIME	SAMPLING DEPTH (M)	SPECIFIC CONDUCTANCE (US/CM)	PH (STANDARD UNITS)	TEMPERATURE WATER (DEG C)	OXYGEN, DISSOLVED (MG/L)	ALKALINITY, CARBONATE IT-FLD (MG/L - CAC03)	TURBIDITY (NTU)	TRANSPARENCY (SECCHI DISK) (M)
OCT									
23...	1309	0.0	284	8.4	12.5	12.2	--	--	--
23...	1313	1.0	285	8.4	12.0	12.2	--	--	--
23...	1317	2.0	283	8.4	12.0	12.2	140	1.4	--
23...	1321	3.0	285	8.3	12.0	10.6	--	--	--
23...	1325	4.0	285	8.2	11.5	10.3	--	--	--
23...	1329	6.0	288	7.9	11.5	6.4	--	--	--
23...	1333	8.0	293	7.9	11.5	6.9	--	--	--
23...	1337	10.0	291	7.9	11.5	8.6	--	1.3	--
23...	1341	11.5	291	7.6	11.0	5.4	--	--	--
30...	1335	0.0	293	8.1	11.5	9.2	--	--	1.3
30...	1341	1.0	286	8.1	11.5	9.1	--	3.7	--
30...	1345	2.0	286	8.1	11.5	9.0	142	--	--
30...	1348	6.0	287	8.1	11.5	8.9	--	--	--
30...	1352	12.0	290	7.8	11.5	6.3	--	6.1	--
NOV									
19...	1257	0.0	299	7.5	7.5	7.9	--	--	1.3
19...	1303	1.0	297	7.5	7.5	7.9	--	--	--
19...	1308	2.0	297	7.5	7.5	7.9	148	--	--
19...	1313	3.0	297	7.5	7.5	7.9	--	--	--
19...	1318	4.0	297	7.5	7.5	7.9	--	--	--
19...	1323	5.0	295	7.5	7.5	8.1	--	--	--
19...	1328	6.0	295	7.5	7.5	8.3	--	--	--
19...	1333	7.0	292	7.5	7.5	8.5	--	--	--
19...	1338	8.0	289	7.5	7.5	8.6	--	--	--
19...	1343	9.0	289	7.5	7.5	8.7	--	--	--
19...	1348	10.0	289	7.5	7.5	8.6	--	--	--
19...	1353	12.0	291	7.4	7.5	8.4	--	--	--

DATE	TIME	SAMPLING DEPTH (M)	HARDNESS NONCARB FLD MG/L AS CACO3	BICARBONATE IT-FLD (MG/L AS HCO3)	CARBONATE IT-FLD (MG/L AS CO3)	SULFATE DISSOLVED (MG/L AS SO4)	NITROGEN, AMMONIA DISSOLVED (MG/L AS N)
OCT							
23...	1317	2.0	0	157	7	--	0.02
NOV							
19...	1308	2.0	0	180	0	12	0.34

DATE	NITROGEN, NO2+NO3 DISSOLVED (MG/L AS N)	NITROGEN, AMMONIA + ORGANIC TOTAL (MG/L AS N)	PHOSPHORUS ORTHO, DISSOLVED (MG/L AS P)	PHOSPHORUS DISSOLVED (MG/L AS P)	PHOSPHORUS TOTAL (MG/L AS P)	ALUMINUM, DISSOLVED (UG/L AS AL)	CHLOR-A PHYTOPLANKTON CHROMO FLUOROM (UG/L)	CHLOR-B PHYTOPLANKTON CHROMO FLUOROM (UG/L)
OCT								
23...	<0.10	--	--	--	--	--	--	--
NOV								
19...	0.13	0.9	0.06	0.07	0.08	30	0.6	<0.1

14034490 WILLOW CREEK LAKE AT HEPPNER, OR--Continued

452037119321000 WILLOW CREEK LAKE SITE 2--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	86/10/23		86/10/30		86/11/19	
SPECIES						
DIVERSITY	1.56		2.06		3.98	
TOTAL COUNT (#/ML)	6420.		1478.		212.	
	COUNT	PCT	COUNT	PCT	COUNT	PCT
CHLOROPHYTA GREEN ALGAE						
-CHLOROPHYCEAE						
--CHLOROCOCCALES						
---OOCYSTACEAE						
----OOCYSTIS LACUSTRIS	--	--	--	--	3	1.2
CRYPTOPHYTA						
-CRYPTOPHYCEAE						
--CRYPTOMONADALES						
---CRYPTOCHRYSIDACEAE						
----RHODOMONAS MINUTA	1492	23.2	426	28.8	10	4.8
---CRYPTOMONADACEAE						
----CRYPTOMONAS EROSA	497	7.7	160	10.8	28	13.1
----CRYPTOMONAS OVATA	--	--	13	0.9	--	--
CHRYSOPHYTA YELLOW-BROWN ALGAE						
-BACILLARIOPHYCEAE DIATOMS						
--CENTRALES CENTRIC DIATIOMS						
---COSCINODISCACEAE						
----CYCLOTELLA MENEGHINIANA	--	--	--	--	3	1.2
----STEPHANODISCUS ASTREA MINUTULA	45	0.7	40	2.7	56	26.2
----STEPHANODISCUS HANTZSCHII	--	--	--	--	15	7.1
--PENNALES PENNATE DIATOMS						
---FRAGILARIACEAE						
----ASTERIONELLA FORMOSA	--	--	--	--	3	1.2
----FRAGILARIA CONSTRUENS	--	--	--	--	3	1.2
----FRAGILARIA CROTONENSIS	3933	61.3	652	44.1	10	4.8
----FRAGILARIA VAUCHERIAE	45	0.7	13	0.9	3	1.2
----SYNEDRA ULNA	--	--	--	--	3	1.2
---ACHNANTHACEAE						
----ACHNANTHES LANCEOLATA	--	--	--	--	10	4.8
----ACHNANTHES MINUTISSIMA	--	--	--	--	3	1.2
----COCCONEIS PLACENTULA	--	--	--	--	3	1.2
----RHOICOSPHENIA CURVATA	--	--	--	--	10	4.8
---NAVICULACEAE						
----NAVICULA SPP.	--	--	--	--	3	1.2
----NAVICULA CRYPTOCEPHALA	--	--	13	0.9	--	--
----NAVICULA CRYPTOCEPHALA VENETA	--	--	--	--	5	2.4
----NAVICULA MINIMA	--	--	--	--	5	2.4
----PINNULARIA SPP.	--	--	--	--	3	1.2
---GOMPHONEMACEAE						
----GOMPHONEMA OLIVACEUM	--	--	--	--	8	3.6
---CYMBELLACEAE						
----AMPHORA PERPUSILLA	--	--	--	--	3	1.2
----CYMBELLA SINUATA	--	--	--	--	3	1.2
---NITZSCHIACEAE						
----NITZSCHIA SPP.	--	--	--	--	3	1.2
----NITZSCHIA ACICULARIS	--	--	--	--	3	1.2
----NITZSCHIA DISSIPATA	--	--	--	--	5	2.4
----NITZSCHIA FRUSTULUM	--	--	--	--	10	4.8
CYANOPHYTA BLUE-GREEN ALGAE						
-MYXOPHYCEAE						
--OSCILLATORIALES						
---NOSTOCACEAE						
----APHANIZOMENON FLOS-AQUAE	407	6.3	160	10.8	3	1.2

14034490 WILLOW CREEK LAKE AT HEPPNER, OR--Continued

WATER QUALITY RECORDS

LOCATION.--Lat 45°20'46", long 119°32'32", in SW 1/4 SE 1/4 sec.35, T.2 S., R.26 E., Morrow County, Hydrologic Unit 17070104, U.S. Corps of Engineer's land, 0.1 mi southeast of outlet structure on Willow Creek Dam, and 0.6 mi southeast of Heppner.

PERIOD OF RECORD.--June 1984 to September 1987 (discontinued).

REMARKS.--Local identifier 452046119323200 Willow Creek Lake Site 3.

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	TIME	SAMPLING DEPTH (M)	SPECIFIC CONDUCTANCE (US/CM)	PH (STANDARD UNITS)	TEMPERATURE WATER (DEG C)	OXYGEN, DISSOLVED (MG/L)	ALKALINITY, CARBONATE IT-FLD (MG/L - CAC03)	TURBIDITY (NTU)	TRANSPARENCY (SECCHI DISK) (M)
OCT									
23...	1142	0.0	290	8.3	12.5	12.1	--	--	1.2
23...	1146	1.0	283	8.4	12.0	12.1	--	--	--
23...	1150	2.0	282	8.4	12.0	12.0	140	1.5	--
23...	1154	3.0	282	8.4	12.0	11.1	--	--	--
23...	1158	4.0	285	8.2	12.0	10.6	--	--	--
23...	1202	5.0	288	8.2	12.0	8.8	--	--	--
23...	1206	6.0	288	8.0	11.5	7.8	--	--	--
23...	1210	7.0	288	7.9	11.5	6.8	--	--	--
23...	1214	8.0	290	7.7	11.5	4.5	--	1.0	--
23...	1218	9.0	289	7.7	11.5	3.3	--	--	--
23...	1222	10.0	288	7.5	11.5	1.3	--	--	--
23...	1226	11.0	288	7.5	11.0	1.0	--	--	--
23...	1228	12.0	281	7.4	10.5	0.3	--	--	--
23...	1230	13.0	276	7.4	10.0	0.2	--	--	--
23...	1231	14.0	269	7.4	10.0	0.2	--	--	--
23...	1232	16.0	272	7.3	10.0	0.2	--	5.1	--
23...	1236	18.0	191	7.3	9.5	0.2	134	--	--
30...	1155	0.0	287	8.0	11.5	9.0	--	--	1.4
30...	1200	1.0	287	8.0	11.5	8.9	--	5.6	--
30...	1210	2.0	287	8.0	11.5	8.9	143	1.8	--
30...	1214	4.0	287	8.0	11.5	8.9	--	--	--
30...	1217	6.0	287	8.0	11.5	8.8	--	--	--
30...	1220	8.0	290	7.7	11.5	5.7	--	2.6	--
30...	1230	10.0	290	7.4	11.0	1.4	--	--	--
30...	1235	11.0	292	7.4	11.0	0.4	--	--	--
30...	1240	12.0	288	7.3	11.0	0.1	--	1.5	--
30...	1245	13.0	281	7.2	10.5	0.1	--	--	--
30...	1250	14.0	277	7.2	10.5	0.1	--	--	--
30...	1253	16.0	275	7.1	10.0	0.1	--	--	--
30...	1258	18.0	273	7.1	10.0	0.1	143	0.7	--
NOV									
05...	1050	0.0	292	7.6	10.5	5.9	--	--	1.7
05...	1100	1.0	292	7.7	10.5	5.8	--	3.1	--
05...	1105	2.0	292	7.7	10.5	5.8	151	--	--
05...	1110	3.0	293	7.7	10.5	5.8	--	--	--
05...	1115	4.0	293	7.7	10.5	5.8	--	--	--
05...	1120	5.0	293	7.7	10.5	5.9	--	--	--
05...	1125	6.0	293	7.7	10.5	5.9	--	--	--
05...	1130	7.0	293	7.7	10.5	5.9	--	--	--
05...	1140	8.0	293	7.7	10.5	5.8	--	--	--
05...	1145	9.0	293	7.7	10.5	5.5	--	--	--
05...	1150	10.0	293	7.6	10.5	5.3	--	--	--
05...	1200	14.0	293	7.4	10.5	2.7	--	2.9	--
05...	1205	18.0	278	7.1	10.0	0.1	--	--	--
05...	1208	20.0	276	7.1	10.0	0.1	144	2.2	--
19...	1118	0.0	300	7.6	8.0	7.7	--	--	1.2
19...	1125	1.0	300	7.5	8.0	7.6	--	--	--
19...	1130	2.0	300	7.5	8.0	7.6	149	--	--
19...	1135	3.0	300	7.5	8.0	7.6	--	--	--
19...	1140	4.0	300	7.5	8.0	7.6	--	--	--
19...	1145	5.0	300	7.5	8.0	7.5	--	--	--
19...	1150	6.0	300	7.5	7.5	7.5	--	--	--
19...	1155	7.0	300	7.5	7.5	7.5	--	--	--
19...	1200	8.0	300	7.5	7.5	7.5	--	--	--
19...	1205	9.0	300	7.5	7.5	7.5	--	--	--
19...	1210	10.0	300	7.5	7.5	7.5	--	--	--
19...	1215	12.0	300	7.5	7.5	7.6	--	--	--
19...	1220	14.0	299	7.5	7.5	7.6	--	--	--
19...	1225	16.0	299	7.5	7.5	7.6	--	--	--
19...	1230	18.0	299	7.4	7.5	7.5	147	--	--
19...	1233	20.0	299	7.4	7.5	7.4	--	--	--

14034490 WILLOW CREEK LAKE AT HEPPNER, OR--Continued

452046119323200 WILLOW CREEK LAKE SITE 3--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	TIME	SAMPLING DEPTH (M)	HARDNESS (MG/L AS CACO3)	HARDNESS NONCARB FLD MG/L AS CACO3	CALCIUM DISSOLVED (MG/L AS CA)	MAGNESIUM, DISSOLVED (MG/L AS MG)	SODIUM, DISSOLVED (MG/L AS NA)	POTASSIUM, DISSOLVED (MG/L AS K)
OCT								
23...	1236	18.0	--	0	--	--	--	--
30...	1210	2.0	110	0	28	9.9	18	3.3
30...	1258	18.0	110	0	29	8.4	13	3.0

DATE	BICARBONATE IT-FLD (MG/L AS HCO3)	CARBONATE IT-FLD (MG/L AS CO3)	SULFATE DISSOLVED (MG/L AS SO4)	CHLORIDE, DISSOLVED (MG/L AS CL)	FLUORIDE, DISSOLVED (MG/L AS F)	NITROGEN, AMMONIA DISSOLVED (MG/L AS N)	NITROGEN, NO2+NO3 DISSOLVED (MG/L AS N)	NITROGEN, AMMONIA + ORGANIC TOTAL (MG/L AS N)
OCT								
23...	163	0	--	--	--	1.40	<0.1	1.6
30...	169	0	11	8.1	0.3	0.05	<0.1	0.9
30...	174	0	4.3	5.7	0.2	1.30	<0.1	1.8

DATE	PHOSPHOROUS ORTHO, DISSOLVED (MG/L AS P)	PHOSPHOROUS DISSOLVED (MG/L AS P)	PHOSPHOROUS TOTAL (MG/L AS P)	SILICA, DISSOLVED (MG/L AS SIO2)	SOLIDS, RESIDUE AT 180 DEG. C DISSOLVED (MG/L)	SOLIDS, SUM OF CONSTITUENTS, DISSOLVED (MG/L)	SULFIDE TOTAL (MG/L AS S)
OCT							
23...	0.28	0.34	0.34	--	--	--	<0.5
30...	0.01	0.01	0.04	22	179	184	--
30...	0.32	0.33	0.40	31	189	183	1.8

14034490 WILLOW CREEK LAKE AT HEPPNER, OR--Continued

452046119323200 WILLOW CREEK LAKE SITE 3--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	86/10/23		86/10/30		86/11/05		86/11/19	
SPECIES								
DIVERSITY	1.63		1.64		2.60		3.88	
TOTAL COUNT (#/ML)	5047.		1681.		274.		292.	
	COUNT	PCT	COUNT	PCT	COUNT	PCT	COUNT	PCT
CHLOROPHYTA GREEN ALGAE								
-CHLOROPHYCEAE								
--VOLVOCALES								
---CHLAMYDOMONADACEAE								
----CHLAMYDOMONAS SPP.	--	--	15	0.9	--	--	--	--
---VOLVOCACEAE								
----EUDORINA ELEGANS	37	0.7	--	--	--	--	--	--
--CHLOROCOCCALES								
---OOCYSTACEAE								
----ANKISTRODESMUS FALCATUS	75	1.5	--	--	--	--	--	--
----CLOSTERIOPSIS LONGISSIMA	--	--	--	--	2	0.9	--	--
----OOCYSTIS LACUSTRIS	--	--	--	--	2	0.9	6	2.1
--ZYGNEMATALES								
---DESMIDIACEAE DESMIDS								
----STAURASTRUM SP.	--	--	--	--	5	1.8	--	--
CRYPTOPHYTA								
-CRYPTOPHYCEAE								
--CRYPTOMONADALES								
---CRYPTOCHRYSIDACEAE								
----RHODOMONAS MINUTA	935	18.5	278	16.5	25	9.1	18	6.2
---CRYPTOMONADACEAE								
----CRYPTOMONAS EROSA	486	5.9	175	10.4	60	21.8	36	12.5
----CRYPTOMONAS OVATA	37	0.7	--	--	12	4.5	3	1.0
CHRYSOPHYTA YELLOW-BROWN ALGAE								
-BACILLARIOPHYCEAE DIATOMS								
--CENTRALES CENTRIC DIATIOMS								
---COSCINODISCACEAE								
----CYCLOTELLA SPP.	--	--	--	--	--	--	3	1.0
----CYCLOTELLA MENEGHINIANA	--	--	--	--	--	--	3	1.0
----STEPHANODISCUS ASTREA MINUTULA	--	--	--	--	5	1.8	85	29.2
----STEPHANODISCUS HANTZSCHII	--	--	15	0.9	--	--	15	5.2
--PENNALES PENNATE DIATOMS								
---FRAGILARIACEAE								
----ASTERIONELLA FORMOSA	--	--	--	--	5	1.8	9	3.1
----FRAGILARIA CONSTRUENS VENTER	--	--	--	--	2	0.9	--	--
----FRAGILARIA CROTONENSIS	3178	63.0	1038	61.7	122	44.5	18	6.2
----FRAGILARIA VAUCHERIAE	--	--	--	--	--	--	3	1.0
----SYNEDRA SOCIA	--	--	--	--	--	--	6	2.1
---ACHNANTHACEAE								
----ACHNANTHES LANCEOLATA	--	--	--	--	2	0.9	18	6.2
----RHOICOSPHENIA CURVATA	--	--	--	--	--	--	3	1.0
---NAVICULACEAE								
----NAVICULA SPP.	--	--	--	--	2	0.9	3	1.0
----NAVICULA CRYPTOCEPHALA VENETA	--	--	--	--	--	--	3	1.0
----NAVICULA PUPULA	--	--	--	--	--	--	3	1.0
----NAVICULA TRIPUNCTATA	--	--	--	--	--	--	3	1.0
---GOMPHONEMACEAE								
----GOMPHONEMA SPP.	--	--	--	--	--	--	3	1.0
----GOMPHONEMA ANGUSTATUM	--	--	--	--	--	--	9	3.1
----GOMPHONEMA OLIVACEUM	--	--	--	--	--	--	3	1.0
---CYMBELLACEAE								
----AMPHORA PERPUSILLA	--	--	--	--	2	0.9	3	1.0
----CYMBELLA AFFINIS	--	--	--	--	--	--	3	1.0
---EPITHEMIACEAE								
----EPITHEMIA SOREX	--	--	--	--	--	--	3	1.0
---NITZSCHIACEAE								
----NITZSCHIA AMPHIBIA	--	--	--	--	--	--	6	2.1
----NITZSCHIA DISSIPATA	--	--	--	--	2	0.9	3	1.0
----NITZSCHIA FRUSTULUM	--	--	--	--	--	--	12	4.2
----NITZSCHIA PALEA	--	--	--	--	--	--	3	1.0
CYANOPHYTA BLUE-GREEN ALGAE								
-MYXOPHYCEAE								
--OSCILLATORIALES								
---NOSTOCACEAE								
----ANABAENA CIRCINALIS	--	--	--	--	2	0.9	--	--
----APHANIZOMENON FLOS-AQUAE	486	9.6	161	9.6	20	7.3	3	1.0

14034500 WILLOW CREEK AT HEPPNER, OR

LOCATION.--Lat 45°21'02", long 119°32'56", in SE 1/4 NW 1/4 sec.35, T.2 S., R.26 E., Morrow County, Hydrologic Unit 17070104, on right bank at Heppner, 100 ft upstream from Court Street bridge, 800 ft southeast of Morrow County courthouse, 0.2 mi downstream from Willow Creek Dam and at mile 52.2.

DRAINAGE AREA.--96.8 mi^2.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--May 1951 to current year.

REVISED RECORDS.--WDR OR-83-1: Drainage area.

GAGE.--Water-stage recorder. Concrete control since September 1985. Datum of gage is 1,952.73 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--No estimated daily discharges. Records good. Flow regulated by Willow Creek Lake, 0.2 mi upstream, since Feb. 16, 1983. Many diversions for irrigation upstream from station. Part of flow of Ditch Creek (John Day River basin) is diverted to Willow Creek upstream from station.

AVERAGE DISCHARGE.--31 years (water years 1951-82), 19.1 ft^3/s, 13,840 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 812 ft^3/s May 10, 1957, gage height, 6.15 ft, from rating curve extended above 230 ft^3/s; maximum gage height, 6.46 ft May 25, 1971, backwater from Shobe Canyon; no flow at times.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum discharge, about 36,000 ft^3/s June 14, 1903, result of slope-area measurement (see WSP 96). Discharge for flood of Feb. 22, 1949, was 1,700 ft^3/s, result of slope-area measurement.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 149 ft^3/s Mar. 19, gage height, 4.53 ft; minimum discharge, 1.5 ft^3/s May 22, 25, 26.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3.9	4.3	44	12	50	32	33	44	11	6.4	4.2	2.9
2	3.8	4.2	44	12	51	32	40	44	10	4.2	6.1	2.9
3	4.3	4.1	44	12	58	48	43	45	10	2.0	3.4	2.9
4	4.3	4.1	44	12	61	61	43	45	11	2.0	3.1	2.9
5	4.3	4.2	36	12	54	82	43	45	11	2.0	2.7	2.8
6	4.3	3.8	32	12	50	102	57	37	11	2.0	2.8	2.8
7	4.1	3.8	32	12	50	103	64	30	11	1.9	2.9	2.8
8	4.0	4.1	22	12	50	102	64	28	6.1	1.9	2.9	2.7
9	4.1	4.2	18	11	43	95	63	28	3.9	1.9	2.9	2.9
10	4.1	4.1	18	12	39	83	63	28	4.0	1.9	2.9	3.0
11	4.1	4.1	18	12	39	72	63	22	4.0	1.9	2.9	2.8
12	4.1	4.1	18	12	39	69	64	19	4.0	1.9	2.9	2.8
13	4.1	4.1	18	12	39	80	64	18	3.8	1.9	2.9	2.8
14	4.1	4.2	18	12	39	100	63	16	3.6	1.8	2.9	2.8
15	4.1	4.1	18	12	39	100	57	15	3.7	1.8	2.9	2.9
16	4.3	4.2	18	7.1	39	119	53	15	4.5	1.8	2.9	2.9
17	3.9	4.3	18	4.3	45	133	53	14	5.6	1.8	2.9	2.8
18	4.3	8.8	18	4.4	51	142	53	9.7	7.5	1.8	2.9	2.8
19	4.3	19	18	4.3	51	139	53	7.1	7.5	1.8	3.2	2.8
20	4.3	24	18	4.3	51	136	54	4.6	7.5	2.4	2.9	2.8
21	4.2	28	18	4.3	51	136	53	2.0	7.5	2.9	2.9	2.8
22	4.2	37	18	6.1	51	108	53	1.7	7.5	3.0	2.9	2.8
23	4.9	37	18	7.1	44	74	48	1.7	7.5	3.1	2.9	2.8
24	4.2	37	18	7.2	39	71	43	1.7	7.5	2.9	2.9	3.2
25	4.1	33	18	7.3	39	71	43	1.5	6.9	3.0	2.9	3.4
26	4.2	31	18	18	34	65	43	2.6	6.5	3.0	2.9	3.4
27	4.3	32	18	33	31	52	44	2.7	6.7	3.0	2.9	3.4
28	4.3	32	18	46	32	52	44	7.3	6.7	3.5	2.9	3.4
29	4.3	32	15	50	---	53	44	10	6.7	3.3	2.9	3.4
30	4.2	36	12	50	---	46	44	10	6.7	3.3	2.9	3.7
31	4.2	---	12	50	---	36	---	11	---	3.2	2.9	---
TOTAL	129.9	456.8	697	482.4	1259	2594	1549	566.6	210.9	79.3	95.1	89.1
MEAN	4.19	15.2	22.5	15.6	45.0	83.7	51.6	18.3	7.03	2.56	3.07	2.97
MAX	4.9	37	44	50	61	142	64	45	11	6.4	6.1	3.7
MIN	3.8	3.8	12	4.3	31	32	33	1.5	3.6	1.8	2.7	2.7
AC-FT	258	906	1380	957	2500	5150	3070	1120	418	157	189	177

CAL YR 1986 TOTAL 9800.9 MEAN 26.9 MAX 264 MIN 2.9 AC-FT 19440
WTR YR 1987 TOTAL 8209.1 MEAN 22.5 MAX 142 MIN 1.5 AC-FT 16280

14034500 WILLOW CREEK AT HEPPNER, OR--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--October 1984 to September 1987 (discontinued).

REMARKS.--Local identifier 452057119324800.

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	TIME	SAMPLING DEPTH (M)	SPECIFIC CONDUCTANCE (US/CM)	PH (STANDARD UNITS)	TEMPERATURE WATER (DEG C)	OXYGEN, DISSOLVED (MG/L)	ALKALINITY, CARBONATE IT-FLD (MG/L - CACO3)	TURBIDITY (NTU)
OCT								
22...	1630	0.0	289	8.8	12.5	11.6	--	3.1
29...	1830	0.0	297	8.4	11.0	9.1	144	3.5
NOV								
04...	1800	0.0	292	8.4	10.5	9.3	--	--
18...	1530	0.0	311	8.2	8.0	10.7	--	--

DATE	TIME	SAMPLING DEPTH (M)	HARDNESS (MG/L AS CACO3)	HARDNESS NONCARB FLD MG/L AS CACO3	CALCIUM DISSOLVED (MG/L AS CA)	MAGNESIUM, DISSOLVED (MG/L AS MG)	SODIUM, DISSOLVED (MG/L AS NA)	POTASSIUM, DISSOLVED (MG/L AS K)
OCT								
29...	1820	0.0	110	0	26	10	20	4.1

DATE	BICARBONATE IT-FLD (MG/L AS HCO3)	CARBONATE IT-FLD (MG/L AS CO3)	SULFATE DISSOLVED (MG/L AS SO4)	CHLORIDE, DISSOLVED (MG/L AS CL)	FLUORIDE, DISSOLVED (MG/L AS F)	SILICA, DISSOLVED (MG/L AS SIO2)	SOLIDS, RESIDUE AT 180 DEG. C DISSOLVED (MG/L)	SOLIDS, SUM OF CONSTITUENTS, DISSOLVED (MG/L)
OCT								
29...	167	4.0	10	7.6	0.3	25	195	193

WILLOW CREEK BASIN

14034800 RHEA CREEK NEAR HEPPNER, OR

LOCATION.--Lat 45°15'46", long 119°36'51", in NW 1/4 SW 1/4 sec.32, T.3 S., R.26 E., Morrow County, Hydrologic Unit 17070104, on left bank 150 ft downstream from road bridge, 0.8 mi downstream from Sanford Canyon, 8 mi southwest of Heppner, and at mile 25.6. Prior to Nov. 4, at site 1,000 ft downstream.

DRAINAGE AREA.--120 mi^2, approximately.

PERIOD OF RECORD.--August 1960 to current year.

REVISED RECORD.--WDR OR-84-1: 1983.

GAGE.--Water-stage recorder. Elevation of gage is 2,320 ft, from topographic map. Prior to May 28, 1976, at site 0.6 mi downstream at different datum and May 28, 1976 to Nov. 3, 1982, at site 1,000 ft downstream at datum 10.5 ft lower.

REMARKS.--Estimated daily discharges: Dec. 10-15, 27-30, Jan. 8-22, Feb. 27, 28. Records good except for estimated daily discharges, and those above 250 ft^3/s, which are poor. No regulation. Many diversions for irrigation upstream from station.

AVERAGE DISCHARGE.--27 years, 23.4 ft^3/s, 16,950 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,280 ft^3/s June 10, 1969, gage height, 7.05 ft, site and datum then in use, from rating curve extended above 130 ft^3/s on basis of slope-area measurement at gage height 6.72 ft; maximum gage height, 7.41 ft Dec. 22, 1964, site and datum then in use; no flow at times.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 230 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Mar. 17	2000	*239	*3.88	No other peak greater than base discharge.			

Minimum discharge, 1.9 ft^3/s Sept. 12.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	9.2	9.5	32	13	104	48	58	32	11	5.4	4.9	3.4
2	9.0	8.4	29	13	93	66	56	30	10	6.8	4.9	3.6
3	8.7	7.9	27	13	80	157	56	26	9.6	6.2	4.7	3.7
4	8.7	7.9	24	13	65	166	56	23	9.0	5.6	4.4	3.7
5	9.8	7.9	25	13	54	153	53	22	8.0	5.4	4.4	3.7
6	9.9	9.0	25	12	51	180	50	20	7.1	5.2	4.4	3.7
7	10	11	24	9.8	53	158	47	19	4.8	4.7	4.2	3.7
8	11	11	23	8.7	48	143	45	18	7.2	4.5	4.1	3.4
9	11	11	19	7.6	47	136	42	17	7.4	4.7	4.1	3.4
10	11	7.8	17	6.6	45	120	42	16	7.4	5.0	3.9	3.4
11	11	11	14	7.0	49	108	46	15	7.4	4.9	4.0	3.4
12	11	14	15	7.4	47	118	42	15	7.1	4.7	3.6	3.1
13	11	12	16	7.6	125	184	39	15	6.8	4.5	4.0	3.1
14	11	15	16	8.4	112	170	37	15	6.6	4.4	4.5	3.2
15	12	16	15	7.7	93	205	35	14	7.7	4.5	4.6	3.4
16	12	16	14	7.0	79	204	34	14	8.3	4.9	4.4	3.4
17	12	21	13	7.5	75	213	35	13	8.6	5.2	4.2	3.7
18	12	20	13	8.4	73	212	34	12	8.5	6.8	4.1	3.7
19	12	23	13	8.2	71	180	33	12	8.2	7.8	4.0	3.6
20	12	22	12	7.6	65	157	31	12	7.6	6.7	3.7	3.4
21	12	26	12	8.4	61	140	29	12	8.8	6.5	3.7	3.4
22	12	24	12	9.0	59	124	26	11	8.6	7.3	3.7	3.4
23	12	24	12	9.3	56	118	25	11	7.7	7.7	4.0	3.4
24	12	25	11	11	54	118	26	12	7.2	6.5	3.9	3.6
25	12	25	11	18	48	118	26	12	6.4	6.0	3.9	3.6
26	12	23	11	37	47	108	25	13	5.2	5.6	3.7	4.0
27	13	24	9.5	68	42	98	24	14	4.9	5.2	3.6	4.3
28	11	29	8.5	69	44	85	25	13	4.9	4.9	3.5	5.0
29	11	35	9.0	50	---	72	27	12	5.2	4.9	3.5	4.7
30	11	35	8.5	41	---	67	26	12	5.1	4.8	3.5	4.4
31	9.2	---	8.4	51	---	62	---	13	---	4.4	3.4	---
TOTAL	341.5	531.4	498.9	558.2	1840	4188	1130	495	222.3	171.7	125.5	109.5
MEAN	11.0	17.7	16.1	18.0	65.7	135	37.7	16.0	7.41	5.54	4.05	3.65
MAX	13	35	32	69	125	213	58	32	11	7.8	4.9	5.0
MIN	8.7	7.8	8.4	6.6	42	48	24	11	4.8	4.4	3.4	3.1
AC-FT	677	1050	990	1110	3650	8310	2240	982	441	341	249	217

CAL YR 1986 TOTAL 11485.7 MEAN 31.5 MAX 390 MIN 3.0 AC-FT 22780
WTR YR 1987 TOTAL 10212.0 MEAN 28.0 MAX 213 MIN 3.1 AC-FT 20260

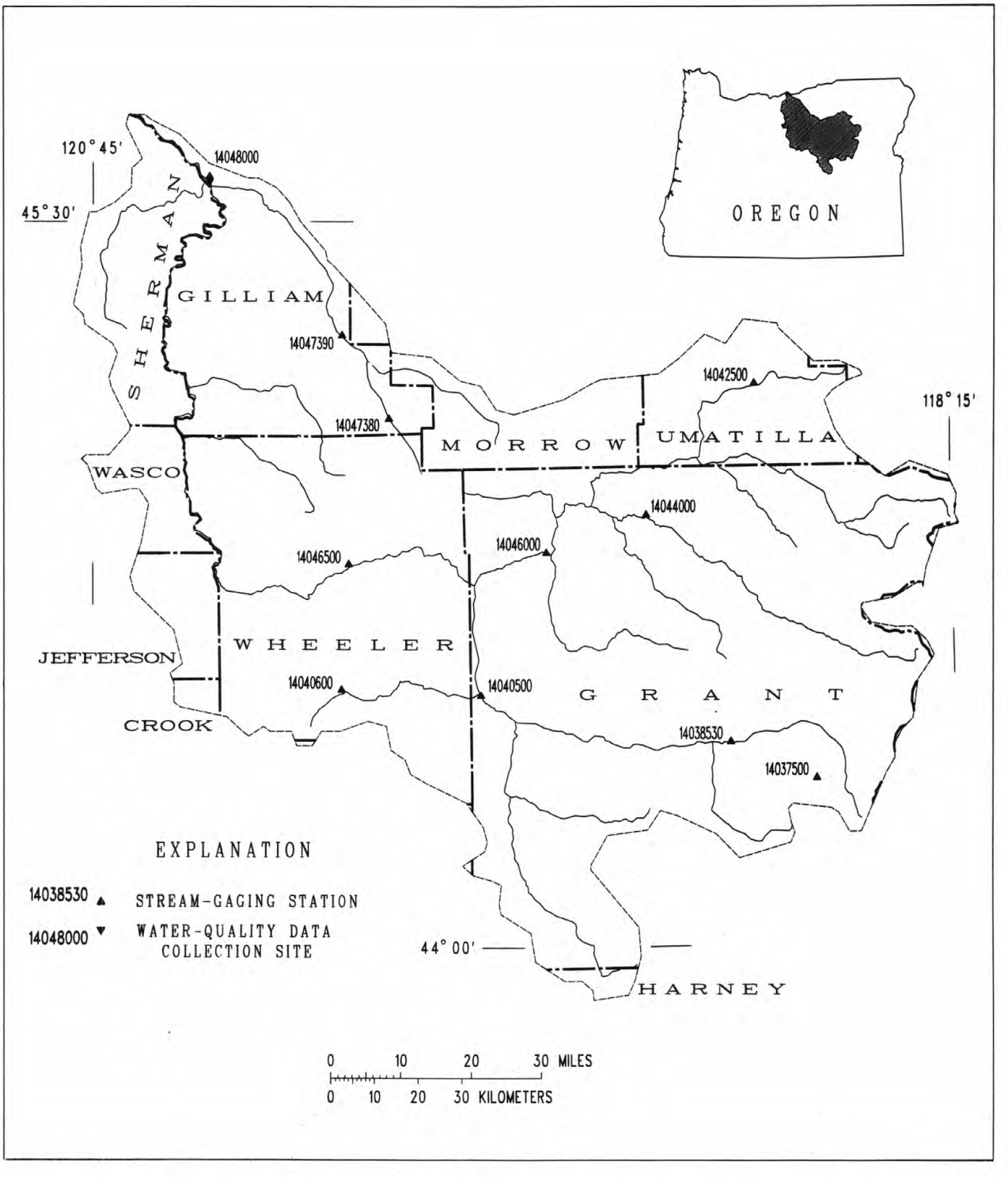

Figure 6.--Location of surface-water and water-quality stations in the John Day River basin.

14037500 STRAWBERRY CREEK ABOVE SLIDE CREEK, NEAR PRAIRIE CITY, OR

LOCATION.--Lat 44°20'30", long 118°39'20", in SE 1/4 NW 1/4 sec.20, T.14 S., R.34 E., Grant County, Hydrologic Unit 17070201, on left bank 100 ft upstream from Slide Creek, 8.5 mi south of Prairie City, and at mile 9.0.

DRAINAGE AREA.--7.00 mi^2.

PERIOD OF RECORD.--October 1930 to current year. Prior to October 1944, published as "above South Fork, near Prairie City."

REVISED RECORDS.--WSP 1488: 1932-33. WSP 1738: Drainage area.

GAGE.--Water-stage recorder and log control. Datum of gage is 4,909.57 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--Estimated daily discharges: Jan. 7-25, Feb. 25-27. Records fair. Flow affected by natural storage in Strawberry Lake. No diversion upstream from station.

AVERAGE DISCHARGE.--57 years, 13.0 ft^3/s, 25.22 in/yr, 9,420 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 354 ft^3/s May 31, 1983, gage height, 2.45 ft, from rating curve extended above 190 ft^3/s; maximum gage height, 3.23 ft May 24, 1956 (backwater from logs); minimum discharge, 1.0 ft^3/s Mar. 20, 1955.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 97 ft^3/s May 10, gage height, 1.71 ft; minimum daily discharge, 2.2 ft^3/s several days in January and September.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3.9	3.9	3.9	2.8	2.7	2.9	3.8	51	23	14	5.7	2.9
2	3.9	3.9	3.9	2.7	2.8	2.9	4.5	57	22	13	5.4	2.9
3	3.9	3.9	3.9	2.7	2.7	3.1	5.5	58	22	13	5.4	2.9
4	3.9	3.9	3.9	2.7	2.7	3.2	6.3	57	22	12	5.2	2.9
5	3.9	3.9	3.9	2.7	2.7	3.5	6.9	56	21	11	5.1	2.8
6	3.9	3.8	3.7	2.7	2.7	3.9	7.2	57	21	11	5.0	2.7
7	3.9	3.9	3.5	2.6	2.7	3.9	8.0	61	21	10	4.9	2.7
8	3.9	3.9	3.5	2.5	2.7	3.9	8.7	72	22	10	4.8	2.7
9	3.9	3.9	3.3	2.4	2.7	3.9	9.1	85	21	10	4.6	2.7
10	3.9	3.5	3.5	2.3	2.7	3.9	9.3	95	21	9.9	4.6	2.6
11	3.9	3.9	3.5	2.2	2.8	3.6	10	92	21	9.8	4.6	2.4
12	3.9	3.9	3.5	2.2	2.9	4.3	10	91	21	9.3	4.6	2.4
13	3.9	3.9	3.5	2.2	3.2	6.7	10	84	21	9.1	4.6	2.4
14	3.9	3.9	3.3	2.2	2.9	6.3	10	82	20	8.6	4.3	2.4
15	3.9	3.9	3.2	2.2	2.9	5.4	11	79	21	8.3	4.2	2.4
16	3.9	3.9	3.2	2.2	3.1	4.7	12	79	20	7.9	4.1	2.4
17	3.9	3.9	3.2	2.2	3.1	4.6	14	76	19	7.9	3.9	2.4
18	3.9	3.9	3.2	2.2	2.9	4.2	15	68	19	7.9	3.9	2.4
19	3.9	3.9	3.2	2.2	2.9	4.2	15	57	19	7.5	3.9	2.4
20	3.9	4.0	2.9	2.2	2.9	4.0	15	50	19	7.1	3.7	2.4
21	3.9	4.0	2.9	2.2	2.9	3.9	14	43	18	7.0	3.6	2.4
22	3.9	3.9	2.9	2.2	2.9	3.9	15	38	17	7.8	3.6	2.3
23	3.9	3.9	2.9	2.2	2.9	3.9	17	32	16	6.8	3.5	2.3
24	3.9	3.9	2.9	2.2	2.9	3.9	19	31	16	6.8	3.2	2.2
25	3.8	3.8	2.9	2.4	2.9	3.9	22	28	16	6.6	3.2	2.2
26	3.6	3.9	2.9	2.7	2.9	3.6	24	27	16	6.3	3.2	2.2
27	3.9	3.9	2.9	2.7	2.9	3.5	29	27	15	6.1	3.2	2.2
28	3.9	3.9	2.9	2.7	2.9	3.5	37	24	15	5.9	3.2	2.2
29	4.0	3.8	2.8	2.7	---	3.5	46	24	14	5.9	3.2	2.2
30	3.9	3.7	2.7	2.7	---	3.5	54	23	14	5.9	3.2	2.2
31	3.9	---	2.7	2.7	---	3.5	---	24	---	5.9	3.1	---
TOTAL	120.6	116.3	101.1	75.5	79.9	123.7	468.3	1728	573	268.3	128.7	74.2
MEAN	3.89	3.88	3.26	2.44	2.85	3.99	15.6	55.7	19.1	8.65	4.15	2.47
MAX	4.0	4.0	3.9	2.8	3.2	6.7	54	95	23	14	5.7	2.9
MIN	3.6	3.5	2.7	2.2	2.7	2.9	3.8	23	14	5.9	3.1	2.2
AC-FT	239	231	201	150	158	245	929	3430	1140	532	255	147
CFSM	.56	.55	.47	.35	.41	.57	2.23	7.96	2.73	1.24	.59	.35
IN.	.64	.62	.54	.40	.42	.66	2.49	9.18	3.05	1.43	.68	.39

CAL YR 1986 TOTAL 4842.1 MEAN 13.3 MAX 142 MIN 2.2 AC-FT 9600 CFSM 1.90 IN. 25.73
WTR YR 1987 TOTAL 3857.6 MEAN 10.6 MAX 95 MIN 2.2 AC-FT 7650 CFSM 1.51 IN. 20.50

14038530 JOHN DAY RIVER NEAR JOHN DAY, OR

LOCATION.--Lat 44°25'07", long 118°54'19", in SW 1/4 SE 1/4 sec.19, T.13 S., R.32 E., Grant County, Hydrologic Unit 17070201, on left bank 1,200 ft downstream from Dog Creek, 2.5 mi east of John Day, and at mile 250.8.

DRAINAGE AREA.--386 mi^2.

PERIOD OF RECORD.--October 1968 to current year.

GAGE.--Water-stage recorder. Datum of gage is 3,130.56 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--Estimated daily discharges: Nov. 9-13, Jan. 11-14, 17-23, Feb. 27 to Mar. 1. Records excellent except for estimated daily discharges, which are good. No regulation upstream. Many diversions upstream from station for irrigation.

AVERAGE DISCHARGE.--19 years, 220 ft^3/s, 159,400 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 5,830 ft^3/s June 9, 1969, gage height, 10.80 ft, from floodmark; minimum discharge, 3.5 ft^3/s Aug. 26-28, 1969.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 800 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Jan. 27	2000	*603	*4.78				

Minimum discharge, 13 ft^3/s Sept. 2.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	119	114	144	115	266	130	196	512	212	40	48	17
2	114	110	140	124	278	139	225	398	158	59	45	14
3	112	109	137	122	238	148	253	326	132	72	41	14
4	110	108	137	119	184	168	277	285	117	63	38	14
5	107	108	143	117	168	200	276	256	108	60	36	14
6	105	128	142	116	171	276	271	250	95	57	32	16
7	105	137	137	107	173	283	266	244	96	54	28	16
8	103	131	132	87	165	260	270	236	148	51	27	17
9	103	135	116	92	160	245	269	248	146	54	23	17
10	100	125	124	100	174	230	269	241	120	59	20	20
11	100	120	128	110	195	217	285	228	101	57	20	22
12	100	120	130	110	185	251	282	206	86	52	21	23
13	100	130	128	110	227	484	264	222	78	50	23	22
14	104	142	129	110	242	405	246	199	75	48	28	22
15	101	142	121	100	215	396	251	192	130	49	32	22
16	100	140	118	78	206	343	260	186	189	47	33	25
17	100	183	115	90	196	309	282	175	174	50	32	28
18	101	164	118	95	200	342	300	160	148	57	30	30
19	101	164	118	95	186	328	280	147	124	54	29	30
20	99	153	114	88	166	312	256	140	101	49	25	29
21	99	180	112	95	163	271	236	119	95	45	23	31
22	98	183	115	115	161	248	228	116	90	153	21	31
23	98	175	116	120	160	240	250	114	82	103	24	29
24	97	166	115	129	148	235	276	147	80	81	29	29
25	97	159	113	137	143	220	272	221	65	74	27	30
26	97	153	117	299	127	214	241	181	56	68	27	32
27	106	154	113	358	125	205	262	286	54	63	27	35
28	111	154	107	280	125	195	321	254	53	57	25	40
29	107	160	115	182	---	184	394	186	49	53	26	44
30	122	145	112	153	---	183	519	178	43	49	23	44
31	117	---	107	143	---	179	---	325	---	47	20	---
TOTAL	3233	4292	3813	4096	5147	7840	8277	6978	3205	1875	883	757
MEAN	104	143	123	132	184	253	276	225	107	60.5	28.5	25.2
MAX	122	183	144	358	278	484	519	512	212	153	48	44
MIN	97	108	107	78	125	130	196	114	43	40	20	14
AC-FT	6410	8510	7560	8120	10210	15550	16420	13840	6360	3720	1750	1500

CAL YR 1986 TOTAL 79072.8 MEAN 217 MAX 2210 MIN 15 AC-FT 156800
WTR YR 1987 TOTAL 50396 MEAN 138 MAX 519 MIN 14 AC-FT 99960

14040500 JOHN DAY RIVER AT PICTURE GORGE, NEAR DAYVILLE, OR

LOCATION.--Lat 44°31'15", long 119°37'30", in SW 1/4 sec.17, T.12 S., R.26 E., Grant County, Hydrologic Unit 17070201, on right bank 0.7 mi upstream from Rock Creek, 5.5 mi northwest of Dayville, and at mile 205.1.

DRAINAGE AREA.--1,680 mi^2, approximately.

PERIOD OF RECORD.--April 1926 to current year. Monthly discharge only April 1926, published in WSP 1318.

REVISED RECORDS.--WSP 1218: 1950. WSP 1348: Drainage area. WSP 1448: 1926, 1928, 1932(M), 1936.

GAGE.--Water-stage recorder. Datum of gage is 2,229.84 ft above National Geodetic Vertical Datum of 1929. Prior to Oct. 11, 1926, nonrecording gage and Oct. 11, 1926, to Sept. 30, 1930, water-stage recorder at same site at datum 2.50 ft higher. Oct. 1, 1930, to Aug. 28, 1970, at datum 2.00 ft higher.

REMARKS.--Estimated daily discharges: Jan. 18-24. Records good except for estimated daily discharges, which are poor. No regulation. Many diversions for irrigation upstream from station.

AVERAGE DISCHARGE.--61 years, 503 ft^3/s, 364,400 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 8,170 ft^3/s Dec. 22, 1964, gage height, 14.97 ft; minimum discharge, 1.0 ft^3/s for several days in August and September 1930, Aug. 8, 9, 1936, Sept. 9, 1966.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 1,800 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Mar. 13	1630	*1,910	*7.90	No other peak greater than base discharge.			

Minimum discharge, 8.5 ft^3/s Aug. 24, due to work in channel.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	251	245	339	258	434	406	697	1100	514	113	90	23
2	239	238	330	300	608	394	813	1020	419	119	87	23
3	232	234	322	281	594	419	966	879	351	133	74	22
4	226	233	318	279	495	567	1100	763	302	139	66	23
5	220	233	321	267	430	748	1110	676	282	133	55	24
6	216	243	325	266	424	970	1060	602	251	124	49	24
7	215	273	316	256	457	1050	1050	565	236	117	44	25
8	211	283	305	208	456	955	1060	525	257	112	38	23
9	208	277	285	197	464	959	1060	517	313	97	38	23
10	207	270	248	214	477	874	1040	504	289	96	38	23
11	205	257	267	248	637	816	1120	474	260	101	37	24
12	206	264	295	253	651	1050	1080	447	242	102	35	25
13	206	284	300	256	864	1740	994	447	211	99	37	25
14	207	286	298	251	936	1710	929	437	201	91	39	25
15	207	293	283	236	753	1750	918	399	218	87	40	29
16	204	291	272	208	670	1550	935	384	356	80	37	38
17	204	322	253	200	615	1320	954	367	356	91	36	34
18	213	365	247	215	597	1330	972	349	346	116	35	36
19	215	343	275	225	565	1250	909	323	317	126	34	36
20	211	339	271	205	519	1170	823	305	280	120	33	36
21	208	352	264	210	496	1060	733	281	260	112	28	35
22	210	393	265	225	482	964	665	272	248	185	27	34
23	210	400	265	245	474	913	668	266	232	308	27	35
24	209	389	264	265	442	894	687	268	215	231	25	34
25	208	377	259	287	404	831	675	372	192	205	26	34
26	204	357	259	375	368	790	653	390	172	186	23	35
27	217	355	264	684	386	754	638	405	155	170	24	38
28	233	381	249	718	410	718	673	538	139	148	23	34
29	231	382	248	496	---	672	747	449	128	134	23	36
30	249	365	257	402	---	665	886	408	121	118	23	45
31	255	---	237	368	---	658	---	471	---	97	24	---
TOTAL	6737	9324	8701	9098	15108	29947	26615	15203	7863	4090	1215	901
MEAN	217	311	281	293	540	966	887	490	262	132	39.2	30.0
MAX	255	400	339	718	936	1750	1120	1100	514	308	90	45
MIN	204	233	237	197	368	394	638	266	121	80	23	22
AC-FT	13360	18490	17260	18050	29970	59400	52790	30160	15600	8110	2410	1790

CAL YR 1986 TOTAL 225247 MEAN 617 MAX 5220 MIN 29 AC-FT 446800
WTR YR 1987 TOTAL 134802 MEAN 369 MAX 1750 MIN 22 AC-FT 267400

14040600 MOUNTAIN CREEK NEAR MITCHELL, OR

LOCATION.--Lat 44°32'06", long 120°01'45", in NW 1/4 NE 1/4 sec.13, T.12 S., R.22 E., Wheeler County, Hydrologic Unit 17070201, on left bank about 1.5 mi southwest of Highway 26, and about 7 mi southeast of Mitchell.

DRAINAGE AREA.--20.0 mi^2.

PERIOD OF RECORD.--October 1985 to current year. May 1966 to September 1985 available from Oregon Water Resources Department.

GAGE.--Water-stage recorder.

REMARKS.--Estimated daily discharges: Nov. 30, Dec. 1, 2, 31, Jan. 1-24, Feb. 20, 23-28, Mar. 1. Records good except for estimated daily discharges, which are poor. Several diversions for irrigation upstream from station.

AVERAGE DISCHARGE.--21 years (1966-87), 11.8 ft^3/s, 8,550 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 538 ft^3/s June 9, 1969, gage height, 2.46 ft; maximum gage height, 3.57 ft Feb. 14, 1981, backwater from ice; no flow at times.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 82 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Jan. 27	1330	170	2.25	Mar. 12	2330	*191	*2.33
Mar. 3	1500	91	1.89	Mar. 17	1830	91	1.89
Mar. 5	1830	102	1.95				

Minimum discharge, 0.27 ft^3/s Aug. 28.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.2	2.2	5.5	1.8	63	13	31	52	7.8	2.0	2.4	.61
2	2.0	2.0	4.5	1.8	39	26	43	41	6.9	5.6	2.3	.54
3	1.7	2.0	3.5	2.4	21	49	51	34	6.4	3.5	2.0	.54
4	1.6	2.0	3.6	2.0	31	42	44	31	5.9	2.7	1.8	.60
5	1.5	2.4	5.9	1.6	17	78	45	28	5.4	2.5	1.6	.62
6	1.5	3.7	4.3	1.4	16	71	42	26	4.5	2.4	1.7	.61
7	1.5	4.2	3.7	1.0	12	46	43	23	4.6	2.3	1.7	.61
8	1.5	2.9	3.2	.75	10	39	45	22	7.9	2.3	1.5	.58
9	1.5	2.8	2.9	.75	12	34	43	25	7.6	2.3	1.4	.60
10	1.4	5.3	2.5	.77	12	28	46	20	6.2	4.3	1.1	.62
11	1.3	4.2	2.6	.80	14	26	52	18	4.8	3.5	.68	.64
12	1.5	4.4	3.0	.90	16	90	41	17	4.2	2.6	1.0	.67
13	1.7	3.4	3.2	.95	41	124	37	16	4.0	2.1	1.4	.67
14	1.6	3.2	2.7	.90	25	73	39	15	4.3	1.8	1.6	.67
15	1.6	3.1	2.3	.80	18	57	40	14	9.3	1.5	1.5	.73
16	1.6	3.2	2.2	.75	16	50	42	13	8.4	1.3	1.4	.79
17	2.6	4.1	2.2	.75	13	57	44	12	6.9	2.0	1.3	.79
18	3.4	3.2	2.2	.80	12	48	41	11	5.8	4.3	1.2	.72
19	2.5	3.0	2.2	.90	10	38	36	11	4.7	3.4	1.1	.79
20	2.2	3.2	2.2	.85	9.0	37	32	11	4.3	2.0	1.1	.79
21	2.1	4.1	2.1	.77	9.1	30	31	9.2	4.4	2.1	.59	.79
22	1.9	3.9	2.1	.80	8.5	28	32	7.5	3.9	18	.40	.92
23	1.9	3.8	2.1	1.0	8.5	33	34	7.9	3.2	8.1	.77	.93
24	1.8	4.8	2.1	1.3	8.0	29	34	15	2.7	5.7	.60	.93
25	1.8	5.0	2.1	1.7	7.0	27	32	12	1.9	4.6	.53	.93
26	2.1	3.5	2.1	57	9.0	25	31	11	2.1	3.9	.55	1.1
27	3.3	5.6	2.1	111	12	23	31	9.6	1.6	3.3	.53	1.1
28	2.3	4.7	2.1	69	14	21	32	8.7	1.3	2.9	.36	1.1
29	2.9	4.4	2.0	50	---	19	34	8.2	1.3	2.7	.48	.93
30	3.0	5.5	1.9	40	---	20	44	8.9	1.4	2.6	.53	.93
31	2.6	---	1.8	47	---	23	---	10	---	2.4	.55	---
TOTAL	62.1	109.8	86.9	402.24	483.1	1304	1172	548.0	143.7	110.7	35.67	22.85
MEAN	2.00	3.66	2.80	13.0	17.3	42.1	39.1	17.7	4.79	3.57	1.15	.76
MAX	3.4	5.6	5.9	111	63	124	52	52	9.3	18	2.4	1.1
MIN	1.3	2.0	1.8	.75	7.0	13	31	7.5	1.3	1.3	.36	.54
AC-FT	123	218	172	798	958	2590	2320	1090	285	220	71	45

CAL YR 1986 TOTAL 4125.40 MEAN 11.3 MAX 81 MIN .46 AC-FT 8180
WTR YR 1987 TOTAL 4481.06 MEAN 12.3 MAX 124 MIN .36 AC-FT 8890

14042500 CAMAS CREEK NEAR UKIAH, OR

LOCATION.--Lat 45°09'25", long 118°49'10", in SE 1/4 SE 1/4 sec.3, T.5 S., R.32 E., Umatilla County, Hydrologic Unit 17070202, on right bank 1.2 mi upstream from Cable Creek, 5.8 mi east of Ukiah, and at mile 18.7.

DRAINAGE AREA.--121 mi^2.

PERIOD OF RECORD.--May 1914 to September 1917, November 1919 to July 1920, November 1920 to June 1924, March 1932 to June 1940 (fragmentary), November 1940 to current year. Monthly discharge only for some periods, published in WSP 1318. Published as "above Cable Creek, near Ukiah" 1914-17, 1919-24.

REVISED RECORDS.--WSP 1448: 1916, 1920, 1922(M), 1924.

GAGE.--Water-stage recorder. Datum of gage is 3,588.61 ft above National Geodetic Vertical Datum of 1929 (levels by State Highway Department). May 1, 1914, to June 30, 1924, nonrecording gage and Mar. 1, 1932, to July 2, 1940, water-stage recorder at site 1.2 mi downstream at different datum.

REMARKS.--Estimated daily discharges: Nov. 10, 11, Dec. 9-31, Jan. 1-24, Feb. 1-13, 25-28, Mar. 1. Records good except those for periods of ice effect Nov. 10, 11 Dec. 9-31, Jan. 1-24, Feb. 1-13, 25-28, Mar. 1, and those above 950 ft^3/s, which are poor. No regulation. Diversions for irrigation upstream from station.

AVERAGE DISCHARGE.--51 years (water years 1915-17, 1922-23, 1942-87), 96.9 ft^3/s, 70,200 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 3,840 ft^3/s Jan. 30, 1965, gage height, 5.21 ft; maximum gage height, 5.92 ft Jan. 24, 1982 (ice jam); minimum discharge recorded, 1.0 ft^3/s Aug. 9, 1932, June 24 to July 2, 1940.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 550 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Mar. 5	1900	*950	*2.88	Mar. 13	1930	751	2.64

Minimum discharge, 3.1 ft^3/s Sept. 24, 15.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	14	12	100	18	66	44	182	186	35	15	6.2	4.0
2	11	9.9	86	17	80	47	273	170	29	17	6.5	4.0
3	10	9.1	74	18	70	218	350	147	27	15	5.7	3.9
4	9.7	8.6	65	19	57	406	396	127	25	13	5.4	3.9
5	8.8	9.0	68	18	43	689	360	113	24	12	5.6	4.0
6	8.4	14	71	18	42	749	349	103	23	11	4.9	4.0
7	8.1	14	64	15	44	517	359	96	22	10	4.9	4.0
8	7.5	13	57	11	45	380	367	88	38	10	4.8	3.9
9	7.5	13	44	8.0	45	328	318	85	32	9.8	4.7	3.7
10	7.5	12	35	6.5	48	310	308	69	26	12	4.5	3.7
11	7.2	17	28	7.0	60	304	348	59	24	10	4.5	3.7
12	7.1	21	32	8.0	80	408	291	54	21	9.1	4.6	3.7
13	7.0	23	40	9.5	130	706	249	52	20	8.6	5.8	3.8
14	6.7	25	33	13	212	602	242	45	20	8.1	6.9	3.8
15	6.6	29	26	12	169	538	257	42	26	7.5	7.2	3.9
16	6.4	30	21	10	141	435	279	38	28	7.3	6.4	4.2
17	6.4	36	19	8.5	125	377	297	34	23	7.9	5.9	3.9
18	6.4	45	18	9.0	107	375	275	31	21	9.5	5.5	3.8
19	6.4	78	17	10	96	313	226	29	19	9.5	5.2	3.9
20	6.4	123	18	9.0	87	270	184	27	18	8.5	4.9	3.9
21	6.4	233	18	9.5	82	233	165	26	20	7.9	4.6	3.8
22	6.1	154	20	10	77	202	165	26	18	9.6	4.5	3.8
23	6.0	125	22	15	72	185	181	25	16	9.6	4.5	4.0
24	5.9	129	24	22	62	173	188	32	15	8.5	4.5	3.5
25	5.8	122	23	33	50	162	178	32	14	10	4.5	3.2
26	5.9	105	25	41	40	156	157	28	14	8.9	4.6	3.9
27	8.7	111	23	77	35	145	150	35	13	7.7	4.2	4.1
28	8.3	146	21	155	40	132	164	32	12	7.2	4.2	4.1
29	8.7	145	18	141	---	118	167	27	11	6.8	4.2	3.9
30	14	116	16	98	---	119	155	25	11	6.4	4.1	3.8
31	13	---	17	71	---	134	---	36	---	6.3	4.0	---
TOTAL	247.9	1927.6	1143	917.0	2205	9775	7580	1919	645	299.7	158.0	115.8
MEAN	8.00	64.3	36.9	29.6	78.7	315	253	61.9	21.5	9.67	5.10	3.86
MAX	14	233	100	155	212	749	396	186	38	17	7.2	4.2
MIN	5.8	8.6	16	6.5	35	44	150	25	11	6.3	4.0	3.2
AC-FT	492	3820	2270	1820	4370	19390	15030	3810	1280	594	313	230

CAL YR 1986 TOTAL 36750.8 MEAN 101 MAX 1190 MIN 3.7 AC-FT 72900
WTR YR 1987 TOTAL 26933.0 MEAN 73.8 MAX 749 MIN 3.2 AC-FT 53420

14044000 MIDDLE FORK JOHN DAY RIVER AT RITTER, OR

LOCATION.--Lat 44°53'20", long 119°08'25", in SW 1/4 NW 1/4 sec.8, T.8 S., R.30 E., Grant County, Hydrologic Unit 17070203, on left bank 0.2 mi south of Ritter, 0.8 mi downstream from Twelvemile Creek, and at mile 14.9.

DRAINAGE AREA.--515 mi^2.

PERIOD OF RECORD.--October 1929 to current year.

REVISED RECORDS.--WSP 739: 1931. WSP 1218: 1950. WSP 1448: 1930-32, 1937, drainage area.

GAGE.--Water-stage recorder. Datum of gage is 2,544.56 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--Estimated daily discharges: Dec. 19-21, Jan. 11-24. Records good except those for periods of ice effect, Dec. 19-21, Jan. 11-24, which are poor. No regulation. Diversions for irrigation upstream from station.

AVERAGE DISCHARGE.--58 years, 256 ft^3/s, 185,500 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 4,730 ft^3/s Jan. 30, 1965, gage height, 8.39 ft, from rating curve extended above 2,200 ft^3/s; maximum gage height, 9.13 ft Feb. 1, 1963, ice jam; minimum discharge, 0.90 ft^3/s Aug. 19, 20, 1966.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 1,000 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Mar. 13	1000	*1,260	*5.17	No other peak greater than base discharge.			

Minimum discharge, 17 ft^3/s Sept. 3, 4, 10-13.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	82	75	114	57	225	161	410	842	215	62	34	20
2	72	68	111	70	235	158	513	715	180	70	34	20
3	66	64	105	79	232	217	604	618	160	96	33	18
4	63	62	94	65	187	366	702	550	146	74	31	17
5	62	62	110	73	171	596	690	542	138	64	29	21
6	61	77	112	71	174	852	666	551	126	61	28	21
7	60	92	103	51	183	806	668	556	119	58	26	20
8	58	90	94	36	181	676	700	565	144	54	26	20
9	57	85	75	27	179	606	671	586	154	52	25	20
10	56	68	48	30	193	566	648	534	131	53	24	18
11	55	69	43	40	254	533	709	476	115	54	24	17
12	54	96	97	52	270	621	668	433	107	48	23	17
13	54	105	93	59	452	1120	599	404	99	43	25	18
14	54	95	84	62	553	1050	554	369	94	41	29	19
15	55	99	75	64	402	1080	583	338	108	39	32	19
16	58	99	73	41	327	909	630	314	151	37	31	21
17	54	207	60	50	303	790	699	284	140	37	29	23
18	53	164	44	58	286	947	698	257	131	48	27	24
19	53	158	52	46	253	795	618	231	123	58	25	24
20	53	140	58	42	220	674	541	215	110	53	24	24
21	53	237	66	44	212	582	507	202	109	48	24	24
22	53	194	73	53	210	521	529	191	106	87	24	23
23	52	164	80	65	198	491	599	180	97	146	23	23
24	52	152	77	85	168	479	641	184	93	82	24	22
25	52	160	72	106	146	444	655	219	85	64	25	22
26	52	134	75	144	133	437	652	202	78	58	24	23
27	59	138	66	283	153	409	690	207	69	49	23	25
28	73	153	61	215	159	380	762	216	63	41	23	26
29	65	159	67	143	---	343	792	182	62	38	22	26
30	90	130	70	124	---	349	858	168	64	37	20	26
31	85	---	52	117	---	354	---	203	---	35	20	---
TOTAL	1866	3596	2404	2452	6659	18312	19256	11534	3517	1787	811	641
MEAN	60.2	120	77.5	79.1	238	591	642	372	117	57.6	26.2	21.4
MAX	90	237	114	283	553	1120	858	842	215	146	34	26
MIN	52	62	43	27	133	158	410	168	62	35	20	17
AC-FT	3700	7130	4770	4860	13210	36320	38190	22880	6980	3540	1610	1270

CAL YR 1986 TOTAL 116372 MEAN 319 MAX 2890 MIN 29 AC-FT 230800
WTR YR 1987 TOTAL 72835 MEAN 200 MAX 1120 MIN 17 AC-FT 144500

14046000 NORTH FORK JOHN DAY RIVER AT MONUMENT, OR

LOCATION.--Lat 44°48'50", long 119°25'50", in SE 1/4 sec.2, T.9 S., R.27 E., Grant County, Hydrologic Unit 17070202, on right bank just downstream from entrance to canyon, 0.7 mi downstream from Cottonwood Creek, 0.8 mi west of Monument, and at mile 15.3.

DRAINAGE AREA.--2,520 mi^2, approximately.

PERIOD OF RECORD.--March 1925 to current year. Monthly discharge only for some periods, published in WSP 1318.

REVISED RECORDS.--WSP 754: 1932(M). WSP 1448: 1927, 1931(M), 1949.

GAGE.--Water-stage recorder. Datum of gage is 1,959.64 ft above National Geodetic Vertical Datum of 1929. Prior to Nov. 24, 1925, nonrecording gage and Nov. 24, 1925, to Oct. 16, 1928, water-stage recorder at datum 1.10 ft higher. Oct. 17, 1928, to Sept. 30, 1930, water-stage recorder at datum 1.00 ft higher.

REMARKS.--Estimated daily discharges: Dec. 20, Jan. 16-23, July 13-28. Records good except for estimated daily discharges, which are poor. Very slight regulation by small reservoirs upstream. Many small diversions for irrigation upstream from station. National Weather Service gage-height telemeter at station.

AVERAGE DISCHARGE.--62 years, 1,293 ft^3/s, 936,800 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 33,400 ft^3/s Jan. 30, 1965, gage height, 18.45 ft, from rating curve extended above 17,000 ft^3/s; minimum discharge, 6 ft^3/s sometime during period Nov. 2-13, 1936 (result of freezeup); minimum daily, 17 ft^3/s Dec. 12, 1932.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 5,300 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Mar. 6	0500	7,390	8.60	Mar. 13	1030	*8,950	*9.30

Minimum discharge, 63 ft^3/s Jan. 10.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	362	313	756	206	1140	880	1880	4120	1040	271	129	82
2	301	283	711	295	1700	842	2630	3520	834	270	124	80
3	263	256	653	353	1520	1960	3330	2920	720	363	121	79
4	240	236	544	299	1210	4610	3910	2550	652	340	118	76
5	226	228	600	287	1000	5850	3890	2370	606	273	114	75
6	219	240	680	310	925	6770	3740	2340	560	248	108	77
7	215	310	642	243	998	5380	3830	2320	515	227	103	79
8	209	329	559	191	988	4270	4170	2290	543	211	102	79
9	202	312	440	105	952	3900	3850	2350	829	199	100	76
10	195	280	286	88	946	3500	3730	2170	668	200	98	74
11	188	217	219	103	1300	3250	4270	1900	557	204	92	74
12	185	269	350	179	1600	4320	3880	1710	492	188	92	74
13	184	379	573	276	2850	8210	3310	1620	444	170	95	74
14	182	370	476	305	3760	7030	3110	1490	405	160	102	74
15	182	364	372	259	2850	7090	3360	1360	416	150	116	74
16	182	381	315	225	2220	6110	3690	1280	574	135	126	74
17	185	470	279	200	2040	4780	4070	1160	600	150	119	76
18	182	563	194	220	1800	5050	4120	1040	573	165	112	81
19	180	583	238	245	1620	4300	3520	938	518	235	104	83
20	181	652	265	230	1400	3590	3010	870	465	205	99	82
21	179	867	311	220	1310	3090	2780	812	435	185	95	81
22	178	1030	448	235	1260	2720	2850	760	450	290	92	81
23	176	864	357	255	1170	2520	3160	725	404	590	90	80
24	174	821	338	285	1030	2400	3430	749	367	350	90	81
25	173	851	322	323	878	2160	3420	911	339	250	90	80
26	175	723	318	861	746	2060	3290	894	311	210	92	81
27	184	705	299	1680	763	1920	3310	836	286	185	93	82
28	212	1040	237	1360	914	1770	3610	1010	263	166	91	85
29	254	1160	226	853	---	1590	3770	840	246	155	88	91
30	257	983	287	676	---	1580	3900	745	247	145	87	91
31	348	---	219	586	---	1620	---	814	---	135	84	---
TOTAL	6573	16079	12514	11953	40890	115122	104820	49414	15359	7025	3166	2376
MEAN	212	536	404	386	1460	3714	3494	1594	512	227	102	79.2
MAX	362	1160	756	1680	3760	8210	4270	4120	1040	590	129	91
MIN	173	217	194	88	746	842	1880	725	246	135	84	74
AC-FT	13040	31890	24820	23710	81110	228300	207900	98010	30460	13930	6280	4710

CAL YR 1986 TOTAL 610302 MEAN 1672 MAX 17100 MIN 104 AC-FT 1211000
WTR YR 1987 TOTAL 385291 MEAN 1056 MAX 8210 MIN 74 AC-FT 764200

14046500 JOHN DAY RIVER AT SERVICE CREEK, OR

LOCATION.--Lat 44°47'38", long 120°00'20", in NW 1/4 NE 1/4 sec.18, T.9 S., R.23 E., Wheeler County, Hydrologic Unit 17070204, on left bank 0.2 mi downstream from bridge on State Highway 207, 0.8 mi downstream from Service Creek, 0.5 mi southwest of town of Service Creek, and at mile 156.7.

DRAINAGE AREA.--5,090 mi^2, approximately.

PERIOD OF RECORD.--March 1925 to September 1926, October 1929 to current year. Monthly discharge only March 1925 to September 1926, published in WSP 1318.

GAGE.--Water-stage recorder. Datum of gage is 1,632.42 ft above National Geodetic Vertical Datum of 1929. See WSP 1738 for history of changes prior to Feb. 24, 1957.

REMARKS.--Estimated daily discharges: Jan. 14-24. Records excellent except for estimated daily discharges, which are fair. Slight regulation by several small reservoirs upstream from station. Many small diversions for irrigation upstream from station.

AVERAGE DISCHARGE.--59 years, 1,941 ft^3/s, 1,406,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 40,200 ft^3/s Dec. 23, 1964, gage height, 17.85 ft, from rating curve extended above 14,000 ft^3/s on basis of slope-area measurement of peak flow; minimum discharge, 6.0 ft^3/s Aug. 23, 24, 1973.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 7,300 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Mar. 6	1300	8,790	8.42	Mar. 13	1830	*11,300	*9.39

Minimum discharge, 86 ft^3/s Sept. 13.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	613	630	1290	557	1420	1470	2750	5430	1560	411	255	99
2	641	585	1150	650	2480	1420	3400	5150	1460	464	242	95
3	578	563	1110	730	2530	1610	4360	4330	1220	480	234	93
4	544	541	1040	730	2160	4890	5100	3760	1080	588	213	96
5	520	526	953	690	1750	6500	5410	3380	984	524	189	94
6	504	524	1070	673	1580	8050	5210	3210	909	467	170	93
7	491	566	1090	647	1610	7370	5170	3130	837	430	157	96
8	483	651	1020	537	1670	5920	5460	3080	813	396	147	98
9	475	667	912	452	1640	5450	5420	3060	984	373	138	101
10	466	641	745	354	1610	4910	5150	3030	1150	354	130	98
11	456	605	610	383	1930	4510	5550	2710	953	357	122	94
12	447	549	626	447	2530	4840	5580	2450	840	360	118	88
13	446	636	830	555	3080	9580	4880	2270	766	347	118	90
14	446	728	927	600	5430	9730	4460	2140	702	314	125	99
15	446	714	820	560	4270	9420	4530	1950	687	281	138	98
16	445	728	733	520	3500	8810	4860	1800	773	259	148	99
17	443	771	685	470	3060	6960	5220	1680	1040	247	161	108
18	453	918	618	520	2850	6920	5470	1540	1010	269	147	117
19	460	954	556	580	2570	6420	5020	1400	936	338	135	131
20	454	1020	649	520	2320	5470	4360	1290	862	373	128	134
21	449	1030	701	500	2060	4840	3910	1210	780	353	127	126
22	446	1440	671	520	1970	4280	3780	1140	757	388	124	125
23	446	1360	703	580	1940	3900	3980	1080	739	546	119	126
24	442	1270	700	640	1760	3780	4340	1070	684	746	121	125
25	437	1260	685	712	1550	3520	4390	1180	637	597	117	125
26	439	1240	684	863	1370	3300	4280	1410	579	508	110	123
27	443	1130	669	1990	1250	3140	4170	1310	528	456	109	125
28	459	1290	629	2160	1420	2920	4390	1470	487	413	107	130
29	507	1550	580	1730	---	2720	4670	1520	451	357	104	129
30	545	1560	601	1390	---	2540	4880	1290	418	317	101	135
31	570	---	609	1220	---	2560	---	1230	---	283	100	---
TOTAL	14994	26647	24666	23480	63310	157750	140150	70700	25626	12596	4454	3290
MEAN	484	888	796	757	2261	5089	4672	2281	854	406	144	110
MAX	641	1560	1290	2160	5430	9730	5580	5430	1560	746	255	135
MIN	437	524	556	354	1250	1420	2750	1070	418	247	100	88
AC-FT	29740	52850	48930	46570	125600	312900	278000	140200	50830	24980	8830	6530

CAL YR 1986 TOTAL 900784 MEAN 2468 MAX 21900 MIN 124 AC-FT 1787000
WTR YR 1987 TOTAL 567663 MEAN 1555 MAX 9730 MIN 88 AC-FT 1126000

14047380 LONE ROCK CREEK NEAR LONEROCK, OR

LOCATION.--Lat 45°05'30", long 119°53'10", in SE 1/4 NE 1/4 sec.36, T.5 S., R.23 E., Gilliam County, Hydrologic Unit 17070204, on left bank about 800 ft downstream from road bridge in Lonerock.

DRAINAGE AREA.--69 mi^2, approximately.

PERIOD OF RECORD.--January 1966 to September 1974, October 1975 to current year. Prior to October 1985, in reports of Oregon Water Resources Department.

GAGE.--Water-stage recorder. Elevation of gage is 2,810 ft above National Geodetic Vertical Datum of 1929, from topographic map. Prior to Sept. 9, 1975, at datum approximately 0.5 ft higher.

REMARKS.--Estimated daily discharges: Dec. 9-16, 25-30, Jan. 7-24, Feb. 26-28, May 5 to June 4. Records good except for estimated daily discharges, which are poor.

AVERAGE DISCHARGE.--20 years (1966-74, 1975-87), 19.8 ft^3/s, 3.90 in/yr, 14,340 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum recorded discharge, 1,210 ft^3/s Jan. 23, 1970, gage height, 5.78 ft, datum then in use; no flow at times.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 220 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Feb. 13	0930	401	3.80	Mar. 13	0100	*754	*4.57
Mar. 5	1430	393	3.78				

Minimum discharge, 0.14 ft^3/s Aug. 31, Sept. 1, 2.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.2	3.2	9.4	4.2	26	20	58	21	4.2	.33	.32	.14
2	2.1	3.1	8.1	4.0	25	28	65	20	3.5	.72	.31	.14
3	2.0	3.0	7.2	4.2	20	105	65	16	3.0	.47	.28	.17
4	1.9	3.0	6.5	3.7	14	180	59	13	2.5	.37	.26	.18
5	1.9	3.0	9.8	3.4	13	306	54	11	2.2	.52	.24	.18
6	2.0	3.4	11	3.2	16	216	48	10	1.8	.41	.22	.18
7	2.0	3.9	8.7	2.3	22	130	46	9.5	1.8	.44	.21	.18
8	2.0	3.9	6.5	1.9	24	111	45	8.5	2.4	.45	.21	.17
9	2.0	4.0	3.5	1.8	24	103	41	7.5	2.8	.38	.19	.17
10	2.0	3.0	3.4	1.9	30	87	42	6.5	2.2	.48	.18	.16
11	2.1	3.7	3.5	2.0	42	81	53	6.0	1.7	.48	.18	.16
12	2.1	4.5	3.6	2.1	41	326	41	5.0	1.2	.48	.18	.16
13	2.1	4.3	3.8	2.2	276	352	35	4.5	.99	.47	.22	.17
14	2.1	5.4	3.7	2.3	131	193	33	4.0	.86	.37	.30	.17
15	2.0	5.2	3.6	2.2	85	179	31	3.5	2.1	.32	.34	.18
16	2.1	5.4	3.5	1.9	62	158	27	3.3	2.7	.29	.33	.22
17	2.1	8.0	3.4	2.0	53	169	26	3.3	2.0	.41	.32	.25
18	2.2	6.1	3.2	2.2	45	159	24	3.5	1.8	.84	.29	.26
19	2.2	8.3	3.3	2.3	39	122	22	3.7	1.7	1.1	.28	.25
20	2.2	7.1	3.3	2.5	33	103	21	3.8	1.8	.70	.25	.24
21	2.2	9.1	3.2	2.4	31	89	21	4.0	1.9	.80	.23	.24
22	2.3	8.0	3.4	2.2	28	78	20	4.1	1.8	1.1	.21	.23
23	2.4	6.7	3.3	2.5	26	77	20	3.9	1.5	1.1	.23	.22
24	2.3	9.3	3.3	3.0	23	72	19	4.0	1.2	.76	.28	.20
25	2.2	11	3.0	5.4	21	65	17	4.3	.90	.73	.26	.20
26	2.3	7.3	2.8	12	19	60	14	4.5	.65	.55	.23	.26
27	3.0	17	2.7	15	18	52	14	5.0	.32	.43	.19	.30
28	2.9	25	2.8	14	19	47	15	5.4	.26	.33	.18	.32
29	3.1	15	2.6	10	---	41	15	4.8	.25	.29	.17	.30
30	3.9	12	2.5	8.9	---	41	16	4.7	.22	.33	.16	.28
31	3.4	---	2.6	10	---	46	---	4.8	---	.32	.15	---
TOTAL	71.3	211.9	141.2	137.7	1206	3796	1007	213.1	52.25	16.77	7.40	6.28
MEAN	2.30	7.06	4.55	4.44	43.1	122	33.6	6.87	1.74	.54	.24	.21
MAX	3.9	25	11	15	276	352	65	21	4.2	1.1	.34	.32
MIN	1.9	3.0	2.5	1.8	13	20	14	3.3	.22	.29	.15	.14
AC-FT	141	420	280	273	2390	7530	2000	423	104	33	15	12
CFSM	.03	.10	.07	.06	.62	1.77	.49	.10	.03	.01	.00	.00
IN.	.04	.11	.08	.07	.65	2.05	.54	.11	.03	.01	.00	.00

CAL YR 1986 TOTAL 9364.44 MEAN 25.7 MAX 460 MIN .07 AC-FT 18570 CFSM .37 IN. 5.05
WTR YR 1987 TOTAL 6866.90 MEAN 18.8 MAX 352 MIN .14 AC-FT 13620 CFSM .27 IN. 3.70

14047390 ROCK CREEK ABOVE WHYTE PARK, NEAR CONDON, OR

LOCATION.--Lat 45°15'53", long 120°01'15", in NE 1/4 SW 1/4 sec.36, T.3 S., R.22 E., Gilliam County, Hydrologic Unit 17070204, on left bank 0.2 mi upstream from Whyte Park, 8.0 mi northeast of Condon, and at mile 40.8.

DRAINAGE AREA.--297 mi^2.

PERIOD OF RECORD.--October 1975 to current year.

GAGE.--Water-stage recorder and crest-stage gage. Datum of gage is 1,714.50 ft above National Geodetic Vertical Datum of 1929 (Soil Conservation Service temporary bench mark).

REMARKS.--Estimated daily discharges: Dec. 8 to Jan. 13, Jan. 15-21, May 12 to June 16. Records fair. No regulation or diversion upstream from station.

AVERAGE DISCHARGE.--12 years, 63.4 ft^3/s, 45,930 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 3,360 ft^3/s May 5, 1983, gage height, 9.17 ft; maximum gage height, 9.4 ft Feb. 6, 1979; minimum discharge, 0.08 ft^3/s Aug. 17, 19, 20, 22, 1977.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 220 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Feb. 13	1600	840	7.58	Mar. 13	0700	*1,070	*7.76
Mar. 6	0030	1,000	7.67				

Minimum discharge, 1.3 ft^3/s July 15, 16.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	9.5	14	37	16	101	61	117	36	14	2.7	2.6	1.5
2	9.4	12	35	19	125	63	125	47	13	2.7	2.6	1.6
3	9.2	11	33	19	113	238	127	40	11	2.9	2.6	1.7
4	9.1	11	31	18	95	543	118	32	9.8	2.5	2.4	1.7
5	9.0	11	32	15	82	740	112	27	9.4	2.7	2.2	1.7
6	9.0	11	37	14	77	781	105	23	9.0	2.5	2.2	1.7
7	8.5	12	37	13	88	525	97	21	7.9	2.5	2.2	1.6
8	8.6	13	30	13	88	424	90	19	7.6	2.4	2.2	1.6
9	8.7	14	20	13	85	428	83	16	7.2	2.2	1.9	1.8
10	8.3	14	18	13	86	352	77	14	7.2	2.3	1.8	1.8
11	8.7	12	17	13	116	302	98	12	6.6	2.1	1.8	1.8
12	9.0	12	17	16	147	478	87	11	5.7	1.8	1.9	1.9
13	9.2	14	18	15	548	875	76	12	5.2	1.7	2.3	2.0
14	9.5	16	19	16	527	549	69	12	4.9	1.6	2.6	2.1
15	9.4	17	17	14	321	578	65	12	5.4	1.5	2.4	2.2
16	9.5	17	17	12	226	560	58	12	6.9	1.5	2.3	2.4
17	9.7	21	17	11	186	534	54	11	7.3	1.9	2.2	2.5
18	9.8	22	16	12	160	556	53	10	6.6	2.6	2.2	2.5
19	9.6	23	16	12	134	420	48	9.0	6.1	4.1	2.1	2.5
20	10	23	16	17	111	340	43	9.4	5.6	3.5	1.9	2.4
21	10	23	16	13	103	289	42	9.4	6.4	3.5	1.9	2.4
22	10	24	16	13	92	243	38	9.4	6.2	3.3	1.9	2.5
23	9.9	23	17	12	88	220	36	9.4	5.6	3.4	1.9	2.4
24	9.4	28	17	14	69	224	34	9.8	5.5	3.5	1.9	2.5
25	9.4	26	17	41	59	199	30	11	4.8	3.3	1.9	2.6
26	9.6	26	17	51	54	178	29	12	4.1	3.0	1.8	2.9
27	12	27	15	65	65	158	26	13	3.5	2.9	1.8	3.1
28	11	53	14	85	65	142	27	14	3.2	2.9	1.8	3.2
29	11	49	14	65	---	125	29	14	3.0	2.6	1.7	3.2
30	14	43	14	56	---	116	26	12	2.8	2.6	1.6	3.3
31	14	---	14	55	---	113	---	14	---	2.6	1.6	---
TOTAL	304.0	622	651	761	4011	11354	2019	513.4	201.5	81.3	64.2	67.1
MEAN	9.81	20.7	21.0	24.5	143	366	67.3	16.6	6.72	2.62	2.07	2.24
MAX	14	53	37	85	548	875	127	47	14	4.1	2.6	3.3
MIN	8.3	11	14	11	54	61	26	9.0	2.8	1.5	1.6	1.5
AC-FT	603	1230	1290	1510	7960	22520	4000	1020	400	161	127	133

CAL YR 1986 TOTAL 28156.4 MEAN 77.1 MAX 1760 MIN 1.7 AC-FT 55850
WTR YR 1987 TOTAL 20649.5 MEAN 56.6 MAX 875 MIN 1.5 AC-FT 40960

14048000 JOHN DAY RIVER AT MCDONALD FERRY, OR
(National stream quality accounting network station)

LOCATION.--Lat 45°35'16", long 120°24'30", in NE 1/4 NW 1/4 sec.11, T.1 N., R.19 E., Sherman County, Hydrologic Unit 17070204, on left bank at McDonald Ferry, 0.8 mi downstream from Rock Creek, 10 mi east of Klondike, and at mile 20.9.

GAGE AREA.--7,580 mi^2, approximately.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--December 1904 to current year. Prior to Oct. 1, 1930, published as "at McDonald."

REVISED RECORDS.--WSP 1094: 1894(M), 1932(M). WSP 1448: 1908-9, 1912, 1916, 1920(M), 1922, 1932.

GAGE.--Water-stage recorder. Datum of gage is 392.27 ft above National Geodetic Vertical Datum of 1929. Prior to Aug. 30, 1930, nonrecording gage at same site and datum.

REMARKS.--Estimated daily discharges: Jan. 20-26. Water-discharge records good. No regulation. Many diversions for irrigation upstream from station.

AVERAGE DISCHARGE.--82 years (water years 1906-87), 2,103 ft^3/s, 1,524,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 42,800 ft^3/s Dec. 24, 1964, gage height, 13.59 ft, from floodmark, from rating curve extended above 11,000 ft^3/s on basis of slope-area measurement of peak flow; no flow for part of Sept. 2, 1966, Aug. 15 to Sept. 16, 1973, Aug. 13, 14, 19-25, 1977.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of 1894 reached a stage of 12.8 ft, from floodmarks, discharge, 39,100 ft^3/s, from rating curve extended above 22,000 ft^3/s.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 6,900 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Mar. 7	0930	9,090	7.19	Mar. 15	0830	*11,900	*8.21

Minimum discharge, 92 ft^3/s Sept. 17.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	658	636	1750	740	1860	1610	2890	4930	1310	449	337	113
2	660	651	1610	797	1930	1760	2970	5420	1350	455	318	111
3	686	729	1390	788	2660	1820	3460	5220	1600	452	295	108
4	727	689	1310	835	2940	2150	4440	4480	1370	445	267	110
5	662	660	1300	927	2660	4820	5180	3880	1220	462	233	109
6	624	631	1220	913	2250	7170	5490	3460	1090	532	226	105
7	593	610	1180	860	1990	8480	5310	3250	1010	528	213	106
8	571	612	1260	829	1900	7650	5250	3150	970	455	193	110
9	558	647	1250	789	1990	6410	5500	3090	904	423	186	112
10	534	749	1160	625	1970	5850	5480	3080	886	399	173	107
11	527	781	1040	528	1950	5300	5250	3040	1110	375	165	107
12	521	739	903	500	2040	5000	5640	2810	1120	355	150	102
13	515	700	754	503	2890	6010	5630	2560	966	342	143	101
14	509	652	777	552	3780	10700	5000	2360	874	334	140	100
15	505	728	1030	658	5720	11100	4580	2240	791	328	137	102
16	502	847	1050	713	4720	10900	4620	2050	742	309	130	97
17	505	843	967	637	3950	9880	4920	1890	722	281	141	95
18	511	880	888	599	3450	8130	5230	1790	827	295	146	97
19	510	918	843	543	3230	7850	5450	1660	1050	309	164	99
20	512	1080	764	540	2950	7100	5060	1530	1010	285	168	105
21	523	1090	685	520	2720	6140	4470	1420	965	289	164	107
22	518	1160	774	540	2440	5460	4040	1340	903	332	150	131
23	512	1260	831	560	2370	4880	3830	1260	820	354	143	145
24	508	1550	805	600	2290	4520	3970	1210	782	418	132	152
25	508	1440	836	720	2120	4310	4320	1180	745	516	133	149
26	510	1410	842	1000	1930	4040	4410	1170	688	739	133	142
27	523	1440	823	1530	1740	3740	4330	1350	639	610	131	138
28	523	1400	809	1910	1600	3560	4200	1430	575	509	116	147
29	527	1390	797	2540	---	3330	4400	1360	520	448	116	156
30	537	1630	758	2290	---	3110	4720	1620	475	409	120	160
31	588	---	694	1880	---	2900	---	1450	---	373	110	---
TOTAL	17167	28552	31100	27966	74040	175680	140040	76680	28034	12810	5373	3523
MEAN	554	952	1003	902	2644	5667	4668	2474	934	413	173	117
MAX	727	1630	1750	2540	5720	11100	5640	5420	1600	739	337	160
MIN	502	610	685	500	1600	1610	2890	1170	475	281	110	95
AC-FT	34050	56630	61690	55470	146900	348500	277800	152100	55610	25410	10660	6990

CAL YR 1986 TOTAL 985576 MEAN 2700 MAX 27700 MIN 125 AC-FT 1955000
WTR YR 1987 TOTAL 620965 MEAN 1701 MAX 11100 MIN 95 AC-FT 1232000

14048000 JOHN DAY RIVER AT MCDONALD FERRY, OR--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1911-12, 1960-68, 1975 to current year.

PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: December 1975 to September 1981.
WATER TEMPERATURE: October 1962 to September 1968, October 1975 to September 1981.
SEDIMENT CONCENTRATION: October 1962 to September 1968.
SEDIMENT DISCHARGE: October 1962 to September 1968.

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SPE-CIFIC CON-DUCT-ANCE (US/CM)	PH (STAND-ARD UNITS)	TEMPER-ATURE WATER (DEG C)	OXYGEN, DIS-SOLVED (MG/L)	OXYGEN DIS-SOLVED (PER-CENT SATUR-ATION)	COLI-FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)	STREP-TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML)	HARD-NESS (MG/L AS CACO3)	HARD-NESS NONCARB (MG/L AS CACO3)	CALCIUM DIS-SOLVED (MG/L AS CA)
NOV												
12...	1435	735	276	8.4	5.0	12.9	101	26	75	110	0	26
FEB												
10...	1130	2000	204	7.8	5.5	12.5	100	240	1100	85	0	20
MAY												
27...	1120	1380	190	8.5	15.5	9.8	101	K63	92	80	0	19
AUG												
12...	1015	151	295	8.8	22.5	8.6	101	K8	K6	120	0	26

DATE	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG)	SODIUM, DIS-SOLVED (MG/L AS NA)	POTAS-SIUM, DIS-SOLVED (MG/L AS K)	ALKA-LINITY WAT DIS IT FIELD (MG/L AS CACO3)	BICAR-BONATE IT-FLD (MG/L AS HCO3)	CAR-BONATE IT-FLD (MG/L AS CO3)	SULFATE DIS-SOLVED (MG/L AS SO4)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)	FLUO-RIDE, DIS-SOLVED (MG/L AS F)	NITRO-GEN, AMMONIA DIS-SOLVED (MG/L AS N)	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N)
NOV											
12...	11	15	2.2	128	140	8	13	3.4	0.2	<0.01	<0.1
FEB											
10...	8.5	11	1.6	98	119	0	3.3	2.7	0.1	<0.01	0.2
MAY											
27...	8.0	11	1.5	92	109	2	6.0	1.5	0.1	0.01	<0.1
AUG											
12...	13	21	2.8	143	174	0	11	4.9	0.2	<0.01	<0.1

DATE	NITRO-GEN, AM-MONIA + ORGANIC TOTAL (MG/L AS N)	PHOS-PHOROUS ORTHO, DIS-SOLVED (MG/L AS P)	PHOS-PHOROUS DIS-SOLVED (MG/L AS P)	PHOS-PHOROUS TOTAL (MG/L AS P)	SILICA, DIS-SOLVED (MG/L AS SIO2)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L)	SOLIDS, DIS-SOLVED (TONS PER DAY)	TUR-BID-ITY (NTU)	SEDI-MENT, SUS-PENDED (MG/L)	SEDI-MENT, DIS-CHARGE, SUS-PENDED (T/DAY)
NOV											
12...	<0.2	<0.01	0.02	<0.01	27	175	175	347	5.4	20	40
FEB											
10...	0.5	0.04	0.04	0.09	31	140	138	756	15	75	405
MAY											
27...	0.5	<0.01	0.02	0.02	25	124	127	462	2.6	9	34
AUG											
12...	1.2	<0.01	0.01	0.05	22	185	187	75.4	1.9	10	4.1

K - Results based on colony count outside acceptable range (non-ideal colony count).

14048000 JOHN DAY RIVER AT MCDONALD FERRY, OR--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	ALUMINUM, DISSOLVED (UG/L AS AL)	ARSENIC DISSOLVED (UG/L AS AS)	BARIUM, DISSOLVED (UG/L AS BA)	BERYLLIUM, DISSOLVED (UG/L AS BE)	CADMIUM DISSOLVED (UG/L AS CD)	CHROMIUM, DISSOLVED (UG/L AS CR)	COBALT, DISSOLVED (UG/L AS CO)	COPPER, DISSOLVED (UG/L AS CU)	IRON, DISSOLVED (UG/L AS FE)	LEAD, DISSOLVED (UG/L AS PB)
NOV 12...	10	1	14	<0.5	<1	<1	<3	2	14	<5
FEB 10...	--	1	14	<0.5	<1	<1	<3	4	--	<5
MAY 27...	10	1	9	<0.5	<1	<1	<3	4	16	<5
AUG 12...	<10	2	20	<0.5	<1	<1	<3	2	13	<5

DATE	LITHIUM DISSOLVED (UG/L AS LI)	MANGANESE, DISSOLVED (UG/L AS MN)	MERCURY DISSOLVED (UG/L AS HG)	MOLYBDENUM, DISSOLVED (UG/L AS MO)	NICKEL, DISSOLVED (UG/L AS NI)	SELENIUM, DISSOLVED (UG/L AS SE)	SILVER, DISSOLVED (UG/L AS AG)	STRONTIUM, DISSOLVED (UG/L AS SR)	VANADIUM, DISSOLVED (UG/L AS V)	ZINC, DISSOLVED (UG/L AS ZN)
NOV 12...	<4	4	<0.1	<10	<1	<1	<1	--	7	<3
FEB 10...	4	4	<0.1	<10	1	<1	<1	75	7	6
MAY 27...	<4	3	<0.1	<10	<1	<1	<1	84	<6	<3
AUG 12...	<4	3	--	<10	2	<1	<1	--	13	<3

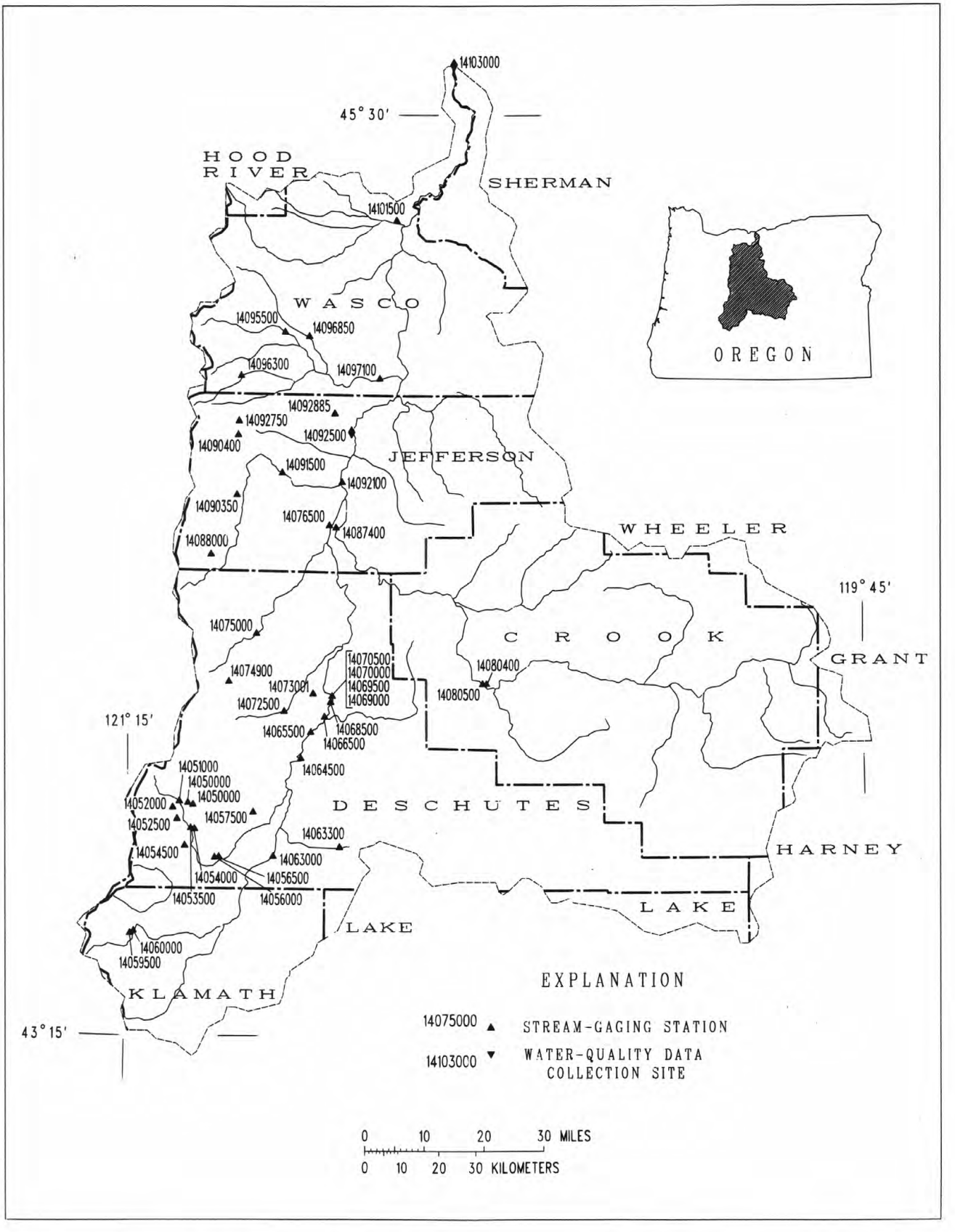

Figure 7.--Location of surface-water and water-quality stations in the Deschutes River and Crooked River basins.

14050000 DESCHUTES RIVER BELOW SNOW CREEK, NEAR LA PINE, OR

LOCATION.--Lat 43°48'51", long 121°46'33", in NW 1/4 sec.28, T.20 S., R.8 E., Deschutes County, Hydrologic Unit 17070301, in Deschutes National Forest, on left bank at flow line of Crane Prairie Reservoir, 20 ft downstream from Snow Creek, 200 ft upstream from highway bridge, and 17 mi northwest of La Pine.

DRAINAGE AREA.--132 mi^2, including Sparks, Elk, and Mud Lake basins, which have no surface outflow to Deschutes River; hydrologic drainage boundary uncertain because of interbasin ground-water exchange.

PERIOD OF RECORD.--October 1937 to current year. Monthly discharge only October 1937, published in WSP 1318. Published as "near Lapine" 1937-64.

REVISED RECORDS.--WSP 1248: 1951.

GAGE.--Water-stage recorder. Elevation of gage is 4,445 ft, from elevation of Crane Prairie Reservoir when slack water extended to gage. Prior to Sept. 10, 1938, nonrecording gage at site 450 ft downstream at different datum.

REMARKS.--Estimated daily discharges: Oct. 8-23, Jan. 5, 7-9, 16, 17, 25. Records excellent June to September, good October to May except for estimated daily discharges, which are fair. No regulation. Crater Creek Canal diverts water to Tumalo Creek basin from tributaries of Soda Creek. Stream is spring fed and peak discharge may occur several months after the precipitation which caused it.

AVERAGE DISCHARGE.--50 years, 151 ft^3/s, 109,400 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 480 ft^3/s Aug. 19, 1974, gage height, 3.17 ft; maximum gage height, 4.12 ft Jan. 21, 1943 (ice jam); minimum discharge, 40 ft^3/s sometime during period Dec. 22, 1959, to Mar. 2, 1960, result of freezeup; minimum daily, 55 ft^3/s for many days April to June 1941.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 190 ft^3/s Oct. 1, gage height, 1.54 ft; minimum discharge, 81 ft^3/s Mar. 25-31.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	187	149	125	101	95	87	82	89	85	102	131	123
2	185	146	123	100	94	88	83	88	85	103	131	123
3	183	146	120	101	93	89	83	88	86	104	132	122
4	181	142	118	100	93	89	83	87	86	105	132	122
5	178	140	118	98	92	89	83	87	86	105	130	121
6	177	139	115	98	92	88	83	87	86	106	132	121
7	174	142	113	96	90	87	83	86	88	107	132	120
8	170	139	112	96	90	86	83	87	88	108	131	120
9	170	141	110	95	90	86	84	87	88	109	131	119
10	170	137	108	95	90	87	85	86	88	110	131	118
11	160	135	108	94	90	88	84	86	88	110	131	118
12	160	134	108	95	91	89	83	86	89	112	130	118
13	160	133	108	95	92	88	84	85	89	112	130	117
14	160	136	106	95	90	88	85	85	89	114	131	116
15	160	134	104	94	90	85	86	84	89	114	129	116
16	160	133	103	93	89	85	85	84	89	114	129	114
17	160	133	101	92	89	85	86	84	90	118	128	114
18	150	133	101	92	89	85	85	84	90	124	128	114
19	150	134	100	92	88	83	84	83	93	123	128	113
20	150	134	100	91	88	83	85	83	93	124	128	112
21	150	135	99	90	88	83	85	84	93	126	127	112
22	150	138	99	91	88	82	85	84	94	134	127	111
23	150	135	100	92	88	83	87	84	95	130	127	110
24	150	135	98	95	88	82	88	85	96	132	126	110
25	150	133	97	96	87	82	88	87	97	132	126	110
26	151	131	98	94	87	82	88	85	98	132	125	109
27	153	137	97	94	87	82	88	85	99	132	125	109
28	149	134	98	94	87	82	89	85	100	132	125	107
29	149	129	99	93	---	81	89	85	100	132	124	107
30	152	126	98	94	---	82	89	85	102	132	124	107
31	152	---	98	94	---	82	---	85	---	131	124	---
TOTAL	5001	4093	3282	2940	2515	2638	2555	2650	2739	3669	3985	3453
MEAN	161	136	106	94.8	89.8	85.1	85.2	85.5	91.3	118	129	115
MAX	187	149	125	101	95	89	89	89	102	134	132	123
MIN	149	126	97	90	87	81	82	83	85	102	124	107
AC-FT	9920	8120	6510	5830	4990	5230	5070	5260	5430	7280	7900	6850

CAL YR 1986 TOTAL 52209.5 MEAN 143 MAX 215 MIN 85 AC-FT 103600
WTR YR 1987 TOTAL 39520 MEAN 108 MAX 187 MIN 81 AC-FT 78390

14050500 CULTUS RIVER ABOVE CULTUS CREEK, NEAR LA PINE, OR

LOCATION.--Lat 43°49'06", long 121°47'40", near line between secs.20 and 29, T.20 S., R.8 E., Deschutes County, Hydrologic Unit 17070301, Deschutes National Forest, on left bank at highway culvert, 2 mi upstream from Cultus Creek, and 18 mi northwest of La Pine.

DRAINAGE AREA.--16.5 mi^2, hydrologic drainage boundry uncertain owing to ground-water exchange.

PERIOD OF RECORD.--October 1922 to September 1925, October 1937 to current year. Monthly discharge only October 1937, published in WSP 1318. Prior to Oct. 1, 1964, published as "near Lapine."

REVISED RECORDS.--WSP 1448: 1923-25, 1947.

GAGE.--Water-stage recorder and cement bag control. Elevation of gage is 4,450 ft, by barometer. Oct 1, 1922, to Sept. 30, 1925, nonrecording gage at site 0.5 mi upstream at different datum.

REMARKS.--Estimated daily discharges: Jan. 6 to Feb. 18. Records good. No regulation or diversions upstream from station.

AVERAGE DISCHARGE.--53 years, 63.2 ft^3/s, 45,790 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 178 ft^3/s May 31, 1956, gage height, 1.04 ft; maximum gage height, 1.32 ft May 16, 1972 (backwater from Crane Prairie Reservoir); minimum discharge, 26 ft^3/s May 26-31, Nov. 23 to Dec. 4, 1959.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 75 ft^3/s Oct. 1-6, gage height, 0.74 ft; minimum daily discharge, 44 ft^3/s Feb. 27 to Mar. 3.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	75	70	64	56	50	44	48	58	58	64	56	56
2	75	70	64	56	50	44	48	58	58	64	57	56
3	75	70	64	56	50	44	50	56	58	63	57	56
4	75	70	62	56	50	45	50	56	58	62	58	56
5	75	70	62	55	50	46	50	57	58	62	58	56
6	75	70	62	54	49	46	50	58	58	62	56	56
7	70	70	60	54	49	47	50	59	59	62	56	56
8	70	71	60	54	49	47	50	60	60	62	56	56
9	70	72	60	54	49	48	50	60	60	63	56	56
10	70	70	60	54	48	46	51	59	60	63	57	56
11	70	70	60	52	48	46	51	58	60	62	57	56
12	70	69	60	52	48	46	52	57	60	62	55	56
13	70	66	60	52	48	46	52	57	61	62	56	56
14	70	66	60	52	48	46	52	56	62	61	56	56
15	70	64	59	50	48	46	52	56	62	61	56	56
16	70	65	58	50	48	46	52	56	62	61	56	56
17	70	66	58	50	48	46	54	54	62	61	54	56
18	70	66	58	50	48	46	54	54	62	61	55	56
19	70	66	58	49	46	46	56	54	63	62	55	55
20	70	66	57	49	46	46	53	54	64	61	55	54
21	70	66	56	49	46	46	52	54	64	60	55	54
22	70	66	56	49	45	46	52	54	64	60	55	54
23	70	66	56	50	46	46	53	54	64	60	54	54
24	70	66	56	52	46	46	54	55	64	60	54	54
25	70	65	56	52	46	48	54	56	65	60	54	54
26	70	64	56	50	45	48	54	56	64	58	54	54
27	70	65	56	50	44	48	54	56	65	58	54	54
28	70	65	56	50	44	48	54	56	64	59	54	54
29	70	64	56	50	---	50	55	56	62	58	54	53
30	70	64	56	50	---	50	56	57	63	58	54	52
31	70	---	56	50	---	48	---	58	---	57	55	---
TOTAL	2200	2018	1822	1607	1332	1441	1563	1749	1844	1889	1719	1654
MEAN	71.0	67.3	58.8	51.8	47.6	46.5	52.1	56.4	61.5	60.9	55.5	55.1
MAX	75	72	64	56	50	50	56	60	65	64	58	56
MIN	70	64	56	49	44	44	48	54	58	57	54	52
AC-FT	4360	4000	3610	3190	2640	2860	3100	3470	3660	3750	3410	3280

CAL YR 1986 TOTAL 24250 MEAN 66.4 MAX 89 MIN 46 AC-FT 48100
WTR YR 1987 TOTAL 20838 MEAN 57.1 MAX 75 MIN 44 AC-FT 41330

14051000 CULTUS CREEK ABOVE CRANE PRAIRIE RESERVOIR, NEAR LA PINE, OR

LOCATION.--Lat 43°49'17", long 121°49'22", in SW 1/4 sec.19, T.20 S., R.8 E., Deschutes County, Hydrologic Unit 17070301, on left bank 1,000 ft upstream from highway bridge, 1.0 mi downstream from Cultus Lake, and 19 mi northwest of La Pine.

DRAINAGE AREA.--33.2 mi^2, hydrologic drainage boundary uncertain because of interbasin ground-water exchange.

PERIOD OF RECORD.--March to September 1924 (published as "above Crane Prairie, near Lapine"), October 1937 to current year. Monthly discharge only October 1937 to September 1949, published in WSP 1318. Records for October 1923 to February 1924, published in WSP 594, have been found to be unreliable and should not be used. Published as "near Lapine" 1937-64.

REVISED RECORDS.--WSP 1568: 1957. WRD Oreg. 1973: 1972. See also PERIOD OF RECORD.

GAGE.--Water-stage recorder. Elevation of gage is 4,545 ft, by barometer. Mar. 1 to Sept. 30, 1924, nonrecording gage at site 100 ft upstream at different datum.

REMARKS.--Estimated daily discharges: Jan. 9-12, 16. Records good. Some regulation by fish screens at Cultus Lake since 1962. No diversion upstream from station.

AVERAGE DISCHARGE.--50 years (water years 1938-87), 22.6 ft^3/s, 16,370 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 336 ft^3/s Dec. 25, 1964, gage height, 4.15 ft, from floodmark, from rating curve extended above 90 ft^3/s; no flow at times.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 78 ft^3/s May 13, gage height, 2.37 ft; minimum discharge, no flow Sept. 25-30.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.0	1.2	8.2	7.3	12	10	9.4	36	35	14	8.0	1.7
2	1.8	1.2	8.3	7.9	14	10	9.2	40	34	13	7.9	1.1
3	1.8	1.2	8.3	8.2	14	10	9.6	43	32	12	8.1	.71
4	1.8	1.2	8.5	8.3	13	10	10	46	31	11	7.8	.95
5	1.8	.99	8.7	7.9	13	9.6	10	48	30	10	7.5	.97
6	1.8	.55	8.2	7.8	13	9.6	10	50	28	10	7.3	.88
7	1.8	.77	7.9	7.5	13	9.4	10	53	29	10	7.1	.61
8	1.6	.82	7.9	7.2	12	9.4	10	57	29	9.9	7.2	.44
9	1.6	1.0	7.6	6.0	12	9.6	10	59	28	9.2	6.9	.37
10	1.4	1.2	7.5	6.0	12	9.2	9.9	64	26	9.3	6.2	.36
11	1.4	1.2	7.4	6.2	12	9.5	9.3	66	24	9.6	5.7	.27
12	1.3	1.2	7.3	6.4	12	10	9.2	70	23	9.6	5.4	.23
13	1.2	1.2	7.5	6.9	13	11	9.4	76	22	9.6	5.0	.18
14	1.2	1.3	7.3	7.2	13	11	9.6	76	21	9.6	4.8	.16
15	1.2	1.4	7.1	7.1	14	11	9.7	76	20	9.3	4.2	.12
16	1.2	1.6	7.1	6.4	14	11	10	72	19	7.9	3.9	.11
17	.94	1.6	6.9	6.7	14	11	9.8	67	19	7.2	3.9	.11
18	.84	1.7	6.7	6.6	14	12	8.9	61	18	7.4	3.9	.10
19	.86	1.7	6.7	6.3	13	12	8.6	56	18	8.0	3.6	.08
20	.97	2.2	6.7	6.3	13	11	9.6	52	17	8.4	3.2	.09
21	.97	3.2	6.3	6.0	13	11	10	49	17	8.7	3.2	.08
22	.92	4.4	6.3	6.0	12	11	11	46	16	9.3	3.1	.08
23	.88	4.7	6.3	6.0	12	11	12	46	16	9.3	2.9	.08
24	.80	5.3	6.3	6.8	12	11	14	45	16	9.9	2.8	.05
25	.80	5.2	6.3	8.5	12	11	16	46	16	9.9	2.4	.03
26	.82	5.9	6.3	9.7	12	10	18	44	16	9.6	2.4	.01
27	.85	7.7	6.3	9.7	11	10	21	41	16	8.7	2.2	.00
28	.80	8.8	6.1	10	11	10	25	39	15	8.7	2.1	.00
29	.90	8.2	6.0	9.8	---	9.8	27	38	15	8.3	1.9	.00
30	1.2	7.9	6.0	9.6	---	9.6	32	36	15	8.1	1.8	.00
31	1.2	---	6.0	10	---	9.6	---	36	---	7.9	1.8	---
TOTAL	38.65	86.53	220.0	232.3	355	320.3	378.2	1634	661	293.4	144.2	9.87
MEAN	1.25	2.88	7.10	7.49	12.7	10.3	12.6	52.7	22.0	9.46	4.65	.33
MAX	2.0	8.8	8.7	10	14	12	32	76	35	14	8.1	1.7
MIN	.80	.55	6.0	6.0	11	9.2	8.6	36	15	7.2	1.8	.00
AC-FT	77	172	436	461	704	635	750	3240	1310	582	286	20

CAL YR 1986 TOTAL 8162.47 MEAN 22.4 MAX 122 MIN .55 AC-FT 16190
WTR YR 1987 TOTAL 4373.45 MEAN 12.0 MAX 76 MIN .00 AC-FT 8670

14052000 DEER CREEK ABOVE CRANE PRAIRIE RESERVOIR, NEAR LA PINE, OR

LOCATION.--Lat 43°48'48", long 121°50'18", in SE 1/4 SW 1/4 sec.25, T.20 S., R.7 E., Deschutes County, Hydrologic Unit 17070301, on right bank 150 ft downstream from highway bridge, 1.2 mi downstream from Little Cultus Lake, and 19 mi northwest of La Pine.

DRAINAGE AREA.--21.5 mi^2, hydrologic drainage boundary uncertain because of interbasin ground-water exchange.

PERIOD OF RECORD.--February to September 1924 (published as "above Crane Prairie, near Lapine"). October 1937 to current year. Monthly discharge only October 1937 to September 1949, published in WSP 1318. Records for October 1923 to January 1924, published in WSP 594, have been found to be unreliable and should not be used. Published as "near Lapine" 1937-64.

REVISED RECORDS.--See PERIOD OF RECORD.

GAGE.--Water-stage recorder and sharp-crested weir control. Elevation of gage is 4,520 ft, by barometer. Feb. 1 to Sept. 30, 1924, nonrecording gage at site 75 ft upstream at various datums. Oct. 1, 1937, to Sept. 30, 1938, water-stage recorder at bridge 150 ft upstream at different datum. Oct. 1, 1938, to Aug. 13, 1968, water-stage recorder and wooden weir control at present site and datum 0.60 ft higher.

REMARKS.--Estimated daily discharges: Jan. 7-14, Feb. 23-26, Sept. 30. Records good except for estimated daily discharges, which are fair. No regulation or diversion upstream from station.

AVERAGE DISCHARGE.--50 years (water years 1938-87), 7.48 ft^3/s, 5,420 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 200 ft^3/s, estimated, Dec. 25, 1964; no flow at times.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 30 ft^3/s May 1, gage height, 2.43 ft; no flow Sept. 18, 26-30.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.22	.25	4.2	2.5	4.8	2.0	3.4	30	5.4	.84	.34	.07
2	.20	.25	3.9	3.4	8.5	1.9	3.6	29	4.9	.75	.34	.06
3	.20	.25	3.6	3.0	6.1	2.0	3.9	27	4.6	.70	.30	.06
4	.20	.25	3.3	2.8	5.1	2.2	4.1	25	4.2	.64	.29	.04
5	.20	.25	3.1	2.5	4.3	2.5	4.5	23	3.8	.54	.27	.04
6	.19	.25	2.9	2.3	3.8	2.6	4.9	23	3.2	.50	.23	.04
7	.14	.36	2.7	2.1	3.4	2.7	5.4	22	4.6	.45	.20	.04
8	.14	.50	2.5	2.0	3.1	2.6	6.8	23	5.6	.40	.18	.03
9	.14	.70	2.4	1.8	2.9	2.7	7.7	23	2.8	.37	.17	.04
10	.14	.78	2.2	1.8	2.7	2.7	9.1	22	2.1	.33	.12	.04
11	.14	.82	2.0	2.0	2.7	2.8	11	21	1.9	.30	.10	.04
12	.14	.81	2.0	2.3	2.8	3.9	11	20	1.7	.30	.10	.05
13	.14	.88	2.0	2.4	3.8	4.4	12	20	1.6	.28	.10	.04
14	.14	1.0	2.0	2.4	3.9	4.9	12	19	1.6	.28	.09	.02
15	.14	.99	1.9	2.1	4.1	4.7	13	18	1.6	.23	.08	.02
16	.14	.99	1.9	1.8	4.0	4.3	14	16	1.4	.17	.07	.02
17	.19	1.2	1.8	1.7	3.8	4.5	13	14	1.3	.20	.10	.02
18	.20	1.4	1.8	1.7	3.9	5.1	14	12	1.3	.41	.10	.02
19	.20	1.5	1.7	1.6	3.5	4.9	16	11	1.2	.26	.10	.02
20	.20	1.8	1.6	1.5	3.2	4.5	16	9.3	1.2	.25	.08	.02
21	.20	2.6	1.6	1.4	3.0	4.1	16	8.3	1.2	.28	.08	.01
22	.17	3.5	1.6	1.3	2.8	3.9	16	7.6	1.0	.83	.06	.01
23	.14	3.6	1.7	1.3	2.7	4.1	17	7.5	.98	.53	.06	.01
24	.14	3.6	1.7	1.5	2.7	4.0	19	7.4	.93	.77	.06	.01
25	.14	3.3	1.7	2.1	2.7	3.7	20	8.7	.91	.77	.06	.02
26	.16	3.3	1.8	4.3	2.5	3.6	21	7.9	.88	.75	.06	.02
27	.26	5.2	1.7	4.1	2.3	3.5	21	6.9	.84	.62	.06	.01
28	.20	6.0	1.7	3.7	2.1	3.2	23	6.2	.74	.58	.06	.01
29	.25	5.3	1.7	3.2	---	3.1	25	5.7	.69	.53	.06	.01
30	.41	4.6	1.8	3.1	---	3.1	28	5.3	.81	.44	.07	.01
31	.33	---	1.8	3.4	---	3.2	---	5.7	---	.38	.10	---
TOTAL	5.80	56.23	68.3	73.1	101.2	107.4	391.4	484.5	64.98	14.68	4.09	0.85
MEAN	.19	1.87	2.20	2.36	3.61	3.46	13.0	15.6	2.17	.47	.13	.028
MAX	.41	6.0	4.2	4.3	8.5	5.1	28	30	5.6	.84	.34	.07
MIN	.14	.25	1.6	1.3	2.1	1.9	3.4	5.3	.69	.17	.06	.01
AC-FT	12	112	135	145	201	213	776	961	129	29	8.1	1.7

CAL YR 1986 TOTAL 2647.30 MEAN 7.25 MAX 33 MIN .02 AC-FT 5250
WTR YR 1987 TOTAL 1372.53 MEAN 3.76 MAX 30 MIN .01 AC-FT 2720

14052500 QUINN RIVER NEAR LA PINE, OR

LOCATION.--Lat 43°47'03", long 121°50'06", in SW 1/4 NW 1/4 sec.1, T.21 S., R.7 E., Deschutes County, Hydrologic Unit 17070302, Deschutes National Forest, on left bank at flow line of Crane Prairie Reservoir, 150 ft downstream from springs at head of river, and 18 mi northwest of La Pine.

DRAINAGE AREA.--Indeterminate, normal flow is entirely from springs 150 ft upstream.

PERIOD OF RECORD.--June 1922 to September 1925, October 1937 to current year. Published as "above Crane Prairie Reservoir near Lapine" 1922-25, and as "near Lapine" 1937-64. Monthly discharge only October 1937, published in WSP 1318.

REVISED RECORDS.--WSP 1448: 1939, 1941.

GAGE.--Water-stage recorder and log control. Datum of gage is 4,442.1 ft above National Geodetic Vertical Datum of 1929, based on elevation of Crane Prairie Reservoir when slack water reached station. June 1, 1922, to Sept. 30, 1925, nonrecording gage at site 150 ft downstream at different datum.

REMARKS.--Estimated daily discharges: Feb. 18 to Apr. 25, July 24-29. Records excellent except those for Feb. 18 to Apr. 25, which are good. No regulation or diversion upstream from station.

AVERAGE DISCHARGE.--53 years, 24.3 ft^3/s, 17,610 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 59 ft^3/s July 4, 1949, gage height, 1.97 ft; maximum gage height, 3.92 ft June 25, 1943 (backwater from Crane Prairie Reservoir); practically no flow Nov. 14, 1941.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 26 ft^3/s June 14, gage height, 1.75 ft; maximum gage height, 2.16 ft Apr. 14 (backwater from Crane Prairie Reservoir); minimum discharge, 12 ft^3/s Sept. 28-30.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	23	20	18	19	19	20	19	21	23	24	22	19
2	23	20	18	19	19	20	19	21	23	24	22	19
3	23	20	18	19	19	20	20	21	23	24	22	18
4	23	19	18	19	19	20	20	21	24	24	22	18
5	23	19	18	19	19	20	20	21	24	24	22	18
6	23	19	18	19	19	20	20	21	24	24	22	18
7	23	19	18	19	19	20	20	21	24	24	22	18
8	23	19	18	19	19	20	20	21	24	24	22	18
9	22	20	18	19	19	20	20	21	24	24	22	18
10	22	19	18	19	19	20	20	21	24	24	22	18
11	22	19	18	19	19	20	20	21	24	24	21	18
12	22	19	18	19	19	20	20	21	24	24	21	17
13	22	20	18	18	20	20	20	21	24	24	21	16
14	22	19	18	18	19	20	20	21	24	24	21	16
15	22	19	18	18	20	20	20	22	24	24	21	16
16	22	19	18	18	20	20	20	22	24	24	20	16
17	21	19	18	18	20	20	20	22	24	24	21	15
18	21	19	18	18	20	19	20	22	24	23	21	15
19	21	18	18	18	20	19	20	22	24	23	21	15
20	21	19	17	17	20	19	20	22	24	23	20	15
21	21	19	17	17	20	19	21	22	24	23	19	15
22	21	18	19	17	20	19	21	22	24	23	19	14
23	21	19	18	17	20	19	21	23	24	23	19	14
24	20	19	19	17	20	19	21	23	24	22	19	13
25	20	18	18	17	20	19	21	23	24	22	20	13
26	20	19	18	17	20	19	22	22	24	22	20	13
27	20	18	18	17	20	19	22	22	24	22	20	13
28	20	18	18	17	20	19	22	22	24	22	19	12
29	20	18	18	17	---	19	22	23	24	22	19	12
30	20	18	18	17	---	19	22	23	24	22	19	12
31	20	---	19	19	---	19	---	23	---	22	19	---
TOTAL	667	568	559	560	547	606	613	674	717	722	640	472
MEAN	21.5	18.9	18.0	18.1	19.5	19.5	20.4	21.7	23.9	23.3	20.6	15.7
MAX	23	20	19	19	20	20	22	23	24	24	22	19
MIN	20	18	17	17	19	19	19	21	23	22	19	12
AC-FT	1320	1130	1110	1110	1080	1200	1220	1340	1420	1430	1270	936

CAL YR 1986 TOTAL 9949 MEAN 27.3 MAX 40 MIN 17 AC-FT 19730
WTR YR 1987 TOTAL 7345 MEAN 20.1 MAX 24 MIN 12 AC-FT 14570

14053500 CRANE PRAIRIE RESERVOIR NEAR LA PINE, OR

LOCATION.--Lat 43°45'20", long 121°47'00", in SW 1/4 NW 1/4 sec.16, T.21 S., R.8 E., Deschutes County, Hydrologic Unit 17070301, in Deschutes National Forest, on control structure at Crane Prairie Dam on Deschutes River, 15.0 mi northwest of La Pine, and at mile 238.3.

DRAINAGE AREA.--254 mi^2, hydrologic drainage boundary uncertain owing to ground-water exchange.

PERIOD OF RECORD.--November 1922 to November 1935, April to December 1936, April 1937 to current year. Prior to Oct. 1, 1964, published as "near Lapine."

REVISED RECORDS.--WSP 1218: Drainage area. WSP 1318: 1925, 1940-41, 1950. WSP 1448: 1925(M,m), 1940(m), 1950(m).

GAGE.--Water-stage recorder. Datum of gage is 4,400.0 ft above National Geodetic Vertical Datum of 1929 (levels by Bureau of Reclamation); gage readings have been reduced to elevations NGVD. Prior to July 13, 1940, nonrecording gage, at site 150 ft upstream at same datum. July 13, 1940, to Sept. 15, 1966, nonrecording gage, at present site and datum.

REMARKS.--Elevation for June 30 is for 0900 and was furnished by Central Oregon Irrigation District. Reservoir originally formed by earthfill dam completed in 1922, reconstructed as rock-faced, earthfill dam in 1940. Capacity, 55,340 acre-ft between elevation 4,424.0 ft lip of fish-screen structure and 4,445.0 ft crest of spillway. Some dead storage in isolated pools in reservoir at stages below 4,428 ft and natural flow passing through reservoir when outlet gates are open prevents withdrawal of remaining storage to elevation of sill of gates. Crater Creek Canal diverts water to Tumalo Creek basin from tributaries of Soda Creek upstream from station. Released water diverted from Deschutes River near Bend for irrigation near Bend and Redmond.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents observed, 60,500 acre-ft June 5-7, 1943, elevation, 4,446.0 ft; no usable contents at times.

EXTREMES FOR CURRENT YEAR.--Maximum contents, 51,580 acre-ft Apr. 14, elevation, 4,444.23 ft; minimum contents, 17,800 acre-ft Sept. 28, 29, elevation, 4,436.09 ft.

MONTHEND ELEVATION AND CONTENTS AT 2400, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

Date	Elevation (feet)	Contents (acre-feet)	Change in contents (acre-feet)
Sept.30	4,438.31	25,930	-
Oct. 31	4,438.09	25,080	-850
Nov. 30	4,439.82	31,930	+6,850
Dec. 31	4,441.50	39,050	+7,120
CAL YR 1986	-	-	-6,170
Jan. 31	4,442.98	45,670	+6,620
Feb. 28	4,443.82	49,610	+3,940
Mar. 31	4,444.10	50,940	+1,330
Apr. 30	4,442.65	44,180	-6,760
May 31	4,440.61	35,220	-8,960
June 30	4,439.22*	29,500	-5,720
July 31	4,439.26	29,660	+160
Aug. 31	4,438.37	26,160	-3,500
Sept.30	4,436.18	18,110	-8,050
WTR YR 1987	-	-	-7,820

* 0900 reading.

14054000 DESCHUTES RIVER BELOW CRANE PRAIRIE RESERVOIR, NEAR LA PINE, OR

LOCATION.--Lat 43°45'13", long 121°46'57", in SW 1/4 NW 1/4 sec.16, T.21 S., R.8 E., Deschutes County, Hydrologic Unit 17070301, Deschutes National Forest, on left bank 0.1 mi downstream from Crane Prairie Dam, 15 mi northwest of La Pine, and at mile 238.2.

DRAINAGE AREA.--254 mi^2, hydrologic drainage boundary uncertain because of interbasin ground-water exchange.

PERIOD OF RECORD.--August 1907 to November 1908 and August 1912 to September 1913 (fragmentary), October 1913 to September 1917, February 1922 to current year. Monthly discharge only for some periods, published in WSP 1318. Prior to October 1949, published as "at Crane Prairie, near Lapine." Published as "near Lapine" 1949-64.

REVISED RECORDS.--WSP 1218: Drainage area. WSP 1318: 1929(M).

GAGE.--Water-stage recorder. Datum of gage is 4,419.78 ft above National Geodetic Vertical Datum of 1929 (Pacific Power & Light Co. bench mark). Aug. 15, 1907, to Sept. 30, 1917, and Feb. 23 to June 8, 1922, nonrecording gage at site 0.5 mi upstream at different datums. June 9, 1922, to May 9, 1932, nonrecording gage or water-stage recorder at present site and datum.

REMARKS.--No estimated daily discharges. Records good. Flow regulated since 1922 by Crane Prairie Reservoir (station 14053500). No diversion upstream from station.

AVERAGE DISCHARGE.--69 years, 214 ft^3/s, 155,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,170 ft^3/s July 28, 1947, gage height, 3.34 ft; no flow Nov. 15, 1978, when gates in Crane Prairie Dam were closed.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 410 ft^3/s Sept. 9, gage height, 1.78 ft; minimum daily discharge, 33 ft^3/s Dec. 13 to Feb. 10.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	355	220	84	33	33	36	78	364	355	185	182	270
2	355	220	84	33	33	36	78	364	354	185	182	270
3	355	188	84	33	33	36	78	364	350	185	182	270
4	355	131	84	33	33	36	78	364	350	185	181	270
5	355	131	84	33	33	63	78	364	349	185	179	270
6	317	131	84	33	33	78	78	360	345	185	179	270
7	274	131	84	33	33	78	78	359	345	185	179	268
8	274	131	84	33	33	78	78	359	345	185	179	266
9	274	131	84	33	33	78	78	359	345	185	179	342
10	274	131	84	33	33	78	78	359	344	185	214	405
11	274	131	84	33	34	78	78	359	340	184	274	405
12	274	111	63	33	34	78	78	359	340	182	274	404
13	274	84	33	33	34	78	78	359	340	182	274	399
14	274	84	33	33	34	78	200	359	340	182	274	399
15	274	84	33	33	34	78	389	359	340	182	274	399
16	274	84	33	33	35	78	389	359	340	182	274	395
17	274	84	33	33	35	78	389	359	282	182	274	394
18	274	84	33	33	35	78	389	359	182	182	274	392
19	274	84	33	33	35	78	389	359	182	182	274	389
20	274	84	33	33	35	78	389	359	182	182	274	389
21	274	84	33	33	35	78	389	359	183	182	274	388
22	274	84	33	33	35	78	388	359	187	185	274	384
23	251	84	33	33	35	78	384	359	188	185	274	384
24	220	84	33	33	35	78	384	359	186	184	274	382
25	220	84	33	33	35	78	384	359	185	182	274	379
26	220	84	33	33	35	78	383	359	185	182	274	379
27	220	84	33	33	35	78	377	357	185	182	272	377
28	220	84	33	33	36	78	371	355	185	182	270	278
29	220	84	33	33	---	78	369	355	185	182	270	95
30	220	84	33	33	---	78	366	355	185	182	270	95
31	220	---	33	33	---	78	---	355	---	182	270	---
TOTAL	8487	3299	1614	1023	956	2235	7343	11137	8204	5682	7572	10007
MEAN	274	110	52.1	33.0	34.1	72.1	245	359	273	183	244	334
MAX	355	220	84	33	36	78	389	364	355	185	274	405
MIN	220	84	33	33	33	36	78	355	182	182	179	95
AC-FT	16830	6540	3200	2030	1900	4430	14560	22090	16270	11270	15020	19850

CAL YR 1986 TOTAL 96241 MEAN 264 MAX 493 MIN 33 AC-FT 190900
WTR YR 1987 TOTAL 67559 MEAN 185 MAX 405 MIN 33 AC-FT 134000

14054500 BROWN CREEK NEAR LA PINE, OR

LOCATION.--Lat 43°42'57", long 121°48'10", in NE 1/4 SW 1/4 sec.29, T.21 S., R.8 E., Deschutes County, Hydrologic Unit 17070301, in Deschutes National Forest, on right bank at highway crossing and 15 mi northwest of La Pine.

DRAINAGE AREA.--21 mi^2, approximately, hydrologic drainage boundary uncertain owing to ground-water exchange.

PERIOD OF RECORD.--May 1922 to September 1925, July 1938 to current year. Monthly discharge only July 1938 to September 1949, published in WSP 1318. Prior to Oct. 1, 1964, published as "near Lapine."

REVISED RECORDS.--WSP 1448: 1922-24. WDR OR-78-1: 1977.

GAGE.--Water-stage recorder. Elevation of gage is 4,370 ft, from topographic map. May 24, 1922, to Sept. 30, 1925, nonrecording gage, and July 1, 1938, to Nov. 1, 1945, water-stage recorder at site 0.4 mi downstream at different datums. Nov. 2, 1945, to Aug. 25, 1971, water-stage recorder at site 0.8 mi upstream at datum of 4,372.94 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--Estimated daily discharges: Jan. 16. Records excellent. No regulation. No diversion upstream from station.

AVERAGE DISCHARGE.--52 years, 38.8 ft^3/s, 28,110 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 104 ft^3/s Aug. 4, 1956, gage height, 1.64 ft; maximum gage height, 3.50 ft Jan. 30, 1980, backwater from ice; minimum discharge, 16 ft^3/s July 22-25, 1941, and at times December 1941 to March 1942.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 48 ft^3/s Oct. 1, 2, gage height, 0.66 ft; maximum gage height, 1.29 ft Jan. 16, backwater from ice; minimum discharge, 30 ft^3/s Sept. 17-19, 29.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	48	43	40	39	37	34	36	34	35	33	32	32
2	47	43	40	38	37	34	36	34	35	33	32	32
3	47	43	40	39	36	35	36	33	35	33	32	32
4	47	42	40	38	36	37	36	33	35	33	32	32
5	47	42	40	38	36	38	36	33	35	33	32	32
6	47	42	40	38	36	37	35	33	35	32	32	32
7	46	42	40	38	36	36	35	33	35	32	32	32
8	46	42	40	37	35	36	35	33	35	32	32	32
9	46	43	39	37	35	35	35	33	34	33	32	32
10	46	42	39	37	35	35	35	34	33	33	32	32
11	46	42	39	37	36	35	35	35	33	32	32	32
12	46	42	39	37	36	38	35	35	33	31	32	32
13	46	42	40	37	37	38	34	35	33	31	32	32
14	46	42	40	37	36	37	34	35	32	31	32	32
15	46	42	39	36	36	36	34	35	32	31	32	31
16	46	41	39	36	35	36	34	35	32	31	32	31
17	46	42	39	36	35	37	34	35	32	32	32	31
18	45	41	39	36	35	36	34	35	32	32	32	30
19	45	42	39	36	35	35	33	35	32	32	32	31
20	45	42	39	36	35	35	33	35	32	32	32	31
21	45	42	39	36	35	35	33	35	32	32	32	31
22	45	42	39	36	35	35	33	35	32	35	32	31
23	45	42	39	36	35	35	33	35	32	33	32	31
24	44	42	39	36	34	35	33	35	32	32	32	31
25	44	41	39	37	34	35	33	36	32	32	32	31
26	44	41	39	36	34	35	33	35	32	32	32	31
27	45	44	39	36	34	35	33	35	32	32	32	31
28	44	42	39	36	34	35	33	35	32	32	32	31
29	44	41	39	36	---	34	33	35	32	32	32	31
30	45	40	39	36	---	35	34	35	33	32	32	31
31	44	---	39	36	---	36	---	35	---	32	32	---
TOTAL	1413	1259	1219	1140	990	1105	1026	1069	991	998	992	943
MEAN	45.6	42.0	39.3	36.8	35.4	35.6	34.2	34.5	33.0	32.2	32.0	31.4
MAX	48	44	40	39	37	38	36	36	35	35	32	32
MIN	44	40	39	36	34	34	33	33	32	31	32	30
AC-FT	2800	2500	2420	2260	1960	2190	2040	2120	1970	1980	1970	1870

CAL YR 1986 TOTAL 15421 MEAN 42.2 MAX 51 MIN 34 AC-FT 30590
WTR YR 1987 TOTAL 13145 MEAN 36.0 MAX 48 MIN 30 AC-FT 26070

14056000 WICKIUP RESERVOIR NEAR LA PINE, OR

LOCATION.--Lat 43°41'02", long 121°41'20", in SW 1/4 NE 1/4 sec. 7, T.22 S., R.9 E., Deschutes County, Hydrologic Unit 17070301, in Deschutes National Forest, in gate-chamber structure at Wickiup Dam on Deschutes River, 9.0 mi west of La Pine, and at mile 226.8.

DRAINAGE AREA.--482 mi^2, hydrologic drainage boundary uncertain because of interbasin ground-water exchange.

PERIOD OF RECORD.--December 1942 to current year. Prior to Oct. 1, 1964, published as "near Lapine."

GAGE.--Nonrecording gage. Datum of gage is National Geodetic Vertical Datum of 1929 (levels by Bureau of Reclamation). Prior to Jan. 15, 1945, nonrecording gage at nearby sites at same datum.

REMARKS.--Reservoir is formed by rock-faced, earthfill dam completed in 1949. Some storage began in December 1942, capacity, 182,100 acre-ft between elevations 4,265.0 ft, no storage, and 4,336.0 ft crest of spillway, with earth plug to elevation 4,339.0 ft. Crater Creek Canal diverts water upstream from station to Tumalo Creek basin. Released water is diverted from Deschutes River at Bend for irrigation near Madras.

COOPERATION.--Daily elevations furnished by North Unit Irrigation District, and capacity table furnished by Bureau of Reclamation.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents observed, 204,000 acre-ft Apr. 8,1974, elevation, 4,338.01 ft; minimum contents observed since reservoir first filled in March 1949, 534 acre-ft, revised on basis of computer expanded capacity table dated June 1970, Oct. 18, 1952, elevation, 4,270.86 ft.

EXTREMES FOR CURRENT YEAR.--Maximum contents observed, 200,400 acre-ft Mar. 13-15, elevation, 4,337.69 ft; minimum contents observed, 35,740 acre-ft Sept. 30, elevation, 4,303.89 ft.

CORRECTIONS.--The 0800 elevation for Aug. 31, 1983 is 4,330.26 ft, superseding the elevation published in the report for 1983.

MONTHEND ELEVATION AND CONTENTS AT 0800, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

Date	Elevation (feet)	Contents (acre-feet)	Change in contents (acre-feet)
Sept.30	4,320.75	78,710	-
Oct. 31	4,327.26	109,300	+30,590
Nov. 30	4,331.42	139,300	+30,000
Dec. 31	4,334.03	162,400	+23,100
CAL YR 1986	-	-	- 4,100
Jan. 31	4,336.20	184,200	+21,800
Feb. 28	4,337.52	198,500	+14,300
Mar. 31	4,337.59	199,300	+800
Apr. 30	4,336.13	183,500	-15,800
May 31	4,332.50	148,500	-35,000
June 30	4,326.54	105,000	-43,500
July 31	4,321.41	81,020	-23,980
Aug. 31	4,310.77	50,490	-30,530
Sept.30	4,303.89	35,740	-14,750
WTR YR 1987	-	-	-42,970

14056500 DESCHUTES RIVER BELOW WICKIUP RESERVOIR, NEAR LA PINE, OR

LOCATION.--Lat 43°41'10", long 121°41'13", in NW 1/4 NE 1/4 sec.7, T.22 S., R.9 E., Deschutes County, Hydrologic Unit 17070301, on left bank 1,000 ft downstream from Wickiup Dam, 9 mi west of La Pine, and at mile 226.4.

DRAINAGE AREA.--483 mi^2, hydrologic drainage boundary uncertain because of interbasin ground-water exchange.

PERIOD OF RECORD.--June 1938 to current year. Monthly discharge only June 1938, published in WSP 1318. Published as "near Lapine" 1938-64.

REVISED RECORDS.--WSP 1448: 1944(m), 1947-51(m).

GAGE.--Water-stage recorder. Datum of gage is 4,257.41 ft above National Geodetic Vertical Datum of 1929 (levels by Bureau of Reclamation).

REMARKS.--No estimated daily discharges. Records excellent except those for October to February and August to September, which are good. Flow regulated by Crane Prairie Reservoir (station 14053500), and since 1942 by Wickiup Reservoir (station 14056000). Some leakage from Crane Prairie and Wickiup Reservoirs does not pass station. Some spill bypassed station in 1955. Crater Creek canal diverts water upstream from station to Tumalo Creek basin.

AVERAGE DISCHARGE.--49 years, 743 ft^3/s, 538,300 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 2,280 ft^3/s July 28 to Aug. 1, 1956, July 31, Aug. 1, 2, 1962; minimum, 1.9 ft^3/s Nov. 10, 1973; minimum daily, 10 ft^3/s Jan. 17, 1952.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 1,850 ft^3/s June 30, gage height, 6.35 ft; minimum discharge, 66 ft^3/s Nov. 4-7.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	376	68	70	80	87	245	311	1270	1140	1840	1200	1480
2	367	68	68	80	88	245	310	1190	1300	1840	1190	1480
3	369	68	69	80	88	247	309	1160	1390	1760	1200	1490
4	365	67	70	81	87	290	364	1110	1460	1620	1260	1490
5	361	66	70	82	88	406	441	1120	1530	1570	1280	1480
6	423	66	72	82	88	411	440	1240	1630	1510	1380	1470
7	490	67	72	82	88	411	440	1370	1630	1470	1520	1480
8	529	68	72	83	88	410	438	1430	1630	1470	1560	1450
9	595	69	73	84	88	410	438	1450	1630	1410	1550	1420
10	633	69	72	84	88	409	438	1480	1630	1380	1550	1380
11	582	69	73	83	88	410	505	1550	1630	1380	1570	1340
12	512	69	73	84	89	446	548	1590	1660	1380	1550	1340
13	513	69	73	84	89	475	688	1550	1650	1460	1540	1330
14	515	69	75	84	89	475	792	1500	1650	1550	1530	1170
15	515	70	75	84	90	474	812	1450	1630	1570	1490	1030
16	515	70	75	83	90	472	836	1330	1580	1610	1470	1060
17	379	69	75	82	153	472	914	1330	1480	1580	1430	1070
18	155	69	75	82	242	472	933	1330	1440	1310	1410	1060
19	107	69	76	83	241	471	932	1310	1440	1240	1400	1060
20	108	70	76	83	242	470	963	1310	1440	1160	1400	1060
21	108	70	76	82	241	470	1030	1310	1440	1120	1390	1060
22	109	70	76	82	241	469	1050	1350	1480	920	1400	1060
23	109	70	76	82	244	468	1160	1370	1560	812	1410	1060
24	109	70	79	82	245	468	1260	1370	1610	780	1400	1030
25	109	70	79	84	245	467	1320	1270	1680	698	1470	950
26	110	71	79	84	244	466	1340	1160	1730	700	1510	951
27	111	72	79	85	245	447	1390	1100	1750	816	1510	954
28	111	73	79	85	245	436	1430	1090	1760	1060	1500	893
29	111	73	79	85	---	435	1430	1110	1800	1230	1490	862
30	108	73	79	85	---	357	1350	1120	1840	1240	1500	780
31	85	---	80	86	---	310	---	1120	---	1220	1490	---
TOTAL	9589	2081	2315	2572	4241	12914	24612	40440	47220	40706	44550	35740
MEAN	309	69.4	74.7	83.0	151	417	820	1305	1574	1313	1437	1191
MAX	633	73	80	86	245	475	1430	1590	1840	1840	1570	1490
MIN	85	66	68	80	87	245	309	1090	1140	698	1190	780
AC-FT	19020	4130	4590	5100	8410	25610	48820	80210	93660	80740	88360	70890

CAL YR 1986 TOTAL 278619 MEAN 763 MAX 1810 MIN 32 AC-FT 552600
WTR YR 1987 TOTAL 266980 MEAN 731 MAX 1840 MIN 66 AC-FT 529600

14057500 FALL RIVER NEAR LA PINE, OR

LOCATION.--Lat 43°47'48", long 121°34'18", in NW 1/4 SE 1/4 sec.31, T.20 S., R.10 E., Deschutes County, Hydrologic Unit 17070301, on left bank 50 ft downstream from pond spillway at State fish hatchery, 9 mi northwest of La Pine, and at mile 4.8.

DRAINAGE AREA.--45.1 mi^2, hydrologic drainage boundary uncertain because of interbasin ground-water exchange.

PERIOD OF RECORD.--July 1938 to current year. Records for May to September 1912 at site 3 mi downstream not equivalent owing to difference in drainage area. Prior to Oct. 1, 1964, published as "near Lapine."

REVISED RECORDS.--WSP 984: 1938-42(M,m).

GAGE.--Water-stage recorder. Elevation of gage is 4,220 ft, by barometer.

REMARKS.--No estimated daily discharge. Records excellent. Diversion only to ponds at fish hatchery 50 ft upstream from station, from which water returns to river upstream from station. Stream is spring fed and momentary extremes are caused by operation of fish hatchery.

AVERAGE DISCHARGE.--49 years, 150 ft^3/s, 108,700 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 254 ft^3/s June 5, 1965, gage height, 2.02 ft; minimum discharge, 67 ft^3/s sometime during period Sept. 20-30, 1969.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 174 ft^3/s Jan. 7, gage height, 1.50 ft; minimum discharge, 121 ft^3/s Sept. 27.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	147	142	139	137	135	134	135	137	137	136	134	130
2	147	142	138	135	135	134	136	137	137	136	134	130
3	147	142	138	136	134	134	137	136	137	136	134	130
4	146	142	138	136	134	134	136	137	137	135	134	130
5	145	142	138	135	134	135	136	137	137	135	134	130
6	145	142	138	135	134	135	136	137	137	135	134	130
7	145	142	138	135	134	134	136	138	137	135	134	130
8	145	142	138	135	134	135	136	138	137	135	134	130
9	145	142	138	135	134	135	136	137	137	135	134	130
10	145	141	138	134	134	135	137	137	136	135	134	130
11	144	141	138	135	134	135	136	137	136	135	134	130
12	144	141	138	135	134	135	136	138	136	135	133	130
13	143	142	138	134	135	135	137	137	137	135	134	130
14	143	142	138	134	134	135	137	137	139	135	134	129
15	143	141	137	134	134	135	137	137	137	135	133	129
16	143	141	137	133	134	135	137	137	137	135	132	129
17	143	141	137	132	133	135	137	137	137	137	132	129
18	143	142	137	133	133	135	137	137	137	140	132	129
19	143	142	137	133	132	135	136	137	136	135	132	129
20	143	142	137	132	132	135	137	137	137	136	132	129
21	143	142	137	132	132	135	137	137	137	135	132	129
22	143	142	137	132	132	135	137	137	136	138	132	129
23	143	140	137	133	133	136	137	137	137	135	132	129
24	143	140	137	135	133	135	137	138	136	136	132	129
25	143	140	137	136	133	135	137	138	136	135	131	129
26	144	141	137	134	133	135	137	137	136	135	131	129
27	144	142	136	134	133	135	137	137	136	135	132	128
28	143	140	135	134	133	135	137	137	136	135	131	128
29	143	140	136	134	---	135	137	137	136	135	131	127
30	143	140	135	134	---	135	137	138	137	135	130	127
31	143	---	136	134	---	136	---	137	---	134	130	---
TOTAL	4464	4241	4255	4160	3739	4182	4098	4252	4101	4199	4112	3877
MEAN	144	141	137	134	134	135	137	137	137	135	133	129
MAX	147	142	139	137	135	136	137	138	139	140	134	130
MIN	143	140	135	132	132	134	135	136	136	134	130	127
AC-FT	8850	8410	8440	8250	7420	8290	8130	8430	8130	8330	8160	7690

CAL YR 1986 TOTAL 54182 MEAN 148 MAX 160 MIN 135 AC-FT 107500
WTR YR 1987 TOTAL 49680 MEAN 136 MAX 147 MIN 127 AC-FT 98540

14059500 CRESCENT LAKE NEAR CRESCENT, OR

LOCATION.--Lat 43°30'05", long 121°58'20", in SW 1/4 sec.11, T.24 S., R.6 E., Klamath County, Hydrologic Unit 17070302, Deschutes National Forest, on outlet works at dam on Crescent Creek, 0.8 mi south of town of Crescent Lake, 14.0 mi west of Crescent, and at mile 30.0.

DRAINAGE AREA.--60.7 mi^2, hydrologic drainage boundary uncertain because of interbasin ground-water exchange.

PERIOD OF RECORD.--August 1922 to current year.

REVISED RECORDS.--WSP 1218: Drainage area. WSP 1318: 1922-31. WSP 1448: 1923-31(M,m).

GAGE.--Water-stage recorder. Datum of gage is National Geodetic Vertical Datum of 1929 (levels by Bureau of Reclamation). Prior to Oct. 1, 1956, nonrecording gage at nearby site at datum 4,825.16 ft above National Geodetic Vertical Datum of 1929. Oct. 1, 1956, to Sept. 12, 1966, nonrecording gage, at present site and datum.

REMARKS.--Reservoir originally formed by dam of earth and logs completed in 1922, reconstructed as earthfill dam in 1956. Capacity, 117,200 acre-ft between elevations 4,821.5 ft, sill of outlet gate and 4,853.0 ft, crest of spillway. Maximum allowable storage, 86,050 acre-ft elevation, 4,845.32 ft. Dead storage about 500,000 acre-ft, Oregon Game Commission survey. Records given herein represent total contents (previously reported as usable contents) above elevation 4,821.5 ft, water surface probably cannot be lowered below elevation 4,823.4 ft, 5,360 acre-ft, because of natural flow through reservoir.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 93,010 acre-ft June 6, 1975, elevation, 4,847.09 ft; minimum contents observed, 9,640 acre-ft Oct. 21, 1931, elevation, 4,827.91 ft.

EXTREMES FOR CURRENT YEAR.--Maximum contents, 80,170 acre-ft May 17, 18, elevation, 4,843.81 ft; minimum contents, 50,060 acre-ft Sept. 29, 30, elevation, 4,835.94 ft.

MONTHEND ELEVATION AND CONTENTS AT 2400, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

Date	Elevation (feet)	Contents (acre-feet)	Change in contents (acre-feet)
Sept.30	4,838.80	60,870	-
Oct. 31	4,839.59	63,880	+3,010
Nov. 30	4,840.52	67,450	+3,570
Dec. 31	4,841.00	69,290	+1,840
CAL YR 1986	-	-	-3,820
Jan. 31	4,841.74	72,140	+2,850
Feb. 28	4,842.19	73,890	+1,750
Mar. 31	4,842.42	74,780	+890
Apr. 30	4,843.02	77,100	+2,320
May 31	4,843.78	80,050	+2,950
June 30	4,843.17	77,680	-2,370
July 31	4,840.44	67,140	-10,540
Aug. 31	4,837.77	56,960	-10,180
Sept.30	4,835.95	50,100	-6,860
WTR YR 1987	-	-	-10,770

14060000 CRESCENT CREEK AT CRESCENT LAKE, NEAR CRESCENT, OR

LOCATION.--Lat 43°30'11", long 121°58'20", in SE 1/4 SW 1/4 sec.11, T.24 S., R.6 E., Klamath County, Hydrologic Unit 17070302, Deschutes National Forest, on left bank 400 ft downstream from Crescent Lake Dam, 0.5 mi south of town of Crescent Lake, 14 mi west of Crescent, and at mile 29.9.

DRAINAGE AREA.--60.7 mi^2, hydrologic drainage boundary uncertain owing to ground-water exchange.

PERIOD OF RECORD.--January to September 1911 (gage heights and discharge measurements only), January 1912 to July 1915, July to September 1927, May 1928 to current year. Published as Crescent Lake outlet near Crescent January 1911 to September 1912, and as Crescent Creek at outlet of Crescent Lake, near Crescent October 1913 to July 1915.

REVISED RECORDS.--WSP 1218: Drainage area.

GAGE.--Water-stage recorder and Parshall flume. Datum of gage is 4,819.96 ft above National Geodetic Vertical Datum of 1929. See WSP 1935 for history of changes prior to Sept. 11, 1956.

REMARKS.--Estimated daily discharges: May 21, 22. Records excellent above 10 ft^3/s, fair below. Flow regulated since 1922 by Crescent Lake (station 14059500). No diversion upstream from station.

AVERAGE DISCHARGE.--61 years (water years 1913-14, 1929-87), 58.2 ft^3/s, 42,170 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 313 ft^3/s July 9, 1929, Aug. 9, 1936; no flow at times.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 205 ft^3/s June 26, gage height, 2.32 ft; minimum discharge, 6.0 ft^3/s Mar. 29, Apr. 29.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	6.8	6.8	6.8	7.2	7.2	6.8	6.4	6.7	52	202	187	174
2	6.6	6.8	6.8	7.2	7.2	6.8	6.4	6.8	52	201	186	174
3	6.4	6.8	6.8	7.2	7.2	6.5	6.4	6.8	52	201	186	173
4	6.4	6.8	6.8	7.2	7.0	6.4	6.4	6.8	52	200	186	173
5	6.4	6.8	6.8	7.2	6.8	6.4	6.4	6.8	52	199	185	172
6	6.4	6.8	6.8	7.2	6.8	6.4	6.4	6.8	52	199	185	171
7	6.6	6.8	6.8	7.0	6.8	6.4	6.4	6.8	52	198	185	171
8	6.8	6.8	6.8	7.0	6.8	6.4	6.4	6.9	52	197	184	171
9	6.8	6.8	6.8	7.0	6.8	6.4	6.4	6.9	52	197	184	154
10	6.8	6.8	6.8	7.2	6.8	6.4	6.4	6.8	52	196	183	132
11	6.8	6.8	6.8	7.2	6.8	6.4	6.4	6.8	53	195	183	132
12	6.8	6.8	6.8	7.2	6.8	6.4	6.4	31	53	196	182	132
13	6.8	6.8	6.8	7.2	6.8	6.4	6.4	54	53	195	182	131
14	6.8	6.8	6.8	7.2	6.8	6.4	6.4	54	52	195	181	131
15	6.8	6.8	6.8	7.0	6.8	6.4	6.4	55	52	195	181	130
16	6.8	6.8	6.8	7.0	6.8	6.4	6.4	55	52	194	180	130
17	6.8	6.8	6.8	7.0	6.8	6.4	6.7	55	52	193	179	130
18	6.8	6.8	6.8	6.9	6.8	6.4	6.8	55	52	193	179	130
19	6.8	6.8	6.8	6.8	6.8	6.4	6.7	55	52	192	179	129
20	6.8	6.8	6.8	6.8	6.8	6.4	6.7	55	52	192	178	129
21	6.8	6.8	6.8	6.8	6.8	6.4	6.6	55	51	192	178	129
22	6.8	6.8	6.8	6.8	6.8	6.4	6.6	55	51	192	178	129
23	6.8	6.8	6.8	6.9	6.8	6.4	6.4	54	51	191	177	128
24	6.8	6.8	6.8	7.2	6.8	6.4	6.4	55	51	191	177	128
25	6.8	6.8	6.8	7.2	6.8	6.4	6.7	55	51	191	176	128
26	6.8	6.8	6.9	7.2	6.8	6.4	6.8	54	122	190	176	127
27	6.8	6.8	7.2	7.2	6.8	6.4	6.8	53	203	189	175	127
28	6.8	6.8	6.9	7.2	6.8	6.4	6.8	52	202	189	175	76
29	6.8	6.8	6.8	7.2	---	6.4	6.6	51	202	188	174	6.7
30	6.8	6.8	6.8	7.2	---	6.2	6.6	52	202	188	174	6.7
31	6.8	---	6.8	7.2	---	6.4	---	52	---	187	174	---
TOTAL	208.8	204.0	211.4	219.8	191.8	199.1	195.6	1131.9	2229	6018	5589	3954.4
MEAN	6.74	6.80	6.82	7.09	6.85	6.42	6.52	36.5	74.3	194	180	132
MAX	6.8	6.8	7.2	7.2	7.2	6.8	6.8	55	203	202	187	174
MIN	6.4	6.8	6.8	6.8	6.8	6.2	6.4	6.7	51	187	174	6.7
AC-FT	414	405	419	436	380	395	388	2250	4420	11940	11090	7840

CAL YR 1986 TOTAL 27952.6 MEAN 76.6 MAX 215 MIN 6.4 AC-FT 55440
WTR YR 1987 TOTAL 20352.8 MEAN 55.8 MAX 203 MIN 6.2 AC-FT 40370

14063000 LITTLE DESCHUTES RIVER NEAR LA PINE, OR

LOCATION.--Lat 43°41'21", long 121°30'06", in SW 1/4 SW 1/4 sec.2, T.22 S., R.10 E., Deschutes County, Hydrologic Unit 17070302, on right bank 10 ft downstream from highway bridge, 1.1 mi north of La Pine, and at mile 26.8.

DRAINAGE AREA.--859 mi^2, hydrologic drainage boundary uncertain owing to ground-water exchange.

PERIOD OF RECORD.--September 1910 to January 1911, March, April, August 1911, March to September 1912, June to October 1913, June to November 1918, August to October 1920, May 1924 to current year. Monthly discharge only for some periods, published in WSP 1318. Published as Deschutes River near Lapine 1910-12, as East Fork Deschutes River near Lapine 1913-20, and as Little Deschutes River near Lapine 1924-64.

REVISED RECORDS.--WSP 1218: 1950.

GAGE.--Water-stage recorder. Datum of gage is 4,192.81 ft above National Geodetic Vertical Datum of 1929. Sept. 1, 1910, to Aug. 31, 1911, nonrecording gage at present site at different datum. Mar. 1 to Sept. 30, 1912, nonrecording gage at site 1.2 mi downstream at different datum. June 1, 1913, to Sept. 28, 1928, nonrecording gage and Sept. 29, 1928, to Sept. 30, 1931, water-stage recorder at present site at different datums.

REMARKS.--Estimated daily discharges: Dec. 28, Jan. 6, 9, 10, 17-30, Feb. 23, 25-27, June 8-24. Records good except for estimated daily discharges, which are fair. Flow regulated since 1922 by Crescent Lake (station 14059500). Many diversions for irrigation upstream from station.

AVERAGE DISCHARGE.--63 years (water years 1925-87), 208 ft^3/s, 150,700 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 3,660 ft^3/s Dec. 25, 1964, gage height, 8.18 ft; minimum discharge, 8 ft^3/s Sept. 2, 3, 1931.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 377 ft^3/s July 24, gage height, 5.20 ft; minimum discharge, 48 ft^3/s Sept. 30.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	101	117	125	105	220	118	159	241	142	198	207	155
2	106	111	116	87	218	124	172	257	142	231	202	154
3	107	101	117	87	225	140	186	264	134	231	197	152
4	102	93	107	74	215	166	189	258	126	218	188	151
5	96	89	111	70	215	184	184	237	121	210	176	150
6	92	87	110	72	202	216	189	218	116	208	175	149
7	94	86	107	64	192	217	189	205	117	202	173	148
8	91	89	104	59	186	191	189	202	120	199	171	148
9	90	91	89	64	172	180	201	229	125	195	170	147
10	89	96	89	66	179	167	207	221	125	195	169	127
11	87	104	84	63	202	162	216	220	125	192	168	122
12	86	105	96	64	215	168	229	215	125	189	168	121
13	85	102	100	66	228	195	230	213	120	187	168	119
14	84	100	101	73	225	226	227	240	115	183	168	118
15	82	100	107	74	178	216	228	237	105	178	167	118
16	77	97	88	68	152	184	222	230	100	176	168	118
17	75	94	83	66	140	169	213	220	95	182	167	117
18	74	94	75	64	134	168	212	210	90	240	165	116
19	74	93	80	64	124	171	222	200	88	308	164	115
20	74	101	87	64	123	158	227	189	86	305	162	114
21	74	114	88	64	123	148	224	180	84	292	161	113
22	74	140	89	66	114	142	218	177	82	320	160	112
23	73	146	85	70	110	142	213	171	80	362	160	112
24	72	143	80	80	110	149	207	173	78	366	161	112
25	73	142	78	100	105	144	208	181	78	330	163	112
26	74	134	83	120	100	143	211	187	76	295	161	112
27	84	142	83	160	100	146	216	176	81	270	160	111
28	96	180	95	209	113	144	215	164	170	256	159	111
29	102	189	85	233	---	142	217	153	190	242	156	69
30	100	155	82	219	---	143	228	145	190	230	155	50
31	110	---	97	202	---	148	---	141	---	212	156	---
TOTAL	2698	3435	2921	2937	4620	5111	6248	6354	3426	7402	5245	3673
MEAN	87.0	114	94.2	94.7	165	165	208	205	114	239	169	122
MAX	110	189	125	233	228	226	230	264	190	366	207	155
MIN	72	86	75	59	100	118	159	141	76	176	155	50
AC-FT	5350	6810	5790	5830	9160	10140	12390	12600	6800	14680	10400	7290

CAL YR 1986 TOTAL 90749 MEAN 249 MAX 717 MIN 72 AC-FT 180000
WTR YR 1987 TOTAL 54070 MEAN 148 MAX 366 MIN 50 AC-FT 107200

14063300 PAULINA CREEK NEAR LA PINE, OR

LOCATION.--Lat 43°42'47", long 121°16'39", in SW 1/4 NE 1/4 sec.34, T.21 S., R.12 E., Deschutes County, Hydrologic Unit 17070302, on right bank 180 ft downstream from dam at outlet of Paulina Lake and 12 mi east of La Pine.

DRAINAGE AREA.--10.1 mi^2, of which 2.2 mi^2 is lake surface at elevation 6,331 ft, hydrologic drainage boundary uncertain because of interbasin ground-water exchange.

PERIOD OF RECORD.--October 1982 to current year.

GAGE.--Water-stage recorder. Datum of gage is 6,315.41 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--No estimated daily discharges. Records excellent. Flow regulated by dam at outlet of Paulina Lake 180 ft upstream.

AVERAGE DISCHARGE.--5 years, 20.9 ft^3/s, 15,140 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 66 ft^3/s Apr. 29, 1983, gage height, 2.35 ft; minimum discharge, 0.19 ft^3/s Oct. 19, 1982, Nov. 22, 1983.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 42 ft^3/s Oct. 7, gage height, 1.81 ft; minimum discharge, 0.26 ft^3/s Oct. 7 (result of regulation).

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	20	7.3	4.4	16	28	22	21	20	21	24	20	16
2	20	7.3	4.7	18	30	21	20	20	21	24	20	16
3	20	7.3	5.1	18	29	20	21	20	20	24	20	16
4	20	7.4	6.6	18	28	20	21	20	19	23	19	16
5	20	7.4	7.4	18	27	19	21	20	18	21	19	15
6	20	7.4	6.3	17	26	19	20	20	18	21	18	16
7	21	7.5	5.8	17	25	19	20	20	18	20	18	15
8	23	7.6	6.1	17	24	19	20	19	18	20	17	16
9	23	7.6	6.8	17	23	19	19	20	20	19	17	15
10	23	7.5	7.2	17	23	19	19	20	23	19	17	15
11	23	6.8	7.7	17	23	19	20	20	22	18	17	15
12	23	6.7	9.4	16	23	20	19	20	21	18	16	15
13	23	6.9	10	16	25	22	19	20	20	17	16	15
14	22	6.8	11	18	25	22	18	23	20	17	16	15
15	23	6.9	11	18	25	23	18	29	21	17	16	15
16	23	6.9	11	18	24	22	18	27	20	17	16	15
17	16	6.9	11	16	24	22	18	26	20	17	16	15
18	9.7	6.9	10	15	25	23	18	25	20	23	16	15
19	9.9	6.9	11	15	24	23	18	24	19	23	16	15
20	9.4	6.7	11	15	23	22	18	23	18	23	16	15
21	7.9	5.7	10	14	23	21	17	21	18	22	16	18
22	7.9	3.8	9.8	12	22	20	17	21	17	32	16	21
23	8.1	3.9	9.9	12	25	21	17	20	17	31	16	21
24	7.3	3.8	10	17	22	21	17	22	17	29	16	21
25	7.2	3.8	10	23	25	20	17	24	16	28	16	21
26	7.2	3.8	11	27	24	20	17	23	15	26	16	21
27	7.2	3.6	11	27	23	19	17	23	15	25	16	21
28	7.2	3.5	11	28	22	23	17	22	15	24	16	20
29	7.2	3.7	12	27	---	23	17	21	16	23	16	21
30	7.2	3.9	13	26	---	22	18	20	24	22	16	21
31	7.2	---	14	26	---	21	---	22	---	21	16	---
TOTAL	473.6	182.2	285.2	576	690	646	557	675	567	688	522	512
MEAN	15.3	6.07	9.20	18.6	24.6	20.8	18.6	21.8	18.9	22.2	16.8	17.1
MAX	23	7.6	14	28	30	23	21	29	24	32	20	21
MIN	7.2	3.5	4.4	12	22	19	17	19	15	17	16	15
AC-FT	939	361	566	1140	1370	1280	1100	1340	1120	1360	1040	1020

CAL YR 1986 TOTAL 7515.1 MEAN 20.6 MAX 54 MIN 3.5 AC-FT 14910
WTR YR 1987 TOTAL 6374.0 MEAN 17.5 MAX 32 MIN 3.5 AC-FT 12640

14064500 DESCHUTES RIVER AT BENHAM FALLS, NEAR BEND, OR

LOCATION.--Lat 43°55'49", long 121°24'39", in SW 1/4 NE 1/4 sec.16, T.19 S., R.11 E., Deschutes County, Hydrologic Unit 17070301, Deschutes National Forest, on right bank 0.5 mi upstream from Benham Falls, 10 mi southwest of Bend, and at mile 181.4.

DRAINAGE AREA.--1,759 mi^2.

PERIOD OF RECORD.--April 1906 to September 1913, April to September 1914, August to December 1920, April to September 1921, February 1924 to current year. Monthly discharge only for some periods, published in WSP 1318. Published as "at West's ranch, near Lava" April 1906 to February 1909, April to September 1914. Records for January 1905 to March 1906 and October 1913 to September 1914, published under present name in WSP 370 and 394, have been found to be unreliable and should not be used.

REVISED RECORDS.--See PERIOD OF RECORD.

GAGE.--Water-stage recorder. Datum of gage is 4,142.10 ft above National Geodetic Vertical Datum of 1929 (Bureau of Reclamation bench mark). See WSP 1738 for history of changes prior to Nov. 20, 1958.

REMARKS.--No estimated daily discharges. Records excellent except those for March, which are good. Flow regulated by Crane Prairie Reservoir, Crescent Lake, and Wickiup Reservoir (see elsewhere in this report). Many diversions for irrigation upstream from station.

AVERAGE DISCHARGE.--70 years (water years 1907-13, 1925-87), 1,418 ft^3/s, 1,027,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 5,000 ft^3/s, estimated, Nov. 27, 1909 (gage height not determined); minimum discharge, 363 ft^3/s Jan. 20, 1962.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 2,390 ft^3/s July 3, gage height, 5.94 ft; minimum discharge, 532 ft^3/s Jan. 16.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	993	696	741	658	726	822	940	2030	1740	2350	1820	2060
2	973	677	708	649	733	828	949	1980	1750	2380	1800	2050
3	958	672	690	660	717	839	964	1920	1860	2380	1790	2030
4	961	664	683	646	711	859	979	1890	1940	2370	1790	2030
5	952	656	687	636	711	912	1030	1850	1970	2260	1820	2030
6	943	649	678	639	713	1050	1100	1840	2020	2170	1840	2030
7	987	650	678	624	712	1080	1110	1910	2130	2110	1890	2020
8	1050	651	668	596	708	1090	1110	2000	2150	2040	1990	2020
9	1090	652	664	588	704	1080	1110	2070	2150	2030	2050	2010
10	1140	662	637	620	710	1070	1120	2090	2150	2000	2060	1990
11	1180	658	621	637	729	1060	1130	2130	2150	1960	2050	1960
12	1140	664	650	625	745	1070	1200	2190	2150	1960	2070	1930
13	1070	667	662	620	794	1110	1260	2240	2160	1950	2070	1910
14	1070	669	663	622	802	1150	1400	2220	2170	1980	2070	1900
15	1070	670	650	606	788	1180	1500	2190	2190	2030	2060	1790
16	1070	666	639	567	771	1170	1520	2150	2160	2060	2040	1640
17	1070	667	643	620	746	1140	1550	2020	2130	2100	2010	1640
18	965	662	642	632	761	1120	1610	1980	2030	2170	2000	1640
19	765	660	640	620	851	1120	1630	1970	1970	2000	1980	1640
20	678	662	644	612	851	1110	1630	1960	1970	1910	1980	1640
21	672	674	646	609	845	1100	1670	1950	1960	1870	1970	1630
22	670	697	651	615	843	1090	1730	1940	1950	1890	1970	1630
23	671	714	657	618	837	1100	1750	1950	1960	1700	1970	1630
24	671	724	651	631	834	1090	1840	1970	1990	1600	1980	1630
25	669	721	643	642	807	1090	1910	1980	2030	1570	1980	1610
26	671	717	650	663	800	1090	1960	1920	2100	1480	2010	1530
27	684	728	642	667	821	1090	1990	1820	2150	1430	2070	1520
28	687	738	626	674	828	1070	2050	1760	2180	1500	2070	1520
29	691	750	629	686	---	1060	2070	1740	2220	1690	2060	1470
30	709	763	637	705	---	1060	2080	1740	2290	1830	2050	1440
31	708	---	630	721	---	995	---	1740	---	1840	2050	---
TOTAL	27628	20500	20350	19708	21598	32695	43892	61140	61770	60610	61360	53570
MEAN	891	683	656	636	771	1055	1463	1972	2059	1955	1979	1786
MAX	1180	763	741	721	851	1180	2080	2240	2290	2380	2070	2060
MIN	669	649	621	567	704	822	940	1740	1740	1430	1790	1440
AC-FT	54800	40660	40360	39090	42840	64850	87060	121300	122500	120200	121700	106300

CAL YR 1986 TOTAL 544927 MEAN 1493 MAX 2550 MIN 602 AC-FT 1081000
WTR YR 1987 TOTAL 484821 MEAN 1328 MAX 2380 MIN 567 AC-FT 961600

DIVERSIONS FROM DESCHUTES RIVER NEAR BEND, OR

The following six canals, all in Deschutes County, Hydrologic Unit 17070301, are the only diversions from Deschutes River between gaging stations at Benham Falls (station 14064500) and below Bend (station 14070500).

14065500 ARNOLD CANAL NEAR BEND diverts at mile 174.5 from right bank at head of Lava Island, in SW 1/4 sec.27, T.18 S., R.11 E., water used for irrigation southeast of Bend. Records available, October 1912 to current year.

14066500 CENTRAL OREGON CANAL ABOVE PILOT BUTTE CANAL, NEAR BEND diverts at mile 169.5 from right bank in NE 1/4 sec.13, T.18 S., R.11 E., water used for irrigation east of Bend. Records available, October 1932 to current year.

14068500 DESCHUTES COUNTY MUNICIPAL IMPROVEMENT DISTRICT CANAL AT BEND diverts at mile 165.8 from left bank in SW 1/4 SE 1/4 sec.29, T.17 S., R.12 E., at Bend, water stored in Crescent Lake for Tumalo project is diverted by this canal and supplements flow in Tumalo project feed canal for irrigation near Tumalo. Records available, May 1923 to current year.

14069000 NORTH UNIT MAIN CANAL NEAR BEND diverts at mile 164.8 from right bank in NE 1/4 sec.29, T.17 S., R.12 E., water used for irrigation near Madras. Records available, October 1945 to current year.

14069500 NORTH CANAL NEAR BEND diverts at mile 164.8 from right bank in NE 1/4 sec.29, T.17 S., R.12 E., water used for irrigation north of Bend, mostly near Redmond. Records available, June 1913 to current year.

14070000 SWALLEY CANAL NEAR BEND diverts at mile 164.8 from right bank in NE 1/4 sec.29, T.17 S., R.12 E., water used for irrigation north of Bend. Records available 1913, to current year.

Records of monthly discharge of these canals, published as a group, are available from October 1926 to current year; records for each canal published separately prior to 1926.

DIVERSIONS, IN ACRE-FEET, WATER YEAR OCTOBER 1986 to SEPTEMBER 1987

MONTH	ARNOLD CANAL	CENTRAL OREGON CANAL	DESCHUTES COUNTY MUNICIPAL IMPROVEMENT DISTRICT CANAL	NORTH UNIT MAIN CANAL	NORTH CANAL	SWALLEY CANAL	TOTAL
OCTOBER	1,930	9,050	0	13,240	6,270	3,720	34,210
NOVEMBER	530	2,180	0	0	1,770	534	5,010
DECEMBER	196	1,950	0	0	1,670	454	4,270
JANUARY	434	1,360	0	0	1,150	256	3,200
FEBRUARY	246	1,970	0	0	1,540	397	4,150
MARCH	301	1,960	0	0	1,580	474	4,320
APRIL	2,560	18,720	756	29,860	16,920	3,600	72,420
MAY	6,370	32,060	2,070	37,540	30,590	6,120	114,800
JUNE	6,580	30,600	6,520	36,570	28,480	7,250	116,000
JULY	6,680	29,850	8,620	32,240	28,500	7,300	113,200
AUGUST	6,850	32,040	7,850	31,830	29,650	7,510	115,700
SEPTEMBER	5,970	27,320	6,260	31,360	24,860	6,000	101,800
WTR YR 1987	38,660	189,100	32,070	212,600	173,000	43,620	689,100

14070500 DESCHUTES RIVER BELOW BEND, OR

LOCATION.--Lat 44°04'59", long 121°18'24", in SE 1/4 SE 1/4 sec.20, T.17 S., R.12 E., Deschutes County, Hydrologic Unit 17070301, on right bank 0.4 mi downstream from North Canal, at city limits of town of Bend, and at mile 164.4.

DRAINAGE AREA.--1,899 mi^2.

PERIOD OF RECORD.--October 1914 to current year.

REVISED RECORDS.--WSP 1318: 1916-18(M), 1926(M), 1931(M).

GAGE.--Water-stage recorder. Datum of gage is 3,503.96 ft above National Geodetic Vertical Datum of 1929. Prior to Oct. 1, 1931, water-stage recorder at site 200 ft downstream at datum 1.00 ft higher.

REMARKS.--Estimated daily discharges: July 19, 20. Records good. Flow regulated by powerplant at Bend, Crescent Lake, Crane Prairie Reservoir, and Wickiup Reservoir (see elsewhere in this report). Six large canals and several small ditches divert water upstream from station for irrigation.

AVERAGE DISCHARGE.--73 years, 501 ft^3/s, 363,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 2,820 ft^3/s Dec. 27, 1964, gage height, 4.90 ft; maximum gage height, 5.38 ft Dec. 15, 1932 (backwater from ice); minimum discharge, 1.0 ft^3/s Aug. 25, 1930.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum discharge near this site since 1905, 4,820 ft^3/s Nov. 27, 1909.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 1,120 ft^3/s Mar. 15, 16, gage height, 3.75 ft; minimum daily discharge, 22 ft^3/s July 19.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	58	649	711	612	646	756	853	41	37	40	31	32
2	58	652	673	599	685	719	827	40	37	40	32	33
3	59	639	652	604	661	733	600	39	38	40	31	33
4	62	634	641	599	647	740	521	38	40	39	30	32
5	61	628	644	586	648	778	481	38	39	36	31	33
6	60	617	634	586	627	973	266	38	39	35	30	33
7	62	616	636	580	602	1020	92	39	40	34	31	32
8	62	618	473	554	596	1040	94	39	40	33	33	33
9	64	619	394	537	339	718	89	41	40	33	32	32
10	63	484	391	557	190	527	86	40	40	33	33	33
11	66	403	380	585	228	480	82	39	39	32	33	33
12	144	403	521	326	240	471	96	41	38	32	48	35
13	98	411	611	102	513	777	81	43	39	30	69	33
14	70	511	612	119	736	1030	41	42	39	32	44	33
15	72	633	411	377	720	1080	36	50	38	33	33	80
16	73	628	284	545	707	1120	35	123	37	32	33	34
17	136	480	296	628	679	1090	35	77	39	33	33	33
18	527	316	312	573	671	1080	37	42	36	33	33	34
19	589	297	434	565	774	1070	36	39	36	22	33	33
20	609	276	539	561	782	1060	35	39	36	28	33	33
21	589	316	573	551	770	1050	34	38	35	32	32	33
22	585	553	601	554	733	1050	33	37	35	217	32	33
23	585	594	605	560	734	1050	33	39	36	248	32	33
24	582	692	601	578	734	1040	35	39	36	147	32	33
25	580	680	596	598	748	1040	38	112	35	155	33	34
26	582	661	597	588	735	1030	40	153	35	59	33	39
27	544	702	595	577	748	1030	40	103	36	32	34	33
28	530	702	580	577	768	1020	41	51	35	33	34	33
29	534	706	576	570	---	1010	41	34	36	33	34	33
30	587	726	588	591	---	1010	42	35	37	32	33	36
31	616	---	583	610	---	972	---	36	---	32	32	---
TOTAL	9307	16846	16744	16549	17661	28564	4800	1605	1123	1690	1067	1047
MEAN	300	562	540	534	631	921	160	51.8	37.4	54.5	34.4	34.9
MAX	616	726	711	628	782	1120	853	153	40	248	69	80
MIN	58	276	284	102	190	471	33	34	35	22	30	32
AC-FT	18460	33410	33210	32820	35030	56660	9520	3180	2230	3350	2120	2080

CAL YR 1986 TOTAL 169047 MEAN 463 MAX 1830 MIN 36 AC-FT 335300
WTR YR 1987 TOTAL 117003 MEAN 321 MAX 1120 MIN 22 AC-FT 232100

14073001 TUMALO CREEK NEAR BEND, OR

LOCATION.--Lat 44°05'16", long 121°22'18", in NW 1/4 SE 1/4 sec.23, T.17S. R.11 E., Deschutes County, Hydrologic Unit 17070301, on left bank 0.25 mi upstream from diversion to Tumalo feed canal, 3.0 mi northwest of Bend, and at mile 3.1.

DRAINAGE AREA.--47.3 mi^2.

PERIOD OF RECORD.--October 1913 to December 1921, February, April to November 1922, March 1923 to September 1987 (discontinued). Published as "below Bend" 1949-50.

REVISED RECORDS.--WSP 864: 1937. WSP 1218: Drainage area. WSP 1448: 1923(M), 1927-29(M), 1935(M), 1942(M). WDR OR-75-1: 1974(M).

GAGE.--Water-stage recorder. Datum of gage is 3,566.82 ft above National Geodetic Vertical Datum of 1929. Prior to Apr. 27, 1915, nonrecording gage and Apr. 27, 1915, to Sept. 30, 1918, water-stage recorder or nonrecording gage at same site and datum.

REMARKS.--Estimated daily discharges: Dec. 10, 11; Jan. 8-12, 15-20; Feb. 25 to Mar. 1. Records good above 10 ft^3/s, fair below 10 ft^3/s, and poor where estimated. All records given herein include flow in Columbia Southern Canal, which diverts 8 mi upstream from station for irrigation of land near Tumalo. No flow in the canal Oct. 1 to Apr. 9. Crater Creek Canal diverts flow of tributaries of Soda Creek into head of Tumalo Creek. Diversion upstream from station for municipal supply of Bend since Dec. 15, 1926.

AVERAGE DISCHARGE.--69 years (water years 1914, 1917-21, 1924-35, 1937-87), 102 ft^3/s, 73,900 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,140 ft^3/s Nov. 9, 1968 (no flow in canal), from rating curve extended above 780 ft^3/s on basis of slope-area measurement at 3.45 ft; minimum daily, 25 ft^3/s Jan. 3, 1924.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 428 ft^3/s May 12; minimum daily, 34 ft^3/s Jan. 16.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	68	70	69	58	77	52	66	196	98	74	61	50
2	63	68	68	54	67	59	66	162	96	74	57	47
3	55	68	67	56	61	65	78	147	118	70	58	48
4	58	68	67	54	59	69	74	151	158	67	58	47
5	62	68	65	51	58	73	75	181	176	67	56	47
6	62	70	65	51	59	73	76	219	157	62	55	48
7	63	66	64	42	58	69	76	252	147	61	55	47
8	59	67	63	40	58	70	84	270	136	62	54	47
9	57	69	63	40	58	68	82	285	133	61	53	45
10	57	67	62	40	59	68	91	285	130	58	53	46
11	56	66	62	48	61	69	94	268	124	57	52	46
12	55	66	61	50	62	78	87	340	140	58	52	47
13	55	66	60	53	68	78	85	375	137	57	53	48
14	55	64	59	51	63	75	90	318	132	58	53	47
15	56	63	57	42	63	72	101	307	140	59	52	49
16	55	63	58	34	60	71	113	258	106	57	52	49
17	58	64	57	40	60	72	118	202	88	62	50	48
18	58	67	58	45	60	68	104	176	79	87	49	47
19	57	72	57	50	58	69	97	148	81	70	49	47
20	58	81	57	52	58	68	98	121	85	66	48	47
21	58	79	57	54	58	67	111	116	85	73	49	46
22	58	74	57	56	59	67	125	109	73	162	50	46
23	58	74	57	58	58	67	138	104	67	93	51	46
24	60	89	55	57	56	65	142	114	69	91	50	46
25	59	76	54	63	56	64	145	154	70	82	48	47
26	62	76	55	63	49	66	148	133	86	73	48	48
27	79	92	53	62	45	64	171	134	91	70	48	48
28	67	80	54	58	45	63	206	124	81	67	47	47
29	69	72	55	56	---	63	220	122	76	68	48	45
30	74	70	52	54	---	63	219	133	76	65	48	46
31	70	---	55	65	---	65	---	139	---	64	48	---
TOTAL	1881	2135	1843	1597	1653	2100	3380	6043	3235	2195	1605	1412
MEAN	60.7	71.2	59.5	51.5	59.0	67.7	113	195	108	70.8	51.8	47.1
MAX	79	92	69	65	77	78	220	375	176	162	61	50
MIN	55	63	52	34	45	52	66	104	67	57	47	45
AC-FT	3730	4230	3660	3170	3280	4170	6700	11990	6420	4350	3180	2800

CAL YR 1986 TOTAL 35943 MEAN 98.5 MAX 408 MIN 50 AC-FT 71290
WTR YR 1987 TOTAL 29079 MEAN 79.7 MAX 375 MIN 34 AC-FT 57680

14074900 SNOW CREEK NEAR SISTERS, OR

LOCATION.--Lat 44°06'59", long 121°39'34", in NE 1/4 SW 1/4 sec.9, T.17 S., R.9 E., Deschutes County, Hydrologic Unit 17070301, on left bank about 250 ft upstream from diversion dam, and 13 mi southwest of Sisters.

DRAINAGE AREA.--1.65 mi^2.

PERIOD OF RECORD.--October 1985 to current year. November 1970 to September 1985 available from Oregon Water Resources Department.

GAGE.--Water-stage recorder. Prior to Oct 14, 1975, on right bank at different datum.

REMARKS.--Estimated daily discharges: Nov. 2, 6, 8-10, 15, 22-30; Dec. 14, 23, 29-31; Jan. 1-4, 14-17; Feb. 2, 14. Records good. No regulation or diversion upstream from station.

AVERAGE DISCHARGE.--16 years (1971-87), 6.79 ft^3/s, 55.88 in/yr, 4,920 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 127 ft^3/s Jan. 18, 1971; maximum gage height, 5.73 ft (backwater from ice), discharge not determined, Jan. 18, 1971; minimum discharge, 1.4 ft^3/s Feb. 25, 1977.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 25 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Jan. 2	0430	(a)	*1.58	May 14	1830	*22	1.20

Minimum discharge, 2.0 ft^3/s Feb. 13.

(a) Backwater from ice.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	5.3	4.5	4.2	4.2	3.4	2.8	2.8	5.6	9.0	8.8	7.1	6.0
2	5.3	4.6	4.2	4.4	3.2	2.8	2.8	5.0	9.0	9.0	7.1	5.8
3	5.1	4.8	4.2	4.4	3.0	2.8	2.6	5.0	10	8.8	6.8	5.3
4	5.5	4.7	4.2	4.0	3.0	2.8	2.6	6.0	12	8.9	6.8	5.3
5	5.3	4.7	4.2	3.7	3.0	2.6	2.6	7.5	12	8.8	6.7	5.2
6	5.4	4.5	4.2	3.7	3.0	2.6	2.6	9.2	11	8.8	6.8	5.3
7	5.4	4.4	4.2	3.7	3.0	2.8	2.7	11	11	8.8	6.7	5.3
8	5.3	4.4	3.9	3.6	3.0	2.8	3.0	12	11	8.6	6.9	5.3
9	5.0	4.4	3.9	3.4	3.0	2.8	3.0	12	11	7.9	6.8	5.3
10	5.0	4.4	3.9	3.4	3.0	2.8	3.4	11	11	7.9	6.7	5.0
11	5.2	4.4	3.9	3.4	3.0	2.8	3.2	11	11	7.8	6.3	5.0
12	5.0	4.4	3.9	3.5	3.0	2.8	3.2	18	11	7.6	6.3	5.0
13	5.0	4.4	3.8	3.4	2.7	2.8	3.2	15	11	7.3	6.3	5.0
14	4.8	4.4	3.7	3.4	2.8	2.9	3.5	15	11	7.5	6.3	5.0
15	5.0	4.0	3.7	3.3	2.8	2.8	3.7	15	11	7.6	6.3	5.0
16	5.0	3.9	3.8	3.3	2.8	2.8	3.8	12	10	7.3	6.3	5.0
17	4.7	4.4	3.9	3.3	2.8	2.8	3.4	11	9.4	9.1	6.5	5.0
18	4.7	4.7	3.9	3.4	2.8	2.8	3.2	11	8.8	9.2	6.3	5.0
19	4.7	4.6	3.9	3.4	2.8	2.6	3.0	9.2	9.4	8.8	6.5	5.0
20	4.7	5.2	3.9	3.4	2.8	2.6	3.2	8.6	8.8	8.8	6.5	5.0
21	4.7	5.1	3.9	3.4	2.8	2.6	3.7	8.5	9.2	9.1	6.1	4.9
22	4.7	4.7	3.9	3.4	2.8	2.6	4.2	8.4	8.8	11	6.3	4.8
23	5.0	4.5	4.0	3.4	2.8	2.6	4.4	8.3	8.8	8.6	6.2	4.8
24	5.0	4.7	4.0	3.7	2.8	2.6	4.2	8.8	8.8	8.9	6.2	4.7
25	4.7	4.9	3.9	3.8	2.8	2.6	4.2	9.4	8.8	8.5	6.1	4.7
26	5.0	4.5	4.0	3.2	2.8	2.7	4.4	8.9	9.2	8.3	6.0	4.7
27	5.0	5.0	3.9	3.2	2.8	2.6	5.6	8.8	9.2	8.0	6.0	4.6
28	4.6	5.5	3.9	3.4	2.8	2.6	6.4	9.0	9.2	7.9	6.0	4.7
29	5.0	4.8	4.0	3.4	---	2.6	7.5	9.2	8.8	8.1	6.0	4.7
30	4.8	4.5	4.1	3.1	---	2.6	7.1	11	8.9	7.6	6.0	4.7
31	4.7	---	4.1	3.3	---	2.7	---	9.7	---	7.3	6.0	---
TOTAL	154.6	138.0	123.2	109.6	81.3	84.1	113.2	310.1	298.1	260.6	198.9	151.1
MEAN	4.99	4.60	3.97	3.54	2.90	2.71	3.77	10.0	9.94	8.41	6.42	5.04
MAX	5.5	5.5	4.2	4.4	3.4	2.9	7.5	18	12	11	7.1	6.0
MIN	4.6	3.9	3.7	3.1	2.7	2.6	2.6	5.0	8.8	7.3	6.0	4.6
AC-FT	307	274	244	217	161	167	225	615	591	517	395	300
CFSM	3.02	2.79	2.41	2.14	1.76	1.64	2.29	6.06	6.02	5.09	3.89	3.05
IN.	3.49	3.11	2.78	2.47	1.83	1.90	2.55	6.99	6.72	5.88	4.48	3.41

CAL YR 1986 TOTAL 2446.5 MEAN 6.70 MAX 22 MIN 3.5 AC-FT 4850 CFSM 4.06 IN. 55.16
WTR YR 1987 TOTAL 2022.8 MEAN 5.54 MAX 18 MIN 2.6 AC-FT 4010 CFSM 3.36 IN. 45.60

14075000 SQUAW CREEK NEAR SISTERS, OR

LOCATION.--Lat 44°14'02", long 121°33'57", in SE 1/4 SW 1/4 sec.29, T.15 S., R.10 E., Deschutes County, Hydrologic Unit 17070301, on right bank 800 ft upstream from intake of McAllister ditch, 4 mi south of Sisters, and at mile 26.8.

DRAINAGE AREA.--45.2 mi^2, not including 12.6 mi^2 of Pole Creek. See REMARKS.

PERIOD OF RECORD.--July 1906 to October 1918, June to August 1919, October 1919 to September 1920, May 1921 to September 1924 (no winter records), April 1925 to current year. Monthly discharge only for some periods, published in WSP 1318.

REVISED RECORDS.--WDR OR-83-1: Drainage area.

GAGE.--Water-stage recorder. Elevation of gage is 3,490 ft, by barometer. July 1, 1906, to May 29, 1913, nonrecording gage at site 1,000 ft downstream at different datum, below intake of McAllister ditch (records include flow in McAllister ditch). May 30, 1913, to Sept. 2, 1915, nonrecording gage and Mar. 24, 1916, to Oct. 5, 1928, water-stage recorder at site 300 ft downstream at different datum. Oct. 6, 1928, to Nov. 7, 1967, water-stage recorder at site 200 ft downstream at datum 2.64 ft lower.

REMARKS.--Estimated daily discharges: Dec. 10-13, 16-21, 28, 30, 31, Jan. 1, 8-27, Feb. 25-28. Records good except for estimated daily discharges, which are fair. No regulation. A canal near mouth of Pole Creek has diverted the entire flow of that creek since 1885. Prior to Oct. 1, 1982, drainage area of 57.8 mi^2 included that of Pole Creek. Water is diverted from Snow Creek, a tributary upstream from station, for irrigation in Three Creek basin.

AVERAGE DISCHARGE.--75 years (water years 1907-18, 1920, 1926-87), 105 ft^3/s, 76,070 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge since 1909, 2,000 ft^3/s Dec. 25, 1980, from rating curve extended above 690 ft^3/s on basis of slope-area measurement of peak flow; a maximum gage height of 9.2 ft from water-borne ice was observed on Jan. 11, 1979, and probably occurred on Jan. 10, 1979; previous maximum gage height, about 8.75 ft, over top of gage Nov. 22, 1909, site and datum then in use (discharge not determined); minimum discharge, 14 ft^3/s Mar. 2, 1966.

EXTREMES FOR CURRENT YEAR.--Peak discharge greater than base discharge of 470 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Jan. 17	2100	(a)	*3.13	May 12	1900	*388	2.77

Minimum daily discharge, 37 ft^3/s Jan. 16, during period of ice effect.

(a) Backwater from ice.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	71	64	63	47	90	49	53	141	128	141	100	83
2	70	62	61	47	73	50	56	117	127	141	98	79
3	70	61	60	48	64	58	58	108	139	134	100	75
4	67	61	60	48	60	63	55	113	172	131	103	72
5	68	61	59	48	57	68	55	131	189	123	102	71
6	68	59	57	46	56	65	54	157	183	118	98	72
7	69	59	54	44	56	59	55	181	180	119	96	73
8	66	58	56	42	55	58	62	210	170	121	96	74
9	65	63	51	40	55	57	59	228	175	118	99	73
10	64	59	51	40	55	56	66	223	174	112	99	72
11	62	59	51	40	56	58	67	207	175	111	92	71
12	61	58	51	40	56	74	60	301	188	111	89	71
13	62	58	51	43	65	71	59	300	191	115	92	70
14	62	58	51	46	57	66	64	262	198	120	88	71
15	61	56	51	40	58	63	72	261	199	121	83	69
16	61	57	51	37	56	62	83	231	168	111	81	62
17	61	57	50	43	55	63	88	199	146	119	81	62
18	60	69	49	50	54	62	77	183	135	143	82	61
19	59	67	48	50	53	60	70	166	142	108	82	61
20	59	78	48	40	53	59	69	151	147	103	82	61
21	58	70	48	44	52	56	75	144	147	104	80	62
22	58	64	48	42	51	56	86	139	132	127	79	63
23	58	69	48	48	51	55	94	135	129	108	81	64
24	58	73	48	55	51	54	97	141	131	117	82	63
25	59	65	47	70	50	53	97	168	138	109	80	62
26	65	70	48	70	45	53	98	141	148	108	78	60
27	77	95	48	60	46	52	115	142	154	111	78	57
28	63	79	47	53	47	52	145	142	152	110	79	57
29	68	69	47	50	---	51	163	142	148	112	79	58
30	67	67	47	49	---	50	162	158	148	110	79	58
31	66	---	47	71	---	51	---	152	---	105	82	---
TOTAL	1983	1945	1596	1491	1577	1804	2414	5474	4753	3641	2720	2007
MEAN	64.0	64.8	51.5	48.1	56.3	58.2	80.5	177	158	117	87.7	66.9
MAX	77	95	63	71	90	74	163	301	199	143	103	83
MIN	58	56	47	37	45	49	53	108	127	103	78	57
AC-FT	3930	3860	3170	2960	3130	3580	4790	10860	9430	7220	5400	3980

CAL YR 1986 TOTAL 38585 MEAN 106 MAX 420 MIN 41 AC-FT 76530
WTR YR 1987 TOTAL 31405 MEAN 86.0 MAX 301 MIN 37 AC-FT 62290

14076500 DESCHUTES RIVER NEAR CULVER, OR

LOCATION.--Lat 44°29'56", long 121°19'12", in NW 1/4 SE 1/4 sec.29, T.12 S., R.12 E., Jefferson County, Hydrologic Unit 17070301, on right bank 2.5 mi downstream from Squaw Creek, 6.0 mi southwest of Culver, and at mile 120.6.

DRAINAGE AREA.--2,705 mi^2.

PERIOD OF RECORD.--July 1952 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 1,980 ft above National Geodetic Vertical Datum of 1929 (river-profile survey). July 14, 1952, to Sept. 30, 1961, at site 4.1 mi downstream at different datum.

REMARKS.--No estimated daily discharges. Records good. Flow regulated by Crescent Lake and Crane Prairie and Wickiup Reservoirs (see elsewhere in this report). Many diversions for irrigation upstream from station.

AVERAGE DISCHARGE.--35 years, 929 ft^3/s, 673,100 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 6,680 ft^3/s Dec. 24, 1964, gage height, 10.00 ft, from rating curve extended above 2,200 ft^3/s on basis of slope-area measurement of peak flow; minimum discharge, 418 ft^3/s July 7, 8, 1964.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 1,650 ft^3/s Mar. 9, gage height, 4.77 ft; minimum discharge, 505 ft^3/s July 14-16.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	586	1100	1290	1200	1260	1360	1480	579	529	540	519	515
2	584	1140	1260	1210	1310	1340	1390	551	521	532	521	515
3	582	1090	1230	1180	1280	1330	1400	528	520	524	520	515
4	581	1070	1210	1180	1260	1350	1130	525	531	523	515	517
5	584	1060	1210	1160	1250	1370	1120	524	566	522	514	518
6	586	1060	1190	1160	1270	1460	1070	533	583	521	513	515
7	617	1050	1170	1150	1230	1590	685	549	551	516	513	517
8	644	1050	1110	1080	1220	1630	596	588	540	514	511	517
9	635	1060	896	1040	1200	1620	593	653	532	513	514	515
10	636	1060	875	1040	806	1180	586	669	529	513	514	514
11	635	931	878	1110	784	1150	586	660	526	512	512	512
12	632	922	873	1140	808	1100	583	691	527	512	515	516
13	697	929	1110	781	833	1090	591	872	532	510	518	516
14	658	933	1160	666	1250	1480	591	804	537	510	543	516
15	635	1090	1130	688	1300	1540	543	760	537	506	536	515
16	637	1130	861	991	1290	1590	540	747	551	507	516	543
17	635	1140	834	1070	1280	1590	544	737	527	515	516	527
18	690	903	843	1190	1280	1570	552	641	521	526	515	520
19	1110	884	860	1180	1310	1550	544	578	519	549	515	519
20	1150	851	1050	1150	1390	1550	540	535	520	543	514	521
21	1130	863	1080	1150	1380	1540	534	522	520	535	514	520
22	1110	979	1140	1150	1350	1530	532	522	517	537	514	520
23	1100	1120	1180	1160	1290	1530	534	521	518	814	514	518
24	1100	1220	1180	1190	1280	1590	535	523	514	745	514	520
25	1090	1250	1180	1220	1290	1580	535	543	515	659	511	519
26	1080	1240	1180	1240	1280	1580	531	617	513	645	512	518
27	1090	1260	1180	1210	1300	1580	529	642	515	569	512	521
28	1040	1300	1170	1190	1300	1570	535	595	521	525	511	521
29	1030	1270	1170	1170	---	1560	555	561	518	519	512	519
30	1030	1270	1170	1160	---	1550	574	532	513	519	511	519
31	1100	---	1180	1190	---	1550	---	535	---	518	513	---
TOTAL	25414	32225	33850	34396	34081	45600	21058	18837	15863	16993	15992	15558
MEAN	820	1074	1092	1110	1217	1471	702	608	529	548	516	519
MAX	1150	1300	1290	1240	1390	1630	1480	872	583	814	543	543
MIN	581	851	834	666	784	1090	529	521	513	506	511	512
AC-FT	50410	63920	67140	68220	67600	90450	41770	37360	31460	33710	31720	30860

CAL YR 1986 TOTAL 368579 MEAN 1010 MAX 2600 MIN 531 AC-FT 731100
WTR YR 1987 TOTAL 309867 MEAN 849 MAX 1630 MIN 506 AC-FT 614600

14080400 PRINEVILLE RESERVOIR NEAR PRINEVILLE, OR

LOCATION.--Lat 44°06'50", long 120°46'50", in SW 1/4 NW 1/4 sec.11, T.17 S., R.16 E., Crook County, Hydrologic Unit 17070304, at right end of Prineville Dam on Crooked River, 13.8 mi south of Prineville, and at mile 72.5.

DRAINAGE AREA.--2,700 mi^2, approximately, of which 500 mi^2 is probably noncontributing.

PERIOD OF RECORD.--October 1960 to current year.

GAGE.--Water-stage recorder. Datum of gage is National Geodetic Vertical Datum of 1929 (levels by Bureau of Reclamation). Prior to Aug. 13, 1969, nonrecording gage at same site and datum.

REMARKS.--Reservoir is formed by earthfill dam with ungated concrete spillway and concrete outlet tunnel controlled by two 4-ft by 6-ft regulating gates. Storage began in December 1960. Total capacity at elevation 3,234.80 ft, crest of spillway, is 154,700 acre-ft, of which 152,800 acre-ft is active storage above 3,114.00 ft, proposed minimum pool. Reservoir used for flood control, irrigation, and recreation. Figures given herein represent active storage.

COOPERATION.--Gage inspected, and elevations and capacity table furnished by Bureau of Reclamation.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents observed, 178,100 acre-ft Apr. 20, 1984, elevation, 3,242.75 ft; minimum contents observed, 37,400 acre-ft Oct. 31, Nov. 1, 1977, elevation, 3,177.40 ft.

EXTREMES FOR CURRENT YEAR.--Maximum contents, 159,200 acre-ft Apr. 12, elevation, 3,236.89 ft; minimum contents, 86,570 acre-ft Sept. 30, elevation, 3,208.13 ft.

Capacity table (elevation, in feet, and usable contents, in acre-feet)

3,175	34,560	3,210	90,380
3,180	40,600	3,215	101,100
3,185	47,390	3,220	112,600
3,190	54,740	3,230	138,700
3,195	62,640	3,235	153,400
3,200	71,190	3,240	169,100
3,205	80,430	3,243	178,900

ELEVATION (FEET NGVD), WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
INSTANTANEOUS OBSERVATIONS AT 2400

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3212.47	3211.18	3211.59	3210.46	3212.72	3216.91	3232.59	3235.13	3231.44	3227.56	3222.92	3217.11
2	3212.38	3211.19	3211.58	3210.49	3212.65	3217.08	3233.21	3235.29	3231.40	3227.40	3222.79	3216.87
3	3212.26	3211.19	3211.58	3210.49	3212.66	3217.34	---	3235.36	3231.26	3227.24	3222.66	3216.67
4	3212.19	3211.20	3211.55	3210.50	3212.66	3218.18	---	3235.40	3231.15	3227.04	3222.50	3216.39
5	3212.10	3211.25	3211.49	3210.50	3212.60	3220.13	3235.19	3235.40	3231.00	3226.88	3222.30	3216.20
6	3212.01	3211.25	3211.48	3210.50	3212.44	3222.32	3235.83	3235.46	3230.89	3226.72	3222.15	3216.00
7	3211.93	3211.25	3211.48	3210.53	3212.28	3223.83	3236.17	3235.44	3230.72	3226.60	3221.97	3215.80
8	3211.81	3211.26	3211.38	3210.53	3212.09	3224.96	3236.44	3235.33	3230.65	3226.40	3221.80	3215.61
9	3211.70	3211.26	3211.31	3210.49	3211.91	3225.82	3236.65	3235.21	3230.55	3226.18	3221.62	3215.42
10	3211.59	3211.27	3211.25	3210.48	3211.91	3226.64	3236.79	3235.13	3230.45	3225.97	3221.42	3215.22
11	3211.47	3211.28	3211.16	3210.48	3212.01	3227.24	3236.88	3234.96	3230.36	3225.79	3221.22	3215.07
12	3211.35	3211.28	3211.09	3210.48	3212.27	3228.70	3236.89	3234.77	3230.23	3225.58	3221.00	3214.78
13	3211.25	3211.33	3211.08	3210.48	3212.61	3230.98	3236.87	3234.62	3230.12	3225.42	3220.80	3214.57
14	3211.18	3211.36	3211.06	3210.48	3213.44	3232.44	3236.73	3234.43	3230.00	3225.23	3220.62	3214.23
15	3211.06	3211.37	3211.01	3210.48	3213.96	3233.50	3236.64	3234.27	3229.84	3225.03	3220.40	3213.89
16	3210.99	3211.38	3210.94	3210.43	3214.29	3234.15	3236.56	3234.10	3229.68	3224.75	3220.19	3213.60
17	3210.83	3211.39	3210.86	3210.43	3214.54	3234.49	3236.45	3233.86	3229.61	3224.54	3220.04	3213.29
18	3210.83	3211.43	3210.75	3210.43	3214.79	3234.69	3236.34	3233.71	3229.53	3224.39	3219.82	3212.97
19	3210.83	3211.44	3210.65	3210.43	3214.94	3234.73	3236.15	3233.43	3229.34	3224.24	3219.67	3212.63
20	3210.83	3211.47	3210.65	3210.43	3215.08	3234.51	3235.96	3233.22	3229.25	3224.11	3219.44	3212.29
21	3210.79	3211.52	3210.65	3210.44	3215.42	3234.13	3235.72	3233.05	3229.13	3223.93	3219.24	3211.92
22	3210.80	3211.52	3210.62	3210.47	3215.69	3233.72	3235.44	3232.88	3229.00	3223.96	3219.02	3211.59
23	3210.81	3211.52	3210.55	3210.54	3215.91	3233.23	3235.23	3232.69	3228.87	3224.09	3218.80	3211.20
24	3210.86	3211.52	3210.52	3210.60	3216.09	3232.90	3235.03	3232.58	3228.75	3224.08	3218.60	3210.82
25	3210.89	3211.52	3210.47	3210.73	3216.26	3232.84	3235.03	3232.42	3228.58	3224.06	3218.48	3210.37
26	3210.93	3211.52	3210.44	3210.91	3216.39	3232.70	3235.03	3232.29	3228.43	3223.94	3218.28	3209.89
27	3210.95	3211.52	3210.44	3211.68	3216.56	3232.60	3235.03	3232.19	3228.22	3223.78	3218.06	3209.43
28	3210.98	3211.52	3210.44	3212.62	3216.74	3232.60	3235.03	3232.04	3228.10	3223.65	3217.86	3209.00
29	3211.07	3211.53	3210.44	3212.98	---	3232.50	3235.03	3231.87	3227.89	3223.39	3217.71	3208.56
30	3211.17	3211.59	3210.44	3212.97	---	3232.45	3235.06	3231.71	3227.73	3223.26	3217.53	3208.13
31	3211.18	---	3210.44	3212.86	---	3232.42	---	3231.56	---	3223.12	3217.32	---
MAX	3212.47	3211.59	3211.59	3212.98	3216.74	3234.73	---	3235.46	3231.44	3227.56	3222.92	3217.11
MIN	3210.79	3211.18	3210.44	3210.43	3211.91	3216.91	---	3231.56	3227.73	3223.12	3217.32	3208.13
(†)	92830	93690	91290	96390	105000	145700	153600	143200	132400	120300	106300	86570
(‡)	-2900	+860	-2400	+5100	+8610	+40700	+7900	-10400	-10800	-12100	-14000	-19730

CAL YR 1986 AC-FT‡ -1580
WTR YR 1987 AC-FT‡ -9160

† Contents in acre-feet, at 2400, on last day of month.
‡ Change in contents, in acre-feet.

14080500 CROOKED RIVER NEAR PRINEVILLE, OR

LOCATION.--Lat 44°06'50", long 120°47'40", in SW 1/4 NE 1/4 sec.10, T.17 S., R.16 E., Crook County, Hydrologic Unit 17070304, on right bank 0.4 mi downstream from Prineville Dam, 13.6 mi south of Prineville, and at mile 72.1.

DRAINAGE AREA.--2,700 mi^2, approximately, of which 500 mi^2 is probably noncontributing.

PERIOD OF RECORD.--November 1908 to September 1914, March 1941 to current year. Published as "near Prineville" 1908-12, as "at Hoffman's ranch, near Prineville" 1913-14, and as "above Hoffman Dam, near Prineville" March 1941 to September 1960. The estimate of monthly mean discharge for October 1908, published in WSP 370, has been found to be unreliable and should not be used.

REVISED RECORDS.--WSP 1448: 1909-13, 1914(M), drainage area (at sites prior to Apr. 24, 1961). See also PERIOD OF RECORD.

GAGE.--Water-stage recorder. Datum of gage is 3,070.85 ft above National Geodetic Vertical Datum of 1929 (levels by Bureau of Reclamation). Prior to September 1914, nonrecording gage at several sites from 9 mi to 23 mi downstream at various datums. Mar. 26, 1941, to Apr. 23, 1961, water-stage recorder at site 5.5 mi downstream at different datum.

REMARKS.--No estimated daily discharges. Records excellent above 300 ft^3/s, good below. Flow completely regulated since December 1960 by Prineville Reservoir (station 14080400). Diversions for irrigation upstream from station. Discharge not adjusted for storage or release from Prineville Reservoir as evaporation from reservoir at times exceeds natural flow.

AVERAGE DISCHARGE.--24 years (water years 1910-14, 1942-60), 378 ft^3/s, 273,900 acre-ft/yr; 27 years (water years 1961-87), 374 ft^3/s, 271,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 8,410 ft^3/s Mar. 26, 1952, gage height, 8.2 ft, from floodmark, site and datum then in use; no flow Aug. 13-21, 1959, Jan. 3-5, 1961.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 1,450 ft^3/s Mar. 20, gage height, 5.96 ft; minimum discharge, 19 ft^3/s Feb. 28 to Mar. 5.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	187	91	182	107	482	19	453	378	231	267	221	236
2	187	91	182	107	482	19	268	389	231	280	221	236
3	187	91	182	107	478	20	270	395	231	280	221	236
4	187	91	182	107	478	20	271	396	229	279	219	236
5	187	91	182	107	478	20	338	346	229	278	221	236
6	187	91	182	107	489	47	483	306	228	278	222	236
7	187	97	182	107	502	86	686	387	229	275	229	236
8	187	106	182	107	502	86	923	380	228	275	236	236
9	187	106	182	103	407	87	958	375	229	275	236	236
10	187	106	182	97	236	87	1060	368	228	275	236	236
11	187	106	182	97	236	87	1150	363	228	275	236	259
12	187	106	182	97	236	88	1170	361	228	275	236	273
13	188	106	182	97	236	257	1150	361	228	275	236	274
14	189	112	182	97	238	460	1130	361	228	275	236	299
15	189	121	182	97	239	463	1120	361	228	275	236	329
16	189	121	182	85	239	659	1100	361	228	275	236	331
17	142	121	182	66	240	794	1090	361	228	276	236	334
18	90	121	182	66	241	974	1080	361	228	275	236	390
19	90	121	171	66	241	1170	1060	361	227	274	236	421
20	90	121	156	66	154	1330	1040	357	226	273	236	423
21	69	137	156	66	51	1440	1010	356	226	273	236	427
22	45	165	156	66	51	1430	990	317	226	275	236	429
23	45	165	156	42	51	1430	971	293	226	273	236	429
24	44	165	156	25	51	1220	735	293	226	273	236	432
25	43	165	156	25	51	815	457	293	251	273	236	486
26	44	165	135	25	51	815	457	293	270	273	236	526
27	44	165	107	25	51	725	457	293	254	273	236	526
28	44	165	107	25	35	614	405	293	254	273	236	524
29	44	165	107	287	---	614	374	270	254	273	236	522
30	44	172	107	482	---	614	374	252	254	242	236	522
31	66	---	107	482	---	614	---	243	---	221	236	---
TOTAL	3943	3746	5053	3440	7226	17104	23030	10524	7011	8432	7218	10516
MEAN	127	125	163	111	258	552	768	339	234	272	233	351
MAX	189	172	182	482	502	1440	1170	396	270	280	236	526
MIN	43	91	107	25	35	19	268	243	226	221	219	236
AC-FT	7820	7430	10020	6820	14330	33930	45680	20870	13910	16720	14320	20860

CAL YR 1986 TOTAL 180909 MEAN 496 MAX 3150 MIN 43 AC-FT 358800
WTR YR 1987 TOTAL 107243 MEAN 294 MAX 1440 MIN 19 AC-FT 212700

14087400 CROOKED RIVER BELOW OPAL SPRINGS, NEAR CULVER, OR

LOCATION.--Lat 44°29'33", long 121°17'50", in NW 1/4 NE 1/4 sec.33, T.12 S., R.12 E., Jefferson County, Hydrologic Unit 17070305, on right bank 0.2 mi downstream from Opal Springs, 4.8 mi southwest of Culver, and at mile 6.7.

DRAINAGE AREA.--4,300 mi^2, approximately, of which 500 mi^2 is probably noncontributing.

PERIOD OF RECORD.--October 1961 to current year.

GAGE.--Water-stage recorder. Datum of gage is 1,953.60 ft above National Geodetic Vertical Datum of 1929 (Portland General Electric Co. bench mark).

REMARKS.--No estimated daily discharges. Records good. Flow regulated since December 1960 by Prineville Reservoir (station 14080400) and Ochoco Reservoir, capacity, 47,500 acre-ft. Dam and powerplant 500 ft upstream, completed in 1985, causes brief fluctuations in flow. Many diversions for irrigation upstream from station. Practically all of the summer flow comes from Opal Springs and other springs within 15 mi upstream from station. Simultaneous records (1961-63) at former gaging station 5.6 mi downstream indicated over 15 percent increase to summer flow from springs downstream from this station.

AVERAGE DISCHARGE.--26 years, 1,609 ft^3/s, 1,166,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 6,660 ft^3/s Dec. 24, 1964, gage height, 9.36 ft; minimum daily discharge, 1,090 ft^3/s May 11, 1981.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 3,740 ft^3/s Mar. 22, gage height, 6.31 ft, due to powerplant operation; maximum daily discharge, 2,730 ft^3/s Mar. 22; minimum discharge not determined, occurred when stage dropped below intakes briefly, on many days, due to powerplant operation; minimum daily, 1,160 ft^3/s June 26.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1470	1290	1410	1330	1680	1290	2070	1450	1340	1190	1390	1320
2	1470	1320	1410	1340	1710	1280	2070	1480	1290	1290	1390	1330
3	1470	1340	1410	1340	1700	1270	2120	1520	1220	1270	1390	1330
4	1460	1340	1420	1330	1700	1330	1610	1520	1210	1300	1350	1340
5	1450	1340	1420	1330	1690	1400	1550	1440	1210	1320	1330	1360
6	1450	1340	1410	1330	1690	1430	1630	1350	1210	1340	1320	1380
7	1450	1330	1410	1320	1700	1390	1720	1240	1190	1280	1320	1380
8	1440	1330	1400	1320	1720	1410	1910	1330	1200	1260	1330	1380
9	1430	1350	1410	1310	1720	1410	2120	1320	1220	1240	1340	1370
10	1430	1350	1430	1290	1650	1400	2110	1300	1220	1250	1320	1360
11	1430	1350	1430	1320	1520	1410	2160	1300	1200	1250	1300	1380
12	1430	1350	1430	1310	1560	1430	2290	1310	1190	1250	1280	1380
13	1430	1350	1420	1310	1640	1590	2280	1320	1190	1250	1270	1420
14	1410	1350	1410	1340	1720	1730	2240	1320	1210	1220	1330	1430
15	1420	1350	1400	1360	1600	1870	2220	1330	1240	1200	1350	1440
16	1430	1360	1400	1290	1560	1840	2220	1320	1240	1200	1360	1470
17	1420	1360	1400	1310	1530	2000	2180	1350	1230	1210	1380	1480
18	1500	1360	1410	1300	1520	2080	2170	1360	1230	1310	1370	1480
19	1410	1350	1420	1270	1510	2320	2160	1350	1220	1450	1350	1520
20	1350	1360	1410	1270	1500	2490	2160	1360	1240	1530	1330	1540
21	1350	1360	1390	1270	1470	2660	2120	1330	1200	1600	1340	1560
22	1340	1370	1370	1270	1340	2730	2090	1340	1220	1790	1340	1540
23	1300	1400	1370	1270	1320	2720	2030	1320	1220	1880	1340	1560
24	1290	1400	1370	1280	1320	2720	1990	1330	1190	1770	1350	1570
25	1300	1400	1370	1260	1300	2460	1740	1430	1170	1750	1330	1570
26	1290	1400	1370	1250	1290	2240	1560	1480	1160	1690	1320	1600
27	1290	1400	1360	1260	1290	2250	1540	1450	1180	1640	1310	1650
28	1300	1410	1330	1250	1290	2150	1510	1450	1190	1550	1300	1670
29	1300	1410	1320	1270	---	2070	1480	1420	1180	1470	1320	1680
30	1300	1400	1320	1380	---	2070	1440	1380	1180	1440	1330	1660
31	1290	---	1320	1660	---	2080	---	1340	---	1430	1330	---
TOTAL	43100	40820	43150	40740	43240	58520	58490	42540	36390	43620	41410	44150
MEAN	1390	1361	1392	1314	1544	1888	1950	1372	1213	1407	1336	1472
MAX	1500	1410	1430	1660	1720	2730	2290	1520	1340	1880	1390	1680
MIN	1290	1290	1320	1250	1290	1270	1440	1240	1160	1190	1270	1320
AC-FT	85490	80970	85590	80810	85770	116100	116000	84380	72180	86520	82140	87570

CAL YR 1986 TOTAL 616860 MEAN 1690 MAX 4900 MIN 1170 AC-FT 1224000
WTR YR 1987 TOTAL 536170 MEAN 1469 MAX 2730 MIN 1160 AC-FT 1063000

14088000 LAKE CREEK NEAR SISTERS, OR

LOCATION.--Lat 44°25'35", long 121°43'30", in NE 1/4 SW 1/4 sec.24, T.13 S., R.8 E., Deschutes County, Hydrologic Unit 17070301, on left bank 300 ft downstream from Suttle Lake and 13 mi northwest of Sisters.

DRAINAGE AREA.--22.2 mi^2.

PERIOD OF RECORD.--June to November 1911, March to September 1912, May to October 1913, April 1915 to current year. Monthly discharge only for some periods, published in WSP 1318.

REVISED RECORDS.--WSP 1124: 1943, 1947. WSP 1218: Drainage area. WSP 1448: 1916(M), 1925. WDR OR-81-1: 1974(M), 1978(M).

GAGE.--Water-stage recorder. Datum of gage is 3,431.68 ft above National Geodetic Vertical Datum of 1929. Prior to Apr. 1, 1916, nonrecording gage at two sites 400 ft upstream at different datums. Apr. 1, 1916, to Oct. 12, 1928, nonrecording gage or water-stage recorder at site 640 ft downstream at different datum. Oct. 13, 1928, to Aug. 13, 1967, water-stage recorder at site 600 ft downstream at datum 1.61 ft lower.

REMARKS.--Estimated daily discharges: Nov. 30 to Dec. 9, Jan. 8-11, 15-21, May 14-20. Records good except for estimated daily discharges, which are poor. Flow occasionally regulated by Suttle Lake 150 ft upstream from station.

AVERAGE DISCHARGE.--72 years (water years 1916-87), 52.5 ft^3/s, 38,040 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum recorded discharge, 446 ft^3/s Dec. 15, 1977, gage height, 4.78 ft, but may have been higher during period of no gage-height record Dec. 23, 1964; minimum discharge, 1.0 ft^3/s Nov. 4, 5, 1940; minimum daily, 8 ft^3/s Nov. 5, 1940, Oct. 6, 1942.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 77 ft^3/s Apr. 10, gage height, 2.61 ft; minimum discharge, 22 ft^3/s Sept. 14.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	31	35	56	49	60	47	48	61	41	31	28	29
2	31	34	54	45	66	48	48	61	39	32	30	30
3	31	33	52	44	61	49	50	61	40	37	30	28
4	31	33	50	42	62	49	49	60	41	31	31	27
5	31	33	49	40	63	49	50	60	40	33	33	28
6	32	33	48	39	61	52	52	61	38	30	29	28
7	32	38	47	39	60	50	54	58	39	33	29	32
8	31	41	46	38	57	54	59	59	38	30	31	32
9	32	38	45	35	56	54	58	59	39	32	32	31
10	31	35	45	35	54	53	65	55	36	31	32	30
11	31	33	45	37	54	54	70	54	37	30	27	29
12	31	32	45	39	53	56	68	48	36	29	30	32
13	32	33	46	43	61	57	68	46	34	33	27	30
14	32	35	46	41	59	59	66	48	31	31	30	24
15	33	36	44	36	60	58	66	48	36	30	31	24
16	33	42	43	34	59	58	65	48	34	31	28	26
17	33	39	42	32	59	61	67	47	34	31	30	31
18	32	39	42	31	61	63	70	47	34	38	27	33
19	32	34	41	30	55	60	71	47	34	36	30	31
20	32	38	40	29	53	57	69	47	36	34	28	26
21	33	44	39	29	52	56	68	44	36	36	29	29
22	33	53	43	30	58	55	65	46	35	36	27	31
23	33	48	46	31	57	56	64	46	32	35	29	28
24	33	44	42	39	53	53	62	46	32	34	29	31
25	33	42	40	48	50	50	59	46	36	34	28	26
26	35	48	40	49	52	50	59	43	34	30	31	29
27	39	57	39	46	47	49	61	40	33	31	28	30
28	35	62	38	44	44	49	63	39	32	32	31	24
29	35	62	43	41	---	49	62	39	33	28	31	25
30	44	58	42	42	---	48	64	41	30	30	29	30
31	41	---	41	54	---	48	---	45	---	31	31	---
TOTAL	1028	1232	1379	1211	1587	1651	1840	1550	1070	1000	916	864
MEAN	33.2	41.1	44.5	39.1	56.7	53.3	61.3	50.0	35.7	32.3	29.5	28.8
MAX	44	62	56	54	66	63	71	61	41	38	33	33
MIN	31	32	38	29	44	47	48	39	30	28	27	24
AC-FT	2040	2440	2740	2400	3150	3270	3650	3070	2120	1980	1820	1710

CAL YR 1986 TOTAL 20104 MEAN 55.1 MAX 291 MIN 29 AC-FT 39880
WTR YR 1987 TOTAL 15328 MEAN 42.0 MAX 71 MIN 24 AC-FT 30400

14090350 JEFFERSON CREEK NEAR CAMP SHERMAN, OR

LOCATION.--Lat 44°34'18", long 121°38'17", in SW 1/4 SE 1/4 sec.34, T.11 S., R.9 E., Jefferson County, Hydrologic Unit 17070301, Warm Springs Indian Reservation, on left bank 100 ft upstream from bridge, 7.6 mi north of Camp Sherman, and at mile 1.3.

DRAINAGE AREA.--27.8 mi^2.

PERIOD OF RECORD.--October 1983 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 2,780 ft, from topographic map.

REMARKS.--No estimated daily discharges. Records good. No regulation or diversion upstream from station.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 428 ft^3/s Feb. 23, 1986, gage height, 3.21 ft; minimum discharge, 49 ft^3/s Jan. 16, 1987.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 220 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
May 12	1000	*216	*2.44				

Minimum discharge, 49 ft^3/s Jan. 16.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	86	76	76	66	114	65	69	119	102	94	82	78
2	84	73	74	64	94	66	73	102	101	94	81	75
3	83	71	71	66	84	69	75	102	104	91	82	72
4	82	69	70	65	79	71	72	107	111	92	82	71
5	82	70	69	65	76	73	72	118	114	91	82	71
6	81	69	67	66	74	72	71	133	108	89	81	72
7	79	69	65	64	73	69	73	139	105	89	81	72
8	78	67	65	62	71	67	85	149	107	90	81	73
9	77	67	63	60	71	67	79	146	107	90	82	71
10	77	66	63	65	71	66	82	137	104	89	81	70
11	76	67	64	65	71	68	85	138	104	88	79	70
12	75	67	63	65	71	80	79	187	106	88	79	71
13	75	66	64	64	77	81	78	153	105	89	81	70
14	75	66	63	64	74	76	80	143	108	90	79	71
15	75	65	61	59	74	73	88	140	109	90	78	70
16	74	66	60	56	71	71	97	126	101	88	77	68
17	73	68	59	59	71	71	98	116	97	90	77	67
18	73	80	59	61	70	70	89	112	96	101	77	67
19	72	82	60	60	69	69	82	106	97	88	77	67
20	71	109	60	62	69	68	81	103	99	87	77	67
21	71	90	60	61	68	67	84	100	101	90	77	67
22	71	80	63	61	68	67	91	100	96	87	75	67
23	71	91	62	61	67	67	95	103	94	86	76	68
24	70	109	62	64	66	66	97	106	94	90	77	67
25	69	85	61	68	65	66	96	108	94	88	77	66
26	70	88	63	75	64	66	94	106	95	88	76	66
27	76	144	63	79	66	65	108	104	96	88	76	65
28	70	101	62	73	65	65	131	101	95	88	76	65
29	72	85	64	68	---	65	133	100	94	87	76	65
30	83	79	63	66	---	65	134	116	94	86	75	65
31	86	---	64	78	---	66	---	115	---	83	77	---
TOTAL	2357	2385	1983	2012	2053	2137	2671	3735	3038	2769	2434	2074
MEAN	76.0	79.5	64.0	64.9	73.3	68.9	89.0	120	101	89.3	78.5	69.1
MAX	86	144	76	79	114	81	134	187	114	101	82	78
MIN	69	65	59	56	64	65	69	100	94	83	75	65
AC-FT	4680	4730	3930	3990	4070	4240	5300	7410	6030	5490	4830	4110
CFSM	2.73	2.86	2.30	2.33	2.64	2.48	3.20	4.33	3.64	3.21	2.82	2.49
IN.	3.15	3.19	2.65	2.69	2.75	2.86	3.57	5.00	4.07	3.71	3.26	2.78

CAL YR 1986 TOTAL 36304 MEAN 99.5 MAX 312 MIN 59 AC-FT 72010 CFSM 3.58 IN. 48.58
WTR YR 1987 TOTAL 29648 MEAN 81.2 MAX 187 MIN 56 AC-FT 58810 CFSM 2.92 IN. 39.67

14090400 WHITEWATER RIVER NEAR CAMP SHERMAN, OR

LOCATION.--Lat 44°43'04", long 121°38'07", in SE 1/4 NE 1/4 sec.11, T.10 S., R.9 E., Jefferson County, Hydrologic Unit 17070301, Warm Springs Indian Reservation, on left bank 0.2 mi downstream from Lionshead Creek, 18 mi north of Camp Sherman, and at mile 7.1.

DRAINAGE AREA.--22.9 mi^2.

PERIOD OF RECORD.--July 1982 to current year.

GAGE.--Water-stage recorder and crest-stage gage. Elevation of gage is 3,230 ft, from topographic map.

REMARKS.--Estimated daily discharges: Nov. 27-30, Jan. 9, 16, 17. Records good. No regulation or diversion upstream from station.

AVERAGE DISCHARGE.--5 years, 86.3 ft^3/s, 51.18 in/yr, 62,520 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 593 ft^3/s Feb. 23, 1986, from rating curve extended above 170 ft^3/s, gage height, 3.20 ft; minimum discharge, 38 ft^3/s Oct. 9, 1985.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 220 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
May 12	1400	*242	*2.27	No other peak greater than base discharge.			

Minimum discharge, 39 ft^3/s Jan. 15, 16, 20-24.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	52	55	78	51	112	55	62	114	83	95	69	81
2	51	49	74	46	86	58	64	102	81	88	69	71
3	50	47	71	50	77	68	67	95	85	83	74	59
4	51	46	69	48	73	72	66	95	101	82	79	56
5	51	47	66	45	71	72	66	103	109	73	79	57
6	50	47	64	45	69	73	65	116	102	69	74	61
7	49	46	61	44	68	68	65	127	98	74	75	65
8	48	45	61	42	67	67	75	141	99	76	79	67
9	47	45	57	42	66	66	70	143	100	74	84	62
10	47	44	54	41	66	66	74	134	96	72	80	61
11	45	45	55	41	66	67	77	134	97	71	74	62
12	45	47	55	41	67	84	72	204	104	75	70	64
13	45	45	55	41	82	85	70	179	103	82	79	62
14	45	45	55	41	74	80	71	161	108	87	69	64
15	45	45	53	40	73	77	75	150	109	86	62	54
16	45	47	52	39	70	75	83	134	90	72	58	46
17	45	52	49	40	68	74	87	122	80	67	58	45
18	45	61	48	40	66	74	84	113	76	77	62	46
19	44	65	48	40	65	71	77	103	81	58	65	48
20	43	92	48	39	63	70	76	96	86	58	65	49
21	43	83	48	39	62	70	76	94	91	68	62	53
22	43	74	51	39	62	67	80	94	78	69	59	55
23	42	81	52	39	60	67	83	90	74	66	65	59
24	42	107	48	41	57	65	85	92	76	81	69	57
25	43	82	47	44	55	64	88	91	82	81	65	53
26	53	91	48	53	55	63	87	88	91	81	64	47
27	61	151	47	57	55	61	95	88	95	86	67	44
28	48	118	45	53	55	60	115	86	94	85	69	45
29	52	96	48	49	---	59	119	85	94	83	68	48
30	57	83	46	47	---	59	125	98	94	82	70	49
31	60	---	45	78	---	59	---	96	---	74	78	---
TOTAL	1487	1981	1698	1395	1910	2116	2399	3568	2757	2375	2160	1690
MEAN	48.0	66.0	54.8	45.0	68.2	68.3	80.0	115	91.9	76.6	69.7	56.3
MAX	61	151	78	78	112	85	125	204	109	95	84	81
MIN	42	44	45	39	55	55	62	85	74	58	58	44
AC-FT	2950	3930	3370	2770	3790	4200	4760	7080	5470	4710	4280	3350
CFSM	2.09	2.88	2.39	1.97	2.98	2.98	3.49	5.03	4.01	3.35	3.04	2.46
IN.	2.42	3.22	2.76	2.27	3.10	3.44	3.90	5.80	4.48	3.86	3.51	2.75

CAL YR 1986 TOTAL 32453 MEAN 88.9 MAX 460 MIN 42 AC-FT 64370 CFSM 3.88 IN. 52.72
WTR YR 1987 TOTAL 25536 MEAN 70.0 MAX 204 MIN 39 AC-FT 50650 CFSM 3.06 IN. 41.48

14091500 METOLIUS RIVER NEAR GRANDVIEW, OR

LOCATION.--Lat 44°37'33", long 121°28'55", in SE 1/4 SW 1/4 sec.12, T.11 S., R.10 E., Jefferson County, Hydrologic Unit 17070301, Deschutes National Forest, on right bank 1.0 mi upstream from maximum controlled pool of Lake Billy Chinook, 15.0 mi northwest of Culver, and at mile 13.6.

DRAINAGE AREA.--316 mi^2, at cableway 1.0 mi downstream, where all discharge measurements are made. Hydrologic drainage boundary uncertain because of interbasin ground-water exchange.

PERIOD OF RECORD.--April 1910 to February 1912 (gage heights and discharge measurements only), March 1912 to December 1913, October 1921 to current year. Published as "at Hubbard's ranch, near Sisters" 1910, and as "at Hubbard's ranch, near Grandview" 1910-13.

REVISED RECORDS.--WSP 1448: 1913.

GAGE.--Water-stage recorder. Datum of gage is 1,974.36 ft above National Geodetic Vertical Datum of 1929 (levels by Portland General Electric Co.). Prior to Dec. 31, 1913, nonrecording gage at site 2.3 mi upstream at different datum. Oct. 1, 1921, to May 3, 1949, nonrecording gage and May 4, 1949, to June 18, 1963, water-stage recorder at site 2.7 mi downstream at datum 64 ft lower.

REMARKS.--No estimated daily discharges. Records good. No regulation. Many small diversions for irrigation upstream from station. Stream is spring fed. Records herein are for measuring site.

AVERAGE DISCHARGE.--67 years (water years 1913, 1922-87), 1,497 ft^3/s, 1,085,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 7,530 ft^3/s Dec. 24, 1964, gage height, 6.81 ft; minimum discharge, 1,080 ft^3/s Feb. 17, 1932, Oct. 2-31, Nov. 6, 7, 10-14, 1942.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 1,770 ft^3/s May 12, gage height, 1.96 ft; minimum discharge, 1,220 ft^3/s Jan. 16.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1360	1350	1430	1370	1590	1370	1370	1540	1410	1370	1320	1310
2	1360	1340	1420	1350	1560	1370	1370	1490	1400	1370	1310	1300
3	1350	1330	1410	1350	1510	1390	1380	1480	1400	1360	1320	1290
4	1350	1320	1400	1340	1470	1400	1370	1470	1430	1360	1320	1280
5	1350	1330	1390	1330	1450	1410	1370	1490	1450	1350	1320	1280
6	1350	1330	1380	1320	1440	1410	1370	1520	1430	1340	1320	1280
7	1350	1340	1370	1310	1420	1400	1370	1550	1420	1340	1310	1290
8	1340	1330	1360	1300	1420	1400	1400	1580	1430	1340	1320	1290
9	1340	1330	1350	1290	1410	1400	1390	1590	1420	1340	1320	1290
10	1340	1320	1350	1300	1400	1390	1400	1570	1420	1340	1320	1280
11	1340	1320	1350	1300	1400	1400	1420	1560	1410	1330	1310	1280
12	1330	1320	1340	1300	1400	1450	1400	1690	1420	1330	1300	1290
13	1330	1320	1350	1300	1480	1460	1390	1670	1420	1340	1320	1290
14	1330	1330	1350	1300	1470	1460	1400	1600	1420	1340	1310	1280
15	1330	1320	1340	1290	1470	1440	1410	1580	1440	1340	1300	1280
16	1330	1330	1330	1250	1460	1430	1430	1550	1400	1330	1290	1270
17	1330	1340	1330	1280	1450	1430	1440	1500	1380	1340	1290	1270
18	1330	1350	1320	1300	1440	1430	1430	1480	1370	1400	1290	1270
19	1320	1380	1330	1280	1430	1420	1420	1450	1380	1340	1300	1270
20	1320	1430	1320	1280	1420	1410	1410	1430	1390	1330	1300	1270
21	1320	1440	1320	1280	1410	1410	1410	1410	1390	1350	1290	1270
22	1320	1440	1330	1280	1410	1400	1420	1410	1370	1350	1290	1270
23	1320	1430	1350	1280	1410	1400	1430	1420	1360	1340	1290	1280
24	1320	1490	1330	1310	1390	1390	1430	1440	1360	1370	1300	1280
25	1320	1420	1320	1340	1380	1380	1430	1440	1360	1360	1290	1270
26	1330	1440	1330	1390	1370	1380	1420	1430	1380	1350	1290	1270
27	1360	1620	1320	1390	1370	1370	1450	1420	1380	1350	1290	1260
28	1330	1560	1310	1370	1370	1370	1500	1410	1370	1350	1300	1260
29	1340	1480	1330	1350	---	1360	1530	1400	1370	1340	1290	1260
30	1380	1440	1320	1330	---	1360	1550	1430	1380	1340	1300	1260
31	1380	---	1320	1420	---	1360	---	1450	---	1320	1300	---
TOTAL	41500	41520	41800	40880	40200	43450	42510	46450	41960	41750	40420	38340
MEAN	1339	1384	1348	1319	1436	1402	1417	1498	1399	1347	1304	1278
MAX	1380	1620	1430	1420	1590	1460	1550	1690	1450	1400	1320	1310
MIN	1320	1320	1310	1250	1370	1360	1370	1400	1360	1320	1290	1260
AC-FT	82320	82350	82910	81090	79740	86180	84320	92130	83230	82810	80170	76050

CAL YR 1986 TOTAL 559390 MEAN 1533 MAX 3890 MIN 1310 AC-FT 1110000
WTR YR 1987 TOTAL 500780 MEAN 1372 MAX 1690 MIN 1250 AC-FT 993300

14092100 LAKE BILLY CHINOOK NEAR METOLIUS, OR

LOCATION.--Lat 44°36'14", long 121°16'40", in SW 1/4 NE 1/4 sec.22, T.11 S., R.12 E., Jefferson County, Hydrologic Unit 17070301, Warm Springs Indian Reservation, near left end of Round Butte Dam on Deschutes River, 5.0 mi west of Metolius, and at mile 110.6.

DRAINAGE AREA.--7,490 mi^2, approximately.

PERIOD OF RECORD.--January 1964 to current year.

GAGE.--Nonrecording gage. Datum of gage is National Geodetic Vertical Datum of 1929 (levels by Portland General Electric Co.).

REMARKS.--Reservoir is formed by rock fill dam completed in June 1964 by Portland General Electric Co.; storage began Jan. 2, 1964. Total capacity is 534,700 acre-ft at elevation 1,945.0 ft proposed upper limit of operation, and usable capacity is 273,900 acre-ft between elevations 1,860.0 ft, proposed lower limit of operation, and 1,945.0 ft. Reservoir used for power generation under FERC license 2030. Figures given herein represent total contents.

COOPERATION.--Gage readings and capacity tables furnished by Portland General Electric Co.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 538,700 acre-ft July 15, 16, 1972, elevation, 1,946.00 ft; minimum contents observed since first filling, 431,100 acre-ft Feb. 13, 1972, elevation, 1,917.13 ft.

EXTREMES FOR CURRENT YEAR.--Maximum contents observed, 534,900 acre-ft July 23, elevation, 1,945.05 ft; minimum contents observed, 491,300 acre-ft Jan. 9, elevation, 1,933.70 ft.

MONTHEND ELEVATION AND CONTENTS AT 2400, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

Date	Elevation (feet)	Contents (acre-feet)	Change in contents (acre-feet)
Sept.30	1,944.27	531,800	--
Oct. 31	1,943.36	528,300	-3,500
Nov. 30	1,941.73	521,900	-6,400
Dec. 31	1,934.08	492,700	-29,200
CAL YR 1986	--	--	-10,300
Jan. 31	1,940.10	515,700	+23,000
Feb. 28	1,939.15	512,000	-3,700
Mar. 31	1,943.30	528,000	+16,000
Apr. 30	1,942.41	524,500	-3,500
May 31	1,944.55	533,000	+8,500
June 30	1,944.11	531,200	-1,800
July 31	1,944.21	531,600	+400
Aug. 31	1,944.49	532,700	+1,100
Sept.30	1,944.30	532,000	-700
WTR YR 1987	--	--	+200

14092500 DESCHUTES RIVER NEAR MADRAS, OR

LOCATION.--Lat 44°43'34", long 121°14'45", in SE 1/4 SW 1/4 sec.1, T.10 S., R.12 E., Jefferson County, Hydrologic Unit 17070306, on right bank 400 ft downstream from reregulating dam, 2.7 mi downstream from Pelton Dam, 8.5 mi northwest of Madras, and at mile 100.1.

DRAINAGE AREA.--7,820 mi^2, approximately.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1923 to current year.

REVISED RECORDS.--WSP 1398: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 1,390.25 ft above National Geodetic Vertical Datum of 1929 (levels by Portland General Electric Co.). See WSP 1738 for history of changes prior to Nov. 23, 1957.

REMARKS.--No estimated daily discharges. Water-discharge records excellent. Diurnal fluctuation caused by Lake Simtustus and reregulating reservoir since 1957, combined capacity for normal operation, 6,500 acre-ft. Some winter and spring runoff stored in Ochoco Reservoir, capacity, 47,500 acre-ft, in Crescent Lake, Crane Prairie and Wickiup Reservoirs, combined capacity, 354,600 acre-ft, and since 1960, in Prineville Reservoir, capacity, 152,800 acre-ft, and since 1964, in Lake Billy Chinook, capacity, 534,700 acre-ft. Large diversions in upper basin for irrigation.

AVERAGE DISCHARGE.--64 years, 4,553 ft^3/s, 3,299,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 22,500 ft^3/s July 16, 1983, accidental release from Pelton Dam, gage height, 7.70 ft, from floodmarks; minimum discharge, 916 ft^3/s July 4, 1982, caused by power company testing control gates on dam.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 7,670 ft^3/s Dec. 17, gage height, 4.07 ft; minimum daily discharge, 3,540 ft^3/s Jan. 27, 28, 31, Feb. 1.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	4260	4720	4740	4790	3540	4860	5700	4150	3900	3850	3750	3830
2	4280	4710	4770	5000	3910	4740	5700	4150	4010	3670	3740	3900
3	4300	4710	4700	5120	4610	4680	5380	4150	4030	3660	3770	3910
4	4280	4710	4840	5090	4980	4680	5140	4150	4180	3650	3940	3910
5	4280	4750	4860	4880	4970	4670	5130	4150	4150	3650	3900	3910
6	4310	4920	4860	4540	4980	4670	4950	4150	4140	3690	3780	3900
7	4290	5050	4860	4350	4970	4680	4860	4210	4150	3970	3860	3900
8	4300	5050	4850	4360	4980	4680	4840	4330	4130	4270	3860	3890
9	4290	5050	4850	4350	5220	4670	4690	4250	4010	4220	3870	3900
10	4300	4970	4860	4110	5400	4680	4610	4330	3910	3990	3870	3890
11	4300	4720	4880	3920	5210	4670	4330	4330	3900	3980	3870	3890
12	4060	4500	4850	3830	5210	4670	4180	4340	3910	3980	3880	3920
13	4060	4500	4850	3730	4510	4670	4320	4330	3910	4050	3890	3950
14	4050	4500	4860	3590	4320	4660	4600	4330	3930	4070	3970	3930
15	4050	4490	5230	3830	4620	4670	4880	4330	3890	4120	3970	3950
16	4100	4500	5740	4180	4890	5040	5060	4330	3750	3700	4010	3910
17	4230	4700	6170	4260	5340	5370	5060	4330	3800	3650	4010	3870
18	4280	4880	5890	4260	5790	5630	5060	4340	4120	3830	4010	3850
19	4250	4900	5420	4260	5900	5750	5060	4310	4110	3830	4050	3940
20	4210	4900	5180	4260	5960	6100	5060	4140	4020	3850	4030	3950
21	4400	4770	5180	4230	5900	6370	5060	4090	4010	4000	3920	3930
22	4810	4680	5400	4120	5900	6370	5060	3980	4000	4180	3810	3940
23	4770	4690	5560	4010	5740	6300	5060	3980	3870	4720	3810	4030
24	4490	4680	5550	3880	5370	6390	5060	3980	3680	5050	3810	4010
25	4490	4680	5560	3890	4860	6420	5050	3990	3680	5460	3810	3980
26	4500	4680	5560	3740	4860	6360	5050	3970	3700	5600	3810	3990
27	4500	4680	5560	3540	4870	5900	4640	3880	3890	5210	3800	3990
28	4520	4890	5330	3540	4860	5690	4210	3880	3890	4220	3810	4040
29	4650	4940	5060	3550	---	5700	4200	3880	3900	3770	3810	4190
30	4700	4740	4890	3550	---	5690	4190	3880	3900	3880	3810	4370
31	4720	---	4790	3540	---	5700	---	3880	---	3870	3800	---
TOTAL	135030	142660	159700	128300	141670	165130	146190	128520	118470	127640	120030	118570
MEAN	4356	4755	5152	4139	5060	5327	4873	4146	3949	4117	3872	3952
MAX	4810	5050	6170	5120	5960	6420	5700	4340	4180	5600	4050	4370
MIN	4050	4490	4700	3540	3540	4660	4180	3880	3680	3650	3740	3830
AC-FT	267800	283000	316800	254500	281000	327500	290000	254900	235000	253200	238100	235200

CAL YR 1986 TOTAL 1895770 MEAN 5194 MAX 11400 MIN 3230 AC-FT 3760000
WTR YR 1987 TOTAL 1631910 MEAN 4471 MAX 6420 MIN 3540 AC-FT 3237000

14092500 DESCHUTES RIVER NEAR MADRAS, OR--Continued

WATER-QUALITY RECORDS

PERIOD OF DAILY RECORD.--
WATER TEMPERATURE: October 1971 to current year.

INSTRUMENTATION.--Temperature recorder since October 1971.

EXTREMES FOR PERIOD OF DAILY RECORD.--
WATER TEMPERATURE: Maximum, 18.0°C occurred during period Aug. 1 to Sept. 30, 1974; minimum, 3.5°C Feb. 8, 1979.

EXTREMES FOR CURRENT YEAR.--
WATER TEMPERATURE: Maximum recorded, 14.5°C Aug. 23 to Sept. 8; minimum, 6.5°C many days in January, February and March.

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		OCTOBER			NOVEMBER			DECEMBER			JANUARY	
1	13.0	12.5	12.5	11.5	11.0	11.5	9.5	9.0	9.5	7.5	7.5	7.5
2	13.0	12.0	12.5	11.5	11.0	11.5	9.0	9.0	9.0	7.5	7.5	7.5
3	13.0	12.0	12.5	11.5	11.0	11.0	9.0	9.0	9.0	7.5	7.5	7.5
4	13.0	12.0	12.5	11.5	11.0	11.0	9.0	9.0	9.0	7.5	7.5	7.5
5	13.0	12.5	12.5	11.0	11.0	11.0	9.0	9.0	9.0	7.5	7.5	7.5
6	13.0	12.0	12.5	11.0	11.0	11.0	9.0	9.0	9.0	7.5	7.5	7.5
7	13.0	12.0	12.5	11.0	11.0	11.0	9.0	8.5	8.5	7.5	7.5	7.5
8	13.0	12.0	12.5	11.0	10.5	11.0	8.5	8.5	8.5	7.5	7.0	7.0
9	12.5	12.0	12.5	10.5	10.5	10.5	8.5	8.5	8.5	7.0	7.0	7.0
10	12.5	12.0	12.5	10.5	10.5	10.5	8.5	8.5	8.5	7.0	6.5	7.0
11	12.5	12.0	12.0	10.5	10.5	10.5	8.5	8.0	8.5	7.0	6.5	7.0
12	12.5	12.0	12.0	10.5	10.5	10.5	8.0	8.0	8.0	7.0	6.5	7.0
13	12.5	12.0	12.0	10.5	10.5	10.5	8.0	8.0	8.0	7.0	6.5	7.0
14	12.5	12.0	12.0	10.5	10.0	10.5	8.5	8.0	8.0	7.0	7.0	7.0
15	12.5	12.0	12.0	10.5	10.0	10.5	8.0	8.0	8.0	7.0	6.5	7.0
16	12.0	12.0	12.0	10.5	10.0	10.5	8.0	8.0	8.0	7.0	6.5	6.5
17	12.0	12.0	12.0	10.5	10.0	10.0	8.0	8.0	8.0	7.0	6.5	6.5
18	12.0	11.5	12.0	10.5	10.0	10.0	8.0	8.0	8.0	6.5	6.5	6.5
19	12.0	11.5	12.0	10.0	10.0	10.0	8.0	8.0	8.0	6.5	6.5	6.5
20	12.0	11.5	11.5	10.0	10.0	10.0	8.0	8.0	8.0	6.5	6.5	6.5
21	12.0	11.5	12.0	10.0	10.0	10.0	8.0	8.0	8.0	6.5	6.5	6.5
22	12.0	11.5	11.5	10.0	10.0	10.0	8.0	8.0	8.0	6.5	6.5	6.5
23	12.0	11.5	11.5	10.0	10.0	10.0	8.0	8.0	8.0	6.5	6.5	6.5
24	12.0	11.5	11.5	10.0	9.5	10.0	8.0	8.0	8.0	6.5	6.5	6.5
25	12.0	11.5	11.5	9.5	9.5	9.5	8.0	8.0	8.0	6.5	6.5	6.5
26	12.0	11.5	11.5	10.0	9.5	10.0	8.0	8.0	8.0	6.5	6.5	6.5
27	12.0	11.5	11.5	10.0	9.5	10.0	8.0	7.5	8.0	6.5	6.5	6.5
28	11.5	11.5	11.5	9.5	9.5	9.5	8.0	7.5	7.5	6.5	6.5	6.5
29	11.5	11.5	11.5	10.0	9.5	9.5	7.5	7.5	7.5	6.5	6.5	6.5
30	11.5	11.0	11.5	9.5	9.5	9.5	8.0	7.5	7.5	6.5	6.5	6.5
31	11.5	11.5	11.5	---	---	---	7.5	7.5	7.5	6.5	6.5	6.5
MONTH	13.0	11.0	12.0	11.5	9.5	10.5	9.5	7.5	8.0	7.5	6.5	7.0

14092500 DESCHUTES RIVER NEAR MADRAS, OR--Continued

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		FEBRUARY			MARCH			APRIL			MAY	
1	6.5	6.5	6.5	7.0	6.5	7.0	8.0	7.5	8.0	9.5	9.0	9.0
2	6.5	6.5	6.5	7.0	7.0	7.0	8.0	7.5	8.0	9.5	9.0	9.0
3	6.5	6.5	6.5	7.5	7.0	7.5	8.0	7.5	7.5	9.5	9.0	9.5
4	6.5	6.5	6.5	7.5	7.0	7.5	8.5	7.5	8.0	9.5	9.0	9.5
5	6.5	6.5	6.5	7.5	7.5	7.5	8.0	7.5	8.0	9.5	9.0	9.5
6	6.5	6.5	6.5	7.5	7.0	7.5	8.5	7.5	8.0	10.0	9.0	9.5
7	6.5	6.5	6.5	8.0	7.0	7.5	8.5	8.0	8.0	10.0	9.0	9.5
8	6.5	6.5	6.5	7.5	7.0	7.5	8.5	8.0	8.0	10.0	9.5	9.5
9	6.5	6.5	6.5	7.5	7.0	7.5	8.5	8.0	8.0	10.0	9.5	10.0
10	7.0	6.5	6.5	7.5	7.0	7.0	8.5	8.0	8.5	10.0	9.5	9.5
11	7.0	6.5	6.5	7.5	7.0	7.0	9.0	8.0	8.5	10.0	9.5	9.5
12	7.0	6.5	6.5	7.5	7.0	7.5	9.0	8.0	8.5	10.0	9.5	9.5
13	7.0	6.5	7.0	7.5	7.0	7.5	8.5	8.0	8.5	10.0	9.5	9.5
14	7.0	6.5	6.5	7.5	7.0	7.5	8.5	8.0	8.5	10.0	9.5	10.0
15	7.0	6.5	7.0	7.5	7.0	7.0	9.0	8.0	8.5	10.0	9.5	10.0
16	7.0	6.5	7.0	7.5	7.0	7.5	9.0	8.5	8.5	10.5	9.5	10.0
17	7.0	6.5	7.0	7.5	7.0	7.5	9.0	8.5	8.5	10.5	9.5	10.0
18	7.0	7.0	7.0	7.5	7.0	7.5	9.0	8.5	8.5	10.5	9.5	10.0
19	7.0	6.5	7.0	7.5	7.0	7.5	9.0	8.0	8.5	10.5	9.5	10.0
20	7.0	7.0	7.0	7.5	7.0	7.5	9.0	8.5	8.5	10.5	10.0	10.5
21	7.0	7.0	7.0	7.5	7.5	7.5	9.0	8.5	8.5	10.5	10.0	10.5
22	7.0	7.0	7.0	7.5	7.0	7.5	9.0	8.5	8.5	11.0	10.0	10.5
23	7.0	6.5	7.0	7.5	7.5	7.5	9.0	8.5	8.5	10.5	10.0	10.5
24	7.0	6.5	6.5	8.0	7.5	7.5	9.0	8.5	9.0	10.5	10.0	10.5
25	7.0	6.5	6.5	8.0	7.0	7.5	9.0	8.5	9.0	10.5	10.0	10.5
26	7.0	6.5	6.5	8.0	7.5	7.5	9.5	8.5	9.0	10.5	10.0	10.5
27	7.0	6.5	6.5	8.0	7.5	7.5	9.5	8.5	9.0	11.0	10.0	10.5
28	7.0	6.5	7.0	8.0	7.5	7.5	9.5	9.0	9.0	11.0	10.5	10.5
29	---	---	---	8.0	7.5	7.5	9.5	9.0	9.0	11.0	10.5	11.0
30	---	---	---	8.0	7.5	7.5	9.5	9.0	9.0	11.0	10.5	10.5
31	---	---	---	8.0	7.0	7.5	---	---	---	11.0	10.5	10.5
MONTH	7.0	6.5	6.5	8.0	6.5	7.5	9.5	7.5	8.5	11.0	9.0	10.0
DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		JUNE			JULY			AUGUST			SEPTEMBER	
1	11.0	10.5	10.5	12.5	12.0	12.5	13.5	13.0	13.5	14.5	14.0	14.0
2	11.0	10.5	11.0	12.5	12.0	12.5	14.0	13.0	13.5	14.5	14.0	14.0
3	11.0	10.5	11.0	12.5	12.0	12.5	14.0	13.0	13.5	14.5	14.0	14.0
4	11.5	11.0	11.0	12.5	12.0	12.5	14.0	13.5	13.5	14.5	13.5	14.0
5	11.5	10.5	11.0	12.5	12.0	12.0	14.0	13.5	13.5	14.5	14.0	14.0
6	11.5	10.5	11.0	12.5	12.0	12.5	14.0	13.0	13.5	14.5	14.0	14.0
7	11.5	11.0	11.0	12.5	12.0	12.5	14.0	13.5	13.5	14.5	14.0	14.0
8	11.5	11.0	11.0	12.5	12.0	12.5	14.0	13.5	13.5	14.5	14.0	14.0
9	11.5	11.0	11.5	12.5	12.0	12.5	14.0	13.5	14.0	---	---	---
10	11.5	11.0	11.5	13.0	12.5	12.5	14.0	13.5	14.0	---	---	---
11	12.0	11.0	11.5	13.0	12.5	12.5	14.0	13.5	14.0	---	---	---
12	12.0	11.0	11.5	13.0	12.5	12.5	14.0	13.5	14.0	---	---	---
13	12.0	11.0	11.5	13.0	12.5	12.5	14.0	13.5	14.0	---	---	---
14	11.5	11.0	11.5	13.0	12.5	13.0	14.0	13.5	14.0	---	---	---
15	11.5	11.0	11.5	13.0	12.5	13.0	14.0	13.5	14.0	---	---	---
16	11.5	11.0	11.5	13.5	12.5	13.0	14.0	13.5	14.0	---	---	---
17	12.0	11.0	11.5	13.0	12.5	12.5	14.0	13.5	14.0	---	---	---
18	12.0	11.5	11.5	13.0	12.5	13.0	14.0	13.5	14.0	---	---	---
19	12.0	11.0	11.5	13.5	12.5	13.0	14.0	13.5	14.0	---	---	---
20	12.0	11.5	11.5	13.0	12.5	13.0	14.0	13.5	14.0	---	---	---
21	12.0	11.5	11.5	13.0	12.5	13.0	14.0	13.5	14.0	---	---	---
22	12.0	11.5	11.5	13.5	12.5	13.0	14.0	13.5	14.0	---	---	---
23	12.0	11.5	11.5	13.5	12.5	13.0	14.5	13.5	14.0	---	---	---
24	12.5	11.5	12.0	13.5	12.5	13.0	14.5	13.5	14.0	---	---	---
25	12.5	11.5	12.0	13.5	13.0	13.0	14.5	13.5	14.0	---	---	---
26	12.5	11.5	12.0	13.5	13.0	13.0	14.5	13.5	14.0	---	---	---
27	12.5	11.5	12.0	13.5	13.0	13.0	14.5	13.5	14.0	---	---	---
28	12.5	12.0	12.0	13.5	12.5	13.0	14.5	14.0	14.0	---	---	---
29	12.5	12.0	12.0	13.5	13.0	13.5	14.5	13.5	14.0	---	---	---
30	12.5	12.0	12.5	13.5	13.0	13.5	14.5	14.0	14.0	---	---	---
31	---	---	---	13.5	13.0	13.5	14.5	14.0	14.0	---	---	---
MONTH	12.5	10.5	11.5	13.5	12.0	13.0	14.5	13.0	14.0	---	---	---

14092750 SHITIKE CREEK AT PETERS PASTURE, NEAR WARM SPRINGS, OR

LOCATION.--Lat 44°45'02", long 121°37'56", in NW 1/4 NE 1/4 sec.35, T.9 S., R.9 E., Jefferson County, Hydrologic Unit 17070306, Warm Springs Indian Reservation, on left bank 0.5 mi downstream from Peters Pasture, and 18 mi west of town of Warm Springs.

DRAINAGE AREA.--22.9 mi^2.

PERIOD OF RECORD.--July 1982 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 3,580 ft, from topographic map.

REMARKS.--Estimated daily discharges: Jan. 9, 10, 15-18. Records excellent except for flows above 250 ft^3/s and estimated daily discharges, which are poor. No regulation or diversion upstream from station.

AVERAGE DISCHARGE.--5 years, 80.9 ft^3/s, 47.97 in/yr, 58,610 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,170 ft^3/s Feb. 23, 1986, gage height, 3.65 ft, from rating curve extended above 170 ft^3/s; minimum discharge, 21 ft^3/s Sept. 23-25, 30, 1987.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 400 ft^3/s and maximum (*) from rating curve extended above 170 ft^3/s:

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Nov. 27	1100	*310	*2.18				

Minimum discharge, 21 ft^3/s Sept. 23-25, 30.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	40	48	93	40	173	49	53	158	76	49	35	25
2	37	40	80	40	155	49	57	122	69	47	35	24
3	35	37	75	40	128	56	60	110	71	45	34	25
4	35	35	71	40	114	73	64	106	85	44	34	25
5	36	34	59	40	100	87	64	118	91	45	33	24
6	35	35	55	38	91	93	64	138	79	43	33	24
7	34	35	52	37	85	88	64	158	76	43	32	23
8	32	34	49	35	75	83	80	175	80	43	32	23
9	30	31	47	35	72	78	84	173	81	41	31	23
10	30	31	43	35	70	75	85	153	75	42	31	23
11	29	31	42	34	70	74	95	146	70	42	31	23
12	29	33	42	34	71	88	93	208	76	40	30	23
13	28	33	42	34	97	109	88	178	74	38	31	23
14	28	33	42	34	92	110	83	158	75	38	31	23
15	28	33	42	36	88	101	85	142	85	38	30	23
16	27	34	41	36	81	93	101	124	67	38	30	23
17	27	41	38	36	76	91	115	104	58	41	29	23
18	28	48	37	36	73	86	110	94	56	61	28	22
19	28	71	37	35	69	80	98	83	59	47	28	22
20	27	98	36	39	65	75	89	78	63	43	27	22
21	27	102	35	36	64	72	81	73	69	50	27	22
22	27	89	37	35	60	69	86	72	60	45	27	22
23	27	92	42	35	58	67	97	76	55	41	27	21
24	27	136	39	34	56	63	102	81	54	44	26	21
25	26	103	37	36	52	62	105	83	55	45	26	21
26	25	107	37	43	54	61	101	81	56	43	26	22
27	36	232	36	52	51	57	109	77	54	40	26	22
28	34	194	36	56	49	54	154	73	52	38	25	22
29	33	131	37	54	---	54	168	69	50	37	25	22
30	47	106	37	52	---	52	174	84	50	37	25	21
31	51	---	36	75	---	52	---	100	---	36	25	---
TOTAL	983	2107	1432	1242	2289	2301	2809	3595	2021	1324	910	682
MEAN	31.7	70.2	46.2	40.1	81.7	74.2	93.6	116	67.4	42.7	29.4	22.7
MAX	51	232	93	75	173	110	174	208	91	61	35	25
MIN	25	31	35	34	49	49	53	69	50	36	25	21
AC-FT	1950	4180	2840	2460	4540	4560	5570	7130	4010	2630	1800	1350
CFSM	1.51	3.35	2.21	1.91	3.90	3.54	4.47	5.54	3.22	2.04	1.40	1.09
IN.	1.75	3.74	2.54	2.21	4.07	4.09	4.99	6.39	3.59	2.35	1.62	1.21

CAL YR 1986 TOTAL 30343 MEAN 83.1 MAX 930 MIN 25 AC-FT 60190 CFSM 3.97 IN. 53.90
WTR YR 1987 TOTAL 21695 MEAN 59.4 MAX 232 MIN 21 AC-FT 43030 CFSM 2.84 IN. 38.54

14092885 SHITIKE CREEK BELOW WOLFORD CANYON, NEAR WARM SPRINGS, OR

LOCATION.--Lat 44°46'20", long 121°18'15", in NW 1/4 SE 1/4 sec.21, T.9 S., R.12 E., Jefferson County, Hydrologic Unit 17070306, Warm Springs Indian Reservation, on left bank at bridge crossing 2.3 mi upstream from Tenino Creek, and 2.1 mi northwest of Warm Springs.

DRAINAGE AREA.--75.8 mi^2.

PERIOD OF RECORD.--October 1974 to current year. Records for June 1911 to October 1916, April 1923 to September 1928, and October 1972 to September 1974 (see sta 14093000) at sites downstream not equivalent owing to difference in drainage areas.

GAGE.--Water-stage recorder. Elevation of gage is 1,600 ft, from topographic map.

REMARKS.--Estimated daily discharges: Jan. 15-18. Records good except for estimated daily discharges, and those above 1,000 ft^3/s, which are poor. No regulation. Some diversion for irrigation and Warm Springs water supply.

AVERAGE DISCHARGE.--13 years, 98.1 ft^3/s, 17.58 in/yr, 71,070 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,980 ft^3/s Feb. 23, 1986, gage height, 6.40 ft, from rating curve extended above 860 ft^3/s; maximum gage height, 7.35 ft Dec. 13, 1977; minimum daily discharge, 17 ft^3/s Oct. 12-15, 17-22, 24-27, Nov. 12, 1978.

EXTREMES FOR CURRENT YEAR.--Peak discharge greater than base discharge of 400 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Nov. 27	1730	*295	*4.51				

Minimum discharge, 33 ft^3/s Sept. 21-26, 29, 30.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	61	68	106	67	183	80	87	195	102	65	47	37
2	58	62	95	67	181	81	89	159	93	63	46	36
3	56	60	88	66	153	86	93	143	90	61	45	36
4	56	58	84	66	134	100	95	137	96	60	44	36
5	57	57	81	65	120	121	95	143	111	61	44	36
6	57	57	78	63	111	130	94	161	100	60	44	35
7	56	57	75	62	104	123	94	181	95	60	42	35
8	55	56	73	61	99	118	102	198	98	59	41	35
9	53	56	70	54	97	113	110	204	97	57	41	35
10	53	55	66	61	95	109	109	187	94	57	40	35
11	52	54	67	61	95	107	121	173	86	56	40	35
12	52	57	67	64	95	121	120	220	89	55	40	35
13	51	58	67	63	132	148	113	229	89	54	40	34
14	51	58	67	60	130	149	109	185	88	53	41	34
15	51	58	66	55	128	139	110	172	98	52	40	34
16	51	58	65	40	119	129	121	159	87	51	39	34
17	51	65	63	55	111	124	138	134	76	53	39	34
18	51	63	63	60	106	121	138	124	73	75	39	34
19	51	86	62	59	100	113	126	110	75	63	38	34
20	50	95	61	49	96	108	117	103	77	58	38	34
21	50	128	61	62	94	104	110	99	80	60	38	33
22	50	106	62	53	92	101	112	96	78	58	36	33
23	50	99	67	54	91	98	122	98	73	55	36	33
24	50	147	64	60	87	95	128	105	70	57	35	33
25	50	128	63	62	84	94	131	105	70	64	35	33
26	50	115	63	72	82	92	127	104	70	55	35	33
27	54	216	62	77	82	90	130	98	70	52	36	34
28	60	220	61	80	81	88	169	96	69	50	37	34
29	56	161	63	77	---	86	196	92	67	50	37	33
30	65	126	63	74	---	85	203	96	66	49	37	33
31	68	---	62	80	---	86	---	123	---	47	36	---
TOTAL	1676	2684	2155	1949	3082	3339	3609	4429	2527	1770	1226	1030
MEAN	54.1	89.5	69.5	62.9	110	108	120	143	84.2	57.1	39.5	34.3
MAX	68	220	106	80	183	149	203	229	111	75	47	37
MIN	50	54	61	40	81	80	87	92	66	47	35	33
AC-FT	3320	5320	4270	3870	6110	6620	7160	8780	5010	3510	2430	2040
CFSM	.71	1.18	.92	.83	1.45	1.42	1.59	1.88	1.11	.75	.52	.45
IN.	.82	1.32	1.06	.96	1.51	1.64	1.77	2.17	1.24	.87	.60	.51

CAL YR 1986 TOTAL 43322 MEAN 119 MAX 1360 MIN 50 AC-FT 85930 CFSM 1.57 IN. 21.26
WTR YR 1987 TOTAL 29476 MEAN 80.8 MAX 229 MIN 33 AC-FT 58470 CFSM 1.07 IN. 14.47

14095500 WARM SPRINGS RIVER NEAR SIMNASHO, OR

LOCATION.--Lat 44°58'10", long 121°28'35", in SE 1/4 SW 1/4 sec.7, T.7 S., R.11 E., Wasco County, Hydrologic Unit 17070306, Warm Springs Indian Reservation, on right bank abutment of log bridge at Hehe Butte rodeo grounds, 3.3 mi upstream from Badger Creek, and 6.2 mi west of Simnasho.

DRAINAGE AREA.--107 mi^2.

PERIOD OF RECORD.--June to September 1915, August 1949 to September 1954, October 1983 to current year. Prior to October 1983, published as "at Hehe Mill near Warm Springs."

GAGE.--Water-stage recorder. Datum of gage is 2,533.78 ft above National Geodetic Vertical Datum of 1929. June to September 1915 1.0 mi downstream at different datum. August 1949 to September 1954 0.5 mi downstream at datum 7.12 ft lower.

REMARKS.--Estimated daily discharges: Jan. 25-29. Records good except for estimated daily discharges, which are fair. No regulation or diversions.

AVERAGE DISCHARGE.--9 years (water years 1950-54, 1984-87) 174 ft^3/s, 22.08 in/yr, 126,100 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,700 ft^3/s Feb. 23, 1986, gage height, 5.70 ft, from floodmark; minimum discharge observed, 97 ft^3/s July 30, Sept. 5, 30, 1915.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 350 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Feb. 1	1700	*235	*3.14				

Minimum discharge, 103 ft^3/s Sept. 12.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	120	122	155	125	208	149	157	174	129	113	110	106
2	120	120	149	124	219	151	159	168	126	113	110	106
3	120	120	143	124	197	157	163	165	124	113	109	106
4	120	119	140	124	182	159	164	160	123	112	109	106
5	119	119	137	122	171	164	166	157	122	113	108	106
6	119	120	135	120	165	170	166	155	121	112	108	106
7	120	129	132	120	160	170	166	153	121	112	107	106
8	120	125	130	120	156	172	178	151	120	112	108	106
9	120	124	128	119	154	174	177	149	119	112	108	106
10	119	120	128	118	153	174	176	144	118	112	107	106
11	118	120	127	118	155	173	183	142	118	112	107	106
12	119	119	126	119	155	188	177	158	117	112	107	106
13	120	118	127	120	194	204	173	154	116	111	107	106
14	120	118	126	119	189	209	172	145	117	110	108	106
15	120	118	125	118	195	206	173	141	118	110	107	107
16	120	124	124	118	188	200	178	137	116	110	107	106
17	120	136	122	118	181	199	185	135	116	114	107	106
18	120	128	122	118	178	199	184	133	116	126	107	106
19	120	134	122	118	173	192	176	132	115	115	107	106
20	120	133	121	118	168	187	172	131	115	114	107	106
21	120	148	121	118	166	183	169	130	115	115	107	106
22	120	161	123	118	165	179	170	130	115	113	107	106
23	120	148	131	118	164	178	169	135	114	112	107	106
24	120	150	126	118	159	173	168	134	114	115	107	106
25	120	149	123	120	154	169	167	132	114	113	107	106
26	120	163	123	130	150	167	165	129	114	112	107	106
27	122	193	123	140	148	163	165	127	113	112	107	106
28	120	206	121	150	147	161	171	126	113	111	106	106
29	121	180	123	130	---	159	171	126	113	111	106	106
30	140	164	126	124	---	159	175	127	113	110	106	106
31	127	---	122	135	---	158	---	128	---	110	106	---
TOTAL	3744	4128	3981	3801	4794	5446	5135	4408	3525	3492	3328	3181
MEAN	121	138	128	123	171	176	171	142	117	113	107	106
MAX	140	206	155	150	219	209	185	174	129	126	110	107
MIN	118	118	121	118	147	149	157	126	113	110	106	106
AC-FT	7430	8190	7900	7540	9510	10800	10190	8740	6990	6930	6600	6310
CFSM	1.13	1.29	1.20	1.15	1.60	1.64	1.60	1.33	1.10	1.05	1.00	.99
IN.	1.30	1.44	1.38	1.32	1.67	1.89	1.79	1.53	1.23	1.21	1.16	1.11

CAL YR 1986 TOTAL 66273 MEAN 182 MAX 1600 MIN 118 AC-FT 131500 CFSM 1.70 IN. 23.04
WTR YR 1987 TOTAL 48963 MEAN 134 MAX 219 MIN 106 AC-FT 97120 CFSM 1.25 IN. 17.02

14096300 MILL CREEK NEAR BADGER BUTTE, NEAR WARM SPRINGS, OR

LOCATION.--Lat 44°51'42", long 121°37'35", in SW 1/4 sec.23, T.8 S., R.9 E., Wasco County, Hydrologic Unit 17070306, Warm Springs Indian Reservation, on right bank 200 ft upstream from bridge on road B241, 3.4 mi upstream from headworks of Mill Creek Canal, and 19.3 mi northwest of town of Warm Springs.

DRAINAGE AREA.--26.8 mi^2.

PERIOD OF RECORD.--October 1983 to current year.

GAGE.--Water-stage recorder and crest-stage gage. Elevation of gage is 3,380 ft, from topographic map.

REMARKS.--Estimated daily discharges: Jan. 16, 17. Records good. No regulation or diversion upstream from station.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 368 ft^3/s Feb. 23, 1986, gage height, 6.53 ft, from rating curve extended above 105 ft^3/s; maximum gage height, 7.30 ft Feb. 23, 1986, from high-water mark on crest-stage gage; minimum discharge, 34 ft^3/s Aug. 28-31, Sept. 2, 3, 1987.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 130 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Nov. 27	1800	*145	*5.73	Feb. 1	1030	139	5.69

Minimum discharge, 34 ft^3/s Aug. 28-31, Sept. 2, 3.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	47	49	80	56	125	58	59	107	73	60	40	35
2	44	47	71	57	108	60	60	102	70	57	40	34
3	44	46	65	57	97	66	62	95	70	56	39	34
4	44	44	63	56	89	70	63	94	67	56	39	35
5	44	44	60	55	82	72	63	94	65	55	39	35
6	43	47	60	53	77	76	65	97	63	55	38	35
7	43	49	56	52	70	74	64	101	64	53	38	35
8	43	50	55	50	70	73	73	103	66	51	36	35
9	43	48	51	50	68	72	74	106	66	50	36	35
10	43	46	51	50	66	71	76	104	63	49	36	35
11	43	45	51	50	66	72	82	102	62	49	36	35
12	43	47	51	50	65	83	80	112	68	49	36	35
13	43	45	51	51	81	89	77	122	68	49	37	35
14	43	45	51	52	78	89	77	114	68	48	37	35
15	43	45	51	50	75	83	77	105	70	48	37	35
16	43	47	49	43	72	77	80	99	70	47	37	35
17	43	59	49	48	70	75	87	93	68	49	37	35
18	43	56	49	51	69	74	88	88	66	62	37	36
19	43	64	48	50	67	70	86	84	66	52	37	36
20	43	66	48	49	65	68	81	80	63	50	37	36
21	43	83	48	48	63	66	77	77	63	50	37	35
22	42	88	50	48	62	64	77	76	63	48	36	35
23	42	83	56	48	61	63	79	78	64	44	36	35
24	42	90	52	52	61	62	81	76	65	50	36	35
25	42	88	50	60	60	61	83	73	65	50	35	35
26	43	96	51	72	59	61	83	70	62	45	35	36
27	47	134	50	72	59	60	84	70	59	44	35	36
28	45	133	50	70	57	59	91	69	57	44	34	36
29	46	110	53	67	---	58	100	67	57	43	34	36
30	57	92	52	65	---	58	103	69	62	42	34	36
31	52	---	51	88	---	59	---	73	---	40	34	---
TOTAL	1369	1986	1673	1720	2042	2143	2332	2800	1953	1545	1135	1056
MEAN	44.2	66.2	54.0	55.5	72.9	69.1	77.7	90.3	65.1	49.8	36.6	35.2
MAX	57	134	80	88	125	89	103	122	73	62	40	36
MIN	42	44	48	43	57	58	59	67	57	40	34	34
AC-FT	2720	3940	3320	3410	4050	4250	4630	5550	3870	3060	2250	2090
CFSM	1.65	2.47	2.01	2.07	2.72	2.58	2.90	3.37	2.43	1.86	1.37	1.31
IN.	1.90	2.76	2.32	2.39	2.83	2.97	3.24	3.89	2.71	2.14	1.58	1.47

CAL YR 1986 TOTAL 24584 MEAN 67.4 MAX 324 MIN 41 AC-FT 48760 CFSM 2.51 IN. 34.12
WTR YR 1987 TOTAL 21754 MEAN 59.6 MAX 134 MIN 34 AC-FT 43150 CFSM 2.22 IN. 30.20

14096850 BEAVER CREEK BELOW QUARTZ CREEK, NEAR SIMNASHO, OR

LOCATION.--Lat 44°57'32", long 121°23'35", in NE 1/4 SW 1/4 sec.14, T.7 S., R.11 E., Wasco County, Hydrologic Unit 17070306, Warm Springs Indian Reservation, on right bank 600 ft downstream from culvert on Warm Springs Reservation Highway 9, 200 ft downstream from Quartz Creek, and 2.4 mi west of Simnasho.

DRAINAGE AREA.--145 mi^2.

PERIOD OF RECORD.--October 1983 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 2,260 ft, from topographic map.

REMARKS.--No estimated daily discharges. Records excellent. No regulation or diversions upstream from station.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 4,340 ft^3/s, Feb. 23, 1986, gage height, 7.96 ft; minimum discharge, 34 ft^3/s Nov. 22, 1985, Jan. 16, July 31, Aug. 3, 4, 1987.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 500 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Feb. 13	1200	*299	*3.35				

Minimum discharge, 34 ft^3/s Jan. 16, July 31, Aug. 3, 4.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	40	42	58	45	190	75	75	72	48	39	37	36
2	40	41	55	48	185	77	76	69	46	39	37	36
3	40	41	52	49	152	85	79	67	45	39	37	36
4	40	41	51	50	119	96	81	65	45	39	36	36
5	40	41	50	47	100	105	80	63	44	39	36	36
6	40	41	49	45	90	117	78	61	44	39	36	36
7	40	43	48	44	83	112	77	60	44	39	36	36
8	40	44	47	43	80	108	79	59	44	38	36	36
9	39	45	45	42	78	110	80	57	43	38	36	36
10	39	44	43	41	76	109	79	56	42	39	36	36
11	40	43	43	42	78	105	82	55	42	39	36	36
12	40	44	44	43	80	133	79	60	42	37	36	36
13	41	44	44	42	231	219	76	60	41	37	37	36
14	41	44	44	42	193	194	73	56	41	37	37	36
15	41	44	44	40	199	199	73	54	42	37	36	36
16	41	45	42	39	170	159	76	52	41	37	36	36
17	42	56	42	38	139	145	80	52	41	39	36	36
18	41	52	42	40	125	141	83	51	41	47	36	36
19	41	58	41	41	112	129	79	50	41	41	36	36
20	41	58	41	41	104	119	75	50	40	40	36	36
21	41	65	41	41	98	111	72	50	40	40	36	36
22	41	67	42	41	93	104	71	49	40	39	36	36
23	41	65	47	41	93	102	71	52	40	39	36	36
24	40	63	46	43	88	97	70	51	40	40	36	36
25	40	62	44	44	80	91	69	50	39	39	36	35
26	40	63	44	56	76	88	68	49	39	38	36	36
27	41	76	44	66	76	84	67	48	39	37	36	36
28	40	89	42	72	74	82	69	47	39	37	36	36
29	40	74	43	71	---	79	70	47	39	37	36	36
30	48	63	45	65	---	77	73	47	39	37	36	36
31	45	---	44	75	---	76	---	48	---	37	36	---
TOTAL	1264	1598	1407	1477	3262	3528	2260	1707	1251	1199	1121	1079
MEAN	40.8	53.3	45.4	47.6	116	114	75.3	55.1	41.7	38.7	36.2	36.0
MAX	48	89	58	75	231	219	83	72	48	47	37	36
MIN	39	41	41	38	74	75	67	47	39	37	36	35
AC-FT	2510	3170	2790	2930	6470	7000	4480	3390	2480	2380	2220	2140
CFSM	.28	.37	.31	.33	.80	.78	.52	.38	.29	.27	.25	.25
IN.	.32	.41	.36	.38	.84	.91	.58	.44	.32	.31	.29	.28

CAL YR 1986 TOTAL 45508 MEAN 125 MAX 3680 MIN 39 AC-FT 90270 CFSM .86 IN. 11.68
WTR YR 1987 TOTAL 21153 MEAN 58.0 MAX 231 MIN 35 AC-FT 41960 CFSM .40 IN. 5.43

14097100 WARM SPRINGS RIVER NEAR KAHNEETA HOT SPRINGS, OR

LOCATION.--Lat 44°51'24", long 121°08'55", in SE 1/4 SW 1/4 sec.23, T.8 S., R.13 E., Wasco County, Hydrologic Unit 17070306, Warm Springs Indian Reservation, on right bank 25 ft upstream from bridge, 2.5 mi east of Kahneeta Hot Springs, and at mile 4.6.

DRAINAGE AREA.--526 mi^2.

PERIOD OF RECORD.--October 1972 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 1,400 ft, from topographic map.

REMARKS.--Estimated daily discharges: Jan. 16-18. Records good except for estimated daily discharges, which are fair. No regulation. Small diversions for irrigation upstream from station.

AVERAGE DISCHARGE.--15 years, 453 ft^3/s, 11.70 in/yr, 328,200 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 9,240 ft^3/s Feb. 23, 1986, gage height, 10.54 ft; minimum daily discharge, 160 ft^3/s Jan. 1, 2, 1979.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 1,700 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Feb. 1	2000	*1,040	*3.08				

Minimum discharge, 176 ft^3/s Jan. 16.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	283	283	488	308	839	421	423	559	312	240	228	223
2	279	269	436	326	936	426	427	529	304	240	233	221
3	276	263	405	315	847	456	441	500	292	237	232	222
4	275	260	383	330	695	502	454	475	289	232	227	224
5	273	258	375	315	602	533	453	457	282	231	223	224
6	272	265	360	302	557	577	453	449	274	231	223	224
7	271	281	346	293	514	574	451	451	270	232	224	222
8	270	290	332	287	485	566	470	454	270	229	223	223
9	269	285	322	264	471	574	504	449	268	229	223	221
10	267	276	300	268	457	564	491	438	261	234	220	220
11	266	266	309	272	461	553	518	420	258	228	219	221
12	266	268	310	283	464	602	521	434	257	227	223	221
13	266	268	310	284	749	783	497	488	250	225	227	223
14	267	270	313	283	776	775	482	458	250	224	230	223
15	266	269	305	267	761	791	479	424	257	217	228	225
16	266	270	298	210	730	710	495	395	252	218	224	226
17	272	330	286	235	637	666	522	373	247	229	223	225
18	272	329	293	260	604	661	557	356	246	309	217	225
19	266	362	289	278	571	627	534	343	241	282	223	225
20	263	354	288	256	539	592	502	333	242	257	222	224
21	259	438	287	259	513	567	482	325	241	257	222	223
22	259	504	289	259	498	544	472	318	242	246	223	221
23	258	479	322	265	503	531	473	325	241	243	226	221
24	259	469	319	294	481	514	476	342	238	265	225	221
25	259	496	301	331	443	492	473	332	235	271	223	220
26	266	491	299	375	421	476	471	311	232	254	224	224
27	272	606	294	439	438	460	469	302	229	242	225	227
28	273	789	279	462	428	445	488	295	227	236	224	225
29	273	662	293	426	---	434	518	288	227	232	221	225
30	320	553	306	403	---	427	545	287	227	229	221	226
31	330	---	297	390	---	423	---	299	---	229	223	---
TOTAL	8433	11203	10034	9539	16420	17266	14541	12209	7661	7455	6949	6695
MEAN	272	373	324	308	586	557	485	394	255	240	224	223
MAX	330	789	488	462	936	791	557	559	312	309	233	227
MIN	258	258	279	210	421	421	423	287	227	217	217	220
AC-FT	16730	22220	19900	18920	32570	34250	28840	24220	15200	14790	13780	13280
CFSM	.52	.71	.62	.58	1.11	1.06	.92	.75	.49	.46	.43	.42
IN.	.60	.79	.71	.67	1.16	1.22	1.03	.86	.54	.53	.49	.47

CAL YR 1986 TOTAL 201578 MEAN 552 MAX 7560 MIN 250 AC-FT 399800 CFSM 1.05 IN. 14.26
WTR YR 1987 TOTAL 128405 MEAN 352 MAX 936 MIN 210 AC-FT 254700 CFSM .67 IN. 9.08

14101500 WHITE RIVER BELOW TYGH VALLEY, OR

LOCATION.--Lat 45°14'30", long 121°05'38", in NE 1/4 NE 1/4 sec.7, T.4 S., R.14 E., Wasco County, Hydrologic Unit 17070306, on left bank 200 ft downstream from former Pacific Power & Light Co. powerplant at White River Falls, 3.9 mi east of town of Tygh Valley, and at mile 2.0.

DRAINAGE AREA.--417 mi^2.

PERIOD OF RECORD.--October 1917 to current year.

REVISED RECORDS.--WSP 1448: 1920, 1923, 1927-28, drainage area. WSP 1935: 1956.

GAGE.--Water-stage recorder. Datum of gage is 870.15 ft above National Geodetic Vertical Datum of 1929 (levels by Pacific Power & Light Co.). Prior to July 28, 1931, at site 750 ft downstream at different datum. July 28, 1931, to Sept. 30, 1954, at site 700 ft downstream at different datums.

REMARKS.--No estimated daily discharges. Records fair. No regulation. Diversions upstream from station for irrigation.

AVERAGE DISCHARGE.--70 years, 426 ft^3/s, 308,600 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 13,300 ft^3/s Jan. 6, 1923, gage height, about 13.3 ft, site and datum then in use, from rating curve extended above 5,000 ft^3/s; minimum discharge, 7.5 ft^3/s Aug. 31, 1961.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 1,600 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Mar. 12	0300	*1,080	*3.68				

Minimum discharge, 90 ft^3/s Sept. 22, 23.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	144	170	370	212	919	362	370	605	241	136	118	105
2	136	145	337	217	803	377	398	523	221	138	117	104
3	131	137	308	209	650	416	456	508	204	136	116	103
4	128	133	289	214	545	510	466	478	198	132	115	102
5	126	134	285	205	473	570	453	465	195	134	113	101
6	126	156	274	197	435	648	445	475	187	133	111	101
7	125	167	256	190	417	619	426	498	180	126	109	101
8	123	164	245	184	404	600	487	496	177	125	108	100
9	123	162	233	174	401	586	484	508	172	127	108	97
10	122	157	218	170	394	586	481	477	167	131	107	95
11	118	153	219	184	403	579	535	449	162	128	104	95
12	116	165	221	190	406	714	500	504	159	125	101	96
13	119	160	216	188	660	1000	471	462	159	122	101	95
14	125	161	214	185	706	946	459	395	164	120	109	94
15	124	159	210	169	699	910	488	375	165	118	107	97
16	124	154	199	147	661	822	540	351	159	114	105	96
17	124	212	194	156	629	789	582	330	156	117	104	94
18	129	200	195	187	589	762	555	315	152	165	102	95
19	125	281	196	186	543	683	493	290	150	145	101	95
20	123	332	187	164	509	628	441	278	150	125	101	95
21	122	456	186	173	483	583	402	267	151	129	101	95
22	122	398	189	164	463	546	417	262	155	130	100	93
23	121	417	227	169	458	521	451	261	148	128	98	93
24	119	563	218	181	431	483	476	254	141	135	99	96
25	119	481	203	195	396	458	467	240	137	134	100	95
26	124	423	203	241	379	440	428	232	138	125	105	97
27	134	604	204	304	378	400	446	225	139	124	105	99
28	140	622	194	328	356	382	548	219	137	121	105	96
29	129	510	194	328	---	370	590	213	138	122	105	96
30	150	418	214	302	---	360	629	214	137	120	104	97
31	169	---	203	412	---	359	---	241	---	118	104	---
TOTAL	3960	8394	7101	6525	14590	18009	14384	11410	4939	3983	3283	2918
MEAN	128	280	229	210	521	581	479	368	165	128	106	97.3
MAX	169	622	370	412	919	1000	629	605	241	165	118	105
MIN	116	133	186	147	356	359	370	213	137	114	98	93
AC-FT	7850	16650	14080	12940	28940	35720	28530	22630	9800	7900	6510	5790

CAL YR 1986 TOTAL 171904 MEAN 471 MAX 6190 MIN 100 AC-FT 341000
WTR YR 1987 TOTAL 99496 MEAN 273 MAX 1000 MIN 93 AC-FT 197400

14103000 DESCHUTES RIVER AT MOODY, NEAR BIGGS, OR
(National stream quality accounting network station)

LOCATION.--Lat 45°37'20", long 120°54'05", in SW 1/4 SE 1/4 sec.26, T.2 N., R.15 E., Sherman County, Hydrologic Unit 17070306, on right bank at Moody, 4.0 mi southwest of Biggs, and at mile 1.4.

DRAINAGE AREA.--10,500 mi^2, approximately.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1897 to December 1899 (published as "near Moro"), July 1906 to current year. Monthly discharge only for some periods, published in WSP 1318.

REVISED RECORDS.--WSP 754: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 167.54 ft above National Geodetic Vertical Datum of 1929. Oct. 19, 1897, to Dec. 31, 1899, nonrecording gage at site 10 mi upstream at different datum. July 22, 1906, to July 18, 1930, nonrecording gage at site 300 ft downstream at datum 0.50 ft lower.

REMARKS.--Estimated daily discharges: Nov. 27 to Dec. 2. Water-discharge records excellent. Some fluctuation caused by regulation at Lake Simtustus since 1957. Some winter and spring runoff stored in Ochoco Reservoir, capacity, 46,420 acre-ft, in Crescent Lake, Crane Prairie, and Wickiup Reservoirs, combined capacity, 323,390 acre-ft, and since 1960, in Prineville Reservoir (station 14080400), and since 1964 in Lake Billy Chinook (station 14092100). Large diversions in upper river basin for irrigation.

AVERAGE DISCHARGE.--83 years, 5,869 ft^3/s, 4,252,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 75,500 ft^3/s Dec. 22, 1964, gage height, 11.80 ft, from rating curve extended above 47,000 ft^3/s; minimum discharge, 2,400 ft^3/s Dec. 5, 1957.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 7,870 ft^3/s Mar. 21, gage height, 3.67 ft; minimum discharge, 4,140 ft^3/s July 17.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	4850	5410	5600	5500	5520	5830	6600	5580	4620	4430	4350	4310
2	4980	5350	5600	5550	6120	5850	6630	5480	4640	4360	4260	4350
3	4980	5320	5580	5830	6570	5730	6680	5390	4690	4220	4250	4420
4	4990	5310	5590	5820	6670	5880	6240	5320	4730	4210	4310	4420
5	4980	5300	5700	5810	6500	6010	6160	5260	4810	4200	4400	4420
6	4970	5370	5660	5490	6330	6180	6140	5240	4790	4210	4340	4420
7	4970	5540	5630	5180	6230	6200	5930	5260	4770	4290	4290	4410
8	4970	5630	5590	5090	6150	6130	5900	5370	4760	4580	4350	4400
9	4970	5620	5570	5060	6120	6110	6000	5420	4720	4770	4340	4390
10	4960	5610	5540	5030	6430	6080	5820	5400	4590	4690	4340	4390
11	4970	5480	5520	4720	6410	6050	5820	5390	4510	4510	4350	4390
12	4900	5280	5570	4650	6340	6120	5490	5420	4500	4500	4350	4400
13	4740	5100	5530	4530	6650	6850	5420	5520	4500	4500	4360	4440
14	4740	5130	5530	4480	6850	7090	5600	5460	4510	4520	4410	4460
15	4740	5130	5530	4250	6420	7090	5720	5370	4550	4600	4470	4430
16	4740	5130	5990	4570	6690	7070	6110	5300	4470	4500	4460	4470
17	4820	5180	6520	4790	6660	7280	6210	5240	4360	4200	4510	4450
18	4970	5490	6730	4950	7020	7290	6260	5180	4480	4360	4490	4400
19	4990	5590	6370	5020	7250	7490	6200	5130	4680	4530	4490	4430
20	4860	5720	5840	4970	7190	7340	6130	5040	4640	4440	4510	4500
21	4900	5850	5780	4940	7140	7770	6050	4890	4600	4470	4480	4500
22	5130	5750	5770	4870	7040	7750	6030	4790	4600	4650	4370	4490
23	5410	5720	6100	4810	7040	7680	6050	4710	4550	4850	4290	4510
24	5300	5820	6170	4710	6730	7520	6070	4730	4390	5270	4300	4590
25	5110	5860	6140	4730	6210	7670	6070	4760	4230	5700	4300	4550
26	5130	5760	6140	5170	5860	7520	6040	4720	4210	5860	4310	4520
27	5150	5700	6130	5310	5850	7340	6030	4650	4280	5960	4310	4550
28	5160	5800	6130	4960	5840	6780	5550	4580	4420	5310	4300	4550
29	5200	5820	5780	4880	---	6670	5510	4570	4420	4620	4320	4650
30	5300	5700	5690	4740	---	6640	5580	4560	4430	4310	4320	4790
31	5410	---	5500	4720	---	6620	---	4610	---	4380	4310	---
TOTAL	155290	165470	180520	155130	181830	209630	180040	158340	136450	144000	135240	134000
MEAN	5009	5516	5823	5004	6494	6762	6001	5108	4548	4645	4363	4467
MAX	5410	5860	6730	5830	7250	7770	6680	5580	4810	5960	4510	4790
MIN	4740	5100	5500	4250	5520	5730	5420	4560	4210	4200	4250	4310
AC-FT	308000	328200	358100	307700	360700	415800	357100	314100	270600	285600	268200	265800

CAL YR 1986 TOTAL 2386000 MEAN 6537 MAX 37100 MIN 3960 AC-FT 4733000
WTR YR 1987 TOTAL 1935940 MEAN 5304 MAX 7770 MIN 4200 AC-FT 3840000

14103000 DESCHUTES RIVER AT MOODY, NEAR BIGGS, OR--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1911-12, 1953-58, 1962 to current year.

PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: October 1975 to September 1981.
WATER TEMPERATURE: December 1952 to February 1954, November 1954 to September 1958, June 1962 to September 1981.

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SPE-CIFIC CON-DUCT-ANCE (US/CM)	PH (STAND-ARD UNITS)	TEMPER-ATURE WATER (DEG C)	OXYGEN, DIS-SOLVED (MG/L)	OXYGEN DIS-SOLVED (PER-CENT SATUR-ATION)	COLI-FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)	STREP-TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML)	HARD-NESS (MG/L AS CACO3)	HARD-NESS NONCARB (MG/L AS CACO3)	CALCIUM DIS-SOLVED (MG/L AS CA)
DEC												
03...	1250	5610	117	7.6	7.5	12.3	102	K3	54	41	0	7.9
JAN												
21...	1255	4930	130	7.7	4.0	13.5	102	K10	K220	46	0	8.7
MAR												
17...	1215	7350	120	7.9	8.5	12	100	K8	K5	41	0	8.2
MAY												
19...	1230	5120	120	8.5	14.5	11	104	K2	K2	42	0	8.1
JUL												
27...	1230	5940	120	8.4	18.0	10	112	K3	K450	42	0	8.1
SEP												
30...	1230	4710	138	8.5	15.0	10.9	108	K4	K25	46	0	8.4

DATE	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG)	SODIUM, DIS-SOLVED (MG/L AS NA)	POTAS-SIUM, DIS-SOLVED (MG/L AS K)	ALKA-LINITY WAT DIS IT FIELD (MG/L AS CACO3)	BICAR-BONATE IT-FLD (MG/L AS HCO3)	CAR-BONATE IT-FLD (MG/L AS CO3)	SULFATE DIS-SOLVED (MG/L AS SO4)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)	FLUO-RIDE, DIS-SOLVED (MG/L AS F)	NITRO-GEN, AMMONIA DIS-SOLVED (MG/L AS N)	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N)
DEC											
03...	5.2	10	1.8	59	72	0	3.2	2.3	0.2	0.02	<0.1
JAN											
21...	6.0	12	1.9	69	82	0	3.8	1.9	0.2	<0.01	0.1
MAR											
17...	4.9	9.9	1.9	60	73	0	3.9	2.5	0.2	0.02	0.1
MAY											
19...	5.2	10	1.8	61	71	1	3.4	1.0	<0.1	0.01	<0.1
JUL											
27...	5.2	11	1.9	60	71	1	3.1	2.8	0.2	0.01	<0.1
SEP											
30...	6.0	12	2.2	67	78	1	3.1	1.8	0.2	0.04	<0.1

DATE	NITRO-GEN, AM-MONIA + ORGANIC TOTAL (MG/L AS N)	PHOS-PHORUS ORTHO, DIS-SOLVED (MG/L AS P)	PHOS-PHORUS DIS-SOLVED (MG/L AS P)	PHOS-PHORUS TOTAL (MG/L AS P)	SILICA, DIS-SOLVED (MG/L AS SIO2)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L)	SOLIDS, DIS-SOLVED (TONS PER DAY)	TUR-BID-ITY (NTU)	SEDI-MENT, SUS-PENDED (MG/L)	SEDI-MENT, DIS-CHARGE, SUS-PENDED (T/DAY)
DEC											
03...	0.2	0.03	0.03	0.03	27	72	93	1090	1.2	13	197
JAN											
21...	0.3	0.04	0.05	0.05	30	92	107	1220	0.6	--	--
MAR											
17...	0.5	0.05	0.06	0.09	30	90	98	1790	9.0	30	595
MAY											
19...	0.4	0.04	0.05	0.07	29	90	95	1240	0.7	45	622
JUL											
27...	0.5	0.04	0.06	0.07	26	92	94	1490	0.6	--	--
SEP											
30...	0.2	0.03	0.04	0.06	29	93	103	1180	2.4	9	114

K - Results based on colony count outside acceptable range (non-ideal colony count).

14103000 DESCHUTES RIVER AT MOODY, NEAR BIGGS, OR--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	ALUMINUM, DISSOLVED (UG/L AS AL)	ARSENIC DISSOLVED (UG/L AS AS)	BARIUM, DISSOLVED (UG/L AS BA)	BERYLLIUM, DISSOLVED (UG/L AS BE)	CADMIUM DISSOLVED (UG/L AS CD)	CHROMIUM, DISSOLVED (UG/L AS CR)	COBALT, DISSOLVED (UG/L AS CO)	COPPER, DISSOLVED (UG/L AS CU)	IRON, DISSOLVED (UG/L AS FE)	LEAD, DISSOLVED (UG/L AS PB)
DEC 03...	<10	2	5	<0.5	1	<1	<3	1	21	<5
JAN 21...	<10	2	5	<0.5	1	6	<3	<1	15	<5
MAR 17...	--	--	--	--	--	--	--	--	--	--
MAY 19...	<10	1	4	<0.5	<1	2	<3	6	13	13
JUL 27...	--	--	--	--	--	--	--	--	--	--
SEP 30...	<10	2	8	<0.5	7	<1	<3	5	9	6

DATE	LITHIUM DISSOLVED (UG/L AS LI)	MANGANESE, DISSOLVED (UG/L AS MN)	MERCURY DISSOLVED (UG/L AS HG)	MOLYBDENUM, DISSOLVED (UG/L AS MO)	NICKEL, DISSOLVED (UG/L AS NI)	SELENIUM, DISSOLVED (UG/L AS SE)	SILVER, DISSOLVED (UG/L AS AG)	STRONTIUM, DISSOLVED (UG/L AS SR)	VANADIUM, DISSOLVED (UG/L AS V)	ZINC, DISSOLVED (UG/L AS ZN)
DEC 03...	7	<1	--	<10	2	<1	<1	47	13	3
JAN 21...	8	4	0.3	<10	1	<1	<1	45	15	11
MAR 17...	--	--	--	--	--	--	--	--	--	--
MAY 19...	7	1	<0.1	<10	<1	<1	<1	44	13	6
JUL 27...	--	--	--	--	--	--	--	--	--	--
SEP 30...	6	2	<0.1	<10	3	<1	<1	44	14	9

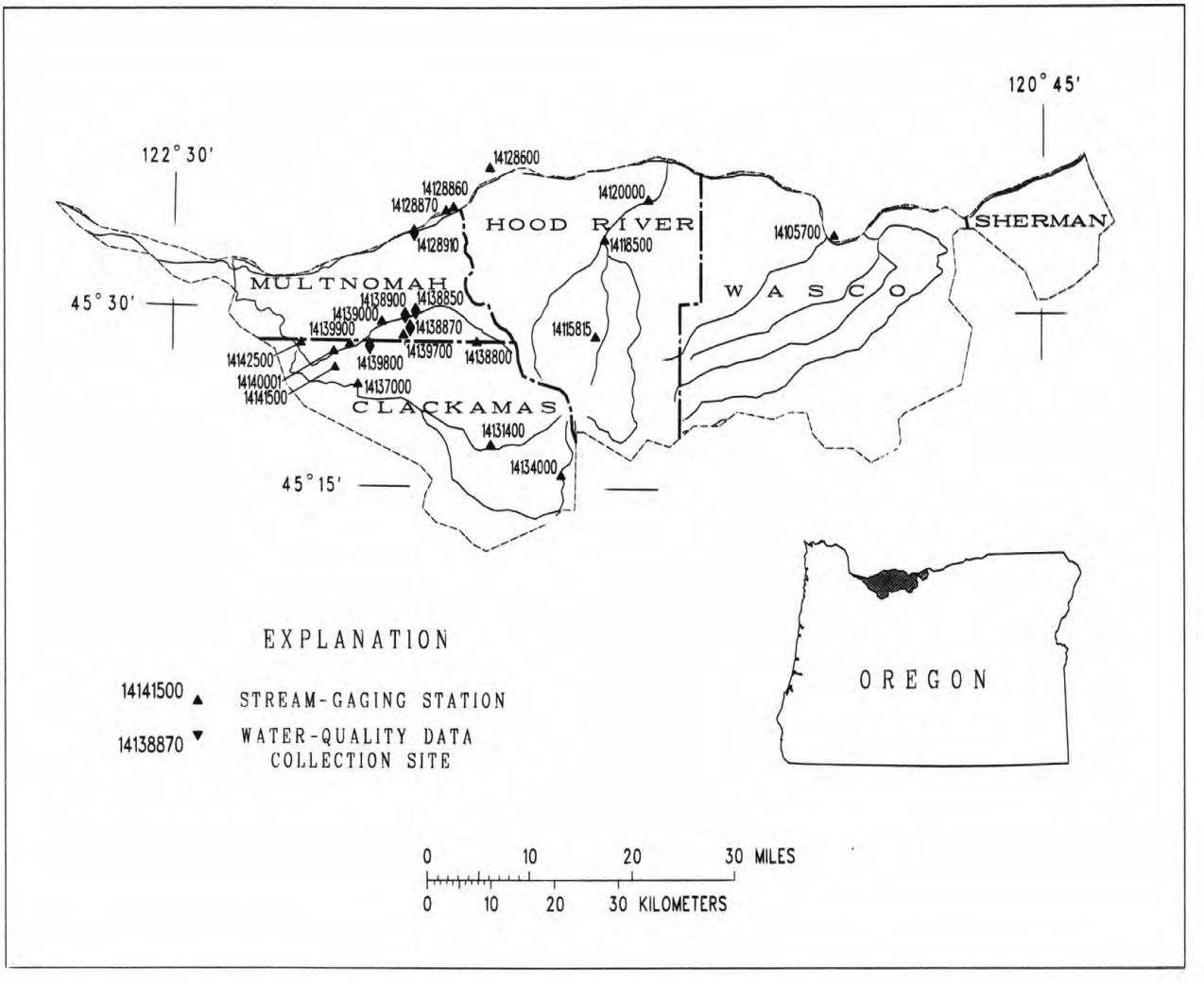

Figure 8.--Location of surface-water and water-quality stations in the Lower Deschutes River, Middle and Lower Columbia River, and Sandy River basins.

14105700 COLUMBIA RIVER AT THE DALLES, OR

LOCATION.--Lat 45°36'27", long 121°10'20", in SW 1/4 SW 1/4 sec.34, T.2 N., R.13 E., Wasco County, Hydrologic Unit 17070105, Corps of Engineers land, on left bank 0.3 mi downstream from Mill Creek, 2.6 mi downstream from The Dalles Dam, and at mile 188.9.

DRAINAGE AREA.--237,000 mi^2, approximately.

PERIOD OF RECORD.--October 1857 to September 1877 (annual maximum only, at Lower Cascades Landing, published in WSP 1318), June 1878 to current year. Published as "near The Dalles" 1936-56.

REVISED RECORDS.--WSP 534: 1920(m). WSP 1094: 1894. WSP 1248: 1866, 1888, 1899, 1909. WSP 1518: 1876(M).

GAGE.--Acoustic velocity meter (AVM) with water-stage and velocity-index recorder. Datum of gage is National Geodetic Vertical Datum of 1929. See WSP 1738 for history of changes prior to Mar. 16, 1957. Mar. 16, 1957, to Sept 30, 1968, water-stage recorder at site 0.4 mi upstream at same datum.

REMARKS.--Estimated daily discharges: Oct. 1 to Sept. 30. Records good. Considerable regulation by many large reservoirs. Diurnal fluctuations caused by powerplant and gates at The Dalles Dam. Many diversions for irrigation upstream from station.

AVERAGE DISCHARGE.--109 years, 193,100 ft^3/s, 139,900,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge (since 1858), 1,240,000 ft^3/s June 6, 1894, elevation, 106.5 ft; minimum discharge (since 1878), 12,100 ft^3/s Apr. 16, 1968 (due to closure of John Day dam, recorded by AVM).

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 295,000 ft^3/s May 17; maximum elevation, not determined; minimum daily discharge, 82,600 ft^3/s Sept. 7.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	121000	142000	154000	161000	126000	131000	126000	259000	189000	130000	114000	104000
2	122000	118000	158000	137000	166000	131000	115000	233000	195000	134000	104000	102000
3	113000	138000	165000	119000	153000	137000	138000	252000	203000	110000	102000	91400
4	90100	127000	168000	121000	134000	122000	132000	248000	189000	92700	108000	109000
5	96700	140000	152000	145000	122000	143000	119000	230000	173000	89100	104000	91500
6	111000	159000	146000	160000	146000	130000	148000	266000	211000	94500	120000	83600
7	141000	142000	132000	196000	130000	121000	142000	258000	212000	97600	137000	82600
8	131000	135000	163000	198000	117000	128000	154000	265000	201000	119000	117000	103000
9	121000	143000	174000	190000	143000	145000	172000	265000	182000	128000	95200	109000
10	133000	161000	171000	170000	144000	140000	157000	278000	214000	135000	93500	116000
11	105000	137000	164000	161000	146000	142000	140000	265000	190000	126000	127000	119000
12	109000	158000	163000	187000	148000	133000	135000	251000	137000	102000	129000	122000
13	123000	141000	154000	178000	149000	135000	160000	247000	122000	125000	93100	120000
14	143000	149000	168000	176000	146000	122000	185000	277000	121000	128000	109000	130000
15	147000	130000	178000	214000	135000	142000	158000	267000	122000	125000	96300	118000
16	137000	139000	166000	175000	150000	171000	131000	268000	117000	121000	86800	123000
17	141000	153000	167000	190000	149000	164000	145000	295000	134000	104000	97400	124000
18	117000	156000	174000	179000	145000	158000	166000	271000	145000	99500	110000	106000
19	114000	156000	144000	202000	133000	183000	137000	235000	142000	86000	105000	96500
20	136000	144000	113000	191000	153000	114000	169000	232000	137000	108000	101000	93400
21	138000	153000	130000	174000	149000	129000	146000	198000	129000	132000	114000	91700
22	126000	145000	143000	188000	131000	151000	148000	186000	110000	114000	118000	109000
23	111000	140000	141000	187000	155000	135000	147000	177000	132000	111000	99800	129000
24	126000	174000	144000	167000	163000	120000	165000	176000	135000	121000	102000	128000
25	128000	159000	132000	136000	160000	123000	142000	206000	137000	109000	98500	108000
26	120000	154000	125000	178000	163000	135000	145000	186000	123000	91800	104000	101000
27	128000	140000	134000	159000	145000	159000	140000	201000	115000	102000	110000	89400
28	120000	145000	135000	139000	138000	140000	143000	209000	104000	121000	122000	110000
29	134000	120000	157000	152000	---	130000	177000	224000	113000	116000	103000	122000
30	135000	130000	168000	148000	---	149000	240000	218000	131000	108000	99900	127000
31	147000	---	154000	124000	---	127000	---	165000	---	121000	121000	---
TOTAL	3864800	4328000	4737000	5202000	4039000	4290000	4522000	7308000	4565000	3501200	3341500	3259100
MEAN	124700	144300	152800	167800	144200	138400	150700	235700	152200	112900	107800	108600
MAX	147000	174000	178000	214000	166000	183000	240000	295000	214000	135000	137000	130000
MIN	90100	118000	113000	119000	117000	114000	115000	165000	104000	86000	86800	82600
AC-FT	7666000	8585000	9396000	10320000	8011000	8509000	8969000	14500000	9055000	6945000	6628000	6464000

CAL YR 1986 TOTAL 68298200 MEAN 187100 MAX 407000 MIN 78000 AC-FT 135469000
WTR YR 1987 TOTAL 52957600 MEAN 145100 MAX 295000 MIN 82600 AC-FT 105041000

14115815 CLEAR BRANCH BELOW LAURANCE LAKE, NEAR PARKDALE, OR

LOCATION.--Lat 45°27'44", long 121°39'04", in SE 1/4 SE 1/4 sec.22, T.1 S., R.9 E., Hood River County, Hydrologic Unit 17070105, on right bank 0.3 mi downstream from Laurance Lake, and 5.0 mi southwest of Parkdale.

DRAINAGE AREA.--8.62 mi^2.

PERIOD OF RECORD.--May 1986 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 2,790 ft above National Geodetic Vertical Datum of 1929, from topographic map.

REMARKS.--Estimated daily discharges: Apr. 15-19, Sept. 18-29. Records good. Flow regulated by Laurance Lake 0.3 mi upstream. Water is diverted from Laurance Lake for irrigation.

EXTREMES FOR PERIOD OF RECORDS.--Maximum discharge, 60 ft^3/s May 28, 1986, gage height, 6.15 ft; maximum gage height, 6.15 ft May 28, 1986, May 12, 1987; minimum discharge, 0.76 ft^3/s Oct. 19, 1986.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 51 ft^3/s May 12, gage height, 6.15 ft; minimum discharge, 0.76 ft^3/s Oct. 19, gage height, 5.35 ft.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	8.6	5.3	9.5	8.0	11	10	6.9	11	9.2	8.8	6.1	2.9
2	8.3	5.3	9.3	8.2	9.6	10	6.9	13	9.3	8.8	6.1	3.0
3	8.3	5.3	9.1	8.2	9.7	11	6.9	17	9.5	8.6	6.1	2.8
4	8.3	5.4	9.0	8.2	9.9	11	6.9	12	9.5	8.5	6.0	2.8
5	8.1	5.5	9.0	8.1	10	11	6.9	9.4	9.5	8.3	6.0	2.6
6	8.2	5.3	9.0	8.0	11	11	7.0	9.6	9.6	8.2	5.9	2.6
7	8.4	5.1	9.0	7.9	11	11	7.1	9.8	9.6	8.1	5.8	2.4
8	8.4	5.0	8.8	7.9	11	11	7.2	9.5	9.7	8.0	5.7	2.4
9	8.3	4.9	8.6	7.8	11	11	7.2	11	9.7	7.8	5.7	2.3
10	8.1	4.6	8.5	7.8	10	11	7.3	17	9.7	7.9	5.5	2.2
11	8.0	4.8	8.3	8.6	10	11	7.3	15	9.9	7.9	5.4	2.2
12	7.7	4.8	8.3	8.6	10	11	7.5	39	10	7.8	5.2	2.2
13	7.5	4.9	8.2	8.6	11	11	7.6	34	10	7.7	5.3	2.1
14	7.4	5.1	8.2	8.6	11	11	7.7	21	9.9	7.6	5.2	2.1
15	7.4	5.0	8.2	8.5	11	11	8.0	15	9.9	7.6	5.0	2.1
16	7.2	5.3	8.4	8.3	11	11	8.2	11	9.8	7.4	4.8	2.0
17	5.2	5.6	8.6	8.2	10	12	8.4	9.9	10	7.3	4.9	2.0
18	4.6	5.6	8.5	8.3	11	11	8.6	9.7	9.9	7.4	4.4	1.9
19	4.3	6.0	8.4	8.2	10	12	8.8	9.8	10	7.3	4.3	1.8
20	4.7	6.6	8.4	8.2	10	15	8.9	9.8	9.9	7.2	4.1	1.8
21	4.8	7.0	8.4	8.2	10	15	8.9	9.8	9.9	7.1	3.9	1.7
22	4.8	7.4	8.4	8.0	10	15	8.9	9.7	9.8	7.1	3.8	1.7
23	4.7	8.0	8.6	8.0	10	15	9.0	9.7	9.8	7.0	3.7	1.6
24	4.8	8.3	8.4	8.0	10	15	9.2	9.6	9.7	7.0	3.6	1.6
25	4.9	8.2	8.2	8.2	9.9	15	10	9.7	9.7	7.0	3.5	1.5
26	5.1	8.7	8.2	8.3	9.9	14	11	9.2	9.7	6.9	3.4	1.5
27	5.3	9.8	8.2	8.2	9.8	14	12	9.1	9.6	6.8	3.4	1.4
28	5.0	9.5	8.2	8.3	9.8	14	17	9.1	9.5	6.8	3.2	1.4
29	5.0	9.4	8.2	8.2	---	14	16	9.0	9.2	6.4	3.2	1.3
30	5.2	9.5	8.2	8.2	---	11	9.6	9.1	9.0	6.3	3.0	1.3
31	5.5	---	8.2	8.9	---	6.9	---	9.2	---	6.2	3.0	---
TOTAL	202.1	191.2	264.5	254.7	288.6	372.9	262.9	396.7	290.5	232.8	145.2	61.2
MEAN	6.52	6.37	8.53	8.22	10.3	12.0	8.76	12.8	9.68	7.51	4.68	2.04
MAX	8.6	9.8	9.5	8.9	11	15	17	39	10	8.8	6.1	3.0
MIN	4.3	4.6	8.2	7.8	9.6	6.9	6.9	9.0	9.0	6.2	3.0	1.3
AC-FT	401	379	525	505	572	740	521	787	576	462	288	121

WTR YR 1987 TOTAL 2963.3 MEAN 8.12 MAX 39 MIN 1.3 AC-FT 5880

14118500 WEST FORK HOOD RIVER NEAR DEE, OR

LOCATION.--Lat 45°35'55", long 121°38'05", in SE 1/4 sec.1, T.1 N., R.9 E., Hood River County, Hydrologic Unit 17070105, on left bank 0.3 mi upstream from Dead Point Creek, 0.8 mi northwest of Dee, and at mile 0.4.

DRAINAGE AREA.--95.6 mi^2.

PERIOD OF RECORD.--September 1913 to February 1916 (incomplete), June 1932 to current year.

REVISED RECORDS.--WDR OR-80-1: 1972(M).

GAGE.--Water-stage recorder. Datum of gage is 802.1 ft above National Geodetic Vertical Datum of 1929. Sept. 1, 1913, to Feb. 12, 1916, nonrecording gage at site 0.5 mi upstream at different datum.

REMARKS.--No estimated daily discharges. Records excellent. No regulation. Dee Irrigation District canal diverts from right bank about 6 mi upstream from station for irrigation upstream from station and in Middle Fork Basin. Diversions from Green Point Creek basin upstream from station for irrigation near Oak Grove; water from two of these diversions is carried in Hood River Irrigation District canal.

AVERAGE DISCHARGE.--56 years (water years 1914, 1933-87), 554 ft^3/s, 401,400 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge not determined, Dec. 22, 1964, gage height, 27.0 ft, from floodmarks; maximum daily discharge, 15,000 ft^3/s Dec. 23, 1964; minimum, 93 ft^3/s Aug. 22, 1941.

EXTREMES FOR CURRENT YEAR.--Peak discharge greater than base discharge of 4,100 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Feb. 1	0900	*6,060	*9.60	No other peak greater than base discharge.			

Minimum discharge, 97 ft^3/s Sept. 5, 18-22, 24.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	239	270	701	444	4110	625	393	575	378	186	134	119
2	204	221	588	462	1880	931	455	609	317	180	132	121
3	181	198	504	507	1200	1550	536	598	306	174	131	115
4	167	183	445	527	920	1590	555	543	295	173	132	109
5	157	190	416	477	753	1290	539	521	286	187	133	109
6	153	278	373	422	647	1160	662	525	266	172	128	111
7	147	393	343	379	573	936	631	543	263	165	128	111
8	141	333	320	348	520	800	871	512	263	167	133	112
9	138	306	296	318	481	741	703	469	251	164	133	110
10	133	261	279	297	448	738	801	449	242	168	132	107
11	128	247	267	283	456	732	911	408	234	164	126	108
12	127	247	260	296	453	1140	787	583	235	160	124	111
13	126	231	260	318	617	1390	687	500	238	158	127	111
14	124	249	255	327	893	1410	638	467	232	157	141	111
15	124	232	251	286	837	1090	689	420	229	158	131	139
16	124	454	234	269	920	894	712	372	210	147	125	114
17	124	1050	225	269	976	1060	824	335	197	146	120	104
18	131	848	220	260	819	1000	720	313	190	185	119	101
19	123	1150	215	240	691	833	611	294	189	170	119	100
20	121	1450	207	231	612	737	548	277	192	158	118	101
21	119	1690	206	225	560	651	524	266	217	172	115	101
22	118	1780	228	217	534	584	525	260	207	159	114	102
23	118	1730	526	216	498	543	538	260	190	154	115	102
24	116	1460	432	234	452	501	531	256	182	158	117	103
25	120	1050	392	312	416	473	493	248	185	154	115	104
26	154	1210	411	583	387	472	485	245	189	147	114	129
27	254	2690	386	714	366	432	540	241	190	147	115	106
28	194	1690	353	726	352	407	637	245	188	145	114	103
29	171	1160	394	701	---	385	597	236	189	144	111	103
30	223	856	497	612	---	369	611	316	193	141	113	102
31	359	---	421	1090	---	367	---	420	---	137	114	---
TOTAL	4858	24107	10905	12590	22371	25831	18754	12306	6943	4997	3823	3279
MEAN	157	804	352	406	799	833	625	397	231	161	123	109
MAX	359	2690	701	1090	4110	1590	911	609	378	187	141	139
MIN	116	183	206	216	352	367	393	236	182	137	111	100
AC-FT	9640	47820	21630	24970	44370	51240	37200	24410	13770	9910	7580	6500

CAL YR 1986 TOTAL 183369 MEAN 502 MAX 7390 MIN 116 AC-FT 363700
WTR YR 1987 TOTAL 150764 MEAN 413 MAX 4110 MIN 100 AC-FT 299000

14120000 HOOD RIVER AT TUCKER BRIDGE, NEAR HOOD RIVER, OR

LOCATION.--Lat 45°39'20", long 121°32'50", in SE 1/4 sec.15, T.2 N., R.10 E., Hood River County, Hydrologic Unit 17070105, on right bank 25 ft downstream from Tucker Bridge, 0.5 mi upstream from Odell Creek, 4.0 mi, southwest of town of Hood River, and at mile 6.1.

DRAINAGE AREA.--279 mi^2.

PERIOD OF RECORD.--October 1897 to December 1899, September 1913 to September 1914, August 1915 to September 1917, January 1965 to current year. Monthly discharge only for some periods, published in WSP 1318.

REVISED RECORDS.--WSP 1318: 1899. WSP 1935: Drainage area.

GAGE.--Water-stage recorder and crest-stage gage. Datum of gage is 383.2 ft above National Geodetic Vertical Datum of 1929 (Oregon State Highway Department bench mark). Prior to July 23, 1915, nonrecording gage at bridge at various datums. July 23 to Dec. 21, 1915, water-stage recorder at site 0.8 mi upstream at different datum. January 1916 to September 1917, nonrecording gage at bridge at different datum. Jan. 16 to July 23, 1965, nonrecording gage at bridge.

REMARKS.--Estimated daily discharges: Nov. 2 to Dec. 4, Apr. 9, 10. Records good. Some daily fluctuation caused by diversion dam upstream from station and sawmill at Dee. Diversions for irrigation upstream from station.

AVERAGE DISCHARGE.--27 years (water years 1898-99, 1914, 1916-17, 1966-87), 1,062 ft^3/s, 769,400 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 22,300 ft^3/s Dec. 13, 1977, gage height, 15.59 ft; minimum discharge recorded, 136 ft^3/s Sept. 16, 1915, caused by temporary storage behind dam at Dee.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of Dec. 22, 1964, reached a stage of 20.6 ft, present datum, discharge, 33,200 ft^3/s, from rating curve extended above 1,500 ft^3/s on basis of slope-area measurement of peak flow.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 4,500 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Nov. 27	unknown	5,680	a8.30	Feb. 1	1000	*9,160	*10.07

Minimum discharge, 186 ft^3/s Sept. 4.

a From high-water mark.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	345	526	1200	709	6050	925	799	1130	650	413	264	262
2	315	440	1010	720	2800	1250	883	1110	557	397	258	249
3	304	385	870	739	1770	1970	968	1090	541	351	263	216
4	297	360	800	774	1410	2150	960	1020	539	345	270	200
5	290	380	731	677	1200	1780	956	997	556	350	274	212
6	283	470	669	607	1090	1640	1100	1070	526	319	257	221
7	277	580	623	569	1030	1360	1090	1090	513	307	257	229
8	280	530	605	512	975	1210	1400	1090	522	314	277	231
9	285	480	576	485	914	1200	1100	1070	502	314	291	216
10	258	440	541	482	872	1150	1200	1010	480	334	292	216
11	243	410	519	473	878	1110	1340	951	457	312	258	226
12	240	400	506	481	873	1650	1190	1300	465	311	245	236
13	230	380	517	516	1120	1980	1070	1140	471	318	273	238
14	229	400	512	529	1370	2000	1040	1010	478	334	288	235
15	250	380	511	475	1310	1660	1120	964	494	332	248	269
16	242	700	493	441	1370	1400	1180	862	433	287	240	228
17	236	1500	471	447	1410	1600	1330	753	406	272	240	211
18	247	1300	470	453	1240	1610	1210	696	356	383	245	212
19	241	1650	461	429	1070	1400	1060	639	353	322	256	213
20	243	2150	444	415	987	1290	975	598	367	280	256	216
21	280	2450	447	406	928	1210	949	552	398	301	245	224
22	307	2600	472	384	906	1090	963	531	375	292	234	227
23	269	2550	813	398	843	1040	986	524	339	295	240	234
24	255	2050	695	423	790	977	986	533	332	339	243	237
25	291	1600	642	511	735	913	943	516	341	325	233	238
26	329	1700	665	815	685	923	942	518	362	315	224	278
27	508	3700	640	1040	653	861	1020	503	379	330	224	237
28	390	2450	591	1010	615	825	1190	504	379	329	233	220
29	336	1820	640	1020	---	804	1170	474	387	324	223	219
30	435	1430	762	910	---	779	1200	577	401	314	227	229
31	604	---	680	1450	---	774	---	747	---	288	240	---
TOTAL	9339	36211	19576	19300	35894	40531	32320	25569	13359	10047	7818	6879
MEAN	301	1207	631	623	1282	1307	1077	825	445	324	252	229
MAX	604	3700	1200	1450	6050	2150	1400	1300	650	413	292	278
MIN	229	360	444	384	615	774	799	474	332	272	223	200
AC-FT	18520	71820	38830	38280	71200	80390	64110	50720	26500	19930	15510	13640

CAL YR 1986 TOTAL 336950 MEAN 923 MAX 9900 MIN 172 AC-FT 668300
WTR YR 1987 TOTAL 256843 MEAN 704 MAX 6050 MIN 200 AC-FT 509400

14128600 COLUMBIA RIVER AT STEVENSON, WA

LOCATION.--Lat 45°41'58", long 121°52'02", in NW 1/4 SE 1/4 sec.36, T.3 N., R.7-1/2 E., Skamania County, Hydrologic Unit 17070105, on right bank 0.9 mi east of Stevenson, and at mile 151.3.

DRAINAGE AREA.--239,800 mi^2, approximately.

PERIOD OF RECORD.--October 1973 to current year (gage heights only).

GAGE.--Water-stage recorder. Datum of gage is National Geodetic Vertical Datum of 1929.

REMARKS.--Flow regulated by many reservoirs upstream.

EXTREMES FOR PERIOD OF RECORD.--Maximum gage height, 79.79 ft June 20, 1974; minimum, 70.39 ft Oct. 25, 1981.

EXTREMES FOR CURRENT YEAR.--Maximum gage height recorded, 78.22 ft Apr. 30; minimum, 71.34 ft June 23.

GAGE HEIGHT, FEET, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		OCTOBER			NOVEMBER			DECEMBER			JANUARY	
1	75.65	73.98	74.50	75.44	73.80	74.54	76.07	73.75	75.26	76.48	74.16	75.04
2	76.72	75.14	75.89	75.41	74.26	74.84	76.02	73.29	74.94	76.33	75.58	75.86
3	76.19	74.47	75.03	75.53	73.56	74.73	76.42	74.07	75.33	76.56	75.53	76.00
4	74.99	74.36	74.67	75.42	73.67	74.73	76.43	74.01	75.13	76.55	75.58	76.13
5	75.31	74.24	74.56	75.83	73.05	74.65	76.39	73.83	75.34	76.65	75.60	76.14
6	75.95	74.83	75.19	75.64	74.02	74.87	76.73	73.92	75.28	76.90	75.64	76.18
7	76.64	75.93	76.28	75.37	73.96	74.62	76.56	74.46	75.47	77.27	75.81	76.41
8	76.79	75.85	76.35	76.20	74.42	75.25	76.96	73.76	75.33	77.11	75.84	76.43
9	75.94	75.26	75.74	76.33	74.94	75.68	76.25	73.81	75.21	76.99	75.83	76.40
10	75.89	74.59	75.24	76.36	74.44	75.01	76.17	73.46	74.86	76.89	75.57	76.28
11	75.85	74.96	75.41	74.89	72.76	73.39	75.56	73.08	74.78	76.89	74.71	75.55
12	75.77	74.96	75.32	74.02	72.55	73.22	75.87	73.40	74.92	76.21	74.10	75.14
13	75.69	74.84	75.29	75.29	73.78	74.60	75.54	73.55	74.40	76.66	74.57	75.63
14	76.01	74.83	75.45	75.04	72.53	73.60	76.04	73.19	74.52	76.56	73.26	75.06
15	76.38	74.42	75.44	75.30	74.82	75.07	75.76	73.28	74.69	76.83	73.38	75.31
16	76.41	74.85	75.46	76.25	74.93	75.34	76.04	73.16	74.49	76.72	73.46	75.19
17	75.90	74.38	75.09	76.34	75.25	75.70	76.02	73.05	74.38	76.15	73.50	74.68
18	75.72	74.65	75.02	76.25	74.84	75.53	76.09	72.84	74.39	76.30	73.71	74.90
19	75.85	74.58	75.09	76.74	74.08	75.08	76.04	73.43	74.93	76.87	73.04	75.05
20	76.05	75.03	75.58	76.90	74.36	75.57	76.03	73.89	74.54	76.64	73.12	75.07
21	75.64	73.97	74.44	76.74	75.17	75.82	75.45	73.74	74.40	76.17	73.13	74.53
22	75.45	72.85	74.00	76.85	74.38	75.53	75.31	72.80	74.13	75.53	73.21	74.66
23	75.64	74.78	75.25	76.81	74.94	75.89	76.58	73.05	74.83	76.05	72.67	74.69
24	76.15	74.27	75.05	77.13	73.59	75.31	76.44	74.11	75.12	---	---	---
25	75.87	74.01	74.82	76.85	74.97	75.75	76.34	74.65	75.31	---	---	---
26	76.15	74.06	75.06	76.07	73.19	74.78	76.10	74.26	75.11	76.27	73.25	74.76
27	75.96	74.17	75.23	76.54	74.70	75.63	76.33	73.86	74.77	76.21	73.63	75.37
28	75.95	73.98	75.19	76.40	74.74	75.33	76.16	74.64	75.21	76.54	74.10	75.50
29	76.16	73.87	75.27	75.74	72.76	74.02	76.00	73.71	74.76	76.39	73.99	75.38
30	76.09	73.94	75.29	75.86	73.50	74.50	76.76	73.92	75.41	76.56	74.38	75.42
31	75.70	74.08	75.09	---	---	---	76.79	75.46	76.11	76.69	75.27	75.94
MONTH	76.79	72.85	75.20	77.13	72.53	74.95	76.96	72.80	74.95	---	---	---

14128600 COLUMBIA RIVER AT STEVENSON, WA--Continued

GAGE HEIGHT, FEET, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		FEBRUARY			MARCH			APRIL			MAY	
1	76.76	75.19	75.87	---	---	---	---	---	---	77.98	77.11	77.60
2	76.60	74.01	75.16	---	---	---	---	---	---	77.59	76.84	77.29
3	76.41	73.80	75.11	---	---	---	---	---	---	77.82	76.78	77.23
4	76.57	74.14	75.55	---	---	---	---	---	---	76.86	76.20	76.49
5	76.46	74.48	75.44	---	---	---	---	---	---	77.24	75.43	76.29
6	76.42	74.75	75.54	---	---	---	---	---	---	77.78	75.39	76.65
7	76.10	74.81	75.37	---	---	---	---	---	---	77.37	76.19	76.52
8	75.52	74.79	75.01	---	---	---	---	---	---	76.62	75.48	75.95
9	75.96	74.29	75.27	---	---	---	---	---	---	77.04	75.33	76.14
10	76.24	74.04	75.11	---	---	---	---	---	---	77.97	76.81	77.35
11	76.17	74.17	75.48	---	---	---	---	---	---	77.93	76.55	77.16
12	76.51	74.31	75.47	---	---	---	---	---	---	77.84	76.37	77.25
13	76.04	74.46	75.31	---	---	---	---	---	---	77.34	75.14	75.85
14	75.24	74.19	74.58	---	---	---	---	---	---	76.65	75.06	75.73
15	75.06	73.14	73.69	---	---	---	---	---	---	75.91	74.45	75.07
16	75.54	73.09	74.18	---	---	---	---	---	---	75.28	74.04	74.65
17	75.94	74.73	75.29	---	---	---	75.15	73.28	74.34	77.91	75.10	76.51
18	76.45	74.60	75.43	---	---	---	75.82	72.92	74.33	77.78	76.52	77.28
19	76.57	73.26	75.00	---	---	---	75.56	73.70	74.36	77.92	76.08	76.91
20	73.30	72.15	72.75	---	---	---	75.91	72.97	74.56	77.55	75.42	76.48
21	73.47	72.09	72.86	---	---	---	75.98	73.60	75.19	77.46	74.88	76.44
22	73.21	72.08	72.78	---	---	---	75.83	73.31	74.89	76.63	75.36	76.12
23	73.28	72.15	72.71	---	---	---	75.24	72.81	74.21	77.49	75.11	75.98
24	75.09	72.92	74.05	---	---	---	75.78	74.08	74.68	77.42	75.22	76.10
25	75.10	74.34	74.76	---	---	---	76.30	74.98	75.54	77.22	75.18	76.17
26	74.98	74.20	74.61	---	---	---	75.67	74.34	75.04	77.18	75.32	76.38
27	74.96	73.99	74.60	---	---	---	76.31	74.61	75.27	77.37	74.91	76.26
28	75.03	74.06	74.60	---	---	---	76.88	76.26	76.59	77.49	75.44	76.56
29	---	---	---	---	---	---	77.51	76.03	76.76	77.67	75.56	76.47
30	---	---	---	---	---	---	78.22	76.74	77.56	77.51	75.49	76.39
31	---	---	---	---	---	---	---	---	---	77.25	75.41	75.98
MONTH	76.76	72.08	74.70	---	---	---	---	---	---	77.98	74.04	76.43
DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		JUNE			JULY			AUGUST			SEPTEMBER	
1	76.38	75.03	75.86	76.66	74.61	75.68	76.21	74.93	75.50	76.58	74.92	75.72
2	76.85	73.88	75.48	76.81	74.67	75.71	76.33	75.14	75.60	76.61	75.17	75.94
3	76.59	73.97	75.39	76.78	75.50	76.24	76.17	75.24	75.64	76.74	75.83	76.35
4	77.23	73.63	75.29	76.46	75.58	75.91	76.08	74.69	75.44	76.23	75.44	75.76
5	76.72	74.58	75.73	76.19	75.56	75.76	76.44	74.90	75.64	76.33	75.38	75.82
6	76.50	74.67	75.58	75.98	75.15	75.54	76.59	75.07	75.71	76.44	75.92	76.17
7	77.08	74.12	75.24	75.54	74.77	75.24	76.55	74.56	75.59	76.39	75.37	76.00
8	77.11	74.77	76.05	76.79	74.88	75.73	76.61	75.37	75.87	76.60	75.45	75.95
9	77.28	74.07	75.69	76.67	75.13	76.14	76.40	75.24	75.78	76.16	75.28	75.70
10	77.19	74.05	75.75	77.06	74.92	76.23	76.36	75.33	75.75	75.94	74.96	75.43
11	77.34	74.68	75.96	76.78	74.77	76.02	76.44	74.75	75.44	76.46	74.69	75.67
12	76.85	75.00	76.10	77.06	75.30	76.13	76.55	74.56	75.46	76.53	75.38	75.98
13	77.18	75.60	76.50	76.84	74.72	75.97	76.49	75.47	75.79	76.39	75.81	76.10
14	77.11	75.84	76.39	76.92	75.03	76.18	76.80	74.63	75.62	76.58	75.42	76.04
15	76.88	75.15	76.09	77.01	74.86	76.06	76.49	75.34	75.87	76.58	74.95	75.87
16	77.03	75.34	76.42	76.94	75.49	76.29	76.02	74.96	75.43	76.24	75.06	75.74
17	77.00	75.23	76.22	76.73	75.50	76.12	76.38	74.67	75.67	76.11	74.69	75.59
18	77.10	75.70	76.59	76.66	75.69	76.17	76.45	75.34	75.97	76.22	74.87	75.49
19	76.81	75.64	76.43	76.62	75.71	76.18	76.67	75.26	76.02	75.90	74.99	75.54
20	76.50	74.80	75.33	76.16	75.07	75.54	76.60	75.23	75.94	75.96	75.25	75.63
21	75.50	73.55	74.42	76.30	75.00	75.66	76.64	75.48	76.05	75.70	74.75	75.21
22	74.77	73.21	73.70	76.44	75.06	75.76	76.55	75.77	76.24	76.48	75.09	75.89
23	75.37	71.34	72.88	76.25	75.28	75.67	76.68	75.44	76.04	76.54	75.10	75.79
24	77.10	74.32	75.63	76.44	74.98	75.68	76.74	75.30	76.15	76.89	75.37	75.96
25	76.90	74.57	75.80	76.90	75.29	76.07	76.65	75.71	76.30	76.64	74.79	75.86
26	76.83	74.92	76.16	76.60	75.83	76.15	76.76	75.31	76.10	76.79	74.80	75.75
27	77.02	76.01	76.44	76.54	75.73	76.06	76.44	75.08	75.89	76.31	75.08	75.60
28	76.97	76.07	76.45	76.79	75.34	76.12	76.45	74.78	75.67	76.44	74.64	75.66
29	76.69	76.19	76.46	76.69	75.58	76.05	76.16	75.21	75.71	76.42	74.44	75.41
30	77.01	75.19	76.09	76.46	75.10	75.86	76.01	75.40	75.73	75.98	74.07	75.12
31	---	---	---	76.17	74.78	75.48	76.82	74.77	75.73	---	---	---
MONTH	77.34	71.34	75.74	77.06	74.61	75.92	76.82	74.56	75.79	76.89	74.07	75.76

14128860 COLUMBIA RIVER AT BONNEVILLE DAM, OR

LOCATION.--Lat 45°38'36", long 121°56'21", in sec.22, T.2 N., R.7 E., Multnomah County, Hydrologic Unit 17080001, on north shore of Bradford Island, 200 ft upstream from Bonneville Dam, at mile 146.1.

DRAINAGE AREA.--239,900 mi^2, approximately.

PERIOD OF RECORD.--May 1981 to September 1987 (gage heights only) (discontinued).

GAGE.--Water-stage recorder. Datum of gage is National Geodetic Vertical Datum of 1929.

REMARKS.--Flow regulated by many reservoirs upstream. No record Oct. 1 to June 25 due to construction.

EXTREMES FOR PERIOD OF RECORD.--Maximum gage height recorded, 77.95 ft Jan. 21, 1986; minimum, 69.65 ft Oct. 25, 1981.

EXTREMES FOR CURRENT YEAR.--Maximum gage height recorded, 76.71 ft June 27; minimum recorded, 73.50 ft Sept. 30.

GAGE HEIGHT (FEET ABOVE DATUM), WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		JUNE			JULY			AUGUST			SEPTEMBER	
1	---	---	---	76.26	74.04	75.22	75.86	74.44	75.06	76.09	74.45	75.27
2	---	---	---	76.52	74.12	75.26	75.98	74.66	75.19	76.29	74.69	75.55
3	---	---	---	76.51	75.15	75.90	75.80	74.79	75.24	76.44	75.44	75.97
4	---	---	---	76.29	75.21	75.61	75.66	74.17	74.99	75.89	74.89	75.31
5	---	---	---	75.97	75.23	75.45	76.07	74.41	75.21	76.05	74.90	75.50
6	---	---	---	75.73	74.82	75.24	76.14	74.56	75.18	76.14	75.56	75.83
7	---	---	---	75.27	74.42	74.93	76.08	73.92	75.04	76.11	74.99	75.63
8	---	---	---	76.52	74.45	75.39	76.29	74.90	75.42	76.26	74.85	75.54
9	---	---	---	76.34	74.59	75.68	76.03	74.76	75.36	75.65	74.77	75.25
10	---	---	---	76.59	74.35	75.75	75.99	74.81	75.34	75.47	74.39	74.95
11	---	---	---	76.50	74.11	75.62	75.90	74.27	74.91	76.08	74.15	75.20
12	---	---	---	76.66	74.91	75.77	76.11	73.93	74.92	76.04	74.87	75.48
13	---	---	---	76.44	74.30	75.56	76.02	75.01	75.36	75.87	75.19	75.60
14	---	---	---	76.51	74.59	75.73	76.45	74.07	75.22	76.22	74.77	75.51
15	---	---	---	76.60	74.33	75.59	76.06	74.84	75.45	76.14	74.36	75.40
16	---	---	---	76.56	74.95	75.85	75.62	74.57	75.04	75.78	74.48	75.23
17	---	---	---	76.36	75.03	75.73	76.06	74.29	75.31	75.72	74.14	75.13
18	---	---	---	76.36	75.31	75.83	76.04	74.81	75.55	75.89	74.35	75.08
19	---	---	---	76.39	75.34	75.84	76.29	74.83	75.60	75.54	74.46	75.14
20	---	---	---	75.89	74.42	75.17	76.26	74.73	75.51	75.65	74.80	75.26
21	---	---	---	75.95	74.42	75.16	76.21	74.96	75.59	75.36	74.31	74.85
22	---	---	---	76.13	74.58	75.31	76.17	75.29	75.80	76.19	74.62	75.51
23	---	---	---	75.84	74.78	75.24	76.36	74.97	75.65	76.06	74.57	75.30
24	---	---	---	76.08	74.39	75.23	76.36	74.79	75.74	76.50	74.74	75.44
25	---	---	---	76.48	74.81	75.65	76.34	75.24	75.92	76.27	74.21	75.40
26	76.44	74.36	75.76	76.30	75.38	75.78	76.36	74.77	75.70	76.42	74.25	75.32
27	76.71	75.50	76.04	76.15	75.20	75.64	75.99	74.59	75.43	75.94	74.67	75.21
28	76.68	75.65	76.12	76.40	74.72	75.65	75.96	74.26	75.17	76.07	74.20	75.26
29	76.39	75.77	76.07	76.28	74.91	75.53	75.65	74.71	75.29	75.95	73.86	74.95
30	76.67	74.63	75.63	76.21	74.65	75.40	75.68	74.98	75.34	75.49	73.50	74.58
31	---	---	---	75.78	74.18	74.98	76.39	74.33	75.31	---	---	---
MONTH	---	---	---	76.66	74.04	75.51	76.45	73.92	75.35	76.50	73.50	75.32

14128870 COLUMBIA RIVER BELOW BONNEVILLE DAM, OR

LOCATION.--Lat 45°38'20", long 121°57'16", in sec.21, T.2 N., R.7 E., Multnomah County, Hydrologic Unit 17080001, on left bank 0.4 mi downstream from Bonneville Dam left bank powerhouse, 0.5 mi upstream from Tanner Creek, and at mile 145.0.

DRAINAGE AREA.--239,900 mi^2, approximately.

PERIOD OF RECORD.--May 1981 to current year (gage heights only).

GAGE.--Water-stage recorder. Datum of gage is National Geodetic Vertical Datum of 1929.

REMARKS.--Flow regulated by many reservoirs upstream.

EXTREMES FOR PERIOD OF RECORD.--Maximum gage height, 30.40 ft June 11, 1981; minimum, 7.00 ft Oct. 4, 1981.

EXTREMES FOR CURRENT YEAR.--Maximum gage height, 22.36 ft May 18; minimum observed, 7.95 ft July 27.

GAGE HEIGHT, FEET, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		OCTOBER			NOVEMBER			DECEMBER			JANUARY	
1	11.77	11.10	11.51	14.59	12.63	13.61	16.20	14.45	15.32	16.43	14.65	15.38
2	12.17	9.47	11.06	12.69	11.33	11.87	16.03	15.26	15.59	15.27	13.47	14.30
3	12.43	10.84	12.00	13.28	11.95	12.37	16.07	15.12	15.32	13.87	12.70	13.32
4	10.83	9.21	10.05	13.30	12.16	12.49	16.25	15.15	15.69	13.85	13.34	13.58
5	9.71	8.61	9.09	14.96	12.25	12.82	16.42	13.60	14.89	15.18	13.52	14.52
6	10.82	8.72	10.02	16.23	13.31	14.60	14.05	13.29	13.65	16.03	13.63	15.15
7	14.88	10.11	12.53	14.40	12.77	13.49	13.99	13.13	13.52	17.60	15.41	16.58
8	15.62	10.86	12.83	12.94	12.13	12.47	15.60	13.34	14.34	17.70	16.48	17.31
9	12.91	10.64	12.17	13.95	12.19	12.91	15.68	14.90	15.38	17.52	15.81	16.70
10	12.66	11.43	11.90	15.62	13.91	14.94	15.63	15.14	15.40	15.89	14.57	15.26
11	12.09	9.18	10.32	15.66	13.25	14.22	15.45	14.17	14.59	15.99	14.95	15.50
12	10.58	9.10	9.84	14.18	12.13	13.37	15.28	14.18	14.72	16.57	15.87	16.08
13	11.77	10.38	11.21	14.45	11.48	12.58	15.20	13.40	14.11	16.45	16.06	16.25
14	13.24	11.44	12.63	14.07	12.42	13.25	15.36	14.30	14.94	16.59	15.88	16.16
15	13.24	12.00	12.92	13.00	11.66	12.50	17.31	15.66	16.08	18.83	15.98	17.20
16	13.79	12.59	13.11	13.94	10.99	12.42	15.70	13.72	14.69	18.93	15.94	16.96
17	13.62	12.47	13.35	15.02	13.59	14.36	15.28	12.08	14.72	16.55	16.17	16.31
18	12.43	11.40	11.95	15.72	14.64	15.04	15.53	14.97	15.38	16.69	15.96	16.18
19	11.38	10.46	10.79	15.65	14.38	14.99	15.54	12.64	13.45	17.86	16.30	16.81
20	13.40	10.50	12.26	15.29	13.46	14.32	13.12	11.32	11.90	17.57	16.42	16.62
21	13.70	13.18	13.42	16.36	14.76	15.53	12.83	11.22	12.18	16.60	15.51	15.95
22	13.72	10.04	11.75	16.19	14.07	15.00	14.19	12.51	13.05	15.82	15.27	15.62
23	11.64	9.65	10.54	16.34	14.09	15.29	14.17	10.66	12.79	16.03	15.48	15.79
24	12.94	9.51	10.85	17.42	14.85	16.53	14.62	13.21	13.89	15.95	14.35	15.29
25	13.09	10.02	12.02	17.23	16.83	17.04	13.56	12.31	12.93	14.48	13.59	14.09
26	12.05	10.37	10.92	17.17	14.39	15.63	13.76	12.22	12.93	16.27	13.51	15.74
27	12.93	11.52	12.27	15.92	14.37	14.98	13.09	11.50	12.44	16.01	15.07	15.51
28	11.90	11.09	11.42	16.61	15.83	16.10	13.57	12.57	13.06	15.36	14.45	14.84
29	12.86	10.94	11.71	16.24	13.82	14.93	15.64	12.82	14.62	16.23	15.30	15.71
30	13.61	12.77	13.13	14.57	13.33	13.97	15.82	14.14	15.13	15.94	14.84	15.41
31	14.66	12.97	13.82	---	---	---	16.35	14.17	15.17	14.93	14.10	14.36
MONTH	15.62	8.61	11.72	17.42	10.99	14.12	17.31	10.66	14.25	18.93	12.70	15.63

14128870 COLUMBIA RIVER BELOW BONNEVILLE DAM, OR--Continued

GAGE HEIGHT, FEET, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		FEBRUARY			MARCH			APRIL			MAY	
1	18.80	14.95	16.88	13.75	13.25	13.51	13.66	12.43	12.94	21.48	20.10	20.60
2	18.44	17.99	18.21	14.39	13.34	13.76	12.93	12.19	12.55	21.45	18.97	19.62
3	18.51	16.48	17.55	16.14	13.21	14.45	14.23	11.72	12.66	22.21	18.86	19.98
4	16.50	14.74	15.55	15.22	14.60	14.87	12.36	11.64	12.03	21.04	18.92	20.34
5	14.70	13.79	14.27	15.05	14.63	14.84	13.44	12.08	12.91	20.59	17.58	18.63
6	14.61	13.72	14.29	14.90	12.48	14.11	13.57	12.15	13.15	21.23	19.09	20.19
7	14.42	12.76	13.77	12.76	12.07	12.45	13.29	12.85	13.10	21.12	19.56	20.70
8	12.80	12.31	12.51	13.25	12.17	12.73	14.88	13.14	14.15	21.53	19.30	20.66
9	13.40	12.26	12.99	14.73	12.89	14.05	15.87	14.64	15.32	21.39	19.17	20.46
10	13.99	13.11	13.75	14.85	12.24	14.12	15.96	13.32	14.97	21.97	20.13	21.34
11	14.18	13.62	13.95	14.95	14.48	14.77	13.66	12.95	13.39	22.19	19.70	20.76
12	14.22	13.64	14.00	14.87	13.47	13.97	14.75	13.17	13.76	20.93	19.99	20.22
13	16.12	13.99	15.00	14.78	13.65	14.39	16.06	14.74	15.47	21.48	20.80	21.11
14	16.18	14.75	15.15	14.96	14.51	14.71	16.58	15.27	15.93	21.62	21.27	21.45
15	15.12	14.18	14.62	18.03	14.63	16.24	16.27	13.27	14.89	21.71	20.23	21.13
16	14.71	13.34	14.04	18.04	13.93	16.34	14.70	13.72	14.09	21.58	20.07	20.94
17	15.49	13.86	14.87	16.29	13.57	15.66	14.99	13.98	14.56	21.48	20.69	21.04
18	15.41	13.13	14.56	16.62	14.84	15.87	14.93	14.12	14.65	22.36	19.99	21.20
19	16.82	13.14	15.48	19.72	16.37	18.08	14.51	14.01	14.24	20.69	18.97	19.76
20	15.62	14.32	14.88	15.87	13.56	14.37	14.54	13.76	14.32	19.94	17.48	18.86
21	14.99	14.15	14.60	13.94	11.86	13.44	14.80	13.67	14.08	18.58	16.02	17.31
22	14.15	12.11	13.27	13.52	11.65	12.86	14.16	13.68	13.98	17.12	15.57	16.40
23	15.17	12.76	14.14	13.01	12.34	12.72	14.25	13.64	13.96	16.45	14.84	15.44
24	15.19	12.88	13.94	12.78	12.30	12.54	15.62	13.72	14.41	16.62	14.82	15.41
25	15.64	13.73	14.75	12.93	11.39	12.38	15.62	12.78	14.02	17.25	16.67	17.07
26	15.83	14.70	15.26	12.72	12.27	12.52	15.03	12.46	13.51	17.40	15.29	16.92
27	15.26	13.54	14.10	18.09	12.36	15.06	12.99	12.42	12.74	18.43	14.62	16.47
28	14.01	12.98	13.54	14.61	13.39	13.79	15.87	12.29	13.29	18.80	15.38	17.33
29	---	---	---	13.62	12.97	13.28	17.17	12.60	15.20	19.38	16.84	18.05
30	---	---	---	13.79	12.78	13.25	20.42	16.73	19.02	19.60	16.69	18.35
31	---	---	---	13.52	12.50	12.88	---	---	---	16.72	15.19	16.17
MONTH	18.80	12.11	14.64	19.72	11.39	14.13	20.42	11.64	14.11	22.36	14.62	19.16
DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		JUNE			JULY			AUGUST			SEPTEMBER	
1	18.18	14.37	16.62	12.96	11.81	12.36	11.26	9.89	10.37	---	---	---
2	17.96	14.62	16.17	13.20	11.46	12.17	10.61	9.08	9.67	---	---	---
3	17.80	16.95	17.31	11.71	9.93	10.65	---	---	---	---	---	---
4	17.37	15.08	15.74	10.40	8.96	9.56	---	---	---	---	---	---
5	16.29	15.62	15.90	9.84	8.94	9.33	---	---	---	---	---	---
6	17.75	15.59	17.28	9.91	8.93	9.40	---	---	---	---	---	---
7	17.63	16.15	17.06	10.00	8.93	9.47	---	---	---	---	---	---
8	18.27	16.94	17.33	10.83	9.08	10.17	---	---	---	---	---	---
9	16.65	15.78	16.15	12.65	10.99	12.04	---	---	---	---	---	---
10	17.95	15.73	17.13	13.09	11.23	12.45	---	---	---	---	---	---
11	17.80	15.37	16.67	13.16	11.07	11.93	---	---	---	---	---	---
12	15.32	12.06	13.65	12.28	9.91	10.79	---	---	---	---	---	---
13	12.46	11.58	12.02	12.47	10.48	11.48	---	---	---	---	---	---
14	12.35	11.52	11.99	13.27	10.65	11.99	---	---	---	---	---	---
15	12.32	11.53	11.87	12.27	11.27	11.64	---	---	---	---	---	---
16	11.86	11.18	11.54	11.83	11.06	11.38	---	---	---	---	---	---
17	12.86	11.27	12.22	11.70	9.34	10.54	---	---	---	---	---	---
18	13.26	12.86	13.06	10.18	8.60	9.41	---	---	---	---	---	---
19	13.41	12.90	13.19	9.61	8.66	9.08	---	---	---	---	---	---
20	13.53	12.97	13.39	10.32	8.73	9.81	---	---	---	---	---	---
21	13.94	11.48	12.76	12.44	9.38	11.62	---	---	---	---	---	---
22	12.92	11.17	11.64	11.89	9.79	10.99	---	---	---	---	---	---
23	12.97	9.71	11.25	11.08	9.68	10.63	---	---	---	---	---	---
24	12.73	9.56	11.29	11.52	9.94	11.00	---	---	---	12.95	10.83	11.95
25	12.99	11.45	12.19	11.74	9.58	10.21	---	---	---	---	---	---
26	12.44	10.85	11.58	11.69	8.56	9.31	---	---	---	---	---	---
27	12.01	10.19	11.31	10.69	7.95	9.77	---	---	---	---	---	---
28	10.95	9.63	10.33	11.89	9.70	10.90	---	---	---	---	---	---
29	11.80	9.61	10.88	12.07	10.50	11.52	---	---	---	---	---	---
30	12.47	11.78	12.05	10.99	9.59	10.35	---	---	---	---	---	---
31	---	---	---	11.33	10.73	11.03	---	---	---	---	---	---
MONTH	18.27	9.56	13.72	13.27	7.95	10.74	---	---	---	---	---	---

SUMMER LAKE BASIN

430701121040001 SILVER LAKE RANGER STATION, OR

LOCATION.--Lat 43°07'01", Long 121°04'00", in NE 1/4 SW 1/4 sec.21, T.28 S., R.14 E., Lake County, Hydrologic Unit 17120005, at Silver Lake Ranger Station, 0.5 mi south of State Highway 31, and 1 mi southwest of town of Silver Lake.

PERIOD OF RECORD.--August 1983 to current year (weekly composite).

INSTRUMENTATION.--The wet-deposition sample collector is an Aerochem Metrics Model 301* wet/dry deposition collector. The sensing circuit is activated by wet deposition, causing the motor to move the cover from the wet bucket and cover the dry bucket. When the heater in the sensor evaporates the precipitation, the cycle is reversed. The sample buckets are polyethylene and have a capacity of 13 liters (28.6 cm inside diameter, 23.2 cm deep). The opening of the collector is approximately 5 ft above ground level.

REMARKS.--Inches of precipitation obtained from an on-site recording weighing-bucket gage.

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	TOTAL PRECIP-ITATION FOR DEFINED PERIOD (IN)	PRECIP-ITATION TOTAL INCHES/ WEEK	COL-LECTOR EFFI-CIENCY WET DEPOS. PERCENT	SPE-CIFIC CON-DUCT-ANCE (US/CM)	SPE-CIFIC CON-DUCT-ANCE LAB (US/CM)	PH (STAND-ARD UNITS)	PH LAB (STAND-ARD UNITS)	CALCIUM DIS-SOLVED (MG/L AS CA)
OCT 07-14	0.00	0.00	--	--	--	--	--	--
OCT 14-21	0.02	0.02	141	--	6	--	5.9	0.13
OCT 21-28	0.19	0.19	97	6	3	4.9	5.8	0.04
OCT 28-NOV 04	0.11	0.11	86	6	6	4.7	5.2	0.03
NOV 04-11	0.1	0.1	38	5	6	4.9	6.6	0.06
NOV 11-19	0.08	0.08	55	10	7	4.8	6.3	0.07
NOV 19-25	0.23	0.23	113	3	2	5.2	5.7	0.05
NOV 25-DEC 02	0.4	0.4	84	5	3	5.2	5.6	0.04
DEC 02-09	0.09	0.09	90	--	--	--	--	--
DEC 09-16	0.04	0.04	86	--	6	--	6.6	0.08
DEC 16-23	0.12	--	26	--	5	--	6.1	0.05
DEC 23-30	0.02	--	47	--	7	--	6.6	0.11
DEC 30 1986-JAN 06 1987	0.54	--	78	3	2	5.2	5.4	0.01
JAN 06-13	0.07	0.07	34	--	--	--	--	--
JAN 13-20	0.01	0.01	6	--	--	--	--	--
JAN 20-27	0.12	0.12	48	5	6	4.9	6.3	0.16
JAN 27-FEB 03	0.5	0.5	98	5	3	5.1	5.6	0.08
FEB 03-10	--	--	--	--	--	--	--	0.08
FEB 03-10	0.01	0.01	--	--	--	--	--	--

* The use of the brand name in this report is for identification purposes only and does not imply endorsement by the U.S. Geological Survey.

SUMMER LAKE BASIN

430701121040001 SILVER LAKE RANGER STATION, OR--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	MAGNESIUM, DISSOLVED (MG/L AS MG)	SODIUM, DISSOLVED (MG/L AS NA)	POTASSIUM, DISSOLVED (MG/L AS K)	SULFATE DISSOLVED (MG/L AS SO4)	CHLORIDE, DISSOLVED (MG/L AS CL)	NITROGEN, AMMONIA DISSOLVED (MG/L AS NH4)	NITROGEN, NITRATE DISSOLVED (MG/L AS NO3)	PHOSPHATE, DISSOLVED (MG/L AS PO4)
OCT 07-14	--	--	--	--	--	--	--	--
OCT 14-21	0.03	0.34	0.19	0.33	0.34	<0.02	0.65	<0.01
OCT 21-28	0.01	0.23	0.1	0.2	0.19	<0.02	<0.03	0.03
OCT 28-NOV 04	0.01	0.23	0.14	0.14	0.21	0.12	0.2	<0.01
NOV 04-11	0.02	0.5	0.06	0.18	0.27	0.11	0.25	<0.01
NOV 11-19	0.02	0.26	0.02	0.3	0.09	0.43	0.87	<0.01
NOV 19-25	0.01	0.13	0.02	0.15	0.08	<0.02	0.14	<0.01
NOV 25-DEC 02	<0.01	0.06	0.02	0.2	0.07	0.09	0.44	<0.01
DEC 02-09	--	--	--	--	--	--	--	--
DEC 09-16	0.02	0.68	0.05	0.37	0.17	<0.02	0.2	<0.01
DEC 16-23	0.02	0.4	0.01	0.24	0.09	<0.02	0.38	<0.01
DEC 23-30	0.03	1.0	<0.02	0.25	<0.18	0.18	0.31	<0.06
DEC 30 1986-JAN 06 1987	<0.01	0.05	0.04	0.09	0.08	0.03	0.14	<0.01
JAN 06-13	--	--	--	--	--	--	--	--
JAN 13-20	--	--	--	--	--	--	--	--
JAN 20-27	0.05	0.23	0.32	0.22	0.56	0.12	0.31	<0.01
JAN 27-FEB 03	0.02	0.09	0.02	0.24	0.08	0.12	0.49	<0.01
FEB 03-10	0.02	--	--	--	--	--	--	--
FEB 03-10	--	--	--	--	--	--	--	--

DATE	TOTAL PRECIPITATION FOR DEFINED PERIOD (IN)	PRECIPITATION TOTAL INCHES/WEEK	COLLECTOR EFFICIENCY WET DEPOS. PERCENT	SPECIFIC CONDUCTANCE (US/CM)	SPECIFIC CONDUCTANCE LAB (US/CM)	PH (STANDARD UNITS)	PH LAB (STANDARD UNITS)	CALCIUM DISSOLVED (MG/L AS CA)
FEB 10-17	0.27	0.27	77	3	3	5.1	5.4	0.03
FEB 17-24	0.11	0.11	23	--	7	--	6.3	0.07
FEB 24-MAR 03	0.0	0.0	--	--	--	--	--	--
MAR 03-10	0.01	0.01	136	--	11	--	5.6	0.18
MAR 10-17	0.42	0.42	81	4	3	5.8	5.4	0.03
MAR 17-24	0.07	0.07	34	--	3	--	5.7	0.11
MAR 24-31	0.0	0.0	--	--	--	--	--	--
MAR 31-APR 07	0.19	0.19	85	12	9	4.6	5.1	0.15
APR 07-14	0.01	0.01	172	--	8	--	6.4	0.16
APR 14-21	0.0	0.0	--	--	--	--	--	--
APR 21-28	0.0	0.0	--	--	--	--	--	--
APR 28-MAY 05	0.66	0.66	94	3	2	5.5	5.4	0.03
MAY 05-12	0.05	0.05	59	--	--	--	--	--
MAY 12-19	0.0	0.0	--	--	--	--	--	--
MAY 19-26	--	--	--	15	10	4.5	5.0	0.13
MAY 26-JUN 02	--	--	--	6	4	4.9	5.2	0.05
JUN 02-09	--	--	--	20	10	4.4	4.9	0.13
JUN 09-16	--	--	--	9	8	4.9	5.0	0.16
JUN 16-23	0.25	0.25	112	5	5	5.0	5.1	0.04

SUMMER LAKE BASIN

430701121040001 SILVER LAKE RANGER STATION, OR--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG)	SODIUM, DIS-SOLVED (MG/L AS NA)	POTAS-SIUM, DIS-SOLVED (MG/L AS K)	SULFATE DIS-SOLVED (MG/L AS SO4)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)	NITRO-GEN, AMMONIA DIS-SOLVED (MG/L AS NH4)	NITRO-GEN, NITRATE DIS-SOLVED (MG/L AS NO3)	PHOS-PHATE, DIS-SOLVED (MG/L AS PO4)
FEB 10-17	0.01	0.05	0.04	0.06	0.08	0.06	0.24	<0.01
FEB 17-24	0.02	0.83	0.15	0.2	0.75	0.08	0.36	<0.01
FEB 24-MAR 03	--	--	--	--	--	--	--	--
MAR 03-10	0.02	1.3	<0.01	0.16	0.29	<0.08	0.49	<0.04
MAR 10-17	0.01	0.02	<0.01	0.11	0.05	<0.02	0.11	<0.01
MAR 17-24	0.02	0.05	0.01	0.15	0.13	0.05	0.2	<0.01
MAR 24-31	--	--	--	--	--	--	--	--
MAR 31-APR 07	0.03	0.19	0.22	0.42	0.31	0.21	1.3	<0.01
APR 07-14	0.04	0.43	0.25	0.37	0.54	<0.07	0.27	<0.03
APR 14-21	--	--	--	--	--	--	--	--
APR 21-28	--	--	--	--	--	--	--	--
APR 28-MAY 05	0.01	0.03	0.01	0.1	0.04	<0.02	0.14	<0.01
MAY 05-12	--	--	--	--	--	--	--	--
MAY 12-19	--	--	--	--	--	--	--	--
MAY 19-26	0.05	0.14	0.11	0.86	0.14	0.21	1.2	<0.01
MAY 26-JUN 02	0.02	0.05	0.04	0.31	0.08	<0.02	0.38	<0.01
JUN 02-09	0.03	0.12	0.05	0.82	0.14	0.25	1.2	<0.01
JUN 09-16	0.03	0.1	0.14	0.65	0.16	0.13	0.87	<0.02
JUN 16-23	0.01	0.03	0.03	0.25	0.12	0.06	0.52	--

DATE	TOTAL PRECIP-ITATION FOR DEFINED PERIOD (IN)	PRECIP-ITATION TOTAL INCHES/ WEEK	COL-LECTOR EFFI-CIENCY WET DEPOS. PERCENT	SPE-CIFIC CON-DUCT-ANCE (US/CM)	SPE-CIFIC CON-DUCT-ANCE LAB (US/CM)	PH (STAND-ARD UNITS)	PH LAB (STAND-ARD UNITS)	CALCIUM DIS-SOLVED (MG/L AS CA)
JUN 23-30	0.05	0.05	2	--	--	--	--	--
JUN 30-JUL 07	0.04	0.04	126	--	--	--	--	--
JUL 07-14	0.0	0.0	--	--	--	--	--	--
JUL 14-21	1.9	1.9	98	7	5	4.9	5.3	0.05
JUL 21-28	1.2	1.2	99	--	--	--	--	--
JUL 28-AUG 04	0.0	0.0	--	--	--	--	--	--
AUG 04-11	0.0	0.0	--	--	--	--	--	--
AUG 11-18	0.0	0.0	--	--	--	--	--	--
AUG 18-25	0.03	0.03	98	--	--	--	--	--
AUG 25-SEP 01	0.03	0.03	102	--	29	--	6.8	2.0
SEP 01-08	0.0	0.0	--	--	--	--	--	--
SEP 08-15	0.0	0.0	--	--	--	--	--	--
SEP 15-22	0.0	0.0	--	--	--	--	--	--
SEP 22-29	0.0	0.0	--	--	--	--	--	--
SEP 29-OCT 06	0.0	0.0	--	--	--	--	--	--

SUMMER LAKE BASIN

430701121040001 SILVER LAKE RANGER STATION, OR--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG)	SODIUM, DIS-SOLVED (MG/L AS NA)	POTAS-SIUM, DIS-SOLVED (MG/L AS K)	SULFATE DIS-SOLVED (MG/L AS SO4)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)	NITRO-GEN, AMMONIA DIS-SOLVED (MG/L AS NH4)	NITRO-GEN, NITRATE DIS-SOLVED (MG/L AS NO3)	PHOS-PHATE, DIS-SOLVED (MG/L AS PO4)
JUN 23-30	--	--	--	--	--	--	--	--
JUN 30-JUL 07	--	--	--	--	--	--	--	--
JUL 07-14	--	--	--	--	--	--	--	--
JUL 14-21	0.01	0.06	0.02	0.3	0.07	0.03	0.37	<0.02
JUL 21-28	--	--	--	--	--	--	--	--
JUL 28-AUG 04	--	--	--	--	--	--	--	--
AUG 04-11	--	--	--	--	--	--	--	--
AUG 11-18	--	--	--	--	--	--	--	--
AUG 18-25	--	--	--	--	--	--	--	--
AUG 25-SEP 01	0.17	2.8	0.53	2.3	0.95	<0.02	3.5	<0.02
SEP 01-08	--	--	--	--	--	--	--	--
SEP 08-15	--	--	--	--	--	--	--	--
SEP 15-22	--	--	--	--	--	--	--	--
SEP 22-29	--	--	--	--	--	--	--	--
SEP 29-OCT 06	--	--	--	--	--	--	--	--

UPPER GRANDE RONDE RIVER BASIN

451328118304100 STARKEY EXPERIMENTAL STATION, OR

LOCATION.--Lat 45°13'28", long 118°30'41", in NE 1/4 NW 1/4 sec.14, T.4 S., R.34 E., Union County, Hdyrologic Unit 17060104, in the Starkey Experimental Forest, 2.5 mi north of State Highway 244, 29 mi west of LaGrande.

PERIOD OF RECORD.--March 1984 to current year (weekly composite).

INSTRUMENTATION.--The wet-deposition sample collector is an Aerochem Metrics Model 301* wet/dry deposition collector. The sensing circuit is activated by wet deposition, causing the motor to move the cover from the wet bucket and cover the dry bucket. When the heater in the sensor evaporates the precipitation, the cycle is reversed. The sample buckets are polyethylene and have a capacity of 13 liters (28.6 cm inside diameter, 23.2 cm deep). The opening of the collector is approximately 8 ft above ground level.

REMARKS.--Inches of precipitation obtained from an on-site recording weighing-bucket gage.

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	TOTAL PRECIP-ITATION FOR DEFINED PERIOD (IN)	PRECIP-ITATION TOTAL INCHES/ WEEK	COL-LECTOR EFFI-CIENCY WET DEPOS. PERCENT	SPE-CIFIC CON-DUCT-ANCE (US/CM)	SPE-CIFIC CON-DUCT-ANCE LAB (US/CM)	PH (STAND-ARD UNITS)	PH LAB (STAND-ARD UNITS)	CALCIUM DIS-SOLVED (MG/L AS CA)
OCT 07-14	0.00	0.00	--	--	--	--	--	--
OCT 14-21	0.0	0.0	--	--	--	--	--	--
OCT 21-28	0.34	0.34	104	3	2	5.4	5.5	0.02
OCT 28-NOV 04	0.54	0.54	104	3	3	5.3	5.4	0.01
NOV 04-11	1.29	1.29	77	6	5	5.0	5.1	0.03
NOV 11-18	1.29	1.29	96	2	2	5.5	5.3	0.01
NOV 18-25	0.86	0.86	91	3	2	5.5	5.6	0.02
NOV 25-DEC 02	0.23	0.23	76	3	2	5.4	5.7	0.06
DEC 02-09	0.04	0.04	71	--	6	--	6.2	0.06
DEC 09-16	0.14	0.14	104	3	3	5.4	5.5	0.03
DEC 16-23	0.03	0.03	46	--	7	--	6.1	0.13
DEC 23-30	0.11	0.11	91	4	3	5.0	5.7	0.06
DEC 30 1986-JAN 06 1987	0.69	0.69	90	2	2	5.6	5.3	0.01
JAN 06-13	0.02	0.02	--	--	--	--	--	--
JAN 13-20	0.5	0.5	5	--	4	--	6.4	0.08
JAN 20-27	0.47	0.47	81	26	2	5.6	5.6	0.05
JAN 27-FEB 03	1.05	1.05	100	2	3	6.0	5.8	0.06
FEB 03-10	0.0	0.0	--	--	--	--	--	--
FEB 10-17	0.66	0.66	97	3	2	5.4	5.5	0.03

* The use of the brand name in this report is for identification purposes only and does not imply endorsement by the U.S. Geological Survey.

UPPER GRANDE RONDE RIVER BASIN

451328118304100 STARKEY EXPERIMENTAL STATION, OR--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	MAGNESIUM, DISSOLVED (MG/L AS MG)	SODIUM, DISSOLVED (MG/L AS NA)	POTASSIUM, DISSOLVED (MG/L AS K)	SULFATE DISSOLVED (MG/L AS SO4)	CHLORIDE, DISSOLVED (MG/L AS CL)	NITROGEN, AMMONIA DISSOLVED (MG/L AS NH4)	NITROGEN, NITRATE DISSOLVED (MG/L AS NO3)	PHOSPHATE, DISSOLVED (MG/L AS PO4)
OCT 07-14	--	--	--	--	--	--	--	--
OCT 14-21	--	--	--	--	--	--	--	--
OCT 21-28	0.01	0.11	<0.01	0.07	<0.03	<0.02	0.11	0.03
OCT 28-NOV 04	0.01	0.05	0.01	0.09	0.06	<0.02	0.1	<0.01
NOV 04-11	0.01	0.08	0.01	0.24	0.18	0.02	0.34	0.01
NOV 11-18	<0.01	0.02	<0.01	0.07	<0.03	<0.02	0.11	<0.01
NOV 18-25	0.01	0.05	<0.01	0.1	0.04	<0.02	0.09	<0.01
NOV 25-DEC 02	0.01	0.13	0.01	0.15	0.07	0.03	0.24	<0.01
DEC 02-09	0.01	0.71	0.01	0.43	0.13	0.05	0.74	<0.01
DEC 09-16	0.01	0.05	0.01	0.17	0.05	0.02	0.35	<0.01
DEC 16-23	0.04	0.42	0.03	0.5	0.32	<0.07	0.97	<0.04
DEC 23-30	0.01	0.14	0.03	0.21	0.09	<0.02	0.27	<0.01
DEC 30 1986-JAN 06 1987	0.01	0.02	<0.01	0.09	0.18	<0.02	0.19	<0.01
JAN 06-13	--	--	--	--	--	--	--	--
JAN 13-20	0.02	0.53	0.01	0.21	0.28	<0.02	0.17	<0.01
JAN 20-27	0.01	0.06	0.01	0.1	0.1	<0.02	0.17	<0.01
JAN 27-FEB 03	0.01	0.14	0.01	0.14	0.1	<0.02	0.1	<0.01
FEB 03-10	--	--	--	--	--	--	--	--
FEB 10-17	0.01	0.07	<0.01	0.1	0.06	<0.02	0.15	<0.01

DATE	TOTAL PRECIPITATION FOR DEFINED PERIOD (IN)	PRECIPITATION TOTAL INCHES/ WEEK	COLLECTOR EFFICIENCY WET DEPOS. PERCENT	SPECIFIC CONDUCTANCE (US/CM)	SPECIFIC CONDUCTANCE LAB (US/CM)	PH (STANDARD UNITS)	PH LAB (STANDARD UNITS)	CALCIUM DISSOLVED (MG/L AS CA)
FEB 17-24	0.68	0.68	88	--	--	--	--	--
FEB 24-MAR 03	0.0	0.0	--	--	--	--	--	--
MAR 03-10	0.24	0.24	93	5	4	5.1	5.2	0.04
MAR 10-17	0.89	0.89	93	3	2	5.4	5.5	0.01
MAR 17-24	0.58	0.58	79	5	4	5.1	5.2	0.04
MAR 24-31	0.05	0.05	62	--	7	--	5.1	0.20
MAR 31-APR 07	0.0	0.0	--	--	--	--	--	--
APR 07-14	0.37	0.37	89	4	3	4.8	5.5	0.05
APR 14-21	0.0	0.0	--	--	--	--	--	--
APR 21-28	0.05	0.05	140	20	17	4.6	4.8	0.50
APR 28-MAY 05	1.03	1.03	100	5	4	5.2	5.2	0.06
MAY 05-12	0.03	0.03	83	--	--	--	--	--
MAY 12-19	0.08	0.08	100	5	5	5.4	5.6	0.15
MAY 19-26	0.41	0.41	91	10	5	4.8	5.8	0.09
MAY 26-JUN 02	0.85	0.85	88	7	6	4.8	5.0	0.05
JUN 02-09	0.8	0.8	95	--	--	--	--	--
JUN 09-16	0.28	0.28	95	--	--	--	--	--
JUN 16-23	0.14	0.14	99	11	8	4.6	5.0	0.10
JUN 23-30	0.0	0.0	--	--	--	--	--	--

CHEMICAL QUALITY OF PRECIPITATION

UPPER GRANDE RONDE RIVER BASIN

451328118304100 STARKEY EXPERIMENTAL STATION, OR--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG)	SODIUM, DIS-SOLVED (MG/L AS NA)	POTAS-SIUM, DIS-SOLVED (MG/L AS K)	SULFATE DIS-SOLVED (MG/L AS SO4)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)	NITRO-GEN, AMMONIA DIS-SOLVED (MG/L AS NH4)	NITRO-GEN, NITRATE DIS-SOLVED (MG/L AS NO3)	PHOS-PHATE, DIS-SOLVED (MG/L AS PO4)
FEB 17-24	--	--	--	--	--	--	--	--
FEB 24-MAR 03	--	--	--	--	--	--	--	--
MAR 03-10	0.01	0.11	0.01	0.13	0.1	0.04	0.38	<0.01
MAR 10-17	0.01	0.01	<0.01	0.1	<0.03	0.05	0.17	<0.01
MAR 17-24	0.01	0.08	<0.01	0.29	0.07	<0.02	0.34	<0.01
MAR 24-31	0.04	0.16	0.01	0.5	0.36	0.1	0.67	<0.01
MAR 31-APR 07	--	--	--	--	--	--	--	--
APR 07-14	0.01	0.05	0.02	0.17	0.1	0.04	0.21	<0.01
APR 14-21	--	--	--	--	--	--	--	--
APR 21-28	0.09	0.23	0.07	1.4	0.25	0.35	2.6	<0.01
APR 28-MAY 05	0.01	0.03	0.01	0.39	0.05	0.07	0.37	<0.01
MAY 05-12	--	--	--	--	--	--	--	--
MAY 12-19	0.03	0.05	0.12	0.22	0.21	0.14	0.6	<0.01
MAY 19-26	0.02	0.06	0.02	0.39	0.09	0.34	0.73	<0.01
MAY 26-JUN 02	0.02	0.03	0.03	0.53	0.04	0.13	0.4	<0.01
JUN 02-09	--	--	--	--	--	--	--	--
JUN 09-16	--	--	--	--	--	--	--	--
JUN 16-23	0.02	0.09	0.04	0.51	0.11	0.13	0.84	0.04
JUN 23-30	--	--	--	--	--	--	--	--

DATE	TOTAL PRECIP-ITATION FOR DEFINED PERIOD (IN)	PRECIP-ITATION TOTAL INCHES/ WEEK	COL-LECTOR EFFI-CIENCY WET DEPOS. PERCENT	SPE-CIFIC CON-DUCT-ANCE (US/CM)	SPE-CIFIC CON-DUCT-ANCE LAB (US/CM)	PH (STAND-ARD UNITS)	PH LAB (STAND-ARD UNITS)	CALCIUM DIS-SOLVED (MG/L AS CA)
JUN 30-JUL 07	0.13	0.13	107	8	7	4.9	5.2	0.08
JUL 07-14	0.09	0.09	74	9	4	4.6	5.5	0.06
JUL 14-21	0.13	0.13	82	9	6	4.8	5.5	0.24
JUL 21-28	0.5	0.5	92	9	10	4.6	5.2	0.32
JUL 28-AUG 04	0.12	0.12	110	--	--	--	--	--
AUG 04-11	0.0	0.0	--	--	--	--	--	--
AUG 11-18	0.11	0.11	105	5	3	4.8	5.4	0.06
AUG 18-25	0.0	0.0	--	--	--	--	--	--
AUG 25-SEP 01	0.0	0.0	--	--	--	--	--	--
SEP 01-08	0.0	0.0	--	--	--	--	--	--
SEP 08-15	0.0	0.0	--	--	--	--	--	--
SEP 15-22	0.0	0.0	--	--	--	--	--	--
SEP 22-29	0.05	0.05	89	17	4	4.4	6.3	0.09
SEP 29-OCT 06	0.0	0.0	--	--	--	--	--	--

CHEMICAL QUALITY OF PRECIPITATION

UPPER GRANDE RONDE RIVER BASIN

451328118304100 STARKEY EXPERIMENTAL STATION, OR--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG)	SODIUM, DIS-SOLVED (MG/L AS NA)	POTAS-SIUM, DIS-SOLVED (MG/L AS K)	SULFATE DIS-SOLVED (MG/L AS SO4)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)	NITRO-GEN, AMMONIA DIS-SOLVED (MG/L AS NH4)	NITRO-GEN, NITRATE DIS-SOLVED (MG/L AS NO3)	PHOS-PHATE, DIS-SOLVED (MG/L AS PO4)
JUN 30-JUL 07	0.01	0.06	0.01	0.4	0.09	0.26	0.84	<0.02
JUL 07-14	0.01	0.09	0.02	0.2	0.12	<0.02	0.23	0.05
JUL 14-21	0.04	0.15	0.06	0.4	0.16	0.05	0.81	0.10
JUL 21-28	0.05	0.12	0.08	0.7	0.17	0.3	2.0	<0.02
JUL 28-AUG 04	--	--	--	--	--	--	--	--
AUG 04-11	--	--	--	--	--	--	--	--
AUG 11-18	0.01	0.08	0.01	0.2	0.11	<0.02	<0.03	0.05
AUG 18-25	--	--	--	--	--	--	--	--
AUG 25-SEP 01	--	--	--	--	--	--	--	--
SEP 01-08	--	--	--	--	--	--	--	--
SEP 08-15	--	--	--	--	--	--	--	--
SEP 15-22	--	--	--	--	--	--	--	--
SEP 22-29	0.02	0.41	0.12	0.2	0.23	<0.02	0.29	<0.02
SEP 29-OCT 06	--	--	--	--	--	--	--	--

Measurements of streamflow at points other than gaging stations or partial-record stations are given in the following table.

Discharge measurements at miscellaneous sites during water year 1987

Stream	Tributary to	Location	Drainage area (mi^2)	Measured previously (water years)	Measurements Date	Measurements Discharge (ft^3/s)	Specific conductance (us/cm)
		ABERT LAKE BASIN					
10382550 Chewaucan River	Abert Lake	Lat 42°29'10", long 120°34'22", in SE 1/4 sec.34, T.35 S., R.18 E., Lake County, Hydrologic Unit 17120006, on left bank at road crossing, 1.0 mi upstream from Ben Young Creek, 1.5 mi northeast of Buck Mountain, and 14.5 mi south of Paisley.	157	1983-86‡	9- 4-87	*26	68
10382600 Chewaucan River	.....do.....	Lat 42°34'07", long 120°35'40", in NW 1/4 NE 1/4 sec.4, T.35 S., R.18 E., Lake County, Hydrologic Unit 17120006, on left bank 1.4 mi downstream from Coffeepot Creek, and 9.0 mi south of Paisley.	216	1983-86‡	9- 4-87	*26	77
		GOOSE LAKE BASIN					
Cottonwood Creek	Goose Lake	Lat 42°16'15", long 120°34'05", in NW 1/4 SW 1/4 sec.14, T.38 S., R.18 E., Lake County, Hydrologic Unit 18020001, and 2.0 mi upstream from Cottonwood Reservoir.	---	---	8-26-87	*1.9	---
Drews Creek	.....do.....	Lat 42°16'47", long 120°45'20", in NE 1/4 NW 1/4 sec.18, T.38 S., R.17 E., Lake County, Hydrologic Unit 18020001, 100 ft downstream from forest bridge, near Lakeview, 7.0 mi northwest of Drews Reservoir.	---	---	9- 2-87	*0.65	---
		KLAMATH RIVER BASIN					
11510000 Spencer Creek near Keno	Klamath River	Lat 42°09'30", long 122°01'40", in SW 1/4 sec.20, T.39 S., R.7 E., Klamath County, Hydrologic Unit 18010206, approximately 50 ft downstream from road bridge, 0.5 mi upstream from mouth and 5.5 mi northwest of Keno.	a90	1927, 1929-32‡, 1934, 1949-53, 1955-56, 1959-71, 1973,1977	9- 2-87	*5.7	127
Munson Springs	Munson Creek	Lat 42°54'20", long 122°08'00", Klamath County, Hydrologic Unit 18010203, (unsurveyed) at site of abandoned water diversion.	---	1967-68, 1977	9- 1-87	*0.17	22
Headquarter Spring	.....do.....	Lat 42°54'10", long 122°08'10", Klamath County, Hydrologic Unit 18010203, (unsurveyed) at original superintendent's house at park headquarters.	---	1967-68, 1977	9- 1-87	b0.09	19
Unnamed Tributary	.....do.....	Lat 42°53'38", long 122°07'45", Klamath County, Hydrologic Unit 18010203, (unsurveyed) near park headquarters.	---	1967-68, 1977	9- 3-87	*0.87	22
Munson Creek	Annie Creek	Lat 42°52'45", long 122°08'15", Klamath County, Hydrologic Unit 18010203, (unsurveyed) 1.4 mi south of park headquarters.	---	1967-68, 1977-84	9- 1-87	*4.9	42
Sun Creek	.....do.....	Lat 42°48'55", long 122°02'05", Klamath County, Hydrologic Unit 18010203, (unsurveyed) at downstream end of Sun Meadow.	---	1967-68, 1977	9- 1-87	*0.21	---
Cascade Spring	Bear Creek	Lat 42°57'18", long 122°01'12", Klamath County, Hydrologic Unit 18010201, (unsurveyed) at park sign that indicates Cascade Spring, site of cabin.	---	1967, 1968	9- 1-87	*b0.85	40

‡ Operated as a continuous-record gaging station.
* Base flow.
a Approximately.
b Springfed.

Discharge measurements at miscellaneous sites during water year 1987--Continued

Stream	Tributary to	Location	Drainage area (mi^2)	Measured previously (water years)	Measurements Date	Measurements Discharge (ft^3/s)	Specific conductance (us/cm)
		KLAMATH RIVER BASIN--Continued					
Bear Creek	Klamath Marsh	Lat 42°58'15", long 122°00'20", Klamath County, Hydrologic Unit 18010201, (unsurveyed) at Forest Service road, just outside park boundary.	---	1967, 1968, 1977	9- 2-87	*0	---
Big Springs Creek	Williamson River in Klamath Marsh	Lat 42°57'20", long 121°45'14", in SE 1/4 sec.22, T.30 S., R.8 E., Klamath County, Hydrologic Unit 18010201.	a80	1915-27, 1930, 1949-54, 1956-57, 1959-62, 1964-71, 1973,1975, 1977	9- 1-87	*b44	65
11493500 Williamson River above Spring Creek near Klamath Agency	Upper Klamath Lake	Lat 42°39'24", long 121°51'13", in NW 1/4 sec.2, T.34 S., R.7 E., Klamath County, Hydrologic Unit 18010201, 2.0 mi upstream from Spring Creek and 5.0 mi northeast of Klamath Agency.	a1,330	1912-13‡, 1918-25‡, 1942, 1949-54, 1956, 1959-62, 1964-71, 1973,1977	9- 1-87	*36	91
Larkin Creek	Williamson River	Lat 42°39'03", long 121°51'22", in SW 1/4 sec.11, T.34 S., R.7 E., Klamath County, Hydrologic Unit 18010201.	---	1924-25, 1950-53, 1956, 1957-62, 1964-71, 1973,1977	9- 1-87	*b5.2	96
Spring Creek	.....do.....	Lat 42°38'36", long 121°52'42", in NE 1/4 sec.9, T.34 S., R.7 E., Klamath County, Hydrologic Unit 18010201, at Collier State Park.	21.0	1905, 1914-17, 1919-20, 1922-29, 1931-34, 1949-54, 1956, 1959-62, 1964-71, 1973,1977	9- 2-87	*309	77
11497000 Fivemile Creek near Bly	North Fork Sprague River	Lat 42°29'57", long 121°09'38", in NE 1/4 sec.34, T.35 S., R.13 E., Klamath County, Hydrologic Unit 18010202, 4.0 mi upstream from mouth, and 8.5 mi northwest of Bly.	a40	1917-20‡, 1921, 1922-23, 1925-26, 1949-54, 1956, 1959-71, 1975,1977	9- 3-87	*22	85
11499000 Sycan River near Beatty	Sprague River	Lat 42°33'20", long 121°19'36", in SE 1/4 sec.8, T.35 S., R.12 E., Klamath County, Hydrologic Unit 18010202, 8.0 mi upstream from mouth and 8.0 mi north of Beatty.	a540	1912-25‡ 1926, 1949-54, 1956, 1959-71, 1973,1975, 1977	9- 3-87	*18	130
Kamkaun Springs	.....do.....	Lat 42°35'29", long 121°42'10", in SE 1/4 sec.25, T.34 S., R.8 E., Klamath County, Hydrologic Unit 18010202.	---	1949, 1951-54, 1956, 1959-62, 1964-71, 1973,1975, 1977	9- 2-87	*b55	60
Wood River Springs	Wood River	Lat 42°44'03", long 121°59'14", in SW 1/4 sec.3, T.33 S., R.7-1/2 E., Klamath County, Hydrologic Unit 18010203.	---	1956, 1959-71, 1973,1977	8-31-87	*b230	94
11504000 Wood River at Fort Klamath	Agency Lake	Lat 42°42'07", long 121°59'18", in NW 1/4 sec.22, T.33 S., R.7-1/2 E., Klamath County, Hydrologic Unit 18010203, at Highway 62 bridge, 0.25 mi east of Fort Klamath.	a90	1911-36‡, 1949-71, 1977	8-31-87	*174	92

‡ Operated as a continuous-record gaging station.
* Base flow.
a Approximately.
b Springfed.

Discharge measurements at miscellaneous sites during water year 1987--Continued

Stream	Tributary to	Location	Drainage area (mi^2)	Measured previously (water years)	Measurements Date	Measurements Discharge (ft^3/s)	Specific conductance (us/cm)
		KLAMATH RIVER BASIN--Continued					
Fort Creek	Wood River	Lat 42°40'53", long 121°58'28", in SW 1/4 sec.26, T.33 S., R.7-1/2 E., Klamath County, Hydrologic Unit 18010203.	---	1906-11, 1915-18, 1920-21, 1923-25, 1927-29, 1931, 1949-53, 1955-56, 1959-71, 1973,1977	8-31-87	*b65	97
11504200 Crooked Creek near Fort Klamath	Agency Lake	Lat 42°37'05", long 121°56'25", in SW 1/4 SE 1/4 sec.13, T.34 S., R.7-1/2 E., Klamath County, Hydrologic Unit 18010203, on left bank 0.3 mi downstream from Agency Creek, and 6.5 mi south of Fort Klamath.	5.68	1905-09, 1915-18, 1920-21, 1923-24, 1928, 1949-50, 1952-53, 1956, 1959-65, 1965-67‡, 1973,1977	8-31-87	*63	101
		OWYHEE RIVER BASIN					
13181500 Crooked Creek near Rome	Owyhee River	Lat 42°48'10", long 117°43'57", in NW 1/4 SE 1/4 sec.6, T.32 S., R.41 E., Malheur County, Hydrologic Unit 17050109, 600 ft upstream from Highway 97, and 5.0 mi northeast of Burns Junction mouth.	a1,700	1950-52‡, 1977	8-26-87	*23	---
		MALHEUR RIVER BASIN					
South Fork Malheur River	Malheur River	Lat 43°26'16", long 118°15'56", in SE 1/4 SW 1/4 sec.35, T.24 S., R.36 E., Harney County, Hydrologic Unit 17050116, 200 ft upstream from power-line crossing, near Dunnean, and 10 mi southwest of Riverside.	---	1977	8-27-87	*9.2	---
South Fork Malheur River	.....do.....	Lat 43°33'14", long 118°10'03", in SW 1/4 SW 1/4 sec.22, T.23 S., R.37 E., Malheur County, Hydrologic Unit 17050116, 75 ft upstream from road crossing, 0.2 mi upstream from mouth, and 1.0 mi northwest of Riverside.	---	1977	8-27-87	*9.8	---
Malheur River	Snake River	Lat 43°54'06", long 118°34'53", in NE 1/4 SW 1/4 sec.19, T.19 S., R.34 E., Harney County, Hydrologic Unit 17050116, 30 ft downstream from farm road bridge, and 9.0 mi northwest of Drewsey.	---	---	8-25-87	*8.3	---
		WALLA WALLA RIVER BASIN					
Walla Walla River	Columbia River	Lat 45°55'40", long 118°22'40", in SW 1/4 NE 1/4 sec.12, T.5 N., R.35 E., Umatilla County, Hydrologic Unit 17070102, 100 ft upstream from bifurcation with Little Walla Walla River, 300 ft upstream from 9th Avenue (cemetery) bridge, just east of east boundary of city of Milton-Freewater.	---	---	7- 6-87 8-27-87	*79 *77	--- ---
Little Walla Walla River (diversion from Walla Walla River)	Walla Walla River	Lat 45°56'35", long 118°23'32", in SE 1/4 NE 1/4 sec.2, T.5 N., R.35 E., Umatilla County, Hydrologic Unit 17070102, 300 ft upstream from 8th Avenue road crossing, in city of Milton-Freewater.	---	---	7- 6-87 8-27-87	59 59	--- ---

‡ Operated as a continuous-record gaging station.
* Base flow.
a Approximately.
b Springfed.

Discharge measurements at miscellaneous sites during water year 1987--Continued

Stream	Tributary to	Location	Drainage area (mi^2)	Measured previously (water years)	Measurements Date	Measurements Discharge (ft^3/s)	Specific conductance (us/cm)
		IMNAHA RIVER BASIN					
Imnaha River	Snake River	Lat 45°10'24", long 116°47'10", in SE 1/4 NW 1/4 sec.31, T.4 S., R.48 E., Wallowa County, Hydrologic Unit 17060102, 0.5 mi upstream from Gumboot Creek, and 0.3 mi downstream from Blackhorse Creek.	99.6	1945-53‡, 1977	9- 1-87	*59	---
Little Sheep Creek	Big Sheep Creek	Lat 45°31'09", long 116°51'43", in SW 1/4 SE 1/4 sec.31, T.1 N., R.48 E., Wallowa County, Hydrologic Unit 17060102, 1,200 ft upstream from mouth, near Gibbs Bridge.	---	1977	9- 4-87	*14	---
		GRANDE RONDE RIVER BASIN					
Chesnismus Creek	Joseph Creek	Lat 45°42'50", long 117°44'06", in NW 1/4 SE 1/4 sec.26, T.3 N., R.45 E., Wallowa County, Hydrologic Unit 17060106, 300 ft upstream from Crow Creek Road bridge.	---	1977	8-31-87	*2.4	---
13323600 Indian Creek near Imbler	Grande Ronde River	Lat 45°25'55", long 117°49'03", in NW 1/4 SE 1/4 sec.33, T.1 S., R.40 E., Union County, Hydrologic Unit 17060104, 600 ft upstream from North Fork, and 7.0 mi southeast of Imbler.	a22	1938-50‡, 1977	9- 3-87	*4.6	---
13324300 Lookingglass Creek at Palmer Junction near Looking Glass	.....do.....	Lat 45°42'27", long 117°50'32", in SE 1/4 SW 1/4 sec.29, T.3 N., R.40 E., Union County, Hydrologic Unit 17060104, 20 ft upstream from highway bridge, 0.1 mi from mouth, and 2.0 mi downstream from U.S. Geological Survey gaging station Lookingglass Creek near Looking Glass.	a78	1977	9- 2-87	c60	---
13325500 Wallowa River above Wallowa Lake near Joseph	.....do.....	Lat 45°16'28", long 117°12'36", in SE 1/4 SE 1/4 sec.20, T.3 S., R.45 E., Wallowa County, Hydrologic Unit 17060105, 0.5 mi upstream from Wallowa Lake, 0.4 mi downstream from confluence of East and West Forks, and 5.0 mi south of Joseph.	a43	1905, 1907-08, 1924-33‡, 1937-38‡, 1940-41‡, 1950-51, 1954-55, 1961,1973, 1977	9- 2-87	*39	---
13333000 Wenaha River at Troy	.....do.....	Lat 45°56'44", long 117°27'03", in NE 1/4 NW 1/4 sec.4, T.5 N.,R.43 E., Wallowa County, Hydrologic Unit 17060106, 200 ft upstream from road bridge, and 0.1 mi upstream from U.S. Geological Survey gaging station Grande Ronde River at Troy.	---	1977	9- 3-87	*130	---
		UMATILLA RIVER BASIN					
Line Creek	Meacham Creek	Lat 45°38'49", long 118°21'28", in SW 1/4 SE 1/4 sec.18, T.2 N., R.36 E., Umatilla County, Hydrologic Unit 17070103, 25 ft upstream from railroad bridge trestle (no. 24178), near Gibbon.	---	1977	9- 3-87	*0.02	---

‡ Operated as a continuous-record gaging station.
* Base flow.
a Approximately.
c Includes approximately 1.0 cfs from fish hatchery wells.

Discharge measurements at miscellaneous sites during water year 1987--Continued

Stream	Tributary to	Location	Drainage area (mi^2)	Measured previously (water years)	Measurements Date	Measurements Discharge (ft^3/s)	Specific conductance (us/cm)
		UMATILLA RIVER BASIN--Continued					
Boston Creek	Meacham Creek	Lat 45°41'04", long 118°21'43", in NE 1/4 NW 1/4 sec.6, T.2 N., R.36 E., Umatilla County, Hydrologic Unit 17070103, upstream from Bonifer Pond, near Gibbon.	---	1977	9- 3-87	no flow	---
Umatilla River	Columbia River	Lat 45°41'07", long 118°27'09", in NW 1/4 NW 1/4 sec.4, T.2 N., R.35 E., Umatilla County, Hydrologic Unit 17070103, 100 ft upstream from Spring Hollow Road crossing, near Thorn Hollow.	---	1977	9- 3-87	*45	---
Eagle Creek	Wildhorse Creek	Lat 45°45'51", long 118°26'40", in SW 1/4 SE 1/4 sec.4, T.3 N., R.35 E., Umatilla County, Hydrologic Unit 17070103, at culvert 0.2 mi upstream from Wildhorse Road.	---	1977	9- 3-87	no flow	---
		JOHN DAY RIVER BASIN					
South Fork John Day River	John Day River	SW 1/4 sec.29, T.17 S., R.28 E., Grant County, Hydrologic Unit 17070201.	---	1977	8-26-87	*2.8	---
Pine Creek	South Fork John Day River	NW 1/4 sec.9, T.17 S., R.27 E., Grant County, Hydrologic Unit 17070201.	---	1977	8-26-87	*0.70	---
Deer Creek	.....do.....	SE 1/4 sec.12, T.16 S., R.27 E., Grant County, Hydrologic Unit 17070201.	---	1977	8-25-87	*0.36	---
South Fork John Day River	John Day River	SE 1/4 sec.26, T.14 S., R.26 E., Grant County, Hydrologic Unit 17070201.	---	1977	8-25-87	*11	---
Tex Creek	Murderers Creek	SW 1/4 sec.18, T.15 S., R.29 E., Grant County, Hydrologic Unit 17070201.	---	1977	8-26-87	no flow	---
Murderers Creek	South Fork John Day River	SW 1/4 sec.18, T.15 S., R.29 E., Grant County, Hydrologic Unit 17070201.	---	1977	8-25-87	*1.2	---
Murderers Creek	.....do.....	NE 1/4 sec.36, T.14 S., R.26 E., Grant County, Hydrologic Unit 17070201.	---	1977	8-25-87	*2.9	---
South Fork John Day River	John Day River	NE 1/4 sec.35, T.14 S., R.26 E., Grant County, Hydrologic Unit 17070201.	---	1977	8-25-87	*11	---
Black Canyon Creek	South Fork John Day River	Sec.26, T.14 S., R.26 E., Grant County, Hydrologic Unit 17070201.	---	1977	8-26-87	*11	---
Desolation Creek	North Fork John Day River	Lat 44°59'20", long 118°55'10", in SW 1/4 sec.6, T.7 S., R.32 E., Grant County, Hydrologic Unit 17070202, on right bank 1.1 mi upstream from mouth, and 1.4 mi east of Dale.	108	1949-58‡, 1977	8-27-87	*9.9	---
North Fork John Day River	John Day River	Lat 44°59'55", long 118°56'25", in SE 1/4 SE 1/4 sec.35, T.6 S., R.31 E., Umatilla County, Hydrologic Unit 17070202, on right bank 0.25 mi downstream from Desolation Creek, and 0.75 mi northeast of Dale.	525	1930-58‡, 1977	8-27-87	*63	---
Camas Creek	North Fork John Day River	Lat 45°10'16", long 118°43'53", in SW 1/4 sec.33, T.4 S., R.33 E., Umatilla County, Hydrologic Unit 17070202, on left bank 2.1 mi downstream from Bowman Creek, and 3.5 mi northwest of Lehman, and at mile 25.5.	60.7	1951-70‡, 1977	8-27-87	*1.0	---

‡ Operated as a continuous-record gaging station.
* Base flow.

Discharge measurements at miscellaneous sites during water year 1987--Continued

Stream	Tributary to	Location	Drainage area (mi^2)	Measured previously (water years)	Measurements Date	Discharge (ft^3/s)	Specific conductance (us/cm)
		JOHN DAY RIVER BASIN--Continued					
Cable Creek	Camas Creek	NW 1/4 sec.10, T.5 S., R.32 E., Umatilla County, Hydrologic Unit 17070202.	a39	1914-17, 1919-24, 1932-37, 1977	8-27-87	*1.5	---
Wall Creek	North Fork John Day River	SE 1/4 sec.7, T.8 S., R.28 E., Grant County, Hydrologic Unit 17070202.	---	1977	8-27-87	*0.04	---
		DESCHUTES RIVER BASIN					
14054100 Deschutes River below Sheep Springs near La Pine	Columbia River	Lat 43°43'56", long 121°47'10", in SE 1/4 SE 1/4 sec.20, T.21 S., R.8 E., Deschutes County, Hydrologic Unit 17070301, on left bank about 500 ft upstream from Sheep Bridge, and about 15 mi northwest of La Pine.	256	e1938-48‡, 1950, 1952-57, 1960-86,	10-23-86 12-10-86 1-26-87 3- 5-87 4-27-87 6- 9-87 8-20-87 8-24-87 9-29-87	d563 d337 d234 d287 d604 d669 d642 d634 d475	--- --- --- --- --- --- --- 49 ---
14070700 Bridge Creek near Bend	Deschutes River	Lat 44°01'52", long 121°34'16", in SW 1/4 NE 1/4 sec.7, T.18 S., R.10 E., Deschutes County, Hydrologic Unit 17070301, on left bank 0.2 mi upstream from city of Bend water intake dam, 14 mi west of Bend, and at mile 0.4.	6.58	1981-85‡	8-24-87	*17	35
14080250 Bear Creek near Prineville	Crooked River	Lat 44°03'40", long 120°43'54", in SE 1/4 sec.30, T.17 S., R.17 E., Crook County, Hydrologic Unit 17070304, on left bank upstream side of State Highway 27 bridge over Bear Creek, 17 mi south of Prineville.	205	1976-81‡	8-24-87	*0.74	---
14090500 Whitewater River near Grandview	Metolius River	Lat 44°40'56", long 121°33'17", in SE 1/4 SW 1/4 sec.21, T.10 S., R.10 E., Jefferson County, Hydrologic Unit 17070301.	30.6	1911-14‡, 1973, 1977	8-25-87	*55	50
Badger Creek	Warm Springs River	NE 1/4 SW 1/4 sec.20, T.7 S., R.11 E., Wasco County, Hydrologic Unit 17070306.	37.2	1973, 1977	8-26-87	*6.1	---
Big Buck Springs	.....do.....	Lat 44°50'44", long 121°19'32", in NW 1/4 SE 1/4 sec.29, T.8 S., R.12 E., Wasco County, Hydrologic Unit 17070306.	---	1973, 1977	8-26-87	*0.78	---
14097200 White River near Government Camp	Deschutes River	Lat 45°10'40", long 121°34'30", in NE 1/4 SW 1/4 sec.32, T.4 S., R.10 E., Wasco County, Hydrologic Unit 17070306, in Mount Hood National Forest, on left bank at Faith Spring, 1.4 mi upstream from Klip Creek, and at mile 33.3.	40.7	1969-81‡	8-26-87	*40	---
14099000 White River near Wapinitia	.....do.....	Lat 45°09'10", long 121°30'20", in NE 1/4 sec.11, T.5 S., R.10 E., Wasco County, Hydrologic Unit 17070306, 500 ft downstream from Crane Creek, 1 mi downstream from Clear Creek, and 12.5 mi west of Wapinitia.	115	1942-50‡, 1977	8-26-87	*61	76

‡ Operated as a continuous-record gaging station.
* Base flow.
a Approximately.
d Base flow from intervening springs can be obtained by subtracting flow of Deschutes River below Crane Prairie Reservoir.
e Published by State of Oregon Water Resources Department.

Discharge measurements at miscellaneous sites during water year 1987--Continued

Stream	Tributary to	Location	Drainage area (mi^2)	Measured previously (water years)	Measurements Date	Measurements Discharge (ft^3/s)	Specific conductance (us/cm)
		DESCHUTES RIVER BASIN--Continued					
14113200 Mosier Creek near Mosier	Columbia River	Lat 45°38'55", long 121°22'35", in NW 1/4 NW 1/4 sec.19, T.2 N., R.12 E., Wasco County, Hydrologic Unit 17070105, on left bank 0.1 mi downstream from West Fork Mosier Creek, 2.5 mi southeast of Mosier, and at mile 3.0.	41.5	1963-81‡	8-27-87	*0.69	---
14113400 Dog River near Parkdale	Hood River	Lat 45°24'30", long 121°31'10", in SW 1/4 sec.11, T.2 S., R.10 E., Hood River County, Hydrologic Unit 17070105, Mount Hood National Forest, on right bank 100 ft upstream from city of The Dalles municipal diversion to Mill Creek basin, and 8.8 mi south of Parkdale.	4.50	1960-71‡, 1977	8-26-87	*2.2	---

‡ Operated as a continuous-record gaging station.
* Base flow.

October 1, 1978

FACTORS FOR CONVERTING INCH-POUND UNITS TO INTERNATIONAL SYSTEM UNITS (SI)

The following factors may be used to convert the inch-pound units published herein to the International System of Units (SI).

Multiply inch-pound units	By	To obtain SI units
	Length	
inches (in)	2.54×10^{1}	millimeters (mm)
	2.54×10^{-2}	meters (m)
feet (ft)	3.048×10^{-1}	meters (m)
miles (mi)	1.609×10^{0}	kilometers (km)
	Area	
acres	4.047×10^{3}	square meters (m^2)
	4.047×10^{-1}	square hectometers (hm^2)
	4.047×10^{-3}	square kilometers (km^2)
square miles (mi^2)	2.590×10^{0}	square kilometers (km^2)
	Volume	
gallons (gal)	3.785×10^{0}	liters (L)
	3.785×10^{0}	cubic decimeters (dm^3)
	3.785×10^{-3}	cubic meters (m^3)
million gallons	3.785×10^{3}	cubic meters (m^3)
	3.785×10^{-3}	cubic hectometers (hm^3)
cubic feet (ft^3)	2.832×10^{1}	cubic decimeters (dm^3)
	2.832×10^{-2}	cubic meters (m^3)
cfs-days	2.447×10^{3}	cubic meters (m^3)
	2.447×10^{-3}	cubic hectometers (hm^3)
acre-feet (acre-ft)	1.233×10^{3}	cubic meters (m^3)
	1.233×10^{-3}	cubic hectometers (hm^3)
	1.233×10^{-6}	cubic kilometers (km^3)
	Flow	
cubic feet per second (ft^3/s)	2.832×10^{1}	liters per second (L/s)
	2.832×10^{1}	cubic decimeters per second (dm^3/s)
	2.832×10^{-2}	cubic meters per second (m^3/s)
gallons per minute (gal/min)	6.309×10^{-2}	liters per second (L/s)
	6.309×10^{-2}	cubic decimeters per second (dm^3/s)
	6.309×10^{-5}	cubic meters per second (m^3/s)
million gallons per day	4.381×10^{1}	cubic decimeters per second (dm^3/s)
	4.381×10^{-2}	cubic meters per second (m^3/s)
	Mass	
tons (short)	9.072×10^{-1}	megagrams (Mg) or metric tons

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