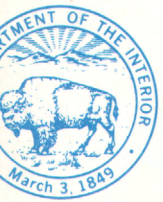
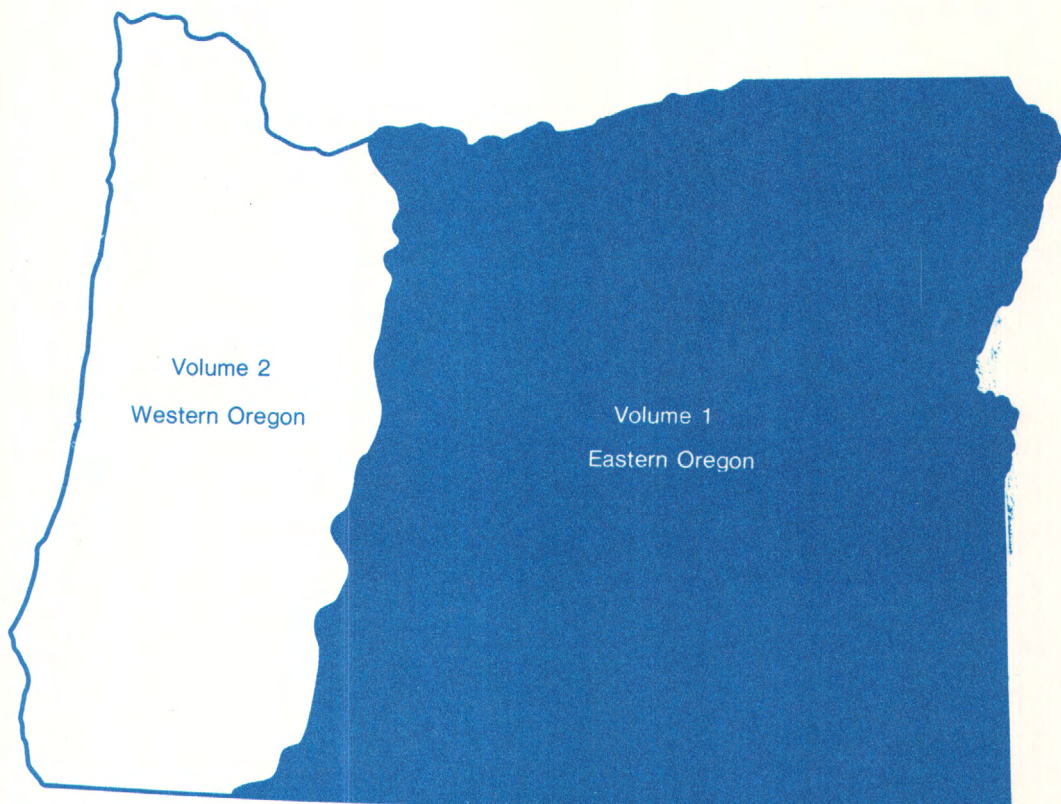
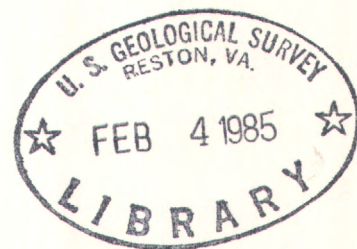


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# Water Resources Data Oregon Water Year 1983

Volume 1. Eastern Oregon



U.S. GEOLOGICAL SURVEY WATER-DATA REPORT OR-83-1  
Prepared in cooperation with the Oregon Water Resources  
Department and with other agencies



# CALENDAR FOR WATER YEAR 1983

1982

## OCTOBER

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## AUGUST

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## SEPTEMBER

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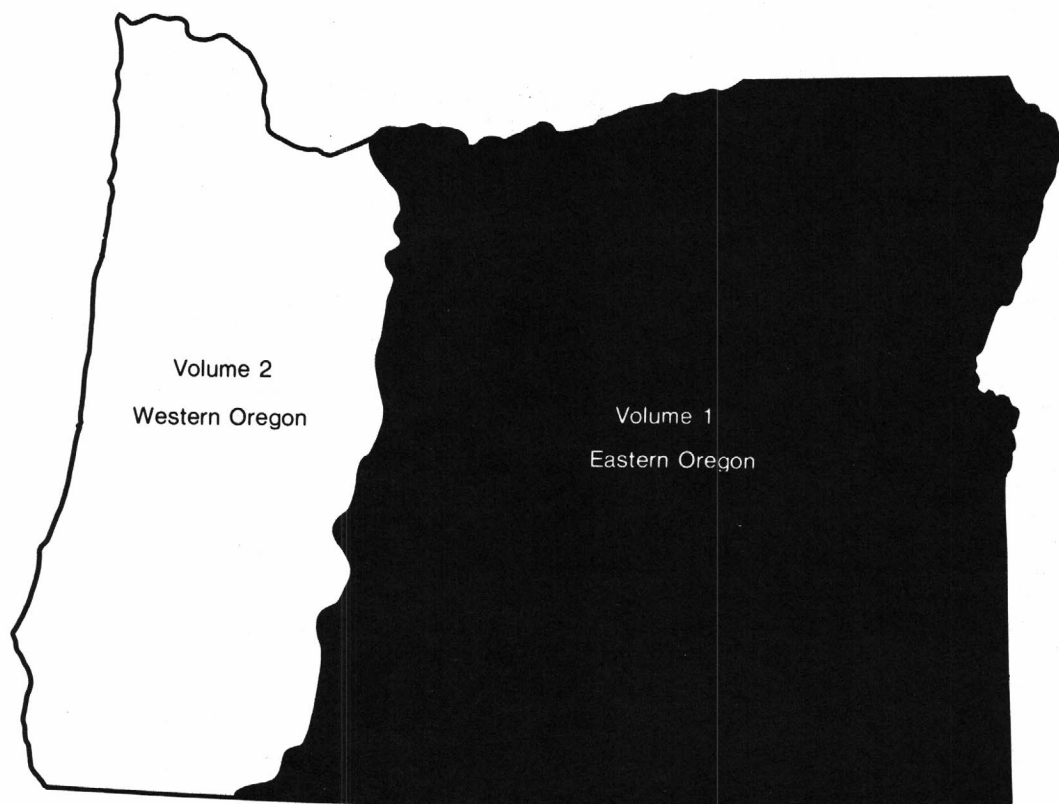




# Water Resources Data Oregon Water Year 1983

## Volume 1. Eastern Oregon

by L.L. Hubbard, T.D. Parks, D.L. Weiss, and L.E. Hubbard



U.S. GEOLOGICAL SURVEY WATER-DATA REPORT OR-83-1  
Prepared in cooperation with the Oregon Water Resources  
Department and with other agencies



UNITED STATES DEPARTMENT OF THE INTERIOR

WILLIAM P. CLARK, Secretary

GEOLOGICAL SURVEY

Dallas L. Peck, Director

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Portland, Oregon 97232

1984



## 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 typed, 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, Oregon Office Chief, and J.D. Bredehoeft, Regional Hydrologist, Western Region.







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GAGING STATIONS, IN DOWNSTREAM ORDER,  
FOR WHICH RECORDS ARE PUBLISHED

VII

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(D) DISCHARGE, (E) ELEVATION OR CONTENTS, (C) CHEMICAL,  
(B) BIOLOGICAL AND MICROBIOLOGICAL, (T) WATER TEMPERATURE,  
(S) SEDIMENT

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## WATER RESOURCES DATA FOR OREGON, 1983

### INTRODUCTION

Water resources data for the 1983 water year for Oregon consist of records of stage, discharge, and water quality of streams; stage, contents, and water quality of lakes and reservoirs; water levels and water quality of wells and springs; and water quality of precipitation. This report, in two volumes, contains discharge records for 254 gaging stations; stage only records for 6 gaging stations; stage and contents for 27 lakes and reservoirs; water quality for 81 stations; water levels for 56 observation wells; and water quality for 1 precipitation station. Also included are data for 33 crest-stage, partial-record stations. Locations of these sites, except for the precipitation station and observation wells, are shown on figures 2, 3, and 4. Additional water data were collected at various sites, not part of the systematic data collection program, and are published as miscellaneous measurements and analyses. 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.

Records of discharge of streams and contents (or stage) of lakes and reservoirs were first published in a series of U.S. Geological Survey water-supply papers entitled, "Surface Water Supply of the United States." Through September 30, 1960, these water-supply papers were in an annual series and then in a multiyear series for 1961-65 and 1966-70. Records of chemical quality, water temperatures, and suspended sediment were published from 1941 to 1970 in an annual series of water-supply papers entitled, "Quality of Surface Waters of the United States." Records of ground-water levels were published from 1935 to 1974 in a series of water-supply papers entitled, "Ground-water Levels in the United States." Water-supply papers may be consulted in the libraries of the principal cities in the United States or may be purchased from the Branch of Distribution, U.S. Geological Survey, 1200 Eads Street, Arlington, VA 22202.

For water years 1961 through 1974, streamflow data were released by the Geological Survey in annual reports on a State-boundary basis. Water-quality records for water years 1964 through 1974 were similarly released either in separate reports or in conjunction with streamflow records.

Beginning with the 1975 water year, water data for streamflow, water quality, and ground water are published as an official Survey report on a State-boundary basis. These official Survey reports carry an identification number consisting of the two letter State abbreviation, the last two digits of the water year, and volume number. For example, this report is identified as "U.S. Geological Survey Water-Data Report OR-83-1." For archiving and general distribution, the reports for water years 1971-74 are also 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 the back of the 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:

Oregon Water Resources Department, James E. Sexson, Director.  
Oregon Department of Transportation, State Highway Division,  
H. S. Coulter, State Highway Engineer.  
Oregon Department of Fish and Wildlife, J. R. Donaldson, Director.  
Oregon State University, R. W. MacVicar, President.  
Benton County Emergency Services, Reagan Crowell, Director.  
Coos Bay-North Bend Water Board, C. W. Heckard, General Manager.  
Eugene Water and Electric Board, Keith Parks, General Manager.  
Douglas County, K. L. Erickson, Director of Public Works.  
Wasco County, through The Northern Wasco County People's Utility  
District, H. E. Haake, Manager.  
City of McMinnville, A. H. Jones, General Manager.  
City of Portland, Bureau of Public Works, Carl Gobel, Administrator.  
The Confederated Tribes of the Umatilla Indian Reservation,  
E. H. Patawa, Chairman of the General Council.  
The Confederated Tribes of the Warm Springs Indian Reservation,  
Ralph Minnick, Secretary-Treasurer.

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 100 stage and discharge stations and 45 water-quality stations published in this report.

The following organizations aided in collecting records for 35 stations under Federal Energy Regulatory Commission licenses: Eugene Water & Electric Board; Pacific Power & Light Co.; Portland General Electric Co.; Idaho Power Co., Idaho.

### GENERAL HYDROLOGIC CONDITIONS

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 Hydrology

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 in. per year in the lower elevations in the southern part of the area to about 200 in. 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 Hydrology

Eastern Oregon has more complex hydrologic patterns than western Oregon. Precipitation is less than 10 in. 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 in. of precipitation per year, much of it occurring as snow fall. On the large streams, flooding can result from winter rains and (or) seasonal snowmelt; in the smaller drainage basins, flooding can result from winter rains, seasonal snowmelt, and convection storms.

Major hydrologic areas are: (1) the three semiarid regions mentioned above; (2) the northeastern part of the state, which includes the drainage basins of the Willamette and Blue Mountains; and (3) the Klamath River basin which drains the east side of the Cascades and also the semiarid areas to the east.

## WATER RESOURCES DATA FOR OREGON, 1983

## HYDROLOGIC CONDITIONS FOR EASTERN OREGON DURING THE 1983 WATER YEAR

Streamflow was generally above the long term average. Precipitation was generally above average while the snowpack was average to above average throughout most eastern Oregon on April 1, with the exception of the Grande Ronde and Lower John Day Basins. No major flooding or drought occurred during the water year, with the exception of Harney Lake Basin.

Closed Basins

Streamflows in the closed basins were above average. Average flow of the Donner und Blitzen River of the Harney Lake Basin (station 10396000) was 196 percent of the 53-year average. The peak for the year occurred on May 31, and resulted from a generalized rainstorm and melting snow. The peak of 2,360 ft<sup>3</sup>/s was a peak with an exceedance probability of about 15 percent, which means there is about a 15 percent chance that a peak of at least this magnitude will occur in any one year.

Malheur Lake and Harney Lake are experiencing the most extreme flooding since water levels have been observed at Malheur Lake (station 10401800). The 1983 water year peak lake level was 4,098.91 ft, 3 ft above the highest level that had been previously observed in 1932.

Klamath River Basin

Flows in the Klamath River basin were generally above average in the 1983 water year. As an example, mean flow of Williamson River below Sprague River near Chiloquin (station 11502500) was 158 percent of the long-term average. Peak discharge of the year was 5,050 ft<sup>3</sup>/s and occurred on April 4 as a result of a general rainstorm. The exceedance probability of this peak is 15 percent, which represents a low magnitude maximum discharge.

Snowpack on April 1 in the Upper Klamath River basin ranged from 145 to 185 percent of average.

North-Central Region

Flows in the north-central part of the state were above average in the 1983 water year. The John Day River at McDonald Ferry (station 14048000) had an annual mean discharge which was 200 percent of the 78-year average. Mean discharge of Deschutes River at Moody, near Biggs (station 14103000) was 126 percent of the 79-year average. Flow of the Deschutes River is regulated by several reservoirs.

On April 1, snowpack throughout the mountains of the north-central area was below average due to an early snowmelt. Peak discharge of John Day River at McDonald Ferry was 23,700 ft<sup>3</sup>/s on March 14 and resulted primarily from a generalized rainstorm. That peak discharge has an exceedance probability of about 10 percent. A flood of this size is exceeded about every 10 years.

## GROUND-WATER LEVELS IN EASTERN OREGON, 1982 WATER YEAR

In eastern Oregon, ground-water levels generally were above average throughout the year. In the Columbia Plateau ground-water reservoir in north-central Oregon, ground-water levels continued to decline. The decline rate varies in the region, accelerating in some areas and remaining steady in others. Probable cause of this trend is the withdrawal of large quantities of ground water from the basalt aquifer for irrigation purposes.



## WATER RESOURCES DATA FOR OREGON, 1983

Southeast Region

In the extreme southeastern part of the state, which is drained by the Owyhee and Malheur Rivers, flow of Owyhee River near Rome (station 13181000) was well above average. At that site, the 1983 mean flow was 215 percent of the 34-year average. The river has some regulation from upstream reservoirs. Head-waters of the Owyhee River are in northern Nevada, southwestern Idaho, and southeastern Oregon. The Malheur River, which has its headwaters in the Blue Mountains of northeastern Oregon and is highly regulated, also had above average flow.

The Malheur River near Drewsey (station 13214000) reported an annual mean discharge of 468 ft<sup>3</sup>/s. This is 248 percent of the 57-year average and makes the 1983 water year the greatest year for runoff for the 57 years that records have been maintained for this gage.

Snowpack on April 1 was much above average throughout the Owyhee River basin and in the Malheur River basin, and ranged from 147 percent to 215 percent of normal.

Maximum flow for the year of Owyhee River near Rome occurred March 14 as the result of a general rainstorm.

Northeast Region

Flows in the northeastern part of the state were above average in the 1983 water year. Typical of the area was Grande Ronde River at Troy (station 13333000) which had an annual mean discharge which was 108 percent of the 39-year average. Mean flow of Minam River at Minam (station 13331500) was 105 percent of the 19-year average.

Snowpack on April 1 was above average in the Powder and Burnt River drainage basins and in the Wallowa and Blue Mountains, with the exception of the Grande Ronde Basin which reported a below average snowpack.

Peak flow of the Grande Ronde River at Troy occurred on March 13 and had an exceedance probability of less than 50 percent, which indicates a fairly low peak flow.

## 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 of Units (SI) 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 equivalent to 43,560 cubic feet or about 326,000 gallons or 1,233 cubic meters.

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

Bacteria are microscopic unicellular organisms, typically spherical, rodlike, or spiral and threadlike in shape, often clumped into colonies. Some bacteria cause disease, 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 may be 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 which produce colonies with a golden-green metallic sheen within 24 hours when incubated at 35°C  $\pm$  1.0°C on M-Endo medium (nutrient medium for bacterial growth). Their concentrations are expressed as number of colonies per 100 ml of sample.

Fecal coliform bacteria are a group of coliform 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 which produce blue colonies within 24 hours when incubated at 44.5°C  $\pm$  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  $\pm$  1.0°C on M-enterococcus medium (nutrient medium for bacterial growth). Their concentrations are expressed as number of colonies per 100 ml of sample.

Benthic organisms (invertebrates) are animals inhabiting the bottom of an aquatic environment. They include a number of different types of organisms, such as bacteria, fungi, insect larvae and nymphs, snails, clams, and crayfish. They are frequently used as indicators of environmental quality because many have restricted mobility during their aquatic life phase, as well as a relatively long lifespan which allows for response to prevailing and changing water-quality conditions. Many benthic organisms inhabit specific types of environments which, if changed, result in changes in the composition of the benthic community.

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

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

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

Dry weight refers to the weight of residue present after drying in an oven at 60°C for zooplankton and 105°C for periphyton, until the weight remains unchanged. This weight represents the total organic matter, ash and sediment, in the sample. Dry weight values are expressed in the same units as ash weight.

Cfs-day (ft<sup>3</sup>/s-day) 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, or about 646,000 gallons, or 2,445 cubic meters. It represents a runoff of approximately 0.0372 inch from 1 square mile or 0.3468 millimeter from 1 square kilometer.

Chemical oxygen demand (COD) indicates the quantity of oxidizable compounds in water and varies with water composition(s), temperature, period of contact, and other factors.

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

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.

Continuing water-quality record station is a specified site which meets one or all conditions listed.

1. Where chemical samples are collected daily or monthly for 10 or more months during the water year.
2. Where water-temperature records include observations taken one or more times daily.
3. Where sediment discharge records include those periods for which sediment loads are computed and are considered to be representative of the runoff for the water year.

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.

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

Discharge is the volume of water (or more broadly, total fluids) that passes a given point within a given period of time.

Instantaneous discharge is the discharge at a given time.

Mean discharge is the arithmetic average of discharge during a specific period.

Dissolved refers to that material in a representative water sample which passes through a 0.45-micrometer 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. It is recognized that certain kinds of samples cannot be filtered; to provide for this, procedures that are considered equivalent to filtering through a 0.45-micrometer membrane filter will be identified and announced at a later date.

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 gage height or discharge are obtained. When used in connection with a discharge record, the term is applied only to those gaging stations where a continuous record of discharge is 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 attributable to the presence of alkaline earths (principally calcium and magnesium) and is expressed as equivalent calcium carbonate ( $\text{CaCO}_3$ ).

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 8-digit number.

Methylene blue active substance (MBAS) is a measure of apparent detergents. This determination depends on the formation of a blue color when methylene blue dye reacts with synthetic detergent compounds.

Micrograms per liter (UG/L, ug/l) is a unit expressing the concentration of chemical constituents in solution as weight (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 concentrations of chemical constituents in solution. Milligrams per liter represents the weight 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 sediment per liter of water-sediment mixture.

National Geodetic Vertical Datum of 1929 (NGVD) 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.

Organism is any living entity, such as an insect, phytoplankter, or zooplankter.

Cells/volume refers to the number of cells of any organism which are 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 volume, usually milliliters (ml) or liters (l).

Organism count/area refers to the number of organisms collected and enumerated in a sample and adjusted to the number per area habitat, usually square meters (m), acres, or hectares. 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 milliliters (ml) or liters (l). Number 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.

Partial-record station is a particular site where limited streamflow 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 suspended sediment or bed material determined either by 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 recommendations 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 material 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 of total 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, number, weight, or volume.

Periphyton is the assemblage of microorganisms attached to and growing upon solid surfaces. While consisting primarily of algae, they also include bacteria, fungi, protozoa, rotifers, and other small organisms. Periphyton is a useful indicator of water quality.

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 primary food producers in the aquatic environment and are commonly known as algae.

Chlorophyta (green algae) have chlorophyll pigments similar in color to those of higher green plants. Some forms produce algal mats of floating "moss" in lakes.

Chrysophyta (yellow-green algae, yellow-brown algae, and diatoms) have pigments in which yellow-green to golden-brown algae predominate. The cell wall of these organisms, especially diatoms, often consists of two overlapping halves which are highly silicified.

Cryptophyta (cryptomonads) have pigments that are usually brown but also occur as red, blue or grass green. The cells are motile with two flagella and occur in freshwaters sometimes rich in organic and in nitrogenous materials.

Cyanophyta (blue-green algae) are groups of phytoplankton organisms having blue pigment in addition to the green pigment called chlorophyll. Blue-green algae often cause nuisance conditions in water.

Euglenophyta (euglenoids) are motile cells usually with one flagella and have a dominant grass-green pigment. They often occur in small pools rich in organic matter and are frequently present in sufficient amounts to color the water or the damp mud along river banks.

Pyrrhophyta (fire algae) have greenish-tan to golden-brown pigments. The cells are motile usually with two flagella. The freshwater forms are more abundant in pools, ditches, and small lakes with considerable vegetation.

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 food web. The zooplankton community is dominated by small crustaceans and rotifers.

Runoff in inches (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.

Solute is any substance derived from the atmosphere, vegetables, soil, or rocks that dissolve in water.

Specific conductance is a measure of the ability of water to conduct an electrical current. It is expressed in micromhos 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 micromhos). 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 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." Streamflow may be applied to discharge whether or not it is affected by diversion or regulation.

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-micrometer 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 would be 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-micrometer 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 classification of organisms is based upon a hierarchical 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.....	Emphemeroptera
Family.....	Ephemeridae
Genus.....	<u>Hexagenia</u>
<u>Species.....</u>	<u>Hexagenia limbata</u>

Thermograph is a thermometer that continuously and automatically records, on a chart, the water temperature of a stream. "Temperature recorder" is the term used to indicate the presence of a thermograph or a digital mechanism that records water temperature in digital format on punched paper tape.

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 received equal quantities of water from the stream each day for the water year.

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

Tons per day is the quantity of a substance in solution or suspension that passes a stream section during a 24-hour day.

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 determines all of the constituent in the sample.)

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 would be required of all laboratories performing such analyses because different digestion procedures are likely to produce different analytical results.

Turbidity of a sample is the reduction of transparency due to the presence of particulate matter. In this report it is expressed in Formazin turbidity units (FTU), obtained from the Nephelometric method for turbidity determination which measures the intensity of light scattered by suspended particles at 90 degrees from the path of an incident light source.

Water year in Geological Survey reports dealing with surface-water supply refers to 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, 1983 is called "1983 water year."

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 year after thorough mixing in the reservoir.

WRD is used as an abbreviation for "Water-Resources Data" in the summary "REVISIONS" paragraph to refer to previously published State annual hydrologic data reports.

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

#### SPECIAL NETWORKS AND PROGRAMS

Some of the stations for which data are published in this report are included in special networks and programs. These stations are identified by their title, set in parentheses, under the station name.

Hydrologic bench-mark station is one that provides hydrologic data for a basin in which the hydrologic regimen will likely be governed solely by natural conditions. Data collected at a bench-mark station may be used to separate effects of natural from manmade changes in other basins which have been developed and in which the physiography, climate, and geology are similar to those in the undeveloped bench-mark basin.

National stream-quality accounting network (NASQAN) is an accounting network designed by the U.S. Geological Survey to meet many of the information demands of agencies or groups involved in national or regional water-quality planning and management. Both accounting and broad-scale monitoring objectives have been incorporated in the network design. Areal configuration of the network is based on river-basin accounting units designated by the Office of Water Data Coordination in consultation with the Water Resources Council. Primary objectives of the network are (1) to depict areal variability of water-quality conditions nationwide on a year-to-year basis and (2) to detect and assess long-term changes in stream quality.

Precipitation program was initiated by the U.S. Geological Survey after the eruption of Mount St. Helens to collect data on the quantity and quality of precipitation for specific events. Primary objectives of the program are to determine (1) the general quality of precipitation and (2) the effect of ash from Mount St. Helens on the quality of precipitation.

## DOWNSTREAM ORDER AND STATION NUMBER

Stations are listed in downstream direction along the main stream, and stations on tributaries are listed between stations on the main stream in the order in which those tributaries enter the main stream. Stations on tributaries entering above all main-stream stations are listed before the first main-stream station. Stations on tributaries to tributaries are listed in a similar manner. In the list of stations in the front of this report, the rank of tributaries is indicated by indentation, each indentation representing one rank.

As an added means of identification, each water-quality station, gaging station, and partial-record station has been assigned a station number. These are in the same downstream order used in this report. In assigning station numbers, no distinction is made between partial-record and continuous-record stations; therefore, the station number for a partial-record station indicates downstream order position in a list made up of both types of stations. Water-quality stations located at or near gaging stations or partial-record stations have the same number as the gaging or partial-record station. Gaps are left in the numbers to allow for new stations that may be established; hence, the numbers are not consecutive. The complete 8-digit number for each station, such as 14105700 which appears just to the left of the station name, includes the 2-digit part number "14" plus the 6-digit downstream order number "105700." In this report, the records are listed in downstream order by parts. The part number refers to an area whose boundaries coincide with certain natural drainage lines. All records for a drainage basin encompassing more than one State could be arranged in downstream order by assembling pages from the various State reports by station number to include all records in the basin.

## EXPLANATION OF STAGE AND WATER-DISCHARGE RECORDS

Collection and Computation of Data

The base data collected at gaging stations consist of records of stage and measurements of discharge of streams or canals, and stage, surface area, and contents of lakes or reservoirs. In addition, observations of factors affecting the stage-discharge relation or the stage-capacity relation, weather records, and other information are used to supplement base data in determining the daily flow or volume of water in storage. Records of stage are obtained from a water-stage recorder which gives a continuous graph of the fluctuations (for digital recorders, a tape punched at 15-, 30-, or 60-minute intervals) or from direct readings on a nonrecording gage. Measurements of discharge are made with a current meter, using the general methods adopted by the Geological Survey on the basis of experience in stream gaging since 1888. These methods are described in standard textbooks on the measurement of stream discharge. Surface areas of lakes or reservoirs are determined from instrument surveys using standard methods.



For a stream-gaging station, rating tables giving the discharge for any stage are prepared from stage-discharge relation curves defined by discharge measurements. If extensions to the rating curves are necessary to define the extremes of discharge, they are made on the basis of indirect measurements of peak discharge (such as slope-area or contracted-opening measurements, computation of flow over dams or weirs), velocity-area studies, and logarithmic plotting. The application of the daily mean gage heights to the rating table gives the daily mean discharge, from which the monthly and the yearly mean discharge are computed. 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 individual discharge measurements and notes by engineers and observers are used in applying the gage heights to the rating tables. If the stage-discharge relation for a station is temporarily changed by the presence of aquatic growth or debris on the control, the daily mean discharge is computed by what is basically the shifting-control method.

At some stream-gaging stations, the stage-discharge relations are affected by backwater from reservoirs, tributary streams, or other causes. This necessitates the use of the slope method in which the slope or fall in a reach of the stream is a factor in determining discharge. Information required for determining the slope or fall is obtained by means of an auxiliary gage set at some distance from the base gage. At some stations, the stage-discharge relation is affected by changing stage; at these stations, the rate of change in stage is used as a factor in determining discharge.

At some stream-gaging stations, the stage-discharge relation is affected by ice in the winter, and it becomes impossible to compute the discharge in the usual manner. Discharge for periods of ice effect is computed on the basis of the gage-height record and occasional winter discharge measurements, consideration being given to the available information on temperature and precipitation, notes by gage observers and hydrologists, and comparable records of discharge for other stations in the same or nearby basins.

For a lake or reservoir station, capacity tables giving the contents for any stage are prepared from stage-area relation curves defined by surveys. Discharge over spillways is computed from a stage-discharge relations curve defined by discharge measurements. The application of the stage to the capacity table gives the contents, from which the daily, monthly, or yearly change in contents is computed.

If the stage-capacity curve is subject to changes because of deposition of sediment in the reservoir, periodic resurveys of the reservoir are necessary to define new stage-capacity curves. During the period between reservoir surveys, the computed contents may be increasingly in error due to the gradual accumulation of sediment.

For some gaging stations, there are periods when no gage-height record is obtained or the recorded gage height is so faulty 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 on the basis of recorded range in stage, good record at adjoining stations, discharge measurements, weather records, and comparison with other station records from the same or nearby basins. Likewise, daily contents may be estimated on the basis of operator's log, good record at adjoining stations, inflow-outflow studies, and other information.

The data in this report generally comprise a description of the station and tabulations of hydrologic data. For gaging stations on streams or canals, a table showing the daily discharge and monthly and yearly discharge is given. For gaging stations on lakes and reservoirs, a monthly summary table of stage and contents or a table showing the daily contents is given. Tables of daily mean gage heights are included for some streamflow stations and for some reservoir stations. Records are published for the water year, which begins on October 1 and ends on September 30.

The description of the gaging station gives the location, drainage area, period of record, notations of revisions of previously published records, type and history of gage, general remarks, average discharge, and extremes of published records. The location of the gaging station and the drainage area are obtained from the most accurate maps available. River mileage, given under "LOCATION" for some stations, is determined by the Corps of Engineers. Periods for which there are published records for the present station or for stations generally equivalent to the present one are given under "PERIOD OF RECORD."

Previously published records of some stations have been found to be in error on the basis of data or information later obtained. Revisions of such records are usually published, along with the current records, in one of the annual or compilation reports. In order to make it easier to find such revised records, a paragraph headed "REVISED RECORDS" has been added to the description of all stations for which revised records have been published. Listed therein are all the reports in which revisions have been published, each followed by the water years for which figures are revised in that report. In listing the water years only one number is given; for instance, 1933 stands for the water year October 1, 1932, to September 30, 1933. If no daily, monthly, or annual figures of discharge are affected by the revision, that fact is brought out by notations after the year dates as follows: "(M)" means only the instantaneous maximum discharge was revised; "(m)" only the instantaneous minimum was revised; and "(P)" only the peak discharges were revised. If the drainage area has been revised, the report in which the revised figure was first published is given.

The type of gage currently in use; the datum of the present gage referred to National Geodetic Vertical Datum; and a condensed history of the types, locations, and datums of previous gages used during the period of record are given under "GAGE." National Geodetic Vertical Datum is explained in "DEFINITION OF TERMS" on page 10.

Information pertaining to the accuracy of the discharge records, and to conditions that affect the natural flow at the gaging station, is given under "REMARKS"; for reservoir stations, information on the dam forming the reservoir, the capacity, outlet works and spillway and purpose and use of the reservoir is also given under "REMARKS."

The average discharge for the number of years indicated is given under "AVERAGE DISCHARGE"; it is not given for stations having fewer than 5 complete years of record or for stations where changes in water development during the period of record cause the figure to have little significance. Under "EXTREMES," the extremes for the period of record are given first; information available outside the period of record is given second; and last, those for the current year are given. Unless otherwise qualified, the maximum discharge (or contents) is the instantaneous maximum corresponding to the crest stage obtained by use of a water-stage recorder (graphic or digital), a crest-stage gage, or a nonrecording gage read at the time of the crest. If the maximum gage height did not occur on the same day as the maximum discharge (or contents), it is given separately. Similarly, the minimum is the instantaneous minimum unless otherwise qualified. For some stations, peak discharges are listed with the time of occurrence and corresponding gage heights with "EXTREMES FOR THE CURRENT YEAR", if they are all independent peaks (including the maximum for the year) above the selected base. The base discharge, which is given in the table heading, is selected so that an average of about three peaks a year will be presented. Peak discharges are not published for any canals, ditches, drains, or for any stream for which the peaks are subject to substantial control by man. Time of day is expressed in 24-hour local standard time; for example, 12:30 a.m. is 0030, 1:30 p.m. is 1330. The minimums for these stations are published in a separate paragraph following the table of peaks.

The daily table for stream-gaging stations gives the 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 line headed "MAX" and "MIN" gives the maximum and minimum daily discharges, respectively, for the month. Discharge

for the month may also be 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, if the drainage area includes large noncontributing areas, or if the average annual rainfall over the drainage basin is usually less than 20 inches. In the yearly summary below the monthly summary, the figures shown are the appropriate daily discharges for the calendar and water years.

Footnotes to tables of daily discharges are introduced by the word "NOTE." Footnotes are used to indicate periods for which the discharge is computed or estimated by special methods because of no gage-height record, backwater from various sources, or other unusual conditions. Periods of no gage-height record are indicated if the period is continuous for a month or more or includes the maximum discharge for the year. Periods of backwater from an unusual source, of indefinite stage-discharge relation, or of any other unusual condition at the gage site are indicated only if they are a month or more in length and the accuracy of the records is affected. Days on which the stage-discharge relation is affected by ice are not indicated. The methods used in computing discharge for various unusual conditions have been explained in preceding paragraphs.

For most gaging stations on lakes and reservoirs, the data presented comprise a description of the station and monthly summary table to stage and contents. For some reservoirs, a table showing daily contents or stage is given. A skeleton table of capacity at given stages is published for all reservoirs for which records are published on a daily basis, but it is not published for reservoirs for which only monthly data are given.

Data collected at partial-record stations follow the information for continuous-record sites. Data for partial-record discharge stations are presented in a table of annual maximum stage and discharge at crest-stage stations. The table of partial-record stations is followed by a listing of discharge measurements made at sites other than continuous-record or partial-record stations. Occasionally, a series of discharge measurements are made within a short time period to investigate the seepage gains or losses along a reach of a stream or to determine the low-flow characteristics of an area. Such measurements are also given in special tables following the tables of partial-record stations.

### Accuracy of Data

The accuracy of discharge data depends primarily on (1) the stability of the stage-discharge relation or, the stability of the control, the frequency of discharge measurements, and (2) the accuracy of observations of stage, measurements of discharge, and interpretation of records.

The station description under "REMARKS" states the degree of accuracy of the records. "Excellent" means that about 95 percent of the daily discharges are within 5 percent, "good" within 10 percent, and "fair" within 15 percent. "Poor" means that daily discharges have less than "fair" accuracy.

Figures of daily mean discharge are shown to the nearest hundredth of a cubic foot per second for discharges of less than 1 ft<sup>3</sup>/s, to tenths between 1.0 and 10 ft<sup>3</sup>/s, to whole numbers between 10 and 1,000 ft<sup>3</sup>/s, and to three significant figures greater than 1,000 ft<sup>3</sup>/s. The number of significant figures used is based solely on the magnitude of the figure. The same rounding rules apply to discharge figures listed for partial-record stations and miscellaneous sites.

Discharge at many stations, as indicated by the monthly mean, may not reflect natural runoff due to the effects of diversion, consumptive use, regulation, evaporation, or other factors. For such stations, discharge in cubic feet per second per square mile and runoff in inches are not published unless satisfactory adjustments can be made for such effects. 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 unadjusted losses (consumptive use, evaporation, seepage, etc.) are large in comparison with the observed discharge.

### Other Data 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 1967 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.



Records of Discharge Collected by Agencies Other than the  
Geological Survey

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.

EXPLANATION OF WATER-QUALITY RECORDS

Collection and Computation of Data

Records of surface water quality are listed in downstream order by station number. The data generally are collected at or near gaging stations, and are reported immediately following other records for those stations. Water-quality data for most ungaged sites are listed with the records for other surface-water stations, in regular downstream order. The exceptions are the less detailed data for several ungaged sites, which are grouped separately in the section titled "Analyses of samples collected at water-quality partial-record stations."

The descriptive headings for detailed records of surface-water quality give periods of record for the various categories of data, extremes for certain pertinent data, and general remarks. For less detailed records, only the overall period of record is listed.

For ground-water records, no descriptive statements are given; however, the well number, depth of well, date of sampling, and other pertinent data are given in the table containing the chemical analyses.

Water analysis

Most methods for collecting and analyzing water samples are described in the U.S. Geological Survey publications on Techniques of Water-Resources Investigations, which are listed on page 33.

One stream-water 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 for the accurate determination of mean concentration and for use in calculating load.

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. Where an apparent inconsistency exists between a reported pH value and 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 published records consist of daily maximum, minimum, and mean values. More detailed records may be obtained from the Oregon office.

Since October 1967, the U.S. Geological Survey has used the metric system for reporting data on chemical constituents and concentrations of suspended sediment. Chemical constituents are now reported in milligrams per liter (mg/l) except for certain minor elements that are reported in micrograms per liter (ug/l). Suspended sediment is reported in milligrams per liter and water temperatures in degrees Celsius (°C). In water with a density other than 1.000 g/ml, values in parts per million should be multiplied by the density to convert to milligrams per liter. To convert temperature in degrees Celsius to degrees Fahrenheit, see table 1 below.

In October 1968, the Geological Survey began reporting many of the chemical constituents as well as the minor elements in micrograms per liter instead of milligrams per liter. (See "Definitions of terms," page 10.)

Table 1.--Degrees Celsius (°C) to degrees Fahrenheit (°F)\*  
(Temperature reported to nearest 0.5°C)

°C	°F	°C	°F	°C	°F	°C	°F	°C	°F
0.0	32	10.0	50	20.0	68	30.0	86	40.0	104
.5	33	10.5	51	20.5	69	30.5	87	40.5	105
1.0	34	11.0	52	21.0	70	31.0	88	41.0	106
1.5	35	11.5	53	21.5	71	31.5	89	41.5	107
2.0	36	12.0	54	22.0	72	32.0	90	42.0	108
2.5	36	12.5	54	22.5	72	32.5	90	42.5	108
3.0	37	13.0	55	23.0	73	33.0	91	43.0	109
3.5	38	13.5	56	23.5	74	33.5	92	43.5	110
4.0	39	14.0	57	24.0	75	34.0	93	44.0	111
4.5	40	14.5	58	24.5	76	34.5	94	44.5	112
5.0	41	15.0	59	25.0	77	35.0	95	45.0	113
5.5	42	15.5	60	25.5	78	35.5	96	45.5	114
6.0	43	16.0	61	26.0	79	36.0	97	46.0	115
6.5	44	16.5	62	26.5	80	36.5	98	46.5	116
7.0	45	17.0	63	27.0	81	37.0	99	47.0	117
7.5	45	17.5	63	27.5	81	37.5	99	47.5	117
8.0	46	18.0	64	28.0	82	38.0	100	48.0	118
8.5	47	18.5	65	28.5	83	38.5	101	48.5	119
9.0	48	19.0	66	29.0	84	39.0	102	49.0	120
9.5	49	19.5	67	29.5	85	39.5	103	49.5	121

\*°C = 5/9 (°F - 32) or °F = 9/5 (°C) + 32.

### Water temperature

Water temperatures are measured at most of the water-quality stations. The water temperatures for daily stations are taken when a sample is collected, at about the same time each day. Large streams have small diurnal temperature changes; shallow streams may have a daily range of several degrees and may closely follow the changes in air temperature. Some streams may be affected by waste-heat discharges. At stations where continuously recording thermographs are used, maximum and minimum temperatures for each day are published.

### Sediment

Suspended-sediment concentrations are determined from samples collected by using depth-integrating samplers. Samples usually are obtained at several verticals in the cross section or a single sample at a fixed point and a coefficient applied to determine concentration in the cross sections.

During periods of rapidly changing flow or concentration, samples may have been collected 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 discharges observed for other periods of similar discharge. A blank in the daily mean concentration column of the suspended-sediment discharge table indicates the value in the sediment discharge column was estimated.

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

In addition to records of the quantities of suspended sediment, records of periodic measurements of particle-size distribution of suspended sediment and bed material are included.

## WATER RESOURCES DATA FOR OREGON, 1983

## EXPLANATION OF GROUND-WATER LEVEL RECORDS

Collection of Data

The observation-well program in Oregon, begun in 1928, was continued through 1983 in cooperation with the Oregon Water Resources Department. During the period 1962-65, the number of wells in the observation-well network was increased from 102 to 840. Observation wells in the program are part of a basic national network for providing a historical record of water-level changes in selected aquifers in the nation. Most of the wells are measured periodically by personnel of the Oregon Water Resources Department. Measurements are made in most of the wells three or four times a year to obtain records of the effects of pumping and seasonal changes in ground-water storage. The measurements are generally made in winter and spring before pumping begins, during the pumping season, and at the end of the pumping season. Water-level measurements in 81 representative wells in the Oregon observation-well network are included in this report.

Each well is identified by means of a 15-digit number that is based on the grid system of latitude and longitude. The first six digits represent degrees, minutes, and seconds of north latitude; the next seven digits are degrees, minutes, and seconds, of west longitude; and the last two numbers are sequential numbers assigned in the order the wells are inventoried in a 1-second quadrangle. Each well is also identified by a local well number that provides continuity with older reports and local needs.

Well Descriptions

For each well, the well description includes, if available, the following information: Latitude-longitude number, local well number, owner, method of construction, use of well, aquifer name or lithology, diameter of casing, depth of well, depth interval perforated or screened, altitude of land-surface datum (lsd) National Geodetic Vertical Datum of 1929 (NGVD), and a description of the measuring point.

The depth of the well at the time it was inventoried is given in the well description, and any subsequent changes also are described. Well diameter reported is the inside of the innermost well casing at land surface.

### Water Levels

Measurements are made in many types of wells under varying conditions, but the methods of measurement are standardized to the extent possible. The equipment and measuring techniques used at each observation well ensure that measurements at each well are of consistent accuracy and reliability.

Water-level measurements in this report are given in feet below land-surface datum unless otherwise indicated. Those water levels that are above land-surface datum are preceded by a plus (+) sign. Land-surface datum is a datum plane that is approximately at land surface at each well. The height of the measuring point (MP) above or below land-surface datum is given in each well description.

Water levels are reported to as many significant figures as can be justified by the local conditions. For example, in a measurement of a depth to water of several hundred feet, the error of determining the absolute value of the total depth to water may be a few tenths of a foot, whereas the error in determining the net change of water level between successive measurements may be only a hundredth or a few hundredths of a foot. For lesser depths to water, the accuracy is greater. Most measurements are reported to a hundredth of a foot; others are reported only to a tenth of a foot or a larger unit. Water levels determined by air line are less accurate than those measured by other methods; therefore, these water levels are reported only to the nearest half a foot.

The highest and lowest water levels measured at each well for the period of record are reported. These are intended to represent static water levels, but the lowest levels reported for some wells may reflect recent pumping.

### Hydrographs

Hydrographs show fluctuations of water levels during 1963-83 in selected observations wells. Generally, water levels are highest during the wet winter and spring months and lowest during the dry summer and autumn months. Water levels are shown on the hydrographs in feet below the land surface at the well.



## WATER RESOURCES DATA FOR OREGON, 1983

Well-Numbering System

Local designations of wells discussed in this report are based on the official system for the rectangular subdivision of public lands, referenced to the Willamette base line and meridian. The number indicates the location of the well, by township, range, section, and its position within the section. A graphic illustration of this method of well numbering is shown below (fig. 1). The numbers indicate the township, the range, and the section, respectively, in which the well is located. The letters following the section number locate the well within the section. The first letter denotes the quarter section (160 acres); the second, the quarter-quarter section (40 acres); and the third, the quarter-quarter-quarter section (10 acres). Where two or more wells are in the same 10-acre subdivision, serial numbers are added after the third letter. The section number and three-letter position indicator are shown on the location map adjacent to the well symbol. Within a county, the wells are arranged in sequential order based on increasing numbers for township and range by section number. For example, well 1S/32E-16CCC is in the NE $\frac{1}{4}$ NE $\frac{1}{4}$ NE $\frac{1}{4}$  sec.16, T.1 S., R.32 E., and will be labeled as 16CCC.

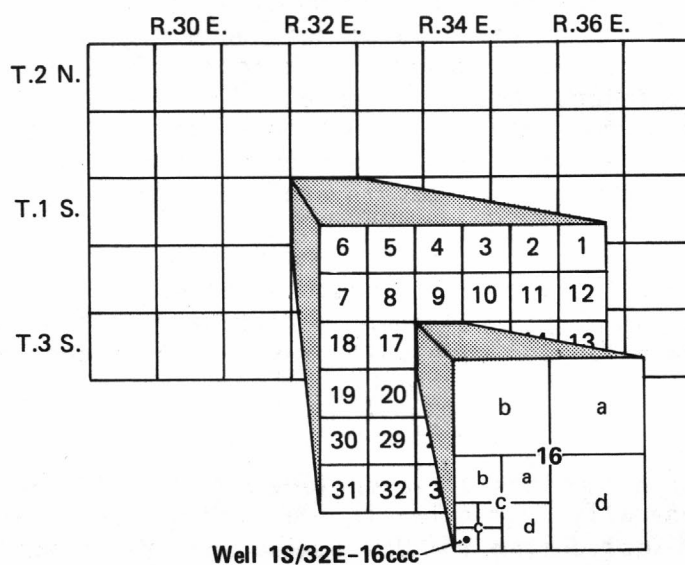


FIGURE 1.--Well-numbering system.

## PUBLICATIONS ON TECHNIQUES OF WATER-RESOURCES INVESTIGATIONS

Thirty-seven manuals by the U.S. Geological Survey have been published to date in the series on techniques describing procedures for planning and executing 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) is on 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, Branch of Distribution, 604 South Pickett Street, Alexandria, VA 22304 (authorized agent of the Superintendent of Documents, Government Printing Office).

NOTE: When ordering 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. 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.
- 2-E1. APPLICATION OF BOREHOLE GEOPHYSICS TO WATER-RESOURCES INVESTIGATIONS, by W. S. Keys and L. M. MacCary: USGS--TWRI Book 2, Chapter E1. 1971. 126 pages.
- 3-A1. GENERAL FIELD AND OFFICE PROCEDURES FOR INDIRECT DISCHARGE MEASUREMENTS, by M. A. Benson and Tate Dalrymple: USGS--TWRI Book 3, Chapter A1. 1967. 30 pages.
- 3-A2. MEASUREMENT OF PEAK DISCHARGE BY THE SLOPE-AREA METHOD, by Tate Dalrymple and M. A. Benson: USGS--TWRI Book 3, Chapter A2. 1967. 12 pages.
- 3-A3. MEASUREMENT OF PEAK DISCHARGE AT CULVERTS BY INDIRECT METHODS, by G. L. Bodhaine: USGS--TWRI Book 3, Chapter A3. 1968. 60 pages.
- 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.
- 3-A8. DISCHARGE MEASUREMENTS AT GAGING STATIONS, by T. J. Buchanan and W. P. Somers: USGS--TWRI Book 3, Chapter A8. 1969. 65 pages.
- 3-A9. MEASUREMENT OF TIME OF TRAVEL AND DISPERSION IN STREAMS BY DYE TRACING, by E. F. Hubbard, F. A. Kilpatrick, L. A. Martens, and J. F. Wilson, Jr.: USGS--TWRI Book 3, Chapter A9. 1982. 44 pages.

## PUBLICATIONS ON TECHNIQUES OF WATER-RESOURCES INVESTIGATIONS

- 3-A11. MEASUREMENT OF DISCHARGE BY MOVING-BOAT METHOD, by G. F. Smoot and C. E. Novak: USGS--TWRI Book 3, Chapter A11. 1969. 22 pages.
- 3-A12. FLUOROMETRIC PROCEDURES FOR DYE TRACING, by J. F. Wilson Jr.: USGS--TWRI Book 3, Chapter A12. 1968. 31 pages. Not currently available.
- 3-A13. COMPUTATION OF CONTINUOUS RECORDS OF STREAMFLOW, by E. J. Kennedy: USGS--TWRI Book 3, Chapter A13. 1983. 53 p.
- 3-A14. USE OF FLUMES IN MESURING DISCHARGE, by F. A. Kilpatrick and V. R. Schneider: USGS--TWRI Book 3, Chapter A14. 1983. 46 p.
- 3-B1. AQUIFER-TEST DESIGN, OBSERVATION, AND DATA ANALYSIS, by R. W. Stallman: USGS--TWRI Book 3, Chapter B1. 1971. 26 pages.
- 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.
- 3-B3. TYPE CURVES FOR SELECTED PROBLEMS OF FLOW TO WELLS IN CONFINED AQUIFERS, by J. E. Reed: USGS--TWRI Book 3, Chapter B3. 1980. 106 pages.
- 3-C1. FLUVIAL SEDIMENT CONCEPTS, by H. P. Guy: USGS--TWRI Book 3, Chapter C1. 1970. 55 pages.
- 3-C2. FIELD METHODS FOR MEASUREMENT OF FLUVIAL SEDIMENT, by H. P. Guy and V. W. Norman: USGS--TWRI Book 3, Chapter C2. 1970. 59 pages.
- 3-C3. COMPUTATION OF FLUVIAL-SEDIMENT DISCHARGE, by George Porterfield: USGS--TWRI Book 3, Chapter C3. 1972. 66 pages.
- 4-A1. SOME STATISTICAL TOOLS IN HYDROLOGY, by H. C. Riggs: USGS--TWRI Book 4, Chapter A1. 1968. 39 pages.
- 4-A2. FREQUENCY CURVES, by H. C. Riggs: USGS--TWRI Book 4, Chapter A2. 1968. 15 pages.
- 4-B1. LOW-FLOW INVESTIGATIONS, by H. C. Riggs: USGS--TWRI Book 4, Chapter B1. 1972. 18 pages.
- 4-B2. STORAGE ANALYSES FOR WATER SUPPLY, by H. C. Riggs and C. H. Hardison: USGS--TWRI Book 4, Chapter B2. 1973. 20 pages.
- 4-B3. REGIONAL ANALYSES OF STREAMFLOW CHARACTERISTICS, by H. C. Riggs: USGS--TWRI Book 4, Chapter B3. 1973. 15 pages.
- 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.
- 5-A1. METHODS FOR COLLECTION AND ANALYSIS OF WATER SAMPLES FOR DISSOLVED MINERALS AND GASES, by Eugene Brown, M. W. Skougstad, and M. J. Fishman: USGS--TWRI Book 5, Chapter A1. 1970. 160 pages.
- 5-A2. DETERMINATION OF MINOR ELEMENTS IN WATER BY EMISSION SPECTROSCOPY, by P. R. Barnett and E. C. Mallory, Jr.: USGS--TWRI Book 5, Chapter A2. 1971. 31 pages.
- 5-A3. METHODS FOR ANALYSIS OF ORGANIC SUBSTANCES IN WATER, by D. F. Goerlitz and Eugene Brown: USGS--TWRI Book 5, Chapter A3. 1972. 40 pages.
- 5-A4.\* METHODS FOR COLLECTION AND ANALYSIS OF AQUATIC BIOLOGICAL AND MICROBIOLOGICAL SAMPLES, edited by P. E. Greeson, T. A. Ehlike, G. A. Irwin, B. W. Lium, and K. V. Slack: USGS--TWRI Book 5, Chapter A4. 1977. 332 pages.
- 5-A5.\* METHODS FOR DETERMINATION OF RADIOACTIVE SUBSTANCES IN WATER AND FLUVIAL SEDIMENTS, by L. L. Thatcher, V. J. Janzer, and K. W. Edwards: USGS--TWRI Book 5, Chapter A5. 1977. 95 pages.
- 5-C1. LABORATORY THEORY AND METHODS FOR SEDIMENT ANALYSIS, by H. P. Guy: USGS--TWRI Book 5, Chapter C1. 1969. 58 pages.

## PUBLICATIONS ON TECHNIQUES OF WATER-RESOURCES INVESTIGATIONS

- 7-C1. FINITE DIFFERENCE MODEL FOR AQUIFER SIMULATION IN TWO DIMENSIONS WITH RESULTS OF NUMERICAL EXPERIMENTS, by P. C. Trescott, G. F. Pinder, and S. P. Larson: USGS--TWRI Book 7, Chapter C1. 1976. 116 pages.
- 7-C2. COMPUTER MODEL OF TWO-DIMENSIONAL SOLUTE TRANSPORT AND DISPERSION IN GROUND WATER, by L. F. Konikow and J. D. Bredehoeft: USGS--TWRI Book 7, Chapter C2. 1976. 90 pages.
- 7-C3. A MODEL FOR SIMULATION OF FLOW IN SINGULAR AND INTERCONNECTED CHANNELS, by R. W. Schaffranek, R. A. Baltzer, and D. E. Goldberg: USGS--TWRI Book 7, Chapter C3. 1981. 110 pages.
- 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-B2. CALIBRATION AND MAINTENANCE OF VERTICAL-AXIS TYPE CURRENT METERS, by G. F. Smoot and C. E. Novak: USGS--TWRI Book 8, Chapter B2. 1968. 15 pages.

\*These publications are available ONLY from Superintendent of Documents, Government Printing Office, Washington, D.C. 20402. They are in looseleaf format and are subscription items. Additional supplements will be issued to subscribers at no extra cost. Checks should be made payable to Superintendent of Documents. Requester should emphasize to Superintendent of Documents that this is a subscription item.

Figure 2. Map of Eastern Oregon showing location of active gaging stations



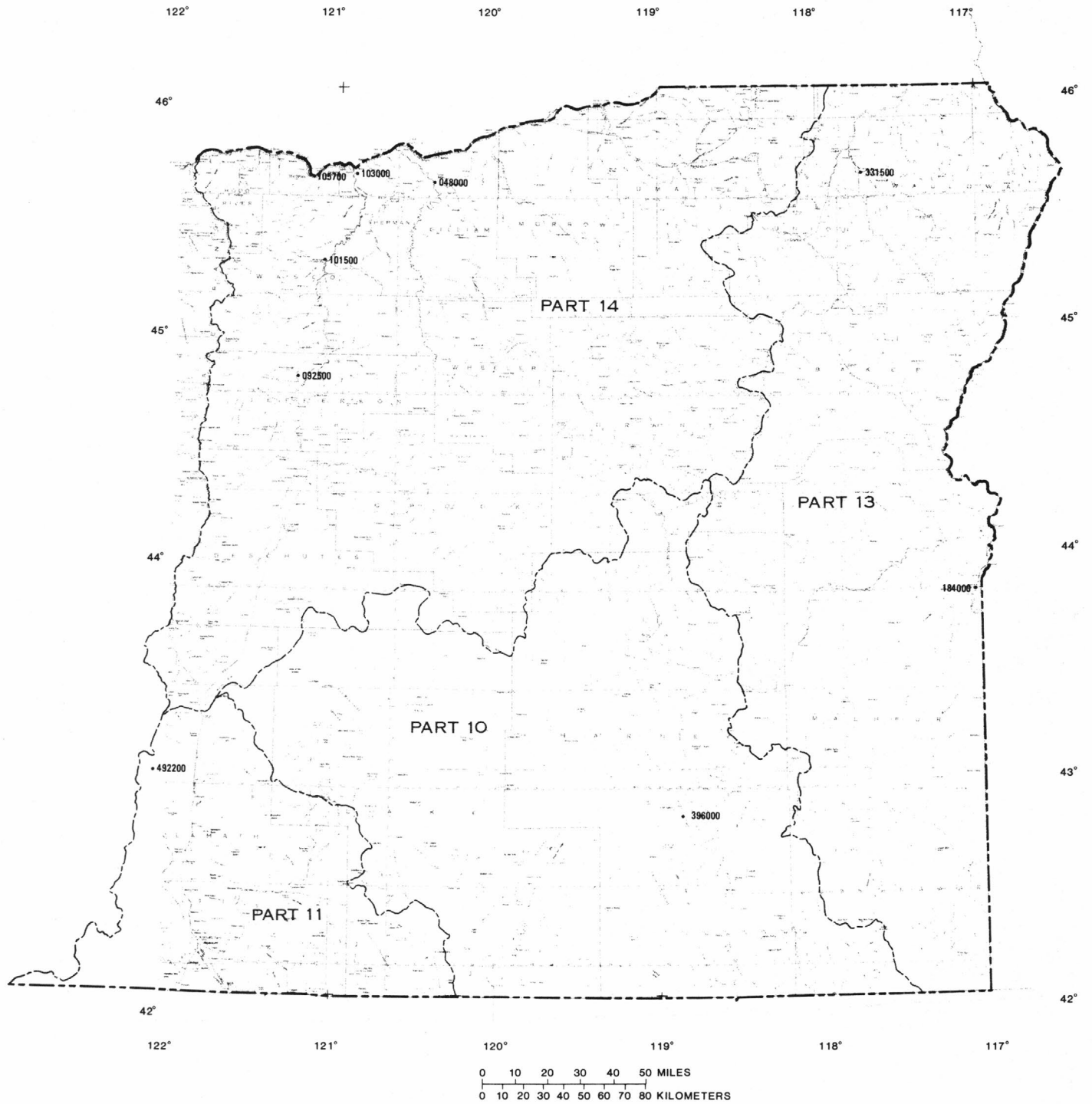


Figure 3. Map of Eastern Oregon showing sites where water-quality data are obtained

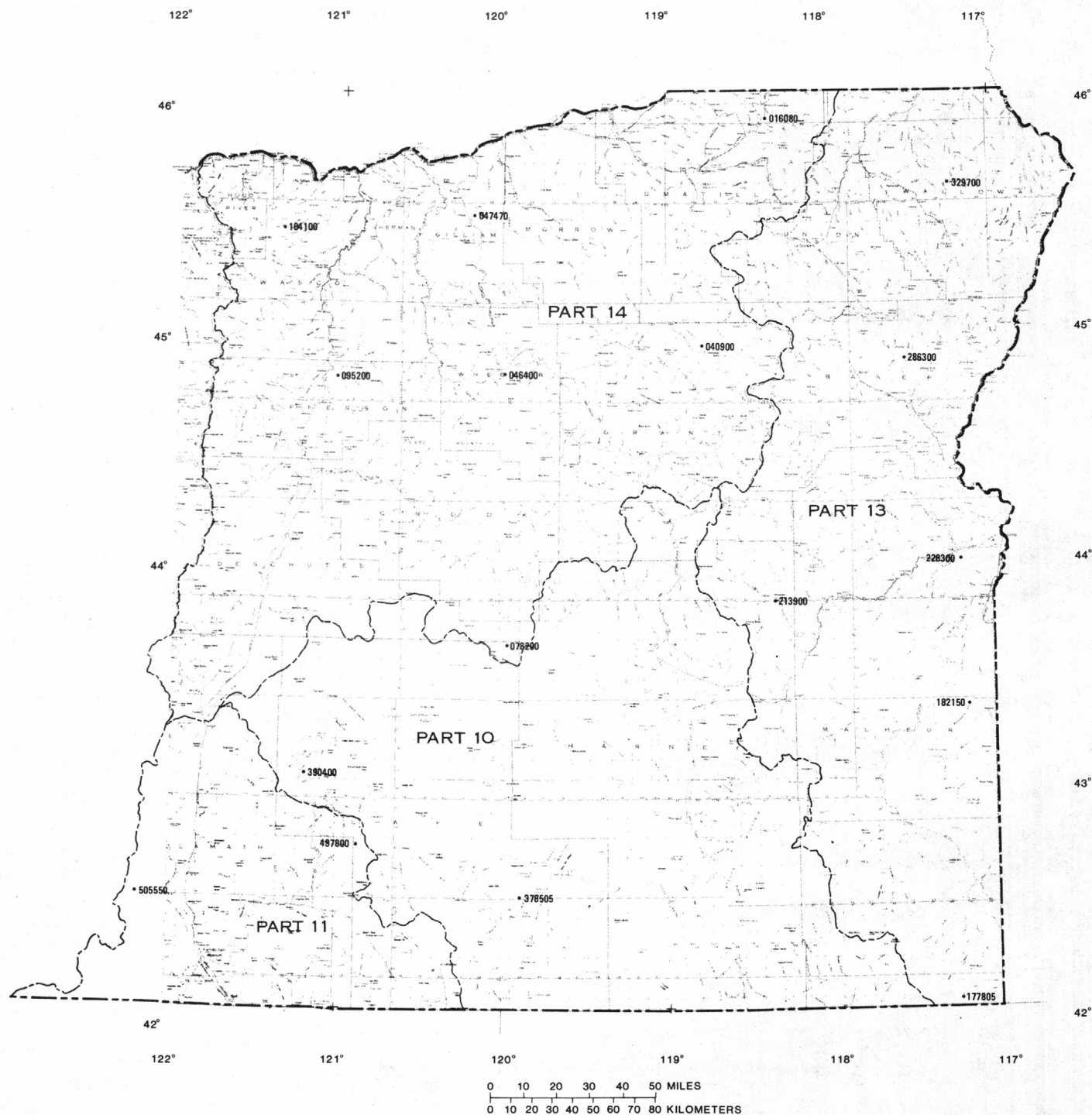


Figure 4. Map of Eastern Oregon showing location of partial-record stations

## THE GREAT BASIN

## WARNER LAKES BASIN

10366000 TWENTYMILE CREEK NEAR ADEL, OR

LOCATION.--Lat 42°04'20", long 119°57'42", in SW¼NW¼ 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<sup>2</sup>, including 46 mi<sup>2</sup> 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).

GAGE.--Water-stage recorder and concrete control. Datum of gage is 4,560.83 ft 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.--Records good. Some regulation by pumpage from Cowhead Lake. Diversions in Oregon for irrigation above station; considerable diversions for irrigation in Cowhead Lake area in California.

AVERAGE DISCHARGE.--48 years (water years 1911-15, 1919, 1941-44, 1946-83), 53.1 ft<sup>3</sup>/s, 38,470 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 3,670 ft<sup>3</sup>/s Dec. 23, 1964, gage height, 16.1 ft, from rating curve extended above 920 ft<sup>3</sup>/s on basis of contracted-opening measurement of 3,260 ft<sup>3</sup>/s; no flow at times.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 510 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Jan. 6	1830	1,130	6.78	Mar. 13	0430	*2,180	*10.07
Feb. 17	2230	1,630	8.35	Mar. 30	2300	1,600	8.25
Feb. 22	2230	730	5.53	Apr. 21	2200	579	5.03
Mar. 1	2030	1,460	7.80	May 1	2230	822	5.82

Minimum, 0.10 ft<sup>3</sup>/s Nov. 14, result of regulation.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1982 TO SEPTEMBER 1983  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	5.7	9.2	27	8.5	12	717	295	486	311	80	12	7.2
2	5.2	7.3	16	10	9.7	867	369	535	289	84	12	7.2
3	5.2	6.7	19	12	8.4	960	179	338	297	67	11	7.7
4	5.2	7.3	158	13	9.7	510	119	291	256	61	10	7.2
5	5.2	7.3	72	15	9.7	313	127	381	224	55	10	7.2
6	5.2	7.3	129	210	9.0	191	112	248	212	52	9.7	6.6
7	5.7	6.7	47	461	8.4	148	103	210	206	50	10	6.1
8	5.7	6.2	31	264	8.4	177	206	204	216	45	11	6.6
9	5.7	4.8	22	99	9.0	345	208	160	218	41	10	6.6
10	5.7	4.6	16	69	13	527	193	143	238	38	9.7	6.6
11	5.2	4.4	14	35	19	877	144	136	208	36	9.7	6.6
12	5.2	4.1	12	23	79	594	125	138	160	34	9.0	6.6
13	5.2	4.1	11	18	208	1690	103	136	141	29	9.0	6.6
14	4.8	4.1	9.9	13	148	639	112	128	135	32	9.7	6.6
15	4.8	6.2	8.5	13	119	336	146	160	135	28	9.0	5.5
16	4.4	7.3	9.9	14	108	201	208	138	130	25	9.0	5.5
17	4.8	8.5	17	15	471	136	230	141	131	23	8.4	5.5
18	4.8	33	15	20	1130	120	272	160	130	22	8.4	6.1
19	5.2	25	13	57	329	97	315	177	108	20	10	5.0
20	5.2	15	12	55	204	81	270	182	99	22	12	5.5
21	5.7	11	12	32	191	83	389	193	90	22	10	5.5
22	6.7	11	11	22	394	90	324	204	84	20	12	5.5
23	9.2	8.5	9.0	16	549	84	234	216	87	19	12	6.1
24	8.5	4.8	7.0	16	409	105	158	242	86	17	9.7	6.6
25	7.3	6.7	30	13	304	127	156	270	80	13	9.0	6.1
26	16	7.3	15	13	177	102	131	283	76	15	8.4	6.1
27	11	7.9	7.5	161	135	100	158	283	72	15	7.7	8.4
28	9.2	11	7.5	114	146	120	175	317	67	14	7.2	7.2
29	9.9	40	7.5	54	---	186	180	340	66	14	7.2	6.6
30	14	38	7.5	23	---	778	266	371	65	13	6.6	6.6
31	11	---	8.0	16	---	829	---	404	---	12	6.6	---
TOTAL	212.6	325.3	781.3	1904.5	5217.3	12130	6007	7615	4617	1018	296.0	193.2
MEAN	6.86	10.8	25.2	61.4	186	391	200	246	154	32.8	9.55	6.44
MAX	16	40	158	461	1130	1690	389	535	311	84	12	8.4
MIN	4.4	4.1	7.0	8.5	8.4	81	103	128	65	12	6.6	5.0
AC-FT	422	645	1550	3780	10350	24060	11910	15100	9160	2020	587	383
CAL YR 1982	TOTAL	26570.4	MEAN	72.8	MAX	2200	MIN	2.3	AC-FT	52700		
WTR YR 1983	TOTAL	40317.2	MEAN	110	MAX	1690	MIN	4.1	AC-FT	79970		

## WARNER LAKES BASIN

10371500 DEEP CREEK ABOVE ADEL, OR

LOCATION.-- Lat 42°11'21", long 120°00'02", in SW¼NW¼ 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<sup>2</sup>.

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.

GAGE.--Water-stage recorder. Datum of gage is 4,980.34 ft 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.--Records good. No regulation. Diversions for irrigation above station.

AVERAGE DISCHARGE.--55 years, 132 ft<sup>3</sup>/s, 95,630 acre-ft/yr.

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

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 600 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Feb. 17	1730	1,120	3.75	Apr. 21	2400	947	3.51
Feb. 22	2030	650	3.05	May 5	0030	863	3.39
Mar. 3	1830	788	3.28	May 31	0830	*2,070	*4.82
Mar. 13	1230	1,600	4.33	June 11	0130	1,290	3.96
Mar. 30	2300	1,220	3.88				

Minimum, 12 ft<sup>3</sup>/s Nov. 9.

REVISIONS.--The peak discharges and annual maximum (\*) for water years 1979, 1980, and 1982 have been revised as shown in the following table. They supersede figures published in the reports for those years.

Water year	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
1979	Mar. 7	1730	*1,380	*4.08
1980	Jan. 12	1630	2,740	5.36
	Apr. 19	2245	*5,120	*6.80
1982	Dec. 15	1030	1,250	3.91
	Dec. 19	2030	*4,590	*6.52
	Feb. 16	1730	3,520	5.88
	Feb. 20	2000	2,230	4.97
	Apr. 11	1700	3,220	5.68

## WARNER LAKES BASIN

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10371500 DEEP CREEK ABOVE ADEL, OR--Continued

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1982 TO SEPTEMBER 1983  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	32	46	40	55	60	347	505	595	1460	319	35	26
2	31	39	38	70	66	500	465	595	1220	398	34	26
3	30	37	43	88	69	525	295	600	1200	274	30	29
4	32	37	57	92	76	475	236	710	1080	219	28	27
5	33	36	77	105	79	343	213	722	947	198	27	26
6	32	36	156	130	48	257	195	595	863	183	26	26
7	39	32	146	172	42	232	201	580	821	163	27	25
8	37	34	123	164	45	299	250	615	849	150	29	25
9	36	29	100	112	40	420	278	495	856	140	29	28
10	34	33	80	88	39	570	264	445	884	125	28	29
11	32	36	69	79	48	752	225	407	1020	105	28	28
12	31	48	60	66	90	550	204	445	746	96	27	28
13	30	46	48	61	103	1370	186	525	632	88	26	27
14	29	48	42	58	84	758	180	540	585	84	29	26
15	29	42	40	56	77	500	186	605	555	78	28	25
16	29	34	45	55	74	375	236	545	510	76	28	26
17	30	39	55	57	450	323	335	605	515	72	27	25
18	28	72	52	63	734	288	420	722	500	69	26	25
19	29	51	49	77	315	243	565	863	420	62	30	25
20	30	34	57	70	246	219	575	940	359	59	40	27
21	31	34	88	60	219	213	746	1050	347	57	42	27
22	32	34	82	58	355	213	758	1120	327	53	48	27
23	35	39	72	55	475	192	605	1180	319	47	64	30
24	40	39	56	57	384	189	520	1290	303	44	50	31
25	35	39	52	55	307	189	435	1420	278	42	41	31
26	58	39	78	58	174	168	402	1520	271	42	35	28
27	48	42	65	118	160	168	384	1530	278	38	31	31
28	39	46	52	110	143	177	435	1560	257	36	29	32
29	46	49	53	88	---	183	500	1680	250	36	27	29
30	67	40	54	72	---	600	620	1650	229	38	26	29
31	54	---	54	66	---	728	---	1900	---	37	25	---
TOTAL	1118	1210	2083	2515	5002	12366	11419	28049	18881	3428	1000	824
MEAN	36.1	40.3	67.2	81.1	179	399	381	905	629	111	32.3	27.5
MAX	67	72	156	172	734	1370	758	1900	1460	398	64	32
MIN	28	29	38	55	39	168	180	407	229	36	25	25
AC-FT	2220	2400	4130	4990	9920	24530	22650	55640	37450	6800	1980	1630
CAL YR 1982	TOTAL	85531	MEAN	234	MAX	3270	MIN	17	AC-FT	169700		
WTR YR 1983	TOTAL	87895	MEAN	241	MAX	1900	MIN	25	AC-FT	174300		



## WARNER LAKES BASIN

10378500 HONEY CREEK NEAR PLUSH, OR

LOCATION.--Lat 42°25'33", long 119°55'23", in SW¼SW¼ 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<sup>2</sup>, 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 4,552.60 ft 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.--Records good except those for December, January, and Sept. 16-30, which are fair. Slight regulation by five small reservoirs, combined capacity, 870 acre-ft. Diversions for irrigation above station.

AVERAGE DISCHARGE.--57 years (water years 1911-14, 1931-83), 30.8 ft<sup>3</sup>/s, 22,310 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 11,000 ft<sup>3</sup>/s Dec. 23, 1964, gage height, 13.4 ft, from floodmark, from rating curve extended above 250 ft<sup>3</sup>/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 above base of 200 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Jan. 7	2330	245	4.05	Apr. 22	0330	382	4.47
Feb. 18	0500	397	4.64	May 5	0430	315	4.29
Mar. 4	0030	270	4.15	May 15	0900	255	4.06
Mar. 11	0530	265	4.13	May 31	0700	688	5.42
Mar. 13	1030	*930	*5.98	June 11	0330	321	4.31

Minimum, 0.21 ft<sup>3</sup>/s Sept. 14.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1982 TO SEPTEMBER 1983  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.9	7.2	11	8.0	10	83	218	202	430	52	9.3	4.0
2	3.2	6.6	10	15	10	114	176	231	360	92	8.3	3.8
3	3.2	6.1	11	20	10	163	103	224	340	65	7.7	4.0
4	3.7	6.6	16	31	10	171	78	260	287	49	7.0	3.7
5	3.8	6.6	18	53	10	102	71	293	249	39	6.4	3.4
6	4.1	6.9	17	90	10	72	63	235	224	34	5.9	2.8
7	4.1	6.9	16	131	10	52	63	213	205	31	5.7	2.0
8	4.5	6.9	13	80	10	51	68	231	202	36	7.7	1.3
9	4.5	6.3	12	51	11	73	79	192	213	37	7.4	.98
10	4.5	6.0	14	25	11	139	79	169	194	36	5.5	.70
11	4.5	6.0	15	12	13	239	70	147	285	33	5.7	.56
12	4.5	6.0	14	12	55	165	65	142	205	29	5.7	.40
13	4.1	6.0	14	12	74	532	62	174	160	26	5.5	.28
14	4.0	6.3	12	12	37	274	57	220	139	27	5.3	.23
15	4.0	6.9	11	12	35	164	54	233	128	26	5.9	.31
16	4.0	7.8	13	12	35	112	56	196	118	25	8.3	.31
17	4.0	8.6	12	12	87	92	73	194	107	23	9.3	.31
18	4.8	15	11	12	288	80	107	262	95	20	11	.31
19	5.2	14	13	11	72	67	188	346	97	18	13	.31
20	5.0	11	14	10	53	57	213	377	89	17	16	.31
21	5.0	11	13	10	50	54	315	416	82	17	10	.31
22	5.2	10	12	11	52	50	354	422	69	16	7.0	3.1
23	4.8	10	11	12	90	47	312	422	64	15	10	3.1
24	5.9	9.0	9.5	12	91	45	255	445	59	14	9.6	3.1
25	6.9	9.5	8.0	12	77	46	194	475	59	13	8.0	3.1
26	7.8	10	12	12	52	47	151	484	54	13	6.4	3.1
27	9.2	11	10	12	48	48	132	481	57	13	5.3	3.1
28	7.2	13	9.0	12	47	49	139	472	54	13	4.6	3.1
29	7.2	15	8.0	11	---	48	153	494	56	12	4.3	3.1
30	8.9	13	8.0	10	---	287	202	460	56	11	4.0	3.1
31	8.6	---	8.0	10	---	366	---	557	---	11	3.7	---
TOTAL	159.3	265.2	375.5	745.0	1358	3889	4150	9669	4737	863	229.5	58.22
MEAN	5.14	8.84	12.1	24.0	48.5	125	138	312	158	27.8	7.40	1.94
MAX	9.2	15	18	131	288	532	354	557	430	92	16	4.0
MIN	2.9	6.0	8.0	8.0	10	45	54	142	54	11	3.7	.23
AC-FT	316	526	745	1480	2690	7710	8230	19180	9400	1710	455	115
CAL YR 1982	TOTAL	22144.08	MEAN	60.7	MAX	852	MIN	.27	AC-FT	43920		
WTR YR 1983	TOTAL	26498.72	MEAN	72.6	MAX	557	MIN	.23	AC-FT	52560		

10382550 CHEWAUCAN RIVER NEAR BUCK MOUNTAIN, NEAR PAISLEY, OR

LOCATION.--Lat 42°29'10", long 120°34'22", in SE¼ 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.

DRAINAGE AREA.--157 mi<sup>2</sup>.

PERIOD OF RECORD.--October 1982 to September 1983.

GAGE.--Water-stage recorder. Altitude of gage is 5,030 ft, from topographic map.

REMARKS.--Records good except those for winter periods and period of no gage-height record Apr. 30 to June 1, which are fair.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 300 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Feb. 18	0230	376	4.28	Apr. 21	2230	465	4.42
Mar. 13	1630	522	4.50	May 4	-	unknown	unknown
Mar. 30	2000	568	4.56	May 31	a0800	*1,800	b*5.60

Minimum daily, 25 ft<sup>3</sup>/s Jan. 1, 2, result of freezeup.

a About.

b From floodmark.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1982 TO SEPTEMBER 1983  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	39	50	54	25	64	152	235	400	1400	465	80	67
2	39	44	52	25	64	152	239	450	1200	534	74	56
3	39	47	56	35	66	163	190	540	1160	346	70	52
4	39	47	62	50	60	156	174	600	1080	301	69	50
5	40	45	62	80	66	152	170	580	1030	280	67	48
6	40	46	90	120	62	135	159	560	1000	265	65	47
7	47	40	70	180	54	129	166	540	987	246	65	44
8	47	39	35	140	56	159	178	480	1010	233	67	43
9	44	38	37	110	54	230	190	430	1030	216	64	44
10	44	37	40	100	54	290	174	400	1010	196	62	44
11	43	36	45	96	70	310	166	370	950	184	60	44
12	41	37	52	90	152	280	159	400	788	170	59	46
13	40	39	56	86	159	445	152	430	685	163	57	44
14	40	40	52	80	101	290	145	430	638	156	60	43
15	39	47	45	76	83	226	148	500	602	147	57	43
16	39	52	66	76	77	190	163	540	551	144	56	43
17	39	56	85	84	132	174	190	600	542	144	52	42
18	39	63	77	100	305	156	230	660	518	132	51	42
19	35	48	62	120	138	138	285	760	458	123	67	42
20	39	44	71	90	111	132	305	900	422	120	72	42
21	39	43	60	76	114	132	376	1000	376	115	59	42
22	43	40	60	80	152	135	432	1100	352	110	76	44
23	67	36	52	70	174	120	400	1200	346	102	80	51
24	53	32	43	100	156	120	382	1300	334	98	72	51
25	48	30	40	100	132	111	320	1380	312	95	59	46
26	84	60	37	100	108	101	290	1460	301	93	54	44
27	55	70	34	200	106	111	261	1550	301	91	51	46
28	48	68	30	130	106	101	266	1650	280	88	50	43
29	69	60	28	90	---	120	275	1700	301	86	47	43
30	82	52	27	80	---	336	320	1650	275	82	46	43
31	62	---	26	70	---	305	---	1700	---	88	54	---
TOTAL	1462	1386	1606	2859	2976	5751	7140	26260	20239	5613	1922	1379
MEAN	47.2	46.2	51.8	92.2	106	186	238	847	675	181	62.0	46.0
MAX	84	70	90	200	305	445	432	1700	1400	534	80	67
MIN	35	30	26	25	54	101	145	370	275	82	46	42
AC-FT	2900	2750	3190	5670	5900	11410	14160	52090	40140	11130	3810	2740
WTR YR 1983	TOTAL	78593	MEAN	215	MAX	1700	MIN	25	AC-FT	155900		

## ABERT LAKE BASIN

10382600 CHEWAUCAN RIVER BELOW COFFEEPOT CREEK, NEAR PAISLEY, OR

LOCATION.--Lat 42°34'07", long 120°35'40", in NW¼NE¼ 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 mi south of Paisley.

DRAINAGE AREA.--216 mi<sup>2</sup>.

PERIOD OF RECORD.--October 1982 to September 1983.

GAGE.--Water-stage recorder. Altitude of gage is 4,880 ft, from topographic map.

REMARKS.--Records good except those for May, which are fair.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 400 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Feb. 18	0900	512	3.25	May 4	-	unknown	unknown
Mar. 13	1930	696	3.58	May 31	a0900	*2,230	b*5.28
Mar. 30	2130	806	3.76	July 1	2400	755	3.58
Apr. 21	-	unknown	unknown				

Minimum, 15 ft<sup>3</sup>/s Nov. 24, Dec. 8, result of freezeup.

a About.

b From floodmark.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1982 TO SEPTEMBER 1983  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	42	55	57	31	76	219	367	468	1500	462	83	75
2	38	45	60	30	76	226	363	500	1230	571	77	61
3	37	48	59	45	80	259	292	580	1200	398	74	56
4	42	54	67	70	69	250	262	660	1090	345	71	52
5	42	50	66	110	79	229	248	620	999	318	69	49
6	41	50	107	150	70	208	233	580	954	299	67	47
7	53	41	74	252	61	194	240	560	939	274	67	45
8	46	40	38	204	65	229	258	540	958	255	71	41
9	45	37	40	140	61	319	273	480	961	231	68	43
10	41	36	45	107	61	408	253	430	932	212	64	44
11	39	36	52	99	96	474	236	414	931	197	63	44
12	38	38	60	99	206	441	227	439	750	184	62	46
13	36	40	72	93	213	640	214	465	664	175	61	44
14	36	41	62	88	146	448	203	500	618	167	63	43
15	35	53	47	85	134	353	202	540	590	159	60	41
16	35	57	84	86	119	301	218	600	560	153	59	44
17	35	58	124	96	190	279	255	660	546	148	54	40
18	33	73	87	109	463	248	300	740	534	137	55	40
19	31	57	81	169	214	220	378	860	490	130	70	39
20	37	51	79	100	169	209	400	1000	458	128	86	40
21	38	46	81	86	165	207	500	1100	430	121	65	40
22	45	45	70	91	227	215	560	1200	401	114	81	43
23	65	40	56	80	263	195	520	1300	395	108	92	52
24	61	35	50	116	238	194	500	1400	384	101	83	54
25	50	33	42	109	212	182	460	1500	359	98	66	48
26	86	60	38	109	168	161	416	1600	350	96	59	45
27	62	74	36	289	164	177	386	1700	346	94	55	47
28	53	71	35	140	164	161	389	1800	319	91	52	44
29	66	64	34	102	---	204	394	1900	347	88	50	43
30	87	55	33	86	---	600	464	1800	318	85	47	43
31	68	---	32	83	---	517	---	1900	---	92	54	---
TOTAL	1463	1483	1868	3454	4249	8967	10011	28836	20553	6031	2048	1393
MEAN	47.2	49.4	60.3	111	152	289	334	930	685	195	66.1	46.4
MAX	87	74	124	289	463	640	560	1900	1500	571	92	75
MIN	31	33	32	30	61	161	202	414	318	85	47	39
AC-FT	2900	2940	3710	6850	8430	17790	19860	57200	40770	11960	4060	2760
WTR YR 1983	TOTAL	90356	MEAN	248	MAX	1900	MIN	30	AC-FT	179200		

## 10384000 CHEWAUCAN RIVER NEAR PAISLEY, OR

LOCATION.--Lat 42°41'05", long 120°34'08", in SW¼NW¼ 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<sup>2</sup>.

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 National Geodetic Vertical Datum of 1929 (river-profile survey). See WSP 1734 for history of changes prior to Oct. 6, 1956.

REMARKS.--Records excellent except those for November and December, which are good, and January, which are fair. No regulation. Diversions for irrigation above station.

AVERAGE DISCHARGE.--68 years, 146 ft<sup>3</sup>/s, 105,800 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 6,490 ft<sup>3</sup>/s Dec. 22, 1964, gage height, 8.35 ft, from rating curve extended above 900 ft<sup>3</sup>/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 above base of 500 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Feb. 18	0830	610	2.95	May 4	0330	807	3.31
Mar. 13	1730	768	3.24	May 31	0900	*2,200	*4.93
Mar. 30	1530	980	3.58	July 2	0330	856	3.39
Apr. 22	0400	711	3.14				

Minimum, 14 ft<sup>3</sup>/s Nov. 24, result of freezeup.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1982 TO SEPTEMBER 1983  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	49	68	64	36	74	223	420	633	1650	475	94	82
2	47	59	60	45	68	245	403	604	1380	717	88	69
3	45	59	69	75	72	279	318	669	1340	475	85	62
4	48	68	74	85	56	286	272	748	1240	403	82	58
5	50	63	74	100	73	249	255	711	1150	359	79	56
6	48	62	65	239	79	226	235	657	1120	335	76	53
7	57	56	45	335	68	208	239	627	1080	307	74	52
8	52	48	35	332	73	239	262	633	1110	290	74	50
9	51	46	42	211	72	347	279	566	1110	269	74	51
10	49	44	42	139	68	460	262	510	1080	239	71	50
11	47	42	55	110	106	550	239	485	1080	220	71	50
12	45	43	62	105	217	505	232	530	891	205	68	51
13	44	45	67	100	245	729	214	582	800	194	68	50
14	44	64	62	98	162	540	199	593	748	184	71	49
15	43	72	52	95	154	403	199	639	717	176	68	48
16	43	73	91	92	134	339	214	669	675	171	67	49
17	43	89	137	90	179	318	262	735	651	162	63	47
18	42	88	89	90	560	279	318	856	639	152	63	47
19	41	74	85	132	239	242	411	988	588	141	79	47
20	44	67	76	92	184	229	480	1110	550	139	101	47
21	45	59	92	79	174	226	582	1250	510	132	77	48
22	50	62	77	80	226	235	675	1340	465	126	92	51
23	68	54	62	76	286	217	657	1420	451	118	108	58
24	71	41	49	91	262	211	615	1540	438	112	97	59
25	58	44	42	97	232	205	545	1650	407	106	77	54
26	92	50	38	96	184	179	480	1700	395	105	69	54
27	73	60	36	208	181	192	438	1790	395	103	63	54
28	63	70	34	148	181	184	447	1870	367	99	60	53
29	73	80	34	112	---	211	451	1970	391	96	58	52
30	99	68	34	94	---	761	621	1890	367	94	54	51
31	82	---	34	88	---	639	---	1990	---	92	59	---
TOTAL	1706	1818	1878	3770	4609	10156	11224	31955	23785	6796	2330	1602
MEAN	55.0	60.6	60.6	122	165	328	374	1031	793	219	75.2	53.4
MAX	99	89	137	335	560	761	675	1990	1650	717	108	82
MIN	41	41	34	36	56	179	199	485	367	92	54	47
AC-FT	3380	3610	3730	7480	9140	20140	22260	63380	47180	13480	4620	3180
CAL YR 1982	TOTAL	102356	MEAN	280	MAX	2080	MIN	34	AC-FT	203000		
WTR YR 1983	TOTAL	101629	MEAN	278	MAX	1990	MIN	34	AC-FT	201600		

## SUMMER LAKE BASIN

10388001 ANA RIVER NEAR SUMMER LAKE, OR

LOCATION.--Lat 43°00'00", long 120°45'00", in SE¼ 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, source of stream is Ana River Springs, three-quarters of a mile above station, which are flooded over 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. Altitude 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.--Records excellent. All records presented herein include flow in Summer Lake Canal which diverts 300 ft above station for irrigation of lands along west side of Summer Lake. Flow regulated by gates at diversion dam.

AVERAGE DISCHARGE.--35 years (water years 1931-32, 1936, 1952-83), 91.1 ft<sup>3</sup>/s, 66,000 acre-ft/yr.

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

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 114 ft<sup>3</sup>/s Oct. 7; minimum, 61 ft<sup>3</sup>/s May 16.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1982 TO SEPTEMBER 1983  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	79	91	90	92	92	93	94	88	86	86	85	94
2	83	91	91	92	92	93	94	88	86	86	85	83
3	98	91	91	91	92	93	94	88	85	85	85	80
4	93	91	91	91	92	93	95	88	78	84	85	81
5	89	91	91	91	92	94	95	88	78	84	86	83
6	90	92	91	91	92	94	95	88	79	89	86	81
7	110	92	91	92	92	94	95	88	82	89	85	80
8	106	92	91	92	92	94	95	88	82	89	86	79
9	98	92	91	92	93	94	95	88	83	87	86	81
10	94	92	91	92	94	94	73	88	85	87	86	81
11	94	92	91	92	94	94	63	87	85	86	81	82
12	93	92	91	92	94	94	65	81	85	85	88	82
13	93	92	91	92	94	94	67	70	85	87	87	81
14	93	92	91	93	94	94	68	68	85	87	87	86
15	92	92	91	93	94	94	69	62	85	89	86	89
16	92	92	92	93	94	94	70	61	84	90	86	88
17	91	92	92	93	94	94	74	68	84	90	86	86
18	91	92	92	94	94	94	79	88	87	90	86	85
19	91	92	92	93	94	94	81	84	87	89	86	84
20	90	92	92	93	94	94	82	81	88	89	86	83
21	90	92	92	93	94	94	85	73	87	86	86	83
22	90	92	93	93	93	94	85	78	86	83	87	85
23	91	92	93	93	93	94	87	83	86	86	88	85
24	90	92	92	93	93	94	86	83	86	75	88	85
25	90	90	92	92	93	94	86	83	87	67	88	84
26	90	90	92	91	93	94	86	82	87	75	88	84
27	90	89	92	91	93	94	86	81	88	92	88	84
28	90	89	92	91	93	94	87	79	88	92	88	83
29	90	90	92	91	---	94	87	80	88	90	88	84
30	91	90	92	91	---	95	87	84	87	87	88	87
31	91	---	92	91	---	94	---	86	---	84	93	---
TOTAL	2853	2741	2838	2854	2608	2911	2505	2522	2549	2666	2684	2513
MEAN	92.0	91.4	91.5	92.1	93.1	93.9	83.5	81.4	85.0	86.0	86.6	83.8
MAX	110	92	93	94	94	95	95	88	88	92	93	94
MIN	79	89	90	91	92	93	63	61	78	67	81	79
AC-FT	5660	5440	5630	5660	5170	5770	4970	5000	5060	5290	5320	4980
CAL YR 1982	TOTAL	31876	MEAN	87.3	MAX	110	MIN	51	AC-FT	63230		
WTR YR 1983	TOTAL	32244	MEAN	88.3	MAX	110	MIN	61	AC-FT	63960		



## 10390001 SILVER CREEK NEAR SILVER LAKE, OR

LOCATION.--Lat 43°06'50", long 121°03'59" in NE¼SW¼ 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<sup>2</sup>, 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 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.--Records good except those for Oct. 14 to Apr. 11, which are fair. Flow regulated by reservoir, capacity, 800 acre-ft, above diversion dam 1.5 mi above station and by Thompson Valley Reservoir, capacity, 17,400 acre-ft, 11 mi above station. Records given herein include flow in Silver Lake Irrigation District Canal which has diverted 1.5 mi above station 1923-43, 1966-83.

AVERAGE DISCHARGE.--71 years (water years 1906, 1910-27, 1930-41, 1944-83), 30.8 ft<sup>3</sup>/s, 22,310 acre-ft/yr, including diversion by Silver Lake Irrigation District Canal.

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

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 494 ft<sup>3</sup>/s May 26; minimum daily, 5.1 ft<sup>3</sup>/s Oct. 7-11, Nov. 18-29.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1982 TO SEPTEMBER 1983  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	5.7	5.4	5.4	5.9	9.9	28	236	233	316	67	62	19
2	5.4	5.4	5.4	6.0	9.8	35	227	263	277	55	62	19
3	5.4	5.4	5.4	6.6	9.8	39	181	278	243	47	57	19
4	5.4	5.4	5.7	7.6	9.6	45	153	286	230	44	55	20
5	5.4	5.4	6.6	8.6	9.4	48	138	338	213	45	54	19
6	5.7	5.4	7.0	9.4	9.4	46	126	342	171	42	54	19
7	5.1	5.4	7.0	9.8	9.3	42	114	306	170	39	54	19
8	5.1	5.4	6.6	13	9.1	58	108	274	139	40	57	19
9	5.1	5.4	6.3	16	9.1	78	109	241	128	41	51	19
10	5.1	5.4	6.3	14	9.1	78	106	220	116	41	48	19
11	5.1	5.4	6.3	13	9.1	77	92	202	114	41	45	19
12	5.4	5.4	6.3	10	10	71	88	188	99	45	45	20
13	9.2	5.4	6.3	10	22	100	83	189	89	45	45	22
14	13	5.4	6.3	9.4	19	91	78	192	86	46	44	22
15	6.6	5.4	6.6	9.4	19	83	73	196	85	46	44	23
16	6.0	5.4	7.7	9.4	20	89	69	189	83	45	44	24
17	6.0	5.4	7.7	9.4	32	99	76	199	82	46	44	27
18	5.7	5.1	7.1	9.4	114	103	97	226	81	47	43	27
19	5.7	5.1	7.0	9.4	55	94	125	256	78	53	42	27
20	5.7	5.1	7.3	9.4	30	90	158	292	76	53	43	33
21	5.7	5.1	7.7	9.4	30	89	198	322	75	51	42	36
22	5.7	5.1	7.7	9.4	43	92	242	355	72	53	42	35
23	5.7	5.1	7.1	9.1	51	91	269	386	79	52	39	37
24	5.7	5.1	6.8	9.1	44	86	304	460	74	52	23	37
25	5.7	5.1	6.8	9.1	36	85	307	476	65	53	18	32
26	5.7	5.1	7.1	9.1	30	77	274	476	64	55	18	30
27	5.7	5.1	8.4	11	27	79	242	462	67	54	16	30
28	5.7	5.1	5.8	21	27	79	221	435	67	53	15	30
29	5.4	5.1	5.8	16	---	79	209	411	67	60	15	30
30	5.4	5.4	5.8	12	---	322	212	379	66	62	16	18
31	5.4	---	5.8	10	---	260	---	343	---	62	18	---
TOTAL	183.6	158.4	205.1	320.9	712.6	2733	4915	9415	3572	1535	1255	750
MEAN	5.92	5.28	6.62	10.4	25.5	88.2	164	304	119	49.5	40.5	25.0
MAX	13	5.4	8.4	21	114	322	307	476	316	67	62	37
MIN	5.1	5.1	5.4	5.9	9.1	28	69	188	64	39	15	18
AC-FT	364	314	407	637	1410	5420	9750	18670	7090	3040	2490	1490
CAL YR 1982	TOTAL	23797.0	MEAN	65.2	MAX	651	MIN	3.4	AC-FT	47200		
WTR YR 1983	TOTAL	25755.6	MEAN	70.6	MAX	476	MIN	5.1	AC-FT	51090		

## MALHEUR AND HARNEY LAKES BASIN

10393500 SILVIES RIVER NEAR BURNS, OR

LOCATION.-- Lat 43°42'55", long 119°10'35", in NW¼ 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<sup>2</sup>.

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 National Geodetic Vertical Datum of 1929 (river-profile survey). See WSP 1734 for history of changes prior to Oct. 4, 1951.

REMARKS.--Records excellent except those for periods of ice effect or no gage-height record, which are good. No regulation. Diversions for irrigation above station during periods of high flow only.

AVERAGE DISCHARGE.--70 years (water years 1904-5, 1910-12, 1918-21, 1923-83), 175 ft<sup>3</sup>/s, 126,800 acre-ft/yr.

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

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 3,460 ft<sup>3</sup>/s May 5, gage height, 14.13 ft; minimum recorded, 43 ft<sup>3</sup>/s Sept. 19.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1982 TO SEPTEMBER 1983  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	56	96	92	48	230	762	1560	2260	1320	286	81	59
2	56	95	89	48	200	1130	1710	2370	1200	412	79	60
3	56	89	87	56	180	1410	1600	2340	1150	418	76	59
4	56	86	94	75	180	1840	1390	2380	1120	413	74	59
5	55	84	107	100	170	2290	1360	2850	946	403	70	58
6	55	81	95	400	170	2060	1240	3290	778	338	64	56
7	55	80	95	1200	170	1880	1170	3070	680	264	63	54
8	56	78	85	1150	221	1700	1170	2970	617	228	63	54
9	58	76	76	850	225	1800	1200	2660	574	210	63	54
10	59	71	76	650	231	1930	1190	2410	553	200	63	52
11	60	74	76	500	246	2430	1140	2250	590	194	62	52
12	60	85	76	350	280	2530	1100	2080	583	191	62	51
13	59	82	80	250	446	2610	1020	1920	556	168	60	51
14	58	73	90	240	601	2800	946	1780	535	149	59	51
15	57	73	103	220	554	2450	908	1650	487	139	58	50
16	56	72	104	220	538	2320	908	1600	440	132	57	48
17	55	75	96	250	592	2070	976	1520	403	128	57	45
18	54	78	90	250	802	1860	1080	1470	376	125	58	44
19	53	83	74	280	1040	1600	1270	1500	359	122	57	43
20	52	91	74	280	920	1430	1480	1490	348	116	57	44
21	52	86	80	258	914	1280	1840	1480	334	109	57	44
22	54	76	85	246	1150	1180	2160	1520	312	105	60	45
23	56	72	85	243	1460	1120	2270	1500	278	100	68	47
24	57	66	85	240	1220	1070	2420	1490	249	96	68	48
25	58	66	62	237	1140	1040	2470	1490	234	92	68	49
26	58	70	62	233	1090	966	2470	1460	224	87	65	48
27	63	80	62	249	930	936	2320	1390	221	85	62	47
28	64	80	56	288	794	942	2170	1310	216	84	59	47
29	69	86	48	296	---	908	2140	1200	221	84	57	46
30	93	94	48	280	---	1220	2190	1070	246	83	55	46
31	95	---	48	249	---	1690	---	1080	---	82	55	---
TOTAL	1845	2398	2480	10236	16694	51254	46868	58850	16150	5643	1957	1511
MEAN	59.5	79.9	80.0	330	596	1653	1562	1898	538	182	63.1	50.4
MAX	95	96	107	1200	1460	2800	2470	3290	1320	418	81	60
MIN	52	66	48	48	170	762	908	1070	216	82	55	43
AC-FT	3660	4760	4920	20300	33110	101700	92960	116700	32030	11190	3880	3000
CAL YR 1982	TOTAL	148523	MEAN	407	MAX	2500	MIN	36	AC-FT	294600		
WTR YR 1983	TOTAL	215886	MEAN	591	MAX	3290	MIN	43	AC-FT	428200		

10396000 DONNER UND BLITZEN RIVER NEAR FRENCHGLEN, OR  
(National stream-quality accounting network station)

LOCATION.--Lat 42°47'28", long 118°52'00", in NW¼NW¼ 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 Migratory Waterfowl Refuge, 2.0 mi downstream from Fish Creek, and 3.5 mi southeast of Frenchglen.

DRAINAGE AREA.--200 mi<sup>2</sup>, approximately.

## WATER-DISCHARGE RECORDS

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 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.--Water-discharge records excellent. No regulation or diversion above station.

AVERAGE DISCHARGE.--53 years (water years 1912-13, 1915-16, 1918-21, 1939-83), 125 ft<sup>3</sup>/s, 90,560 acre-ft/yr.

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

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 650 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Feb. 22	1930	1,010	4.33	Apr. 30	2130	1,650	5.11
Mar. 4	0230	1,110	4.47	May 5	0300	947	4.18
Mar. 13	0400	1,750	5.32	May 31	2100	*2,360	*5.77
Apr. 2	0300	1,100	4.46	July 1	2000	1,160	4.45

Minimum, 18 ft<sup>3</sup>/s Nov. 23.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1982 TO SEPTEMBER 1983  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	63	68	64	37	55	336	408	618	1620	551	143	83
2	61	61	62	42	53	633	618	405	1270	672	131	85
3	61	65	84	60	47	340	247	412	1120	426	121	81
4	65	64	111	78	49	813	198	473	947	379	116	78
5	63	63	146	92	58	452	178	752	882	393	112	76
6	61	63	80	101	64	297	145	501	844	404	108	75
7	64	58	60	183	57	338	135	434	829	381	108	73
8	62	61	54	197	54	334	140	449	907	302	112	73
9	62	56	58	110	53	326	145	424	1000	267	128	73
10	61	63	54	89	56	296	139	437	982	231	122	73
11	60	59	56	67	88	360	131	425	872	225	121	72
12	60	59	58	66	132	446	123	320	618	237	105	71
13	59	60	62	62	281	1010	117	315	545	304	98	70
14	58	55	61	60	142	425	115	340	548	340	99	71
15	58	71	60	60	184	320	119	363	582	245	95	69
16	58	61	58	58	136	238	134	340	577	203	93	68
17	57	62	74	58	138	254	172	324	621	189	93	68
18	56	79	60	59	420	259	213	400	677	177	95	67
19	54	88	65	75	216	192	288	456	528	175	100	67
20	56	65	78	69	166	156	331	558	465	169	121	67
21	56	61	355	66	148	144	410	702	413	162	99	67
22	55	57	193	65	580	141	435	809	423	162	106	67
23	56	38	92	63	636	163	439	890	498	164	129	78
24	57	36	78	68	441	175	440	1040	488	161	107	78
25	57	45	60	65	301	171	386	1200	437	151	102	70
26	67	52	52	92	196	175	333	1280	437	144	93	68
27	61	62	43	184	134	228	296	1310	429	140	88	69
28	57	74	33	108	209	228	306	1480	399	139	85	68
29	73	100	35	82	---	332	343	1630	399	141	82	67
30	141	75	37	70	---	648	769	1470	384	142	80	67
31	81	---	35	61	---	650	---	1850	---	149	80	---
TOTAL	1960	1881	2418	2547	5094	10880	8253	22407	20741	7925	3272	2159
MEAN	63.2	62.7	78.0	82.2	182	351	275	723	691	256	106	72.0
MAX	141	100	355	197	636	1010	769	1850	1620	672	143	85
MIN	54	36	33	37	47	141	115	315	384	139	80	67
AC-FT	3890	3730	4800	5050	10100	21580	16370	44440	41140	15720	6490	4280
CAL YR 1982	TOTAL	60334	MEAN	165	MAX	1570	MIN	33	AC-FT	119700		
WTR YR 1983	TOTAL	89537	MEAN	245	MAX	1850	MIN	33	AC-FT	177600		

10396000 DONNER UND BLITZEN RIVER NEAR FRENCHGLEN, OR--Continued

## WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1975 to current year.

PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: October 1975 to September 1981.

WATER TEMPERATURES: October 1975 to September 1981.

## WATER QUALITY DATA, WATER YEAR OCTOBER 1982 TO SEPTEMBER 1983

DATE	TIME	STREAM- FLOW, INSTAN- TANEOUS (CFS)	SPE- CIFIC CON- DUCT- ANCE (UMHOS)	PH (STAND- ARD UNITS)	TEMPER- ATURE (DEG C)	OXYGEN, DIS- SOLVED (MG/L)	COLI- FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)	STREP- TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML)	HARD- NESS (MG/L AS CAC03)	CALCIUM DIS- SOLVED (MG/L AS CA)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG)
DEC 08...	1110	51	75	E7.6	.0	E12.2	K2	+500	29	7.0	2.9
FEB 02...	1150	52	91	E7.8	2.0	E11.7	13	46	37	9.2	3.5
MAY 25...	1240	1060	51	7.8	9.5	E9.8	+150	85	22	5.4	2.1
SEP 15...	1130	73	98	8.3	15.5	9.8	K5	23	38	9.0	3.7

DATE	SODIUM, DIS- SOLVED (MG/L AS NA)	POTAS- SIUM, DIS- SOLVED (MG/L AS K)	ALKA- LITY FIELD (MG/L AS CAC03)	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)	NITRO- GEN,AM- MONIA + ORGANIC TOTAL (MG/L AS N)	PHOS- PHATE, ORTHO, DIS- SOLVED (MG/L AS PO4)
DEC 08...	4.5	1.3	34	8.0	1.1	.10	.080	.190	1.0	.06
FEB 02...	5.3	1.3	43	<5.0	.80	<.10	<.060	.230	.40	.03
MAY 25...	2.9	.90	28	9.0	.90	<.10	.100	.160	.90	.09
SEP 15...	5.5	1.5	47	1.8	1.1	<.10	.160	.180	.40	.06

DATE	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 CONSTITUENTS, DIS- SOLVED (MG/L)	SOLIDS, DIS- SOLVED (TONS PER DAY)	TUR- BID- ITY (NTU)	SEDI- MENT, SUS- PENDE (MG/L)	SEDI- MENT, DIS- CHARGE, SUS- PENDE (T/DAY)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM
DEC 08...	.050	.080	29	93	75	13	23	10	1.4	92
FEB 02...	.030	.040	30	74	--	10	4.3	1	.14	67
MAY 25...	.020	.530	21	--	59	170	50	--	--	--
SEP 15...	.020	.040	29	69	80	14	2.0	--	--	--

## MALHEUR AND HARNEY LAKES BASIN

47

10396000 DONNER UND BLITZEN RIVER NEAR FRENCHGLEN, OR--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1982 TO SEPTEMBER 1983

DATE	ALUM- INUM, DIS- SOLVED (UG/L AS AL)	ARSENIC DIS- SOLVED (UG/L AS AS)	BARIUM, DIS- SOLVED (UG/L AS BA)	BERYL- LIUM, DIS- SOLVED (UG/L AS BE)	CADMIUM DIS- SOLVED (UG/L AS CD)	CHRO- MIUM, DIS- SOLVED (UG/L AS CR)	COBALT, DIS- SOLVED (UG/L AS CO)	COPPER, DIS- SOLVED (UG/L AS CU)	IRON, DIS- SOLVED (UG/L AS FE)	LEAD, DIS- SOLVED (UG/L AS PB)
DEC 08...	380	1	16	<1	<1	<1	<3	3	570	<1
FEB 02...	100	<1	14	<1	<1	<1	<3	1	130	<1
MAY 25...	130	<1	13	<1	<1	<1	<3	5	32	2
SEP 15...	30	<1	12	<1	<1	<1	<3	2	<3	1

DATE	LITHIUM DIS- SOLVED (UG/L AS LI)	MANGA- NESE, DIS- SOLVED (UG/L AS MN)	MERCURY DIS- SOLVED (UG/L AS HG)	MOLYB- DENUM, DIS- SOLVED (UG/L AS MO)	NICKEL, DIS- SOLVED (UG/L AS NI)	SELE- NIUM, DIS- SOLVED (UG/L AS SE)	SILVER, DIS- SOLVED (UG/L AS AG)	STRON- TIUM, DIS- SOLVED (UG/L AS SR)	VANA- DIUM, DIS- SOLVED (UG/L AS V)	ZINC, DIS- SOLVED (UG/L AS ZN)
DEC 08...	6	11	<.1	<10	<1	<1	<1	44	<6	7
FEB 02...	<4	3	<.1	<10	2	<1	<1	52	<6	16
MAY 25...	<4	5	<.1	<10	1	<1	1	33	<6	4
SEP 15...	<4	4	<.1	<10	4	<1	<1	57	<6	3

E - Estimated value, based on values reported by Denver Central Laboratory.

K - Results based on colony count outside acceptable range (non-ideal colony count).



## MALHEUR AND HARNEY LAKES BASIN

10401800 MALHEUR LAKE NEAR VOLTAGE, OR

LOCATION.--Lat 43°16'02", long 118°47'56", on line between secs.31 and 32, T.27 S., R.32 E., Harney County, Hydrologic Unit 17120001, In Malheur National Wildlife Refuge, 2.0 mi north of Voltage.

DRAINAGE AREA.--2,150 mi<sup>2</sup>, approximately.

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

GAGE.--Water-stage recorder. Datum of gage is National Geodetic Vertical Datum of 1929; prior to Oct. 22, 1975, at site 6 mi northeast at break in Cole Island dike. Oct. 23, 1975, to Sept. 30, 1978, supplementary water-stage recorder at site 6 mi northeast.

EXTREMES FOR PERIOD OF RECORD.--Maximum elevation, 4,098.91 ft June 6, 1983; 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 MARCH TO SEPTEMBER.--Maximum elevation, 4,098.91 ft June 6; minimum, 4,095.61 ft Mar. 10.

ELEVATION (FEET NGVD), WATER YEAR OCTOBER 1982 TO SEPTEMBER 1983  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1						---	4096.80	4097.34	4098.62	---	4098.52	4098.29
2						---	4096.88	4097.38	4098.65	---	4098.53	4098.28
3						---	4097.00	4097.45	4098.63	---	4098.53	4098.26
4						---	4097.00	4097.46	4098.67	---	4098.52	4098.26
5						---	4096.91	4097.51	4098.74	---	4098.50	4098.23
6						---	4096.92	4097.64	4098.82	---	4098.47	4098.22
7						---	4096.95	4097.64	4098.78	---	4098.46	4098.21
8						---	4096.96	4097.73	4098.76	---	4098.46	4098.21
9						---	4096.98	4097.81	4098.82	---	4098.44	4098.20
10					4095.65	4097.03	4097.88	4098.80	---	4098.43	4098.17	
11					4095.66	4097.06	4098.08	4098.80	---	4098.43	4098.15	
12					4095.73	4097.09	4098.00	4098.80	---	4098.41	4098.14	
13					4095.79	4097.05	4098.00	4098.80	---	4098.39	4098.13	
14					4095.91	4097.03	4098.04	4098.76	---	4098.39	4098.13	
15					4096.00	4097.04	4098.07	---	---	4098.39	4098.13	
16					4096.04	4097.04	4098.21	---	---	4098.37	4098.11	
17					4096.11	4097.05	4098.20	---	---	4098.34	4098.11	
18					4096.23	4097.01	4098.22	---	---	4098.34	4098.11	
19					4096.28	4097.03	4098.30	---	---	4098.33	4098.10	
20					4096.33	4097.05	4098.26	---	---	4098.33	4098.08	
21					4096.37	4097.07	4098.26	---	4098.70	4098.35	4098.02	
22					4096.38	4097.03	4098.30	---	4098.66	4098.35	4098.00	
23					4096.45	4097.03	4098.31	---	4098.64	4098.35	4098.00	
24					4096.49	4097.04	4098.32	---	4098.65	4098.35	4098.00	
25					4096.59	4097.11	4098.34	---	4098.65	4098.34	4098.01	
26					4096.55	4097.14	4098.38	---	4098.63	4098.33	4098.00	
27					4096.61	4097.16	4098.39	---	4098.62	4098.33	4098.01	
28					4096.65	4097.18	4098.39	---	4098.61	4098.31	4098.00	
29					4096.59	4097.22	4098.43	---	4098.59	4098.29	4097.99	
30					4096.73	4097.25	4098.58	---	4098.58	4098.27	4097.96	
31					4096.80	---	4098.58	---	4098.53	4098.29	---	
MEAN						---	4097.04	4098.05	---	---	4098.39	4098.12
MAX						---	4097.25	4098.58	---	---	4098.53	4098.29
MIN						---	4096.80	4097.34	---	---	4098.27	4097.96

10406500 TROUT CREEK NEAR DENIO, NV

LOCATION.--Lat 42°09'20", long 118°27'14", in NW¼SE¼ 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<sup>2</sup>, 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 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.--Records good except those above 100 ft<sup>3</sup>/s, which are fair. No regulation. Diversions for irrigation above station.

AVERAGE DISCHARGE.--52 years (water years 1923, 1933-83), 16.1 ft<sup>3</sup>/s, 11,660 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 470 ft<sup>3</sup>/s Aug. 1, 1933, gage height, 5.26 ft, from rating curve extended above 230 ft<sup>3</sup>/s; minimum observed, 0.10 ft<sup>3</sup>/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 above base of 50 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Mar. 14	1900	76	2.93	May 6	1530	135	3.45
Mar. 31	1800	65	2.88	May 29	0200	*330	*4.42
Apr. 30	2000	138	3.47				

Minimum, 3.6 ft<sup>3</sup>/s Dec. 28, but may have been less during period of ice effect Dec. 29 to Jan. 2.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1982 TO SEPTEMBER 1983  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	8.3	10	8.9	4.5	7.6	18	62	105	217	57	20	12
2	7.5	9.2	9.7	4.0	7.6	19	64	88	182	58	16	12
3	7.2	9.4	9.2	5.5	7.6	20	56	79	167	49	16	11
4	7.2	9.2	9.7	7.0	6.4	28	52	95	155	46	12	9.8
5	7.2	9.2	10	8.5	6.4	27	49	113	158	51	9.8	9.4
6	7.0	8.6	11	9.5	7.0	26	44	119	154	47	10	8.8
7	8.0	7.8	10	11	7.5	27	41	124	145	46	10	8.2
8	7.5	8.3	9.0	12	8.5	27	37	106	141	42	12	8.5
9	7.5	8.3	8.0	13	9.7	28	36	102	138	42	16	8.8
10	7.2	9.2	8.0	13	11	34	36	103	143	38	15	9.8
11	7.0	9.2	8.0	11	10	41	35	109	143	35	15	9.4
12	6.8	10	8.0	7.0	10	41	33	99	123	32	13	9.8
13	6.8	15	8.0	6.2	12	53	32	96	113	33	12	12
14	7.0	11	8.0	6.2	11	66	30	96	106	35	11	15
15	7.0	10	9.4	6.2	11	69	28	96	100	32	11	12
16	6.8	12	10	6.6	11	57	28	98	97	33	12	12
17	6.5	9.2	10	7.2	12	56	29	88	91	30	11	11
18	6.8	13	10	7.6	14	54	33	88	96	29	10	11
19	6.5	11	9.4	7.8	13	49	40	96	86	27	13	11
20	7.2	11	9.4	7.8	13	45	50	124	81	26	14	11
21	7.2	9.7	11	7.8	13	44	59	148	79	26	13	12
22	7.0	10	11	7.8	14	42	73	142	74	24	15	11
23	7.0	8.0	10	7.8	15	39	88	168	75	23	18	14
24	7.2	7.8	8.5	7.8	15	37	99	177	67	20	15	14
25	9.2	7.6	7.0	7.8	17	38	100	217	60	20	14	12
26	13	7.6	8.0	8.4	19	35	95	237	61	20	12	11
27	9.7	7.8	6.0	9.0	18	37	87	217	59	19	10	11
28	8.6	8.5	4.4	9.0	19	36	82	184	58	19	9.8	11
29	10	11	4.4	8.2	---	37	83	237	55	18	9.4	11
30	16	9.4	4.4	7.6	---	42	117	213	54	16	8.8	11
31	12	---	5.0	7.6	---	58	---	231	---	21	8.8	---
TOTAL	249.9	288.0	263.4	250.4	326.3	1230	1698	4195	3278	1014	392.6	330.5
MEAN	8.06	9.60	8.50	8.08	11.7	39.7	56.6	135	109	32.7	12.7	11.0
MAX	16	15	11	13	19	69	117	237	217	58	20	15
MIN	6.5	7.6	4.4	4.0	6.4	18	28	79	54	16	8.8	8.2
AC-FT	496	571	522	497	647	2440	3370	8320	6500	2010	779	656
CAL YR 1982	TOTAL	8813.9	MEAN	24.1	MAX	450	MIN	3.3	AC-FT	17480		
WTR YR 1983	TOTAL	13516.1	MEAN	37.0	MAX	237	MIN	4.0	AC-FT	26810		

## KLAMATH RIVER BASIN

11491400 WILLIAMSON RIVER BELOW SHEEP CREEK, NEAR LENZ, OR

LOCATION.--Lat 42°54'42", long 121°28'32", in NE¼SW¼ 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<sup>2</sup>.

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

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

REMARKS.--Records good except those for January to June, which are fair. Diversions for irrigation above station.

AVERAGE DISCHARGE.--10 years, 71.4 ft<sup>3</sup>/s, 51,730 acre-ft/yr.

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

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 210 ft<sup>3</sup>/s May 29 to June 1; maximum recorded gage height, 3.21 ft Apr. 2; minimum daily, 55 ft<sup>3</sup>/s Dec. 29 to Jan. 2, result of freezeup.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1982 TO SEPTEMBER 1983  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	70	65	64	55	74	97	192	179	210	99	75	73
2	69	64	64	55	73	98	196	180	205	105	74	72
3	68	64	65	56	71	98	194	180	205	101	75	71
4	68	64	67	58	70	98	188	185	200	99	75	70
5	68	63	68	64	70	100	183	185	195	94	74	68
6	66	63	68	64	70	101	177	185	190	92	74	69
7	66	62	65	64	70	100	174	180	180	91	74	69
8	65	63	63	62	70	100	171	180	175	91	74	69
9	64	63	62	60	70	101	170	185	170	90	74	69
10	62	63	61	58	71	105	167	185	165	89	72	68
11	61	63	61	58	72	111	165	185	160	88	69	68
12	61	63	61	58	77	117	162	180	155	86	68	70
13	61	62	61	58	79	130	160	175	150	86	68	70
14	61	61	61	58	79	134	158	170	140	85	69	70
15	61	61	63	62	79	132	155	165	135	85	69	69
16	61	61	72	66	80	128	152	165	130	84	67	70
17	61	63	75	66	82	130	151	165	125	85	65	70
18	61	65	70	66	100	128	152	165	120	84	68	69
19	61	65	69	66	95	124	155	165	115	81	70	70
20	60	65	69	64	89	121	158	165	110	80	71	70
21	61	65	70	64	93	123	169	170	107	80	70	69
22	62	65	69	64	101	124	169	170	104	79	70	70
23	65	64	68	70	101	124	172	175	102	79	72	71
24	72	63	58	75	99	124	180	180	99	78	74	72
25	74	62	58	80	99	126	185	185	98	78	74	71
26	73	62	58	80	95	121	185	190	96	78	73	71
27	69	63	64	80	93	123	181	200	96	77	71	71
28	67	65	58	80	95	125	180	205	96	77	71	69
29	70	68	55	80	---	125	179	210	95	76	71	69
30	70	65	55	78	---	178	176	210	94	76	72	70
31	67	---	55	78	---	193	---	210	---	76	71	---
TOTAL	2025	1905	1977	2047	2317	3739	5156	5629	4222	2649	2214	2097
MEAN	65.3	63.5	63.8	66.0	82.8	121	172	182	141	85.5	71.4	69.9
MAX	74	68	75	80	101	193	196	210	210	105	75	73
MIN	60	61	55	55	70	97	151	165	94	76	65	68
AC-FT	4020	3780	3920	4060	4600	7420	10230	11170	8370	5250	4390	4160

CAL YR 1982 TOTAL 34239 MEAN 93.8 MAX 200 MIN 50 AC-FT 67910  
WTR YR 1983 TOTAL 35977 MEAN 98.6 MAX 210 MIN 55 AC-FT 71360

NOTE.--No gage-height record Dec. 29 to Jan. 31, May 3 to June 20.

## KLAMATH RIVER BASIN

51

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<sup>2</sup>, of which 20.5 mi<sup>2</sup> 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 Portland district office.

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 snow melt 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, 6,176.72 ft July 2; minimum, 6,173.27 ft Oct. 20.

ELEVATION (FEET NGVD), WATER YEAR OCTOBER 1982 TO SEPTEMBER 1983  
INSTANTANEOUS OBSERVATIONS AT 2400

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	6173.52	6173.61	6173.70	6174.63	6174.88	6175.74	6176.63	6176.47	6176.48	6176.71	6176.54	6176.38
2	6173.50	6173.59	6173.83	6174.65	6174.86	6175.73	6176.66	6176.46	6176.48	6176.71	6176.54	6176.36
3	6173.49	6173.58	6173.84	6174.70	6174.84	6175.74	6176.66	6176.45	6176.48	6176.71	6176.52	6176.36
4	6173.48	6173.55	6173.88	6174.73	6174.83	6175.73	6176.63	6176.45	6176.48	6176.70	6176.52	6176.33
5	6173.46	6173.57	6174.07	6174.70	6174.79	6175.75	6176.61	6176.47	6176.47	6176.70	6176.50	6176.32
6	6173.50	6173.55	6174.07	6174.74	6174.88	6175.75	6176.61	6176.46	6176.47	6176.70	6176.49	6176.31
7	6173.49	6173.54	6174.04	6174.75	6174.90	6175.79	6176.59	6176.47	6176.48	6176.70	6176.48	6176.30
8	6173.48	6173.52	6174.02	6174.79	6174.93	6175.79	6176.57	6176.52	6176.48	6176.70	6176.47	6176.29
9	6173.45	6173.50	6174.00	6174.75	6175.14	6175.77	6176.59	6176.52	6176.48	6176.68	6176.47	6176.27
10	6173.45	6173.48	6173.99	6174.72	6175.17	6175.82	6176.57	6176.50	6176.54	6176.68	6176.46	6176.25
11	6173.45	6173.46	6173.98	6174.70	6175.13	6175.79	6176.56	6176.48	6176.54	6176.68	6176.43	6176.24
12	6173.42	6173.45	6174.00	6174.70	6175.22	6175.89	6176.56	6176.46	6176.54	6176.67	6176.41	6176.23
13	6173.42	6173.41	6174.02	6174.67	6175.24	6176.04	6176.54	6176.45	6176.54	6176.67	6176.40	6176.21
14	6173.40	6173.39	6174.07	6174.66	6175.27	6176.09	6176.54	6176.46	6176.54	6176.65	6176.39	6176.20
15	6173.38	6173.36	6174.22	6174.63	6175.31	6176.05	6176.52	6176.48	6176.54	6176.64	6176.38	6176.20
16	6173.36	6173.38	6174.52	6174.64	6175.29	6176.04	6176.50	6176.46	6176.54	6176.64	6176.38	6176.18
17	6173.33	6173.41	6174.59	6174.61	6175.48	6176.04	6176.48	6176.47	6176.55	6176.65	6176.36	6176.16
18	6173.31	6173.54	6174.59	6174.72	6175.58	6176.04	6176.47	6176.45	6176.57	6176.65	6176.34	6176.14
19	6173.29	6173.59	6174.59	6174.73	6175.56	6176.02	6176.47	6176.45	6176.56	6176.64	6176.36	6176.08
20	6173.27	6173.63	6174.65	6174.70	6175.61	6176.02	6176.47	6176.43	6176.55	6176.63	6176.33	6176.06
21	6173.36	6173.65	6174.77	6174.70	6175.63	6176.02	6176.45	6176.43	6176.55	6176.63	6176.31	6176.05
22	6173.41	6173.63	6174.77	6174.74	6175.64	6176.09	6176.45	6176.43	6176.55	6176.63	6176.36	6176.04
23	6173.43	6173.63	6174.79	6174.74	6175.65	6176.09	6176.50	6176.43	6176.54	6176.61	6176.39	6176.04
24	6173.41	6173.61	6174.75	6174.77	6175.64	6176.14	6176.50	6176.43	6176.54	6176.61	6176.38	6176.04
25	6173.42	6173.59	6174.73	6174.77	6175.68	6176.13	6176.49	6176.43	6176.54	6176.59	6176.38	6176.02
26	6173.46	6173.56	6174.73	6174.92	6175.67	6176.15	6176.49	6176.45	6176.54	6176.59	6176.36	6176.02
27	6173.45	6173.63	6174.71	6174.93	6175.70	6176.17	6176.48	6176.45	6176.54	6176.57	6176.36	6175.99
28	6173.49	6173.64	6174.70	6174.91	6175.71	6176.17	6176.49	6176.45	6176.54	6176.56	6176.34	6175.97
29	6173.66	6173.70	6174.67	6174.91	---	6176.32	6176.48	6176.46	6176.54	6176.56	6176.40	6175.95
30	6173.65	6173.71	6174.66	6174.89	---	6176.54	6176.49	6176.47	6176.54	6176.55	6176.38	6175.93
31	6173.63	---	6174.64	6174.88	---	6176.58	---	6176.49	---	6176.55	6176.40	---
MEAN	6173.45	6173.55	6174.34	6174.74	6175.29	6176.00	6176.54	6176.46	6176.52	6176.64	6176.41	6176.16
MAX	6173.66	6173.71	6174.79	6174.93	6175.71	6176.58	6176.66	6176.52	6176.57	6176.71	6176.54	6176.38
MIN	6173.27	6173.36	6173.70	6174.61	6174.79	6175.73	6176.45	6176.43	6176.47	6176.55	6176.31	6175.93
CAL YR 1982	MEAN	6174.02	MAX	6174.83	MIN	6173.27						
WTR YR 1983	MEAN	6175.51	MAX	6176.71	MIN	6173.27						

## KLAMATH RIVER BASIN

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

## WATER-QUALITY RECORDS

## PERIOD OF DAILY RECORD.--

WATER TEMPERATURES: October 1963 to current year.

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

## EXTREMES FOR PERIOD OF DAILY RECORD.--

WATER TEMPERATURES: Maximum, 18.5°C Aug. 9, 10, 1978; minimum, 0.5°C on several days in 1969.

## EXTREMES FOR CURRENT YEAR.--

WATER TEMPERATURES: Maximum, 17.0°C Aug. 11; minimum, 2.0°C April 3-5, 13.

## WATER QUALITY DATA, WATER YEAR OCTOBER 1982 TO SEPTEMBER 1983

DATE	TIME	SPECIFIC CONDUCTANCE (UMHOS)	PH (STANDARD UNITS)	TEMPERATURE (DEG C)	HARDNESS (MG/L AS CaCO3)	HARDNESS, NONCARBONATE (MG/L AS CaCO3)	CALCIUM DIS-SOLVED (MG/L AS Ca)	MAGNESIUM, DIS-SOLVED (MG/L AS Mg)	SODIUM, DIS-SOLVED (MG/L AS Na)	POTASSIUM, DIS-SOLVED (MG/L AS K)	ALKALINITY FIELD (MG/L AS CaCO3)
OCT 14...	1230	116	7.4	9.0	29	0	7.3	2.5	10	1.7	--
JUN 30...	1300	116	7.2	7.5	28	0	6.7	2.7	10	2.0	--
AUG 19...	1130	112	7.1	15.0	30	2	7.7	2.7	11	1.8	28

DATE	SULFATE DIS-SOLVED (MG/L AS SO4)	CHLORIDE, DIS-SOLVED (MG/L AS CL)	FLUORIDE, DIS-SOLVED (MG/L AS F)	NITROGEN, NO2+NO3 DIS-SOLVED (MG/L AS N)	NITROGEN, AMMONIA DIS-SOLVED (MG/L AS N)	NITROGEN, AMMONIA + ORGANIC TOTAL (MG/L AS N)	PHOSPHORUS, DIS-SOLVED (MG/L AS P)	PHOSPHORUS, 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 CONSTITUENTS, DIS-SOLVED (MG/L)
OCT 14...	12	10	.10	<.100	.140	1.3	.040	.060	17	--	81
JUN 30...	9.7	9.7	<.10	--	--	--	--	--	18	--	78
AUG 19...	17	9.7	.10	<.100	.110	.50	.020	<.010	17	75	84

DATE	TURBIDITY (NTU)	ALUMINUM, DIS-SOLVED (UG/L AS AL)	ARSENIC, DIS-SOLVED (UG/L AS AS)	BARIUM, DIS-SOLVED (UG/L AS BA)	BERYLLIUM, DIS-SOLVED (UG/L AS BE)	CADMIUM, DIS-SOLVED (UG/L AS CD)	CHROMIUM, DIS-SOLVED (UG/L AS CR)	COBALT, DIS-SOLVED (UG/L AS CO)	COPPER, DIS-SOLVED (UG/L AS CU)	IRON, DIS-SOLVED (UG/L AS FE)	LEAD, DIS-SOLVED (UG/L AS PB)
OCT 14...	.50	--	--	--	--	--	--	--	--	--	--
JUN 30...	.30	10	3	12	<1	1	2	<3	<1	4	15
AUG 19...	.50	<10	3	10	<1	1	<1	<3	1	7	13



## KLAMATH RIVER BASIN

53

11492200 CRATER LAKE NEAR CRATER LAKE, OR--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1982 TO SEPTEMBER 1983

DATE	LITHIUM DIS- SOLVED (UG/L AS LI)	MANGA- NESE, DIS- SOLVED (UG/L AS MN)	MERCURY DIS- SOLVED (UG/L AS HG)	MOLYB- DENUM, DIS- SOLVED (UG/L AS MO)	NICKEL, DIS- SOLVED (UG/L AS NI)	SELE- NIUM, DIS- SOLVED (UG/L AS SE)	SILVER, DIS- SOLVED (UG/L AS AG)	STRON- TIUM, DIS- SOLVED (UG/L AS SR)	VANA- DIUM, DIS- SOLVED (UG/L AS V)	ZINC, DIS- SOLVED (UG/L AS ZN)
OCT 14...	--	--	--	--	--	--	--	--	--	--
JUN 30...	55	<1	<.1	<10	6	<1	<1	58	<6	11
AUG 19...	50	3	.1	<10	3	<1	<1	57	<6	29

DATE	GROSS ALPHA, DIS- SOLVED (UG/L AS U-NAT)	GROSS ALPHA, SUSP. TOTAL (UG/L AS U-NAT)	GROSS BETA, DIS- SOLVED (PCI/L AS CS-137)	GROSS BETA, DIS- SOLVED (PCI/L AS YT-90)	GROSS BETA, SUSP. TOTAL (PCI/L AS CS-137)	GROSS BETA, SUSP. TOTAL (PCI/L AS YT-90)	RADIUM 226, DIS- SOLVED, RADON METHOD (PCI/L)	URANIUM DIS- SOLVED, EXTRAC- TION (UG/L)
JUN 30...	<1.5	<.4	2.5	2.4	.4	.4	.05	.02
AUG 19...	4.3	<.6	3.4	3.3	<.7	<.7	.03	.16

## KLAMATH LAKE BASIN

11492200 CRATER LAKE NEAR CRATER LAKE, OR--Continued

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1982 TO SEPTEMBER 1983

DAY	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN
	OCTOBER		NOVEMBER		DECEMBER		JANUARY		FEBRUARY		MARCH	
1	9.5	9.5	7.5	7.0	5.0	5.0	3.5	3.5	3.5	3.0	3.0	2.5
2	10.0	9.5	7.5	7.0	5.0	4.5	3.5	3.5	3.0	3.0	3.0	2.5
3	10.0	9.5	7.5	7.0	4.5	4.5	3.5	3.5	3.0	3.0	3.0	2.5
4	9.5	9.5	7.0	7.0	4.5	4.5	3.5	3.5	3.5	3.0	3.0	2.5
5	9.5	9.5	7.0	7.0	4.5	4.5	3.5	3.5	3.0	2.5	3.0	2.5
6	9.5	9.0	7.0	7.0	4.5	4.5	3.5	3.5	3.0	3.0	3.0	2.5
7	9.0	9.0	7.0	6.5	4.5	4.5	4.0	3.5	3.0	2.5	3.0	2.5
8	9.0	9.0	6.5	6.5	4.5	4.0	3.5	3.5	3.0	3.0	3.0	2.5
9	9.0	9.0	6.5	6.5	4.5	4.5	4.0	3.5	3.0	3.0	3.0	2.5
10	9.0	8.5	6.5	6.5	4.5	4.5	4.0	3.5	3.0	3.0	3.0	2.5
11	9.0	9.0	6.5	6.5	4.5	4.5	4.0	3.5	3.0	3.0	3.5	2.5
12	9.0	9.0	6.5	6.0	4.5	4.0	4.0	3.5	3.0	3.0	3.0	2.5
13	9.0	9.0	6.5	6.0	4.5	4.5	4.0	3.5	3.0	3.0	3.0	2.5
14	9.0	9.0	6.5	6.0	4.5	4.0	4.0	3.5	3.0	3.0	3.0	2.5
15	9.5	9.0	6.0	6.0	4.5	4.0	3.5	3.5	3.0	2.5	3.0	2.5
16	9.0	9.0	6.0	6.0	4.0	4.0	3.5	3.5	3.0	2.5	2.5	2.5
17	9.0	9.0	6.0	6.0	4.0	4.0	3.5	3.5	3.0	2.5	3.0	2.5
18	9.0	8.5	6.0	5.5	4.0	4.0	3.5	3.5	3.0	2.5	3.0	2.5
19	9.0	8.5	5.5	5.5	4.0	4.0	3.5	3.5	3.0	2.5	3.0	2.5
20	8.5	8.5	5.5	5.5	4.0	4.0	3.5	3.0	3.0	2.5	3.0	2.5
21	8.5	8.5	5.5	5.5	4.0	4.0	3.5	3.0	3.0	2.5	3.0	2.5
22	8.5	8.0	5.5	5.0	4.0	3.5	3.0	3.0	3.0	3.0	3.0	2.5
23	8.0	8.0	5.5	5.0	4.0	3.5	3.5	3.0	3.0	3.0	3.0	2.5
24	8.0	8.0	5.5	5.0	3.5	3.5	3.5	3.0	3.0	3.0	2.5	2.5
25	8.0	8.0	5.5	5.0	4.0	3.5	3.5	3.0	3.0	2.5	3.0	2.5
26	8.0	7.5	5.0	5.0	4.0	3.5	3.5	3.0	3.0	2.5	2.5	2.5
27	8.0	7.5	5.0	5.0	3.5	3.5	3.5	3.5	2.5	2.5	2.5	2.5
28	7.5	7.5	5.0	5.0	3.5	3.0	3.5	3.0	3.0	2.5	2.5	2.5
29	7.5	7.5	5.0	5.0	3.5	3.0	3.5	3.0	---	---	2.5	2.5
30	7.5	7.5	5.0	5.0	3.5	3.0	3.5	3.0	---	---	2.5	2.5
31	7.5	7.0	---	---	3.5	3.5	3.5	3.0	---	---	3.0	2.5
MONTH	10.0	7.0	7.5	5.0	5.0	3.0	4.0	3.0	3.5	2.5	3.5	2.5
DAY	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN
	APRIL		MAY		JUNE		JULY		AUGUST		SEPTEMBER	
1	2.5	2.5	3.0	3.0	4.0	3.5	7.5	6.5	12.5	11.0	14.0	13.5
2	2.5	2.5	3.5	3.0	4.5	4.0	6.5	6.0	14.5	13.0	13.5	13.0
3	2.5	2.0	3.5	3.0	4.5	4.0	6.5	6.0	15.0	13.5	13.5	13.0
4	2.5	2.0	3.5	3.0	4.5	4.0	6.0	6.0	15.5	13.5	13.5	13.0
5	3.0	2.0	3.5	3.0	4.5	4.0	6.5	5.5	14.5	13.0	13.5	13.0
6	2.5	2.5	3.5	3.0	4.5	4.0	7.5	6.0	14.0	12.5	13.5	13.5
7	3.0	2.5	3.5	3.0	4.5	4.0	7.0	6.5	14.0	12.5	13.5	13.0
8	3.0	2.5	3.0	3.0	4.5	4.0	7.0	6.5	15.5	14.0	13.5	13.0
9	2.5	2.5	3.5	3.0	4.5	4.0	7.0	6.5	15.0	13.5	13.0	13.0
10	3.0	2.5	3.5	3.0	4.0	4.0	7.5	6.5	16.5	13.5	13.0	12.5
11	3.0	2.5	3.5	3.0	4.5	4.0	8.0	7.0	17.0	13.5	13.0	12.5
12	2.5	2.5	3.5	3.0	4.5	4.0	9.0	7.5	16.0	13.0	13.0	13.0
13	2.5	2.0	3.5	3.0	4.5	4.0	8.5	8.5	14.5	13.5	13.0	12.5
14	3.0	2.5	3.5	3.0	4.5	4.0	8.5	8.0	15.5	14.5	13.5	12.5
15	3.0	2.5	3.5	3.0	4.5	4.0	8.0	6.5	15.0	13.5	13.5	13.5
16	3.0	2.5	3.5	3.0	4.5	4.5	9.0	7.0	15.5	14.0	13.5	13.5
17	3.0	2.5	4.0	3.5	4.5	4.5	8.5	8.0	16.0	14.5	13.5	13.0
18	3.0	2.5	4.0	3.5	4.5	4.0	9.0	7.5	16.5	14.5	13.5	13.0
19	3.0	2.5	4.0	3.5	5.0	4.5	9.5	9.0	16.5	15.0	13.0	12.0
20	3.0	2.5	4.0	3.5	5.0	4.5	9.5	8.5	16.5	14.5	12.0	11.0
21	3.5	3.0	4.0	3.5	5.0	4.5	10.0	9.0	16.5	16.0	11.0	11.0
22	3.0	3.0	4.0	3.5	5.0	5.0	10.0	9.0	16.5	14.5	11.5	11.0
23	3.0	2.5	4.0	3.5	5.5	4.5	10.0	9.0	16.0	12.0	11.5	11.5
24	3.0	2.5	4.0	3.5	6.0	5.5	10.0	9.5	15.0	14.0	11.5	11.0
25	3.5	2.5	4.0	3.5	6.0	5.5	12.5	10.0	15.5	15.0	11.5	11.0
26	3.0	3.0	4.0	3.5	5.5	5.5	11.5	10.5	15.5	14.5	11.5	11.0
27	3.0	3.0	4.0	3.5	6.0	5.5	12.0	11.0	15.5	15.0	11.5	11.0
28	3.0	2.5	4.5	4.0	6.0	5.5	11.5	11.0	15.0	15.0	11.0	11.0
29	3.5	2.5	4.0	4.0	8.0	6.0	12.0	10.0	15.0	15.0	11.0	10.5
30	3.0	3.0	4.0	4.0	7.5	6.5	11.5	10.5	15.0	14.5	10.5	10.5
31	---	---	4.0	3.5	---	---	12.0	10.5	14.5	14.0	---	---
MONTH	3.5	2.0	4.5	3.0	8.0	3.5	12.5	5.5	17.0	11.0	14.0	10.5

## KLAMATH RIVER BASIN

55

11493500 WILLIAMSON RIVER NEAR KLAMATH AGENCY, OR

LOCATION.--Lat 42°44'25", long 121°50'00", in NW¼SW¼ 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<sup>2</sup>, 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 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.--Records good. Flow affected by natural storage in Klamath Marsh. Small diversions above station for irrigation in vicinity of marsh.

AVERAGE DISCHARGE.--29 years (water years 1955-83), 204 ft<sup>3</sup>/s, 147,800 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge observed, 1,590 ft<sup>3</sup>/s Mar. 13, 1910, gage height, 3.7 ft, site and datum then in use, from rating curve extended above 800 ft<sup>3</sup>/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, 1,000 ft<sup>3</sup>/s Apr. 4, gage height, 5.44 ft; minimum, 6.5 ft<sup>3</sup>/s Oct. 6.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1982 TO SEPTEMBER 1983  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	8.7	67	160	170	306	639	923	674	438	284	141	63
2	8.4	71	170	170	309	648	901	663	432	284	133	63
3	8.2	75	180	167	309	650	932	658	429	282	129	61
4	7.9	79	180	167	312	650	966	650	423	278	125	60
5	8.0	82	180	170	309	653	972	640	417	271	122	58
6	7.6	86	175	175	309	654	955	629	410	264	118	52
7	7.5	92	180	181	304	652	928	612	401	257	113	49
8	8.0	97	190	190	302	659	903	595	400	251	110	45
9	8.5	101	200	196	300	665	834	606	389	247	106	44
10	8.6	106	200	199	297	683	795	626	379	243	103	41
11	8.4	104	200	204	299	726	820	630	380	238	102	41
12	8.4	105	200	209	308	738	837	626	375	227	100	41
13	8.4	108	200	212	331	768	835	618	369	219	96	40
14	8.3	108	190	214	353	778	816	596	359	219	91	39
15	8.1	108	179	214	369	805	803	570	356	213	87	38
16	8.1	107	186	216	379	824	790	576	352	207	85	37
17	7.9	107	189	221	408	824	781	569	337	202	82	35
18	9.7	109	190	225	453	838	769	568	331	195	76	32
19	11	115	191	232	473	832	753	563	329	191	72	36
20	11	120	193	240	492	816	736	551	329	187	69	36
21	12	125	195	239	518	804	722	541	322	184	65	37
22	12	131	194	239	548	781	686	530	314	181	68	37
23	18	133	186	240	578	769	669	518	308	175	76	39
24	21	130	180	246	594	771	669	505	307	168	81	41
25	24	125	180	251	610	776	669	490	302	164	78	42
26	27	120	180	259	613	768	671	477	300	160	75	42
27	32	120	180	275	622	763	675	470	310	156	71	44
28	35	130	178	285	630	762	681	459	302	153	66	47
29	45	140	175	294	---	754	680	448	293	151	64	47
30	57	150	172	298	---	856	675	443	285	149	64	49
31	61	---	172	303	---	913	---	440	---	146	63	---
TOTAL	514.7	3251	5725	6901	11635	23219	23846	17541	10678	6546	2831	1336
MEAN	16.6	108	185	223	416	749	795	566	356	211	91.3	44.5
MAX	61	150	200	303	630	913	972	674	438	284	141	63
MIN	7.5	67	160	167	297	639	669	440	285	146	63	32
AC-FT	1020	6450	11360	13690	23080	46050	47300	34790	21180	12980	5620	2650
CAL YR 1982	TOTAL	85658.0	MEAN	235	MAX	961	MIN	2.7	AC-FT	169900		
WTR YR 1983	TOTAL	114023.7	MEAN	312	MAX	972	MIN	7.5	AC-FT	226200		

## 11497500 SPRAGUE RIVER NEAR BEATTY, OR

LOCATION.--Lat 42°26'50", long 121°14'15", in NW¼SE¼ 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<sup>2</sup>.

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 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.--Records good except those for April and May, which are fair. No regulation. Diversions for irrigation above station in the vicinity of Bly.

AVERAGE DISCHARGE.--33 years (water years 1914-15, 1920, 1954-83), 313 ft<sup>3</sup>/s, 226,800 acre-ft/yr.

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

EXTREMES FOR CURRENT YEAR.--Maximum recorded discharge, 1,610 ft<sup>3</sup>/s Mar. 31, gage height, 7.32 ft; minimum, 78 ft<sup>3</sup>/s Nov. 25, result of freezeup.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1982 TO SEPTEMBER 1983  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	141	169	171	115	250	548	1520	810	1420	422	188	169
2	143	159	155	115	228	617	1500	840	1400	662	182	171
3	138	153	155	150	209	590	1200	880	1350	570	173	167
4	141	151	186	171	194	779	1000	860	1300	481	173	161
5	153	147	198	180	198	704	750	840	1250	425	169	151
6	155	145	252	184	209	623	650	840	1180	388	169	153
7	163	141	250	283	207	551	600	860	1110	356	163	141
8	165	145	161	548	207	542	570	860	1070	346	159	141
9	157	143	120	341	239	656	550	860	1090	339	167	140
10	157	140	120	228	311	824	530	820	1070	322	163	141
11	151	138	125	196	517	976	500	780	1090	311	159	145
12	145	134	141	180	674	1090	480	730	1020	292	165	141
13	138	136	145	175	845	1230	460	700	878	283	167	141
14	134	128	145	169	713	1520	430	680	791	267	167	140
15	141	128	143	165	620	1130	430	680	743	258	167	145
16	141	132	217	182	683	824	430	680	701	250	169	147
17	143	138	713	224	486	725	470	690	665	245	153	145
18	141	161	554	278	644	680	520	700	635	247	155	147
19	140	180	336	520	1130	593	560	710	593	234	161	147
20	140	159	341	358	635	548	610	730	562	219	211	145
21	140	143	388	252	503	528	660	770	520	211	222	149
22	141	147	506	230	602	545	720	820	492	213	207	155
23	145	143	261	228	701	568	780	900	464	217	283	173
24	155	126	190	304	665	523	830	960	447	226	290	175
25	149	123	155	551	584	523	870	1020	422	224	263	171
26	173	141	196	356	542	481	900	1130	404	211	209	165
27	169	149	205	734	559	456	870	1230	409	203	186	165
28	157	155	155	800	526	478	850	1300	386	205	175	157
29	167	177	110	428	---	436	820	1380	383	198	169	153
30	198	192	110	313	---	719	800	1420	406	194	165	153
31	188	---	110	278	---	1420	---	1440	---	198	157	---
TOTAL	4709	4423	7014	9236	13881	22427	21860	27920	24251	9217	5706	4594
MEAN	152	147	226	298	496	723	729	901	808	297	184	153
MAX	198	192	713	800	1130	1520	1520	1440	1420	662	290	175
MIN	134	123	110	115	194	436	430	680	383	194	153	140
AC-FT	9340	8770	13910	18320	27530	44480	43360	55380	48100	18280	11320	9110
CAL YR 1982	TOTAL	159320	MEAN	436	MAX	3130	MIN	100	AC-FT	316000		
WTR YR 1983	TOTAL	155238	MEAN	425	MAX	1520	MIN	110	AC-FT	307900		

NOTE.--No gage-height record Apr. 1 to June 6.

## 11499100 SYCAN RIVER BELOW SNAKE CREEK, NEAR BEATTY, OR

LOCATION.--Lat 42°29'10", long 121°16'40", in SW¼SE¼ 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<sup>2</sup>.

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

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

REMARKS.--Records good except those for November, December, April and May, which are fair. Diversions for irrigation above station.

AVERAGE DISCHARGE.--10 years, 182 ft<sup>3</sup>/s, 131,900 acre-ft/yr.

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

EXTREMES FOR CURRENT YEAR.--Maximum recorded discharge, 2,020 ft<sup>3</sup>/s Mar. 31, gage height, 8.85 ft; minimum daily, 27 ft<sup>3</sup>/s Dec. 28-31, result of freezeup.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1982 TO SEPTEMBER 1983  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	36	56	54	30	229	547	1650	1200	1450	188	55	44
2	33	54	46	40	182	688	1300	1200	1350	193	55	43
3	33	54	60	48	142	768	1010	1200	1200	188	52	44
4	36	52	79	50	119	755	789	1300	1050	183	50	42
5	36	51	86	52	103	783	675	1400	900	178	49	41
6	35	50	127	53	94	789	598	1400	792	177	48	40
7	42	48	100	63	81	718	580	1300	735	169	47	39
8	37	49	45	77	81	705	582	1100	675	162	46	39
9	37	48	45	86	82	852	573	1000	643	151	45	38
10	36	46	45	88	82	1050	542	900	615	144	42	37
11	35	39	50	92	100	1150	535	800	594	135	41	36
12	35	38	60	100	133	1130	525	700	578	127	40	36
13	35	38	75	100	144	1500	490	650	558	120	39	35
14	35	34	64	94	159	1630	460	620	534	113	40	35
15	36	37	52	82	193	1190	460	600	496	105	39	34
16	36	39	103	86	197	898	460	600	452	100	41	34
17	35	48	94	79	198	748	510	600	416	99	38	33
18	34	54	82	100	344	668	580	600	380	96	39	33
19	32	50	84	123	463	587	700	610	350	92	44	33
20	34	46	83	114	536	553	850	630	324	87	50	33
21	35	52	90	117	613	529	1000	670	305	84	46	33
22	36	60	70	121	690	523	1250	740	287	82	51	35
23	37	50	67	113	798	485	1350	800	265	77	59	37
24	37	45	57	120	912	459	1350	880	253	73	49	37
25	39	45	52	113	912	454	1200	1000	239	70	46	35
26	51	60	59	147	683	430	1100	1150	227	67	45	36
27	45	83	50	224	596	424	950	1300	217	66	43	35
28	46	92	27	276	536	432	850	1450	202	63	43	35
29	63	87	27	322	---	465	850	1500	193	60	44	37
30	64	68	27	322	---	1230	1000	1500	182	59	43	38
31	55	---	27	283	---	1910	---	1500	---	59	42	---
TOTAL	1216	1573	1987	3715	9402	25050	24769	30900	16462	3567	1411	1107
MEAN	39.2	52.4	64.1	120	336	808	826	997	549	115	45.5	36.9
MAX	64	92	127	322	912	1910	1650	1500	1450	193	59	44
MIN	32	34	27	30	81	424	460	600	182	59	38	33
AC-FT	2410	3120	3940	7370	18650	49690	49130	61290	32650	7080	2800	2200
CAL YR 1982	TOTAL	120408	MEAN	330	MAX	4500	MIN	26	AC-FT	238800		
WTR YR 1983	TOTAL	121159	MEAN	332	MAX	1910	MIN	27	AC-FT	240300		



## KLAMATH RIVER BASIN

11501000 SPRAGUE RIVER NEAR CHILOQUIN, OR

LOCATION.--Lat 42°35'05", long 121°50'55", in NE¼NW¼ 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<sup>2</sup>, 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 National Geodetic Vertical Datum of 1929. Prior to Oct. 1, 1931, nonrecording gage at site 12 mi upstream at different datum.

REMARKS.--Records good. Minor regulation from irrigation diversions above station.

AVERAGE DISCHARGE.--62 years (water years 1922-83), 584 ft<sup>3</sup>/s, 423,100 acre-ft/yr.

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

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 3,780 ft<sup>3</sup>/s Apr. 4, gage height, 5.62 ft; minimum, 289 ft<sup>3</sup>/s Aug. 9-11.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1982 TO SEPTEMBER 1983  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	328	420	451	410	989	1780	2230	1950	3190	690	363	347
2	325	399	455	410	844	1660	2790	1920	3230	727	349	337
3	325	379	435	410	729	1610	3480	1980	3230	746	331	348
4	327	368	418	420	643	1660	3760	2060	3190	849	327	354
5	323	362	429	426	569	1750	3310	2110	3090	881	314	344
6	325	370	463	445	531	1840	2700	2080	2920	813	314	334
7	339	368	476	493	528	1960	2200	2050	2700	744	318	339
8	342	366	529	583	536	1970	1860	2070	2480	693	307	333
9	350	366	527	725	544	1880	1660	2100	2280	659	297	314
10	355	365	425	870	589	1770	1580	2070	2100	641	290	312
11	349	362	418	720	688	1820	1560	2010	1960	633	292	312
12	343	360	431	546	893	2030	1530	1960	1860	609	304	312
13	335	354	398	491	1120	2410	1440	1870	1790	569	310	306
14	315	347	398	471	1250	2700	1360	1760	1740	530	306	308
15	304	344	414	460	1330	2950	1290	1680	1690	511	312	301
16	315	341	435	459	1370	3260	1230	1640	1590	501	307	301
17	332	345	548	467	1370	3590	1190	1630	1480	501	315	303
18	336	366	782	534	1500	3180	1200	1650	1370	515	314	303
19	330	389	995	619	1510	2570	1250	1670	1270	511	324	301
20	331	408	1000	767	1600	2110	1330	1680	1190	505	316	301
21	335	417	789	906	1770	1840	1450	1730	1110	481	330	305
22	336	406	749	776	1860	1650	1590	1790	1030	445	382	312
23	343	390	806	630	1770	1550	1720	1880	962	406	407	318
24	346	391	758	602	1770	1500	1840	2000	891	411	406	323
25	346	378	667	645	1830	1490	1940	2140	826	411	435	345
26	355	345	500	791	1920	1450	2060	2300	788	415	462	356
27	362	351	450	1010	1980	1410	2140	2480	769	419	454	356
28	377	377	430	1070	1920	1380	2170	2660	741	403	414	345
29	399	403	430	1250	---	1370	2110	2840	706	394	388	343
30	390	422	420	1350	---	1630	2010	3000	678	385	367	330
31	396	---	420	1220	---	1870	---	3120	---	367	352	---
TOTAL	10614	11259	16846	20976	33953	61640	57980	63880	52851	17365	10707	9743
MEAN	342	375	543	677	1213	1988	1933	2061	1762	560	345	325
MAX	399	422	1000	1350	1980	3590	3760	3120	3230	881	462	356
MIN	304	341	398	410	528	1370	1190	1630	678	367	290	301
AC-FT	21050	22330	33410	41610	67350	122300	115000	126700	104800	34440	21240	19330
CAL YR 1982	TOTAL	375485	MEAN	1029	MAX	8650	MIN	205	AC-FT	744800		
WTR YR 1983	TOTAL	367814	MEAN	1008	MAX	3760	MIN	290	AC-FT	729600		

## KLAMATH RIVER BASIN

59

11502500 WILLIAMSON RIVER BELOW SPRAGUE RIVER, NEAR CHILOQUIN, OR

LOCATION.--Lat 42°34'15", long 121°52'35", in NE¼NE¼ sec.4, T.35 S., R.7 E., Klamath County, Hydrologic Unit 1801Q202, on right bank 0.2 mi downstream from Sprague River and 0.8 mi southwest of Chiloquin.

DRAINAGE AREA.--3,000 mi<sup>2</sup>, 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 National Geodetic Vertical Datum of 1929. Prior to Sept. 1, 1923, at different datum.

REMARKS.--Records excellent. Some regulation by diversion dams and logpond operations of Sprague River. Diversions for irrigation above station.

AVERAGE DISCHARGE.--66 years, 1,049 ft<sup>3</sup>/s, 760,000 acre-ft/yr.

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

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 5,050 ft<sup>3</sup>/s Apr. 4, gage height, 5.97 ft; minimum, 587 ft<sup>3</sup>/s Oct. 14, 15.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1982 TO SEPTEMBER 1983  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	622	780	920	869	1590	2850	3670	3050	3960	1270	799	733
2	616	768	933	892	1440	2730	4210	3020	4000	1310	778	717
3	618	755	920	905	1330	2680	4770	3040	4000	1320	753	722
4	621	749	902	917	1240	2740	5020	3130	3960	1410	744	729
5	615	744	924	939	1170	2850	4770	3170	3850	1440	728	716
6	622	756	962	963	1140	2950	4220	3120	3690	1370	730	708
7	630	758	980	1020	1130	3080	3680	3070	3480	1290	733	702
8	634	764	1020	1080	1130	3100	3300	3070	3260	1220	722	698
9	640	765	1030	1190	1140	3020	3020	3100	3050	1190	715	673
10	646	767	944	1330	1180	2930	2870	3090	2850	1160	709	668
11	635	766	929	1190	1270	3000	2840	3030	2690	1140	706	666
12	627	770	952	1050	1490	3230	2820	2970	2570	1120	714	666
13	616	766	919	1020	1730	3690	2740	2870	2480	1070	720	665
14	602	761	920	997	1870	3970	2630	2740	2420	1030	709	659
15	587	762	935	989	1980	4230	2530	2610	2350	996	710	656
16	599	766	980	994	2030	4510	2430	2550	2260	988	704	652
17	613	774	1060	996	2070	4710	2380	2540	2020	980	707	652
18	615	801	1260	1070	2300	4520	2360	2550	2000	996	698	654
19	611	819	1470	1140	2290	3970	2400	2550	1880	988	705	650
20	616	839	1500	1280	2380	3490	2480	2560	1790	979	702	649
21	623	866	1300	1420	2610	3170	2590	2590	1710	953	699	657
22	625	860	1250	1310	2800	2950	2720	2640	1630	920	747	667
23	641	840	1270	1160	2740	2820	2820	2730	1550	873	810	678
24	648	839	1060	1140	2750	2760	2940	2830	1470	867	817	687
25	655	827	918	1180	2850	2750	3060	2960	1410	866	831	702
26	671	796	910	1330	2930	2690	3180	3130	1370	863	864	718
27	675	796	900	1570	3010	2650	3270	3290	1360	864	860	723
28	698	832	880	1640	2980	2600	3310	3470	1330	849	811	712
29	752	872	872	1820	---	2590	3250	3630	1280	840	782	709
30	738	888	870	1940	---	3040	3140	3780	1250	826	756	702
31	752	---	857	1810	---	3320	---	3880	---	809	735	---
TOTAL	19863	23846	31547	37151	54570	99590	95420	92760	72920	32797	23198	20590
MEAN	641	795	1018	1198	1949	3213	3181	2992	2431	1058	748	686
MAX	752	888	1500	1940	3010	4710	5020	3880	4000	1440	864	733
MIN	587	744	857	869	1130	2590	2360	2540	1250	809	698	649
AC-FT	39400	47300	62570	73690	108200	197500	189300	184000	144600	65050	46010	40840
CAL YR 1982	TOTAL	568169	MEAN	1557	MAX	10100	MIN	482	AC-FT	1127000		
WTR YR 1983	TOTAL	604252	MEAN	1655	MAX	5020	MIN	587	AC-FT	1199000		

## KLAMATH RIVER BASIN

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 National Geodetic Vertical Datum of 1929 (National Park Service bench mark).

REMARKS.--Records good. Slight regulation 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.--6 years, 3.06 ft<sup>3</sup>/s, 2,220 acre-ft/yr, adjusted for diversion.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 16 ft<sup>3</sup>/s June 22-24, 1982, gage height, 1.55 ft; minimum, 0.33 ft<sup>3</sup>/s Nov. 20, 22, 1977.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 13 ft<sup>3</sup>/s July 14, gage height, 1.52 ft; minimum, 0.96 ft<sup>3</sup>/s Apr. 9-20.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1982 TO SEPTEMBER 1983  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.9	2.1	1.9	1.7	1.6	1.3	1.2	1.3	10	11	9.9	4.9
2	2.8	2.1	1.8	1.8	1.6	1.3	1.1	1.2	10	11	9.7	4.8
3	2.8	2.1	1.9	1.8	1.5	1.3	1.1	1.2	10	11	9.7	4.8
4	2.7	2.1	1.9	1.7	1.5	1.4	1.1	1.2	10	11	9.6	4.6
5	2.7	2.1	1.9	1.8	1.5	1.4	1.1	1.3	9.9	11	9.2	4.5
6	2.7	2.1	2.0	1.8	1.5	1.3	1.2	1.3	9.9	11	8.9	4.4
7	2.6	2.1	2.0	1.8	1.5	1.3	1.1	1.3	9.7	11	8.8	4.4
8	2.5	2.1	2.0	1.7	1.5	1.2	1.1	1.3	9.4	11	8.6	4.3
9	2.6	2.0	2.0	1.7	1.5	1.3	1.1	1.4	9.6	12	8.5	4.3
10	2.4	2.0	2.0	1.7	1.5	1.3	1.1	1.4	9.9	11	8.3	4.2
11	2.5	2.0	2.0	1.7	1.4	1.3	1.1	1.4	9.7	11	8.1	4.1
12	2.5	2.0	2.0	1.7	1.4	1.2	1.1	1.4	9.9	11	8.0	4.1
13	2.4	2.0	2.0	1.6	1.5	1.1	1.1	1.4	9.9	11	7.7	4.0
14	2.3	2.0	2.0	1.6	1.4	1.2	1.1	1.5	10	12	7.7	4.0
15	2.3	2.0	2.0	1.6	1.5	1.2	1.1	1.4	11	12	7.4	4.0
16	2.3	2.0	2.0	1.6	1.4	1.2	1.1	1.4	11	12	7.3	4.0
17	2.3	1.9	2.0	1.6	1.4	1.2	1.1	1.5	11	12	7.0	4.0
18	2.3	2.0	1.9	1.6	1.4	1.2	1.1	1.5	11	12	6.6	3.9
19	2.3	2.0	2.0	1.6	1.3	1.2	1.1	1.6	11	11	6.5	3.9
20	2.2	1.9	2.0	1.6	1.3	1.2	1.1	1.8	11	11	6.4	3.9
21	2.2	1.9	2.0	1.6	1.4	1.2	1.1	2.1	11	11	6.1	3.9
22	2.2	1.9	2.0	1.6	1.3	1.2	1.1	2.6	11	11	5.8	3.8
23	2.2	1.9	1.9	1.6	1.3	1.2	1.2	2.9	10	11	5.6	3.8
24	2.2	2.0	1.9	1.6	1.2	1.2	1.2	3.2	10	11	5.4	3.8
25	2.2	1.9	1.9	1.6	1.3	1.2	1.2	3.9	10	11	5.3	3.8
26	2.1	1.9	1.9	1.6	1.3	1.2	1.2	4.7	10	11	5.3	3.7
27	2.1	1.9	1.8	1.6	1.3	1.2	1.2	5.9	10	11	5.2	3.7
28	2.1	1.9	1.7	1.6	1.3	1.2	1.2	7.1	10	10	5.1	3.7
29	2.1	1.9	1.8	1.6	---	1.2	1.2	8.0	10	10	5.0	3.6
30	2.1	1.9	1.8	1.6	---	1.2	1.2	9.0	10	9.9	5.1	3.6
31	2.1	---	1.7	1.6	---	1.2	---	10	---	9.7	4.9	---
TOTAL	73.7	59.7	59.7	51.3	39.6	38.3	34.0	87.2	305.9	342.6	222.7	122.5
MEAN	2.38	1.99	1.93	1.65	1.41	1.24	1.13	2.81	10.2	11.1	7.18	4.08
MAX	2.9	2.1	2.0	1.8	1.6	1.4	1.2	10	11	12	9.9	4.9
MIN	2.1	1.9	1.7	1.6	1.2	1.1	1.1	1.2	9.4	9.7	4.9	3.6
AC-FT	146	118	118	102	79	76	67	173	607	680	442	243
MEAN†	2.41	2.02	1.95	1.69	1.45	1.27	1.16	2.85	10.2	11.1	7.25	4.13
AC-FT†	148	120	120	104	80.5	77.9	69.3	175	610	684	446	246

CAL YR 1982	TOTAL	1518.0	MEAN	4.16	MAX	15	MIN	1.5	AC-FT	3010	MEAN†	4.22	AC-FT†	3062
WTR YR 1983	TOTAL	1437.2	MEAN	3.94	MAX	12	MIN	1.1	AC-FT	2850	MEAN†	3.98	AC-FT†	2880

† Adjusted for diversion by pumping.

## 11507001 UPPER KLAMATH LAKE NEAR KLAMATH FALLS, OR

LOCATION.--Lat 42°15'00", long 121°48'55", in NW¼SW¼ 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<sup>2</sup>, approximately, including 26.2 mi<sup>2</sup> 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 National Geodetic Vertical Datum of 1929, or 4,100.00 ft Bureau of Reclamation datum. Gage readings have been reduced to elevations 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, 4,143.14 ft May 31, June 5; minimum daily, 4,140.64 ft Dec. 15.

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 1982 TO SEPTEMBER 1983  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	4141.34	4141.43	4141.04	4140.72	4141.11	4142.03	4142.36	4142.86	4143.12	4142.92	4142.59	4142.35
2	4141.35	4141.40	4141.00	4140.68	4141.16	4142.05	4142.40	4142.84	4143.10	4142.97	4142.56	4142.36
3	4141.36	4141.37	4141.00	4140.67	4141.17	4142.08	4142.46	4142.84	4143.13	4142.97	4142.54	4142.36
4	4141.36	4141.35	4141.00	4140.66	4141.16	4142.08	4142.46	4142.84	4143.13	4142.99	4142.48	4142.35
5	4141.33	4141.32	4140.99	4140.66	4141.16	4142.07	4142.43	4142.82	4143.14	4143.00	4142.50	4142.35
6	4141.32	4141.34	4140.99	4140.66	4141.14	4142.07	4142.43	4142.83	4143.12	4143.02	4142.48	4142.34
7	4141.32	4141.32	4140.99	4140.68	4141.23	4142.10	4142.43	4142.86	4143.12	4143.02	4142.46	4142.34
8	4141.32	4141.27	4140.94	4140.66	4141.24	4142.09	4142.43	4142.91	4143.10	4143.00	4142.46	4142.34
9	4141.34	4141.27	4140.89	4140.67	4141.26	4142.06	4142.44	4142.94	4143.08	4143.00	4142.46	4142.28
10	4141.34	4141.28	4140.84	4140.69	4141.36	4142.12	4142.43	4142.99	4143.07	4142.97	4142.44	4142.28
11	4141.32	4141.22	4140.82	4140.71	4141.30	4142.12	4142.44	4142.98	4143.10	4142.96	4142.42	4142.27
12	4141.32	4141.19	4140.78	4140.71	4141.40	4142.11	4142.44	4142.98	4143.09	4142.95	4142.40	4142.28
13	4141.31	4141.19	4140.75	4140.70	4141.49	4142.20	4142.43	4142.97	4143.09	4142.94	4142.38	4142.27
14	4141.31	4141.17	4140.70	4140.70	4141.54	4142.26	4142.44	4142.96	4143.09	4142.94	4142.34	4142.26
15	4141.29	4141.14	4140.64	4140.70	4141.62	4142.26	4142.46	4142.98	4143.10	4142.94	4142.32	4142.24
16	4141.30	4141.09	4140.78	4140.71	4141.66	4142.24	4142.51	4142.95	4143.07	4142.90	4142.31	4142.22
17	4141.30	4141.09	4140.90	4140.73	4141.64	4142.28	4142.52	4142.96	4143.08	4142.88	4142.30	4142.20
18	4141.30	4141.11	4140.88	4140.74	4141.72	4142.31	4142.53	4142.98	4143.03	4142.85	4142.26	4142.20
19	4141.30	4141.14	4140.90	4140.74	4141.78	4142.28	4142.54	4142.99	4143.00	4142.82	4142.22	4142.17
20	4141.28	4141.16	4140.86	4140.76	4141.80	4142.24	4142.58	4142.97	4142.96	4142.82	4142.21	4142.14
21	4141.19	4141.16	4140.86	4140.79	4141.86	4142.24	4142.57	4142.98	4142.94	4142.83	4142.20	4142.10
22	4141.15	4141.20	4140.94	4140.81	4141.92	4142.16	4142.49	4142.98	4142.92	4142.82	4142.20	4142.08
23	4141.29	4141.23	4140.94	4140.80	4141.91	4142.12	4142.55	4142.99	4142.94	4142.79	4142.25	4142.08
24	4141.32	4141.16	4140.90	4140.83	4141.94	4142.14	4142.65	4142.99	4142.91	4142.78	4142.28	4142.09
25	4141.28	4141.12	4140.88	4140.80	4141.93	4142.16	4142.70	4143.01	4142.93	4142.77	4142.28	4142.09
26	4141.32	4141.09	4140.84	4140.75	4141.98	4142.10	4142.74	4143.04	4142.92	4142.74	4142.30	4142.09
27	4141.34	4141.02	4140.81	4140.94	4141.97	4142.16	4142.77	4143.06	4142.95	4142.72	4142.30	4142.10
28	4141.33	4141.00	4140.79	4140.98	4142.01	4142.16	4142.82	4143.06	4142.95	4142.69	4142.30	4142.12
29	4141.36	4141.02	4140.76	4141.00	---	4142.15	4142.84	4143.07	4142.96	4142.66	4142.31	4142.08
30	4141.43	4141.06	4140.74	4141.05	---	4142.30	4142.85	4143.11	4142.92	4142.65	4142.27	4142.04
31	4141.42	---	4140.73	4141.08	---	4142.37	---	4143.14	---	4142.62	4142.32	---
MEAN	4141.32	4141.20	4140.87	4140.77	4141.55	4142.16	4142.54	4142.96	4143.04	4142.87	4142.36	4142.22
MAX	4141.43	4141.43	4141.04	4141.08	4142.01	4142.37	4142.85	4143.14	4143.14	4143.02	4142.59	4142.36
MIN	4141.15	4141.00	4140.64	4140.66	4141.11	4142.03	4142.36	4142.82	4142.91	4142.62	4142.20	4142.04
(†)	367000	340700	315300	343000	416000	444300	488900	510100	490600	465200	440900	414400
(‡)	+4700	-26300	-25400	+27700	+73000	+28300	+44600	+21200	-19500	-25400	-24300	-26500
CAL YR 1982	MEAN	4142.02	MAX	4143.27	MIN	4140.64	AC-FT‡	-86800				
WTR YR 1983	MEAN	4141.99	MAX	4143.14	MIN	4140.64	AC-FT‡	+52100				

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

‡ Change in contents, in acre-feet.

## KLAMATH RIVER BASIN

## 11507501 LINK RIVER AT KLAMATH FALLS, OR

LOCATION.--Lat 42°13'25", long 121°47'35", in SW¼NW¼ 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<sup>2</sup>, approximately, including 26.2 mi<sup>2</sup> in closed basin of Crater Lake.

PERIOD OF RECORD.--May 1904 to current year.

GAGE.--Water-stage recorder. Datum of gage is 4,083.71 ft 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.--Records good. Flow regulated since 1919 by Upper Klamath Lake (see station 11507001). Large diurnal fluctuation caused by powerplant above station. Water diverted above station by main or "A" Canal of Klamath project (see station 11507200). Many other diversions above lake. All records presented herein 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 below station.

AVERAGE DISCHARGE.--79 years, 1,593 ft<sup>3</sup>/s, 1,154,000 acre-ft/yr, not adjusted for "A" Canal.

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

EXTREMES FOR CURRENT YEAR.-- Maximum discharge, 6,440 ft<sup>3</sup>/s Mar. 18; minimum daily, 299 ft<sup>3</sup>/s Aug. 26.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1982 TO SEPTEMBER 1983  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1090	2330	2860	2430	1870	4290	5790	4890	3680	945	800	680
2	909	2420	2880	2570	1870	4400	5920	4140	3680	774	828	547
3	920	2500	3450	2500	1870	4360	6080	3480	3620	654	934	841
4	781	2450	3750	2240	1680	4340	6050	3450	3520	563	809	751
5	1070	2450	3820	2330	1620	4290	5880	3330	3490	655	595	724
6	1110	2360	3840	2350	1630	4270	5910	2850	3540	879	626	735
7	1320	2350	3870	2320	1450	4360	5660	2790	3660	1260	469	976
8	1220	2420	3810	2130	1560	4550	4720	2870	3910	1140	474	1170
9	1320	2420	3380	2080	1730	4580	4270	2890	3270	1020	472	965
10	1290	2470	3050	2040	1580	4600	4220	3190	2560	988	523	921
11	1170	2500	2930	2040	1530	4580	3780	3420	2100	806	630	656
12	1260	2500	2870	2050	1490	4570	3250	3590	2090	612	910	675
13	1320	2480	2790	2130	1520	4760	3040	3650	2080	932	1060	693
14	1330	2490	2780	2370	1530	5220	2740	3330	2210	970	1030	998
15	1310	2360	2710	2290	1860	5970	2090	3430	2450	995	1040	1130
16	1330	2480	2570	2080	2540	5880	1790	3050	2650	970	953	1230
17	1330	2400	2510	2010	2690	5990	3030	2540	2800	819	938	1170
18	1320	2370	3200	1960	3050	6190	2970	2380	3040	591	955	1240
19	1320	2350	3410	1730	3130	6150	2260	2360	3000	479	802	1390
20	1330	2330	3490	1610	3070	6040	2310	2350	2360	618	790	1240
21	1150	2320	3490	1870	3350	6080	2390	2400	1650	534	704	1160
22	1180	2370	3670	1890	3540	5850	2000	2490	1320	676	700	1200
23	1220	2650	3290	2260	3800	5700	1640	2460	1220	874	485	1090
24	1220	2840	3300	2210	3960	5090	1640	2150	1160	762	495	1100
25	993	2820	3510	1800	4270	4130	2240	1930	867	762	436	1090
26	1060	2870	3570	1400	4380	4000	2780	2130	865	630	299	1100
27	1180	2920	3060	1490	4250	3880	2780	2570	807	685	423	1090
28	1740	2820	2630	1490	4310	3750	3290	2800	886	640	371	1430
29	2250	2810	2550	2030	---	3950	3750	2720	1030	494	574	1800
30	2350	2830	2440	2320	---	4430	4200	2570	1040	583	493	1520
31	2350	---	2430	2290	---	5360	---	3010	---	671	664	---
TOTAL	40743	75680	97910	64310	71130	151610	108470	91210	70555	23981	21282	31312
MEAN	1314	2523	3158	2075	2540	4891	3616	2942	2352	774	687	1044
MAX	2350	2920	3870	2570	4380	6190	6080	4890	3910	1260	1060	1800
MIN	781	2320	2430	1400	1450	3750	1640	1930	807	479	299	547
AC-FT	80810	150100	194200	127600	141100	300700	215200	180900	139900	47570	42210	62110
CAL YR 1982	TOTAL	846019	MEAN	2318	MAX	7970	MIN	392	AC-FT	1678000		
WTR YR 1983	TOTAL	848193	MEAN	2324	MAX	6190	MIN	299	AC-FT	1682000		

## KLAMATH RIVER BASIN

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## 11509500 KLAMATH RIVER AT KENO, OR

LOCATION.--Lat 42°08'00", long 121°57'40", in NW¼SE¼ 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<sup>2</sup>, approximately (not including Lost River or Lower Klamath Lake basins).

PERIOD OF 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 National Geodetic Vertical Datum of 1929 (from river-profile survey). See WSP 1735 for history of changes prior to Nov. 6, 1954.

REMARKS.--Records excellent. Flow regulated since 1919 by Upper Klamath Lake (see station 11507001). Diversions for irrigation above station.

AVERAGE DISCHARGE.--63 years, 1,684 ft<sup>3</sup>/s, 1,220,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 10,200 ft<sup>3</sup>/s Feb. 24, 1982, gage height, 12.74 ft, caused by regulation from Keno Dam 0.9 mi upstream; minimum, 26 ft<sup>3</sup>/s Sept. 23, 1956; minimum daily, 60 ft<sup>3</sup>/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<sup>3</sup>/s.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 9,100 ft<sup>3</sup>/s Mar. 14, gage height, 12.18 ft, caused by regulation from Keno Dam 0.9 mi upstream; minimum, 280 ft<sup>3</sup>/s July 18; minimum daily, 296 ft<sup>3</sup>/s July 19.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1982 TO SEPTEMBER 1983  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1270	2450	3170	2530	2420	5980	7490	5690	3420	628	551	834
2	1270	2480	3160	2530	2420	6010	7400	5220	3310	629	670	830
3	1270	2500	3550	2530	2370	6130	7400	5130	3360	628	667	832
4	1310	2490	3900	2430	2330	6210	7050	4600	3360	626	487	834
5	1330	2490	3880	2290	2330	6180	6980	4080	3350	713	325	833
6	1450	2500	3880	2270	2340	6010	6640	3830	3350	798	326	901
7	1600	2490	3870	2270	2330	5930	6640	3660	3350	800	323	986
8	1550	2500	3830	2270	2370	6050	5750	3660	3230	803	323	990
9	1510	2500	3320	2270	2480	6050	5100	3670	2760	803	323	992
10	1510	2490	2750	2280	2720	6090	4550	3970	2310	802	363	992
11	1510	2490	2620	2270	3050	6480	4050	4050	2070	676	411	991
12	1510	2490	2620	2270	3050	6720	3600	3930	2070	547	632	989
13	1510	2490	2560	2270	3770	7660	3340	3710	2070	485	836	988
14	1510	2490	2520	2260	4130	8180	2850	3400	2200	411	836	1290
15	1510	2490	2520	2270	4350	8470	3170	3490	2310	395	837	1290
16	1510	2490	2520	2270	4540	7950	3090	3220	2230	398	862	1290
17	1510	2490	3170	2260	4290	7750	2160	2590	2370	399	881	1290
18	1510	2490	3790	2270	4520	7820	1790	2270	2370	336	881	1290
19	1440	2490	3790	2270	5830	7620	2360	2190	2380	296	881	1290
20	1320	2500	3770	2270	6320	6690	2650	2190	1950	313	879	1300
21	1140	2500	3770	2270	5290	6810	2770	2180	1220	368	881	1300
22	1260	2500	3790	2260	5560	6740	2600	2110	870	409	882	1300
23	1270	2790	3810	2260	5700	6710	2340	2000	639	410	879	1460
24	1270	3000	3740	2280	5990	5950	2350	1740	569	411	880	1470
25	1140	3000	3760	2290	6240	5170	3050	1590	569	369	879	1470
26	1270	2990	3760	2290	5990	5170	3620	1740	567	318	876	1470
27	1320	3000	3340	2600	5980	5170	3530	2020	568	317	881	1470
28	1860	3000	2740	3300	5980	5160	4090	2190	567	317	880	1780
29	2410	3000	2570	3290	---	5150	4560	2200	572	359	827	2000
30	2410	3070	2540	3240	---	5490	5040	2210	593	415	752	1930
31	2410	---	2530	2720	---	7110	---	2840	---	415	786	---
TOTAL	46670	78650	101540	75150	114690	200610	128010	97370	60554	15594	21697	36682
MEAN	1505	2622	3275	2424	4096	6471	4267	3141	2018	503	700	1223
MAX	2410	3070	3900	3300	6320	8470	7490	5690	3420	803	882	2000
MIN	1140	2450	2520	2260	2330	5150	1790	1590	567	296	323	830
AC-FT	92570	156000	201400	149100	227500	397900	253900	193100	120100	30930	43040	72760

CAL YR 1982	TOTAL	943790	MEAN	2586	MAX	9210	MIN	279	AC-FT	1872000
WTR YR 1983	TOTAL	977217	MEAN	2677	MAX	8470	MIN	296	AC-FT	1938000



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

LOCATION.--Lat 42°05'05", long 122°04'20", in SE¼SE¼ 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<sup>2</sup>, 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 National Geodetic Vertical Datum of 1929 (levels by Pacific Power & Light Co.).

REMARKS.--Records excellent. Flow regulated by Upper Klamath Lake (see station 11507001). Large diurnal fluctuation caused by John C. Boyle powerplant and 2 powerplants below Upper Klamath Lake. Diversions for irrigation above station.

AVERAGE DISCHARGE.--24 years, 1,874 ft<sup>3</sup>/s, 1,358,000 acre-ft/yr.

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

EXTREMES FOR CURRENT YEAR --Maximum discharge, 9,640 ft<sup>3</sup>/s Mar. 14, gage height, 8.88 ft; minimum, 357 ft<sup>3</sup>/s Oct. 21, 25; minimum daily, 603 ft<sup>3</sup>/s July 26.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1982 TO SEPTEMBER 1983  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1530	2710	3350	2890	2750	5940	7810	5740	3790	930	879	1060
2	1530	2770	3330	2890	2720	5970	7610	5370	3600	938	930	1110
3	1530	2780	3550	2880	2710	6080	7620	5220	3640	924	976	1150
4	1530	2780	3890	2740	2600	6180	7200	4850	3610	982	706	1150
5	1520	2780	3900	2620	2560	6180	7160	4390	3630	1060	618	1140
6	1520	2780	3900	2590	2570	6010	6800	4130	3600	1140	616	1150
7	1840	2770	3900	2590	2620	5850	6770	3950	3590	1130	617	1190
8	1820	2800	3890	2550	2690	6030	5880	3950	3550	1190	614	1250
9	1730	2780	3530	2430	2800	6020	5170	3920	3140	1060	617	1240
10	1490	2780	3020	2580	2930	6070	4660	4060	2690	1070	619	1250
11	1900	2780	2940	2590	3270	6520	4320	4220	2440	1020	619	1110
12	1880	2800	2920	2580	3290	6800	3820	4110	2560	745	841	1280
13	1520	2800	2890	2520	3750	7920	3680	4010	2450	745	1160	1480
14	1940	2800	2820	2500	4160	8510	3170	3680	2510	746	1160	1480
15	1910	2800	2820	2520	4360	8920	3240	3790	2690	659	1160	1020
16	1510	2780	2880	2530	4510	8260	3540	3600	2540	658	1160	1470
17	1510	2770	3300	2540	4310	7950	2570	3060	2710	653	1150	1470
18	1960	2810	3840	2540	4430	8050	2070	2790	2720	653	1110	1540
19	1780	2810	3860	2570	5730	7790	2760	2630	2710	605	1110	1550
20	1600	2810	3860	2560	6280	6800	3170	2610	2330	752	1110	1500
21	1320	2810	3850	2550	5330	6910	3210	2620	1360	750	1110	1520
22	1740	2800	3850	2550	5460	6840	3130	2630	1130	609	1110	1560
23	1460	2940	3840	2550	5640	6820	2870	2390	916	610	1110	1710
24	1600	3230	3800	2550	5920	6090	2850	2260	852	611	1150	1850
25	1140	3200	3790	2560	6250	5150	3300	2070	843	607	1160	1650
26	1650	3180	3820	2590	5930	5160	3880	2220	866	603	1110	1680
27	1430	3200	3560	2830	5940	5160	3800	2420	845	606	1160	1680
28	2000	3200	2980	3470	5930	5150	4150	2680	710	605	1160	1970
29	2610	3210	2860	3430	---	5120	4660	2720	823	607	1160	2200
30	2700	3230	2890	3420	---	5590	5070	2750	966	651	1060	2190
31	2710	---	2890	3010	---	7230	---	3200	---	699	1060	---
TOTAL	53910	86690	106520	83720	117440	203070	135940	108040	69811	24618	30122	43600
MEAN	1739	2890	3436	2701	4194	6551	4531	3485	2327	794	972	1453
MAX	2710	3230	3900	3470	6280	8920	7810	5740	3790	1190	1160	2200
MIN	1140	2710	2820	2430	2560	5120	2070	2070	710	603	614	1020
AC-FT	106900	171900	211300	166100	232900	402800	269600	214300	138500	48830	59750	86480
CAL YR 1982	TOTAL	1020067	MEAN	2795	MAX	10000	MIN	360	AC-FT	2023000		
WTR YR 1983	TOTAL	1063481	MEAN	2914	MAX	8920	MIN	603	AC-FT	2109000		

KLAMATH RIVER BASIN

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11516530 KLAMATH RIVER BELOW IRON GATE DAM, CA

LOCATION.--Lat 41°55'41", long 122°26'35", in SE¼NE¼ 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<sup>2</sup>, approximately (not including Lost River and Lower Klamath Lake basins).

PERIOD OF RECORD.--October 1960 to current year.

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

REMARKS.--Records excellent. Flow regulated by Upper Klamath Lake (see station 11507001), other smaller reservoirs, and diversions above station. Iron Gate Dam 0.6 mi upstream is a reregulating reservoir. Records of chemical analyses and water temperatures for the current year are published in "Water Resources Data, California, Volume 2."

AVERAGE DISCHARGE.--23 years, 2,239 ft<sup>3</sup>/s, 1,622,000 acre-ft/yr.

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

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 10,800 ft<sup>3</sup>/s Mar. 15, gage height, 9.20 ft; minimum daily, 720 ft<sup>3</sup>/s July 27, 29, 30.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1982 TO SEPTEMBER 1983  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1580	2830	3530	3060	3170	7480	9880	6420	4480	1120	1020	1300
2	1710	2830	3660	3070	2940	7230	9440	6190	4210	1120	1030	1310
3	1730	2830	3890	3070	2910	7150	9250	5580	4080	1110	1010	1310
4	1730	2820	4510	2960	2900	7240	8890	5710	4050	1100	1030	1310
5	1730	2820	4470	2730	2860	7230	8190	5360	4030	1240	1020	1300
6	1730	2820	4440	2670	2850	7070	7970	4960	4010	1430	1010	1370
7	1780	2820	4360	2700	2910	6780	7490	4540	3990	1340	1010	1490
8	1820	3000	4280	2910	3060	6680	7240	4530	3970	1110	1010	1500
9	1820	2830	3900	2910	3880	6760	6140	4510	3690	891	1010	1510
10	1810	2810	3250	2890	4170	6930	5810	4580	2880	882	1020	1510
11	1810	2810	3100	2750	4240	7440	5080	4880	2520	880	1010	1510
12	1810	2820	3070	2730	4440	7990	4350	4640	2700	885	1010	1510
13	1820	2780	3090	2730	4670	9840	4340	4650	2800	873	1010	1510
14	1820	2780	2980	2720	5470	9900	3840	4320	2720	875	1010	1420
15	1820	2840	3080	2720	5860	10500	3410	4210	3040	940	1010	1470
16	1810	2920	5530	2750	5900	9430	3390	4270	3090	876	1000	1380
17	1810	2950	6490	2790	5590	9010	3400	3620	2730	874	993	1510
18	1810	3080	4700	2880	5910	9010	3420	3220	2860	875	1000	1510
19	1810	3180	4600	3190	6840	8980	3180	3440	2930	736	1000	1510
20	1810	2980	4640	3020	7570	7910	3390	3680	2820	724	1020	1700
21	1820	2960	5450	2940	6950	7560	3920	3710	1940	724	1030	1840
22	1820	2960	5010	2920	6330	7820	3990	3720	1240	722	1060	1800
23	1820	3110	4560	2910	6760	7740	3660	3350	955	722	1030	1810
24	1820	3570	4410	2990	6870	7260	3560	2710	914	722	1020	1810
25	1820	3260	4320	2970	7320	6040	3550	2580	913	722	1020	1810
26	1820	3390	4240	3180	7150	5870	4430	2880	908	724	1020	1810
27	1820	3300	4230	4030	6960	5940	4330	3070	939	720	1000	1800
28	1820	3370	3210	4410	6950	5890	4470	3590	757	722	998	1800
29	2270	3590	2870	4130	---	5910	5150	3340	736	720	1000	1800
30	2860	3560	2960	3910	---	8040	5440	3450	827	720	1000	1790
31	2840	---	3090	3670	---	9490	---	3500	---	900	1020	---
TOTAL	58100	90620	125920	95310	143430	238120	160600	129210	77729	27999	31431	47010
MEAN	1874	3021	4062	3075	5123	7681	5353	4168	2591	903	1014	1567
MAX	2860	3590	6490	4410	7570	10500	9880	6420	4480	1430	1060	1840
MIN	1580	2780	2870	2670	2850	5870	3180	2580	736	720	993	1300
AC-FT	115200	179700	249800	189000	284500	472300	318600	256300	154200	55540	62340	93240
CAL YR 1982 TOTAL	1192996			3268		16100	707	AC-FT	2366000			
WTR YR 1983 TOTAL	1225479			3357		10500	720	AC-FT	2431000			

## 12472800 COLUMBIA RIVER BELOW PRIEST RAPIDS DAM, WA

LOCATION.--Lat 46°37'44", long 119°51'49", in SE¼NW¼ 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<sup>2</sup>, approximately.

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.

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 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 National Geodetic Vertical Datum of 1929 (river-profile survey).

REMARKS.--Records excellent. Diversions for irrigation of about 500,000 acres above station. Flow regulated by 10 major reservoirs and numerous smaller reservoirs and powerplants. Records of water temperatures for the current year are published in "Water Resources Data, Washington, Volume 2."

AVERAGE DISCHARGE.--66 years, 120,300 ft<sup>3</sup>/s, 87,160,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 692,600 ft<sup>3</sup>/s June 12, 1948, gage height, 59.35 ft, site and datum then in use; minimum, 4,120 ft<sup>3</sup>/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<sup>3</sup>/s, based on information obtained at other points.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 307,000 ft<sup>3</sup>/s July 2, elevation, 417.55 ft; minimum, 36,900 ft<sup>3</sup>/s Oct. 2, elevation, 396.48 ft.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1982 TO SEPTEMBER 1983  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	74100	95600	80400	94200	134000	210000	194000	180000	159000	99700	182000	124000
2	56600	124000	88800	95900	139000	198000	155000	167000	200000	72600	155000	134000
3	59600	117000	79700	114000	134000	213000	147000	164000	186000	71200	143000	66200
4	77800	99800	62900	118000	140000	207000	159000	175000	190000	92100	142000	61700
5	71900	95000	78600	125000	153000	208000	171000	164000	180000	99000	152000	64700
6	74400	89800	97500	106000	177000	195000	175000	175000	159000	116000	157000	87400
7	77400	97600	96000	71400	164000	177000	139000	167000	189000	137000	145000	95600
8	77100	115000	108000	75100	158000	190000	148000	154000	178000	129000	164000	81700
9	60900	106000	115000	63100	168000	185000	136000	164000	175000	112000	153000	103000
10	60800	102000	118000	100000	140000	175000	150000	183000	167000	111000	156000	58600
11	75100	109000	82100	95500	133000	138000	164000	156000	143000	98100	143000	45600
12	74600	108000	73500	115000	118000	167000	159000	172000	141000	132000	130000	84900
13	87600	85500	92000	131000	121000	170000	172000	166000	140000	122000	124000	95600
14	94700	90700	101000	138000	130000	158000	171000	137000	132000	137000	118000	82800
15	82200	109000	103000	140000	134000	208000	167000	154000	134000	131000	113000	75300
16	67200	92800	88300	135000	115000	207000	154000	142000	129000	146000	136000	92600
17	72300	91600	94900	122000	110000	215000	138000	163000	128000	185000	148000	54900
18	98900	94500	68800	128000	126000	188000	136000	174000	124000	168000	144000	82200
19	85100	88300	83300	115000	121000	210000	152000	153000	114000	162000	140000	90400
20	104000	69700	112000	123000	111000	226000	153000	164000	109000	167000	133000	79800
21	103000	83700	106000	134000	135000	215000	179000	150000	122000	190000	121000	85900
22	92300	96100	84900	110000	137000	209000	158000	146000	123000	177000	121000	87200
23	68100	112000	66000	129000	194000	240000	141000	175000	132000	149000	122000	86500
24	65300	119000	72100	120000	179000	226000	180000	154000	138000	134000	101000	47400
25	78200	122000	62900	137000	185000	230000	198000	187000	141000	174000	94000	47200
26	87400	98600	74500	135000	183000	213000	168000	171000	127000	179000	81700	78200
27	90500	88500	101000	119000	196000	217000	195000	191000	134000	175000	58700	81300
28	92700	93600	103000	131000	182000	215000	194000	170000	115000	187000	53000	72400
29	106000	105000	109000	106000	---	215000	169000	201000	102000	181000	79300	83500
30	94000	102000	114000	110000	---	222000	160000	193000	109000	177000	106000	80500
31	82400	---	108000	124000	---	208000	---	217000	---	159000	128000	---
TOTAL	2492200	3001400	2825200	3560200	4117000	6255000	4882000	5229000	4320000	4369700	3943700	2411100
MEAN	80390	100000	91140	114800	147000	201800	162700	168700	144000	141000	127200	80370
MAX	106000	124000	118000	140000	196000	240000	198000	217000	200000	190000	182000	134000
MIN	56600	69700	62900	63100	110000	138000	136000	137000	102000	71200	53000	45600
AC-FT	4943000	5953000	5604000	7062000	8166000	12410000	9683000	10370000	8569000	8667000	7822000	4782000
CAL YR 1982 TOTAL	50495400			MEAN 138300	MAX 246000	MIN 54000	AC-FT 100200000					
WTR YR 1983 TOTAL	47406500			MEAN 129900	MAX 240000	MIN 45600	AC-FT 94030000					

## OWYHEE RIVER BASIN

67

13181000 OWYHEE RIVER NEAR ROME, OR

LOCATION.--Lat 42°52'02", long 117°38'52", in SE¼NE¼ 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<sup>2</sup>.

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

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

REMARKS.--Records excellent. 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 above station for irrigation.

AVERAGE DISCHARGE.--34 years, 949 ft<sup>3</sup>/s, 687,600 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 33,500 ft<sup>3</sup>/s Dec. 24, 1964, gage height, 16.7 ft, from floodmark; minimum, 42 ft<sup>3</sup>/s Aug. 12, 1954, July 28, Aug. 5, 1961, July 31, 1968.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 5,400 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Mar. 4	2000	10,400	10.37	Apr. 24	1530	7,250	8.43
Mar. 14	1430	*16,400	*13.07	May 2	1830	10,200	10.27
Apr. 1	1300	11,200	10.74	June 4	2200	8,210	9.12

Minimum, 192 ft<sup>3</sup>/s Oct. 14, 15, 19, 20.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1982 TO SEPTEMBER 1983  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	225	795	432	270	512	3570	9210	6560	5620	890	324	304
2	219	651	436	245	472	5120	7290	9320	6180	896	312	292
3	212	503	448	300	468	7300	6460	8290	6870	932	300	277
4	209	412	412	400	380	8660	5390	6790	6810	932	300	273
5	222	356	396	633	344	9430	4540	6550	6370	908	304	266
6	222	316	472	888	368	7540	4000	7350	5070	824	288	259
7	222	288	795	1150	404	6470	3650	7700	4350	740	280	249
8	222	277	633	1690	468	7290	3450	6910	3810	695	277	231
9	215	270	503	2540	452	6980	3550	6300	3410	630	280	221
10	212	270	424	1750	480	7730	3990	5820	3300	585	288	207
11	205	266	392	1280	525	7950	3560	5700	3190	550	316	198
12	202	270	348	1020	710	8200	3170	5750	3040	520	360	201
13	199	259	320	800	1150	10000	2990	5880	2910	510	463	204
14	196	256	320	629	3580	15300	2780	5000	2750	515	409	207
15	199	249	340	561	3320	12400	2800	4540	2500	515	392	207
16	205	232	370	548	2430	8660	3000	4290	2210	510	384	214
17	205	225	408	579	1920	6770	3420	4080	2010	525	384	207
18	199	270	416	593	2070	5860	3970	3910	1780	454	380	210
19	192	324	412	579	2850	5610	4630	3960	1520	441	388	210
20	196	440	420	543	2820	4960	4840	3960	1280	423	392	201
21	202	660	420	530	2160	4280	5490	4060	1200	400	409	201
22	202	615	472	507	2290	3820	6370	4220	1210	380	445	224
23	202	498	584	476	3010	3600	6160	4390	1240	376	454	221
24	199	368	570	464	3260	3430	6560	4570	1110	356	490	214
25	205	252	476	472	3700	3200	6440	4830	1010	324	500	217
26	219	277	364	472	4220	3190	6330	4980	926	308	481	214
27	222	280	260	460	4440	3150	6290	5180	860	300	445	217
28	235	300	260	593	3760	3340	5830	5340	890	308	400	221
29	259	328	260	651	---	3640	5220	5350	944	324	360	217
30	364	376	270	579	---	5090	5310	5330	962	328	332	221
31	539	---	290	561	---	7070	---	5350	---	336	312	---
TOTAL	7026	10883	12923	22763	52563	199610	146690	172260	85332	16735	11449	6805
MEAN	227	363	417	734	1877	6439	4890	5557	2844	540	369	227
MAX	539	795	795	2540	4440	15300	9210	9320	6870	932	500	304
MIN	192	225	260	245	344	3150	2780	3910	860	300	277	198
AC-FT	13940	21590	25630	45150	104300	395900	291000	341700	169300	33190	22710	13500
CAL YR 1982	TOTAL	562664	MEAN	1542	MAX	18600	MIN	164	AC-FT	1116000		
WTR YR 1983	TOTAL	745039	MEAN	2041	MAX	15300	MIN	192	AC-FT	1478000		

## OWYHEE RIVER BASIN

13182500 LAKE OWYHEE NEAR NYSSA, OR

LOCATION.--Lat 43°38'30", long 117°14'30", in NW¼ 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<sup>2</sup>, 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.--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.

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 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 contents, 1,131,000 acre-ft June 5, elevation, 2,670.71 ft; minimum, 888,000 acre-ft Oct. 15, elevation, 2,649.96 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 1982 TO SEPTEMBER 1983  
INSTANTANEOUS OBSERVATIONS AT 2400

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2650.83	2651.06	2653.76	2657.00	2662.25	2666.18	2666.63	2666.21	2670.42	2668.81	2663.61	2657.97
2	2650.77	2651.22	2653.84	2657.05	2662.35	2666.23	2667.19	2666.65	2670.42	2668.73	2663.45	2657.81
3	2650.71	2651.34	2653.96	2657.13	2662.44	2666.59	2667.45	2667.23	2670.55	2668.61	2663.20	2657.64
4	2650.65	2651.48	2654.06	2657.22	2662.55	2667.12	2667.48	2667.55	2670.55	2668.54	2663.00	2657.47
5	2650.59	2651.59	2654.21	2657.43	2662.62	2667.65	2667.42	2667.75	2670.69	2668.46	2662.78	2657.28
6	2650.52	2651.69	2654.28	2657.71	2662.72	2667.91	2667.20	2667.96	2670.55	2668.35	2662.54	2657.10
7	2650.44	2651.73	2654.41	2658.06	2662.80	2667.89	2666.94	2668.35	2670.30	2668.23	2662.36	2656.91
8	2650.39	2651.79	2654.57	2658.46	2662.97	2667.85	2666.71	2668.61	2670.00	2668.07	2662.14	2656.71
9	2650.34	2651.87	2654.70	2658.86	2663.03	2667.87	2666.47	2668.75	2670.00	2667.93	2661.94	2656.61
10	2650.29	2651.95	2654.80	2659.25	2663.10	2667.83	2666.26	2668.76	2669.96	2667.79	2661.73	2656.39
11	2650.24	2652.02	2654.89	2659.51	2663.23	2667.97	2666.00	2668.74	2669.95	2667.65	2661.50	2656.26
12	2650.17	2652.10	2655.05	2659.73	2663.38	2668.26	2665.69	2668.73	2669.94	2667.48	2661.27	2656.12
13	2650.09	2652.16	2655.10	2659.91	2663.89	2668.72	2665.34	2668.71	2669.95	2667.32	2661.11	2655.99
14	2650.02	2652.25	2655.18	2660.07	2664.38	2669.49	2664.96	2668.69	2670.00	2667.15	2660.86	2655.80
15	2650.00	2652.29	2655.32	2660.21	2665.18	2670.03	2664.78	2668.51	2670.00	2666.95	2660.64	2655.63
16	2650.03	2652.37	2655.38	2660.32	2665.63	2669.96	2664.80	2668.27	2669.99	2666.77	2660.48	2655.49
17	2650.04	2652.43	2655.53	2660.42	2666.02	2669.44	2664.85	2668.08	2669.99	2666.61	2660.27	2655.31
18	2650.05	2652.57	2655.62	2660.55	2666.22	2668.60	2665.00	2667.89	2669.94	2666.45	2660.06	2655.14
19	2650.08	2652.61	2655.71	2660.72	2666.24	2667.76	2665.04	2667.77	2669.94	2666.26	2659.88	2654.96
20	2650.13	2652.68	2655.84	2660.88	2666.26	2667.12	2665.16	2667.70	2669.89	2666.09	2659.71	2654.78
21	2650.18	2652.78	2656.05	2660.99	2666.10	2667.06	2665.27	2667.64	2669.83	2665.89	2659.58	2654.64
22	2650.24	2652.90	2656.08	2661.13	2665.95	2666.95	2665.59	2667.80	2669.74	2665.67	2659.41	2654.53
23	2650.30	2653.04	2656.25	2661.18	2665.86	2666.79	2665.76	2668.15	2669.61	2665.51	2659.23	2654.38
24	2650.33	2653.17	2656.35	2661.36	2665.85	2666.66	2665.91	2668.59	2669.55	2665.27	2659.12	2654.25
25	2650.40	2653.23	2656.47	2661.44	2665.83	2666.44	2666.06	2669.03	2669.47	2665.06	2658.99	2654.14
26	2650.50	2653.32	2656.58	2661.54	2665.93	2666.17	2666.20	2669.52	2669.29	2664.85	2658.86	2654.00
27	2650.53	2653.39	2656.68	2661.68	2666.06	2665.92	2666.24	2670.00	2669.23	2664.65	2658.73	2653.85
28	2650.58	2653.43	2656.74	2661.72	2666.17	2665.70	2666.30	2670.39	2669.10	2664.45	2658.60	2653.75
29	2650.76	2653.55	2656.82	2661.91	---	2665.50	2666.24	2670.49	2668.95	2664.25	2658.46	2653.59
30	2650.85	2653.64	2656.88	2662.02	---	2665.52	2666.20	2670.42	2668.88	2664.06	2658.28	2653.46
31	2650.94	---	2656.93	2662.16	---	2665.86	---	2670.40	---	2663.80	2658.10	---
MEAN	2650.39	2652.39	2655.42	2659.92	2664.46	2667.39	2666.04	2668.49	2669.89	2666.64	2660.64	2655.60
MAX	2650.94	2653.64	2656.93	2662.16	2666.26	2670.03	2667.48	2670.49	2670.69	2668.81	2663.61	2657.97
MIN	2650.00	2651.06	2653.76	2657.00	2662.25	2665.50	2664.78	2666.21	2668.88	2663.80	2658.10	2653.46
(+)	898400	927700	964400	1025000	1074000	1070000	1074000	1127000	1108000	1045000	977800	925700
(#)	+800	+29300	+36700	+60600	+49000	-4000	+4000	+53000	-19000	-63000	-67200	-52100

CAL YR 1982 MEAN 2658.70 MAX 2670.12 MIN 2640.28 AC-FT# +175600  
WTR YR 1983 MEAN 2661.42 MAX 2670.69 MIN 2650.00 AC-FT# +28100

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

# Change in contents, in acre-feet.

OWYHEE RIVER BASIN

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13183000 OWYHEE RIVER BELOW OWYHEE DAM, OR

LOCATION.--Lat 43°39'17", long 117°15'16", in SE¼ 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<sup>2</sup>, 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 National Geodetic Vertical Datum of 1929 (levels by Bureau of Reclamation).

REMARKS.--Records good. Flow regulated since October 1932 by Lake Owyhee (see station 13182500), and by many smaller reservoirs. Diversion of 438,500 acre-ft from Lake Owyhee during the year for irrigation of lands below station and outside the basin. Many smaller diversions above Lake Owyhee for irrigation above station.

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

AVERAGE DISCHARGE.--51 years (water years 1933-83), 380 ft<sup>3</sup>/s, 275,300 acre-ft/yr, not adjusted for storage or diversion.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 22,900 ft<sup>3</sup>/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, 12,800 ft<sup>3</sup>/s Mar. 15, gage height, 12.46 ft; minimum recorded, 2.7 ft<sup>3</sup>/s Nov. 22-28, Dec. 1, but may have been less during period of ice effect.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1982 TO SEPTEMBER 1983  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	134	3.2	2.9	3.3	9.8	3930	5240	4590	4100	183	160	188
2	134	3.1	3.1	3.3	9.8	4030	5230	4840	4380	178	158	185
3	134	3.1	3.2	3.3	11	4500	5420	4980	4710	178	155	188
4	136	3.0	3.1	3.3	12	6590	5780	4620	4750	180	158	185
5	136	3.1	3.2	3.3	12	7980	5530	4410	4810	183	155	185
6	136	3.1	3.3	4.5	12	7880	5340	4540	4830	188	155	185
7	126	3.1	3.0	6.0	12	7960	5180	4590	4810	188	153	185
8	118	3.0	3.0	6.8	13	7920	4990	4840	4430	188	153	175
9	118	3.0	3.0	6.5	12	7980	4890	4840	2190	188	153	163
10	120	3.0	3.0	5.8	12	8020	5040	4830	2080	188	153	160
11	120	3.0	3.0	5.4	13	9360	5210	4830	1940	183	150	160
12	120	3.0	3.0	5.4	13	8620	5200	4860	1510	178	150	165
13	120	3.0	2.8	5.4	14	9000	4950	4860	1100	178	153	160
14	120	2.9	2.8	5.4	14	9120	5080	4830	895	183	153	150
15	120	2.9	3.2	5.4	14	10600	3130	4810	1030	188	153	143
16	120	2.9	3.3	5.4	14	11300	2150	4680	984	185	153	138
17	120	3.0	3.3	5.4	229	11300	2190	4260	765	185	170	140
18	120	3.0	3.2	5.4	1520	11300	2570	3890	476	183	183	138
19	110	2.9	3.3	5.4	2380	11100	3010	3560	256	180	185	138
20	10	2.9	3.3	8.8	3220	9080	3390	3200	229	183	185	140
21	5.0	3.0	3.4	8.3	3820	5120	3570	2900	208	180	185	163
22	3.5	2.9	3.4	8.3	3710	4890	3820	1760	211	180	188	140
23	3.3	2.9	3.7	8.0	3710	4580	4330	576	211	180	188	130
24	3.3	2.7	3.3	8.0	3670	4750	4550	316	211	180	185	126
25	3.3	2.7	3.3	7.5	3670	4960	4740	265	208	178	185	126
26	3.4	2.7	3.3	7.8	3720	5040	4920	274	208	178	185	126
27	3.2	2.7	3.3	8.8	3770	4990	4920	277	196	173	185	126
28	3.2	2.9	3.3	9.3	3690	4990	4930	1160	183	170	185	128
29	4.7	2.9	3.3	9.0	---	5070	4840	3780	183	170	185	128
30	3.7	2.9	3.3	9.0	---	5160	4750	3800	183	173	185	116
31	3.2	---	3.3	9.3	---	5080	---	3850	---	173	185	---
TOTAL	2411.8	88.5	98.9	196.8	37306.6	221200	134890	109818	52277	5603	5229	4580
MEAN	77.8	2.95	3.19	6.35	1332	7135	4496	3543	1743	181	169	153
MAX	136	3.2	3.7	9.3	3820	11300	5780	4980	4830	188	188	188
MIN	3.2	2.7	2.8	3.3	9.8	3930	2150	265	183	170	150	116
AC-FT	4780	176	196	390	74000	438800	267600	217800	103700	11110	10370	9080
MEAN†	334	495	600	992	2215	7071	5043	5604	2924	598	434	282
AC-FT†	20520	29480	36900	60990	123000	434800	300100	344600	174000	36770	26710	16760
CAL YR 1982	TOTAL	306759.8	MEAN	840	MAX	7530	MIN	1.7	AC-FT	608500		
WTR YR 1983	TOTAL	573699.6	MEAN	1572	MAX	11300	MIN	2.7	AC-FT	1138000		

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



## OWYHEE RIVER BASIN

13184000 OWYHEE RIVER AT OWYHEE, OR  
(National stream-quality accounting network station)

LOCATION.--Lat 43°46'57", long 117°03'30", in SE¼SE¼ sec.35, T.20 S., R.46 E., Malheur County, Hydrologic Unit 17050110, on left bank 0.3 mi upstream from State Highway 201 bridge, 0.9 mi southwest of Owyhee, and at mile 3.1.

DRAINAGE AREA.--11,300 mi<sup>2</sup>, approximately.

## WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--March 1890 to June 1891, February to June 1892, February to July, October to December 1893, January 1895 to May 1897, August 1903 to September 1916, May 1920 to July 1929, July 1979 to current year. Monthly discharge only for some periods published in WSP 1317. Published as "at Rigsby", 1890-93, "at Nyssa", 1895-96 and as "at Owyhee" in WSP 370. Records for September, October 1903, May to October 1904, March, April 1905, published in WSP 135 in conjunction with records for Owyhee River near Owyhee and in WSP 370, have been found in error and should not be used.

REVISED RECORDS.--WSP 1317: 1890-91, 1904, 1909-11, 1929, drainage area.

GAGE.--Water-stage recorder. Altitude of gage is 2,190 ft, from topographic map.

REMARKS.--Water-discharge records good. Flow regulated since October 1932 by Lake Owyhee (see station 13182500), and smaller reservoirs. Diversions from Lake Owyhee for irrigation of lands above station and outside the basin. Many smaller diversions above Lake Owyhee for irrigation.

AVERAGE DISCHARGE.--20 years (water years 1896, 1904-16, 1922-27), 1,048 ft<sup>3</sup>/s, 759,300 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 29,000 ft<sup>3</sup>/s Mar. 2, 1910, gage height, 12.9 ft, site and datum then in use, from rating curve extended above 14,000 ft<sup>3</sup>/s; no flow July 7, 19, Aug. 14-16, 1924, July 5, 6, 1926. Maximum discharge recorded since construction of Owyhee Dam in 1932, 12,100 ft<sup>3</sup>/s Mar. 17, 1983, gage height, 13.46 ft, from floodmark.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 12,100 ft<sup>3</sup>/s Mar. 17, gage height, 13.46 ft, from floodmark; minimum, 39 ft<sup>3</sup>/s Oct. 21.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1982 TO SEPTEMBER 1983  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	61	58	53	53	64	4170	5310	4900	4000	127	97	76
2	56	55	52	54	63	4150	5230	4840	4260	136	92	84
3	54	54	55	55	63	4410	5370	5140	4720	119	88	83
4	55	53	53	56	63	4400	5660	4910	4820	112	90	85
5	54	54	53	56	63	5220	5640	4600	4860	107	88	85
6	54	54	62	57	64	7470	5390	4690	4890	100	87	87
7	53	53	57	68	65	7870	5360	4720	4910	104	87	87
8	51	53	54	75	65	7810	5120	4930	4870	109	87	84
9	50	53	53	68	65	7910	5000	5010	2800	112	86	82
10	48	52	49	61	65	7850	5100	4990	2230	122	85	78
11	49	52	49	58	65	8140	5240	4980	2070	121	87	76
12	52	52	49	59	65	8400	5250	4940	1840	119	87	72
13	54	53	51	59	66	8940	5100	5060	1270	106	87	69
14	55	52	51	59	80	10000	5120	5000	1010	108	95	66
15	56	52	54	58	81	11000	4350	4900	987	110	94	59
16	48	52	61	58	71	11800	2470	4950	1050	111	88	59
17	44	53	64	59	70	11900	2500	4510	863	109	82	60
18	43	53	60	59	70	11900	2710	4110	664	107	82	64
19	42	53	59	69	1570	11700	3210	3760	283	106	100	61
20	42	52	58	83	2690	11300	3540	3430	206	101	110	59
21	50	53	58	77	3550	5690	3730	3040	163	104	110	60
22	57	52	62	69	4140	5140	3950	2340	157	105	107	69
23	56	52	69	68	4200	4890	4290	1010	148	109	115	65
24	54	50	61	69	4080	4730	4710	387	142	116	89	56
25	54	50	58	67	4120	5110	4780	267	137	110	88	56
26	54	50	57	67	4070	5160	5020	232	137	103	88	55
27	52	50	56	67	4090	5130	5120	228	139	102	79	54
28	53	52	54	65	4110	5100	5050	227	134	102	76	54
29	72	54	54	66	---	5180	5050	3240	123	101	79	57
30	82	54	53	66	---	5220	4960	3650	126	101	81	57
31	67	---	53	65	---	5190	---	3840	---	97	75	---
TOTAL	1672	1580	1732	1970	37828	222880	139330	112831	54009	3396	2786	2059
MEAN	53.9	52.7	55.9	63.5	1351	7190	4644	3640	1800	110	89.9	68.6
MAX	82	58	69	83	4200	11900	5660	5140	4910	136	115	87
MIN	42	50	49	53	63	4150	2470	227	123	97	75	54
AC-FT	3320	3130	3440	3910	75030	442100	276400	223800	107100	6740	5530	4080
CAL YR 1982	TOTAL	315046	MEAN	863	MAX	7470	MIN	42	AC-FT	624900		
WTR YR 1983	TOTAL	582073	MEAN	1595	MAX	11900	MIN	42	AC-FT	1155000		

NOTE.--No gage-height record Mar. 14-17.

## OWYHEE RIVER BASIN

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13184000 OWYHEE RIVER AT OWYHEE, OR--Continued

## WATER-QUALITY RECORDS

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

PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: March 1980 to September 1982.

WATER TEMPERATURES: July 1979 to September 1982.

## WATER QUALITY DATA, WATER YEAR OCTOBER 1982 TO SEPTEMBER 1983

DATE	TIME	STREAM- FLOW, INSTAN- TANEOUS (CFS)	SPE- CIFIC CON- DUCT- ANCE (UMHOS)	PH (STAND- ARD UNITS)	TEMPER- ATURE (DEG C)	OXYGEN, DIS- SOLVED (MG/L)	COLI- FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)	STREP- TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML)	HARD- NESS AS CAC03)	CALCIUM DIS- SOLVED (MG/L AS CA)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG)
DEC 06...	1410	62	1170	8.2	7.5	10.5	†600	--	300	82	23
JAN 31...	1325	61	1120	7.8	5.0	12.2	K190	3000	300	82	23
MAR 28...	1440	5070	222	8.2	8.0	--	--	--	62	17	4.6
MAY 23...	1355	884	223	8.0	17.5	7.9	K78	630	65	18	4.8
JUL 19...	1330	110	586	8.3	21.0	8.6	800	3100	160	44	11
SEP 13...	1300	71	724	8.3	18.0	E10.8	940	6900	210	59	15

DATE	SODIUM, DIS- SOLVED (MG/L AS NA)	POTAS- SIUM, DIS- SOLVED (MG/L AS K)	ALKA- LITY FIELD (MG/L AS CAC03)	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)	NITRO- GEN,AM- MONIA + ORGANIC TOTAL (MG/L AS N)	PHOS- PHATE, ORTHO, DIS- SOLVED (MG/L AS PO4)
DEC 06...	140	15	300	250	49	1.4	.110	3.30	2.9	.46
JAN 31...	150	9.1	280	280	46	1.4	.070	3.40	.80	.21
MAR 28...	20	3.5	79	19	7.8	.70	.270	.330	.70	.25
MAY 23...	21	3.0	74	32	7.3	.50	.170	.330	.90	.12
JUL 19...	61	6.9	170	99	20	.80	.120	1.60	1.1	.21
SEP 13...	66	8.7	210	150	29	.80	.150	1.90	1.1	.21

## OWHYEE RIVER BASIN

13184000 OWYHEE RIVER AT OWYHEE, OR--Continued

## WATER QUALITY DATA, WATER YEAR OCTOBER 1982 TO SEPTEMBER 1983

DATE	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- PENDE (MG/L)	SEDI- MENT, DIS- CHARGE, SUS- PENDE (T/DAY)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM
DEC 06...	.180	.410	44	805	790	134	70	124	21	98
JAN 31...	.070	.130	45	774	800	128	16	52	8.6	56
MAR 28...	.070	.120	23	141	140	1930	28	--	--	--
MAY 23...	.060	.140	25	157	160	375	33	--	--	--
JUL 19...	.080	.140	30	377	380	112	70	--	--	--
SEP 13...	.060	.130	37	493	510	95	32	--	--	--

DATE	ALUM- INUM, DIS- SOLVED (UG/L AS AL)	ARSENIC, DIS- SOLVED (UG/L AS AS)	BARIUM, DIS- SOLVED (UG/L AS BA)	BERYL- LIUM, DIS- SOLVED (UG/L AS BE)	CADMIUM, DIS- SOLVED (UG/L AS CD)	CHRO- MIUM, DIS- SOLVED (UG/L AS CR)	COBALT, DIS- SOLVED (UG/L AS CO)	COPPER, DIS- SOLVED (UG/L AS CU)	IRON, DIS- SOLVED (UG/L AS FE)	LEAD, DIS- SOLVED (UG/L AS PB)
DEC 06...	70	47	58	<1	<1	<1	<3	3	40	1
MAR 28...	310	5	26	<1	<1	<1	<3	3	160	3
MAY 23...	440	5	29	<1	<1	<1	<3	5	130	1
SEP 13...	50	23	52	1	<1	<1	<3	4	<3	1

DATE	LITHIUM, DIS- SOLVED (UG/L AS LI)	MANGA- NESE, DIS- SOLVED (UG/L AS MN)	MERCURY, DIS- SOLVED (UG/L AS HG)	MOLYB- DENUM, DIS- SOLVED (UG/L AS MO)	NICKEL, DIS- SOLVED (UG/L AS NI)	SELE- NIUM, DIS- SOLVED (UG/L AS SE)	SILVER, DIS- SOLVED (UG/L AS AG)	STRON- TIUM, DIS- SOLVED (UG/L AS SR)	VANA- DIUM, DIS- SOLVED (UG/L AS V)	ZINC, DIS- SOLVED (UG/L AS ZN)
DEC 06...	100	58	.1	20	2	4	<1	320	26	30
MAR 28...	16	6	<.1	<10	2	<1	<1	83	6	12
MAY 23...	10	35	<.1	<10	1	<1	1	86	<6	10
SEP 13...	63	36	<.1	10	6	3	<1	240	19	8

E - Estimated value, based on values reported by Denver Central Laboratory.

K - Results based on colony count outside acceptable range (non-ideal colony count).

## 13214000 MALHEUR RIVER NEAR DREWSEY, OR

LOCATION.--Lat 43°47'05", long 118°19'50", in NE¼SE¼ 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<sup>2</sup>, 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 (21 km) 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 National Geodetic Vertical Datum of 1929. Prior to Apr. 27, 1923, water-stage recorder on 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.--Records good except those for May 18 to Aug. 3, which are fair. Slight regulation by small reservoirs above station. Diversions for irrigation above station.

AVERAGE DISCHARGE.--57 years (water years 1927-83), 189 ft<sup>3</sup>/s, 136,900 acre-ft/yr.

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

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 800 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Jan. 7	2100	1,450	7.01	Mar. 14	0300	2,570	9.02
Feb. 13	0930	1,260	6.56	Mar. 31	0300	2,210	8.46
Feb. 18	2300	1,560	7.23	Apr. 22	1800	1,650	7.42
Feb. 23	0500	1,500	7.10	June 1	1130	1,140	6.26
Mar. 4	1600	*3,690	*10.32				

Minimum, 14 ft<sup>3</sup>/s July 29.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1982 TO SEPTEMBER 1983  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	90	132	110	64	192	1240	1310	1420	1100	266	35	67
2	89	120	96	64	184	1440	1340	1440	980	513	33	65
3	83	104	105	64	158	1470	1230	1450	845	404	29	64
4	86	104	150	120	130	2850	1100	1450	744	299	29	63
5	94	104	200	181	134	2270	1030	1500	660	238	28	60
6	104	102	160	587	154	1620	1010	1600	604	204	27	59
7	98	102	135	1070	158	1550	1030	1500	548	184	26	54
8	94	96	115	1020	170	1550	1060	1390	520	188	26	32
9	90	89	90	576	170	1660	1070	1320	516	182	26	31
10	90	94	82	429	230	1740	1050	1220	492	176	26	32
11	89	84	82	355	439	1860	884	1120	541	172	25	35
12	86	86	94	296	583	1710	810	996	516	168	25	37
13	86	74	112	215	1170	2040	765	928	397	152	25	42
14	86	77	124	198	768	2290	737	904	317	140	25	50
15	84	65	130	188	667	1680	740	880	287	146	25	52
16	86	75	136	186	828	1440	789	877	275	150	25	52
17	84	102	215	202	726	1340	888	824	266	148	29	53
18	89	124	183	204	1240	1260	988	775	253	140	32	54
19	89	204	166	202	1100	1130	1040	800	255	122	32	56
20	89	136	156	208	733	1060	1160	793	250	108	34	56
21	89	114	299	198	796	1030	1370	803	233	100	37	56
22	94	106	515	188	1180	1000	1590	835	233	94	42	58
23	92	70	320	182	1340	972	1630	870	210	80	52	59
24	96	64	250	196	1160	912	1630	859	206	75	65	63
25	96	64	204	225	1110	896	1630	884	200	67	74	64
26	104	80	125	210	1260	775	1540	896	184	62	78	65
27	136	95	80	258	980	772	1470	908	186	56	77	65
28	112	120	64	266	984	817	1430	908	186	49	74	67
29	126	150	64	228	---	758	1390	892	194	40	71	67
30	166	130	64	204	---	1520	1390	888	213	22	70	68
31	152	---	64	184	---	1820	---	928	---	32	68	---
TOTAL	3049	3067	4690	8768	18744	44472	35101	32858	12411	4777	1270	1646
MEAN	98.4	102	151	283	669	1435	1170	1060	414	154	41.0	54.9
MAX	166	204	515	1070	1340	2850	1630	1600	1100	513	78	68
MIN	83	64	64	64	130	758	737	775	184	22	25	31
AC-FT	6050	6080	9300	17390	37180	88210	69620	65170	24620	9480	2520	3260
CAL YR 1982	TOTAL	149867.1	MEAN	411	MAX	4030	MIN	9.1	AC-FT	297300		
WTR YR 1983	TOTAL	170853	MEAN	468	MAX	2850	MIN	22	AC-FT	338900		

## MALHEUR RIVER BASIN

## 13214500 WARMSPRINGS RESERVOIR NEAR RIVERSIDE, OR

LOCATION.--Lat 43°35'07", long 118°12'30", on line between NW¼SW¼ and SW¼SW¼ 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<sup>2</sup>, 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 National Geodetic Vertical Datum of 1929 (levels by Bureau of Reclamation); gage readings have been reduced to elevations NGVD. Prior to May 29, 1964, nonrecording gage read daily or weekly.

REMARKS.--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, 191,700 acre-ft May 31, elevation, 3,406.15 ft; minimum, 125,700 acre-ft Sept. 30, elevation, 3,390.30 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 1982 TO SEPTEMBER 1983  
INSTANTANEOUS OBSERVATIONS AT 2400

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3393.47	3393.58	3395.23	3394.37	3393.82	3394.77	3402.24	3403.72	3406.07	3403.66	3398.18	3392.37
2	3393.44	3393.64	3395.31	3394.13	3393.78	3395.17	3402.24	3403.74	3405.99	3403.64	3397.93	3392.30
3	3393.41	3393.70	3395.37	3394.05	3393.73	3395.57	3402.13	3403.80	3405.92	3403.64	3397.69	3392.25
4	3393.39	3393.75	3395.48	3394.05	3393.65	3397.04	3401.89	3403.85	3405.90	3403.58	3397.43	3392.19
5	3393.36	3393.79	3395.64	3394.17	3393.56	3398.03	3401.66	3403.98	3405.88	3403.51	3397.17	3392.13
6	3393.35	3393.85	3395.88	3394.38	3393.51	3398.60	3401.64	3404.24	3405.87	3403.35	3396.90	3392.08
7	3393.33	3393.90	3396.03	3394.79	3393.44	3399.18	3401.73	3404.31	3405.89	3403.21	3396.64	3392.03
8	3393.31	3393.95	3396.11	3395.15	3393.40	3399.46	3401.83	3404.29	3405.92	3403.03	3396.38	3391.95
9	3393.30	3394.00	3396.16	3395.16	3393.37	3399.71	3401.98	3404.18	3405.93	3402.88	3396.12	3391.86
10	3393.28	3394.05	3396.21	3395.03	3393.43	3400.02	3402.09	3404.16	3405.95	3402.72	3395.87	3391.77
11	3393.25	3394.09	3396.28	3394.88	3393.55	3400.48	3402.10	3404.24	3405.98	3402.56	---	3391.69
12	3393.23	3394.14	3396.36	3394.68	3393.66	3400.81	3402.12	3404.32	3406.01	3402.40	---	3391.62
13	3393.21	3394.17	3396.39	3394.55	3394.15	3401.41	3402.23	3404.34	3405.97	3402.21	---	3391.55
14	3393.20	3394.21	3396.37	3394.42	3394.23	3402.03	3402.42	3404.62	3405.89	3402.02	---	3391.48
15	3393.18	3394.24	3396.36	3394.29	3394.14	3401.94	3402.55	3405.05	3405.82	3401.83	---	3391.41
16	3393.17	3394.28	3396.38	3394.17	3394.19	3401.68	3402.64	3405.24	3405.75	3401.62	3394.52	3391.33
17	3393.14	3394.34	3396.38	3394.12	3394.18	3401.45	3402.65	3405.27	3405.63	3401.45	3394.30	3391.24
18	3393.13	3394.44	3396.35	3394.12	3394.42	3401.24	3402.71	3405.30	3405.52	3401.27	3394.09	3391.14
19	3393.10	3394.54	3396.32	3394.12	3394.59	3400.96	3402.76	3405.41	3405.39	3401.05	3393.88	3391.02
20	3393.09	3394.62	3396.32	3394.11	3394.33	3400.63	3402.85	3405.55	3405.27	3400.90	3393.69	3390.93
21	3393.08	3394.68	3396.28	3394.08	3394.04	3400.28	3403.05	3405.65	3405.14	3400.70	3393.52	3390.85
22	3393.08	3394.73	3396.37	3394.03	3394.17	3399.92	3403.28	3405.75	3405.01	3400.47	3393.34	3390.77
23	3393.08	3394.77	3396.27	3394.00	3394.47	3399.68	3403.46	3405.82	3404.86	3400.26	3393.21	3390.71
24	3393.08	3394.80	3396.10	3393.97	3394.52	3399.48	3403.67	3405.88	3404.71	3400.05	3393.08	3390.65
25	3393.12	3394.83	3395.92	3393.97	3394.54	3399.50	3403.86	3405.95	3404.55	3399.82	3393.01	3390.59
26	3393.18	3394.87	3395.73	3393.95	3394.67	3399.78	3403.92	3406.01	3404.40	3399.59	3392.95	3390.55
27	3393.20	3394.91	3395.53	3393.93	3394.52	3400.05	3403.91	3406.06	3404.24	3399.36	3392.85	3390.47
28	3393.26	3394.97	3395.29	3393.95	3394.50	3400.30	3403.82	3406.06	3404.07	3399.14	3392.76	3390.41
29	3393.36	3395.08	3395.05	3393.95	---	3400.53	3403.75	3406.03	3403.90	3398.92	3392.66	3390.36
30	3393.44	3395.16	3394.83	3393.92	---	3401.19	3403.70	3406.05	3403.75	3398.64	3392.54	3390.30
31	3393.52	---	3394.60	3393.87	---	3402.03	---	3406.13	---	3398.42	3392.45	---
MEAN	3393.25	3394.34	3395.90	3394.27	3394.02	3399.77	3402.70	3405.00	3405.37	3401.48	---	3391.33
MAX	3393.52	3395.16	3396.39	3395.16	3394.67	3402.03	3403.92	3406.13	3406.07	3403.66	---	3392.37
MIN	3393.08	3393.58	3394.60	3393.87	3393.37	3394.77	3401.64	3403.72	3403.75	3398.42	---	3390.30
(†)	137900	144400	142200	139300	141800	173200	180600	191600	180800	157800	133800	125700
(‡)	+100	+6500	-2200	-2900	+2500	+31400	+7400	+11000	-10800	-23000	-24000	-8100

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

‡ Change in contents, in acre-feet.

## MALHEUR RIVER BASIN

75

## 13215000 MALHEUR RIVER BELOW WARMSPRINGS RESERVOIR, NEAR RIVERSIDE, OR

LOCATION.--Lat 43°34'29", long 118°12'31", on line between NW¼SW¼ and SW¼NW¼ sec.17, T.23 S., R.37 E., Malheur County, Hydrologic Unit 17050116, on left bank 0.9 mi downstream from Warm Springs Dam, 3.0 mi upstream from South Fork, 4.0 mi northwest of Riverside, and at mile 113.0.

DRAINAGE AREA.--1,100 mi<sup>2</sup>, 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 Warm Springs reservoir site, near Riverside 1914-17.

REVISED RECORDS.--WSP 333: 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. Altitude of gage is 3,305 ft, by barometer. See WSP 1317 or 1737 for history of changes prior to Sept. 29, 1949.

REMARKS.--Records excellent. Flow completely regulated since November 1919 by Warm Springs Reservoir (see station 13214500). Diversions for irrigation above station.

AVERAGE DISCHARGE.--64 years (water years 1920-83), 186 ft<sup>3</sup>/s, 134,800 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge observed, 7,200 ft<sup>3</sup>/s Mar. 1, 1910, gage height, 10.7 ft, site and datum then in use, from rating curve extended above 820 ft<sup>3</sup>/s; no flow at times.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 2,630 ft<sup>3</sup>/s Mar. 15, gage height, 8.91 ft; no flow Nov. 15.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1982 TO SEPTEMBER 1983  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	129	.25	.05	461	277	1010	1230	1860	1410	466	484	219
2	132	.25	.05	461	277	1120	1600	1860	1290	421	479	198
3	132	.20	.08	273	277	1430	1690	1740	1000	403	488	151
4	132	.20	.05	130	277	1750	1690	1700	735	403	497	126
5	132	.20	.08	130	277	1760	1560	1610	613	416	497	126
6	120	.16	.12	282	277	1180	1100	1700	502	452	493	130
7	115	.12	.08	543	277	866	885	1870	430	470	497	126
8	123	.12	.08	646	277	1370	885	1870	407	470	497	139
9	129	.12	.08	651	210	1790	885	1860	394	470	497	172
10	129	.08	.08	646	177	1800	885	1550	398	470	484	177
11	129	.08	.08	646	308	1800	885	1070	398	470	466	172
12	129	.05	.08	646	470	1810	726	913	398	488	461	172
13	117	.05	47	502	735	1840	443	913	448	511	448	172
14	112	.03	181	421	843	2320	344	317	443	506	443	172
15	112	.00	189	421	843	2590	407	7.0	425	502	443	172
16	112	.03	189	421	843	2370	557	511	425	502	439	185
17	112	.03	227	313	843	2110	810	810	448	502	434	206
18	112	.08	248	235	950	1950	890	716	475	488	434	214
19	112	.20	248	235	1220	1830	1060	571	484	470	430	214
20	112	.08	248	248	1330	1800	1150	511	484	466	416	214
21	112	.05	380	269	1320	1800	1310	613	484	493	403	202
22	96	.05	443	277	1120	1800	1700	660	484	515	389	193
23	84	.03	466	277	1220	1500	1840	744	506	497	322	193
24	84	.03	466	265	1330	1330	1860	805	515	484	277	193
25	31	.03	466	256	1330	871	1860	805	515	493	269	189
26	.05	.03	466	269	1330	214	1860	847	515	497	227	189
27	.12	.05	466	277	1500	193	1860	871	515	484	198	172
28	.30	.05	466	277	1230	317	1860	964	515	470	198	164
29	.35	.12	466	277	---	317	1860	997	515	475	223	164
30	.35	.08	466	277	---	744	1860	913	502	479	256	164
31	.25	---	461	277	---	1070	---	1100	---	479	252	---
TOTAL	2840.42	2.85	6589.91	11309	21368	44652	37552	33278.0	16673	14712	12341	5280
MEAN	91.6	.09	213	365	763	1440	1252	1073	556	475	398	176
MAX	132	.25	466	651	1500	2590	1860	1870	1410	515	497	219
MIN	.05	.00	.05	130	177	193	344	7.0	394	403	198	126
AC-FT	5630	5.7	13070	22430	42380	88570	74480	66010	33070	29180	24480	10470
CAL YR 1982	TOTAL 153742.35	MEAN	421	MAX	2660	MIN	.00	AC-FT	304900			
WTR YR 1983	TOTAL 206598.18	MEAN	566	MAX	2590	MIN	.00	AC-FT	409800			



## MALHEUR RIVER BASIN

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

LOCATION.--Lat 43°57'01", long 118°10'28", in NW¼ sec.4, T.19 S., R.37 E., Malheur County, Hydrologic Unit 17050116, on left bank 500 ft upstream from Beulah Reservoir, 2.5 mi upstream from Warm Springs Creek, 3.5 mi northwest of Beulah, and at mile 18.0.

DRAINAGE AREA.--355 mi<sup>2</sup>.

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. Datum of gage is 3,349.4 ft National Geodetic Vertical Datum of 1929. 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 present site at datum 1.6 ft higher.

REMARKS.--Records good except those for March to May, which are fair. No regulation. Diversions for irrigation above station.

AVERAGE DISCHARGE.--47 years (water years 1937-83), 135 ft<sup>3</sup>/s, 97,810 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 3,970 ft<sup>3</sup>/s Dec. 23, 1964, gage height, 9.90 ft, present datum, from floodmark, from rating curve extended above 1,300 ft<sup>3</sup>/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<sup>3</sup>/s Dec. 13, 1967, result of freezeup.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 500 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Jan. 7	1930	unknown	*a7.64	Mar. 30	0730	1,090	5.69
Feb. 25	2200	580	4.13	Apr. 24	0200	1,070	5.65
Mar. 4	0930	1,410	6.27	May 5	0930	1,120	5.72
Mar. 13	1930	*1,760	6.91	May 31	2100	1,200	5.66

Minimum, 25 ft<sup>3</sup>/s Nov. 23.

a Ice jam.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1982 TO SEPTEMBER 1983  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	76	84	84	50	102	403	636	865	1090	192	84	83
2	75	78	80	54	80	616	712	901	984	268	80	79
3	74	78	103	58	78	520	604	918	855	224	79	70
4	80	80	157	65	57	1100	552	918	750	192	79	68
5	80	79	137	80	54	668	528	1040	660	176	78	70
6	76	80	201	150	58	520	512	1010	588	165	74	70
7	79	75	102	600	70	584	520	934	536	156	71	69
8	79	69	56	500	91	632	536	855	496	150	76	70
9	80	68	52	200	93	708	532	760	488	149	76	70
10	76	78	50	150	97	835	508	668	457	147	75	70
11	74	68	50	133	117	1020	457	588	488	142	82	71
12	73	62	50	117	137	810	439	536	436	137	75	71
13	70	76	50	108	221	1340	418	504	397	133	71	70
14	73	51	55	108	147	1200	403	492	358	128	69	70
15	71	60	70	97	157	890	394	476	331	125	69	70
16	75	80	82	90	197	760	406	468	308	121	73	70
17	73	88	91	90	170	708	439	454	295	120	71	69
18	73	154	80	95	340	648	488	460	298	117	71	69
19	73	128	79	105	265	584	536	496	290	115	69	71
20	70	90	79	105	217	548	632	524	278	112	71	74
21	73	79	128	105	313	524	810	592	263	108	71	76
22	74	73	161	102	367	512	962	664	243	105	84	74
23	76	40	111	100	376	488	1010	692	221	99	91	73
24	78	40	79	105	364	480	1020	728	212	96	87	71
25	75	42	62	91	397	464	962	800	203	93	82	70
26	100	46	58	105	376	442	875	865	192	91	76	70
27	88	60	54	117	319	468	800	934	190	90	73	75
28	79	88	52	111	340	445	740	962	188	88	71	73
29	109	102	50	109	---	472	760	978	184	88	70	71
30	109	90	50	100	---	934	820	978	184	87	69	71
31	91	---	50	87	---	720	---	1070	---	85	69	---
TOTAL	2452	2286	2563	4087	5600	21043	19011	23130	12463	4099	2336	2148
MEAN	79.1	76.2	82.7	132	200	679	634	746	415	132	75.4	71.6
MAX	109	154	201	600	397	1340	1020	1070	1090	268	91	83
MIN	70	40	50	50	54	403	394	454	184	85	69	68
AC-FT	4860	4530	5080	8110	11110	41740	37710	45880	24720	8130	4630	4260
CAL YR 1982	TOTAL	99459	MEAN	272	MAX	1940	MIN	35	AC-FT	197300		
WTR YR 1983	TOTAL	101218	MEAN	277	MAX	1340	MIN	40	AC-FT	200800		

## MALHEUR RIVER BASIN

77

## 13217000 BEULAH RESERVOIR AT BEULAH, OR

LOCATION.--Lat 43°54'41", long 118°09'25", in SW¼ 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<sup>2</sup>, 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 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, 60,700 acre-ft June 1, gage height, 3,340.41 ft; minimum, 18,160 acre-ft Oct. 21, gage height, 3,311.20 ft.

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

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

GAGE HEIGHT (FEET ABOVE DATUM), WATER YEAR OCTOBER 1982 TO SEPTEMBER 1983  
INSTANTANEOUS OBSERVATIONS AT 2400

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3312.70	---	3317.25	3322.65	3330.27	3337.04	3339.21	3340.05	3340.34	3338.67	3333.33	3324.32
2	3312.64	---	3317.41	3322.79	3330.39	3337.57	3339.34	3339.93	3340.23	3338.65	3333.09	3324.03
3	3312.55	---	3317.63	3322.95	3330.49	3337.84	3339.15	3339.61	3339.98	3338.59	3332.84	3323.73
4	3312.49	---	3317.91	3323.16	3330.58	3338.49	3338.87	3339.31	3339.78	3338.53	3332.57	3323.41
5	3312.29	---	3318.20	3323.38	3330.69	3338.03	3338.56	3339.20	3339.73	3338.48	3332.30	3323.08
6	3312.21	---	3318.58	3323.93	3330.84	3337.47	3338.40	3339.07	3339.88	3338.35	3332.06	3322.75
7	3312.13	---	3318.80	3324.92	3330.99	3337.08	3338.35	3338.77	3340.00	3338.23	3331.77	3322.42
8	3312.09	---	3319.10	3325.68	3331.15	3336.75	3338.32	3338.40	3340.01	3338.07	3331.52	3322.07
9	3312.02	---	3319.26	3326.08	3331.30	3336.62	3338.28	3338.28	3339.99	3337.92	3331.24	3321.71
10	3311.96	---	3319.36	3326.39	3331.46	3336.62	3338.20	3338.27	3339.90	3337.83	3330.92	3321.37
11	3311.87	---	3319.46	3326.61	3331.64	3336.72	3338.21	3338.13	3340.00	3337.69	3330.61	3321.04
12	3311.72	---	3319.61	3326.82	3331.90	3336.63	3338.24	3338.16	3340.04	3337.51	3330.30	3320.70
13	3311.60	---	3319.74	3327.01	3332.32	3337.28	3338.31	3338.30	3340.07	3337.32	3330.00	3320.36
14	3311.54	---	3319.95	3327.19	3332.58	3337.49	3338.35	3338.40	3340.03	3337.03	3329.68	3320.00
15	3311.50	---	3320.13	3327.39	3332.87	3337.27	3338.39	3338.42	3339.99	3336.82	3329.36	3319.65
16	3311.46	---	3320.31	3327.55	3333.22	3337.06	3338.45	3338.55	3339.98	3336.61	3329.07	3319.29
17	3311.36	---	3320.48	3327.74	3333.53	3336.83	3338.55	3338.70	3339.89	3336.42	3328.77	3318.93
18	3311.30	---	3320.63	3327.92	3334.20	3336.98	3338.69	3338.82	3339.86	3336.23	3328.46	3318.55
19	3311.27	---	3320.78	3328.12	3334.57	3336.26	3338.90	3339.02	3339.82	3336.00	3328.13	3318.18
20	3311.24	---	3320.97	3328.29	3334.81	3335.90	3339.31	3339.28	3339.76	3335.90	3327.84	3317.81
21	---	---	3321.29	3328.46	3335.23	3335.68	3339.83	3339.61	3339.73	3335.72	3327.54	3317.43
22	---	---	3321.63	3328.62	3335.55	3335.71	3340.04	3340.04	3339.65	3335.53	3327.26	3317.08
23	---	---	3321.83	3328.80	3335.85	3335.83	3340.06	3340.06	3339.50	3335.34	3327.02	3316.72
24	---	---	3321.95	3328.97	3336.12	3335.94	3340.04	3339.93	3339.41	3335.11	3326.77	3316.39
25	---	---	3322.06	3329.14	3336.42	3336.01	3339.97	3339.90	3339.32	3334.88	3326.49	3316.11
26	---	3316.34	3322.19	3329.32	3336.67	3336.08	3339.82	3339.95	3339.16	3334.65	3326.21	3315.82
27	---	3316.52	3322.25	3329.47	3336.79	3336.17	3339.80	3340.05	3339.06	3334.43	3325.90	3315.56
28	---	3316.71	3322.32	3329.67	3336.86	3336.40	3339.77	3340.10	3338.96	3334.22	3325.59	3315.27
29	---	3316.90	3322.39	3329.84	---	3336.91	3339.82	3340.13	3338.82	3334.01	3325.27	3315.00
30	---	3317.09	3322.47	3329.98	---	3338.17	3339.89	3340.15	3338.69	3333.78	3324.95	3314.72
31	3312.80	---	3322.57	3330.13	---	3338.89	---	3340.25	---	3333.54	3324.62	---
MEAN	---	---	3320.27	3327.06	3333.19	3336.88	3339.04	3339.25	3339.72	3336.52	3329.08	3319.45
MAX	---	---	3322.57	3330.13	3336.86	3338.89	3340.06	3340.25	3340.34	3338.67	3333.33	3324.32
MIN	---	---	3317.25	3322.65	3330.27	3335.68	3338.20	3338.13	3338.69	3333.54	3324.62	3314.72
(+)	19810	24680	31640	42740	54120	57840	59710	60400	57460	48310	34490	21910
(+)	+20	+4870	+6960	+11100	+11380	+3720	+1870	+690	-2940	-9150	-13820	-12580

CAL YR 1982 MEAN - MAX 3340.29 MIN - AC-FT# -830  
WTR YR 1983 MEAN - MAX 3340.34 MIN - AC-FT# +2120

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

‡ Change in contents, in acre-feet.

## MALHEUR RIVER BASIN

## 13217500 NORTH FORK MALHEUR RIVER AT BEULAH, OR

LOCATION.--Lat 43°54'28", long 118°09'08", in NW¼NE¼ 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<sup>2</sup>, 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 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.--Records good. Flow regulated since 1935 by Beulah Reservoir (see station 13217000). Diversions for irrigation above station.

AVERAGE DISCHARGE.--48 years (water years 1936-83), 146 ft<sup>3</sup>/s, 105,800 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 7,000 ft<sup>3</sup>/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<sup>3</sup>/s on basis of computation of peak flow over dam; no flow at times.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 1,760 ft<sup>3</sup>/s Mar. 4, gage height, 6.38 ft; minimum daily, 0.20 ft<sup>3</sup>/s Nov. 11-13, Dec. 28 to Jan. 1.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1982 TO SEPTEMBER 1983  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	118	.32	.25	.20	1.6	546	506	842	1070	300	282	309
2	110	.28	.28	.22	1.6	546	842	1180	1110	291	291	306
3	112	.25	.32	.24	1.6	725	955	1330	1100	291	306	306
4	112	.25	.32	.28	1.7	1410	945	1330	955	264	303	306
5	112	.25	.32	.33	1.7	1630	935	1330	702	246	297	306
6	112	.25	.30	.40	1.8	1550	797	1330	434	246	297	303
7	112	.22	.28	.70	1.8	1490	675	1320	410	246	297	303
8	112	.22	.28	1.0	1.8	1470	648	1310	470	261	312	300
9	112	.22	.28	1.1	1.9	1380	648	995	518	270	324	306
10	112	.22	.28	1.1	1.9	1370	648	801	490	270	330	306
11	128	.20	.28	1.2	1.9	1390	522	797	387	288	327	306
12	160	.20	.28	1.2	2.0	1380	450	602	381	309	327	303
13	140	.20	.28	1.3	2.1	1390	394	422	369	315	327	303
14	114	.22	.28	1.3	2.2	1420	390	470	369	315	327	303
15	106	.22	.35	1.3	2.3	1420	390	490	333	315	321	303
16	106	.22	.42	1.3	2.4	1240	394	402	324	315	318	303
17	106	.28	.48	1.3	2.4	1130	394	363	324	315	315	300
18	106	.42	.36	1.4	.80	1050	390	363	327	312	315	300
19	106	.25	.36	1.4	118	1020	394	363	327	291	315	300
20	106	.25	.36	1.4	118	1010	372	327	327	276	315	300
21	108	.25	.32	1.5	118	824	530	297	324	276	318	297
22	84	.25	.32	1.5	261	542	955	288	324	276	315	297
23	66	.22	.32	1.5	345	442	1150	702	321	276	315	297
24	66	.22	.32	1.5	348	442	1160	970	315	276	315	261
25	30	.22	.27	1.5	348	446	1150	891	315	273	315	240
26	.48	.22	.25	1.5	360	446	1130	878	315	273	312	243
27	.28	.25	.22	1.5	366	446	925	882	315	273	312	243
28	.25	.28	.20	1.5	470	285	837	940	318	279	312	246
29	.72	.42	.20	1.5	---	193	837	965	318	285	309	243
30	.36	.28	.20	1.5	---	195	842	970	318	285	309	243
31	.32	---	.20	1.6	---	195	---	970	---	285	309	---
TOTAL	2658.41	7.55	9.18	35.27	2964.7	29023	21205	25120	13910	8793	9687	8682
MEAN	85.8	.25	.30	1.14	106	936	707	810	464	284	312	289
MAX	160	.42	.48	1.6	470	1630	1160	1330	1110	315	330	309
MIN	.25	.20	.20	.20	1.6	193	372	288	315	246	282	240
AC-FT	5270	15	18	70	5880	57570	42060	49830	27590	17440	19210	17220
CAL YR 1982	TOTAL	111866.19	MEAN	306	MAX	2060	MIN	.15	AC-FT	221900		
WTR YR 1983	TOTAL	122095.11	MEAN	335	MAX	1630	MIN	.20	AC-FT	242200		

## 13226500 BULLY CREEK AT WARMSPRINGS, NEAR VALE, OR

LOCATION.--Lat 44°01'10", long 117°27'35", in SE¼NW¼ sec.9, T.18 S., R.43 E., Malheur County, Hydrologic Unit 17050118, on left bank 400 ft downstream from Cottonwood Creek, 4.7 mi upstream from Bully Creek Dam, 11.4 mi northwest of Vale, and at mile 17.2.

DRAINAGE AREA.--539 mi<sup>2</sup>.

PERIOD OF RECORD.--September 1903 to February 1904, February 1905 to March 1907, February 1910, January 1911 to May 1917, March 1922 to June 1923, October 1963 to current year. Monthly discharge only for some periods, published in WSP 1317. Published as "near Vale" 1903, 1907, and as "above Vale" 1904-6, 1910.

REVISED RECORDS.--WSP 1317: Drainage area (former site). WSP 1397: 1904-6, 1911, 1914, 1915.

GAGE.--Water-stage recorder. Datum of gage is 2,527.21 ft National Geodetic Vertical Datum of 1929 (Bureau of Reclamation bench mark). Prior to July 1, 1923, nonrecording gages within 0.5 mi downstream at different datums.

REMARKS.--Records good except those for period of no gage-height record May 19 to Sept. 30, which are poor. No regulation. Many diversions for irrigation above station.

AVERAGE DISCHARGE.--26 years (water years 1906, 1912-16, 1964-83), 50.9 ft<sup>3</sup>/s, 36,880 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 12,800 ft<sup>3</sup>/s Dec. 22, 1964, gage height, 8.68 ft, from rating curve extended above 200 ft<sup>3</sup>/s on basis of slope-area measurement of peak flow; no flow at times.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 600 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Dec. 6	0800	663	2.76	Feb. 26	0430	1,370	3.57
Dec. 22	0130	1,380	3.58	Mar. 4	1130	*6,990	*6.69
Jan. 5	2130	2,290	4.26	Mar. 13	1830	3,600	5.08
Feb. 13	1000	1,340	3.54	Mar. 30	1645	1,100	3.18
Feb. 19	0015	3,000	4.78				

Minimum daily, 5.2 ft<sup>3</sup>/s Aug. 7-20.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1982 TO SEPTEMBER 1983  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	16	21	23	46	92	936	506	232	70	24	6.1	20
2	16	18	21	37	88	1110	586	217	45	43	5.9	18
3	15	17	25	37	74	1160	530	190	38	36	5.7	16
4	17	17	75	37	58	4440	434	169	33	32	5.5	14
5	20	17	229	300	51	1550	370	169	28	29	5.4	12
6	18	18	390	828	54	852	336	166	25	26	5.3	12
7	17	18	184	1050	60	868	312	140	24	24	5.2	12
8	16	16	84	900	67	780	296	138	23	21	5.2	12
9	16	16	70	308	67	772	288	133	22	19	5.2	12
10	14	16	47	181	83	844	280	115	21	18	5.2	12
11	14	16	36	140	133	828	268	90	19	16	5.2	12
12	12	14	31	118	226	607	259	74	18	15	5.2	12
13	10	14	34	108	963	1940	250	61	17	13	5.2	12
14	9.6	12	34	101	464	1580	247	52	16	12	5.2	12
15	9.6	12	35	95	292	1040	241	35	15	11	5.2	12
16	9.6	14	38	101	440	820	223	29	14	10	5.2	12
17	9.6	14	95	90	434	740	193	24	14	10	5.2	13
18	9.0	20	103	84	1320	670	208	14	13	9.4	5.2	14
19	9.6	31	69	95	1270	544	211	14	13	9.0	5.2	15
20	9.6	28	63	113	446	476	244	13	13	8.7	5.2	15
21	9.6	24	482	118	537	434	268	13	13	8.3	7.0	15
22	9.6	21	712	95	780	395	271	13	13	8.0	12	15
23	9.0	19	190	88	796	370	296	14	13	7.7	22	15
24	9.6	13	86	99	712	360	395	15	13	7.4	20	14
25	8.5	12	52	123	740	370	304	17	13	7.1	19	14
26	14	12	49	95	900	365	277	19	13	6.9	18	14
27	15	15	46	128	488	352	259	23	13	6.7	17	15
28	14	17	38	143	416	360	250	30	13	6.6	17	15
29	29	25	38	115	---	348	244	40	13	6.5	16	15
30	43	24	38	103	---	860	241	55	13	6.4	16	14
31	27	---	43	97	---	670	---	75	---	6.3	17	---
TOTAL	455.9	531	3460	5973	12051	27441	9087	2389	611	464.0	287.7	415
MEAN	14.7	17.7	112	193	430	885	303	77.1	20.4	15.0	9.28	13.8
MAX	43	31	712	1050	1320	4440	586	232	70	43	22	20
MIN	8.5	12	21	37	51	348	193	13	13	6.3	5.2	12
AC-FT	904	1050	6860	11850	23900	54430	18020	4740	1210	920	571	823
CAL YR 1982	TOTAL	50570.1	MEAN	139	MAX	3330	MIN	2.3	AC-FT	100300		
WTR YR 1983	TOTAL	63165.6	MEAN	173	MAX	4440	MIN	5.2	AC-FT	125300		

## MALHEUR RIVER BASIN

## 13226800 BULLY CREEK RESERVOIR NEAR VALE, OR

LOCATION.--Lat 44°00'55", long 117°23'45", in SE¼SW¼ 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<sup>2</sup>.

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, 30,890 acre-ft Apr. 24, elevation, 2,516.92 ft; minimum, 16,370 acre-ft Sept. 30, elevation, 2,500.11 ft.

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

2,484	7,000	2,505	20,130
2,490	9,930	2,510	24,370
2,495	12,900	2,520	34,040
2,500	16,290		

ELEVATION (FEET NGVD), WATER YEAR OCTOBER 1982 TO SEPTEMBER 1983  
INSTANTANEOUS OBSERVATIONS AT 2400

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2502.75	2503.03	2504.25	2502.90	2504.51	2508.67	2514.17	2516.42	2514.24	2512.71	2508.33	2502.64
2	2502.75	2503.07	2504.20	2502.64	2504.43	2509.37	2514.42	2516.37	2514.21	2512.76	2508.10	2502.53
3	2502.74	2503.11	2504.08	2502.45	2504.35	2510.10	2514.33	2516.28	2514.19	2512.81	2507.87	2502.48
4	2502.74	2503.15	2503.94	2502.25	2504.29	2513.65	2514.08	2516.21	2514.12	2512.85	2507.64	2502.40
5	2502.74	2503.21	2503.92	2502.45	2504.26	2512.09	2513.92	2516.06	2514.05	2512.85	2507.40	2502.33
6	2502.75	2503.25	2504.14	2504.03	2504.29	2510.05	2513.92	2515.94	2514.01	2512.76	2507.19	2502.26
7	2502.68	2503.29	2504.17	2505.83	2504.33	2509.08	2514.08	2515.78	2513.96	2512.67	2506.94	2502.19
8	2502.65	2503.34	2504.11	2507.28	2504.35	2508.32	2514.17	2515.58	2513.92	2512.56	2506.71	2502.10
9	2502.62	2503.39	2504.01	2507.59	2504.39	2507.88	2514.22	2515.51	2513.90	2512.37	2506.49	2502.01
10	2502.58	2503.43	2503.90	2507.54	2504.40	2507.79	2514.22	2515.51	2513.83	2512.30	2506.23	2501.92
11	2502.56	2503.47	2503.77	2507.37	2504.47	2507.70	2514.42	2515.44	2513.85	2512.17	2505.98	2501.85
12	2502.50	2503.50	2503.67	2507.12	2504.71	2507.14	2514.65	2515.46	2513.87	2512.01	2505.74	2501.76
13	2502.45	2503.53	2503.55	2506.84	2506.49	2508.43	2514.85	2515.58	2513.92	2511.80	2505.55	2501.69
14	2502.41	2503.56	2503.49	2506.52	2507.19	2508.92	2515.01	2515.69	2513.96	2511.53	2505.30	2501.60
15	2502.39	2503.60	2503.42	2506.18	2507.53	2508.80	2515.24	2515.76	2513.96	2511.33	2505.05	2501.51
16	2502.41	2503.65	2503.36	2505.87	2508.00	2508.85	2515.53	2515.83	2514.03	2511.17	2504.83	2501.40
17	2502.34	2503.72	2503.34	2505.54	2508.24	2508.92	2515.80	2515.87	2514.05	2511.03	2504.58	2501.28
18	2502.33	2503.79	2503.33	2505.33	2509.63	2508.97	2516.10	2515.78	2513.97	2510.87	2504.37	2501.19
19	2502.34	2503.87	2503.27	2505.28	2510.31	2508.81	2516.35	2515.76	2513.92	2510.71	2504.12	2501.03
20	2502.36	2503.91	2503.23	2505.22	2509.58	2508.51	2516.42	2515.69	2513.90	2510.51	2503.92	2500.94
21	2502.37	2503.97	2503.69	2505.18	2509.00	2508.68	2516.46	2515.58	2513.83	2510.35	2503.92	2500.85
22	2502.41	2504.01	2504.93	2505.10	2508.91	2509.03	2516.51	2515.49	2513.76	2510.19	2503.76	2500.76
23	2502.40	2504.04	2505.10	2504.99	2508.93	2509.29	2516.67	2515.40	2513.62	2510.01	2503.67	2500.67
24	2502.43	2504.05	2504.93	2504.90	2508.87	2509.53	2516.83	2515.30	2513.47	2509.85	2503.56	2500.60
25	2502.44	2504.09	2504.71	2504.89	2508.86	2509.75	2516.56	2515.19	2513.35	2509.65	2503.49	2500.51
26	2502.48	2504.12	2504.54	2504.82	2509.15	2509.89	2516.39	2515.10	2513.19	2509.44	2503.39	2500.42
27	2502.55	2504.18	2504.29	2504.77	2508.73	2510.03	2516.46	2514.96	2513.03	2509.26	2503.28	2500.33
28	2502.64	2504.24	2503.99	2504.78	2508.22	2510.49	2516.51	2514.83	2512.92	2509.08	2503.14	2500.24
29	2502.82	2504.33	2503.70	2504.77	---	2511.05	2516.49	2514.71	2512.80	2508.92	2502.99	2500.19
30	2502.91	2504.33	2503.42	2504.70	---	2512.60	2516.46	2514.53	2512.76	2508.74	2502.87	2500.12
31	2502.97	---	2503.17	2504.61	---	2513.58	---	2514.35	---	2508.53	2502.74	---
MEAN	2502.56	2503.67	2503.92	2505.15	2506.80	2509.55	2515.37	2515.55	2513.75	2511.09	2505.13	2501.39
MAX	2502.97	2504.33	2505.10	2507.59	2510.31	2513.65	2516.83	2516.42	2514.24	2512.85	2508.33	2502.64
MIN	2502.33	2503.03	2503.17	2502.25	2504.26	2507.14	2513.92	2514.35	2512.76	2508.53	2502.74	2500.12
(†)	18520	19590	18670	19810	22820	27630	30430	28380	26860	23080	18330	16370
(‡)	+170	+1070	-920	+1140	+3010	+4810	+2800	-2050	-1520	-3780	-4750	-1960

CAL YR 1982 MEAN 2508.62 MAX 2516.74 MIN 2500.88 AC-FT‡ -720  
WTR YR 1983 MEAN 2507.83 MAX 2516.83 MIN 2500.12 AC-FT‡ -1980

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

‡ Change in contents, in acre-feet.



## BURNT RIVER BASIN

81

13272500 UNITY RESERVOIR NEAR UNITY, OR

LOCATION.--Lat 44°30'13", long 118°10'45", in SE¼SW¼ 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<sup>2</sup>.

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, 25,690 acre-ft Mar. 14, elevation, 3,820.51 ft; minimum, 10,390 acre-ft Sept. 30, elevation, 3,801.23 ft.

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

3,800	9,600	3,815	20,770
3,805	12,960	3,820	25,220
3,810	16,680	3,821	26,150

ELEVATION (FEET NGVD), WATER YEAR OCTOBER 1982 TO SEPTEMBER 1983  
INSTANTANEOUS OBSERVATIONS AT 2400

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3802.78	3804.66	3807.40	3809.38	3809.34	3812.21	3815.35	3818.84	3819.86	3818.12	3814.45	3807.36
2	3802.60	3804.89	3807.55	3809.44	3809.25	3813.14	3815.53	3819.07	3819.76	3818.21	3814.23	3807.15
3	3802.40	3805.13	3807.69	3809.50	3809.15	3813.96	3815.47	3819.17	3819.72	3818.28	3814.00	3806.95
4	3802.21	3805.31	3807.81	3809.62	3809.06	3815.45	3815.24	3819.24	3819.72	3818.27	3813.77	3806.71
5	3802.05	3805.48	3807.96	3809.68	3808.98	3816.21	3814.97	3819.53	3819.73	3818.25	3813.53	3806.49
6	3801.85	3805.58	3808.09	3809.76	3808.95	3816.51	3814.75	3819.75	3819.74	3818.18	3813.33	3806.29
7	3801.69	3805.69	3808.15	3809.83	3808.91	3816.81	3814.63	3819.79	3819.77	3818.11	3813.09	3806.06
8	3801.69	3805.81	3808.19	3809.92	3808.87	3817.32	3814.58	3819.78	3819.75	3818.02	3812.86	3805.81
9	3801.80	3805.92	3808.22	3809.94	3808.80	3818.15	3814.50	3819.68	3819.75	3817.92	3812.65	3805.57
10	3801.90	3806.01	3808.26	3809.94	3808.75	3819.03	3814.34	3819.53	3819.67	3817.89	3812.45	3805.39
11	3801.99	3806.04	3808.28	3809.93	3808.69	3819.52	3814.21	3819.37	3819.67	3817.81	3812.21	3805.18
12	3802.07	3806.09	3808.34	3809.92	3808.70	3819.57	3814.05	3819.20	3819.67	3817.72	3811.99	3804.97
13	3802.16	3806.13	3808.38	3809.91	3808.83	3820.20	3813.95	3819.06	3819.64	3817.64	3811.79	3804.75
14	3802.24	3806.17	3808.46	3809.89	3808.90	3820.44	3813.92	3819.03	3819.58	3817.52	3811.56	3804.51
15	3802.33	3806.22	3808.51	3809.90	3808.92	3820.01	3813.96	3819.03	3819.49	3817.45	3811.33	3804.29
16	3802.42	3806.29	3808.60	3809.90	3808.94	3819.66	3814.10	3819.03	3819.44	3817.37	3811.06	3804.07
17	3802.48	3806.38	3808.71	3809.86	3809.10	3819.26	3814.36	3818.99	3819.30	3817.32	3810.80	3803.82
18	3802.56	3806.48	3808.79	3809.88	3809.55	3818.94	3814.65	3818.98	3819.21	3817.25	3810.52	3803.57
19	3802.63	3806.56	3808.85	3809.88	3809.91	3818.59	3814.97	3819.07	3819.11	3817.16	3810.23	3803.37
20	3802.74	3806.64	3808.92	3809.85	3810.11	3818.23	3815.45	3819.14	3819.03	3817.02	3809.98	3803.16
21	3802.85	3806.71	3809.06	3809.83	3810.31	3817.93	3816.08	3819.22	3818.95	3816.84	3809.72	3802.97
22	3802.97	3806.74	3809.19	3809.80	3810.48	3817.65	3816.79	3819.32	3818.88	3816.64	3809.50	3802.79
23	3803.03	3806.75	3809.26	3809.79	3810.68	3817.37	3817.37	3819.43	3818.73	3816.39	3809.30	3802.60
24	3803.15	3806.78	3809.27	3809.76	3810.95	3817.06	3817.86	3819.55	3818.62	3816.15	3809.13	3802.40
25	3803.27	3806.81	3809.31	3809.72	3811.28	3816.66	3818.15	3819.72	3818.54	3815.89	3808.91	3802.21
26	3803.38	3806.86	3809.34	3809.68	3811.55	3816.29	3818.28	3819.84	3818.40	3815.65	3808.69	3802.02
27	3803.48	3806.93	3809.34	3809.62	3811.73	3815.91	3818.34	3819.90	3818.31	3815.44	3808.46	3801.79
28	3803.61	3807.04	3809.34	3809.58	3811.88	3815.52	3818.33	3819.91	3818.27	3815.25	3808.24	3801.60
29	3803.93	3807.17	3809.34	3809.53	---	3815.13	3818.36	3819.90	3818.16	3815.06	3808.00	3801.42
30	3804.20	3807.29	3809.35	3809.45	---	3815.27	3818.55	3819.88	3818.09	3814.85	3807.78	3801.23
31	3804.44	---	3809.39	3809.41	---	3815.37	---	3819.86	---	3814.65	3807.58	---
MEAN	3802.67	3806.22	3808.62	3809.75	3809.66	3817.21	3815.70	3819.41	3819.22	3817.04	3811.00	3804.22
MAX	3804.44	3807.29	3809.39	3809.94	3811.88	3820.44	3818.55	3819.91	3819.86	3818.28	3814.45	3807.36
MIN	3801.69	3804.66	3807.40	3809.38	3808.69	3812.21	3813.92	3818.84	3818.09	3814.65	3807.58	3801.23
(†)	12570	14620	16210	16230	18160	21090	23900	25080	23490	20470	14840	10390
(‡)	+1010	+2050	+1590	+20	+1930	+2930	+2810	+1180	-1590	-3020	-5630	-4450
CAL YR 1982	MEAN	3812.05	MAX	3820.56	MIN	3801.69	AC-FT‡	+3240				
WTR YR 1983	MEAN	3811.75	MAX	3820.44	MIN	3801.23	AC-FT‡	-1170				

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

‡ Change in contents, in acre-feet.



## BURNT RIVER BASIN

13273000 BURNT RIVER NEAR HEREFORD, OR

LOCATION.--Lat 44°30'14", long 118°10'35", in SE¼ 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<sup>2</sup>.

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 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.--Records excellent. Flow regulated since 1938 by Unity Reservoir (see station 13272500). Diversions for irrigation above station.

AVERAGE DISCHARGE.--55 years (water years 1929-83), 86.1 ft<sup>3</sup>/s, 62,380 acre-ft/yr.

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

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 861 ft<sup>3</sup>/s Mar. 14, gage height, 7.63 ft; minimum, 6.6 ft<sup>3</sup>/s Nov. 28-30, Dec. 1, 2.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1982 TO SEPTEMBER 1983  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	102	14	6.6	33	87	163	444	460	303	80	119	110
2	102	14	6.8	32	86	166	442	474	283	77	117	110
3	102	14	6.9	32	85	198	463	495	217	77	117	109
4	102	14	7.1	30	83	247	471	495	163	77	117	108
5	101	21	27	47	83	303	467	497	153	77	116	107
6	101	16	39	59	89	321	442	498	139	77	116	107
7	101	15	38	61	91	322	423	499	121	77	116	106
8	51	15	36	74	91	333	416	496	115	76	115	106
9	17	15	36	81	91	418	414	489	115	76	115	105
10	12	24	37	80	88	546	411	449	113	76	115	105
11	12	33	36	80	88	762	388	401	111	76	114	103
12	12	35	36	78	88	750	370	398	110	76	113	103
13	12	32	36	77	88	776	311	371	110	76	113	102
14	12	31	38	77	89	857	280	325	110	75	112	101
15	12	32	37	76	94	836	258	305	109	75	113	101
16	13	32	38	77	97	689	252	304	109	75	126	101
17	13	32	38	77	97	650	253	302	109	75	130	100
18	13	32	38	76	109	567	282	286	108	75	129	100
19	13	29	38	76	117	516	299	278	108	75	128	99
20	14	28	38	76	112	507	338	293	107	90	128	99
21	14	29	38	76	113	476	393	309	107	117	127	98
22	14	28	36	77	129	466	411	310	107	123	126	98
23	14	30	35	76	137	465	449	311	107	129	124	97
24	14	29	35	79	138	480	499	312	106	132	115	97
25	14	33	35	82	140	479	478	313	106	131	114	96
26	14	36	34	81	152	472	484	329	106	131	114	96
27	14	35	34	86	158	467	470	336	105	125	113	96
28	14	26	33	89	161	461	464	336	104	120	113	95
29	14	6.6	33	88	---	452	461	337	103	120	112	95
30	14	6.6	33	87	---	438	461	315	100	120	111	94
31	14	---	32	87	---	438	---	304	---	119	111	---
TOTAL	1071	737.2	991.4	2207	2981	15021	11994	11627	3864	2905	3649	3044
MEAN	34.5	24.6	32.0	71.2	106	485	400	375	129	93.7	118	101
MAX	102	36	39	89	161	857	499	499	303	132	130	110
MIN	12	6.6	6.6	30	83	163	252	278	100	75	111	94
AC-FT	2120	1460	1970	4380	5910	29790	23790	23060	7660	5760	7240	6040
CAL YR 1982	TOTAL	61318.6	MEAN	168	MAX	864	MIN	6.6	AC-FT	121600		
WTR YR 1983	TOTAL	60091.6	MEAN	165	MAX	857	MIN	6.6	AC-FT	119200		

## POWDER RIVER BASIN

83

## 13275300 POWDER RIVER NEAR SUMPTER, OR

LOCATION.--Lat 44°40'20", long 117°59'40", in NE¼NE¼ 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<sup>2</sup>, approximately. Prior to Oct. 1, 1970, 170 mi<sup>2</sup> 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 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.--Records good. Flow completely regulated since Oct. 31, 1967, by Phillips Lake, active capacity, 90,540 acre-ft. Many small diversions for irrigation above station.

AVERAGE DISCHARGE.--16 years, 112 ft<sup>3</sup>/s, 81,140 acre-ft/yr, not adjusted for storage in Phillips Lake.

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

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

EXTREMES FOR CURRENT YEAR.--Maximum discharge recorded, 575 ft<sup>3</sup>/s June 24, 25, 26, gage height, 3.69 ft; minimum recorded, 8.3 ft<sup>3</sup>/s Jan. 25.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1982 TO SEPTEMBER 1983  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	14	10	10	8.5	10	145	259	358	540	500	224	100
2	14	10	9.4	8.7	8.9	145	286	286	540	449	225	96
3	14	10	9.4	9.0	11	145	310	374	540	449	226	79
4	14	10	9.4	9.5	10	147	310	374	540	453	227	66
5	14	10	9.4	10	10	147	310	374	540	453	227	82
6	14	10	10	10	10	147	310	374	540	453	227	121
7	11	10	10	11	10	147	310	374	545	453	227	172
8	10	10	10	12	10	147	310	378	545	413	272	175
9	10	10	10	12	10	152	310	374	540	268	346	147
10	10	10	10	12	10	203	310	378	540	165	362	123
11	10	10	10	12	10	272	310	378	540	142	300	123
12	10	10	10	12	10	322	310	378	540	177	286	117
13	10	10	11	12	10	346	310	378	525	182	265	88
14	10	10	11	12	10	346	310	378	525	172	221	106
15	10	10	11	12	10	346	310	378	525	172	212	130
16	10	10	10	12	10	346	310	378	525	172	212	137
17	10	9.4	10	12	10	346	310	378	530	157	212	137
18	10	9.4	10	12	55	346	310	378	550	150	212	137
19	10	9.4	10	12	116	346	262	378	570	180	218	137
20	10	9.4	10	12	145	346	230	378	570	210	275	130
21	10	9.4	10	12	145	346	252	378	570	268	296	117
22	10	9.4	10	12	145	346	275	378	570	268	293	108
23	10	9.4	9.5	11	145	346	282	382	570	268	268	98
24	10	9.4	9.0	9.4	145	346	282	417	570	268	245	79
25	10	9.4	9.0	8.9	145	346	282	449	570	268	245	57
26	10	9.4	9.0	8.9	145	346	342	467	570	239	215	32
27	10	10	9.0	8.9	145	346	374	495	560	224	185	9.4
28	10	10	9.0	8.9	145	346	374	495	530	224	182	16
29	10	10	8.5	9.4	---	286	374	505	530	224	112	16
30	10	10	8.5	8.9	---	259	370	520	530	224	57	15
31	10	---	8.5	9.4	---	259	---	525	---	224	72	---
TOTAL	335	294.0	300.6	330.4	1645.9	8459	9204	12435	16380	8469	7146	2950.4
MEAN	10.8	9.80	9.70	10.7	58.8	273	307	401	546	273	231	98.3
MAX	14	10	11	12	145	346	374	525	570	500	362	175
MIN	10	9.4	8.5	8.5	8.9	145	230	286	525	142	57	9.4
AC-FT	664	583	596	655	3260	16780	18260	24660	32490	16800	14170	5850

CAL YR 1982	TOTAL	64882.9	MEAN	178	MAX	560	MIN	4.4	AC-FT	128700
WTR YR 1983	TOTAL	67949.3	MEAN	186	MAX	570	MIN	8.5	AC-FT	134800

NOTE.--No gage-height record Dec. 19 to Jan. 20.

## POWDER RIVER BASIN

13277000 POWDER RIVER AT BAKER, OR

LOCATION.--Lat 44°46'06", long 117°49'50", in SE¼NE¼ 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<sup>2</sup>.

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 National Geodetic Vertical Datum of 1929. Prior to Oct. 19, 1971, nonrecording gage at site 0.7 mi downstream at different datum.

REMARKS.--Records excellent. 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 below station.

AVERAGE DISCHARGE.--11 years, 116 ft<sup>3</sup>/s, 84,040 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,120 ft<sup>3</sup>/s Jan. 15, 1974, gage height, 5.55 ft; minimum, 0.7 ft<sup>3</sup>/s Oct. 28, 29, 1973.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 601 ft<sup>3</sup>/s Mar. 13, gage height, 4.20 ft; maximum gage height, 4.82 ft Jan. 7 (ice jam); minimum discharge, 9.8 ft<sup>3</sup>/s Oct. 1.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1982 TO SEPTEMBER 1983  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	13	22	24	24	32	246	342	464	512	482	190	87
2	14	21	23	25	31	283	383	355	490	428	184	88
3	14	21	25	30	30	298	409	440	477	424	187	73
4	15	23	28	39	27	466	395	442	466	415	181	49
5	14	23	26	50	26	342	384	475	458	422	169	51
6	14	24	36	70	32	285	379	466	444	427	170	89
7	16	23	28	97	30	287	378	453	440	422	169	145
8	14	23	24	106	29	289	374	448	440	401	194	160
9	14	23	25	56	32	301	372	450	442	290	257	136
10	12	22	24	42	34	346	368	443	460	163	300	102
11	17	23	25	39	40	447	364	431	466	116	258	101
12	19	22	26	37	83	494	361	421	459	121	230	101
13	19	24	24	34	127	571	357	411	462	138	221	73
14	19	27	25	32	86	561	355	405	429	118	182	68
15	19	32	26	31	104	518	354	403	367	119	168	92
16	19	24	29	31	131	484	352	392	364	121	158	100
17	19	27	38	30	201	469	357	371	367	116	146	121
18	20	28	31	30	357	454	364	357	370	101	147	123
19	20	27	26	30	249	437	329	350	365	99	150	107
20	20	25	24	31	206	426	277	350	376	84	190	105
21	20	24	32	31	218	420	317	356	399	109	226	94
22	19	25	41	29	243	417	360	359	398	176	229	83
23	20	23	31	30	243	415	396	359	451	179	236	84
24	20	25	28	33	239	413	426	380	477	185	215	86
25	19	29	27	33	244	408	412	441	473	190	222	56
26	20	30	23	35	236	400	429	450	475	180	213	44
27	19	29	24	59	209	405	468	489	493	170	174	37
28	18	27	25	52	208	401	459	487	459	180	172	35
29	26	26	24	37	---	363	455	489	463	180	130	22
30	27	24	24	34	---	375	456	498	462	190	69	14
31	23	---	23	32	---	348	---	496	---	200	42	---
TOTAL	562	746	839	1269	3727	12369	11432	13131	13204	6946	5779	2526
MEAN	18.1	24.9	27.1	40.9	133	399	381	424	440	224	186	84.2
MAX	27	32	41	106	357	571	468	498	512	482	300	160
MIN	12	21	23	24	26	246	277	350	364	84	42	14
AC-FT	1110	1480	1660	2520	7390	24530	22680	26050	26190	13780	11460	5010
CAL YR 1982	TOTAL	71072	MEAN	195	MAX	633	MIN	10	AC-FT	141000		
WTR YR 1983	TOTAL	72530	MEAN	199	MAX	571	MIN	12	AC-FT	143900		

## 13285000 THIEF VALLEY RESERVOIR NEAR NORTH POWDER, OR

LOCATION.--Lat 45°00'45", long 117°46'50", in NE¼SW¼ 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<sup>2</sup>, 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.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 18,900 acre-ft July 2, 1982, elevation, 3,134.99 ft; minimum recorded, 2,250 acre-ft Oct. 1, 1981, elevation, 3,104.66 ft; minimum (estimated), 2,190 acre-ft Sept. 30, 1981.

EXTREMES FOR CURRENT YEAR.--Maximum contents, 18,640 acre-ft May 30, elevation, 3,134.64 ft; minimum, 13,120 acre-ft Sept. 20, elevation, 3,126.94 ft.

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

3,125	11,880
3,130	15,210
3,135	18,910

ELEVATION (FEET NGVD), WATER YEAR OCTOBER 1982 TO SEPTEMBER 1983  
INSTANTANEOUS OBSERVATIONS AT 2400

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3131.24	3133.34	3133.26	3133.06	---	3133.78	3133.89	3134.02	3134.44	3133.95	3130.45	3129.43
2	3131.48	3133.31	3133.30	3133.07	---	3133.86	3133.88	3134.00	3134.42	3134.01	3130.22	3129.32
3	3131.71	3133.28	3133.25	3133.13	3133.36	3133.93	3133.87	3133.93	3134.30	3134.10	3130.00	3129.16
4	3131.97	3133.30	3133.35	3133.17	3133.33	3134.16	3133.88	3133.95	3134.24	3134.08	3129.73	3128.99
5	3132.23	3133.30	3133.39	3133.22	---	3134.20	3133.87	3133.97	3134.17	3134.01	3129.48	3128.82
6	3132.48	3133.31	3133.42	3133.30	---	3134.09	3133.87	3134.05	3134.12	3133.91	3129.21	3128.62
7	3132.67	3133.29	3133.36	3133.47	---	3134.01	3133.86	3134.05	3134.08	3133.93	3128.91	3128.42
8	3132.89	3133.27	3133.27	3133.64	---	3134.00	3133.83	3134.02	3134.04	3133.82	3128.63	3128.27
9	3133.12	3133.28	3133.22	3133.69	---	3134.00	3133.85	3134.01	3134.12	3133.76	3128.36	3128.18
10	3133.23	3133.27	3133.22	3133.56	---	3133.98	3133.83	3133.97	3134.10	3133.70	3128.30	3128.12
11	3133.28	3133.27	3133.21	3133.46	---	3134.01	3133.80	3133.86	3134.13	3133.55	3128.27	3128.03
12	3133.25	3133.24	3133.21	3133.38	---	3134.10	3133.81	3133.76	3134.11	3133.40	3128.27	3127.93
13	3133.23	3133.22	3133.25	3133.37	---	---	3133.78	3133.71	3134.08	3133.31	3128.31	3127.79
14	3133.24	3133.20	3133.27	3133.30	---	---	3133.79	3133.67	3134.05	3133.20	3128.35	3127.64
15	3133.26	3133.20	3133.29	3133.28	---	---	3133.79	3133.60	3134.02	3133.15	3128.43	3127.45
16	3133.29	3133.22	3133.38	3133.30	---	3134.19	3133.78	3133.62	3134.02	3133.15	3128.41	3127.32
17	3133.27	3133.27	3133.49	3133.29	3133.81	3134.16	3133.79	3133.56	3133.93	3133.10	3128.32	3127.08
18	3133.24	3133.33	3133.49	3133.30	3134.00	3134.07	3133.81	3133.53	3134.00	3133.10	3128.19	3127.02
19	3133.23	3133.34	3133.42	3133.37	3134.05	3134.03	3133.82	3133.54	3133.96	3132.99	3128.04	3126.96
20	3133.24	3133.31	3133.41	3133.43	3133.92	3134.02	3133.84	3133.63	3133.93	3132.73	3127.87	3127.00
21	3133.28	3133.27	3133.47	3133.42	3133.88	3134.01	3133.83	3133.64	3133.90	3132.54	3127.76	3127.17
22	3133.29	3133.19	3133.51	3133.39	3133.87	3133.99	3133.88	3133.65	3133.86	3132.29	3127.68	3127.33
23	3133.30	3133.13	3133.44	3133.37	3133.84	3133.96	3133.97	3133.70	3133.85	3132.02	3127.68	3127.48
24	3133.30	3133.14	3133.34	3133.39	3133.86	3133.94	3134.05	3133.84	3133.75	3131.79	3127.85	3127.68
25	3133.28	3133.15	3133.23	3133.45	3133.82	3133.91	3134.05	3133.99	3133.81	3131.60	3128.19	3127.86
26	3133.29	3133.20	3133.24	---	3133.80	3133.91	3134.05	3134.17	3133.80	3131.40	3128.51	3127.97
27	3133.28	3133.21	3133.15	---	3133.78	3133.92	3134.05	3134.33	3133.85	3131.24	3128.86	3128.01
28	3133.26	3133.23	3133.10	---	3133.75	3133.93	3134.07	3134.45	3133.89	3131.07	3129.16	3128.09
29	3133.32	3133.26	3133.06	---	---	3133.91	3134.06	3134.55	3133.89	3130.98	3129.37	3128.12
30	3133.38	3133.26	3133.07	---	---	3133.91	3134.04	3134.58	3133.90	3130.81	3129.53	3128.12
31	3133.38	---	3133.07	3133.40	---	3133.89	---	3134.51	---	3130.62	3129.53	---
MEAN	3132.96	3133.25	3133.29	---	---	---	3133.89	3133.93	3134.03	3132.82	3128.71	3127.98
MAX	3133.38	3133.34	3133.51	---	---	---	3134.07	3134.58	3134.44	3134.10	3130.45	3129.43
MIN	3131.24	3133.13	3133.06	---	---	---	3133.78	3133.53	3133.75	3130.62	3127.68	3126.96
(+)	17680	17600	174450	17700	17960	18070	18180	18540	18080	15660	14880	13900
(#)	+1740	-80	-150	+250	+260	+110	+110	+360	-460	-2420	-780	-980
CAL YR 1982	MEAN	-	MAX	3134.97	MIN	3128.04	AC-FT	-80				
WTR YR 1983	MEAN	-	MAX	3134.58	MIN	3126.96	AC-FT	-2040				

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

# Change in contents, in acre-feet.

## POWDER RIVER BASIN

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

LOCATION.--Lat 45°00'20", long 117°46'50", in NE¼NW¼ 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<sup>2</sup>, 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 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.--Records excellent. 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. Many diversions for irrigation above station.

AVERAGE DISCHARGE.--5 years (water years 1979-83), 273 ft<sup>3</sup>/s, 197,800 acre-ft/yr.

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

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 1,780 ft<sup>3</sup>/s May 30, gage height, 9.25 ft; minimum, 60 ft<sup>3</sup>/s Sept. 22-29.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1982 TO SEPTEMBER 1983  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	86	235	188	119	297	543	701	903	1580	675	145	143
2	86	216	180	116	283	601	714	895	1500	763	145	143
3	88	202	190	130	258	702	708	809	1400	859	145	142
4	88	197	206	146	219	892	708	774	1250	878	147	142
5	88	200	249	151	196	1070	697	800	1130	796	146	141
6	89	205	269	205	196	1030	674	878	1010	720	146	141
7	90	200	279	314	200	875	668	925	916	670	145	141
8	91	194	211	447	217	813	645	938	847	620	145	140
9	97	197	172	469	212	812	640	917	902	560	145	139
10	131	206	172	379	224	792	644	894	957	500	107	139
11	160	200	166	297	250	826	640	779	1030	430	89	139
12	163	183	162	251	346	894	621	646	1010	330	89	139
13	156	182	170	224	505	1080	599	535	944	220	89	139
14	148	167	182	210	571	1210	585	485	857	190	105	139
15	150	150	188	194	511	1210	570	467	845	160	113	139
16	163	171	197	198	498	1150	555	444	798	150	132	138
17	171	191	264	199	552	1080	554	419	751	150	141	137
18	167	209	328	198	719	1000	563	381	765	150	140	137
19	167	230	288	237	871	930	577	378	768	150	141	137
20	170	218	254	297	830	879	603	413	747	150	140	104
21	167	205	240	289	693	849	617	443	676	150	140	73
22	164	186	318	278	671	831	644	446	628	150	139	60
23	172	147	360	247	658	814	702	481	587	150	139	60
24	180	131	294	250	643	786	877	585	523	145	139	60
25	178	136	207	303	628	772	926	760	528	145	140	60
26	187	139	177	354	619	737	930	1010	558	145	141	61
27	193	152	160	473	586	748	899	1230	594	145	141	61
28	189	163	150	491	553	755	915	1420	619	145	141	61
29	211	182	134	417	---	744	937	1610	642	145	142	61
30	248	187	129	348	---	741	918	1710	652	145	143	61
31	250	---	127	312	---	729	---	1690	---	145	143	---
TOTAL	4688	5581	6611	8543	13006	26895	21031	25065	26014	10731	4143	3377
MEAN	151	186	213	276	465	868	701	809	867	346	134	113
MAX	250	235	360	491	871	1210	937	1710	1580	878	147	143
MIN	86	131	127	116	196	543	554	378	523	145	89	60
AC-FT	9300	11070	13110	16950	25800	53350	41710	49720	51600	21280	8220	6700
CAL YR 1982	TOTAL	161063	MEAN	441	MAX	2370	MIN	59	AC-FT	319500		
WTR YR 1983	TOTAL	155685	MEAN	427	MAX	1710	MIN	60	AC-FT	308800		

## POWDER RIVER BASIN

87

13286700 POWDER RIVER NEAR RICHLAND, OR

LOCATION.--Lat 44°46'40", long 117°17'30", in SE¼ 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<sup>2</sup>, approximately.

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

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

REMARKS.--Records good. Regulation by several reservoirs, the largest being Phillips Lake since Oct. 31, 1967, active capacity, 90,540 acre-ft, Thief Valley Reservoir, capacity, 17,400 acre-ft, and since April 1975, Wolf Creek Reservoir, capacity, 10,400 acre-ft. Diversions for irrigation above and below station.

AVERAGE DISCHARGE.--25 years, 266 ft<sup>3</sup>/s, 192,700 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 4,090 ft<sup>3</sup>/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<sup>3</sup>/s Aug. 11, 12, 1966.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 2,100 ft<sup>3</sup>/s Mar. 14, gage height, 5.10 ft; minimum, 13 ft<sup>3</sup>/s Aug. 17, 18.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1982 TO SEPTEMBER 1983  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	127	286	218	140	479	981	1110	1220	1550	678	79	99
2	129	273	217	135	455	1080	1160	1230	1450	800	80	112
3	130	252	231	150	420	1250	1160	1210	1350	856	77	103
4	133	237	259	200	377	1600	1080	1110	1250	898	73	101
5	135	229	296	260	340	1900	1040	1140	1110	871	72	101
6	131	237	396	360	343	1740	1010	1200	997	781	72	100
7	134	236	386	600	325	1680	978	1200	896	719	67	97
8	150	231	324	720	329	1510	960	1210	812	680	67	99
9	140	225	280	740	344	1570	939	1180	782	625	74	103
10	144	230	240	580	359	1590	929	1090	824	567	75	96
11	176	235	230	450	407	1620	903	1030	905	493	74	99
12	204	225	240	380	552	1650	874	875	941	350	82	101
13	206	209	242	340	809	1780	836	755	966	239	59	98
14	201	203	249	320	916	2040	811	648	900	209	46	103
15	194	186	246	290	853	1940	799	600	781	177	47	102
16	200	177	310	300	1020	1790	785	571	778	109	29	98
17	211	209	447	305	1080	1660	789	520	727	96	18	100
18	212	235	458	300	1390	1520	814	491	691	92	51	104
19	201	252	424	389	1360	1390	842	467	731	88	63	115
20	202	266	359	498	1270	1290	894	461	723	80	123	110
21	205	252	435	483	1170	1220	969	506	684	99	95	106
22	207	233	530	459	1250	1180	1020	557	618	103	121	81
23	204	216	511	429	1240	1190	1120	588	579	106	106	78
24	213	180	453	415	1120	1140	1320	625	530	108	114	68
25	221	160	336	455	1110	1100	1400	738	485	117	110	71
26	230	165	285	571	1090	1050	1360	888	503	109	108	72
27	238	170	230	745	1020	1060	1290	1060	534	104	115	65
28	238	185	200	827	994	1100	1230	1200	564	106	113	61
29	280	196	158	702	---	1090	1220	1310	616	94	109	68
30	316	215	155	596	---	1180	1230	1440	657	73	98	69
31	310	---	150	521	---	1150	---	1540	---	67	97	---
TOTAL	6022	6605	9495	13660	22422	44041	30872	28660	24934	10494	2514	2780
MEAN	194	220	306	441	801	1421	1029	925	831	339	81.1	92.7
MAX	316	286	530	827	1390	2040	1400	1540	1550	898	123	115
MIN	127	160	150	135	325	981	785	461	485	67	18	61
AC-FT	11940	13100	18830	27090	44470	87360	61230	56850	49460	20810	4990	5510
CAL YR 1982	TOTAL	202034	MEAN	554	MAX	3620	MIN	42	AC-FT	400700		
WTR YR 1983	TOTAL	202499	MEAN	555	MAX	2040	MIN	18	AC-FT	401700		



## POWDER RIVER BASIN

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

LOCATION.--Lat 44°52'50", long 117°15'10", in SE¼ 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<sup>2</sup>.

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

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

REMARKS.--Records good. No regulation. Some diversions above 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.--26 years, 325 ft<sup>3</sup>/s, 235,500 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 5,310 ft<sup>3</sup>/s July 12, 1975, gage height, 5.06 ft, from rating curve extended above 2,500 ft<sup>3</sup>/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<sup>3</sup>/s Nov. 28, 1976.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 1,700 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
May 28	2130	*2,820	*3.97	July 1	1900	1,970	3.60

Minimum daily, 82 ft<sup>3</sup>/s Jan. 2.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1982 TO SEPTEMBER 1983  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	109	170	125	84	121	210	327	604	2080	1440	409	184
2	107	158	122	82	116	276	348	625	2010	1360	405	183
3	108	159	127	90	107	332	320	662	1920	976	394	167
4	109	157	145	139	96	400	299	696	1850	923	371	161
5	107	154	133	169	94	376	284	756	1700	1040	351	158
6	110	154	138	168	100	328	276	701	1620	1220	332	156
7	111	145	125	162	110	341	275	663	1610	1170	322	149
8	108	143	107	168	120	340	277	629	1670	985	312	147
9	105	142	129	155	111	438	274	572	1640	877	299	144
10	104	138	153	147	102	474	262	527	1670	739	299	143
11	104	135	187	140	102	529	252	496	1490	727	287	143
12	105	130	216	137	102	499	241	494	1160	752	264	143
13	104	134	208	134	105	541	232	510	1030	793	246	140
14	102	119	190	125	104	519	229	524	1050	847	242	137
15	101	133	177	115	107	439	231	523	1270	725	240	135
16	104	132	145	120	116	384	249	501	1250	621	228	131
17	103	139	131	127	139	349	282	517	1260	590	218	128
18	117	155	121	125	175	321	311	614	1250	576	202	129
19	113	148	118	128	170	295	339	675	982	585	196	132
20	112	137	120	124	160	277	420	789	847	588	193	119
21	113	132	131	124	151	266	516	984	793	553	192	116
22	135	107	131	123	167	263	571	1110	845	539	196	113
23	152	105	128	122	174	260	684	1300	1080	594	193	110
24	168	100	119	122	176	249	856	1640	1140	586	194	108
25	156	110	112	119	188	241	705	1890	1050	551	174	104
26	265	120	110	127	197	232	602	2060	1100	511	167	99
27	207	150	105	129	188	237	541	2150	1220	462	186	98
28	186	180	96	127	182	225	509	2310	1120	425	188	97
29	203	139	94	127	---	252	517	2270	1210	422	183	97
30	186	130	90	127	---	339	562	2320	1080	427	177	96
31	176	---	88	121	---	343	---	2250	---	432	168	---
TOTAL	4090	4155	4121	4007	3780	10575	11791	32362	39997	23036	7828	3967
MEAN	132	139	133	129	135	341	393	1044	1333	743	253	132
MAX	265	180	216	169	197	541	856	2320	2080	1440	409	184
MIN	101	100	88	82	94	210	229	494	793	422	167	96
AC-FT	8110	8240	8170	7950	7500	20980	23390	64190	79330	45690	15530	7870
CAL YR 1982	TOTAL	131597	MEAN	361	MAX	1920	MIN	60	AC-FT	261000		
WTR YR 1983	TOTAL	149709	MEAN	410	MAX	2320	MIN	82	AC-FT	296900		

## 13292000 IMNAHA RIVER AT IMNAHA, OR

LOCATION.--Lat 45°33'45", long 116°50'00", in SW¼ 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<sup>2</sup>.

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 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.--Records excellent. No regulation. Diversions for irrigation above station. Water is diverted from Big Sheep Creek and tributaries above station for irrigation in Wallowa River basin.

AVERAGE DISCHARGE.--55 years, 521 ft<sup>3</sup>/s, 377,500 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 10,100 ft<sup>3</sup>/s Jan. 17, 1974, gage height, 7.86 ft, from rating curve extended above 3,500 ft<sup>3</sup>/s; minimum observed, 16 ft<sup>3</sup>/s Nov. 22, 1931, result of freezeup; minimum daily, 25 ft<sup>3</sup>/s Nov. 22, 23, 1931.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 1,600 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Mar. 14	0200	1,930	4.36	May 27	0230	*3,470	*5.60
Apr. 24	1300	3,040	5.28	June 18	0400	1,730	4.18
May 5	2200	2,050	4.46	July 2	0130	2,100	4.50

Minimum, 107 ft<sup>3</sup>/s Jan. 1.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1982 TO SEPTEMBER 1983  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	251	282	234	126	294	592	673	1630	2580	1600	529	225
2	242	267	225	197	275	930	696	1740	2480	1830	511	260
3	254	266	221	210	235	1210	674	1670	2260	1460	498	226
4	266	265	237	240	211	1230	646	1720	2160	1340	469	216
5	260	259	236	270	199	1250	608	1930	2030	1380	427	209
6	248	261	248	330	248	1110	597	1910	1920	1520	402	203
7	266	246	241	680	274	1000	597	1740	1910	1560	390	196
8	260	232	205	660	254	934	587	1690	1980	1430	380	196
9	252	248	210	600	256	951	578	1490	2030	1330	371	202
10	244	236	185	520	249	1200	569	1330	2040	1140	359	214
11	237	232	184	450	236	1540	539	1200	2160	1080	356	227
12	235	209	224	400	246	1470	524	1120	1770	1100	332	219
13	227	235	248	350	251	1540	500	1120	1500	1110	311	210
14	223	187	229	320	244	1830	482	1150	1410	1280	301	205
15	217	189	221	290	241	1500	479	1210	1530	1110	298	204
16	214	238	224	280	252	1250	496	1190	1540	930	306	204
17	215	240	249	270	262	1100	566	1170	1490	858	289	201
18	221	275	233	260	477	978	679	1370	1630	814	275	204
19	209	348	234	270	767	872	741	1470	1410	793	262	232
20	208	302	231	280	648	777	1010	1660	1280	809	260	212
21	206	284	262	260	557	721	1350	2020	1190	761	271	206
22	227	228	351	240	509	676	1490	2130	1170	736	303	202
23	257	165	354	235	511	659	1760	2300	1390	775	293	195
24	311	157	310	230	568	613	2790	2580	1520	779	302	193
25	275	170	232	240	665	608	2500	2830	1420	746	266	188
26	348	180	170	264	720	566	2000	3030	1390	697	252	184
27	362	200	160	285	687	559	1680	3140	1550	637	244	182
28	309	230	157	306	625	544	1500	3170	1470	591	233	182
29	307	256	150	313	---	545	1420	3200	1550	565	220	182
30	305	244	138	315	---	618	1480	3100	1560	557	216	182
31	290	---	125	292	---	686	---	2930	---	549	211	---
TOTAL	7946	7131	6928	9983	10961	30059	30211	59940	51320	31867	10137	6161
MEAN	256	238	223	322	391	970	1007	1934	1711	1028	327	205
MAX	362	348	354	680	767	1830	2790	3200	2580	1830	529	260
MIN	206	157	125	126	199	544	479	1120	1170	549	211	182
AC-FT	15760	14140	13740	19800	21740	59620	59920	118900	101800	63210	20110	12220
CAL YR 1982	TOTAL	286314	MEAN	784	MAX	2890	MIN	94	AC-FT	567900		
WTR YR 1983	TOTAL	262644	MEAN	720	MAX	3200	MIN	125	AC-FT	521000		

## GRANDE RONDE RIVER BASIN

13319000 GRANDE RONDE RIVER AT LA GRANDE, OR

LOCATION.--Lat 45°20'47", long 118°07'26", in NW¼SE¼ 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<sup>2</sup>.

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 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.--Records excellent. Since 1915, slight regulation by city of La Grande reservoir on Beaver Creek, capacity, about 900 acre-ft. Diversions for irrigation above station. Since 1909, city of La Grande has diverted about 3 ft<sup>3</sup>/s from Beaver Creek above station for domestic water supply.

AVERAGE DISCHARGE.--75 years, 386 ft<sup>3</sup>/s, 279,700 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 14,100 ft<sup>3</sup>/s Jan. 30, 1965, gage height, 11.44 ft, site and datum then in use, from rating curve extended above 7,200 ft<sup>3</sup>/s; minimum, 3.9 ft<sup>3</sup>/s Aug. 26, 1940.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 2,100 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Jan. 8	0100	2,200	6.39	Mar. 4	1530	*4,410	*8.89
Feb. 18	2030	2,140	6.30	Mar. 11	1730	3,010	7.37

Minimum, 22 ft<sup>3</sup>/s Nov. 23, result of freezeup.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1982 TO SEPTEMBER 1983  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	81	174	128	115	263	1090	1170	1240	1090	276	70	49
2	77	158	126	120	212	1520	1210	1280	939	355	65	57
3	97	149	141	130	163	1700	1150	1250	823	327	62	49
4	116	149	265	150	150	3380	1060	1250	727	282	59	45
5	102	140	425	180	153	3260	953	1580	644	251	57	43
6	91	174	745	450	199	2520	867	1800	580	232	53	41
7	100	183	645	1700	204	2150	809	1670	543	220	51	40
8	108	171	460	1840	185	2250	768	1580	537	207	52	40
9	114	178	377	1310	193	2620	737	1470	581	194	55	40
10	126	158	266	985	189	2570	714	1360	532	183	123	41
11	112	147	222	788	196	2840	668	1230	560	169	126	44
12	103	115	230	656	260	2680	627	1090	514	156	89	44
13	95	160	240	563	428	2710	592	1000	443	149	73	40
14	91	90	249	483	473	2670	555	955	388	156	66	38
15	88	79	248	402	458	2310	528	1070	377	153	62	36
16	91	164	266	447	616	1920	518	1030	347	139	57	36
17	91	158	414	431	690	1630	544	962	322	138	53	35
18	100	155	355	359	1330	1410	606	1020	380	143	50	36
19	94	154	329	364	1620	1200	689	1070	332	127	48	46
20	87	142	304	349	1200	1030	836	1150	316	118	48	56
21	90	136	316	313	1060	921	1130	1340	284	110	50	48
22	92	92	339	285	1510	834	1310	1450	257	102	66	45
23	99	50	317	285	1920	812	1390	1510	247	96	78	44
24	105	82	272	288	1840	753	1640	1630	243	111	90	43
25	98	110	142	260	1740	744	1560	1720	222	102	75	41
26	96	143	130	296	1600	721	1410	1770	212	93	64	40
27	109	163	125	335	1330	769	1280	1690	320	87	58	45
28	99	162	118	305	1130	784	1150	1610	308	84	54	51
29	166	158	110	302	---	812	1120	1560	274	80	50	45
30	210	134	105	287	---	1090	1120	1450	296	75	48	44
31	186	---	100	251	---	1290	---	1300	---	71	45	---
TOTAL	3314	4228	8509	15029	21312	52990	28711	42087	13638	4986	1997	1302
MEAN	107	141	274	485	761	1709	957	1358	455	161	64.4	43.4
MAX	210	183	745	1840	1920	3380	1640	1800	1090	355	126	57
MIN	77	50	100	115	150	721	518	955	212	71	45	35
AC-FT	6570	8390	16880	29810	42270	105100	56950	83480	27050	9890	3960	2580
CAL YR 1982	TOTAL	225909	MEAN	619	MAX	4860	MIN	36	AC-FT	448100		
WTR YR 1983	TOTAL	198103	MEAN	543	MAX	3380	MIN	35	AC-FT	392900		

## GRANDE RONDE RIVER BASIN

91

13320000 CATHERINE CREEK NEAR UNION, OR

LOCATION.--Lat 45°09'20", long 117°46'26", in NW¼SE¼ 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<sup>2</sup>.

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 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.--Records excellent except those for November through February, which are fair. No regulation. Several small diversions for irrigation above 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.--60 years (water years 1912, 1919, 1926-83), 119 ft<sup>3</sup>/s, 86,220 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,740 ft<sup>3</sup>/s May 27, 1948, gage height, 4.57 ft; minimum, 6.5 ft<sup>3</sup>/s Feb. 4, 1955, result of freezeup; minimum daily, 8 ft<sup>3</sup>/s Nov. 7, 1925.

EXTREMES FOR CURRENT YEAR.--Peak discharge above base of 500 ft<sup>3</sup>/s and maximum discharge, 1,090 ft<sup>3</sup>/s May 28, gage height, 3.60 ft; minimum, 27 ft<sup>3</sup>/s Nov. 12.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1982 TO SEPTEMBER 1983  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	39	52	38	39	54	139	121	326	681	281	58	41
2	37	47	38	43	50	170	132	340	627	281	54	38
3	42	48	41	46	46	223	126	349	591	228	53	35
4	40	46	51	52	42	263	123	361	548	205	51	34
5	38	45	50	61	39	265	118	401	500	204	48	33
6	37	48	57	75	38	238	115	376	465	213	47	33
7	44	43	53	150	39	223	115	349	449	203	46	33
8	43	43	49	145	40	208	115	331	448	186	46	33
9	42	42	44	125	41	257	117	301	434	171	45	33
10	43	39	40	105	42	317	114	268	441	154	61	33
11	42	38	40	90	43	341	107	243	395	142	52	37
12	40	38	41	74	45	304	102	231	348	136	46	33
13	38	38	42	70	49	319	97	228	303	133	43	31
14	37	33	43	65	51	323	94	221	284	130	42	31
15	37	35	44	62	53	296	93	229	308	121	41	30
16	43	46	48	59	65	258	99	217	299	111	39	30
17	40	46	51	58	79	230	117	221	306	103	39	30
18	41	58	46	55	113	205	139	259	304	98	38	33
19	38	51	45	58	123	181	159	284	264	93	36	39
20	38	46	44	55	111	163	205	335	235	93	38	33
21	38	44	52	52	101	151	245	405	215	87	47	33
22	41	42	58	50	116	145	276	458	210	82	52	32
23	44	31	56	49	134	143	340	532	227	82	46	33
24	43	35	50	51	144	131	428	648	226	82	43	32
25	40	38	44	50	162	125	390	771	214	76	38	31
26	73	41	41	59	171	115	341	884	216	73	37	32
27	55	44	37	64	157	119	304	909	234	70	35	32
28	49	45	36	62	142	110	281	964	219	66	34	32
29	66	47	35	61	---	111	280	956	236	63	33	32
30	57	40	35	60	---	118	297	900	217	60	32	32
31	52	---	36	56	---	124	---	804	---	60	32	---
TOTAL	1357	1289	1385	2101	2290	6315	5590	14101	10444	4087	1352	994
MEAN	43.8	43.0	44.7	67.8	81.8	204	186	455	348	132	43.6	33.1
MAX	73	58	58	150	171	341	428	964	681	281	61	41
MIN	37	31	35	39	38	110	93	217	210	60	32	30
AC-FT	2690	2560	2750	4170	4540	12530	11090	27970	20720	8110	2680	1970

CAL YR 1982 TOTAL 49384 MEAN 135 MAX 646 MIN 25 AC-FT 97950  
WTR YR 1983 TOTAL 51305 MEAN 141 MAX 964 MIN 30 AC-FT 101800

## GRANDE RONDE RIVER BASIN

## 13324300 LOOKINGGLASS CREEK NEAR LOOKING GLASS, OR

LOCATION.--Lat 45°43'55", long 117°51'50", in NW¼NW¼ 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<sup>2</sup>.

PERIOD OF RECORD.--October 1982 to September 1983.

GAGE.--Water-stage recorder. Altitude of gage is 2,530 ft, from topographic map.

REMARKS.--Records excellent except those for period of no gage-height record Aug. 25 to Sept. 30, which are fair. Records include a diversion 0.3 mi above station of up to 50 ft<sup>3</sup>/s that is returned to the gage pool.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 380 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Feb. 18	1530	407	5.49	May 1	1930	414	5.51
Mar. 13	1230	440	5.59	May 25	1800	*497	*5.78

Minimum daily, 50 ft<sup>3</sup>/s Sept. 8, 9, 15-17.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1982 TO SEPTEMBER 1983  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	57	65	70	64	100	229	311	379	357	106	62	54
2	57	64	69	57	95	274	310	381	331	121	59	60
3	58	62	78	62	89	292	291	367	306	106	58	58
4	58	61	113	67	87	310	273	372	272	96	57	56
5	58	62	102	88	84	316	255	376	245	92	57	54
6	57	77	116	178	88	307	238	360	220	89	58	52
7	60	68	103	303	88	304	224	352	212	86	57	52
8	61	64	90	304	87	312	212	348	199	85	57	50
9	67	65	83	246	91	342	201	332	189	83	57	50
10	66	64	78	200	91	367	189	312	187	82	62	52
11	63	60	75	170	94	387	177	293	183	79	61	58
12	57	58	75	155	108	382	170	285	176	78	57	56
13	56	61	75	140	117	404	162	283	156	77	57	54
14	56	56	75	131	117	412	156	290	142	79	57	52
15	64	59	82	124	115	387	152	318	137	77	57	50
16	72	60	91	120	135	358	154	299	131	75	57	50
17	66	70	107	115	219	333	165	296	126	75	57	50
18	64	73	98	111	378	309	182	355	123	73	57	52
19	59	74	91	110	339	285	201	359	118	71	55	58
20	58	70	87	107	274	266	245	382	115	75	55	68
21	57	67	96	103	234	250	304	416	111	71	55	66
22	60	61	105	101	256	235	321	428	106	70	57	62
23	63	62	98	100	277	226	343	440	103	70	67	60
24	65	64	89	99	283	210	399	454	105	70	62	58
25	61	63	81	95	276	194	381	466	103	70	60	56
26	67	61	79	105	276	182	355	467	103	68	58	54
27	62	62	73	112	254	181	335	453	106	65	56	56
28	61	64	73	113	228	172	322	440	104	65	54	64
29	77	74	71	111	---	188	323	430	107	63	54	60
30	67	74	70	108	---	336	---	416	102	63	52	56
31	65	---	73	102	---	331	---	390	---	62	52	---
TOTAL	1919	1945	2666	4001	4880	9081	7687	11539	4975	2442	1781	1678
MEAN	61.9	64.8	86.0	129	174	293	256	372	166	78.8	57.5	55.9
MAX	77	77	116	304	378	412	399	467	357	121	67	68
MIN	56	56	69	57	84	172	152	283	102	62	52	50
AC-FT	3810	3860	5290	7940	9680	18010	15250	22890	9870	4840	3530	3330
WTR YR 1983	TOTAL	54594	MEAN	150	MAX	467	MIN	50	AC-FT	108300		

## GRANDE RONDE RIVER BASIN

93

13326000 WALLOWA LAKE NEAR JOSEPH, OR

LOCATION.--Lat 45°20'10", long 117°13'15", in NW¼ 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<sup>2</sup>.

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 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 13, 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 observed, 4,790 acre-ft Oct. 10, 1929, gage height, 3.10 ft.

EXTREMES FOR CURRENT YEAR.--Maximum contents, 38,640 acre-ft July 26, gage height, 24.32 ft; minimum, 28,110 acre-ft May 23, gage height, 17.88 ft.

## MONTHEND GAGE-HEIGHT AND CONTENTS AT 2400, WATER YEAR OCTOBER 1982 TO SEPTEMBER 1983

Date	Gage Height (feet)	Contents (acre-feet)	Change in contents (acre-feet)
Sept. 30.....	21.20	33,510	-
Oct. 31.....	23.40	37,120	+3,610
Nov. 30.....	21.57	34,110	-3,010
Dec. 31.....	20.82	32,880	-1,230
CAL YR 1982.....	-	-	+6,640
Jan. 31.....	19.53	30,790	-2,090
Feb. 28.....	19.12	30,110	-680
Mar. 31.....	18.52	29,140	-970
Apr. 30.....	19.10	30,080	+940
May 31.....	20.53	32,420	+2,340
June 30.....	21.88	34,630	+2,210
July 31.....	24.03	38,160	+3,530
Aug. 31.....	20.12	31,740	-6,420
Sept. 30.....	18.95	29,840	-1,900
WTR YR 1983.....	-	-	-3,670



## GRANDE RONDE RIVER BASIN

## 13327500 WALLOWA RIVER AT JOSEPH, OR

LOCATION.--Lat 45°20'15", long 117°13'35", in NW¼ 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<sup>2</sup>.

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 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.--Records good. Monthly discharge adjusted for storage in Wallowa Lake (see 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<sup>3</sup>/s from Wallowa Lake for municipal use.

AVERAGE DISCHARGE.--56 years (water years 1928-83), 135 ft<sup>3</sup>/s, 36.02 in/yr, 97,810 acre-ft/yr, adjusted for storage and diversion.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,550 ft<sup>3</sup>/s June 10, 1969, gage height, 5.15 ft; no flow at times in some years.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 478 ft<sup>3</sup>/s June 11, gage height, 3.68 ft; minimum, 28 ft<sup>3</sup>/s Apr. 20-24, 26-30, May 1-4.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1982 TO SEPTEMBER 1983  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	37	121	112	55	97	91	31	28	386	363	263	126
2	38	121	113	55	97	91	31	28	401	366	274	126
3	38	121	113	55	97	91	31	29	404	367	317	156
4	38	121	114	55	66	91	31	29	405	367	342	174
5	38	121	114	55	48	91	31	29	405	353	342	174
6	38	120	95	55	48	91	31	40	406	347	340	150
7	38	120	83	55	48	91	31	66	430	349	339	128
8	38	120	83	81	48	91	31	66	450	350	337	115
9	38	119	83	103	48	91	68	67	449	351	336	112
10	38	120	83	103	49	91	90	67	464	352	327	113
11	38	120	82	102	49	91	90	103	474	353	307	91
12	38	120	82	102	48	91	90	154	474	346	282	81
13	38	119	82	102	47	91	90	211	474	315	267	82
14	38	120	82	102	47	91	90	228	472	318	255	82
15	38	120	81	100	47	91	89	273	468	319	254	81
16	39	120	82	99	47	91	89	318	468	308	253	81
17	39	119	82	99	47	91	88	314	468	303	252	81
18	39	119	82	99	47	91	88	310	469	303	250	81
19	39	119	70	98	47	90	88	308	469	303	248	81
20	39	119	55	99	47	90	50	306	466	302	246	81
21	39	118	55	99	47	90	28	299	464	302	243	81
22	39	118	55	99	47	80	28	294	464	252	239	81
23	40	118	55	99	47	71	28	294	464	199	237	81
24	39	117	55	98	75	48	29	294	465	153	217	81
25	39	117	55	98	92	31	29	295	380	188	155	81
26	40	117	55	98	92	32	28	298	354	234	108	81
27	55	115	55	98	91	31	28	302	355	264	102	81
28	62	112	55	98	91	32	28	306	357	264	102	80
29	77	112	55	98	---	32	28	325	359	264	109	80
30	102	113	55	98	---	32	28	348	361	263	111	79
31	113	---	55	98	---	31	---	365	---	263	121	---
TOTAL	1409	3556	2378	2755	1701	2328	1540	6394	12925	9381	7575	3002
MEAN	45.5	119	76.7	88.9	60.8	75.1	51.3	206	431	303	244	100
MAX	113	121	114	103	97	91	90	365	474	367	342	174
MIN	37	112	55	55	47	31	28	28	354	153	102	79
AC-FT	2790	7050	4720	5460	3370	4620	3050	12680	25640	18610	15030	5950
MEAN†	112	69.2	62.9	61.6	54.9	65.4	70.8	254	522	404	183	83.4
CFSM†	2.20	1.36	1.24	1.21	1.08	1.28	1.39	4.99	10.3	7.94	3.60	1.64
IN.†	2.53	1.52	1.43	1.40	1.12	1.48	1.55	5.76	11.46	9.16	4.16	1.83
AC-FT†	6870	4120	3870	3790	3050	4020	4210	15620	31090	24860	11280	4960

CAL YR 1982 TOTAL 58412 MEAN 160 MAX 761 MIN 25 AC-FT 115900 MEAN† 186 CFSM† 3.65 IN.† 49.57 AC-FT† 134520  
WTR YR 1983 TOTAL 54944 MEAN 151 MAX 474 MIN 28 AC-FT 109000 MEAN† 163 CFSM† 3.20 IN.† 43.39 AC-FT† 117770

† Adjusted for change in contents of Wallowa Lake and diversion by Silver Lake ditch.

## GRANDE RONDE RIVER BASIN

95

13330000 LOSTINE RIVER NEAR LOSTINE, OR

LOCATION.--Lat 45°26'20", long 117°25'35", in NW¼ 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<sup>2</sup>.

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. Altitude 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.--Records excellent. 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 above station.

AVERAGE DISCHARGE.--59 years (water years 1913, 1926-83), 196 ft<sup>3</sup>/s, 142,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 2,550 ft<sup>3</sup>/s June 16, 1974, gage height, 8.59 ft, present datum; minimum, 7.5 ft<sup>3</sup>/s Mar. 2, 1966, result of freezeup; minimum daily, 10 ft<sup>3</sup>/s Nov. 28-30, 1936.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 1,100 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
May 28	2330	*1,740	*7.36	July 1	2130	1,130	6.13
June 10	2030	1,310	6.52	July 6	2230	1,150	6.17
June 17	2200	1,130	6.12				

Minimum, 24 ft<sup>3</sup>/s Feb. 3.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1982 TO SEPTEMBER 1983  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	69	103	50	30	42	55	63	174	1050	937	278	75
2	69	90	48	32	39	59	64	181	1030	895	280	79
3	83	95	53	35	33	61	61	197	998	649	270	67
4	81	90	63	38	34	74	59	216	963	607	245	62
5	76	87	55	60	34	73	57	243	893	720	225	59
6	73	88	62	74	39	70	55	218	864	924	209	57
7	78	79	55	81	39	69	55	204	906	922	200	54
8	75	76	42	82	37	70	54	197	999	790	200	53
9	72	74	40	72	39	76	54	183	1030	669	186	52
10	71	69	44	66	40	86	54	171	1090	514	184	53
11	89	64	44	62	39	104	52	159	989	492	178	65
12	93	64	44	59	42	98	53	149	714	547	153	54
13	91	67	46	57	41	100	52	145	573	650	133	51
14	77	55	45	55	39	97	50	145	563	717	124	49
15	81	60	49	53	38	89	50	152	718	545	122	47
16	97	64	51	52	40	84	50	143	736	425	112	45
17	92	62	53	50	63	80	54	141	835	378	106	44
18	87	62	48	49	76	76	60	165	903	365	98	48
19	81	59	47	48	62	73	68	174	656	403	92	60
20	81	58	47	48	55	70	84	221	522	440	90	50
21	79	58	50	46	51	68	115	321	452	391	91	49
22	100	43	49	45	52	65	124	395	474	382	92	46
23	136	42	47	45	53	64	158	506	658	433	91	44
24	150	44	44	44	54	62	216	700	751	451	89	44
25	131	47	35	44	59	63	188	921	697	416	80	42
26	172	49	45	44	60	61	164	1160	729	369	75	42
27	147	50	30	49	57	61	151	1280	840	316	71	42
28	130	52	29	45	56	59	143	1460	785	280	68	41
29	129	51	28	44	---	60	143	1500	865	276	65	40
30	119	51	28	43	---	73	152	1450	800	283	63	39
31	108	---	29	42	---	68	---	1260	---	293	61	---
TOTAL	3017	1953	1400	1594	1313	2268	2703	14531	24083	16479	4331	1553
MEAN	97.3	65.1	45.2	51.4	46.9	73.2	90.1	469	803	532	140	51.8
MAX	172	103	63	82	76	104	216	1500	1090	937	280	79
MIN	69	42	28	30	33	55	50	141	452	276	61	39
AC-FT	5980	3870	2780	3160	2600	4500	5360	28820	47770	32690	8590	3080
CAL YR 1982	TOTAL	90635	MEAN	248	MAX	1680	MIN	27	AC-FT	179800		
WTR YR 1983	TOTAL	75225	MEAN	206	MAX	1500	MIN	28	AC-FT	149200		

## GRANDE RONDE RIVER BASIN

13330500 BEAR CREEK NEAR WALLOWA, OR

LOCATION.--Lat 45°31'37", long 117°33'05", in NW¼NE¼ sec.34, T.1 N., R.42 E., Wallowa County, Hydrologic Unit 17060105, on right bank 30 ft downstream from road bridge, 3.0 mi southwest of Wallowa, and at mile 4.4.

DRAINAGE AREA.--68 mi<sup>2</sup>, approximately.

PERIOD OF RECORD.--April to September 1915, April 1924 to current year. Monthly discharge only for some periods, published in WSP 1317.

REVISED RECORDS.--WSP 1397: 1915, 1927, 1929-30, 1932, 1936-40, 1945, 1949.

GAGE.--Water-stage recorder. Altitude of gage is 3,250 ft, by barometer. Apr. 13 to Sept. 16, 1915, nonrecording gage at site 1.0 mi upstream at different datum. Apr. 22, 1924, to Nov. 2, 1931, water-stage recorder at site 1.5 mi upstream at different datum.

REMARKS.--Records good. No regulation. Diversions for irrigation above station. Water for irrigation in Lostine River basin diverted from Little Bear Creek, a tributary above station, in sec.32, T.1 S., R.43 E.

AVERAGE DISCHARGE.--59 years (water years 1925-83), 114 ft<sup>3</sup>/s, 82,590 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,730 ft<sup>3</sup>/s June 15, 1974; maximum gage height, 3.82 ft Apr. 22, 1936 (from floodmark); minimum daily discharge, 3 ft<sup>3</sup>/s Jan. 20, Feb. 1, 1937.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 600 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
May 28	2030	*1,400	*3.43	June 10	1930	645	2.84

Minimum, 12 ft<sup>3</sup>/s Sept. 26-30.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1982 TO SEPTEMBER 1983  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	26	54	32	21	38	98	78	169	651	384	52	19
2	28	46	26	23	37	96	81	169	589	397	48	17
3	41	48	32	25	27	98	76	181	556	309	45	17
4	39	47	40	35	25	125	74	201	505	289	43	16
5	36	45	38	50	24	147	70	230	452	318	39	16
6	36	49	48	74	23	145	66	208	441	361	36	15
7	41	43	45	90	27	136	65	185	452	329	34	15
8	38	41	35	150	26	132	63	172	493	296	34	15
9	36	40	33	130	28	139	63	155	506	257	33	15
10	37	37	36	109	29	159	60	139	529	202	35	16
11	38	36	35	94	30	194	58	124	451	190	33	18
12	40	36	36	84	33	187	56	114	366	196	30	16
13	39	36	37	76	34	183	52	112	310	214	28	15
14	40	30	36	69	33	180	50	114	298	219	26	15
15	43	33	35	65	33	165	49	122	375	166	25	14
16	56	35	35	61	38	146	49	114	367	137	24	13
17	53	35	37	57	57	130	56	111	399	122	23	13
18	48	34	34	53	112	119	68	138	422	114	22	14
19	43	33	33	50	128	106	79	152	325	114	21	16
20	43	31	33	48	110	95	96	200	266	120	21	14
21	43	30	36	45	94	88	128	314	227	109	21	14
22	53	25	36	43	90	82	150	382	229	100	22	13
23	65	22	36	42	92	75	179	451	294	102	22	13
24	66	23	34	40	98	71	232	593	306	102	21	13
25	60	25	25	38	113	67	220	757	289	90	20	13
26	79	26	23	40	118	62	190	932	311	81	19	13
27	71	27	23	43	114	61	165	944	363	72	18	13
28	64	32	22	40	105	58	148	1050	326	65	18	12
29	66	32	21	40	---	58	143	1100	348	60	17	12
30	61	34	21	40	---	74	153	1040	321	57	16	12
31	56	---	22	39	---	78	---	839	---	55	16	---
TOTAL	1485	1065	1015	1814	1716	3554	3017	11512	11767	5627	862	437
MEAN	47.9	35.5	32.7	58.5	61.3	115	101	371	392	182	27.8	14.6
MAX	79	54	48	150	128	194	232	1100	651	397	52	19
MIN	26	22	21	21	23	58	49	111	227	55	16	12
AC-FT	2950	2110	2010	3600	3400	7050	5980	22830	23340	11160	1710	867
CAL YR 1982	TOTAL	54491	MEAN	149	MAX	987	MIN	17	AC-FT	108100		
WTR YR 1983	TOTAL	43871	MEAN	120	MAX	1100	MIN	12	AC-FT	87020		

## GRANDE RONDE RIVER BASIN

97

13331500 MINAM RIVER AT MINAM, OR  
(Hydrologic bench-mark station)

LOCATION.--Lat 45°37'12", long 117°43'32", in SW¼SW¼ 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<sup>2</sup>, 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 National Geodetic Vertical Datum of 1929. June 1912 to March 1914, nonrecording gage at approximately same site at different datum.

REMARKS.--Water-discharge records good. No regulation or diversion above station.

AVERAGE DISCHARGE.--19 years, 478 ft<sup>3</sup>/s, 27.05 in/yr, 346,300 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 6,260 ft<sup>3</sup>/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<sup>3</sup>/s Dec. 6, 1972, Jan. 10, 1973, result of freezeup.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 1,450 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
May 29	0130	*4,420	*a5.35	July 1	2200	2,200	3.72
June 10	2400	2,540	4.00	July 7	0230	1,780	3.35
June 18	0230	2,030	3.57				

Minimum, 49 ft<sup>3</sup>/s Dec. 28.

a From peak-stage indicator.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1982 TO SEPTEMBER 1983  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP		
1	125	205	146	74	161	298	271	596	2640	1700	403	126		
2	122	183	141	85	143	319	279	590	2540	1870	389	160		
3	150	182	158	110	126	373	262	626	2400	1440	378	130		
4	150	182	210	141	103	504	251	678	2290	1290	352	121		
5	140	179	232	204	101	596	238	799	2120	1350	323	114		
6	128	194	267	365	127	570	231	735	1970	1550	299	110		
7	147	178	260	702	141	523	227	682	2020	1590	287	105		
8	143	158	214	657	134	520	220	662	2140	1380	284	104		
9	135	170	190	495	141	576	218	613	2160	1250	276	102		
10	137	153	170	386	129	648	213	568	2240	1040	326	102		
11	139	150	180	312	121	777	198	526	2120	951	284	125		
12	139	134	200	275	145	716	194	492	1690	966	257	112		
13	134	162	220	256	169	765	184	482	1420	1000	227	101		
14	131	118	210	229	180	794	176	476	1360	1120	206	95		
15	134	116	200	212	180	681	174	515	1560	967	199	92		
16	147	165	190	212	224	570	176	476	1600	791	191	89		
17	149	163	203	194	320	498	199	452	1640	701	183	85		
18	149	157	204	184	734	441	231	550	1810	648	175	87		
19	136	166	197	177	706	387	258	592	1460	652	166	121		
20	135	150	189	173	470	342	309	707	1240	710	166	104		
21	135	145	199	162	360	315	411	972	1100	647	165	96		
22	153	107	210	156	335	293	467	1120	1090	610	190	91		
23	181	87	206	154	366	286	542	1360	1300	642	172	88		
24	206	90	189	150	386	261	749	1770	1400	707	178	85		
25	185	129	144	146	425	248	686	2120	1330	653	156	82		
26	261	229	130	158	431	235	589	2770	1360	590	145	80		
27	256	241	95	180	374	234	527	3020	1540	510	139	80		
28	223	226	70	180	328	223	487	3440	1460	445	132	77		
29	236	178	70	179	---	220	479	3800	1550	414	126	76		
30	230	157	74	176	---	252	519	3650	1470	405	121	76		
31	211	---	70	163	---	276	---	3240	---	413	116	---		
TOTAL	5047	4854	5438	7247	7560	13741	9965	39079	52020	29002	7011	3016		
MEAN	163	162	175	234	270	443	332	1261	1734	936	226	101		
MAX	261	241	267	702	734	794	749	3800	2640	1870	403	160		
MIN	122	87	70	74	101	220	174	452	1090	405	116	76		
CFSM	.68	.67	.73	.97	1.13	1.85	1.38	5.25	7.22	3.90	.94	.42		
IN.	.78	.75	.84	1.12	1.17	2.13	1.54	6.06	8.06	4.50	1.09	.47		
AC-FT	10010	9630	10790	14370	15000	27260	19770	77510	103200	57530	13910	5980		
CAL YR 1982	TOTAL	215632	MEAN	591	MAX	3600	MIN	66	CFSM	2.46	IN.	33.42	AC-FT	427700
WTR YR 1983	TOTAL	183980	MEAN	504	MAX	3800	MIN	70	CFSM	2.10	IN.	28.52	AC-FT	364900

## GRANDE RONDE RIVER BASIN

13331500 MINAM RIVER AT MINAM, OR--Continued

## WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1966 to current year.

PERIOD OF DAILY RECORD.--

WATER TEMPERATURES: October 1965 to current year.

INSTRUMENTATION.--Temperature recorder since October 1965.

EXTREMES FOR PERIOD OF DAILY RECORD.--

WATER TEMPERATURES: Maximum, 27.0°C July 23, 27, 1977; minimum, 0.0°C on many days during winter periods each year.

EXTREMES FOR CURRENT YEAR.--

WATER TEMPERATURES: Maximum, 23.5°C Aug. 9; minimum, 0.0°C on many days during winter periods.

## WATER QUALITY DATA, WATER YEAR OCTOBER 1982 TO SEPTEMBER 1983

DATE	TIME	STREAM- FLOW, INSTAN- TANEOUS (CFS)	SPE- CIFIC CON- DUCT- ANCE (UMHOS)	PH (STAND- ARD UNITS)	TEMPER- ATURE (DEG C)	OXYGEN, DIS- SOLVED (MG/L)	COLI- FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)	STREP- TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML)	HARD- NESS (MG/L AS CAC03)	CALCIUM DIS- SOLVED (MG/L AS CA)
NOV 23...	0910	101	52	E7.7	.0	13.5	K1	110	21	6.1
JAN 25...	0900	145	61	E7.8	1.0	E11.4	K3	12	23	6.4
APR 05...	0830	284	59	7.4	5.0	--	K1	<1	--	--
JUL 06...	0820	1440	25	7.3	11.0	E9.8	30	27	9	2.8
AUG 24...	1000	162	42	8.1	17.0	9.1	K7	38	18	5.4

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- LITY FIELD (MG/L AS CAC03)	SULFATE DIS- SOLVED (MG/L AS S04)	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 23...	1.5	2.3	1.1	26	<5.0	.40	<.10	<.060	<.100
JAN 25...	1.7	2.6	1.1	26	<5.0	.50	<.10	<.060	<.100
APR 05...	--	2.6	1.1	30	2.2	--	<.10	.120	<.100
JUL 06...	.60	1.1	.60	12	.9	<.10	<.10	<.060	<.100
AUG 24...	1.0	2.6	.90	21	.9	.30	<.10	.070	<.100

## GRANDE RONDE RIVER BASIN

13331500 MINAM RIVER AT MINAM, OR--Continued

## WATER QUALITY DATA, WATER YEAR OCTOBER 1982 TO SEPTEMBER 1983

DATE	NITRO- GEN, AM- MONIA + ORGANIC TOTAL (MG/L AS N)	PHOS- PHATE, ORTHO, DIS- SOLVED (MG/L AS PO4)	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 CONSTITUENTS, DIS- SOLVED (MG/L)	SOLIDS, DIS- SOLVED (TONS PER DAY)	TUR- BID- ITY (NTU)
NOV 23...	.40	--	.010	.450	19	48	--	13	2.2
JAN 25...	.40	--	.020	.020	22	49	--	19	2.7
APR 05...	.60	.12	.030	.030	25	E38	--	--	2.9
JUL 06...	.80	.06	.010	.040	9.9	20	--	78	2.0
AUG 24...	.40	--	<.010	<.010	15	35	39	15	.80

DATE	ALUM- INUM, DIS- SOLVED (UG/L AS AL)	ARSENIC DIS- SOLVED (UG/L AS AS)	BARIUM, DIS- SOLVED (UG/L AS BA)	BERYL- LIUM, DIS- SOLVED (UG/L AS BE)	CADMIUM DIS- SOLVED (UG/L AS CD)	CHRO- MIUM, DIS- SOLVED (UG/L AS CR)	COBALT, DIS- SOLVED (UG/L AS CO)	COPPER, DIS- SOLVED (UG/L AS CU)	IRON, DIS- SOLVED (UG/L AS FE)	LEAD, DIS- SOLVED (UG/L AS PB)
APR 05...	230	<1	14	<1	<1	<1	<3	1	150	1
JUL 06...	180	<1	11	<1	<1	2	<3	<1	130	2
AUG 24...	20	<1	11	<1	<1	<1	<3	1	12	<1

DATE	LITHIUM DIS- SOLVED (UG/L AS LI)	MANGA- NESE, DIS- SOLVED (UG/L AS MN)	MERCURY DIS- SOLVED (UG/L AS HG)	MOLYB- DENUM, DIS- SOLVED (UG/L AS MO)	NICKEL, DIS- SOLVED (UG/L AS NI)	SELE- NIUM, DIS- SOLVED (UG/L AS SE)	SILVER, DIS- SOLVED (UG/L AS AG)	STRON- TIUM, DIS- SOLVED (UG/L AS SR)	VANA- DIUM, DIS- SOLVED (UG/L AS V)	ZINC, DIS- SOLVED (UG/L AS ZN)
APR 05...	4	2	<.1	<10	2	<1	<1	--	--	8
JUL 06...	4	5	.2	<10	1	<1	<1	12	<6	5
AUG 24...	<4	1	<.1	<10	1	<1	<1	20	<6	14

DATE	GROSS ALPHA, DIS- SOLVED (UG/L AS U-NAT)	GROSS ALPHA, SUSP. TOTAL (UG/L AS U-NAT)	GROSS BETA, DIS- SOLVED (PCI/L AS CS-137)	GROSS BETA, DIS- SOLVED (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, DIS- SOLVED, RADON METHOD (PCI/L)	URANIUM DIS- SOLVED, EXTRAC- TION (UG/L)
APR 05...	<.8	<.4	1.1	1.1	<.5	<.5	.04	.23

E - Estimated value, based on values reported by Denver Central Laboratory.

K - Results based on colony count outside acceptable range (non-ideal colony count).



## GRANDE RONDE RIVER BASIN

13331500 MINAM RIVER AT MINAM, OR--Continued

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1982 TO SEPTEMBER 1983

DAY	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN
OCTOBER			NOVEMBER		DECEMBER		JANUARY		FEBRUARY		MARCH	
1	11.5	4.5	6.0	3.5	1.0	.0	.0	.0	3.5	.5	7.0	4.0
2	11.5	6.5	4.5	1.5	.5	.0	.0	.0	1.5	.0	7.5	5.0
3	12.0	8.0	4.0	.5	3.5	.0	.0	.0	.5	.0	6.0	4.5
4	9.0	6.5	4.0	2.0	4.5	2.0	.0	.0	.0	.0	5.5	4.5
5	10.5	5.5	5.0	3.0	2.5	1.5	.5	.0	.5	.0	5.5	4.0
6	6.0	4.5	6.0	3.5	3.5	2.0	.5	.0	.0	.0	6.5	3.5
7	8.0	5.5	4.5	1.5	2.5	.0	2.5	.0	.0	.0	6.5	4.0
8	7.5	5.0	2.5	.5	.0	.0	2.5	1.5	.0	.0	6.5	4.0
9	10.5	5.0	3.0	.5	.0	.0	2.5	1.5	.0	.0	6.5	5.0
10	10.0	4.5	2.0	1.0	.0	.0	3.5	1.5	1.5	.0	8.0	5.0
11	10.0	4.0	2.5	.0	.0	.0	2.0	.0	2.5	.0	6.0	4.0
12	10.5	5.0	1.5	.0	.0	.0	1.0	.0	5.0	.5	4.5	3.0
13	10.5	4.5	2.0	.0	.0	.0	1.0	.0	3.5	2.0	5.5	4.0
14	11.0	5.0	.0	.0	.0	.0	.5	.0	4.0	1.5	5.5	3.5
15	10.0	6.0	.0	.0	.0	.0	.0	.0	4.0	2.0	6.0	3.5
16	11.5	7.0	.0	.0	1.5	.0	.5	.0	5.5	2.5	6.0	2.0
17	8.5	5.5	3.0	.0	2.5	1.5	1.5	.5	4.0	3.0	6.0	1.5
18	7.5	3.5	3.0	1.0	1.5	.5	1.0	.0	4.0	3.0	4.0	2.5
19	6.5	2.0	2.5	.5	2.5	1.0	1.5	.5	5.0	2.5	5.5	1.5
20	5.0	.5	3.0	.5	2.0	1.0	2.5	1.0	5.0	3.0	6.0	1.0
21	6.5	2.5	1.5	.0	3.5	2.0	3.0	1.0	6.0	3.5	6.5	2.0
22	9.5	5.5	.0	.0	2.5	1.0	1.5	.5	6.0	4.0	6.5	3.5
23	9.0	8.0	.0	.0	1.5	1.0	3.5	.5	5.5	4.0	6.5	3.5
24	8.5	7.0	.0	.0	1.0	.0	3.5	1.0	6.5	3.0	7.0	2.5
25	9.0	6.5	.0	.0	.0	.0	2.5	.5	6.0	4.0	7.0	3.5
26	9.0	6.5	.0	.0	.0	.0	2.0	1.0	6.0	3.0	7.0	3.0
27	6.5	4.5	.0	.0	.0	.0	3.5	2.0	4.0	2.0	5.5	3.5
28	5.0	3.0	.0	.0	.5	.0	2.5	.5	6.0	2.5	7.5	2.5
29	5.0	4.5	.0	.0	.0	.0	1.0	.0	---	---	5.5	3.5
30	6.0	4.5	.0	.0	.0	.0	3.0	1.0	---	---	7.5	4.5
31	6.0	4.0	---	---	.0	.0	2.0	.5	---	---	8.0	4.5
MONTH	12.0	.5	6.0	.0	4.5	.0	3.5	.0	6.5	.0	8.0	1.0
DAY	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN
APRIL			MAY		JUNE		JULY		AUGUST		SEPTEMBER	
1	8.0	3.0	8.0	5.5	9.5	5.0	9.0	7.5	19.5	13.0	19.5	16.0
2	7.0	4.0	8.5	6.0	9.0	5.5	8.0	6.5	21.5	14.5	19.5	13.0
3	5.0	3.0	10.0	5.5	9.5	5.5	11.0	6.0	20.5	14.5	19.5	12.0
4	8.0	3.0	9.5	5.5	9.5	5.0	13.0	7.5	21.5	14.5	19.5	12.0
5	8.5	2.0	7.5	5.5	9.0	5.0	14.0	9.0	21.5	15.0	20.0	13.0
6	9.0	2.0	8.5	5.0	10.0	5.5	12.5	10.0	22.5	15.0	18.5	10.5
7	9.0	3.0	7.5	5.0	10.0	6.0	11.5	8.5	21.5	16.0	19.0	12.0
8	8.5	4.5	6.5	5.0	8.5	6.0	11.5	9.0	21.0	16.5	16.0	12.0
9	6.5	4.5	7.0	4.0	9.5	6.0	10.5	7.5	23.5	17.0	15.5	10.0
10	8.5	2.5	6.0	4.0	8.0	5.5	12.5	7.0	20.0	17.0	11.0	7.5
11	8.5	2.5	10.0	3.0	7.5	4.5	13.5	9.0	18.5	15.5	17.0	10.0
12	5.0	3.0	10.0	4.0	7.0	5.0	13.5	10.5	20.5	13.0	18.0	10.0
13	9.0	2.0	10.0	4.5	10.0	5.0	14.5	11.0	21.5	13.0	19.0	10.0
14	10.0	2.0	10.0	4.5	11.0	7.0	13.0	10.0	23.0	16.5	18.5	11.5
15	11.0	3.0	9.5	5.5	10.5	8.0	10.5	8.5	22.5	16.0	18.0	10.0
16	11.5	3.5	8.0	4.5	10.0	6.0	12.5	7.5	23.0	15.5	17.5	9.5
17	11.5	4.5	11.5	4.5	9.5	7.0	12.5	8.5	22.5	14.5	14.5	10.0
18	10.0	5.5	9.5	7.5	8.0	6.0	16.0	9.0	22.5	15.0	10.5	8.5
19	11.5	5.5	11.5	5.5	7.5	5.5	16.5	11.0	21.0	14.0	12.0	7.0
20	11.0	6.0	12.5	6.5	9.5	5.5	15.0	11.5	21.5	16.0	12.5	4.5
21	8.5	6.5	11.0	7.0	10.0	6.5	16.0	9.5	17.5	14.5	13.5	5.0
22	9.0	4.5	11.0	6.0	11.0	7.5	17.5	11.5	17.5	14.0	12.5	5.5
23	7.0	6.0	11.0	5.5	10.5	8.5	18.0	13.0	18.0	14.5	12.5	7.5
24	7.5	5.0	10.0	5.0	10.5	7.5	15.5	12.5	19.5	13.0	16.0	7.5
25	8.0	4.0	10.0	5.0	11.0	6.5	16.5	12.5	21.5	13.5	16.5	8.0
26	8.5	4.0	9.5	4.5	11.5	8.0	16.5	11.5	21.0	13.5	16.5	9.5
27	8.5	3.0	9.5	4.5	10.0	7.5	15.5	11.0	20.5	13.5	16.0	10.5
28	9.0	4.0	9.5	5.0	11.5	7.0	18.0	11.0	21.0	14.5	13.5	6.0
29	9.5	5.5	9.0	4.5	10.0	7.5	19.5	12.5	21.5	14.0	12.0	4.5
30	9.0	5.5	9.5	5.0	9.5	7.0	20.5	13.5	20.5	13.5	12.0	4.5
31	---	---	7.0	5.0	---	---	17.0	15.0	20.5	13.5	---	---
MONTH	11.5	2.0	12.5	3.0	11.5	4.5	20.5	6.0	23.5	13.0	20.0	4.5

## GRANDE RONDE RIVER BASIN

101

## 13332500 GRANDE RONDE RIVER AT RONDOWA, OR

LOCATION.--Lat 45°43'36", long 117°46'59", in SW¼NW¼ 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<sup>2</sup>.

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 National Geodetic Vertical Datum of 1929.

REMARKS.--Records excellent. Flow slightly regulated by Wallowa Lake (see station 13326000) and small reservoirs. Diversions for irrigation above 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.--57 years, 2,166 ft<sup>3</sup>/s, 1,569,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 24,700 ft<sup>3</sup>/s Jan. 30, 1965, gage height, 10.93 ft; minimum, 179 ft<sup>3</sup>/s Aug. 24, 1977.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 6,200 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Feb. 18	1530	7,820	5.55	May 29	0500	*11,600	*6.96
Mar. 13	1600	9,240	6.10	June 11	0130	7,140	5.27

Minimum, 595 ft<sup>3</sup>/s Sept. 10, 17, 18.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1982 TO SEPTEMBER 1983  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	850	1210	966	741	1570	3720	3830	3980	8210	4620	1270	720
2	830	1150	964	780	1510	3970	3840	4100	7790	5440	1230	823
3	908	1120	1110	840	1360	4420	3720	4090	7270	4400	1160	774
4	951	1100	1490	965	1240	5810	3510	4120	6810	4000	1090	781
5	933	1070	1580	1430	1140	6780	3280	4380	6270	4030	975	777
6	883	1130	2040	3040	1130	6770	3080	4540	5760	4460	945	757
7	926	1110	2140	4630	1180	6310	2920	4530	5660	4640	891	728
8	926	1060	1840	4520	1240	6170	2780	4510	5890	4070	867	684
9	897	1070	1580	3900	1310	6360	2680	4320	6080	3800	867	643
10	887	1030	1340	3520	1330	6550	2670	4070	6230	3250	980	610
11	902	1010	1170	3450	1460	7340	2560	3860	6340	2960	995	736
12	890	941	1160	2980	2240	7590	2460	3670	5260	2930	977	717
13	865	978	1270	2480	2210	8250	2360	3500	4480	2980	902	645
14	849	889	1310	2160	2150	7990	2250	3400	4120	3290	847	622
15	849	832	1400	1960	2050	7230	2170	3500	4460	2850	819	620
16	885	911	1650	1880	2620	6470	2130	3510	4540	2400	816	615
17	890	1000	1910	1820	3850	5780	2150	3420	4470	2180	789	598
18	900	1010	1730	1730	6630	5150	2260	3590	5340	2060	751	612
19	853	1040	1590	1660	5880	4560	2430	3670	4460	2040	712	726
20	840	1020	1500	1660	4680	4100	2670	3840	3940	2190	713	672
21	825	990	1610	1610	4000	3780	3110	4400	3540	2050	727	663
22	847	875	1750	1550	4050	3470	3550	4900	3330	1900	846	687
23	947	747	1610	1530	4450	3260	3850	5530	3770	1860	919	675
24	1050	708	1470	1520	4610	3080	4730	6490	4100	1970	998	686
25	994	781	1260	1500	4820	2900	4720	7600	3880	1840	959	669
26	1130	820	1120	1680	4790	2800	4440	8990	3830	1700	884	657
27	1170	878	1030	2010	4320	2740	4160	9620	4210	1560	810	636
28	1090	945	888	1910	3950	2780	3950	10300	4150	1420	781	628
29	1200	1010	843	1730	---	2800	3800	10700	4340	1340	757	636
30	1220	1000	760	1700	---	3880	3810	10400	4310	1290	727	647
31	1210	---	720	1640	---	3960	---	9640	---	1270	713	---
TOTAL	29397	29435	42801	64526	81770	156770	95870	167170	152840	86790	27717	20444
MEAN	948	981	1381	2081	2920	5057	3196	5393	5095	2800	894	681
MAX	1220	1210	2140	4630	6630	8250	4730	10700	8210	5440	1270	823
MIN	825	708	720	741	1130	2740	2130	3400	3330	1270	712	598
AC-FT	58310	58380	84900	128000	162200	311000	190200	331600	303200	172100	54980	40550
CAL YR 1982	TOTAL	1152535	MEAN	3158	MAX	14300	MIN	568	AC-FT	2286000		
WTR YR 1983	TOTAL	955530	MEAN	2618	MAX	10700	MIN	598	AC-FT	1895000		

## GRANDE RONDE RIVER BASIN

13333000 GRANDE RONDE RIVER AT TROY, OR

LOCATION.--Lat 45°56'47", long 117°26'54", in NE¼NW¼ 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<sup>2</sup>.

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 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.--Records excellent. Flow slightly regulated by Wallowa Lake (see station 13326000) and small reservoirs. Diversions for irrigation above 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.--39 years, 3,132 ft<sup>3</sup>/s, 2,269,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 42,200 ft<sup>3</sup>/s Dec. 23, 1964, gage height, 11.25 ft; minimum, 344 ft<sup>3</sup>/s Aug. 19-21, 23, 1977.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 9,000 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Feb. 18	2000	12,900	7.06	Mar. 13	2030	*13,000	*7.07
Mar. 4	2300	10,400	6.53	May 29	0730	12,500	6.98

Minimum, 777 ft<sup>3</sup>/s Sept. 16-18.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1982 TO SEPTEMBER 1983  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1060	1510	1320	980	2100	5490	6470	5380	9280	4870	1440	894
2	1050	1480	1280	1050	2010	5950	6270	5610	8650	5630	1400	959
3	1090	1390	1430	1140	1830	6950	5900	5500	7980	5210	1330	955
4	1170	1370	2080	1300	1680	8290	5450	5510	7450	4650	1270	935
5	1170	1350	2280	1590	1540	9960	5010	5730	6880	4530	1170	940
6	1120	1460	2600	3680	1500	9590	4650	5900	6320	4860	1110	922
7	1140	1440	2810	6840	1510	8960	4400	5850	6100	5220	1070	894
8	1190	1380	2450	7320	1570	8740	4150	5850	6110	4670	1030	865
9	1150	1350	2060	6170	1630	9090	3930	5670	6360	4350	1020	829
10	1120	1320	1760	5210	1690	9410	3840	5360	6330	3790	1070	809
11	1130	1280	1530	4740	1790	10400	3670	5000	6640	3380	1170	918
12	1130	1230	1440	4270	2350	10700	3470	4730	5850	3270	1150	923
13	1110	1230	1510	3500	3180	11400	3310	4510	5340	3280	1080	843
14	1100	1180	1550	3000	3000	11900	3150	4390	4820	3580	1010	810
15	1080	1110	1610	2680	2840	10400	3030	4520	5020	3330	972	801
16	1110	1120	1930	2510	3400	9170	2970	4510	5240	2800	970	791
17	1150	1270	2350	2390	4810	8200	3030	4410	5000	2500	961	781
18	1170	1350	2320	2260	10300	7340	3230	4550	5560	2340	938	794
19	1130	1430	2120	2160	10300	6530	3480	4700	5250	2270	900	868
20	1100	1390	1970	2120	7660	5860	3870	4860	4620	2370	888	879
21	1090	1350	2060	2060	6260	5340	4610	5540	4130	2400	893	832
22	1110	1240	2580	1970	6040	4910	5170	6010	3820	2160	977	848
23	1220	1090	2380	1920	6640	4620	5520	6580	4120	2070	1090	842
24	1320	1040	2080	1920	6910	4350	6660	7480	4610	2190	1170	846
25	1290	1050	1780	1900	7220	4100	6670	8590	4450	2110	1140	828
26	1320	1120	1560	2080	7450	3910	6230	9890	4270	1960	1080	818
27	1540	1150	1390	2480	6740	3810	5820	10600	4670	1800	1000	797
28	1380	1210	1260	2760	6000	3800	5480	11100	4760	1670	962	790
29	1550	1290	1150	2430	---	3860	5200	11800	4750	1540	931	791
30	1550	1360	1050	2320	---	6990	5210	11400	5040	1480	909	804
31	1530	---	960	2220	---	7140	---	10800	---	1430	886	---
TOTAL	37370	38540	56650	88970	119950	227160	139850	202330	169420	97710	32987	25606
MEAN	1205	1285	1827	2870	4284	7328	4662	6527	5647	3152	1064	854
MAX	1550	1510	2810	7320	10300	11900	6670	11800	9280	5630	1440	959
MIN	1050	1040	960	980	1500	3800	2970	4390	3820	1430	886	781
AC-FT	74120	76440	112400	176500	237900	450600	277400	401300	336000	193800	65430	50790
CAL YR 1982	TOTAL	1471303	MEAN	4031	MAX	23000	MIN	762	AC-FT	2918000		
WTR YR 1983	TOTAL	1236543	MEAN	3388	MAX	11900	MIN	781	AC-FT	2453000		

## SNAKE RIVER BASIN

103

## 13353000 SNAKE RIVER BELOW ICE HARBOR DAM, WA

LOCATION.--Lat 46°14'53", long 118°52'43", in NE¼SW¼, 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<sup>2</sup>, 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. Chemical analyses October 1965 to September 1969, October 1971 to September 1972. For records collected at site 7.5 mi downstream see station 13353200.

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.--Records computed from power output, flow over spillway, flow through fish ladder, and lockage records at Ice Harbor Dam. Diversions above station for irrigation of over 4,090,000 acres. Flow regulated by Lake Sacajawea and many storage reservoirs and powerplants upstream.

COOPERATION.--Records furnished by Corps of Engineers. Records not reviewed.

AVERAGE DISCHARGE.--28 years (water years 1910-16, 1963-83), 55,990 ft<sup>3</sup>/s, 40,560,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 312,000 ft<sup>3</sup>/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 Corps of Engineers.

EXTREMES FOR CURRENT YEAR.--Maximum hourly discharge, 204,000 ft<sup>3</sup>/s May 30; maximum forebay elevation, 440.10 ft May 27; minimum hourly discharge, 300 ft<sup>3</sup>/s Feb. 1; minimum forebay elevation, 436.60 ft July 7.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1982 TO SEPTEMBER 1983  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	25900	52400	53100	40400	49300	79300	102000	96100	196000	90800	38000	24800
2	23500	50900	54600	41100	58600	95500	94000	120000	177000	95900	20100	25600
3	29000	34300	50300	51500	61800	91500	89300	97900	174000	105000	38500	32900
4	33900	28100	46100	45300	61300	92100	92300	115000	160000	105000	35000	24000
5	32600	32000	32500	49200	27600	105000	93200	111000	163000	115000	36800	22300
6	39700	33900	48000	64900	30900	111000	92100	108000	158000	96200	18200	18300
7	33500	32700	50900	63400	47300	94200	70500	116000	155000	67700	15800	26100
8	34400	46000	54300	76600	43900	105000	70600	120000	158000	87500	27400	39500
9	32400	36000	47700	85200	40800	109000	72600	115000	153000	70900	25100	45200
10	35600	39300	41400	84300	43500	107000	79700	113000	161000	65000	26400	46200
11	43500	37100	50700	67100	47400	121000	80300	115000	161000	74400	31200	29800
12	29000	35400	50200	69500	40700	138000	73500	108000	155000	81600	18100	31200
13	32800	35400	49400	69500	38400	120000	80000	111000	153000	78300	23500	29800
14	31800	32000	38900	66300	54500	123000	77300	99400	141000	74500	18600	31900
15	35800	34900	49300	40500	40700	129000	65800	105000	115000	74900	36200	38500
16	30600	36800	29900	38700	56600	125000	60200	91200	129000	49600	30500	30400
17	32000	40100	55400	68900	65200	124000	53200	95100	132000	68600	29000	36700
18	40600	43300	42400	56200	64800	116000	54400	98100	123000	65700	34000	22900
19	27700	54700	54400	57900	82800	106000	58200	96000	128000	55800	44900	31600
20	38100	38400	52300	52000	82600	101000	54800	95800	130000	57800	47400	35000
21	40500	31900	44800	43500	88700	101000	47900	93800	117000	44900	22500	35000
22	31700	47100	50200	48800	83000	106000	40800	97000	103000	39300	17800	37200
23	22400	46000	66900	45100	72900	101000	75500	107000	91600	37300	19800	29700
24	28900	43200	66800	52600	81400	89300	104000	119000	92200	31400	29700	38800
25	36000	30200	47700	42700	84500	76100	109000	136000	68100	38200	27700	32300
26	44200	37400	33100	63500	85600	78800	119000	151000	69800	38800	43900	34400
27	39300	28700	41700	52600	94300	87900	111000	182000	79400	32700	46700	31900
28	39800	36800	44600	56200	95400	81200	104000	182000	87900	42600	44500	33500
29	47800	37500	47800	51200	---	80500	94800	198000	103000	32100	28400	34200
30	44900	41000	52400	54100	---	78900	102000	190000	90000	29700	44100	33500
31	44400	---	45500	55800	---	74400	---	191000	---	23700	22500	---
TOTAL	1082300	1153500	1493300	1754600	1724500	3147700	2422000	3773400	3924000	1970900	942300	963200
MEAN	34910	38450	48170	56600	61590	101500	80730	121700	130800	63580	30400	32110
MAX	47800	54700	66900	85200	95400	138000	119000	198000	196000	115000	47400	46200
MIN	22400	28100	29900	38700	27600	74400	40800	91200	68100	23700	15800	18300
AC-FT	2147000	2288000	2962000	3480000	3421000	6243000	4804000	7485000	7783000	3909000	1869000	1911000
CAL YR 1982	TOTAL	26515600	MEAN	72650	MAX	203000	MIN	11700	AC-FT	52590000		
WTR YR 1983	TOTAL	24351700	MEAN	66720	MAX	198000	MIN	15800	AC-FT	48300000		

## LOWER COLUMBIA RIVER BASIN

## WALLA WALLA RIVER BASIN

14010000 SOUTH FORK WALLA WALLA RIVER NEAR MILTON, OR

LOCATION.--Lat 45°49'48", long 118°10'08", in NE¼NE¼ 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, and at mile 59.1.

DRAINAGE AREA.--63 mi<sup>2</sup>, 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 and as "above Pacific Power & Light Co.'s intake near Milton" 1907-10.

REVISED RECORDS.--WSP 964: Drainage area. WSP 1398: 1912, 1940, drainage area at former site.

GAGE.--Water-stage recorder. Altitude 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.--Records good. No regulation or diversion above station.

AVERAGE DISCHARGE.--62 years (water years 1908-17, 1932-83), 178 ft<sup>3</sup>/s, 38.37 in/yr, 129,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 2,530 ft<sup>3</sup>/s Jan. 29, 1965, gage height, 5.60 ft; minimum, 72 ft<sup>3</sup>/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 above base of 600 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Jan. 7	1530	*750	*2.60	Mar. 30	0930	714	2.54
Feb. 18	2230	646	2.42				

Minimum daily, 100 ft<sup>3</sup>/s Oct. 14-17.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1982 TO SEPTEMBER 1983  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP		
1	115	155	173	115	158	205	360	307	275	153	115	109		
2	115	150	168	115	150	230	347	295	258	163	113	109		
3	121	143	212	113	143	247	311	283	240	150	113	109		
4	117	140	237	153	140	287	287	291	230	143	115	109		
5	117	145	226	275	133	299	268	299	216	140	113	109		
6	115	173	240	547	133	283	251	287	209	138	113	107		
7	121	160	223	696	133	275	240	287	202	135	113	107		
8	121	155	199	586	130	272	226	299	199	135	113	109		
9	119	150	181	404	148	287	219	299	190	133	113	109		
10	110	145	170	320	150	315	209	307	202	130	115	113		
11	105	143	165	272	170	320	199	307	190	130	113	113		
12	105	140	163	244	202	299	193	299	187	130	113	111		
13	105	138	163	223	212	324	187	287	173	128	111	111		
14	100	135	160	209	205	347	181	299	168	135	111	111		
15	100	135	196	199	196	320	181	347	168	128	109	109		
16	100	135	251	190	216	287	181	329	163	125	107	109		
17	100	153	265	181	299	261	193	315	163	125	107	109		
18	107	158	209	178	503	244	209	382	160	123	107	115		
19	107	165	181	181	476	219	223	366	158	121	107	117		
20	105	163	168	184	347	205	244	377	155	128	109	113		
21	105	150	173	175	272	196	265	388	155	123	109	111		
22	105	140	181	170	275	193	261	377	153	121	109	111		
23	110	130	173	168	287	193	299	377	155	121	113	111		
24	120	130	153	168	283	184	347	382	153	121	109	111		
25	130	130	140	170	268	181	303	377	148	121	107	111		
26	143	130	135	193	251	173	279	360	150	119	107	111		
27	135	140	128	219	226	175	265	338	153	119	107	109		
28	138	153	123	205	209	170	254	329	150	119	107	109		
29	178	175	121	190	---	212	258	329	153	115	109	111		
30	163	181	119	175	---	586	268	315	145	115	109	111		
31	155	---	117	163	---	437	---	295	---	115	109	---		
TOTAL	3687	4440	5513	7381	6315	8226	7508	10129	5421	4002	3425	3314		
MEAN	119	148	178	238	226	265	250	327	181	129	110	110		
MAX	178	181	265	696	503	586	360	388	275	163	115	117		
MIN	100	130	117	113	130	170	181	283	145	115	107	107		
CFSM	1.89	2.35	2.83	3.78	3.59	4.21	3.97	5.19	2.87	2.05	1.75	1.75		
IN.	2.18	2.62	3.26	4.36	3.73	4.86	4.43	5.98	3.20	2.36	2.02	1.96		
AC-FT	7310	8810	10940	14640	12530	16320	14890	20090	10750	7940	6790	6570		
CAL YR 1982	TOTAL	73257	MEAN	201	MAX	876	MIN	100	CFSM	3.19	IN.	43.26	AC-FT	145300
WTR YR 1983	TOTAL	69361	MEAN	190	MAX	696	MIN	100	CFSM	3.02	IN.	40.96	AC-FT	137600

## WALLA WALLA RIVER BASIN

105

14010800 NORTH FORK WALLA WALLA RIVER NEAR MILTON-FREEWATER, OR

LOCATION.--Lat 45°53'06", long 118°11'06", in SE¼NW¼ 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<sup>2</sup>.

PERIOD OF RECORD.--October 1969 to current year.

GAGE.--Water-stage recorder. Altitude of gage is 1,940 ft, from topographic map.

REMARKS.--Records good. No regulation or diversion above station.

AVERAGE DISCHARGE.--14 years, 54.4 ft<sup>3</sup>/s, 21.48 in/yr, 39,410 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,040 ft<sup>3</sup>/s Jan. 25, 1975, gage height, 6.58 ft, from rating curve extended above 400 ft<sup>3</sup>/s on basis of discharge measurement at gage height 5.67 ft and slope-area measurement at gage height 6.30 ft; minimum, 3.9 ft<sup>3</sup>/s July 19-21, 1979.

EXTREMES FOR CURRENT YEAR.--Peak discharge above base of 300 ft<sup>3</sup>/s and maximum discharge, 528 ft<sup>3</sup>/s Jan. 7, gage height, 5.57 ft; minimum, 9.4 ft<sup>3</sup>/s Sept. 27-30.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1982 TO SEPTEMBER 1983  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP		
1	12	38	54	23	55	77	204	58	32	20	13	11		
2	11	35	57	24	52	85	194	52	29	25	12	11		
3	16	30	152	24	50	90	170	49	28	22	12	11		
4	15	28	141	52	47	157	145	45	26	19	12	11		
5	13	28	99	182	44	200	118	56	24	17	12	11		
6	12	43	106	338	44	188	102	63	23	17	12	11		
7	14	39	90	458	43	165	90	64	23	17	12	10		
8	15	38	73	374	41	152	77	90	22	17	12	11		
9	14	37	59	268	53	157	69	132	22	16	12	11		
10	13	35	50	198	66	165	63	152	26	15	12	11		
11	12	32	44	147	75	170	57	139	25	15	13	13		
12	12	30	42	114	95	161	53	115	25	14	12	11		
13	11	30	44	96	105	168	47	95	23	15	12	10		
14	11	27	44	81	102	166	44	87	21	23	11	10		
15	11	27	78	72	87	154	43	99	22	19	11	10		
16	10	26	123	66	97	126	42	88	21	17	12	10		
17	12	29	129	61	108	103	44	85	20	16	11	9.7		
18	13	35	92	56	204	89	47	106	20	15	12	11		
19	13	40	64	55	270	74	49	92	20	14	11	14		
20	12	39	50	58	202	62	52	88	20	15	12	11		
21	12	40	49	56	152	54	59	84	19	15	12	10		
22	12	35	49	53	141	51	62	73	19	14	12	10		
23	13	30	45	52	152	55	73	67	19	13	13	10		
24	14	29	40	58	154	51	89	58	20	13	13	10		
25	14	28	36	63	141	50	72	54	18	13	13	10		
26	21	29	35	74	121	47	57	49	17	13	12	9.7		
27	20	30	31	96	95	48	49	44	18	13	12	9.4		
28	21	36	29	87	84	46	47	41	18	13	11	9.4		
29	108	44	28	74	---	51	45	40	19	13	11	9.4		
30	61	51	26	67	---	214	42	37	19	13	11	9.4		
31	45	---	24	59	---	243	---	35	---	13	11	---		
TOTAL	593	1018	1983	3486	2880	3619	2305	2337	658	494	369	316.0		
MEAN	19.1	33.9	64.0	112	103	117	76.8	75.4	21.9	15.9	11.9	10.5		
MAX	108	51	152	458	270	243	204	152	32	25	13	14		
MIN	10	26	24	23	41	46	42	35	17	13	11	9.4		
CFSM	.56	.99	1.86	3.26	2.99	3.40	2.23	2.19	.64	.46	.35	.31		
IN.	.64	1.10	2.14	3.77	3.11	3.91	2.49	2.53	.71	.53	.40	.34		
AC-FT	1180	2020	3930	6910	5710	7180	4570	4640	1310	980	732	627		
CAL YR 1982	TOTAL	27495.1	MEAN	75.3	MAX	596	MIN	6.7	CFSM	2.19	IN.	29.73	AC-FT	54540
WTR YR 1983	TOTAL	20058.0	MEAN	55.0	MAX	458	MIN	9.4	CFSM	1.60	IN.	21.69	AC-FT	39790



## UMATILLA RIVER BASIN

14020000 UMATILLA RIVER ABOVE MEACHAM CREEK, NEAR GIBBON, OR

LOCATION.--Lat 45°43'11", long 118°19'20", in SE¼SW¼ 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<sup>2</sup>.

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 National Geodetic Vertical Datum of 1929. Prior to June 27, 1939, at site 1 mi downstream at datum 43.94 ft lower.

REMARKS.--Records good. No regulation or diversion above station.

AVERAGE DISCHARGE.--50 years, 228 ft<sup>3</sup>/s, 23.64 in/yr, 165,200 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 5,930 ft<sup>3</sup>/s Jan. 25, 1975, gage height, 9.18 ft, from rating curve extended above 3,500 ft<sup>3</sup>/s; maximum gage height, 9.50 ft Jan. 29, 1965; minimum discharge, 16 ft<sup>3</sup>/s Nov. 9, 1965, momentary regulation from unknown source.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 1,400 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
*Jan. 7	--	Stage and discharge unknown.		Feb. 17	1000	4,320	7.97
Minimum, 41 ft <sup>3</sup> /s Sept. 16-18.							

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1982 TO SEPTEMBER 1983  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	58	140	280	100	178	379	824	638	233	82	49	46
2	56	128	400	100	165	415	768	698	209	97	49	46
3	66	115	700	113	155	530	680	578	188	81	48	45
4	63	110	600	197	143	650	578	525	170	75	48	45
5	61	145	470	596	143	1080	495	520	158	70	49	44
6	58	143	480	1300	143	929	430	480	145	69	47	44
7	70	142	420	1600	140	768	379	455	138	64	47	44
8	75	139	350	1300	143	710	345	460	130	67	48	44
9	70	135	290	1000	194	754	325	465	123	64	47	43
10	66	128	240	800	236	866	293	495	125	63	49	47
11	63	115	205	662	264	866	271	475	130	64	53	49
12	58	113	205	480	333	796	254	440	115	63	49	46
13	57	108	205	388	341	873	229	401	106	63	49	45
14	56	105	240	341	333	866	212	379	99	72	48	44
15	56	105	450	297	317	704	203	430	99	66	47	44
16	55	115	600	257	435	566	203	435	96	63	47	43
17	60	143	500	219	1040	475	222	425	90	63	47	43
18	61	175	450	206	1360	410	261	500	89	63	47	46
19	58	197	341	209	1200	353	289	490	87	60	47	53
20	58	197	285	229	782	305	345	475	87	61	47	47
21	60	175	278	219	674	285	410	480	81	60	47	46
22	64	155	301	209	596	278	430	445	78	58	47	45
23	67	145	289	206	500	278	480	425	78	58	53	44
24	66	138	240	209	430	261	614	410	81	60	53	44
25	76	139	209	212	379	271	505	401	75	58	49	44
26	81	140	191	257	415	268	435	379	72	58	47	43
27	87	160	170	301	500	285	383	353	78	57	46	44
28	293	190	140	285	430	293	361	333	78	56	46	43
29	222	230	120	233	---	345	361	317	75	55	46	44
30	178	270	105	206	---	1110	374	297	75	55	46	45
31	155	---	105	191	---	1080	---	268	---	51	44	---
TOTAL	2574	4440	9859	12922	11969	18049	11959	13872	3388	1996	1486	1350
MEAN	83.0	148	318	417	427	582	399	447	113	64.4	47.9	45.0
MAX	293	270	700	1600	1360	1110	824	698	233	97	53	53
MIN	55	105	105	100	140	261	203	268	72	51	44	43
CFSM	.63	1.13	2.43	3.18	3.26	4.44	3.05	3.41	.86	.49	.37	.34
IN.	.73	1.26	2.80	3.67	3.40	5.13	3.40	3.94	.96	.57	.42	.38
AC-FT	5110	8810	19560	25630	23740	35800	23720	27520	6720	3960	2950	2680

CAL YR 1982	TOTAL	117983	MEAN	323	MAX	2580	MIN	44	CFSM	2.47	IN.	33.50	AC-FT	234000
WTR YR 1983	TOTAL	93864	MEAN	257	MAX	1600	MIN	43	CFSM	1.96	IN.	26.65	AC-FT	186200

NOTE.--No gage-height record Jan. 6 to Feb. 11.

14020300 MEACHAM CREEK AT GIBBON, OR

LOCATION.--Lat 45°41'20", long 118°21'20", in SE¼SE¼ 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<sup>2</sup>.

PERIOD OF RECORD.--August 1975 to current year.

GAGE.--Water-stage recorder. Datum of gage is 1,803.05 ft National Geodetic Vertical Datum of 1929.

REMARKS.--Records good. No regulation or diversion above station.

AVERAGE DISCHARGE.--8 years, 203 ft<sup>3</sup>/s, 15.66 in/yr, 147,100 acre-ft.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 5,750 ft<sup>3</sup>/s Feb. 20, 1982, gage height, 6.60 ft, from floodmark, from rating curve extended above 2,600 ft<sup>3</sup>/s; minimum, 7.1 ft<sup>3</sup>/s Aug. 11-14, 1977.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of Jan. 25, 1975, reached a stage of 7.21 ft, from floodmark, discharge, about 8,200 ft<sup>3</sup>/s.

EXTREMES FOR CURRENT YEAR.--Peak discharge above base of 1,600 ft<sup>3</sup>/s and maximum discharge, 3,000 ft<sup>3</sup>/s Jan. 6, gage height, 5.52 ft; minimum, 9.5 ft<sup>3</sup>/s Aug. 16.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1982 TO SEPTEMBER 1983  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP		
1	18	65	163	79	190	434	762	326	115	38	16	14		
2	19	57	169	81	175	602	729	444	103	52	15	13		
3	21	51	317	85	161	684	671	416	91	53	14	12		
4	22	46	539	134	149	1130	577	396	81	45	14	11		
5	21	43	595	452	137	1270	494	432	73	40	14	11		
6	20	48	676	1760	133	1010	414	497	67	36	14	11		
7	22	50	609	2010	132	911	358	475	65	35	14	11		
8	23	50	448	1270	124	937	315	472	60	33	14	11		
9	22	49	346	975	142	1080	283	491	57	31	13	11		
10	22	47	272	728	147	1110	258	536	61	29	15	12		
11	22	44	222	567	168	1060	231	509	64	28	16	13		
12	22	43	192	469	214	965	210	443	59	26	15	12		
13	22	43	185	404	278	1020	190	380	55	25	16	11		
14	22	41	171	349	318	1030	175	338	48	27	15	12		
15	21	40	324	308	324	849	162	355	46	25	10	12		
16	21	39	466	278	449	674	155	350	43	24	10	12		
17	22	45	498	251	781	550	159	338	40	23	10	12		
18	22	52	430	227	1370	452	173	352	39	22	10	14		
19	21	64	344	222	1200	372	187	338	40	23	11	19		
20	21	83	288	231	825	317	220	324	40	22	11	15		
21	21	95	260	217	622	279	262	325	37	21	11	14		
22	20	90	259	206	689	253	275	300	35	20	11	14		
23	21	79	261	198	932	239	281	278	34	20	14	14		
24	21	73	227	191	938	224	347	268	34	20	14	14		
25	21	68	188	189	822	221	308	251	31	19	14	14		
26	23	64	176	217	720	210	264	233	30	19	14	14		
27	22	61	153	246	578	223	231	203	33	19	14	13		
28	22	71	129	258	474	232	209	184	34	18	14	13		
29	67	102	117	248	---	289	204	168	35	17	14	13		
30	82	148	100	230	---	721	212	152	35	17	14	13		
31	75	---	84	208	---	900	---	134	---	16	14	---		
TOTAL	821	1851	9208	13288	13192	20248	9316	10708	1585	843	415	385		
MEAN	26.5	61.7	297	429	471	653	311	345	52.8	27.2	13.4	12.8		
MAX	82	148	676	2010	1370	1270	762	536	115	53	16	19		
MIN	18	39	84	79	124	210	155	134	30	16	10	11		
CFSM	.15	.35	1.69	2.44	2.68	3.71	1.77	1.96	.30	.15	.08	.07		
IN.	.17	.39	1.95	2.81	2.79	4.28	1.97	2.26	.34	.18	.09	.08		
AC-FT	1630	3670	18260	26360	26170	40160	18480	21240	3140	1670	823	764		
CAL YR 1982	TOTAL	106253.6	MEAN	291	MAX	2710	MIN	9.3	CFSM	1.65	IN.	22.46	AC-FT	210800
WTR YR 1983	TOTAL	81860	MEAN	224	MAX	2010	MIN	10	CFSM	1.27	IN.	17.30	AC-FT	162400

## 14021000 UMATILLA RIVER AT PENDLETON, OR

LOCATION.--Lat 45°40'20", long 118°47'30", in NW¼NE¼ 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<sup>2</sup>.

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 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 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 National Geodetic Vertical Datum of 1929. Nov. 19, 1965, to Mar. 28, 1967, and at datum of 1,064.02 ft 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.--Records good except those for discharges between 630 and 4,380 ft<sup>3</sup>/s, which are fair. No regulation. Many diversions for irrigation above station.

AVERAGE DISCHARGE.--49 years (water years 1935-83), 505 ft<sup>3</sup>/s, 365,900 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 15,500 ft<sup>3</sup>/s Jan. 30, 1965, gage height, 9.40 ft, datum then in use; minimum, 10 ft<sup>3</sup>/s July 13-16, 1940.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum discharge, 17,000 ft<sup>3</sup>/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<sup>3</sup>/s, estimated by Corps of Engineers.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 3,500 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Jan. 7	0530	*6,330	*7.57	Mar. 4	1430	4,610	6.87
Feb. 18	2000	5,380	7.20				

Minimum, 38 ft<sup>3</sup>/s Aug. 17, Sept. 9.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1982 TO SEPTEMBER 1983  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	83	239	480	240	495	884	2250	884	372	120	51	54
2	80	210	468	240	456	1170	2400	1350	335	160	53	58
3	76	193	790	245	432	1560	2010	992	301	152	53	51
4	90	171	1310	301	384	3460	1770	884	263	136	51	53
5	82	160	1450	884	360	3530	1450	965	239	120	45	51
6	81	166	1380	3770	335	2700	1100	965	215	104	44	50
7	83	188	1380	5280	343	2230	965	884	199	101	45	48
8	88	188	911	3730	326	2120	830	965	182	98	50	45
9	94	188	750	2450	444	2230	810	965	171	94	48	44
10	91	177	615	1730	540	2250	750	1170	188	94	50	48
11	88	171	540	1170	615	2550	690	1070	210	91	53	58
12	83	166	480	884	730	2350	650	884	182	81	54	54
13	83	160	480	790	790	2550	585	810	171	78	50	50
14	81	160	600	730	790	2550	525	770	148	94	48	50
15	78	148	1000	650	790	2150	495	790	144	91	47	53
16	78	148	1700	615	1310	1730	468	830	140	81	45	50
17	78	152	1400	555	1840	1350	468	790	132	81	43	48
18	88	188	1150	510	4360	992	495	857	128	81	42	53
19	88	227	950	510	4090	810	540	857	132	76	44	71
20	86	275	750	615	2400	750	630	830	128	78	42	74
21	86	292	650	585	1770	710	710	830	124	74	48	62
22	83	284	650	540	1630	690	790	770	117	69	50	58
23	88	263	650	510	1910	650	810	710	110	62	56	58
24	91	239	600	495	1980	615	1100	690	117	71	64	56
25	91	221	510	495	1840	615	938	670	110	64	91	54
26	101	204	468	585	1590	615	857	650	104	59	91	56
27	104	193	432	650	1380	650	750	570	128	61	58	54
28	110	199	384	690	1050	690	670	510	124	64	58	56
29	284	263	352	650	---	810	650	480	120	59	58	56
30	352	468	309	600	---	2250	650	456	117	59	54	56
31	284	---	275	540	---	2750	---	420	---	56	54	---
TOTAL	3353	6301	23864	32239	34980	50961	27806	25268	5151	2709	1640	1629
MEAN	108	210	770	1040	1249	1644	927	815	172	87.4	52.9	54.3
MAX	352	468	1700	5280	4360	3530	2400	1350	372	160	91	74
MIN	76	148	275	240	326	615	468	420	104	56	42	44
AC-FT	6650	12500	47330	63950	69380	101100	55150	50120	10220	5370	3250	3230
CAL YR 1982	TOTAL	300928	MEAN	824	MAX	7200	MIN	38	AC-FT	596900		
WTR YR 1983	TOTAL	215901	MEAN	592	MAX	5280	MIN	42	AC-FT	428200		

## UMATILLA RIVER BASIN

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14022200 NORTH FORK MCKAY CREEK NEAR PILOT ROCK, OR

LOCATION.--Lat 45°30'24", long 118°36'57", in NE¼SE¼ 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<sup>2</sup>.

PERIOD OF RECORD.--May 1973 to current year.

GAGE.--Water-stage recorder. Altitude of gage is 1,870 ft, from topographic map.

REMARKS.--Records good. No regulation or diversion above station.

AVERAGE DISCHARGE.--10 years, 46.1 ft<sup>3</sup>/s, 33,400 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,980 ft<sup>3</sup>/s Jan. 25, 1975, gage height, 8.48 ft, from floodmark, from rating curve extended above 150 ft<sup>3</sup>/s on basis of slope-area measurement of peak flow; minimum, 0.30 ft<sup>3</sup>/s July 15, 1975 (result of temporary construction upstream).

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 290 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Dec. 3	0830	319	3.15	Feb. 18	1900	395	3.43
Dec. 16	0200	294	3.05	Mar. 4	1130	541	3.97
Jan. 6	1900	*596	*4.24	Mar. 12	1500	332	3.18

Minimum, 0.43 ft<sup>3</sup>/s Aug. 2.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1982 TO SEPTEMBER 1983  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.4	24	59	22	54	74	170	53	9.2	3.7	.89	1.1
2	2.4	19	93	22	48	83	227	59	8.8	12	.81	1.0
3	3.4	15	282	22	43	77	191	50	7.9	7.1	.81	.92
4	3.8	13	173	36	39	360	153	44	7.0	5.0	.80	.89
5	3.7	12	127	182	34	316	121	103	6.3	3.8	.77	.83
6	3.5	13	168	412	32	277	97	132	5.6	3.2	.75	.83
7	4.2	12	131	394	32	244	80	110	5.0	3.0	.72	.83
8	4.9	12	98	275	30	228	67	133	4.7	2.7	.75	.83
9	4.8	12	75	184	45	233	60	158	4.5	2.4	.71	.80
10	4.4	12	58	140	53	190	53	156	7.6	2.1	.91	.99
11	4.0	12	48	109	90	237	47	126	8.5	2.0	.90	1.4
12	3.7	11	44	89	108	280	43	99	6.3	1.9	.81	1.2
13	3.5	12	55	73	116	285	39	78	5.0	1.8	.72	1.0
14	3.4	11	70	62	118	231	35	65	4.3	2.8	.71	1.0
15	3.3	10	226	53	120	174	32	72	4.7	2.5	.66	.96
16	3.0	10	271	47	287	135	28	63	4.0	2.1	.60	.92
17	3.4	11	198	43	274	106	26	55	3.4	1.9	.57	.92
18	3.4	13	130	41	336	86	24	51	3.6	1.8	.57	1.2
19	3.2	15	97	45	302	69	23	43	3.9	1.7	.57	2.4
20	3.0	17	79	62	219	58	22	38	3.8	1.6	.64	1.6
21	2.9	19	76	60	172	50	21	33	3.1	1.5	.64	1.4
22	2.8	20	75	56	191	45	19	28	2.7	1.5	.65	1.3
23	3.8	19	66	52	187	46	21	25	2.9	1.4	1.3	1.4
24	4.2	18	54	54	162	41	24	22	3.1	1.5	1.1	1.4
25	4.0	16	48	58	136	48	20	19	2.4	1.4	.88	1.4
26	4.8	15	45	92	114	53	19	16	2.3	1.3	.95	1.4
27	5.1	15	40	105	94	90	18	14	4.4	1.3	.84	1.4
28	5.6	17	35	91	80	118	19	12	3.7	1.2	.74	1.4
29	82	46	32	79	---	143	22	11	3.2	1.1	.74	1.4
30	45	57	29	69	---	184	19	9.5	2.9	.97	.74	1.5
31	32	---	23	60	---	202	---	9.3	---	.97	.76	---
TOTAL	263.6	508	3005	3089	3516	4763	1740	1886.8	144.8	79.24	24.01	35.62
MEAN	8.50	16.9	96.9	99.6	126	154	58.0	60.9	4.83	2.56	.77	1.19
MAX	82	57	282	412	336	360	227	158	9.2	12	1.3	2.4
MIN	2.4	10	23	22	30	41	18	9.3	2.3	.97	.57	.80
AC-FT	523	1010	5960	6130	6970	9450	3450	3740	287	157	48	71

CAL YR 1982	TOTAL	23819.04	MEAN	65.3	MAX	682	MIN	.75	AC-FT	47250
WTR YR 1983	TOTAL	19055.07	MEAN	52.2	MAX	412	MIN	.57	AC-FT	37800

## UMATILLA RIVER BASIN

14022500 MCKAY CREEK NEAR PILOT ROCK, OR

LOCATION.--Lat 45°32'57", long 118°46'24", in NW¼SE¼ 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<sup>2</sup>.

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 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.--Records good. No regulation. Many small diversions for irrigation above station.

AVERAGE DISCHARGE.--55 years (water years 1927, 1930-83), 102 ft<sup>3</sup>/s, 73,900 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 7,400 ft<sup>3</sup>/s Jan. 30, 1965, gage height, 8.40 ft; no flow at times.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 840 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Jan. 6	2130	1,270	5.52	Mar. 13	1430	922	5.06
Mar. 4	1500	*1,740	*6.06				

Minimum daily, 0.87 ft<sup>3</sup>/s Aug. 20, 21.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1982 TO SEPTEMBER 1983  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	10	81	92	61	133	190	443	154	12	14	1.7	3.9
2	9.3	66	120	61	123	211	520	196	19	20	1.7	3.9
3	11	57	515	61	112	217	491	172	29	48	1.7	3.9
4	12	48	435	70	102	1110	438	157	27	26	1.5	3.5
5	12	44	330	302	90	1240	373	295	23	21	1.5	3.5
6	11	46	450	829	86	978	317	511	22	17	1.5	3.5
7	11	46	382	1060	85	810	267	433	21	16	1.5	3.1
8	12	46	278	824	84	750	226	472	20	16	1.5	3.1
9	13	46	207	583	102	762	202	511	20	14	1.5	3.1
10	14	46	167	433	123	685	181	511	24	13	1.5	3.5
11	14	46	138	325	172	756	160	448	32	11	1.2	3.9
12	14	43	120	260	226	792	148	369	27	11	1.5	4.8
13	14	44	146	214	260	845	135	298	23	7.0	1.5	4.3
14	14	43	170	181	284	762	123	253	19	4.8	1.2	4.3
15	13	41	465	160	281	615	110	253	19	5.4	1.2	3.9
16	11	39	525	145	472	496	104	229	18	4.8	1.2	3.9
17	11	43	435	133	482	404	100	202	16	4.8	1.2	3.9
18	14	46	306	125	589	329	102	190	15	4.3	1.2	4.3
19	14	49	225	128	631	267	104	169	16	4.3	1.0	7.0
20	15	53	182	172	496	220	108	151	15	3.9	.87	7.0
21	15	61	164	175	409	190	114	133	14	3.9	.87	5.9
22	15	62	158	163	448	166	112	116	12	3.1	1.1	5.9
23	15	62	146	148	487	160	114	104	9.1	3.5	1.7	5.9
24	15	61	125	145	433	145	133	90	12	4.3	2.0	5.4
25	16	57	113	148	373	175	118	80	9.8	3.5	3.5	4.8
26	18	53	106	208	321	190	110	71	9.1	2.7	2.0	5.4
27	18	51	97	235	263	281	104	57	11	2.7	1.7	4.8
28	19	55	83	211	220	395	100	49	17	2.7	1.7	5.4
29	143	72	70	184	---	414	108	31	14	2.7	1.7	4.8
30	130	90	65	163	---	482	100	16	14	2.0	1.5	5.4
31	104	---	61	145	---	482	---	13	---	1.7	1.2	---
TOTAL	757.3	1597	6876	8052	7887	15519	5765	6734	539.0	299.1	46.64	136.0
MEAN	24.4	53.2	222	260	282	501	192	217	18.0	9.65	1.50	4.53
MAX	143	90	525	1060	631	1240	520	511	32	48	3.5	7.0
MIN	9.3	39	61	61	84	145	100	13	9.1	1.7	.87	3.1
AC-FT	1500	3170	13640	15970	15640	30780	11430	13360	1070	593	93	270
CAL YR 1982	TOTAL	60573.80	MEAN	166	MAX	1320	MIN	.70	AC-FT	120100		
WTR YR 1983	TOTAL	54208.04	MEAN	149	MAX	1240	MIN	.87	AC-FT	107500		

## UMATILLA RIVER BASIN

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## 14023000 MCKAY RESERVOIR NEAR PENDLETON, OR

LOCATION.--Lat 45°36'28", long 118°47'30", in SE¼ 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<sup>2</sup>.

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 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, 68,060 acre-ft May 28, 29, gage height, 1,317.30 ft; minimum, 16,380 acre-ft Sept. 30, gage height, 1,251.55 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 ABOVE DATUM), WATER YEAR OCTOBER 1982 TO SEPTEMBER 1983  
INSTANTANEOUS OBSERVATIONS AT 2400

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1262.35	1264.93	1269.72	1291.33	1299.86	1310.38	1317.07	1316.63	1317.05	1306.42	1290.55	1267.16
2	1262.38	1265.18	1270.10	1291.51	1299.96	1310.64	1317.00	1316.65	1316.81	1306.13	1289.84	1266.63
3	1262.43	1265.37	1271.57	1291.55	1300.08	1310.97	1317.01	1316.63	1316.67	1305.97	1289.04	1266.14
4	1262.46	1265.55	1273.05	1291.70	1300.18	1312.10	1317.11	1316.62	1316.52	1305.74	1288.34	1265.61
5	1262.49	1265.68	1274.19	1292.25	1300.25	1312.90	1317.13	1316.68	1316.36	1305.47	1287.58	1265.11
6	1262.46	1265.86	1275.54	1294.18	1300.39	1313.11	1317.05	1316.55	1316.31	1305.12	1286.79	1264.51
7	1262.51	1266.02	1276.81	1296.42	1300.45	1313.17	1316.86	1316.39	1316.08	1304.71	1286.00	1263.84
8	1262.53	1266.16	1277.75	1297.92	1300.53	1313.18	1316.61	1316.31	1315.69	1304.36	1285.25	1263.10
9	1262.61	1266.29	1278.47	1298.86	1300.63	1313.21	1316.47	1316.42	1315.29	1303.84	1284.41	1262.35
10	1262.63	1266.43	1279.04	1299.32	1300.79	1313.11	1316.41	1316.57	1314.91	1303.30	1283.69	1261.62
11	1262.67	1266.57	1279.52	1299.48	1300.98	1313.07	1316.43	1316.61	1314.53	---	1282.82	1260.85
12	1262.70	1266.72	1279.91	1299.48	1301.39	1313.19	1316.43	1316.50	1314.16	1302.44	1282.04	1260.18
13	1262.73	1266.85	1280.39	1299.40	1301.83	1313.41	1316.44	1316.42	1313.77	1301.93	1281.30	1259.52
14	1262.77	1266.98	1280.92	1299.25	1302.31	1313.42	1316.42	1316.44	1313.40	1301.48	1280.46	1258.84
15	1262.79	1267.11	1282.01	1299.02	1302.81	1313.47	1316.40	1316.49	1313.02	1301.00	1279.95	1258.16
16	1262.84	1267.21	1283.79	1298.77	1303.64	1313.71	1316.38	1316.54	1312.65	1300.57	1279.06	1257.46
17	1262.83	1267.36	1285.15	1298.50	1304.48	1314.11	1316.38	1316.66	1312.24	1300.11	1277.82	1256.78
18	1262.90	1267.45	1286.04	1298.20	1305.54	1314.55	1316.42	1316.76	1311.82	1299.64	1276.89	1256.10
19	1262.93	1267.60	1286.79	1297.98	1306.51	1314.93	1316.46	1316.84	1311.40	1299.14	1276.08	1255.44
20	1262.95	1267.71	1287.37	1297.91	1307.20	1315.28	1316.56	1316.90	1310.96	1298.62	1275.15	1254.87
21	1262.95	1267.89	1287.91	1298.05	1307.69	1315.59	1316.59	1316.93	1310.53	1298.05	1274.22	1254.42
22	1263.01	1268.06	1288.41	1298.20	1308.21	1315.75	1316.62	1316.98	1310.08	1297.40	1273.34	1254.13
23	1263.09	1268.21	1288.89	1298.33	1308.77	1315.98	1316.64	1317.04	1309.61	1296.72	---	1253.82
24	1263.13	1268.36	1289.28	1298.36	1309.26	1316.16	1316.64	1317.13	1309.19	1295.99	1271.94	1253.55
25	1263.15	1268.51	1289.64	1298.39	1309.62	1316.35	1316.58	1317.19	1308.74	1295.30	1271.41	1253.25
26	1263.20	1268.64	1289.97	1298.69	1309.86	1316.44	1316.57	1317.23	1308.29	1294.55	1270.89	1252.88
27	1263.24	1268.78	1290.27	1299.01	1310.01	1316.48	1316.54	1317.28	1307.86	1293.87	1270.30	1252.38
28	1263.30	1268.96	1290.53	1299.21	1310.17	1316.42	1316.52	1317.29	1307.46	1293.18	1269.60	1252.05
29	1263.71	1269.11	1290.81	1299.43	---	1316.49	1316.52	1317.29	1307.10	1292.53	1268.95	1251.69
30	1264.21	1269.42	1291.01	1299.57	---	1316.68	1316.50	1317.25	1306.73	1291.86	1268.37	1251.55
31	1264.63	---	1291.18	1299.68	---	1316.97	---	1317.20	---	1291.16	1267.77	---
MEAN	1262.92	1267.17	1282.78	1297.42	1304.05	1314.23	1316.63	1316.79	1312.51	---	---	1258.47
MAX	1264.63	1269.42	1291.18	1299.68	1310.17	1316.97	1317.13	1317.29	1317.05	---	---	1267.16
MIN	1262.35	1264.93	1269.72	1291.33	1299.86	1310.38	1316.38	1316.31	1306.73	---	---	1251.55
(†)	23550	26740	42090	49530	60040	67660	67100	67940	56400	42080	25440	16380
(‡)	+1360	+2920	+15920	+7440	+10510	+7620	-560	+840	-11540	-14320	-16640	-9060

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

‡ Change in contents, in acre-feet.



## UMATILLA RIVER BASIN

14023500 MCKAY CREEK NEAR PENDLETON, OR

LOCATION.--Lat 45°36'34", long 118°47'55", in SE¼NW¼ 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<sup>2</sup>.

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 1,163.71 ft 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.--Records good. Flow completely regulated since 1927 by McKay Reservoir (see station 14023000). Many diversions for irrigation above station. Since 1932, records have excluded flow in Elder ditch which, since 1953, has diverted not over 1.5 ft<sup>3</sup>/s at station for irrigation during season and up to 1 ft<sup>3</sup>/s seepage from reservoir, for stock water at other times.

AVERAGE DISCHARGE.--46 years (water years 1933-43, 1949-83), 96.8 ft<sup>3</sup>/s, 70,130 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge observed, 3,250 ft<sup>3</sup>/s Feb. 10, 1921, gage height, 4.4 ft, site and datum then in use, from rating curve extended above 1,200 ft<sup>3</sup>/s; no flow at times each year.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 817 ft<sup>3</sup>/s Mar. 6, 10, gage height, 2.31 ft; no flow Oct. 1 to Jan. 6.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1982 TO SEPTEMBER 1983  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.00	.00	.00	102	111	395	179	85	173	278	185
2	.00	.00	.00	.00	69	102	361	188	102	146	278	164
3	.00	.00	.00	.00	53	104	144	542	102	125	278	152
4	.00	.00	.00	.00	53	542	144	530	133	125	278	152
5	.00	.00	.00	.00	53	775	144	485	200	125	302	152
6	.00	.00	.00	.00	53	775	144	420	246	173	306	179
7	.00	.00	.00	74	55	775	144	375	246	197	306	188
8	.00	.00	.00	143	55	782	144	375	242	218	302	204
9	.00	.00	.00	146	55	782	144	360	243	228	294	211
10	.00	.00	.00	221	55	782	144	298	243	225	282	211
11	.00	.00	.00	256	55	782	144	239	243	225	282	211
12	.00	.00	.00	256	55	775	144	173	243	207	282	194
13	.00	.00	.00	256	55	775	143	173	243	194	278	179
14	.00	.00	.00	256	55	782	143	120	243	194	278	179
15	.00	.00	.00	256	55	602	115	93	243	194	278	176
16	.00	.00	.00	256	55	355	87	93	243	191	278	176
17	.00	.00	.00	256	55	158	73	93	243	191	298	176
18	.00	.00	.00	256	69	75	57	94	243	191	314	176
19	.00	.00	.00	225	179	39	60	94	243	218	314	161
20	.00	.00	.00	188	179	24	60	95	243	239	310	143
21	.00	.00	.00	115	179	22	106	87	243	239	306	108
22	.00	.00	.00	100	197	29	140	55	242	267	286	83
23	.00	.00	.00	102	207	38	123	32	242	294	274	75
24	.00	.00	.00	100	207	38	104	23	239	310	200	75
25	.00	.00	.00	102	207	95	91	20	239	306	173	73
26	.00	.00	.00	102	211	135	83	20	239	306	170	87
27	.00	.00	.00	102	211	263	69	18	239	290	188	113
28	.00	.00	.00	102	164	420	59	18	221	282	214	113
29	.00	.00	.00	102	---	385	133	18	211	278	200	85
30	.00	.00	.00	102	---	355	197	18	207	278	188	30
31	.00	---	.00	102	---	282	---	41	---	278	188	---
TOTAL	.00	.00	.00	4176.00	2998	11959	4039	5369	6594	6907	8203	4411
MEAN	.00	.00	.00	135	107	386	135	173	220	223	265	147
MAX	.00	.00	.00	256	211	782	395	542	246	310	314	211
MIN	.00	.00	.00	.00	53	22	57	18	85	125	170	30
AC-FT	.00	.00	.00	8280	5950	23720	8010	10650	13080	13700	16270	8750
CAL YR 1982	TOTAL	55744.80	MEAN	153	MAX	692	MIN	.00	AC-FT	110600		
WTR YR 1983	TOTAL	54656.00	MEAN	150	MAX	782	MIN	.00	AC-FT	108400		

## 14026000 UMATILLA RIVER AT YOAKUM, OR

LOCATION.--Lat 45°40'38", long 119°02'09", in SW¼SW¼ 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<sup>2</sup>, 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 National Geodetic Vertical Datum of 1929. See WSP 1318 or 1738 for history of changes prior to Oct. 21, 1948.

REMARKS.--Records good. Slight regulation by Furnish Reservoir 1910-34, capacity, 3,900 acre-ft prior to filling with silt. Flow regulated to some extent since 1927 by McKay Reservoir (see station 14023000). Many diversions for irrigation above station.

AVERAGE DISCHARGE.--80 years, 679 ft<sup>3</sup>/s, 491,900 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 20,000 ft<sup>3</sup>/s May 30, 1906, gage height, about 15.0 ft, site and datum then in use, from floodmarks, from rating curve extended above 6,600 ft<sup>3</sup>/s; minimum, 12 ft<sup>3</sup>/s Aug. 10-12, 1908, Aug. 4, 1910.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 3,600 ft<sup>3</sup>/s and maximum (\*)

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Jan. 7	0730	6,480	6.74	Mar. 11	1630	5,130	6.42
Feb. 19	0130	6,350	6.75	Apr. 2	1030	4,190	5.90
Mar. 4	1900	*7,040	*7.40				

Minimum daily, 100 ft<sup>3</sup>/s Oct. 16-18.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1982 TO SEPTEMBER 1983  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	128	294	526	315	878	1460	3160	1110	515	340	340	256
2	122	260	520	306	798	1550	3420	1780	491	345	335	248
3	117	239	862	315	713	1800	2990	1650	455	325	335	222
4	112	218	1330	340	664	4550	2530	1490	415	303	335	216
5	107	204	1460	798	629	5570	2240	1690	385	280	340	213
6	103	207	1470	3300	608	4550	1980	2130	360	285	360	225
7	105	225	1550	5800	615	3930	1810	2010	360	321	355	244
8	108	225	1190	4300	587	3680	1650	2100	410	325	360	252
9	115	225	942	3150	713	3790	1480	2020	449	335	360	260
10	119	218	769	2390	862	3790	1290	2070	479	330	345	268
11	115	211	643	1980	926	4300	1080	2030	527	330	345	276
12	110	204	568	1720	1110	4290	983	1850	491	307	345	268
13	105	200	568	1530	1190	4460	910	1610	455	294	335	244
14	103	197	580	1380	1260	4570	841	1400	410	307	330	237
15	102	191	1290	1270	1260	3850	787	1380	395	307	325	237
16	100	188	1940	1190	1620	2960	728	1410	380	303	325	237
17	100	191	1710	1120	2050	2330	712	1280	365	298	330	234
18	100	204	1420	1060	4380	1900	736	1280	360	298	350	244
19	111	246	1120	1020	5260	1590	841	1300	400	303	355	256
20	109	302	902	1090	3400	1330	950	1220	390	325	355	240
21	107	335	814	986	2530	1140	1080	1160	380	321	355	207
22	107	330	830	918	2350	1020	1230	1050	370	330	340	171
23	115	302	822	886	2770	983	1260	920	370	360	340	156
24	115	282	734	862	2980	910	1650	850	375	390	307	156
25	115	260	636	854	2650	940	1500	796	360	385	252	153
26	125	246	587	934	2360	1020	1290	744	350	380	294	150
27	130	232	532	1060	2070	1180	1120	666	385	370	256	180
28	130	235	460	1090	1780	1510	994	617	385	355	280	183
29	294	278	420	1040	---	1580	940	578	360	350	272	171
30	415	490	390	986	---	2810	930	533	355	345	252	140
31	345	---	350	934	---	3610	---	509	---	340	252	---
TOTAL	4189	7439	27935	44924	49013	82953	43112	41233	12182	10187	10060	6544
MEAN	135	248	901	1449	1750	2676	1437	1330	406	329	325	218
MAX	415	490	1940	5800	5260	5570	3420	2130	527	390	360	276
MIN	100	188	350	306	587	910	712	509	350	280	252	140
AC-FT	8310	14760	55410	89110	97220	164500	85510	81790	24160	20210	19950	12980
CAL YR 1982	TOTAL	384308	MEAN	1053	MAX	8680	MIN	100	AC-FT	762300		
WTR YR 1983	TOTAL	339771	MEAN	931	MAX	5800	MIN	100	AC-FT	673900		

## UMATILLA RIVER BASIN

14032000 BUTTER CREEK NEAR PINE CITY, OR

LOCATION.--Lat 45°32'48", long 119°18'14", in SE¼SW¼ 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<sup>2</sup>.

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. Altitude 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.--Records good. No regulation. Several small diversions for irrigation above station. Water is diverted into headwaters of Butter Creek from Fivemile Creek, a tributary of Camas Creek in John Day River basin, for irrigation below station.

AVERAGE DISCHARGE.--51 years (water years 1930, 1932, 1934-41, 1943-83), 27.3 ft<sup>3</sup>/s, 19,780 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 3,800 ft<sup>3</sup>/s Feb. 21, 1949, gage height, 12.4 ft, present datum, from floodmark, from rating curve extended above 440 ft<sup>3</sup>/s on basis of computation of peak flow over dam; no flow at times.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 200 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Oct. 29	1700	209	3.55	Feb. 18	2300	342	4.31
Dec. 17	1100	211	3.57	Mar. 4	1900	*1,480	*7.59
Jan. 7	0100	252	3.85	Mar. 13	1800	1,040	6.52

Minimum, 4.9 ft<sup>3</sup>/s Aug. 19, 20.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1982 TO SEPTEMBER 1983  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	9.8	58	28	33	48	99	133	113	51	19	9.8	8.7
2	9.1	47	27	33	45	101	133	112	48	21	8.7	8.0
3	8.7	40	29	33	41	100	128	108	45	21	7.7	8.0
4	9.1	34	98	36	36	698	122	105	42	19	7.1	8.0
5	9.1	31	89	43	35	566	116	141	39	17	7.1	7.7
6	8.7	32	116	134	36	402	111	157	37	16	6.4	7.4
7	8.7	31	114	217	37	332	108	138	33	14	6.1	7.1
8	9.1	29	81	196	37	402	105	140	31	14	7.1	7.4
9	10	27	72	151	42	332	103	140	31	15	7.1	7.7
10	10	25	57	118	43	292	100	132	31	14	6.1	8.4
11	10	24	48	101	52	352	98	125	37	13	5.8	9.1
12	9.8	22	48	88	110	420	96	117	31	13	5.8	8.7
13	9.4	21	51	79	131	728	94	109	28	13	6.1	8.7
14	9.4	21	46	71	116	500	91	104	25	12	6.1	8.4
15	9.1	18	55	64	106	350	89	112	24	12	6.1	8.4
16	9.1	20	109	61	147	284	88	112	23	12	5.8	8.4
17	8.7	19	177	60	138	247	87	104	22	12	5.5	8.0
18	9.1	19	122	58	202	217	89	99	22	12	5.5	8.4
19	10	23	93	56	247	198	96	95	22	11	5.2	10
20	10	23	79	57	179	183	100	91	22	9.8	5.2	11
21	10	22	86	54	150	171	107	87	22	9.8	5.8	11
22	11	20	142	52	166	161	114	85	20	9.4	5.5	10
23	13	16	104	50	185	151	122	81	20	9.1	6.4	9.8
24	16	16	82	50	166	144	138	78	20	10	7.4	9.8
25	15	17	66	48	142	144	124	74	19	12	7.4	9.4
26	14	18	67	49	131	144	115	70	18	10	7.1	9.1
27	18	18	51	54	113	143	105	67	19	9.8	7.1	8.7
28	17	19	40	56	106	139	101	63	21	9.8	7.1	8.7
29	97	21	42	53	---	133	114	58	20	9.4	7.1	8.7
30	133	28	34	51	---	148	116	55	20	8.7	7.4	9.1
31	78	---	35	49	---	145	---	52	---	8.7	7.4	---
TOTAL	608.9	759	2288	2255	2987	8426	3243	3124	843	396.5	206.0	261.8
MEAN	19.6	25.3	73.8	72.7	107	272	108	101	28.1	12.8	6.65	8.73
MAX	133	58	177	217	247	728	138	157	51	21	9.8	11
MIN	8.7	16	27	33	35	99	87	52	18	8.7	5.2	7.1
AC-FT	1210	1510	4540	4470	5920	16710	6430	6200	1670	786	409	519
CAL YR 1982	TOTAL	21335.4	MEAN	58.5	MAX	398	MIN	2.4	AC-FT	42320		
WTR YR 1983	TOTAL	25398.2	MEAN	69.6	MAX	728	MIN	5.2	AC-FT	50380		

## 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 $\frac{1}{4}$ SW $\frac{1}{4}$  sec. 31, T.3 N., R.30 E., for irrigation in vicinity of Stanfield. Records available March 1921 to current year (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 $\frac{1}{4}$  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 current year (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 $\frac{1}{4}$  sec.16, T.3 N., R.29 E., for irrigation west of Echo. Records available May 1921 to current year (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 $\frac{1}{4}$  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 Ordance. Gage is 1 mi downstream from intake. Records available May 1921 to current year (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 $\frac{1}{4}$  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 current year (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 $\frac{1}{4}$  sec.28, T.5 N., R.28 E., for irrigation near Irrigon and Boardman. Records of monthly figures April 1921 to current year (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 1982 TO SEPTEMBER 1983

MONTH	FURNISH CANAL	UMATILLA PROJECT FEED CANAL	ALLEN CANAL	WESTERN LAND CANAL	MAXWELL CANAL	WEST DIVISION MAIN CANAL
OCTOBER.....	120	0	88	5,840	699	307
NOVEMBER.....	0	3,900	0	4,310	0	0
DECEMBER.....	0	8,070	0	1,590	0	0
JANUARY.....	0	10,670	0	99	0	0
FEBRUARY.....	0	6,220	0	120	0	0
MARCH.....	0	9,310	0	72	0	413
APRIL.....	3,480	5,800	575	6,880	1,470	4,980
MAY.....	7,190	11,400	927	12,060	2,910	7,500
JUNE.....	7,680	591	995	12,050	2,520	8,430
JULY.....	6,810	0	914	11,090	2,210	8,410
AUGUST.....	6,450	0	844	10,380	2,410	8,170
SEPTEMBER.....	3,700	0	936	7,180	1,870	5,800
WTR YR 1983.....	35,430	55,970	5,280	71,670	14,100	44,020

NOTE.--No gage-height record for months of little or no flow and short periods at other times.

## UMATILLA RIVER BASIN

14033500 UMATILLA RIVER NEAR UMATILLA, OR

LOCATION.--Lat 45°54'11", long 119°19'33", in SW¼NW¼ 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<sup>2</sup>, 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 National Geodetic Vertical Datum of 1929. Oct. 21, 1903 to Jan. 25, 1931, nonrecording gage.

REMARKS.--Records good above 200 ft<sup>3</sup>/s and poor below. Some regulation since 1927 by McKay Reservoir (see station 14023000). Many diversions above station for irrigation of lands above and below station; Brownell Canal diverts below station. Diversions since 1908 to Cold Springs Reservoir, an off-channel reservoir, capacity, 52,380 acre-ft.

AVERAGE DISCHARGE.--56 years (water years 1928-83), 456 ft<sup>3</sup>/s, 330,400 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<sup>3</sup>/s Jan. 30, 1965, gage height, 10.75 ft; no flow at times.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 3,100 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Jan. 7	1500	5,710	6.03	Mar. 14	1130	5,180	5.87
Feb. 19	0830	5,150	5.87	Mar. 31	0730	3,530	5.27
Mar. 5	0230	*8,090	*6.63				

Minimum, 1.1 ft<sup>3</sup>/s June 9, 10.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1982 TO SEPTEMBER 1983  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	159	436	373	375	670	1530	3250	439	14	101	5.2	43
2	154	366	368	329	608	1450	3310	917	21	147	1.8	42
3	142	332	420	329	511	1800	3130	1000	7.8	147	2.0	63
4	139	304	1150	331	464	3380	2490	913	5.3	107	1.7	72
5	140	297	1450	503	428	6350	2220	818	3.1	72	1.5	66
6	139	289	1230	1900	404	5000	2000	1550	2.4	35	2.2	48
7	134	297	1510	4960	407	4100	1830	1520	1.8	24	1.7	33
8	144	313	1180	4450	408	3630	1620	1730	1.6	17	1.8	32
9	164	306	906	3450	408	3710	1460	1720	1.2	20	1.6	39
10	165	304	726	2560	614	3990	1310	1640	1.5	21	1.7	58
11	154	293	591	1980	638	4270	1050	1670	82	8.6	1.5	77
12	148	285	496	1630	803	4520	953	1500	115	17	1.5	87
13	141	269	464	1350	947	4470	863	1240	71	17	1.9	64
14	136	266	489	1180	1030	5100	693	1060	18	3.3	1.6	49
15	126	257	809	1040	1040	4250	604	950	10	9.3	1.6	43
16	136	251	1690	941	1230	3420	489	992	2.0	17	1.5	60
17	135	248	1710	867	1720	2510	375	914	1.8	33	1.6	55
18	134	229	1540	806	3210	2080	300	784	3.1	14	1.6	61
19	169	180	1160	765	4840	1710	272	802	17	2.2	1.6	63
20	142	208	896	774	3660	1400	308	737	14	1.6	1.7	109
21	119	246	768	764	2720	1210	352	686	21	1.5	1.9	122
22	143	229	777	656	2170	1060	525	589	11	1.4	6.4	94
23	196	222	794	605	2660	1010	554	466	2.2	1.4	72	81
24	194	198	745	577	3020	941	974	356	1.7	1.3	147	72
25	193	167	701	567	2830	860	1040	267	23	1.3	122	59
26	164	154	626	637	2400	976	790	209	36	1.5	97	41
27	180	147	575	739	2100	1020	651	145	52	1.6	85	30
28	186	137	520	801	1890	1350	530	119	81	1.7	55	58
29	226	133	481	792	---	1410	435	96	83	1.7	48	74
30	535	178	464	785	---	2130	409	59	86	1.7	40	82
31	528	---	417	732	---	3500	---	17	---	1.7	41	---
TOTAL	5565	7541	26026	38175	43830	84137	34787	25905	790.5	830.8	752.6	1877
MEAN	180	251	840	1231	1565	2714	1160	836	26.4	26.8	24.3	62.6
MAX	535	436	1710	4960	4840	6350	3310	1730	115	147	147	122
MIN	119	133	368	329	404	860	272	17	1.2	1.3	1.5	30
AC-FT	11040	14960	51620	75720	86940	166900	69000	51380	1570	1650	1490	3720

CAL YR 1982	TOTAL	313046.2	MEAN	858	MAX	9610	MIN	1.1	AC-FT	620900
WTR YR 1983	TOTAL	270216.9	MEAN	740	MAX	6350	MIN	1.2	AC-FT	536000

## WILLOW CREEK BASIN

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14034470 WILLOW CREEK ABOVE WILLOW CREEK LAKE, NEAR HEPPNER, OR

LOCATION.--Lat 45°20'27", long 119°30'53", in NE¼NE¼ 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<sup>2</sup>.

PERIOD OF RECORD.--October 1982 to September 1983.

GAGE.--Water-stage recorder. Datum of gage is 2,085.41 ft National Geodetic Vertical Datum of 1929 (levels by Corps of Engineers).

REMARKS.--Records good except those for period of no gage-height record Oct. 1 to Nov. 7, which are fair. Many diversions for irrigation above station. Part of flow of Ditch Creek (John Day River basin) is diverted to Willow Creek above station.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 140 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Mar. 4	1415	*445	*a6.93	May 5	1845	228	5.97
Mar. 13	1215	251	6.10				

Minimum, 1.1 ft<sup>3</sup>/s July 31, Aug. 1.

a From floodmark.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1982 TO SEPTEMBER 1983  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	5.0	15	8.3	10	14	42	62	61	36	13	2.3	3.9
2	5.8	14	7.7	11	13	41	68	67	34	16	1.9	3.5
3	6.0	12	9.4	12	11	41	63	62	32	14	2.4	3.7
4	6.2	11	15	13	9.7	229	60	60	31	12	3.1	3.6
5	5.6	10	16	15	12	248	57	164	31	11	3.1	3.0
6	4.5	10	29	34	13	205	55	211	31	11	2.8	3.0
7	5.0	9.7	32	71	12	170	50	179	24	9.5	2.5	3.0
8	5.8	9.1	23	76	11	150	46	163	21	8.5	3.3	2.9
9	6.2	9.0	24	66	14	139	44	155	21	9.5	3.8	2.8
10	5.6	8.3	18	55	15	132	41	141	28	9.1	3.7	2.8
11	5.2	7.4	17	44	27	141	38	126	25	8.4	4.5	3.0
12	4.9	7.4	18	40	38	146	35	112	21	7.5	4.1	3.1
13	4.5	8.0	29	34	39	196	33	102	19	7.7	3.6	3.1
14	4.3	5.8	28	30	38	192	31	98	16	8.2	3.3	3.1
15	4.0	6.3	38	25	41	160	30	116	14	6.9	3.2	3.0
16	3.6	8.0	50	24	51	131	28	124	11	6.4	3.6	2.8
17	3.7	7.4	47	24	50	108	26	121	13	6.4	3.2	2.5
18	5.2	7.7	37	22	66	94	26	117	13	5.5	2.7	2.5
19	4.8	8.3	32	22	86	80	29	110	14	6.1	2.5	4.3
20	4.6	8.0	27	21	81	65	33	102	14	6.1	3.3	4.1
21	4.4	7.1	27	20	70	55	53	98	14	6.0	3.4	3.8
22	4.7	5.4	27	18	76	52	69	96	13	5.7	2.3	3.7
23	7.6	5.2	26	17	84	54	73	89	14	7.7	2.3	3.7
24	6.6	5.6	22	17	81	55	84	85	13	14	2.7	3.5
25	6.0	6.1	18	16	69	61	78	81	12	9.4	3.0	3.5
26	7.4	6.8	20	16	58	63	68	75	11	7.8	3.1	3.4
27	7.2	7.1	12	17	49	65	59	66	15	5.4	3.0	3.1
28	6.6	7.7	9.0	17	46	60	54	59	13	3.4	3.5	3.1
29	29	8.3	9.4	16	---	60	59	50	13	2.5	4.2	3.2
30	23	8.7	9.6	16	---	68	56	42	12	2.0	4.0	3.2
31	17	---	9.8	16	---	66	---	39	---	1.4	4.0	---
TOTAL	220.0	250.4	695.2	835	1174.7	3369	1508	3171	579	248.1	98.4	97.9
MEAN	7.10	8.35	22.4	26.9	42.0	109	50.3	102	19.3	8.00	3.17	3.26
MAX	29	15	50	76	86	248	84	211	36	16	4.5	4.3
MIN	3.6	5.2	7.7	10	9.7	41	26	39	11	1.4	1.9	2.5
AC-FT	436	497	1380	1660	2330	6680	2990	6290	1150	492	195	194

WTR YR 1983 TOTAL 12246.7 MEAN 33.6 MAX 248 MIN 1.4 AC-FT 24290

NOTE.--No gage-height record Oct. 1 to Nov. 7.



## WILLOW CREEK BASIN

14034480 BALM FORK NEAR HEPPNER, OR

LOCATION.--Lat 45°19'56", long 119°32'24", in NW¼SE¼ 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<sup>2</sup>, revised.

PERIOD OF RECORD.--May 1982 to current year.

GAGE.--Water-stage recorder. Concrete control since Aug. 24, 1982. Datum of gage is 2,101.52 ft National Geodetic Vertical Datum of 1929 (Corps of Engineers bench mark).

REMARKS.--Records excellent. Diversion for irrigation of about 170 acres above station.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 190 ft<sup>3</sup>/s Mar. 4, 1983, gage height, 4.90 ft, from rating curve extended above 82 ft<sup>3</sup>/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<sup>3</sup>/s June 14, 1903, result of slope-area measurement (see WSP 96).

EXTREMES FOR CURRENT YEAR.--Peak discharge above base of 60 ft<sup>3</sup>/s and maximum discharge, 190 ft<sup>3</sup>/s Mar. 4, gage height, 4.90 ft, from rating curve extended above 82 ft<sup>3</sup>/s on basis of slope-area measurement of peak flow; minimum, 0.01 ft<sup>3</sup>/s Oct. 11-17.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1982 TO SEPTEMBER 1983  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.03	.31	.63	1.3	1.9	4.2	5.5	2.8	2.6	1.2	.22	.36
2	.03	.36	.71	1.3	1.8	4.1	6.7	2.3	2.5	1.4	.20	.32
3	.02	.41	.73	1.4	1.7	4.2	6.5	2.2	2.4	1.4	.24	.31
4	.02	.40	.66	1.6	1.6	61	5.8	2.2	2.3	1.3	.31	.30
5	.02	.41	.78	1.7	1.6	29	5.2	25	2.1	1.4	.31	.30
6	.02	.44	.99	3.2	1.7	28	5.1	26	2.0	1.2	.31	.51
7	.02	.48	.96	5.9	1.7	23	4.9	20	1.8	1.1	.26	.38
8	.02	.53	.86	5.9	1.7	21	4.4	22	1.7	1.1	.21	.36
9	.02	.56	1.1	5.2	2.3	18	4.0	20	1.6	.96	.19	.60
10	.02	.56	1.1	4.4	2.4	15	4.0	18	2.1	.87	.16	.57
11	.02	.57	1.1	4.0	2.8	17	3.6	15	2.0	.77	.17	.46
12	.02	.58	1.1	3.5	2.9	19	3.3	12	1.6	.57	.14	.43
13	.02	.57	1.5	3.2	3.1	29	3.1	9.6	1.5	.49	.12	.40
14	.02	.56	1.8	3.1	3.3	22	2.7	9.6	1.6	.48	.11	.36
15	.02	.61	2.5	2.9	3.9	18	2.4	16	1.7	.47	.14	.35
16	.02	.64	3.4	2.8	4.3	15	2.2	22	1.6	.49	.15	.33
17	.02	.60	3.4	2.7	4.5	13	2.1	17	1.5	.48	.12	.32
18	.02	.59	3.1	2.6	5.4	11	2.1	14	1.4	.47	.26	.37
19	.02	.60	2.8	2.6	7.9	9.4	2.1	11	1.5	.45	.46	.43
20	.03	.61	2.7	2.5	8.7	8.6	2.6	9.3	1.3	.37	.61	.37
21	.03	.63	2.6	2.4	7.8	7.9	3.1	8.0	.86	.35	.47	.36
22	.04	.61	2.5	2.4	7.2	7.4	2.7	6.9	.96	.26	.24	.35
23	.07	.60	2.5	2.4	6.5	6.3	2.5	5.1	.87	.23	.31	.34
24	.06	.59	2.2	2.3	5.8	5.4	2.5	3.7	.93	.22	.51	.33
25	.06	.55	2.1	2.2	5.3	6.5	2.4	3.7	.60	.22	.47	.32
26	.07	.57	2.2	2.2	4.9	6.6	2.4	3.8	.38	.27	.47	.31
27	.07	.61	1.8	2.1	4.5	7.7	2.4	3.5	.63	.33	.42	.31
28	.12	.64	1.6	2.0	4.5	7.3	2.4	3.2	.58	.30	.43	.32
29	.42	.65	1.4	2.0	---	5.6	2.7	3.5	.63	.28	.40	.35
30	.31	.63	1.3	1.9	---	4.7	2.7	3.2	.83	.23	.36	.40
31	.29	---	1.3	1.9	---	4.8	---	2.8	---	.22	.34	---
TOTAL	1.97	16.47	53.42	85.6	111.7	439.7	104.1	323.4	44.07	19.88	9.11	11.22
MEAN	.06	.55	1.72	2.76	3.99	14.2	3.47	10.4	1.47	.64	.29	.37
MAX	.42	.65	3.4	5.9	8.7	61	6.7	26	2.6	1.4	.61	.60
MIN	.02	.31	.63	1.3	1.6	4.1	2.1	2.2	.38	.22	.11	.30
AC-FT	3.9	33	106	170	222	872	206	641	87	39	18	22
WTR YR 1983	TOTAL	1220.64	MEAN	3.34	MAX	61	MIN	.02	AC-FT	2420		

## 14034490 WILLOW CREEK LAKE AT HEPPNER, OR

LOCATION.--Lat 45°20'50", long 119°32'37", in NW¼SE¼ 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<sup>2</sup>.

PERIOD OF RECORD.--February to September 1983.

GAGE.--Nonrecording gage. Datum of gage is National Geodetic Vertical Datum of 1929 (levels by Corps of Engineers).

REMARKS.--Lake is formed by roller compacted concrete construction; 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 CURRENT YEAR.--Maximum observed contents during period February to September, 706 acre-ft May 6, elevation, 2,020.90 ft.

## MONTHEND ELEVATIONS AND CONTENTS AT 2400, FEBRUARY 1983 TO SEPTEMBER 1983

Date	Elevation (feet)	Contents (acre-feet)	Change in contents (acre-feet)
Feb. 28.....	g2,001.92	108	+108
Mar. 31.....	g2,018.45	599	+491
Apr. 30.....	g2,018.68	608	+9
May 31.....	g2,017.69	568	-40
June 30.....	g2,008.20	254	-314
July 31.....	g2,006.32	205	-49
Aug. 31.....	g2,006.49	210	+5
Sept.30.....	g2,005.08	176	-34
February to September 1983.....	-	176	+176

g Computed from graph based on gage readings.

## WILLOW CREEK BASIN

14034500 WILLOW CREEK AT HEPPNER, OR

LOCATION.--Lat 45°21'02", long 119°32'56", in SE¼NW¼ 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<sup>2</sup>, revised.

PERIOD OF RECORD.--May 1951 to current year.

GAGE.--Water-stage recorder. Datum of gage is 1,952.73 ft National Geodetic Vertical Datum of 1929.

REMARKS.--Records fair. Flow regulated by Willow Creek Lake, 0.2 mi upstream, since Feb. 16, 1983. Many diversions for irrigation above station. Part of flow of Ditch Creek (John Day River basin) is diverted to Willow Creek above station.

AVERAGE DISCHARGE.--31 years (water years 1951-82), 19.1 ft<sup>3</sup>/s, 13,840 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 812 ft<sup>3</sup>/s May 10, 1957, gage height, 6.15 ft, from rating curve extended above 230 ft<sup>3</sup>/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<sup>3</sup>/s June 14, 1903, result of slope-area measurement (see WSP 96). Discharge for flood of Feb. 22, 1949, was 1,700 ft<sup>3</sup>/s, result of slope-area measurement.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 317 ft<sup>3</sup>/s May 6, gage height, 3.75 ft; minimum, 0.02 ft<sup>3</sup>/s Feb. 16.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1982 TO SEPTEMBER 1983  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	4.5	16	8.3	11	18	35	58	64	37	16	1.8	8.3
2	5.3	13	8.2	12	16	30	59	86	24	17	1.4	7.3
3	5.6	12	9.9	13	14	28	65	77	22	17	.79	4.8
4	5.5	11	16	15	12	124	67	59	22	17	.48	4.8
5	5.0	10	17	17	14	253	62	185	21	19	1.2	5.0
6	4.2	10	28	42	16	201	51	306	69	19	1.8	5.1
7	4.5	9.7	33	81	16	195	42	292	71	14	1.8	3.9
8	5.3	9.3	24	84	15	171	53	213	20	10	1.8	3.2
9	5.7	9.1	25	75	19	174	50	201	23	9.2	1.8	3.1
10	5.1	8.4	19	61	18	164	43	208	23	9.2	1.8	3.1
11	4.6	7.9	17	50	31	164	43	139	23	9.5	2.1	3.1
12	4.1	8.0	19	43	43	177	41	115	23	10	3.7	3.5
13	3.8	8.8	30	38	44	251	37	104	92	8.7	3.0	3.9
14	3.7	6.7	31	34	40	245	36	97	16	8.3	1.4	3.7
15	3.5	7.7	35	30	45	186	32	97	4.3	8.3	1.6	3.0
16	3.2	8.8	53	29	29	147	31	182	4.5	8.3	1.7	2.5
17	3.4	8.0	51	27	33	113	32	134	4.7	8.3	1.8	2.4
18	4.8	8.4	39	26	86	88	32	134	4.9	7.1	1.8	2.4
19	4.5	9.3	32	26	111	84	33	109	5.3	6.6	1.7	3.7
20	4.2	8.5	30	25	104	78	37	103	22	6.6	1.7	5.3
21	3.8	8.0	30	23	97	65	59	102	38	6.6	1.6	4.8
22	4.3	5.9	30	22	97	59	73	101	36	6.6	1.7	4.1
23	7.6	5.5	28	21	101	61	73	74	32	6.6	1.8	4.0
24	6.8	5.8	25	21	98	51	84	72	25	6.9	2.4	3.9
25	5.6	6.8	20	20	76	54	102	72	25	14	3.2	3.7
26	7.6	7.5	22	20	77	64	82	73	24	17	3.4	3.7
27	7.3	7.9	15	21	59	64	64	63	21	14	3.4	2.5
28	6.2	8.3	12	20	45	64	62	62	18	7.3	3.4	1.8
29	34	8.9	11	20	---	58	63	51	20	3.9	5.0	2.2
30	26	8.7	11	18	---	56	64	41	16	3.4	5.6	2.6
31	19	---	11	19	---	62	---	39	---	3.3	5.9	---
TOTAL	218.7	263.9	740.4	964	1374	3566	1630	3655	786.7	318.7	72.57	115.4
MEAN	7.05	8.80	23.9	31.1	49.1	115	54.3	118	26.2	10.3	2.34	3.85
MAX	34	16	53	84	111	253	102	306	92	19	5.9	8.3
MIN	3.2	5.5	8.2	11	12	28	31	39	4.3	3.3	.48	1.8
AC-FT	434	523	1470	1910	2730	7070	3230	7250	1560	632	144	229
CAL YR 1982	TOTAL		11940.49		MEAN	32.7	MAX	167	MIN	.15	AC-FT	23680
WTR YR 1983	TOTAL		13705.37		MEAN	37.5	MAX	306	MIN	.48	AC-FT	27180

## WILLOW CREEK BASIN

121

14034800 RHEA CREEK NEAR HEPPNER, OR

LOCATION.--Lat 45°15'46", long 119°36'51", in NW¼SW¼ 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<sup>2</sup>, approximately.

PERIOD OF RECORD.--August 1960 to current year.

GAGE.--Water-stage recorder. Altitude 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.--Records good. No regulation. Many diversions for irrigation above station.

AVERAGE DISCHARGE.--23 years, 21.1 ft<sup>3</sup>/s, 15,290 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,280 ft<sup>3</sup>/s June 10, 1969, gage height, 7.05 ft, site and datum then in use, from rating curve extended above 130 ft<sup>3</sup>/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 above base of 230 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Mar. 4	1330	*582	5.73	May 5	1530	321	*5.89
Mar. 13	1230	570	5.68				

Minimum, 3.8 ft<sup>3</sup>/s Oct. 2, 3.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1982 TO SEPTEMBER 1983  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	4.7	35	14	24	30	79	79	59	38	14	9.0	6.1
2	3.9	25	14	24	28	77	86	58	36	16	7.7	6.1
3	4.7	20	21	24	24	73	83	56	33	14	7.3	5.5
4	4.9	16	35	27	22	374	81	57	31	13	7.0	5.5
5	4.9	16	38	38	22	429	76	235	29	12	6.7	5.2
6	4.5	15	66	108	25	399	72	188	27	11	6.4	5.2
7	4.5	14	56	136	26	360	68	152	25	9.7	6.1	5.5
8	5.3	14	40	136	30	333	65	137	23	9.7	6.1	5.5
9	6.2	14	39	106	36	330	61	132	22	11	6.1	5.5
10	5.7	12	32	84	40	303	57	123	23	9.3	6.1	6.1
11	5.1	11	26	71	81	306	55	114	23	9.3	6.4	6.1
12	4.9	11	26	60	99	335	50	107	19	9.3	6.1	6.1
13	4.7	11	27	51	90	477	48	100	17	9.3	5.8	5.8
14	4.7	9.0	35	45	84	357	46	97	15	11	5.5	5.8
15	4.7	9.7	67	40	97	260	44	102	14	11	5.2	6.1
16	4.5	10	124	36	123	184	43	102	14	9.7	4.7	6.1
17	4.7	11	132	36	112	163	42	99	14	9.7	4.7	6.1
18	5.3	13	86	34	175	146	42	95	14	9.3	4.7	6.7
19	5.7	13	67	36	183	130	42	88	14	9.0	4.7	10
20	5.1	11	59	37	160	119	42	81	14	9.0	5.0	8.6
21	4.9	10	70	35	133	109	50	76	14	9.0	5.0	8.3
22	5.9	6.4	82	34	144	103	51	72	13	8.3	4.5	8.0
23	9.4	6.4	67	33	131	96	54	68	14	8.3	5.5	7.7
24	7.8	6.4	57	33	117	91	56	64	13	9.7	5.8	8.0
25	6.4	6.6	48	32	104	92	54	60	13	8.6	5.2	7.7
26	6.4	6.4	46	35	98	89	52	56	12	8.3	5.8	7.7
27	8.0	7.0	33	38	87	91	51	53	14	8.0	5.2	7.7
28	8.5	12	28	36	86	87	51	49	14	8.0	5.8	8.0
29	40	16	25	36	---	83	58	46	14	7.7	5.5	8.0
30	70	16	25	33	---	87	58	43	14	7.3	5.5	8.3
31	45	---	24	32	---	83	---	40	---	7.7	5.2	---
TOTAL	311.0	383.9	1509	1530	2387	6245	1717	2809	580	307.2	180.3	203.0
MEAN	10.0	12.8	48.7	49.4	85.3	201	57.2	90.6	19.3	9.91	5.82	6.77
MAX	70	35	132	136	183	477	86	235	38	16	9.0	10
MIN	3.9	6.4	14	24	22	73	42	40	12	7.3	4.5	5.2
AC-FT	617	761	2990	3030	4730	12390	3410	5570	1150	609	358	403
CAL YR 1982	TOTAL	14503.2	MEAN	39.7	MAX	398	MIN	1.8	AC-FT	28770		
WTR YR 1983	TOTAL	18162.4	MEAN	49.8	MAX	477	MIN	3.9	AC-FT	36030		

## JOHN DAY RIVER BASIN

14037500 STRAWBERRY CREEK ABOVE SLIDE CREEK, NEAR PRAIRIE CITY, OR

LOCATION.--Lat 44°20'30", long 118°39'20", in SE¼NW¼ 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<sup>2</sup>.

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 National Geodetic Vertical Datum of 1929.

REMARKS.--Records good. Flow affected by natural storage in Strawberry Lake. No diversion above station.

AVERAGE DISCHARGE.--53 years, 12.9 ft<sup>3</sup>/s, 25.03 in/yr, 9,350 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 354 ft<sup>3</sup>/s May 31, 1983, gage height, 2.45 ft, from rating curve extended above 190 ft<sup>3</sup>/s; maximum gage height, 3.23 ft May 24, 1956 (backwater from logs); minimum discharge, 1.0 ft<sup>3</sup>/s Mar. 20, 1955.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 354 ft<sup>3</sup>/s May 31, gage height, 2.45 ft, from rating curve extended above 190 ft<sup>3</sup>/s; minimum daily, 3.2 ft<sup>3</sup>/s Feb. 5.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1982 TO SEPTEMBER 1983  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP		
1	6.6	6.6	4.8	3.8	3.6	5.2	5.5	14	215	77	20	7.7		
2	6.6	6.4	4.8	3.8	3.6	5.4	5.5	15	195	98	18	7.4		
3	6.6	6.3	5.0	3.9	3.6	5.7	5.5	15	136	102	17	7.0		
4	6.6	6.3	4.8	4.0	3.3	6.2	5.1	16	141	88	16	6.9		
5	6.5	6.2	4.9	4.0	3.2	6.5	5.1	19	138	80	16	6.7		
6	6.5	6.3	5.2	4.1	3.3	6.4	5.0	20	120	87	15	6.6		
7	6.2	6.0	5.1	4.2	3.3	6.2	4.8	20	115	91	15	6.5		
8	6.2	6.1	5.1	4.5	3.3	5.9	4.8	19	120	86	15	6.2		
9	6.0	5.9	5.1	4.5	3.3	6.1	4.8	19	116	74	15	6.2		
10	5.8	5.9	5.1	4.5	3.3	7.3	4.8	17	115	62	14	6.1		
11	5.8	5.8	5.0	4.5	3.3	8.5	4.6	17	109	53	14	5.8		
12	5.8	5.8	4.5	4.5	3.3	8.8	4.5	16	92	49	13	5.8		
13	5.8	5.8	4.5	4.5	3.3	10	4.5	17	75	49	13	5.8		
14	5.8	5.8	4.5	4.4	3.3	12	4.2	16	65	52	13	5.8		
15	5.8	5.8	4.5	3.9	3.3	11	4.4	16	64	53	12	5.8		
16	5.8	5.6	4.4	3.9	3.3	9.4	4.5	16	68	48	12	5.7		
17	5.6	5.3	4.3	3.9	3.7	8.5	4.6	16	74	42	12	5.5		
18	5.2	5.3	4.2	3.8	4.5	7.7	5.0	17	82	38	12	5.5		
19	5.2	5.1	4.2	3.9	4.5	7.1	5.4	18	77	35	11	5.5		
20	5.1	5.1	4.3	3.6	4.5	6.6	6.1	21	68	33	11	5.2		
21	5.2	5.1	4.4	3.6	4.5	6.2	7.8	26	59	32	11	5.1		
22	5.1	5.1	4.2	3.6	4.6	5.9	8.8	30	52	30	10	5.1		
23	5.5	5.1	4.2	3.6	4.9	5.8	10	36	51	29	10	5.1		
24	5.1	5.1	4.2	3.6	5.3	5.5	12	48	54	28	9.7	5.0		
25	5.1	5.1	4.2	3.6	5.7	5.5	12	56	57	27	9.4	4.9		
26	5.9	4.9	4.2	3.6	5.7	5.1	12	67	59	26	9.0	4.9		
27	5.5	4.8	4.0	3.6	5.5	5.1	12	95	63	24	8.7	5.1		
28	5.7	4.8	3.5	3.3	5.4	4.8	12	127	65	23	8.5	4.8		
29	6.3	4.8	3.6	3.3	---	5.0	12	109	70	23	8.2	4.8		
30	6.2	4.8	3.7	3.3	---	5.3	12	95	72	22	8.0	4.6		
31	6.6	---	3.7	3.3	---	5.5	---	148	---	21	7.9	---		
TOTAL	181.7	167.0	138.2	120.6	112.4	210.2	209.3	1181	2787	1582	384.4	173.1		
MEAN	5.86	5.57	4.46	3.89	4.01	6.78	6.98	38.1	92.9	51.0	12.4	5.77		
MAX	6.6	6.6	5.2	4.5	5.7	12	12	148	215	102	20	7.7		
MIN	5.1	4.8	3.5	3.3	3.2	4.8	4.2	14	51	21	7.9	4.6		
CFSM	.84	.80	.64	.56	.57	.97	.00	5.44	13.3	7.29	1.77	.82		
IN.	.97	.89	.73	.64	.60	1.12	1.11	6.28	14.81	8.41	2.04	.92		
AC-FT	360	331	274	239	223	417	415	2340	5530	3140	762	343		
CAL YR 1982	TOTAL	6267.5	MEAN	17.2	MAX	119	MIN	3.1	CFSM	2.46	IN.	33.31	AC-FT	12430
WTR YR 1983	TOTAL	7246.9	MEAN	19.9	MAX	215	MIN	3.2	CFSM	2.84	IN.	38.51	AC-FT	14370

## JOHN DAY RIVER BASIN

123

14038530 JOHN DAY RIVER NEAR JOHN DAY, OR

LOCATION.--Lat 44°25'07", long 118°54'19", in SW¼SE¼ 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<sup>2</sup>.

PERIOD OF RECORD.--October 1968 to current year.

GAGE.--Water-stage recorder. Datum of gage is 3,130.56 ft National Geodetic Vertical Datum of 1929.

REMARKS.--Records good. Some regulation from irrigation ditches upstream. Many diversions above station for irrigation.

AVERAGE DISCHARGE.--15 years, 215 ft<sup>3</sup>/s, 155,800 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 5,830 ft<sup>3</sup>/s June 9, 1969, gage height, 10.80 ft, from floodmark; minimum, 3.5 ft<sup>3</sup>/s Aug. 26-28, 1969.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 800 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Jan. 7	0330	888	5.39	May 5	1130	871	5.33
Feb. 18	2230	1,040	5.62	May 31	1100	*2,220	*7.15
Mar. 4	1030	2,160	7.08	June 10	1900	1,020	5.55
Mar. 13	1600	1,240	5.85	July 2	0100	850	5.30

Minimum, 51 ft<sup>3</sup>/s Aug. 19.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1982 TO SEPTEMBER 1983  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	140	163	145	130	170	322	400	538	1720	633	125	82
2	140	158	145	130	160	545	445	551	1350	696	112	82
3	150	153	165	130	155	480	425	544	1110	512	106	82
4	155	150	190	185	148	1660	405	570	955	435	106	82
5	148	148	178	395	150	969	375	801	836	410	100	82
6	145	150	322	741	158	794	360	766	738	410	93	82
7	160	145	227	776	158	710	355	682	633	405	80	79
8	153	145	178	566	158	717	346	647	710	370	80	79
9	158	145	175	385	170	773	346	612	738	341	76	76
10	153	140	163	310	163	724	341	557	822	314	79	77
11	150	140	158	258	183	969	323	494	808	289	74	80
12	148	138	155	227	190	955	314	461	675	269	71	79
13	145	140	165	212	212	1120	301	445	544	258	70	79
14	140	130	160	195	203	969	289	435	461	255	68	79
15	140	133	180	185	218	829	281	450	456	251	64	80
16	140	138	314	190	355	717	281	435	445	244	60	82
17	140	153	608	190	365	633	293	395	467	237	59	80
18	143	158	282	183	811	570	314	395	564	217	56	80
19	140	160	224	200	692	494	340	400	478	197	51	82
20	140	150	212	203	445	450	400	425	430	194	59	82
21	140	145	310	180	370	420	472	505	370	185	62	82
22	140	140	314	178	480	395	489	591	337	176	91	82
23	138	135	238	180	445	400	512	661	337	167	89	87
24	140	125	203	190	440	375	551	780	350	164	89	93
25	138	125	183	183	435	370	538	948	337	162	85	93
26	170	130	190	193	405	346	500	1050	365	154	80	93
27	160	138	170	242	360	346	461	1120	456	151	77	98
28	160	145	130	212	334	328	440	1230	415	154	71	98
29	330	153	130	193	---	332	472	1330	478	159	65	102
30	218	148	130	180	---	494	489	1350	445	139	68	112
31	173	---	130	175	---	440	---	1960	---	127	71	---
TOTAL	4835	4321	6474	7897	8533	19646	11858	22128	18830	8675	2437	2546
MEAN	156	144	209	255	305	634	395	714	628	280	78.6	84.9
MAX	330	163	608	776	811	1660	551	1960	1720	696	125	112
MIN	138	125	130	130	148	322	281	395	337	127	51	76
AC-FT	9590	8570	12840	15660	16930	38970	23520	43890	37350	17210	4830	5050
CAL YR 1982	TOTAL	134623	MEAN	369	MAX	2160	MIN	41	AC-FT	267000		
WTR YR 1983	TOTAL	118180	MEAN	324	MAX	1960	MIN	51	AC-FT	234400		



## JOHN DAY RIVER BASIN

14040500 JOHN DAY RIVER AT PICTURE GORGE, NEAR DAYVILLE, OR

LOCATION.--Lat 44°31'15", long 119°37'30", in SW¼ 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<sup>2</sup>, 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 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.--Records excellent. No regulation. Many diversions for irrigation above station.

AVERAGE DISCHARGE.--57 years, 490 ft<sup>3</sup>/s, 355,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 8,170 ft<sup>3</sup>/s Dec. 22, 1964, gage height, 14.97 ft; minimum, 1.0 ft<sup>3</sup>/s for several days in August and September 1930, Aug. 8, 9, 1936, Sept. 9, 1966.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 1,800 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Jan. 8	0300	2,160	8.24	Mar. 30	0900	4,230	10.54
Feb. 18	1100	3,620	9.94	Apr. 24	0730	2,830	9.06
Feb. 24	0230	2,680	8.88	May 5	2130	4,610	10.89
Mar. 4	2030	5,340	11.52	June 1	0400	4,740	11.01
Mar. 13	1800	*7,170	a*13.14				

Minimum, 119 ft<sup>3</sup>/s Aug. 20.

a From floodmark.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1982 TO SEPTEMBER 1983  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	280	396	344	280	617	1700	2490	2380	4400	967	255	162
2	281	370	341	320	577	2010	2610	2430	3440	1370	236	179
3	288	353	349	370	521	2110	2450	2390	2770	1130	207	182
4	297	341	462	441	482	4190	2270	2430	2370	973	190	175
5	299	334	821	534	470	4320	2100	3780	2060	876	179	170
6	284	332	676	1540	541	3460	1980	4080	1850	789	173	173
7	298	333	485	1960	540	3170	1900	3310	1630	750	173	172
8	305	326	470	1910	527	3290	1850	2970	1510	713	176	170
9	304	327	432	1410	581	3530	1830	2750	1600	655	171	172
10	305	319	405	1120	593	3480	1810	2530	1560	622	183	163
11	300	312	417	969	680	4710	1690	2280	1770	584	174	166
12	293	305	427	879	779	4940	1620	2080	1560	537	165	166
13	286	303	418	812	951	5800	1540	1970	1370	509	157	164
14	282	292	476	748	969	5640	1460	1900	1190	482	154	160
15	276	277	1000	692	974	4560	1400	1920	1110	477	150	163
16	271	298	1340	706	1580	3800	1380	1920	1060	479	145	161
17	271	313	818	685	1490	3310	1430	1780	1010	482	136	162
18	278	339	660	678	3270	2990	1550	1710	1080	456	130	163
19	277	362	639	748	2910	2640	1710	1760	1060	411	128	167
20	272	346	773	812	2100	2390	1920	1830	989	384	129	176
21	272	330	938	708	1840	2230	2450	2010	900	371	126	188
22	272	317	967	675	2360	2120	2640	2170	817	351	129	189
23	270	274	763	681	2550	2000	2630	2290	755	342	148	191
24	275	200	633	685	2520	1910	2790	2440	750	321	180	193
25	273	210	473	685	2340	1830	2660	2690	713	307	189	200
26	277	230	410	661	2180	1750	2480	2880	714	301	179	201
27	302	280	370	776	1920	1760	2260	2970	802	294	172	201
28	291	320	320	827	1770	1730	2120	2990	823	283	165	221
29	379	330	300	721	---	1750	2220	3030	817	287	157	215
30	586	370	260	676	---	3600	2270	3020	903	286	149	226
31	451	---	240	638	---	2860	---	4010	---	265	146	---
TOTAL	9395	9439	17427	25347	38632	95580	61510	78700	43383	17054	5151	5391
MEAN	303	315	562	818	1380	3083	2050	2539	1446	550	166	180
MAX	586	396	1340	1960	3270	5800	2790	4080	4400	1370	255	226
MIN	270	200	240	280	470	1700	1380	1710	713	265	126	160
AC-FT	18630	18720	34570	50280	76630	189600	122000	156100	86050	33830	10220	10690
CAL YR 1982	TOTAL	376375	MEAN	1031	MAX	6500	MIN	85	AC-FT	746500		
WTR YR 1983	TOTAL	407009	MEAN	1115	MAX	5800	MIN	126	AC-FT	807300		

## JOHN DAY RIVER BASIN

125

14042500 CAMAS CREEK NEAR UKIAH, OR

LOCATION.--Lat 45°09'25", long 118°49'10", in SE¼SE¼ 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<sup>2</sup>.

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 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.--Records good except those for December and January, which are fair. No regulation. Diversions for irrigation above station.

AVERAGE DISCHARGE.--47 years (water years 1915-17, 1922-23, 1942-83), 96.2 ft<sup>3</sup>/s, 69,700 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 3,840 ft<sup>3</sup>/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<sup>3</sup>/s Aug. 9, 1932, June 24 to July 2, 1940.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 550 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Feb. 18	1730	782	2.63	Mar. 13	1900	774	2.62
Mar. 4	0700	*856	*2.72				

Minimum, 5.0 ft<sup>3</sup>/s Sept. 14-18.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1982 TO SEPTEMBER 1983  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	11	67	37	52	51	241	247	217	114	59	9.0	8.2
2	10	57	36	54	48	367	269	208	91	79	8.4	7.7
3	18	51	72	60	42	392	249	199	78	86	7.8	6.9
4	18	47	193	78	38	786	233	204	69	77	7.6	6.5
5	16	46	206	120	35	677	211	292	61	67	7.0	6.6
6	15	72	170	210	32	543	193	298	54	60	6.7	5.9
7	22	66	140	370	38	482	184	264	49	52	6.5	5.7
8	24	61	120	389	44	491	179	250	53	46	7.1	5.8
9	27	57	94	256	43	568	173	233	59	40	7.7	6.0
10	24	52	76	199	45	590	162	217	65	37	29	5.9
11	22	48	62	161	44	614	150	199	71	31	30	6.3
12	20	43	58	139	63	546	140	179	58	28	17	5.9
13	18	42	60	130	77	662	129	169	47	26	14	5.6
14	16	35	61	120	75	628	121	165	39	27	13	5.3
15	16	31	64	110	77	495	118	203	38	24	11	5.2
16	14	37	88	96	108	390	126	197	34	22	9.8	5.1
17	15	41	180	85	134	323	146	183	32	23	9.1	5.0
18	18	49	140	77	490	272	172	185	32	24	8.6	5.5
19	17	56	120	75	446	231	195	190	31	20	8.3	7.8
20	16	52	110	68	304	200	226	205	31	18	8.3	7.2
21	17	49	130	62	277	182	277	236	27	16	8.0	6.5
22	18	40	150	60	373	169	282	245	24	15	8.2	6.2
23	21	30	104	59	461	166	290	245	24	14	8.4	6.0
24	23	27	91	56	451	158	314	265	24	14	8.5	5.9
25	21	30	84	51	408	158	286	270	21	13	7.8	5.7
26	22	35	74	58	358	151	246	255	20	13	7.4	5.5
27	22	39	68	74	290	160	213	219	61	12	7.0	5.5
28	21	43	62	64	251	153	196	202	56	11	6.6	5.9
29	64	40	58	63	---	164	194	191	51	10	6.5	5.7
30	87	38	54	58	---	269	203	169	51	9.5	6.3	5.8
31	78	---	52	54	---	280	---	142	---	9.1	6.4	---
TOTAL	751	1381	3014	3508	5103	11508	6124	6696	1465	982.6	307.0	182.8
MEAN	24.2	46.0	97.2	113	182	371	204	216	48.8	31.7	9.90	6.09
MAX	87	72	206	389	490	786	314	298	114	86	30	8.2
MIN	10	27	36	51	32	151	118	142	20	9.1	6.3	5.0
AC-FT	1490	2740	5980	6960	10120	22830	12150	13280	2910	1950	609	363
CAL YR 1982	TOTAL	52482.9	MEAN	144	MAX	1470	MIN	5.1	AC-FT	104100		
WTR YR 1983	TOTAL	41022.4	MEAN	112	MAX	786	MIN	5.0	AC-FT	81370		

## JOHN DAY RIVER BASIN

## 14044000 MIDDLE FORK JOHN DAY RIVER AT RITTER, OR

LOCATION.--Lat 44°53'20", long 119°08'25", in SW¼NW¼ 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<sup>2</sup>.

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 National Geodetic Vertical Datum of 1929.

REMARKS.--Records excellent. No regulation. Diversions for irrigation above station.

AVERAGE DISCHARGE.--54 years, 250 ft<sup>3</sup>/s, 181,100 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 4,730 ft<sup>3</sup>/s Jan. 30, 1965, gage height, 8.39 ft, from rating curve extended above 2,200 ft<sup>3</sup>/s; maximum gage height, 9.13 ft Feb. 1, 1963, ice jam; minimum discharge, 0.90 ft<sup>3</sup>/s Aug. 19, 20, 1966.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 1,000 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Jan. 2	1200	(a)	*8.14	Mar. 13	2000	*2,430	6.31
Feb. 18	2200	1,300	5.21	Apr. 24	0830	1,370	5.28
Feb. 23	0100	1,090	4.97	May 5	1600	1,980	5.89
Mar. 4	2000	2,240	6.13	May 29	0500	1,720	5.62

Minimum, 45 ft<sup>3</sup>/s Nov. 25, Sept. 17, 18.

a Result of ice jam.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1982 TO SEPTEMBER 1983  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	83	138	130	96	182	640	876	1190	1340	389	80	64
2	79	122	123	100	159	1080	932	1230	1170	574	77	70
3	87	112	192	110	139	1100	901	1190	1050	465	73	58
4	92	108	290	140	126	1920	841	1200	933	381	71	51
5	88	106	241	170	124	1820	767	1650	845	332	69	50
6	82	120	548	190	137	1600	723	1690	777	300	66	49
7	95	119	365	400	146	1420	704	1470	749	277	64	49
8	99	107	223	782	147	1480	699	1350	751	256	67	49
9	105	111	187	569	153	1610	694	1320	788	237	71	51
10	103	104	156	445	154	1740	685	1220	726	221	94	51
11	95	99	139	369	170	2050	631	1070	733	203	84	52
12	91	88	140	329	200	1890	584	964	600	186	75	52
13	86	99	153	292	302	2220	537	897	520	177	69	50
14	83	76	153	270	305	2160	502	856	479	169	67	49
15	81	68	150	245	302	1710	487	897	479	157	65	48
16	79	95	224	246	491	1350	500	865	453	153	62	47
17	79	105	506	247	443	1160	560	800	429	149	60	46
18	84	114	323	227	918	1030	657	809	487	145	58	46
19	83	128	255	234	962	896	746	847	419	135	55	51
20	80	112	230	240	686	800	870	900	391	127	54	52
21	79	104	315	210	645	744	1150	1030	347	123	55	50
22	81	78	385	206	941	710	1250	1110	323	116	66	51
23	84	57	295	195	1020	693	1240	1200	314	108	74	50
24	90	56	239	201	924	668	1320	1370	302	102	69	51
25	87	62	158	195	883	662	1240	1520	281	96	68	50
26	91	97	140	197	844	619	1120	1630	277	93	62	49
27	107	103	120	237	709	636	1010	1610	372	93	58	52
28	94	111	110	232	642	618	946	1610	362	91	56	53
29	193	129	104	216	---	600	1050	1610	340	87	54	51
30	257	138	100	201	---	836	1100	1510	349	85	53	51
31	168	---	98	188	---	950	---	1500	---	80	52	---
TOTAL	3085	3066	6792	7979	12854	37412	25322	38115	17386	6107	2048	1543
MEAN	99.5	102	219	257	459	1207	844	1230	580	197	66.1	51.4
MAX	257	138	548	782	1020	2220	1320	1690	1340	574	94	70
MIN	79	56	98	96	124	600	487	800	277	80	52	46
AC-FT	6120	6080	13470	15830	25500	74210	50230	75600	34490	12110	4060	3060
CAL YR 1982	TOTAL	166800	MEAN	457	MAX	2490	MIN	50	AC-FT	330800		
WTR YR 1983	TOTAL	161709	MEAN	443	MAX	2220	MIN	46	AC-FT	320700		

## JOHN DAY RIVER BASIN

127

14046000 NORTH FORK JOHN DAY RIVER AT MONUMENT, OR

LOCATION.--Lat 44°48'50", long 119°25'50", in SE¼ 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<sup>2</sup>, 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 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.--Records excellent. Very slight regulation by small reservoirs upstream. Many small diversions for irrigation above station.

AVERAGE DISCHARGE.--58 years, 1,267 ft<sup>3</sup>/s, 917,900 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 33,400 ft<sup>3</sup>/s Jan. 30, 1965, gage height, 18.45 ft, from rating curve extended above 17,000 ft<sup>3</sup>/s; minimum, 6 ft<sup>3</sup>/s sometime during period Nov. 2-13, 1936 (result of freezeup); minimum daily, 17 ft<sup>3</sup>/s Dec. 12, 1932.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 5,300 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Jan. 7	0900	5,570	7.71	Mar. 30	1430	6,490	8.18
Feb. 18	2130	12,300	10.68	Apr. 24	0630	7,430	8.62
Feb. 23	0300	7,060	8.45	May 5	1700	11,200	10.23
Mar. 4	2130	14,700	11.65	May 26	0730	8,550	9.12
Mar. 13	2100	*14,900	*11.72				

Minimum, 166 ft<sup>3</sup>/s Sept. 17, 18.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1982 TO SEPTEMBER 1983  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	352	729	699	600	1200	3820	4740	5860	6000	1740	376	217
2	319	647	653	620	1090	4520	5200	6020	5130	2540	357	261
3	330	561	737	660	880	5090	4780	5780	4510	2240	328	256
4	386	545	2140	800	766	12100	4280	5860	4010	1890	311	221
5	368	534	2010	1000	800	10700	3850	9130	3620	1680	299	204
6	344	574	3060	1300	840	9020	3560	8950	3300	1540	283	197
7	337	680	2640	5230	884	8030	3430	7420	3110	1450	270	190
8	393	590	1670	5070	862	7880	3340	6810	3030	1340	273	186
9	407	563	1360	3780	947	8430	3240	6370	3370	1220	288	186
10	451	546	1120	2960	1030	8520	3110	5820	3060	1120	371	189
11	426	475	940	2430	1330	10300	2900	5140	3370	1020	427	192
12	390	455	898	2100	1950	10300	2720	4630	2790	939	389	197
13	367	424	992	1860	2530	12800	2520	4340	2420	884	328	191
14	347	433	975	1650	2480	12100	2350	4140	2140	837	298	180
15	331	278	1040	1470	2340	9040	2260	4390	2120	828	283	175
16	321	369	1850	1490	4000	7160	2300	4330	2040	771	265	171
17	325	514	4100	1460	3920	6120	2560	3950	1910	753	247	169
18	328	537	2500	1350	8170	5300	2960	4090	2110	737	234	167
19	343	631	1810	1390	8140	4570	3370	4440	1930	681	224	173
20	324	610	1580	1450	5480	4030	3960	4790	1810	616	221	205
21	314	551	2120	1290	4820	3750	5590	5480	1610	577	222	206
22	332	452	2820	1230	6130	3530	6130	5950	1460	544	230	191
23	357	277	2020	1180	6680	3370	6060	6260	1400	521	344	188
24	377	258	1590	1200	6110	3210	7030	6960	1370	513	313	186
25	396	286	1200	1220	5490	3170	6490	7670	1280	490	309	181
26	377	393	1100	1280	5190	3060	5790	8030	1230	454	282	177
27	468	500	900	1710	4380	3090	5140	7800	1490	437	252	176
28	442	612	774	1660	4000	3140	4770	7650	1910	421	232	186
29	667	641	700	1460	---	3060	5460	7580	1630	406	220	200
30	1220	812	660	1360	---	5450	5580	7090	1840	386	212	188
31	881	---	620	1270	---	5480	---	6670	---	372	205	---
TOTAL	13020	15477	47278	53530	92439	200140	125470	189400	77000	29947	8893	5806
MEAN	420	516	1525	1727	3301	6456	4182	6110	2567	966	287	194
MAX	1220	812	4100	5230	8170	12800	7030	9130	6000	2540	427	261
MIN	314	258	620	600	766	3060	2260	3950	1230	372	205	167
AC-FT	25830	30700	93780	106200	183400	397000	248900	375700	152700	59400	17640	11520
CAL YR 1982	TOTAL	843426	MEAN	2311	MAX	16300	MIN	186	AC-FT	1673000		
WTR YR 1983	TOTAL	858400	MEAN	2352	MAX	12800	MIN	167	AC-FT	1703000		

## JOHN DAY RIVER BASIN

14046500 JOHN DAY RIVER AT SERVICE CREEK, OR

LOCATION.--Lat 44°47'38", long 120°00'20", in NW¼NE¼ 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<sup>2</sup>, 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 National Geodetic Vertical Datum of 1929. See WSP 1738 for history of changes prior to Feb. 24, 1957.

REMARKS.--Records excellent except those for period of no gage-height record, May 6 to June 13, which are fair. Very slight regulation by several small reservoirs above station. Many small diversions for irrigation above station.

AVERAGE DISCHARGE.--55 years, 1,895 ft<sup>3</sup>/s, 1,373,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 40,200 ft<sup>3</sup>/s Dec. 23, 1964, gage height, 17.85 ft, from rating curve extended above 14,000 ft<sup>3</sup>/s on basis of slope-area measurement of peak flow; minimum, 6.0 ft<sup>3</sup>/s Aug. 23, 24, 1973.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 7,300 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Jan. 8	1200	7,970	8.27	Mar. 30	2000	10,300	9.30
Feb. 19	0430	15,600	11.21	Apr. 24	1300	10,100	9.23
Feb. 23	1200	9,990	9.17	May 5	2200	15,900	11.33
Mar. 5	0200	20,000	12.67	May 25	unknown	unknown	unknown
Mar. 14	0330	*20,800	*12.89				

Minimum, 198 ft<sup>3</sup>/s Dec. 31, result of freezeup.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1982 TO SEPTEMBER 1983  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	703	1390	1230	900	2100	5770	7720	8330	8800	2630	739	399
2	659	1220	1160	1000	1990	6150	7770	8760	7400	3450	672	429
3	656	1110	1150	1230	1750	7260	7710	8510	6600	3570	613	489
4	674	1030	1940	1550	1540	13000	6820	8500	6000	3000	572	481
5	740	1010	2830	1880	1420	17400	6290	12000	5400	2630	544	442
6	710	1010	3030	4460	1480	13600	5790	14000	5000	2390	523	418
7	674	1100	4040	7030	1700	11700	5530	11000	4700	2230	495	411
8	706	1100	2760	7530	1660	11300	5390	10000	5000	2150	494	402
9	759	1020	2090	6080	1760	12300	5260	9400	4800	2000	496	398
10	785	1020	1900	4570	1970	12300	5180	8400	5200	1870	533	394
11	814	950	1620	3780	2230	14000	4900	7600	4800	1740	608	397
12	771	887	1440	3250	2810	15900	4620	7000	4200	1610	631	402
13	728	826	1560	2930	3670	17800	4380	6800	3700	1490	572	411
14	697	853	1610	2630	3940	19200	4070	7000	3460	1410	512	395
15	673	749	1600	2420	3610	14800	3860	7200	3300	1370	486	381
16	653	653	2060	2310	5530	11800	3790	6600	3210	1340	462	374
17	640	819	5010	2350	5720	10000	3970	6400	3020	1310	439	370
18	657	975	4450	2270	9450	8770	4460	6600	3010	1300	415	373
19	672	1030	3040	2270	13000	7710	5010	7000	3180	1230	390	379
20	681	1140	2620	2530	8610	6840	5790	7800	2880	1110	382	392
21	656	1050	2690	2370	7040	6270	7490	8400	2670	1040	377	437
22	654	975	4210	2170	8250	5940	8890	8600	2400	982	378	446
23	679	773	3370	2130	9690	5660	8720	9400	2250	952	412	434
24	714	546	2720	2120	9230	5390	9630	10000	2200	924	535	431
25	739	570	2240	2190	8280	5250	9370	11000	2130	879	537	432
26	737	663	1930	2130	7700	5140	8730	10800	2070	831	530	431
27	752	829	2070	2450	6780	4970	7730	10500	2200	789	489	427
28	869	947	1520	2830	6150	5180	7100	10500	2660	764	455	427
29	976	1020	1180	2460	---	4890	7780	10000	2490	744	430	460
30	1810	1240	1090	2320	---	7770	8050	10500	2680	726	416	472
31	1720	---	935	2200	---	8910	---	10000	---	782	390	---
TOTAL	24358	28505	71095	88340	139060	302970	191800	278600	117410	49243	15527	12534
MEAN	786	950	2293	2850	4966	9773	6393	8987	3914	1588	501	418
MAX	1810	1390	5010	7530	13000	19200	9630	14000	8800	3570	739	489
MIN	640	546	935	900	1420	4890	3790	6400	2070	726	377	370
AC-FT	48310	56540	141000	175200	275800	600900	380400	552600	232900	97670	30800	24860
CAL YR 1982	TOTAL	1273108	MEAN	3488	MAX	23000	MIN	245	AC-FT	2525000		
WTR YR 1983	TOTAL	1319442	MEAN	3615	MAX	19200	MIN	370	AC-FT	2617000		

NOTE.--No gage-height record May 6 to June 13.

## JOHN DAY RIVER BASIN

129

14047390 ROCK CREEK ABOVE WHYTE PARK, NEAR CONDON, OR

LOCATION.--Lat 45°15'53", long 120°01'15", in NE¼SW¼ 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<sup>2</sup>.

PERIOD OF RECORD.--October 1975 to current year.

GAGE.--Water-stage recorder and crest-stage gage. Datum of gage is 1,714.50 ft National Geodetic Vertical Datum of 1929 (Soil Conservation Service temporary bench mark).

REMARKS.--Records good. No regulation or diversion above station.

AVERAGE DISCHARGE.--8 years, 54.5 ft<sup>3</sup>/s, 39,490 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 3,360 ft<sup>3</sup>/s May 5, 1983, gage height, 9.17 ft; maximum gage height, 9.4 ft Feb. 6, 1979; minimum discharge, 0.08 ft<sup>3</sup>/s Aug. 17, 19, 20, 22, 1977.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 220 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Dec. 17	0700	326	5.66	Mar. 13	1530	1,400	7.45
Jan. 7	0100	396	5.84	Mar. 30	1000	650	6.49
Feb. 18	2030	810	6.65	Apr. 2	0700	505	6.25
Mar. 4	1500	1,490	7.45	May 5	1130	*3,360	*9.17

Minimum, 1.9 ft<sup>3</sup>/s Aug. 18, 19.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1982 TO SEPTEMBER 1983  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	4.0	25	37	43	110	376	270	157	39	18	4.9	5.2
2	4.0	22	33	47	105	404	444	166	38	21	6.0	4.6
3	4.0	20	32	47	83	352	348	130	35	21	7.1	4.3
4	4.3	19	52	50	67	816	288	124	32	18	6.0	4.3
5	4.3	18	77	59	62	816	256	1860	30	16	4.9	4.0
6	4.5	18	103	260	62	786	226	1320	29	13	4.0	4.0
7	4.3	18	105	372	65	738	205	834	27	12	3.8	3.8
8	4.3	17	61	340	65	625	184	708	26	12	3.5	3.5
9	4.8	17	61	256	81	655	169	635	32	12	3.5	3.5
10	5.0	16	52	199	95	585	154	495	31	12	3.3	3.5
11	5.3	15	44	166	130	495	145	348	38	11	3.0	3.8
12	5.3	15	44	145	260	515	130	309	35	10	4.0	3.8
13	5.3	15	48	127	298	1070	118	267	30	9.1	4.0	3.8
14	5.3	14	45	105	239	858	108	211	26	8.7	3.8	3.5
15	5.3	13	48	88	235	666	90	184	26	8.3	3.0	3.5
16	5.5	15	139	93	356	530	81	199	24	7.9	2.6	3.5
17	5.3	15	281	93	372	444	77	164	23	8.7	2.6	3.3
18	5.5	16	196	93	684	380	72	140	20	9.1	2.1	3.5
19	5.8	18	151	105	625	323	68	128	19	7.1	1.9	6.0
20	6.3	19	121	118	505	281	72	117	20	6.7	2.1	6.0
21	6.5	18	115	103	465	260	166	104	18	6.0	2.1	6.3
22	6.9	16	178	93	525	246	142	95	18	5.6	2.1	6.0
23	8.3	15	148	90	525	226	110	85	17	5.2	3.0	6.0
24	8.3	15	103	90	485	208	115	78	17	6.0	4.0	6.0
25	9.0	14	81	100	444	193	98	69	15	6.3	4.6	5.6
26	9.0	15	83	118	424	184	81	63	12	7.1	4.6	5.6
27	9.7	15	65	175	352	196	75	59	11	6.7	4.3	5.2
28	10	16	55	169	356	205	68	51	13	6.3	4.0	5.2
29	35	23	45	151	---	193	199	47	14	5.6	4.3	5.2
30	62	41	43	130	---	515	172	43	15	5.2	4.6	6.0
31	33	---	43	118	---	348	---	38	---	4.9	4.3	---
TOTAL	296.1	533	2689	4143	8075	14489	4731	9228	730	306.5	118.0	138.5
MEAN	9.55	17.8	86.7	134	288	467	158	298	24.3	9.89	3.81	4.62
MAX	62	41	281	372	684	1070	444	1860	39	21	7.1	6.3
MIN	4.0	13	32	43	62	184	68	38	11	4.9	1.9	3.3
AC-FT	587	1060	5330	8220	16020	28740	9380	18300	1450	608	234	275
CAL YR 1982	TOTAL	29404.93	MEAN	80.6	MAX	1280	MIN	4.40	AC-FT	58320		
WTR YR 1983	TOTAL	45477.1	MEAN	125	MAX	1860	MIN	1.9	AC-FT	90200		



## JOHN DAY RIVER BASIN

14048000 JOHN DAY RIVER AT McDONALD FERRY, OR  
(National stream-quality accounting network station)

LOCATION.--Lat 45°35'16", long 120°24'30", in NE¼NW¼ 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.

DRAINAGE AREA.--7,580 mi<sup>2</sup>, 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 National Geodetic Vertical Datum of 1929. Prior to Aug. 30, 1930, nonrecording gage at same site and datum.

REMARKS.--Water-discharge records excellent. No regulation. Many diversions for irrigation above station.

AVERAGE DISCHARGE.--78 years (water years 1906-83), 2,064 ft<sup>3</sup>/s, 1,495,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 42,800 ft<sup>3</sup>/s Dec. 24, 1964, gage height, 13.59 ft, from floodmark, from rating curve extended above 11,000 ft<sup>3</sup>/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<sup>3</sup>/s, from rating curve extended above 22,000 ft<sup>3</sup>/s.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 6,900 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Dec. 18	1600	6,950	6.31	Mar. 31	1600	11,600	8.06
Jan. 9	0830	8,570	6.96	Apr. 25	1230	10,700	7.77
Feb. 20	0100	17,400	9.87	May 6	1930	18,300	10.15
Mar. 5	2200	22,100	11.18	May 27	1230	12,100	8.24
Mar. 14	2400	*23,700	*11.55				

Minimum, 427 ft<sup>3</sup>/s Sept. 17, 18.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1982 TO SEPTEMBER 1983  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	742	2040	1120	1160	2590	7350	9970	8860	11400	2920	835	493
2	787	1650	1340	1060	2460	6950	9100	9180	11400	2990	892	490
3	783	1430	1280	1160	2350	7370	9280	9470	9680	3610	801	473
4	751	1300	1220	1270	2180	8600	8880	9180	8430	4140	745	484
5	744	1190	1290	1570	1920	17600	8140	10700	7530	3490	692	504
6	757	1120	2940	2050	1770	18400	7500	16100	6780	2990	642	527
7	807	1100	2940	4670	1730	15300	6970	15900	6190	2670	603	498
8	786	1100	4430	7840	1910	13600	6650	13200	5710	2470	584	468
9	757	1210	3250	8180	1970	13600	6460	11800	5360	2350	566	462
10	780	1160	2400	6650	2100	14600	6320	11000	5680	2210	550	462
11	822	1100	2140	5180	2310	14300	6200	10200	5480	2080	551	456
12	846	1090	1900	4430	2680	17000	5870	9170	5910	1960	556	447
13	869	1030	1710	3850	3390	18900	5530	8360	5400	1830	613	448
14	834	976	1640	3470	4270	21800	5240	7860	4760	1690	648	461
15	804	920	1780	3170	4660	21000	4900	7590	4170	1590	611	464
16	775	946	1940	2890	4550	16200	4640	7830	3790	1500	548	461
17	751	863	2510	2720	6330	13300	4520	7930	3690	1520	524	438
18	727	780	5290	2760	7840	11500	4640	7340	3440	1480	508	443
19	713	917	5130	2700	13400	10100	5120	7070	3320	1430	490	447
20	724	1030	3640	2630	13900	9040	5740	7420	3650	1390	458	448
21	738	1110	3070	2790	9740	8220	6710	7690	3270	1300	452	453
22	763	1180	2980	2760	8610	7720	8420	8400	3060	1210	447	454
23	805	1090	4440	2520	10300	7310	9590	9080	2750	1140	438	470
24	769	1030	3910	2450	11400	6970	9460	9470	2540	1090	450	497
25	762	864	3170	2420	10600	6670	10400	10200	2430	1070	472	489
26	789	683	2670	2480	9530	6490	10000	11100	2340	1030	575	489
27	801	642	2190	2550	8860	6350	9350	11700	2240	986	572	484
28	809	749	2260	2680	7930	6190	8460	11600	2350	932	573	481
29	945	924	1930	3190	---	6330	8040	11400	2760	890	554	477
30	1230	1030	1550	2940	---	6370	8700	11400	2860	854	527	473
31	1480	---	1270	2750	---	9780	---	11100	---	829	508	---
TOTAL	25450	32254	79330	98940	161280	354910	220800	309300	148370	57641	17985	14141
MEAN	821	1075	2559	3192	5760	11450	7360	9977	4946	1859	580	471
MAX	1480	2040	5290	8180	13900	21800	10400	16100	11400	4140	892	527
MIN	713	642	1120	1060	1730	6190	4520	7070	2240	829	438	438
AC-FT	50480	63980	157400	196200	319900	704000	438000	613500	294300	114300	35670	28050
CAL YR 1982	TOTAL	1406861	MEAN	3854	MAX	26000	MIN	324	AC-FT	2791000		
WTR YR 1983	TOTAL	1520401	MEAN	4165	MAX	21800	MIN	438	AC-FT	3016000		

## 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 TEMPERATURES: October 1962 to September 1968, October 1975 to September 1981.

SEDIMENT CONCENTRATIONS: October 1962 to September 1968.

SEDIMENT DISCHARGE: October 1962 to September 1968.

## WATER QUALITY DATA, WATER YEAR OCTOBER 1982 TO SEPTEMBER 1983

DATE	TIME	STREAM- FLOW, INSTAN- TANEOUS (CFS)	SPE- CIFIC CON- DUCT- ANCE (UMHOS)	PH (STAND- ARD UNITS)	TEMPER- ATURE (DEG C)	OXYGEN, DIS- SOLVED (MG/L)	COLI- FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)	STREP- TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML)	HARD- NESS (MG/L AS CAC03)	CALCIUM DIS- SOLVED (MG/L AS CA)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG)
OCT 14...	1130	815	247	8.4	13.5	10.8	K6	K9	98	23	9.7
FEB 09...	1030	1990	230	8.0	3.0	13.4	41	23	97	23	9.7
APR 12...	1030	5910	198	8.2	8.0	11.8	32	37	85	21	7.8
AUG 02...	0945	862	256	8.9	23.0	9.6	K17	97	110	26	11

DATE	SODIUM, DIS- SOLVED (MG/L AS NA)	POTAS- SIUM, DIS- SOLVED (MG/L AS K)	ALKA- LINITY FIELD (MG/L AS CAC03)	SULFATE DIS- SOLVED (MG/L AS S04)	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)	NITRO- GEN,AM- MONIA + ORGANIC TOTAL (MG/L AS N)	PHOS- PHATE, ORTHO, DIS- SOLVED (MG/L AS P04)
OCT 14...	13	2.0	--	10	2.5	.10	.160	<.100	.80	--
FEB 09...	11	1.5	110	9.0	2.1	.10	.080	.120	.60	.18
APR 12...	8.6	1.5	98	8.6	1.6	.10	.140	<.100	.50	.15
AUG 02...	15	2.2	130	11	2.6	.20	.110	<.100	.70	.12

DATE	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 CONSTITU- ENTS, 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)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM
OCT 14...	.010	.040	21	152	160	334	4.1	7	15	98
FEB 09...	.040	.050	33	142	160	763	6.2	--	--	--
APR 12...	.040	.070	33	130	140	2070	17	--	--	--
AUG 02...	.050	.050	22	164	170	382	1.0	--	--	--

## JOHN DAY RIVER BASIN

14048000 JOHN DAY RIVER AT MCDONALD FERRY, OR--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1982 TO SEPTEMBER 1983

DATE	ALUM- INUM, DIS- SOLVED (UG/L AS AL)	ARSENIC DIS- SOLVED (UG/L AS AS)	BARIUM, DIS- SOLVED (UG/L AS BA)	BERYL- LIUM, DIS- SOLVED (UG/L AS BE)	CADMIUM DIS- SOLVED (UG/L AS CD)	CHRO- MIUM, DIS- SOLVED (UG/L AS CR)	COBALT, DIS- SOLVED (UG/L AS CO)	COPPER, DIS- SOLVED (UG/L AS CU)	IRON, DIS- SOLVED (UG/L AS FE)	LEAD, DIS- SOLVED (UG/L AS PB)
OCT 14...	20	2	15	<1	<1	<1	<3	4	10	5
FEB 09...	80	1	21	<1	<1	<1	<3	2	56	<1
APR 12...	90	1	19	<1	<1	<1	<3	6	57	1
AUG 02...	20	1	21	<1	<1	<1	<3	2	14	4

DATE	LITHIUM DIS- SOLVED (UG/L AS LI)	MANGA- NESE, DIS- SOLVED (UG/L AS MN)	MERCURY DIS- SOLVED (UG/L AS HG)	MOLYB- DENUM, DIS- SOLVED (UG/L AS MO)	NICKEL, DIS- SOLVED (UG/L AS NI)	SELE- NIUM, DIS- SOLVED (UG/L AS SE)	SILVER, DIS- SOLVED (UG/L AS AG)	STRON- TIUM, DIS- SOLVED (UG/L AS SR)	VANA- DIUM, DIS- SOLVED (UG/L AS V)	ZINC, DIS- SOLVED (UG/L AS ZN)
OCT 14...	11	13	<.1	<10	6	<1	<1	100	<6	5
FEB 09...	7	2	<.1	<10	<1	<1	<1	92	<6	9
APR 12...	10	2	.2	<10	<1	1	<1	93	6	10
AUG 02...	11	2	.6	<10	<1	1	<1	120	10	11

K - Results based on colony count outside acceptable range (non-ideal colony count).

## 14050000 DESCHUTES RIVER BELOW SNOW CREEK, NEAR LA PINE, OR

LOCATION.--Lat 43°48'51", long 121°46'33", in NW¼ 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 (revised) ft upstream from highway bridge, and 17 mi northwest of La Pine.

DRAINAGE AREA.--132 mi<sup>2</sup>, including Sparks, Elk, and Mud Lake basins, which have no surface outflow to Deschutes River; hydrologic drainage boundary uncertain owing to 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. Altitude 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.--Records good. 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.--46 years, 150 ft<sup>3</sup>/s, 108,700 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 480 ft<sup>3</sup>/s Aug. 19, 1974, gage height, 3.17 ft; maximum gage height, 4.12 ft Jan. 21, 1943 (ice jam); minimum discharge, 40 ft<sup>3</sup>/s sometime during period Dec. 22, 1959, to Mar. 2, 1960, result of freezeup; minimum daily, 55 ft<sup>3</sup>/s for many days April to June 1941.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 298 ft<sup>3</sup>/s Aug. 29, gage height, 1.88 ft; minimum, 109 ft<sup>3</sup>/s Apr. 16.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1982 TO SEPTEMBER 1983  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	273	226	187	160	138	127	122	119	242	232	263	293
2	270	221	190	160	136	125	127	122	239	232	266	291
3	270	218	193	160	136	125	122	119	239	226	266	291
4	268	218	193	168	133	125	119	125	234	224	268	291
5	266	215	196	165	136	125	119	130	232	226	268	291
6	266	215	196	168	138	122	119	136	229	226	268	289
7	266	212	187	168	138	125	119	138	229	224	268	289
8	263	212	184	168	138	125	117	138	229	226	270	289
9	261	210	182	163	144	122	117	138	229	224	270	287
10	258	207	179	157	141	125	117	141	229	224	273	287
11	256	201	176	154	138	125	117	138	226	224	273	287
12	256	201	176	154	138	130	114	144	224	224	270	284
13	254	198	176	152	136	136	114	149	224	226	275	284
14	251	196	182	152	136	133	112	152	224	226	280	284
15	249	193	184	149	133	127	114	160	224	229	282	282
16	246	193	190	152	130	125	112	163	221	229	284	282
17	246	198	190	152	144	127	114	168	224	232	287	280
18	242	201	187	152	144	125	114	176	224	232	289	280
19	242	201	184	154	133	122	117	176	224	234	289	278
20	239	196	182	149	133	119	117	184	221	234	289	278
21	239	196	184	149	133	119	119	193	221	234	289	278
22	239	193	182	149	133	122	117	198	224	237	289	278
23	246	190	182	149	133	119	117	207	224	239	291	278
24	237	187	176	149	130	119	117	212	221	242	289	278
25	234	184	171	146	130	119	117	215	224	244	289	273
26	234	184	176	149	127	119	114	218	224	246	289	273
27	232	187	173	149	127	119	112	224	224	251	289	273
28	229	187	163	146	127	117	114	226	221	254	289	270
29	246	190	163	144	---	122	119	229	221	254	293	268
30	237	190	163	141	---	133	119	234	224	258	293	268
31	232	---	160	138	---	127	---	239	---	263	293	---
TOTAL	7747	6020	5607	4766	3783	3850	3508	5311	6795	7276	8691	8454
MEAN	250	201	181	154	135	124	117	171	227	235	280	282
MAX	273	226	196	168	144	136	127	239	242	263	293	293
MIN	229	184	160	138	127	117	112	119	221	224	263	268
AC-FT	15370	11940	11120	9450	7500	7640	6960	10530	13480	14430	17240	16770
CAL YR 1982	TOTAL	65121	MEAN	178	MAX	336	MIN	80	AC-FT	129200		
WTR YR 1983	TOTAL	71808	MEAN	197	MAX	293	MIN	112	AC-FT	142400		

## 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<sup>2</sup>, 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. Altitude 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.--Records good. No regulation or diversions above station.

AVERAGE DISCHARGE.--49 years, 62.7 ft<sup>3</sup>/s, 45,430 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 178 ft<sup>3</sup>/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<sup>3</sup>/s May 26-31, Nov. 23 to Dec. 4, 1959.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 133 ft<sup>3</sup>/s May 31, gage height, 1.04 ft; minimum, 60 ft<sup>3</sup>/s Apr. 12, 13, 15, 16.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1982 TO SEPTEMBER 1983  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	82	80	75	70	64	62	64	68	125	99	99	99
2	82	80	77	70	64	62	64	68	115	99	102	99
3	82	80	80	68	64	62	64	70	108	99	102	96
4	82	77	80	66	64	62	64	70	99	99	99	96
5	82	77	80	66	64	62	64	72	96	99	99	96
6	82	75	80	66	64	62	64	72	94	99	102	96
7	82	75	80	64	64	62	64	75	94	102	102	94
8	82	75	80	64	64	62	64	75	92	102	96	94
9	82	75	80	64	64	62	64	75	94	99	96	94
10	82	75	80	64	64	62	64	77	92	99	96	92
11	82	75	77	62	64	62	64	77	94	99	96	92
12	82	75	77	62	64	64	62	77	94	102	96	94
13	82	75	80	64	64	64	62	82	92	102	96	92
14	82	75	80	64	64	64	62	82	92	102	96	92
15	80	75	82	62	64	64	62	84	94	102	96	92
16	80	75	82	62	64	64	62	82	92	102	96	92
17	77	75	82	62	64	64	62	84	92	105	96	92
18	77	75	80	64	64	64	64	87	92	105	96	92
19	77	75	80	66	62	64	64	92	94	102	96	89
20	77	75	80	66	62	64	66	92	94	102	96	89
21	77	75	80	66	62	64	66	94	94	102	96	89
22	80	77	80	66	62	64	68	99	94	102	96	89
23	80	77	82	66	62	64	66	110	94	102	99	89
24	80	75	80	66	64	64	66	118	94	102	99	89
25	80	75	77	66	64	64	66	123	96	102	99	89
26	80	75	75	66	62	64	66	123	99	102	99	89
27	80	75	70	66	62	64	66	120	99	102	99	87
28	80	75	70	66	62	64	66	120	99	102	99	87
29	80	77	70	66	---	64	68	123	96	99	99	87
30	80	77	70	64	---	64	68	123	96	99	99	87
31	80	---	70	64	---	64	---	128	---	99	99	---
TOTAL	2493	2277	2416	2018	1776	1962	1936	2842	2900	3132	3036	2754
MEAN	80.4	75.9	77.9	65.1	63.4	63.3	64.5	91.7	96.7	101	97.9	91.8
MAX	82	80	82	70	64	64	68	128	125	105	102	99
MIN	77	75	70	62	62	62	62	68	92	99	96	87
AC-FT	4940	4520	4790	4000	3520	3890	3840	5640	5750	6210	6020	5460
CAL YR 1982	TOTAL	26231	MEAN	71.9	MAX	102	MIN	39	AC-FT	52030		
WTR YR 1983	TOTAL	29542	MEAN	80.9	MAX	128	MIN	62	AC-FT	58600		

## 14051000 CULTUS CREEK ABOVE CRANE PRAIRIE RESERVOIR, NEAR LA PINE, OR

LOCATION.--Lat 43°49'17", long 121°49'22", in SW¼ 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<sup>2</sup>, hydrologic drainage boundary uncertain owing to 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. Altitude 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.--Records excellent. Some regulation by fish screens at Cultus Lake since 1962. No diversion above station.

AVERAGE DISCHARGE.--46 years (water years 1938-83), 22.8 ft<sup>3</sup>/s, 16,520 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 336 ft<sup>3</sup>/s Dec. 25, 1964, gage height, 4.15 ft, from floodmark, from rating curve extended above 90 ft<sup>3</sup>/s; no flow at times.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 217 ft<sup>3</sup>/s May 29, gage height, 3.40 ft; minimum, 2.9 ft<sup>3</sup>/s Sept. 29, 30.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1982 TO SEPTEMBER 1983  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	5.6	7.1	8.8	19	23	25	30	24	199	60	24	11
2	5.2	7.1	9.7	19	23	24	30	25	186	63	23	10
3	5.2	7.5	11	20	22	24	31	26	167	63	22	9.4
4	4.9	7.9	12	25	22	24	29	28	159	61	22	8.3
5	4.9	7.9	14	25	20	23	29	29	148	60	20	7.4
6	4.9	7.9	16	26	20	23	28	31	141	59	20	6.6
7	4.9	7.9	17	28	20	24	28	33	137	56	19	6.0
8	4.9	7.9	18	29	20	25	26	35	134	54	20	5.4
9	4.9	7.9	19	30	22	25	26	36	129	51	19	5.0
10	4.9	7.9	19	30	22	25	26	35	129	49	18	4.7
11	4.9	7.9	19	30	22	25	25	33	126	48	17	4.4
12	4.9	7.9	20	30	22	25	25	29	123	46	17	4.1
13	4.9	7.1	20	30	22	28	25	27	119	45	17	3.9
14	4.5	7.1	21	29	22	28	25	26	114	44	16	3.7
15	4.5	7.1	24	29	22	28	24	26	112	42	16	3.5
16	4.5	7.1	28	29	22	28	23	26	108	40	15	3.4
17	4.2	7.5	30	29	23	28	23	27	100	39	15	3.3
18	3.8	7.9	31	28	25	28	22	29	96	38	14	3.5
19	3.8	7.5	31	28	25	28	22	30	91	38	14	3.7
20	3.5	7.5	31	28	25	27	22	32	87	36	14	4.0
21	3.5	7.9	31	28	25	27	22	35	82	34	13	4.2
22	3.8	7.9	31	27	26	27	22	43	79	35	12	4.2
23	4.5	7.9	30	27	26	27	22	47	75	34	13	4.2
24	4.5	7.5	28	26	25	26	22	47	71	33	13	3.8
25	4.5	7.5	27	26	25	26	22	58	70	31	12	3.8
26	4.5	7.5	26	26	25	26	23	83	68	29	12	3.8
27	4.5	7.5	24	26	25	26	23	132	65	28	12	3.5
28	4.5	7.9	23	25	25	26	23	164	65	28	12	3.2
29	6.7	8.3	22	25	---	26	23	196	62	27	12	2.9
30	7.5	8.8	21	24	---	29	23	189	59	26	12	2.9
31	7.1	---	20	24	---	30	---	193	---	26	12	---
TOTAL	149.4	230.3	682.5	825	646	811	744	1774	3301	1323	497	147.8
MEAN	4.82	7.68	22.0	26.6	23.1	26.2	24.8	57.2	110	42.7	16.0	4.93
MAX	7.5	8.8	31	30	26	30	31	196	199	63	24	11
MIN	3.5	7.1	8.8	19	20	23	22	24	59	26	12	2.9
AC-FT	296	457	1350	1640	1280	1610	1480	3520	6550	2620	986	293
CAL YR 1982	TOTAL	12822.8	MEAN	35.1	MAX	126	MIN	3.5	AC-FT	25430		
WTR YR 1983	TOTAL	11131.0	MEAN	30.5	MAX	199	MIN	2.9	AC-FT	22080		



## 14052000 DEER CREEK ABOVE CRANE PRAIRIE RESERVOIR, NEAR LA PINE, OR

LOCATION.--Lat 43°48'48", long 121°50'18", in SE¼SW¼ 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<sup>2</sup>, hydrologic drainage boundary uncertain owing to 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. Altitude 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.--Records good. No regulation or diversion above station.

AVERAGE DISCHARGE.--46 years (water years 1938-83), 7.53 ft<sup>3</sup>/s, 5,460 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 200 ft<sup>3</sup>/s, estimated, Dec. 25, 1964; no flow at times.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 65 ft<sup>3</sup>/s May 27, gage height, 2.68 ft; minimum, 0.06 ft<sup>3</sup>/s Sept. 16-20.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1982 TO SEPTEMBER 1983  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.80	5.2	3.8	4.4	5.0	10	14	18	62	7.5	1.0	.30
2	.70	4.6	5.0	4.1	4.6	10	14	19	56	9.1	.96	.27
3	.70	4.1	7.5	3.8	4.2	10	14	19	48	9.4	.80	.24
4	.70	3.8	8.8	4.5	3.8	11	14	21	42	8.8	.75	.24
5	.65	3.5	10	6.0	3.6	11	13	23	37	8.0	.60	.21
6	.75	3.8	14	8.8	3.6	11	12	25	33	7.2	.55	.18
7	1.0	3.8	15	11	4.2	12	11	26	30	6.0	.50	.15
8	1.3	3.6	15	13	4.4	12	11	27	29	5.4	.50	.15
9	1.2	3.3	14	13	5.8	13	11	27	26	4.8	.45	.12
10	1.1	3.0	13	13	6.5	13	10	26	26	4.2	.40	.12
11	1.1	2.9	12	13	6.2	13	10	24	26	3.9	.30	.12
12	1.0	2.5	10	13	6.0	14	9.7	23	24	3.6	.24	.12
13	.96	2.3	9.7	12	6.0	17	9.4	22	22	3.3	.24	.09
14	.96	2.2	9.7	11	5.8	18	8.8	22	20	3.0	.21	.09
15	.88	2.0	10	11	5.8	17	8.5	22	19	2.6	.21	.09
16	.80	1.9	13	9.7	5.6	16	8.5	23	17	2.2	.18	.09
17	.80	2.4	14	9.1	7.8	16	8.5	26	16	2.3	.15	.09
18	.80	3.0	14	8.8	11	15	8.8	28	15	2.3	.15	.09
19	.75	3.5	12	8.8	10	14	9.1	30	14	2.6	.12	.12
20	.75	3.6	11	8.0	9.1	14	9.7	33	14	2.4	.12	.09
21	.75	3.8	11	7.8	9.4	13	11	37	13	2.2	.12	.12
22	.88	3.6	11	7.5	10	13	12	40	13	2.0	.12	.12
23	1.8	3.5	10	7.5	10	13	13	45	12	1.9	.27	.15
24	1.8	3.2	9.4	7.2	10	12	14	50	11	1.8	.21	.15
25	1.7	2.9	9.4	6.7	9.7	12	14	55	10	1.7	.21	.15
26	1.8	2.6	7.2	7.0	9.7	11	15	60	9.1	1.4	.18	.15
27	1.8	2.6	6.7	7.5	9.7	11	15	64	8.5	1.4	.18	.15
28	1.8	2.7	6.7	7.0	9.7	11	15	62	8.0	1.3	.18	.12
29	6.0	3.5	6.4	6.5	---	11	16	60	7.5	1.1	.27	.12
30	7.2	3.9	5.5	6.0	---	14	17	63	6.5	1.1	.30	.12
31	6.2	---	4.9	5.4	---	15	---	62	---	1.1	.30	---
TOTAL	49.43	97.3	309.7	262.1	197.2	403	357.0	1082	674.6	115.6	10.77	4.32
MEAN	1.59	3.24	9.99	8.45	7.04	13.0	11.9	34.9	22.5	3.73	.35	.14
MAX	7.2	5.2	15	13	11	18	17	64	62	9.4	1.0	.30
MIN	.65	1.9	3.8	3.8	3.6	10	8.5	18	6.5	1.1	.12	.09
AC-FT	98	193	614	520	391	799	708	2150	1340	229	21	8.6
CAL YR 1982	TOTAL	4665.79	MEAN	12.8	MAX	74	MIN	.21	AC-FT	9250		
WTR YR 1983	TOTAL	3563.02	MEAN	9.76	MAX	64	MIN	.09	AC-FT	7070		

DESCHUTES RIVER BASIN

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14052500 QUINN RIVER NEAR LA PINE, OR

LOCATION.--Lat 43°47'03", long 121°50'06", in SW¼NW¼ 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 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.--Records good. No regulation or diversion above station.

AVERAGE DISCHARGE.--49 years, 24.0 ft<sup>3</sup>/s, 17,390 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 59 ft<sup>3</sup>/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 daily discharge, 50 ft<sup>3</sup>/s May 27-31; maximum gage height, 3.30 ft May 20 (backwater from Crane Prairie Reservoir); minimum discharge, 25 ft<sup>3</sup>/s Jan. 4-7, 19, 20, 24, 25, Jan. 27-Feb. 22.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1982 TO SEPTEMBER 1983  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	31	26	27	27	25	27	28	29	49	43	41	37
2	31	26	27	27	25	27	28	29	49	43	41	37
3	31	26	27	27	25	27	28	29	49	43	40	36
4	31	26	27	26	25	27	28	30	48	43	40	36
5	30	26	27	25	25	27	28	30	48	43	40	36
6	30	26	27	25	25	27	28	30	47	43	40	36
7	29	26	27	25	25	28	28	31	46	43	40	36
8	29	26	27	26	25	28	28	31	46	43	40	36
9	29	26	27	26	25	28	28	32	46	43	40	36
10	29	26	27	26	25	28	28	32	46	43	39	35
11	29	26	27	26	25	28	28	33	46	43	39	35
12	29	26	27	27	25	28	28	34	46	43	39	35
13	29	26	27	27	25	28	28	34	45	43	39	35
14	29	26	27	27	25	28	28	35	45	43	39	35
15	28	26	27	27	25	28	28	35	45	43	39	35
16	28	26	27	26	25	28	28	35	45	43	39	35
17	28	26	30	26	25	28	28	36	45	43	38	35
18	28	27	30	26	25	28	28	37	45	42	38	35
19	28	26	29	26	25	28	28	38	45	42	38	35
20	28	26	29	25	25	28	28	39	45	42	38	34
21	28	26	29	26	25	28	28	40	45	42	38	34
22	28	26	28	26	25	28	28	42	44	42	38	34
23	28	26	27	26	26	28	28	44	44	42	38	34
24	27	26	27	26	26	28	28	46	43	42	37	34
25	27	26	27	25	27	28	28	47	44	42	37	34
26	26	26	27	26	27	28	28	49	44	41	37	34
27	26	27	27	25	27	28	28	50	43	41	37	34
28	26	27	27	25	27	28	28	50	43	41	37	34
29	27	27	27	26	---	28	28	50	43	41	37	34
30	26	27	27	25	---	28	28	50	43	41	37	34
31	26	---	27	25	---	28	---	50	---	41	37	---
TOTAL	879	785	850	804	710	862	840	1177	1362	1313	1197	1050
MEAN	28.4	26.2	27.4	25.9	25.4	27.8	28.0	38.0	45.4	42.4	38.6	35.0
MAX	31	27	30	27	27	28	28	50	49	43	41	37
MIN	26	26	27	25	25	27	28	29	43	41	37	34
AC-FT	1740	1560	1690	1590	1410	1710	1670	2330	2700	2600	2370	2080
CAL YR 1982	TOTAL	11170	MEAN	30.6	MAX	45	MIN	14	AC-FT	22160		
WTR YR 1983	TOTAL	11829	MEAN	32.4	MAX	50	MIN	25	AC-FT	23460		

## DESCHUTES RIVER BASIN

14053500 CRANE PRAIRIE RESERVOIR NEAR LA PINE, OR

LOCATION.--Lat 43°45'20", long 121°47'00", in SW¼NW¼ 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<sup>2</sup>, 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 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.--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 above 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, 57,190 acre-ft May 20, 23, 24, elevation, 4,445.37 ft; minimum, 30,150 acre-ft Oct. 18, elevation, 4,439.38 ft.

## MONTHEND ELEVATION AND CONTENTS AT 2400, WATER YEAR OCTOBER 1982 TO SEPTEMBER 1983

Date	Elevation (feet)	Contents (acre-feet)	Change in contents (acre-feet)
Sept. 30.....	4,440.12	33,160	-
Oct. 31.....	4,440.84	36,190	+3,030
Nov. 30.....	4,442.69	44,360	+8,170
Dec. 31.....	4,443.04	45,950	+1,590
CAL YR 1982.....	-	-	+13,860
Jan. 31.....	4,442.19	42,090	-3,860
Feb. 28.....	4,443.14	46,420	+4,330
Mar. 31.....	4,444.64	53,570	+7,150
Apr. 30.....	4,444.97	55,180	+1,610
May 31.....	4,445.18	56,240	+1,060
June 30.....	4,442.23	42,270	-13,970
July 31.....	4,441.51	39,090	-3,180
Aug. 31.....	4,440.95	36,650	-2,440
Sept. 30.....	4,441.26	38,000	+1,350
WTR YR 1983.....	-	-	+4,840

DESCHUTES RIVER BASIN

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14054000 DESCHUTES RIVER BELOW CRANE PRAIRIE RESERVOIR, NEAR LA PINE, OR

LOCATION.--Lat 43°45'13", long 121°46'57", in SW¼NW¼ 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<sup>2</sup>, hydrologic drainage boundary uncertain owing to 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 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.--Records good. Flow regulated since 1922 by Crane Prairie Reservoir (see station 14053500). No diversion above station.

AVERAGE DISCHARGE.--65 years, 212 ft<sup>3</sup>/s, 153,600 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,170 ft<sup>3</sup>/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, 650 ft<sup>3</sup>/s June 18-20, 24, 25, 27, 28, gage height, 2.42 ft; minimum, 90 ft<sup>3</sup>/s Feb. 18-24.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1982 TO SEPTEMBER 1983  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	455	118	121	325	297	92	94	151	509	495	428	432
2	455	118	121	325	297	92	94	151	522	405	428	432
3	455	118	123	325	297	92	94	151	600	405	428	432
4	455	118	123	325	297	92	94	153	635	401	428	432
5	455	118	123	325	297	92	94	153	640	401	432	428
6	450	118	123	325	297	92	94	153	640	401	432	428
7	450	121	123	329	297	92	118	156	640	414	428	432
8	450	121	123	329	254	92	151	158	645	432	428	432
9	450	121	123	329	188	92	151	161	645	432	428	345
10	450	121	126	329	179	92	151	161	640	432	428	278
11	450	121	123	329	194	92	151	179	640	432	428	278
12	450	121	126	329	200	92	151	194	640	432	428	278
13	442	121	126	329	194	92	151	194	640	428	428	282
14	442	121	126	329	194	92	151	194	640	428	428	285
15	442	121	126	329	185	92	151	197	645	428	428	285
16	442	121	126	329	185	94	151	197	645	432	428	282
17	442	118	218	329	185	94	151	200	645	432	428	282
18	300	121	329	329	143	94	151	200	650	432	428	282
19	116	121	329	329	90	94	151	200	650	432	428	282
20	116	121	329	321	90	94	151	244	650	432	428	282
21	116	121	329	321	90	94	151	271	645	432	428	282
22	116	121	329	321	90	94	151	271	645	428	428	282
23	116	121	329	321	90	94	151	271	645	428	428	282
24	116	121	329	317	90	94	151	381	645	428	432	282
25	116	121	329	317	92	94	151	468	650	428	432	282
26	118	121	325	313	92	94	151	464	645	428	432	282
27	118	121	325	305	92	94	151	477	650	428	432	282
28	118	121	325	305	92	94	151	482	650	428	432	282
29	118	121	325	301	---	94	151	486	645	428	432	282
30	118	121	325	297	---	94	151	491	645	428	432	282
31	118	---	325	297	---	94	---	500	---	428	432	---
TOTAL	9455	3609	6782	9963	5088	2884	4155	8109	19026	13238	13308	9709
MEAN	305	120	219	321	182	93.0	139	262	634	427	429	324
MAX	455	121	329	329	297	94	151	500	650	495	432	432
MIN	116	118	121	297	90	92	94	151	509	401	428	278
AC-FT	18750	7160	13450	19760	10090	5720	8240	16080	37740	26260	26400	19260
CAL YR 1982	TOTAL	94970	MEAN	260	MAX	459	MIN	44	AC-FT	188400		
WTR YR 1983	TOTAL	105326	MEAN	289	MAX	650	MIN	90	AC-FT	208900		

## DESCHUTES RIVER BASIN

14054500 BROWN CREEK NEAR LA PINE, OR

LOCATION.--Lat 43°42'57", long 121°48'10", in NE¼SW¼ 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<sup>2</sup>, 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. Altitude 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 National Geodetic Vertical Datum of 1929.

REMARKS.--Records good. No regulation. No diversion above station.

AVERAGE DISCHARGE.--48 years, 38.5 ft<sup>3</sup>/s, 27,890 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 104 ft<sup>3</sup>/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<sup>3</sup>/s July 22-25, 1941, and at times December 1941 to March 1942.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 58 ft<sup>3</sup>/s Aug. 23, gage height, 0.91 ft; minimum recorded, 39 ft<sup>3</sup>/s Feb. 1-3.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1982 TO SEPTEMBER 1983  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	54	53	50	42	41	43	47	48	48	53	53	53
2	54	53	50	42	40	43	47	48	48	52	53	53
3	54	53	50	42	39	43	47	48	48	52	52	52
4	54	52	50	42	41	43	47	48	48	52	53	52
5	54	52	50	41	41	43	47	48	48	52	52	53
6	53	52	50	41	41	43	47	48	48	52	53	52
7	53	52	50	41	42	43	47	48	48	52	54	52
8	53	52	50	41	42	44	47	48	48	52	53	53
9	53	52	50	41	42	44	46	48	48	52	53	52
10	53	52	50	41	42	45	46	48	49	52	53	52
11	52	52	50	41	42	45	44	47	49	52	53	52
12	52	52	50	41	42	45	43	47	49	52	53	52
13	52	52	50	41	42	45	43	47	49	52	53	52
14	52	52	50	41	43	45	44	47	49	52	53	52
15	52	52	50	41	43	45	45	48	50	52	53	52
16	52	52	50	41	43	46	46	47	50	52	53	52
17	52	51	48	41	43	46	47	46	49	53	53	52
18	52	51	48	41	43	46	48	47	50	53	53	52
19	52	51	48	41	43	46	48	47	50	53	53	50
20	51	51	48	41	43	46	49	46	50	53	53	50
21	52	51	48	41	43	47	50	46	50	52	53	50
22	52	51	48	41	43	47	49	46	50	52	53	50
23	56	51	48	42	43	47	49	46	50	53	56	50
24	53	51	48	42	43	47	49	46	50	53	55	51
25	52	51	47	41	43	47	48	46	50	53	53	51
26	53	51	46	41	43	47	48	46	50	53	53	51
27	53	51	46	41	43	47	48	47	50	53	53	51
28	53	51	45	41	43	47	48	47	51	53	53	52
29	53	51	44	41	---	47	50	47	51	53	55	52
30	53	51	44	41	---	47	49	47	51	52	53	52
31	53	---	43	41	---	47	---	48	---	52	53	---
TOTAL	1637	1549	1499	1277	1182	1406	1413	1461	1479	1624	1649	1550
MEAN	52.8	51.6	48.4	41.2	42.2	45.4	47.1	47.1	49.3	52.4	53.2	51.7
MAX	56	53	50	42	43	47	50	48	51	53	56	53
MIN	51	51	43	41	39	43	43	46	48	52	52	50
AC-FT	3250	3070	2970	2530	2340	2790	2800	2900	2930	3220	3270	3070
CAL YR 1982	TOTAL	15869	MEAN	43.5	MAX	56	MIN	24	AC-FT	31480		
WTR YR 1983	TOTAL	17726	MEAN	48.6	MAX	56	MIN	39	AC-FT	35160		

## 14056000 WICKIUP RESERVOIR NEAR LA PINE, OR

LOCATION.--Lat 43°41'02", long 121°41'20", in SW¼NE¼ 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<sup>2</sup>, hydrologic drainage boundary uncertain owing to 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 above 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 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 May 1, elevation, 4,337.69 ft; minimum observed, 103,750 acre-ft Oct. 1, elevation, 4,326.32 ft.

## MONTHEND ELEVATION AND CONTENTS AT 0800, WATER YEAR OCTOBER 1982 TO SEPTEMBER 1983

Date	Elevation (feet)	Contents (acre-feet)	Change in contents (acre-feet)
Sept. 30.....	4,326.15	102,800	-
Oct. 31.....	4,331.08	136,470	+33,670
Nov. 30.....	4,334.35	165,570	+29,100
Dec. 31.....	4,336.71	189,650	+24,080
CAL YR 1982.....	-	-	+85,650
Jan. 31.....	4,337.12	194,070	+4,420
Feb. 28.....	4,337.03	193,070	-1,000
Mar. 31.....	4,337.56	198,950	+5,880
Apr. 30.....	4,337.68	200,280	+1,330
May 31.....	4,336.02	182,300	-17,980
June 30.....	4,334.92	171,120	-11,180
July 31.....	4,332.86	151,660	-19,460
Aug. 31.....	4,320.26	130,040	-21,620
Sept. 30.....	4,328.15	119,980	-10,060
WTR YR 1983.....	-	-	+17,180



## DESCHUTES RIVER BASIN

14056500 DESCHUTES RIVER BELOW WICKIUP RESERVOIR, NEAR LA PINE, OR

LOCATION.--Lat 43°41'10", long 121°41'13", in NW¼NE¼ 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<sup>2</sup>, hydrologic drainage boundary uncertain owing to 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 National Geodetic Vertical Datum of 1929 (levels by Bureau of Reclamation).

REMARKS.--Records good. Flow regulated by Crane Prairie Reservoir (see station 14053500), and since 1942 by Wickiup Reservoir (see 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 above station to Tumalo Creek basin.

AVERAGE DISCHARGE.--45 years, 738 ft<sup>3</sup>/s, 534,700 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 2,280 ft<sup>3</sup>/s July 28 to Aug. 1, 1956, July 31, Aug. 1, 2, 1962; minimum, 1.9 ft<sup>3</sup>/s Nov. 10, 1973; minimum daily, 10 ft<sup>3</sup>/s Jan. 17, 1952.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 1,580 ft<sup>3</sup>/s Aug. 12, gage height, 6.84 ft; minimum, 24 ft<sup>3</sup>/s Nov. 3.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1982 TO SEPTEMBER 1983  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	592	26	189	524	711	533	542	669	1340	1140	1390	1080
2	592	27	228	524	711	536	542	669	1300	1110	1400	1070
3	592	27	258	530	711	536	542	669	1270	1120	1420	1040
4	542	27	255	536	707	536	571	669	1170	1120	1460	1030
5	515	27	253	536	711	536	599	669	1140	1140	1460	1040
6	518	27	253	536	707	542	599	672	1140	1190	1480	1020
7	518	29	255	536	711	542	595	672	1140	1190	1520	1000
8	518	29	253	600	707	542	634	676	1130	1200	1520	1020
9	461	30	253	700	711	542	662	676	1250	1200	1560	1020
10	300	30	253	714	714	542	662	676	1300	1200	1570	1010
11	300	30	253	714	711	542	662	676	1330	1220	1570	996
12	300	29	255	714	714	542	662	672	1330	1290	1580	1120
13	300	29	258	714	711	542	662	669	1330	1370	1520	1260
14	300	30	260	714	711	539	658	739	1320	1410	1530	1300
15	300	30	260	718	711	539	658	809	1320	1410	1530	1320
16	300	30	260	714	711	539	658	830	1320	1460	1530	1320
17	300	30	260	714	714	542	658	938	1320	1480	1530	1310
18	300	171	326	714	714	539	606	1060	1340	1440	1530	1310
19	300	191	371	714	714	542	564	1140	1350	1370	1430	1310
20	300	189	374	714	711	542	530	1230	1350	1370	1420	1320
21	300	189	368	711	711	542	512	1240	1280	1370	1420	1320
22	300	189	371	711	707	542	512	1240	1280	1370	1430	1320
23	300	189	401	714	707	542	512	1320	1250	1380	1430	1320
24	300	189	503	711	679	542	512	1480	1230	1380	1430	1320
25	126	189	521	711	623	539	512	1540	1230	1380	1350	1310
26	27	196	527	711	623	539	574	1540	1230	1370	1350	1280
27	27	194	530	711	623	539	616	1530	1220	1390	1340	1210
28	26	189	530	711	564	536	637	1530	1220	1390	1310	1210
29	26	191	527	711	---	542	669	1520	1190	1400	1230	1080
30	26	189	524	711	---	545	669	1520	1170	1390	1160	917
31	26	---	527	711	---	545	---	1470	---	1390	1100	---
TOTAL	9632	2942	10656	20704	19460	16748	17991	31410	37790	40640	44500	35183
MEAN	311	98.1	344	668	695	540	600	1013	1260	1311	1435	1173
MAX	592	196	530	718	714	545	669	1540	1350	1480	1580	1320
MIN	26	26	189	524	564	533	512	669	1130	1110	1100	917
AC-FT	19110	5840	21140	41070	38600	33220	35690	62300	74960	80610	88270	69790
CAL YR 1982	TOTAL	222529	MEAN	610	MAX	1620	MIN	24	AC-FT	441400		
WTR YR 1983	TOTAL	287656	MEAN	788	MAX	1580	MIN	26	AC-FT	570600		

DESCHUTES RIVER BASIN

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14057500 FALL RIVER NEAR LA PINE, OR

LOCATION.--Lat 43°47'48", long 121°34'18", in NW¼SE¼ 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<sup>2</sup>, hydrologic drainage boundary uncertain owing to 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. Altitude of gage is 4,220 ft, by barometer.

REMARKS.--Records excellent. Diversion only to ponds at fish hatchery 50 ft above station, from which water returns to river above station. Stream is spring fed and momentary extremes are caused by operation of fish hatchery.

AVERAGE DISCHARGE.--45 years, 149 ft<sup>3</sup>/s, 108,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 254 ft<sup>3</sup>/s June 5, 1965, gage height, 2.02 ft; minimum, 67 ft<sup>3</sup>/s sometime during period Sept. 20-30, 1969.

EXTREMES FOR CURRENT YEAR.--Maximum discharge recorded, 206 ft<sup>3</sup>/s May 2, gage height, 1.69 ft; minimum recorded, 132 ft<sup>3</sup>/s Dec. 28.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1982 TO SEPTEMBER 1983  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	147	147	146	143	145	150	166	176	176	177	174	171
2	147	147	146	143	145	152	167	176	176	176	174	169
3	147	147	146	143	145	152	167	176	176	176	172	169
4	147	147	146	143	145	152	167	176	174	176	172	169
5	147	147	146	143	145	154	167	177	174	176	172	169
6	147	147	146	145	147	152	167	177	174	176	172	169
7	147	147	146	145	147	154	169	177	174	176	172	169
8	147	147	145	147	147	154	169	177	174	176	172	169
9	147	146	145	145	147	154	169	176	176	176	172	169
10	147	146	145	143	145	155	169	176	176	176	172	169
11	147	146	145	143	145	155	171	176	176	176	172	169
12	147	146	144	143	147	159	171	176	176	176	172	169
13	147	146	144	143	145	160	171	176	176	176	172	169
14	147	146	144	143	145	160	171	176	177	176	172	167
15	147	146	143	143	145	160	171	176	176	176	172	167
16	147	146	147	145	143	160	171	176	176	176	171	167
17	147	146	143	145	149	164	171	176	177	176	171	167
18	147	146	143	145	147	162	172	176	176	176	171	167
19	147	146	142	145	145	162	174	176	176	176	171	167
20	147	146	143	145	147	162	174	176	176	176	171	167
21	147	146	143	145	147	164	174	176	176	176	171	167
22	147	146	145	145	147	164	174	176	176	177	171	167
23	147	146	145	145	149	164	176	174	176	176	171	167
24	147	146	143	145	149	166	176	176	176	176	171	167
25	147	146	143	145	149	166	176	176	176	176	171	167
26	147	146	143	147	149	166	176	176	177	174	171	167
27	147	146	143	147	150	166	176	176	177	174	171	166
28	147	146	143	147	150	164	177	176	176	174	171	166
29	147	146	143	147	---	166	176	176	174	174	171	166
30	147	146	143	147	---	167	176	176	176	174	171	167
31	147	---	143	145	---	166	---	176	---	174	171	---
TOTAL	4557	4388	4472	4485	4106	4952	5151	5458	5272	5446	5320	5035
MEAN	147	146	144	145	147	160	172	176	176	176	172	168
MAX	147	147	147	147	150	167	177	177	177	177	174	171
MIN	147	146	142	143	143	150	166	174	174	174	171	166
AC-FT	9040	8700	8870	8900	8140	9820	10220	10830	10460	10800	10550	9990
CAL YR 1982	TOTAL	50009	MEAN	137	MAX	154	MIN	105	AC-FT	99190		
WTR YR 1983	TOTAL	58642	MEAN	161	MAX	177	MIN	142	AC-FT	116300		

NOTE.--No gage-height record Oct. 1 to Dec. 14.

## DESCHUTES RIVER BASIN

14059500 CRESCENT LAKE NEAR CRESCENT, OR

LOCATION.--Lat 43°30'05", long 121°58'20", in SW¼ 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<sup>2</sup>, hydrologic drainage boundary uncertain owing to 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, 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, owing to natural flow through reservoir.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 93,010 acre-ft June 6, 1975, elevation, 4,847.09 ft; minimum observed, 9,640 acre-ft Oct. 21, 1931, elevation, 4,827.91 ft.

EXTREMES FOR CURRENT YEAR.--Maximum contents, 86,600 acre-ft June 20, elevation, 4,845.46 ft; minimum, 47,700 acre-ft Oct. 1, elevation, 4,835.31 ft.

## MONTHEND ELEVATION AND CONTENTS AT 2400, WATER YEAR OCTOBER 1982 TO SEPTEMBER 1983

Date	Elevation (feet)	Contents (acre-feet)	Change in contents (acre-feet)
Sept. 30.....	4,835.31	47,700	-
Oct. 31.....	4,836.24	51,170	+3,470
Nov. 30.....	4,837.08	54,340	+3,170
Dec. 31.....	-	a60,550	+6,210
CAL YR 1982.....	-	-	+36,750
Jan. 31.....	-	a63,860	+3,310
Feb. 28.....	4,840.70	68,130	+4,270
Mar. 31.....	-	a72,470	+4,340
Apr. 30.....	4,842.33	74,430	+1,960
May 31.....	4,844.14	81,460	+7,030
June 30.....	4,845.28	85,900	+4,440
July 31.....	4,844.88	84,340	-1,560
Aug. 31.....	4,843.87	80,400	-3,940
Sept. 30.....	4,842.80	76,240	-4,160
WTR YR 1983.....	-	-	+28,540

a Contents interpolated.

DESCHUTES RIVER BASIN

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14060000 CRESCENT CREEK AT CRESCENT LAKE, NEAR CRESCENT, OR

LOCATION.--Lat 43°30'11", long 121°58'20", in SE¼SW¼ 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<sup>2</sup>, 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 National Geodetic Vertical Datum of 1929. See WSP 1935 for history of changes prior to Sept. 11, 1956.

REMARKS.--Records good. Flow regulated since 1922 by Crescent Lake (see station 14059500). No diversion above station.

AVERAGE DISCHARGE.--57 years (water years 1913-14, 1929-83), 56.6 ft<sup>3</sup>/s, 41,010 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 313 ft<sup>3</sup>/s July 9, 1929, Aug. 9, 1936; no flow at times.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 140 ft<sup>3</sup>/s Sept. 15, gage height, 1.96 ft; minimum, 3.5 ft<sup>3</sup>/s Oct. 3.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1982 TO SEPTEMBER 1983  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3.8	4.9	5.3	4.5	4.5	4.5	5.3	5.7	6.1	119	122	120
2	3.8	4.9	5.3	4.5	4.5	4.5	5.3	5.7	6.1	119	122	120
3	3.8	4.9	5.3	4.5	4.5	4.5	5.3	5.7	6.1	119	121	120
4	3.8	4.5	5.3	4.5	4.5	4.5	5.3	6.1	6.1	120	121	120
5	3.8	4.9	5.3	4.5	4.5	4.5	5.3	6.1	6.1	120	121	119
6	4.0	4.9	5.3	4.5	4.5	4.5	5.3	6.1	6.1	120	121	119
7	4.0	4.9	5.3	4.5	4.5	4.5	5.3	6.1	6.5	120	121	119
8	4.0	4.9	5.3	4.5	4.5	4.5	5.3	6.1	6.5	120	121	119
9	4.0	4.9	5.3	4.5	4.5	4.5	5.3	6.1	6.9	120	121	119
10	4.0	4.9	5.3	4.5	4.5	4.5	5.3	6.1	6.9	120	121	118
11	4.0	4.9	5.3	4.5	4.5	4.5	5.3	5.7	6.9	120	121	118
12	4.3	4.9	5.3	4.5	4.5	4.5	5.3	5.3	6.9	120	121	118
13	4.3	4.9	4.9	4.5	4.5	4.5	5.7	5.3	27	120	121	118
14	4.3	4.9	4.9	4.5	4.5	4.5	6.1	5.3	49	121	120	118
15	4.3	4.9	4.9	4.5	4.5	4.5	5.7	5.3	49	120	120	118
16	4.3	5.3	4.9	4.5	4.5	4.5	5.7	5.3	49	120	120	117
17	4.5	5.3	4.9	4.5	4.5	4.5	5.7	5.3	50	121	120	117
18	4.5	5.3	4.9	4.5	4.5	4.9	5.7	5.3	50	121	120	117
19	4.5	5.3	4.9	4.5	4.5	4.9	5.7	5.3	50	121	120	117
20	4.5	5.3	4.9	4.5	4.5	4.9	5.7	5.3	82	121	120	115
21	4.5	5.3	4.9	4.5	4.5	4.9	5.7	5.3	120	121	120	113
22	4.5	5.3	4.9	4.5	4.5	4.9	5.7	5.3	120	121	120	113
23	4.5	5.3	4.9	4.5	4.5	4.9	5.7	5.3	118	121	120	113
24	4.5	5.3	4.9	4.5	4.5	4.9	5.7	5.3	119	121	120	113
25	4.5	5.3	4.9	4.5	4.5	4.9	5.7	5.7	118	121	120	113
26	4.5	5.3	4.9	4.5	4.5	4.9	5.7	6.1	118	121	120	112
27	4.5	5.3	4.9	4.5	4.5	4.9	5.7	6.1	118	121	120	112
28	4.5	5.3	4.5	4.5	4.5	4.9	5.7	6.1	119	121	120	112
29	4.5	5.3	4.5	4.5	---	4.9	5.7	6.1	118	121	120	112
30	4.5	5.3	4.5	4.5	---	5.3	5.7	6.1	119	121	120	112
31	4.5	---	4.5	4.5	---	5.3	---	6.1	---	122	120	---
TOTAL	132.0	152.6	155.1	139.5	126.0	145.9	166.6	176.7	1670.2	3734	3735	3491
MEAN	4.26	5.09	5.00	4.50	4.50	4.71	5.55	5.70	55.7	120	120	116
MAX	4.5	5.3	5.3	4.5	4.5	5.3	6.1	6.1	120	122	122	120
MIN	3.8	4.5	4.5	4.5	4.5	4.5	5.3	5.3	6.1	119	120	112
AC-FT	262	303	308	277	250	289	330	350	3310	7410	7410	6920
CAL YR 1982	TOTAL	7824.90	MEAN	21.4	MAX	106	MIN	.00	AC-FT	15520		
WTR YR 1983	TOTAL	13824.6	MEAN	37.9	MAX	122	MIN	3.8	AC-FT	27420		

## DESCHUTES RIVER BASIN

## 14063000 LITTLE DESCHUTES RIVER NEAR LA PINE, OR

LOCATION.--Lat 43°41'21", long 121°30'06", in SW¼SW¼ 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<sup>2</sup>, 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 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.--Records good. Flow regulated since 1922 by Crescent Lake (see station 14059500). Many diversions for irrigation above station.

AVERAGE DISCHARGE.--59 years (water years 1925-83), 206 ft<sup>3</sup>/s, 149,200 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 3,660 ft<sup>3</sup>/s Dec. 25, 1964, gage height, 8.18 ft; minimum, 8 ft<sup>3</sup>/s Sept. 2, 3, 1931.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 768 ft<sup>3</sup>/s June 3, gage height, 6.67 ft; minimum, 77 ft<sup>3</sup>/s Nov. 24.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1982 TO SEPTEMBER 1983  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP		
1	117	182	123	122	153	300	482	442	704	371	223	225		
2	109	156	114	124	143	307	484	472	740	387	218	212		
3	104	139	125	135	137	320	462	476	756	413	210	205		
4	99	130	173	155	128	322	411	476	712	413	203	198		
5	97	125	217	197	127	321	363	480	657	411	197	198		
6	95	121	240	248	124	335	332	492	618	394	189	193		
7	94	119	254	278	124	335	320	503	573	373	191	189		
8	103	118	229	301	132	324	320	515	533	362	194	188		
9	104	116	212	310	134	332	324	530	482	355	197	185		
10	100	113	176	290	131	353	324	538	452	341	192	184		
11	97	110	182	254	147	374	313	545	442	332	191	184		
12	95	104	165	222	186	397	300	523	454	322	188	184		
13	93	94	154	199	217	425	287	484	454	311	187	179		
14	90	91	168	191	210	450	270	460	450	297	188	177		
15	88	89	176	182	195	472	259	442	440	293	188	175		
16	87	96	176	188	183	468	265	433	439	290	188	174		
17	85	106	210	189	200	429	274	432	425	294	185	174		
18	85	124	203	193	335	408	292	423	405	304	183	172		
19	85	142	191	203	383	384	308	416	399	301	180	171		
20	85	139	184	191	331	366	329	409	392	287	183	171		
21	85	121	174	182	318	359	342	406	385	277	182	169		
22	87	115	175	169	320	360	363	413	399	265	182	168		
23	98	105	171	172	345	363	390	419	423	252	209	171		
24	132	92	168	167	371	350	397	422	411	245	272	176		
25	133	96	154	171	380	339	408	442	394	243	272	172		
26	123	106	149	168	352	322	415	474	384	239	248	171		
27	118	114	149	187	320	315	411	513	390	233	225	167		
28	118	128	139	213	301	307	405	553	385	230	221	166		
29	123	139	137	192	---	304	416	612	374	227	219	167		
30	160	142	128	169	---	377	427	660	370	221	225	166		
31	191	---	122	157	---	458	---	668	---	223	229	---		
TOTAL	3280	3572	5338	6119	6427	11276	10693	15073	14442	9506	6359	5431		
MEAN	106	119	172	197	230	364	356	486	481	307	205	181		
MAX	191	182	254	310	383	472	484	668	756	413	272	225		
MIN	85	89	114	122	124	300	259	406	370	221	180	166		
AC-FT	6510	7090	10590	12140	12750	22370	21210	29900	28650	18860	12610	10770		
CAL YR 1982	TOTAL		98672	MEAN		270	MAX		1030	MIN		80	AC-FT	195700
WTR YR 1983	TOTAL		97516	MEAN		267	MAX		756	MIN		85	AC-FT	193400

DESCHUTES RIVER BASIN

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14063300 PAULINA CREEK NEAR LA PINE, OR

LOCATION.--Lat 43°42'47", long 121°16'39", in SW¼NE¼ 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<sup>2</sup>, of which 2.2 mi<sup>2</sup> is lake surface at elevation 6,331 ft, hydrologic drainage boundary uncertain owing to ground-water exchange.

PERIOD OF RECORD.--October 1982 to September 1983.

GAGE.--Water-stage recorder. Datum of gage is 6,315.41 ft National Geodetic Vertical Datum of 1929.

REMARKS.--Records excellent. Flow regulated by dam at outlet of Paulina Lake 180 ft upstream.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 66 ft<sup>3</sup>/s Apr. 29, gage height, 2.35 ft, result of regulation; minimum, 0.19 ft<sup>3</sup>/s Oct. 19, result of regulation.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1982 TO SEPTEMBER 1983  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	18	14	4.8	12	31	31	33	54	26	31	20	36
2	18	14	4.8	12	31	28	35	50	29	33	22	36
3	17	14	5.1	12	31	27	32	46	35	32	21	35
4	17	14	5.4	14	30	28	31	43	34	31	21	35
5	17	13	5.6	15	29	28	28	42	31	30	21	34
6	17	13	5.6	16	27	28	26	39	31	29	22	34
7	16	13	5.6	16	28	29	25	37	30	28	22	34
8	15	13	5.6	16	29	29	24	37	30	28	22	33
9	15	13	5.9	17	31	28	23	36	29	28	24	33
10	15	13	5.9	17	33	26	23	35	31	27	34	32
11	15	13	5.9	17	34	25	22	32	31	26	38	32
12	15	13	5.9	16	36	27	22	30	30	25	37	31
13	14	13	5.9	16	37	30	21	28	29	25	36	31
14	14	13	5.9	16	37	28	21	27	29	25	36	29
15	14	13	6.5	15	37	28	18	27	28	24	35	26
16	14	13	6.8	14	37	27	16	25	28	24	37	18
17	14	13	7.4	16	39	26	11	24	28	24	40	22
18	14	8.4	8.1	17	49	26	1.6	23	27	23	39	22
19	8.1	3.0	11	18	49	25	1.8	21	27	22	39	22
20	13	3.0	16	18	48	24	2.4	21	27	21	39	22
21	13	3.3	17	18	47	24	2.8	20	26	21	38	22
22	13	3.0	17	19	45	25	3.0	20	25	21	38	22
23	11	3.0	17	22	44	25	3.0	20	25	19	39	22
24	4.0	3.0	17	32	40	24	3.3	20	25	19	38	22
25	7.8	3.2	16	32	37	25	3.5	21	24	20	38	22
26	8.1	3.4	14	34	35	25	3.5	21	25	20	38	22
27	8.1	3.8	14	36	33	27	3.8	21	25	20	37	22
28	12	4.3	14	36	32	26	3.8	22	25	20	37	22
29	14	4.5	13	34	---	28	36	24	26	20	36	22
30	14	4.8	12	32	---	37	59	24	27	20	36	22
31	14	---	12	31	---	35	---	25	---	19	36	---
TOTAL	419.1	275.7	296.7	636	1016	849	538.5	915	843	755	1016	817
MEAN	13.5	9.19	9.57	20.5	36.3	27.4	17.9	29.5	28.1	24.4	32.8	27.2
MAX	18	14	17	36	49	37	59	54	35	33	40	36
MIN	4.0	3.0	4.8	12	27	24	1.6	20	24	19	20	18
AC-FT	831	547	589	1260	2020	1680	1070	1810	1670	1500	2020	1620
WTR YR 1983	TOTAL	8377.0	MEAN	23.0	MAX	59	MIN	1.6	AC-FT	16620		



## DESCHUTES RIVER BASIN

## 14064500 DESCHUTES RIVER AT BENHAM FALLS, NEAR BEND, OR

LOCATION.--Lat 43°55'49", long 121°24'39", in SW¼NE¼ 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<sup>2</sup>.

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 National Geodetic Vertical Datum of 1929 (Bureau of Reclamation bench mark). See WSP 1738 for history of changes prior to Nov. 20, 1958.

REMARKS.--Records good. Flow regulated by Crane Prairie Reservoir, Crescent Lake, and Wickiup Reservoir (see elsewhere in this report). Many diversions for irrigation above station.

AVERAGE DISCHARGE.--66 years (water years 1907-13, 1925-83), 1,410 ft<sup>3</sup>/s, 1,022,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 5,000 ft<sup>3</sup>/s, estimated, Nov. 27, 1909 (gage height not determined); minimum, 363 ft<sup>3</sup>/s Jan. 20, 1962.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 2,550 ft<sup>3</sup>/s May 31, June 1; minimum discharge, 564 ft<sup>3</sup>/s Nov. 14.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1982 TO SEPTEMBER 1983  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1200	634	756	1130	1440	1460	1490	1570	2550	2070	2120	1880
2	1200	644	748	1150	1430	1400	1530	1570	2500	2060	2120	1850
3	1200	623	796	1220	1420	1400	1540	1580	2450	2010	2110	1810
4	1190	609	836	1240	1410	1420	1530	1600	2450	2020	2120	1770
5	1130	606	878	1240	1390	1420	1540	1620	2400	2030	2140	1760
6	1080	599	937	1250	1390	1420	1510	1610	2400	2030	2150	1760
7	1070	595	946	1350	1400	1420	1470	1610	2350	2060	2150	1750
8	1070	599	923	1500	1410	1430	1440	1630	2350	2070	2190	1720
9	1070	595	910	1500	1430	1430	1450	1630	2300	2060	2210	1720
10	1050	592	883	1510	1440	1420	1480	1630	2300	2040	2220	1710
11	856	592	832	1500	1440	1430	1480	1640	2300	2040	2250	1700
12	816	588	832	1480	1460	1450	1470	1630	2300	2040	2250	1700
13	808	585	852	1460	1500	1500	1460	1670	2300	2100	2250	1800
14	804	581	852	1440	1520	1510	1450	1710	2300	2180	2230	1910
15	800	571	844	1430	1520	1510	1440	1770	2300	2220	2210	1950
16	796	574	901	1430	1500	1520	1430	1880	2300	2220	2210	1950
17	792	581	928	1440	1510	1540	1420	1900	2300	2270	2210	1950
18	792	592	869	1440	1590	1540	1430	1900	2300	2300	2190	1940
19	796	658	937	1460	1630	1510	1390	1930	2300	2280	2190	1950
20	804	752	1020	1450	1670	1480	1370	2080	2300	2210	2160	1950
21	820	756	1050	1440	1660	1450	1360	2150	2250	2190	2120	1950
22	816	728	1050	1440	1650	1440	1350	2200	2200	2180	2110	1920
23	840	690	1020	1430	1640	1440	1360	2200	2170	2160	2110	1950
24	840	648	1020	1430	1630	1440	1390	2250	2170	2160	2130	1880
25	850	665	1040	1430	1610	1420	1400	2300	2160	2140	2140	1860
26	850	708	1180	1440	1570	1410	1410	2400	2140	2140	2140	1730
27	609	716	1200	1460	1540	1400	1490	2450	2120	2130	2120	1620
28	599	728	1000	1450	1520	1390	1510	2450	2110	2130	2110	1610
29	609	756	995	1470	---	1380	1550	2500	2090	2130	2070	1550
30	616	760	1110	1460	---	1430	1560	2500	2070	2130	1990	1480
31	613	---	1110	1460	---	1470	---	2550	---	2130	1910	---
TOTAL	27386	19325	29255	43530	42320	44880	43700	60110	68530	65930	66630	54080
MEAN	883	644	944	1404	1511	1448	1457	1939	2284	2127	2149	1803
MAX	1200	760	1200	1510	1670	1540	1560	2550	2550	2300	2250	1950
MIN	599	571	748	1130	1390	1380	1350	1570	2070	2010	1910	1480
AC-FT	54320	38330	58030	86340	83940	89020	86680	119200	135900	130800	132200	107300
CAL YR 1982	TOTAL	483624	MEAN	1325	MAX	2420	MIN	500	AC-FT	959300		
WTR YR 1983	TOTAL	565676	MEAN	1550	MAX	2550	MIN	571	AC-FT	1122000		

NOTE.--No gage-height record May 17 to June 30.

## 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 and below Bend.

14065500 ARNOLD CANAL NEAR BEND diverts at mile 174.5 from right bank at head of Lava Island, in SW $\frac{1}{4}$  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 $\frac{1}{4}$  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 $\frac{1}{4}$ SE $\frac{1}{4}$  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 $\frac{1}{4}$  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 $\frac{1}{4}$  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 $\frac{1}{4}$  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 1982 to SEPTEMBER 1983

MONTH	DESCHUTES COUNTY						TOTAL
	ARNOLD CANAL	CENTRAL OREGON CANAL	MUNICIPAL IMPROVEMENT DISTRICT CANAL	NORTH UNIT MAIN CANAL	NORTH CANAL	SWALLEY CANAL	
OCTOBER.....	1,460	4,670	0	14,700	4,330	3,220	28,380
NOVEMBER.....	378	2,090	0	0	1,640	510	4,620
DECEMBER.....	63	2,160	0	0	1,800	508	4,530
JANUARY.....	350	2,130	0	0	1,820	465	4,760
FEBRUARY.....	441	2,190	0	0	1,790	496	4,920
MARCH.....	395	2,150	0	0	1,830	532	4,910
APRIL.....	1,430	7,650	0	7,540	7,720	2,900	27,240
MAY.....	5,500	26,830	528	40,380	26,650	5,520	105,400
JUNE.....	6,780	32,330	529	45,200	31,000	6,710	122,500
JULY.....	6,850	31,540	1,640	37,780	31,670	5,970	115,400
AUGUST.....	7,190	32,500	6,220	30,240	33,180	6,960	116,300
SEPTEMBER.....	5,350	25,260	6,470	26,120	27,030	5,140	95,370
WTR YR 1983.....	36,190	171,500	15,390	202,000	170,400	38,930	634,400

## 14070500 DESCHUTES RIVER BELOW BEND, OR

LOCATION.--Lat 44°04'59", long 121°18'24", in SE¼SE¼ sec.20, T.17 S., R.12 E., Deschutes County, Hydrologic Unit 17070301, on right bank 0.4 mi downstream from North Canal, 0.5 mi north of Bend city limits, and at mile 164.4.

DRAINAGE AREA.--1,899 mi<sup>2</sup>.

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 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.--Records excellent. 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 above station for irrigation.

AVERAGE DISCHARGE.--69 years, 500 ft<sup>3</sup>/s, 362,200 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 2,820 ft<sup>3</sup>/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<sup>3</sup>/s Aug. 25, 1930.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum discharge near this site since 1905, 4,820 ft<sup>3</sup>/s Nov. 27, 1909.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 1,640 ft<sup>3</sup>/s Feb. 21, gage height, 4.25 ft; minimum, 20 ft<sup>3</sup>/s Nov. 17.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1982 TO SEPTEMBER 1983  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	145	604	706	1140	1330	1360	1380	265	140	123	66	174
2	128	616	688	1100	1310	1290	1420	272	228	138	57	162
3	130	604	718	1050	1300	1280	1450	213	207	115	51	153
4	130	580	765	1100	1290	1290	1450	123	201	125	53	130
5	110	568	800	1100	1260	1300	1450	140	162	171	66	108
6	54	562	856	1080	1260	1310	1440	143	128	171	54	88
7	50	545	863	1150	1270	1310	1380	140	94	156	48	88
8	45	550	870	1340	1280	1320	1340	140	59	41	59	64
9	43	550	856	1360	1320	1320	1340	143	43	38	44	50
10	240	540	828	992	1320	1310	1390	156	43	39	44	57
11	344	540	786	848	1330	1320	1390	153	41	38	44	53
12	288	535	765	869	1340	1350	1390	153	41	39	44	44
13	280	530	445	869	1380	1420	1370	140	68	38	44	44
14	276	520	312	968	1030	1050	1360	68	78	38	45	44
15	300	352	312	1320	855	869	1340	48	70	38	64	43
16	320	100	348	1310	848	869	1310	50	53	38	62	43
17	316	22	500	1310	869	897	1270	50	44	59	54	43
18	312	41	786	1300	1050	1100	1000	51	41	103	56	43
19	316	177	779	1270	1500	1390	706	51	41	125	53	78
20	316	598	894	1250	1540	1370	616	51	82	145	50	125
21	320	628	862	1250	1540	1370	335	53	118	123	54	153
22	396	646	876	1270	1550	1350	165	53	92	76	57	168
23	724	604	855	1270	1520	1350	143	54	60	68	76	168
24	730	580	827	1280	1510	1340	156	56	60	62	113	168
25	737	556	848	1320	1500	1330	177	56	64	50	177	174
26	744	634	1020	1330	1450	1280	177	64	66	43	171	177
27	592	658	1060	1340	1470	1270	198	59	59	41	159	180
28	515	658	946	1340	1440	1250	247	64	74	41	168	162
29	535	658	869	1350	---	1260	244	76	115	50	189	189
30	535	676	1000	1350	---	1330	261	86	125	74	195	268
31	556	---	1100	1340	---	1360	---	98	---	80	186	---
TOTAL	10527	15432	24140	37166	36662	39215	27895	3269	2697	2486	2603	3441
MEAN	340	514	779	1199	1309	1265	930	105	89.9	80.2	84.0	115
MAX	744	676	1100	1360	1550	1420	1450	272	228	171	195	268
MIN	43	22	312	848	848	869	143	48	41	38	44	43
AC-FT	20880	30610	47880	73720	72720	77780	55330	6480	5350	4930	5160	6830
CAL YR 1982	TOTAL	121866	MEAN	334	MAX	1340	MIN	22	AC-FT	241700		
WTR YR 1983	TOTAL	205533	MEAN	563	MAX	1550	MIN	22	AC-FT	407700		

## 14070700 BRIDGE CREEK NEAR BEND, OR

LOCATION.--Lat 44°01'52", long 121°34'16", in SW¼NE¼ 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.

DRAINAGE AREA.--6.58 mi<sup>2</sup>.

PERIOD OF RECORD.--October 1980 to current year.

GAGE.--Water-stage recorder. Altitude of gage is 5,180 ft, from topographic map.

REMARKS.--Records good. Water is diverted into Bridge Creek from unnamed springs on Middle Fork of Tumalo Creek 3.0 mi above station.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 545 ft<sup>3</sup>/s May 29, 1983, gage height, 1.93 ft, from rating curve extended above 110 ft<sup>3</sup>/s on basis of slope-area measurement of peak flow; maximum gage height, 2.01 ft Feb. 6, 1982 (backwater from ice); minimum discharge, 3.6 ft<sup>3</sup>/s Oct. 1-9, 1980.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 545 ft<sup>3</sup>/s May 29, gage height, 1.93 ft, from rating curve extended above 110 ft<sup>3</sup>/s on basis of slope-area measurement of peak flow; minimum discharge, 18 ft<sup>3</sup>/s Apr. 3.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1982 TO SEPTEMBER 1983  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	20	23	20	21	23	22	19	25	145	72	27	24
2	20	22	22	20	23	22	19	25	109	68	27	24
3	20	22	28	20	22	22	19	26	94	55	26	24
4	20	22	28	22	22	22	19	27	85	53	26	24
5	20	22	28	26	22	22	20	28	83	54	26	24
6	20	23	28	29	22	22	20	27	85	51	26	24
7	20	21	28	30	22	21	20	28	94	46	26	24
8	20	21	28	30	22	22	20	27	127	43	25	24
9	20	21	28	29	22	23	20	26	119	41	25	22
10	20	21	27	28	22	24	20	26	116	39	25	22
11	20	20	26	27	22	24	19	26	82	40	25	23
12	20	20	26	27	21	24	19	26	70	42	24	22
13	20	20	26	27	21	24	19	27	68	43	24	22
14	20	22	26	26	20	24	19	28	70	42	24	22
15	20	20	26	26	20	24	19	29	71	37	24	22
16	20	20	26	26	20	23	19	29	67	35	24	22
17	20	22	25	26	20	23	20	30	70	35	23	22
18	19	22	24	26	20	23	20	33	63	34	23	22
19	20	21	24	26	20	22	20	34	57	35	23	22
20	20	21	24	25	20	22	21	39	54	32	23	22
21	21	20	24	25	20	22	22	43	52	32	22	22
22	22	20	24	25	22	22	22	47	52	32	22	22
23	27	20	24	25	23	22	22	56	52	32	22	22
24	22	20	23	25	23	22	23	67	48	31	23	22
25	21	21	22	24	23	21	23	83	48	31	24	22
26	22	21	22	24	22	20	22	91	55	28	23	22
27	21	21	23	25	22	20	22	102	55	28	24	22
28	20	21	22	24	22	20	23	147	52	28	24	21
29	32	21	22	24	---	20	24	307	52	28	25	21
30	26	21	21	24	---	20	24	394	51	28	24	21
31	24	---	21	24	---	19	---	215	---	28	24	---
TOTAL	657	632	766	786	603	683	618	2118	2246	1223	753	674
MEAN	21.2	21.1	24.7	25.4	21.5	22.0	20.6	68.3	74.9	39.5	24.3	22.5
MAX	32	23	28	30	23	24	24	394	145	72	27	24
MIN	19	20	20	20	20	19	19	25	48	28	22	21
AC-FT	1300	1250	1520	1560	1200	1350	1230	4200	4450	2430	1490	1340
CAL YR 1982	TOTAL	11115	MEAN	30.5	MAX	129	MIN	13	AC-FT	22050		
WTR YR 1983	TOTAL	11759	MEAN	32.2	MAX	394	MIN	19	AC-FT	23320		

## DESCHUTES RIVER BASIN

14073001 TUMALO CREEK NEAR BEND, OR

LOCATION.--Lat 44°05'16", long 121°22'18", in NW¼ 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<sup>2</sup>.

PERIOD OF RECORD.--October 1913 to December 1921, February, April to November 1922, March 1923 to current year. 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 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.--Records excellent. All records given herein include flow in Columbia Southern Canal, which diverts 8 mi above station for irrigation of land near Tumalo. No flow in the canal Oct. 1 to May 11. Crater Creek Canal diverts flow of tributaries of Soda Creek into head of Tumalo Creek. Diversion above station for municipal supply of Bend since Dec. 15, 1926, 4,350 acre-ft during water year 1983.

AVERAGE DISCHARGE.--65 years (water years 1914, 1917-21, 1924-35, 1937-83), 102 ft<sup>3</sup>/s, 73,900 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,140 ft<sup>3</sup>/s Nov. 9, 1968 (no flow in canal), from rating curve extended above 780 ft<sup>3</sup>/s on basis of slope-area measurement at 3.45 ft; minimum daily, 25 ft<sup>3</sup>/s Jan. 3, 1924.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 501 ft<sup>3</sup>/s May 30; minimum daily, 55 ft<sup>3</sup>/s Dec. 29-31, result of freezeup.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1982 TO SEPTEMBER 1983  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	95	85	70	58	77	83	77	95	344	331	170	106
2	93	83	73	62	75	83	75	95	326	331	153	96
3	95	81	104	75	75	83	73	97	305	239	136	91
4	91	79	104	85	75	83	72	102	282	236	124	90
5	91	79	104	99	73	85	70	104	267	261	116	88
6	93	83	130	113	75	83	70	104	268	269	108	84
7	93	77	109	111	75	85	72	104	285	236	111	85
8	93	77	93	113	75	89	70	104	325	205	110	84
9	95	77	72	109	77	95	70	99	339	191	105	82
10	97	75	72	104	75	97	70	99	335	184	101	82
11	95	75	72	102	75	97	70	99	276	194	96	86
12	95	73	76	99	77	99	68	100	241	233	87	84
13	93	73	89	97	75	102	66	104	238	316	91	82
14	91	75	91	95	73	97	66	110	245	296	95	84
15	91	73	91	93	73	95	66	114	262	213	95	81
16	91	73	95	95	72	95	68	110	250	183	95	80
17	93	79	89	91	85	93	70	113	262	180	98	80
18	91	81	87	93	85	91	73	126	251	172	95	84
19	91	75	85	91	77	89	73	136	222	197	94	83
20	91	75	85	87	73	87	77	148	205	190	91	79
21	95	73	85	85	75	87	81	163	188	181	88	79
22	97	72	85	85	87	85	83	178	202	189	88	77
23	111	70	83	85	91	83	85	195	206	199	103	78
24	93	63	79	85	89	81	85	226	188	194	101	78
25	85	62	79	81	85	79	85	264	199	184	93	77
26	87	63	79	85	83	79	83	300	235	160	92	76
27	79	65	75	87	83	79	83	307	245	151	91	78
28	79	73	65	81	81	77	87	351	237	154	95	78
29	118	75	55	81	---	83	91	412	247	154	117	78
30	104	72	55	79	---	85	93	442	240	162	112	60
31	91	---	55	79	---	77	---	414	---	171	103	---
TOTAL	2897	2236	2586	2785	2191	2706	2272	5415	7715	6556	3254	2470
MEAN	93.5	74.5	83.4	89.8	78.3	87.3	75.7	175	257	211	105	82.3
MAX	118	85	130	113	91	102	93	442	344	331	170	106
MIN	79	62	55	58	72	77	66	95	188	151	87	60
AC-FT	5750	4440	5130	5520	4350	5370	4510	10740	15300	13000	6450	4900
CAL YR 1982	TOTAL	45354	MEAN	124	MAX	417	MIN	38	AC-FT	89960		
WTR YR 1983	TOTAL	43083	MEAN	118	MAX	442	MIN	55	AC-FT	85460		

## DESCHUTES RIVER BASIN

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14075000 SQUAW CREEK NEAR SISTERS, OR

LOCATION.--Lat 44°14'02", long 121°33'57", in SE¼SW¼ 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<sup>2</sup> (revised), not including 12.6 mi<sup>2</sup> 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.--WSP 1218: Drainage area.

GAGE.--Water-stage recorder. Altitude 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.--Records excellent. 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 54.8 mi<sup>2</sup> included that of Pole Creek. Water is diverted from Snow Creek, a tributary above station, for irrigation in Three Creek basin.

AVERAGE DISCHARGE.--71 years (water years 1907-18, 1920, 1926-83), 106 ft<sup>3</sup>/s, 76,800 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge since 1909, 2,000 ft<sup>3</sup>/s Dec. 25, 1980, from rating curve extended above 690 ft<sup>3</sup>/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<sup>3</sup>/s Mar. 2, 1966.

EXTREMES FOR CURRENT YEAR.--Peak discharge above base of 470 ft<sup>3</sup>/s and maximum discharge, 540 ft<sup>3</sup>/s July 13, gage height, 3.04 ft; minimum, 53 ft<sup>3</sup>/s Apr. 12.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1982 TO SEPTEMBER 1983  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	87	94	62	63	64	84	73	75	294	357	259	141
2	87	89	79	70	64	82	73	75	266	322	252	127
3	89	87	100	85	62	82	70	78	246	246	240	119
4	84	85	140	100	64	81	67	82	231	243	225	119
5	82	87	141	120	66	81	67	87	225	269	216	115
6	84	89	189	150	62	78	66	82	228	287	207	111
7	81	78	129	147	62	78	66	82	243	255	204	113
8	82	78	80	145	64	84	65	79	283	225	210	109
9	84	76	68	125	64	101	65	75	294	207	213	103
10	81	76	68	117	64	107	62	73	325	207	210	99
11	79	72	68	109	67	96	61	72	266	225	195	107
12	78	75	72	103	66	98	60	72	231	294	177	107
13	78	70	85	98	62	105	58	76	219	400	168	107
14	76	67	82	92	61	96	58	81	228	388	174	107
15	76	73	85	90	61	90	57	81	246	287	180	101
16	75	72	94	89	61	89	57	76	234	280	174	98
17	76	87	85	85	92	89	58	81	255	240	168	96
18	73	81	82	84	90	84	61	92	234	228	165	98
19	72	72	81	82	81	82	64	99	204	240	161	98
20	72	72	81	78	79	78	66	111	189	234	147	90
21	85	72	81	78	81	78	70	127	183	231	141	87
22	92	69	75	76	107	76	70	137	189	234	139	82
23	154	65	73	75	117	73	67	152	192	249	141	84
24	98	60	72	73	105	72	67	180	177	255	133	84
25	87	60	70	72	96	69	65	213	183	249	131	82
26	85	60	68	75	90	69	64	234	204	228	129	85
27	81	60	66	75	87	67	64	237	210	213	127	84
28	85	65	65	70	84	66	69	266	222	216	131	81
29	213	66	62	69	---	76	72	304	240	219	177	79
30	127	65	60	67	---	89	72	325	237	225	161	76
31	105	---	60	66	---	76	---	315	---	246	145	---
TOTAL	2808	2222	2623	2828	2123	2576	1954	4119	6978	7999	5500	2989
MEAN	90.6	74.1	84.6	91.2	75.8	83.1	65.1	133	233	258	177	99.6
MAX	213	94	189	150	117	107	73	325	325	400	259	141
MIN	72	60	60	63	61	66	57	72	177	207	127	76
AC-FT	5570	4410	5200	5610	4210	5110	3880	8170	13840	15870	10910	5930
CAL YR 1982	TOTAL	50400	MEAN	138	MAX	670	MIN	45	AC-FT	99970		
WTR YR 1983	TOTAL	44719	MEAN	123	MAX	400	MIN	57	AC-FT	88700		



## DESCHUTES RIVER BASIN

14076500 DESCHUTES RIVER NEAR CULVER, OR

LOCATION.--Lat 44°29'56", long 121°19'12", in NW¼SE¼ 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<sup>2</sup>.

PERIOD OF RECORD.--July 1952 to current year.

GAGE.--Water-stage recorder. Datum of gage is 1,980 ft 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.--Records excellent. Flow regulated by Crescent Lake and Crane Prairie and Wickiup Reservoirs (see elsewhere in this report). Many diversions for irrigation above station.

AVERAGE DISCHARGE.--31 years, 910 ft<sup>3</sup>/s, 659,300 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 6,680 ft<sup>3</sup>/s Dec. 24, 1964, gage height, 10.00 ft, from rating curve extended above 2,200 ft<sup>3</sup>/s on basis of slope-area measurement of peak flow; minimum, 418 ft<sup>3</sup>/s July 7, 8, 1964.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 2,060 ft<sup>3</sup>/s Feb. 23, gage height, 5.58 ft; minimum, 485 ft<sup>3</sup>/s Aug. 16, Sept. 16-20.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1982 TO SEPTEMBER 1983  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	643	1040	1210	1480	1870	1940	1900	733	839	690	566	642
2	696	1050	1210	1530	1860	1870	1910	738	837	914	571	628
3	693	1070	1230	1590	1840	1840	1930	743	861	828	547	624
4	690	1090	1320	1600	1830	1850	1940	681	762	687	532	614
5	687	1080	1370	1610	1770	1860	1930	605	731	675	519	595
6	677	1110	1480	1610	1760	1860	1930	616	687	710	517	564
7	631	1130	1430	1630	1760	1860	1920	619	655	712	519	534
8	621	1120	1370	1810	1710	1860	1880	616	647	667	507	529
9	620	1130	1360	1930	1750	1900	1850	608	680	533	512	520
10	619	1120	1380	1930	1740	1920	1890	606	683	504	513	503
11	810	1110	1380	1520	1740	1910	1920	613	686	491	501	501
12	880	1110	1350	1520	1740	1870	1880	608	633	491	493	500
13	844	1070	1340	1530	1800	1910	1850	605	584	562	488	495
14	794	1050	965	1510	1800	1930	1840	590	558	759	487	490
15	778	1040	919	1720	1430	1430	1830	541	597	722	487	487
16	809	869	946	1860	1430	1430	1780	508	608	628	486	486
17	821	707	990	1870	1450	1450	1730	500	583	550	505	485
18	817	670	1190	1870	1600	1460	1710	495	574	533	494	485
19	811	661	1300	1860	1800	1840	1360	495	562	561	487	485
20	812	868	1330	1820	1970	1920	1230	495	529	602	487	490
21	817	1180	1420	1810	1960	1930	1140	494	526	612	487	545
22	828	1210	1460	1770	2010	1930	734	493	553	606	488	575
23	1030	1210	1460	1780	2010	1910	638	492	547	566	494	598
24	1290	1170	1420	1770	1980	1910	609	492	522	554	501	594
25	1250	1150	1420	1790	1970	1910	619	501	510	549	528	594
26	1250	1160	1470	1810	1920	1860	634	527	512	533	595	597
27	1230	1230	1570	1830	1930	1840	641	571	536	520	605	600
28	1120	1210	1550	1880	1930	1830	658	579	574	505	598	601
29	1160	1180	1410	1870	---	1820	715	639	584	503	610	593
30	1180	1200	1380	1890	---	1900	715	738	639	503	630	608
31	1090	---	1480	1870	---	1880	---	808	---	528	639	---
TOTAL	26998	31995	41110	53870	50360	56630	43313	18349	18799	18798	16393	16562
MEAN	871	1067	1326	1738	1799	1827	1444	592	627	606	529	552
MAX	1290	1230	1570	1930	2010	1940	1940	808	861	914	639	642
MIN	619	661	919	1480	1430	1430	609	492	510	491	486	485
AC-FT	53550	63460	81540	106900	99890	112300	85910	36400	37290	37290	32520	32850
CAL YR 1982	TOTAL	320945		MEAN	879	MAX	2480	MIN	470	AC-FT	636600	
WTR YR 1983	TOTAL	393177		MEAN	1077	MAX	2010	MIN	485	AC-FT	779900	

## 14080400 PRINEVILLE RESERVOIR NEAR PRINEVILLE, OR

LOCATION.--Lat 44°06'50", long 120°46'50", in SW¼NW¼ 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<sup>2</sup>, approximately, of which 500 mi<sup>2</sup> 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 capacity table furnished by Bureau of Reclamation.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents observed, 165,800 acre-ft Dec. 27, 1964, elevation, 3,238.95 ft; minimum observed, 37,400 acre-ft Oct. 31, Nov. 1, 1977, elevation, 3,177.40 ft.

EXTREMES FOR CURRENT YEAR.--Maximum contents, 157,700 acre-ft Apr. 26, elevation, 3,236.40 ft; minimum, 91,700 acre-ft Nov. 26-29, elevation, 3,210.65 ft.

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

3,175	34,600	3,210	90,400
3,180	40,600	3,215	101,100
3,185	47,400	3,220	112,600
3,190	54,700	3,230	138,700
3,195	62,600	3,235	153,400
3,200	71,200	3,239	165,900
3,205	80,400		

ELEVATION (FEET NGVD), WATER YEAR OCTOBER 1982 TO SEPTEMBER 1983  
INSTANTANEOUS OBSERVATIONS AT 2400

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3220.05	3216.16	3210.78	3211.10	3212.01	3219.12	3234.08	3235.63	3235.84	3233.78	3228.83	3223.83
2	3219.85	3215.90	3210.80	3211.10	3211.94	3219.70	3233.48	3235.64	3236.00	3233.76	3228.63	3223.65
3	3219.70	3215.85	3210.83	3211.12	3211.62	3220.63	3232.80	3235.63	3235.99	3233.74	3228.43	3223.55
4	3219.52	3215.80	3210.85	3211.20	3211.48	3222.10	3232.20	3235.60	3235.73	3233.72	3228.23	3223.35
5	3219.37	3215.44	3211.10	3211.32	3211.48	3224.00	3231.92	3235.80	3235.52	3233.70	3228.13	3223.25
6	3219.18	3215.20	3211.54	3212.40	3211.46	3225.30	3231.84	3236.06	3235.32	3233.55	3228.00	3223.15
7	3218.95	3214.96	3211.90	3213.02	3211.46	3226.00	3232.00	3235.84	3235.34	3233.38	3227.83	3222.95
8	3218.80	3214.64	3212.15	3213.20	3211.48	3226.68	3232.20	3235.40	3235.36	3233.20	3227.65	3222.80
9	3218.70	3214.28	3212.25	3212.70	3211.58	3228.20	3232.40	3234.64	3235.32	3233.00	3227.53	3222.65
10	3218.60	3214.00	3212.42	3211.96	3211.68	3229.40	3232.58	3233.85	3235.22	3232.82	3227.33	3222.53
11	3218.50	3213.72	3212.62	3211.44	3212.28	3230.20	3232.60	3233.20	3235.22	3232.63	3227.23	3222.40
12	3218.38	3213.20	3212.80	3211.75	3213.04	3230.80	3232.68	3232.98	3235.20	3232.42	3227.03	3222.25
13	3218.20	3212.65	3212.95	3212.00	3214.08	3232.20	3232.60	3232.92	3235.14	3232.25	3226.93	3222.07
14	3218.10	3212.15	3213.00	3211.98	3214.92	3233.20	3232.54	3233.04	3235.12	3232.08	3226.83	3221.95
15	3218.00	3211.78	3212.96	3211.80	3215.48	3233.32	3232.63	3233.22	3235.10	3231.90	3226.65	3221.80
16	3217.80	3211.72	3212.90	3211.74	3216.03	3232.80	3232.90	3233.40	3235.00	3231.78	3226.53	3221.60
17	3217.72	3211.60	3212.70	3211.60	3216.40	3232.02	3233.35	3233.56	3234.92	3231.62	3226.40	3221.45
18	3217.60	3211.15	3212.65	3211.60	3217.36	3231.53	3233.90	3233.60	3234.74	3231.62	3226.23	3221.25
19	3217.58	3210.80	3212.60	3211.63	3218.20	3230.92	3234.20	3233.60	3234.64	3231.34	3226.03	3221.10
20	3217.46	3210.80	3212.59	3211.82	3218.28	3230.16	3234.40	3234.04	3234.52	3231.18	3225.89	3220.95
21	3217.35	3210.78	3212.58	3211.94	3218.16	3229.90	3235.00	3234.40	3234.42	3230.83	3225.70	3220.85
22	3217.20	3210.82	3212.53	3211.82	3220.10	3230.50	3235.50	3234.80	3234.34	3230.65	3225.60	3220.65
23	3217.10	3210.82	3212.50	3211.60	3221.28	3231.18	3235.88	3235.00	3234.32	3230.48	3225.43	3220.55
24	3216.84	3210.80	3212.34	3211.50	3221.70	3231.70	3236.20	3235.10	3234.20	3230.30	3225.23	3220.40
25	3216.70	3210.75	3212.10	3211.45	3221.58	3232.16	3236.32	3235.30	3234.12	3230.05	3225.13	3220.25
26	3216.60	3210.65	3211.82	3211.50	3220.84	3232.50	3236.38	3235.42	3234.10	3229.93	3224.90	3220.10
27	3216.46	3210.65	3211.60	3211.62	3219.80	3232.84	3236.06	3235.60	3234.04	3229.73	3224.80	3219.95
28	3216.38	3210.65	3211.28	3211.91	3219.08	3232.20	3235.76	3235.62	3233.92	3229.60	3224.63	3219.83
29	3216.35	3210.75	3211.10	3212.02	---	3233.50	3235.60	3235.62	3233.89	3229.33	3224.43	3219.67
30	3216.34	3210.72	3211.08	3212.07	---	3234.20	3235.60	3235.60	3233.80	3229.20	3224.25	3219.55
31	3216.32	---	3211.08	3212.12	---	3234.60	---	3235.60	---	3229.03	3224.08	---
MEAN	3217.93	3212.64	3212.01	3211.81	3215.53	3229.47	3233.85	3234.70	3234.88	3231.70	3226.47	3221.68
MAX	3220.05	3216.16	3213.00	3213.20	3221.70	3234.60	3236.38	3236.06	3236.00	3233.78	3228.83	3223.83
MIN	3216.32	3210.65	3210.78	3211.10	3211.46	3219.12	3231.84	3232.92	3233.80	3229.03	3224.08	3219.55
(+)	104000	91870	92620	94810	110400	152200	155300	155300	149800	136000	122700	111500
(+)	-9100	-12130	+750	+2190	+15590	+41800	+3100	0	-5500	-13800	-13300	-11200
CAL YR 1982	MEAN	3223.47	MAX	3235.64	MIN	3210.65	AC-FT#	-340				
WTR YR 1983	MEAN	3223.60	MAX	3236.38	MIN	3210.65	AC-FT#	-1600				

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

‡ Change in contents, in acre-feet.

## DESCHUTES RIVER BASIN

## 14080500 CROOKED RIVER NEAR PRINEVILLE, OR

LOCATION.--Lat 44°06'50", long 120°47'40", in SW¼ 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<sup>2</sup>, approximately, of which 500 mi<sup>2</sup> 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 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.--Records excellent. Flow completely regulated since December 1960 by Prineville Reservoir (see station 14080400). Diversions for irrigation above 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<sup>3</sup>/s, 273,700 acre-ft/yr; 23 years (water years 1961-83), 344 ft<sup>3</sup>/s, 249,200 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 8,410 ft<sup>3</sup>/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, 3,230 ft<sup>3</sup>/s Mar. 31, gage height, 7.72 ft; minimum, 5.3 ft<sup>3</sup>/s Dec. 8.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1982 TO SEPTEMBER 1983  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	267	373	97	83	536	1510	3210	2230	1060	286	298	260
2	267	415	97	83	536	1520	3200	2240	1070	286	286	245
3	266	239	108	84	536	1370	3190	2240	1070	286	286	224
4	266	325	126	84	353	1270	2710	2390	1060	286	262	224
5	266	469	127	84	265	1280	2020	2470	1040	286	224	224
6	266	469	60	119	265	1280	1440	2870	704	350	224	224
7	266	469	11	514	265	1720	1210	3080	362	417	224	224
8	240	469	11	1120	204	1980	1210	3050	528	417	224	223
9	227	469	11	1420	171	2340	1210	3010	524	417	225	222
10	227	468	11	1410	170	2540	1210	3000	441	417	225	223
11	227	466	11	879	169	2940	1210	2530	375	417	225	222
12	227	526	11	91	169	3170	1210	1790	375	417	226	222
13	227	568	11	230	169	3180	1210	1300	375	380	224	222
14	227	568	145	420	169	3190	1070	1180	374	314	224	222
15	227	437	268	420	480	3200	815	1180	372	314	225	222
16	227	216	365	420	880	3200	700	1180	372	314	230	222
17	227	392	476	379	1130	3190	700	1180	372	312	235	223
18	160	562	476	324	1270	2790	883	1180	372	311	235	223
19	145	346	476	324	1580	2560	1390	1180	372	311	235	224
20	249	141	476	324	1800	2560	1850	1130	372	311	235	224
21	249	141	476	434	1650	2110	1900	1100	323	311	235	224
22	249	141	476	508	1590	1410	1910	1110	284	310	233	224
23	249	141	476	508	2530	615	1960	1330	285	310	233	224
24	249	141	476	508	3110	616	2000	1510	284	310	233	224
25	249	141	474	407	3110	616	2020	1320	285	309	246	224
26	249	141	473	349	3070	619	2190	1210	285	309	260	224
27	249	141	473	349	3060	620	2280	1220	286	309	260	224
28	249	141	473	402	2260	733	2250	1230	286	309	260	224
29	249	141	323	445	---	840	2230	1230	286	309	260	224
30	247	116	219	445	---	2190	2230	1230	286	309	260	239
31	256	---	141	495	---	3210	---	1130	---	309	260	---
TOTAL	7445	9772	7854	13662	31497	60369	52618	54030	14480	10253	7512	6774
MEAN	240	326	253	441	1125	1947	1754	1743	483	331	242	226
MAX	267	568	476	1420	3110	3210	3210	3080	1070	417	298	260
MIN	145	116	11	83	169	615	700	1100	284	286	224	222
AC-FT	14770	19380	15580	27100	62470	119700	104400	107200	28720	20340	14900	13440
CAL YR 1982	TOTAL	214842	MEAN	589	MAX	3150	MIN	11	AC-FT	426100		
WTR YR 1983	TOTAL	276266	MEAN	757	MAX	3210	MIN	11	AC-FT	548000		

## DESCHUTES RIVER BASIN

157,

## 14087400 CROOKED RIVER BELOW OPAL SPRINGS, NEAR CULVER, OR

LOCATION.--Lat 44°29'33", long 121°17'50", in NW¼NE¼ 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<sup>2</sup>, approximately, of which 500 mi<sup>2</sup> is probably noncontributing.

PERIOD OF RECORD.--October 1961 to current year.

GAGE.--Water-stage recorder. Datum of gage is 1,953.60 ft National Geodetic Vertical Datum of 1929 (Portland General Electric Co. bench mark).

REMARKS.--Records excellent. Flow regulated since December 1960 by Prineville Reservoir (see station 14080400) and Ochoco Reservoir, capacity, 47,500 acre-ft. Many diversions for irrigation above station. Practically all of the summer flow comes from Opal Springs and other springs within 15 mi above station. Simultaneous records (1961-63) at former gaging station 5.6 mi downstream indicated over 15 percent increase to summer flow from springs below this station.

AVERAGE DISCHARGE.--22 years, 1,582 ft<sup>3</sup>/s, 1,146,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 6,660 ft<sup>3</sup>/s Dec. 24, 1964, gage height, 9.36 ft; minimum, 836 ft<sup>3</sup>/s Sept. 8, 1981, caused by refilling of small forebay upstream from gage.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 4,960 ft<sup>3</sup>/s Mar. 14, gage height, 7.88 ft; minimum, 1,070 ft<sup>3</sup>/s Dec. 10, caused by refilling of small forebay upstream from gage; minimum daily, 1,120 ft<sup>3</sup>/s Dec. 10-13.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1982 TO SEPTEMBER 1983  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1510	1400	1250	1230	1760	4100	4750	3680	2130	1540	1420	1490
2	1510	1500	1210	1230	1790	3340	4850	3660	2070	1710	1420	1540
3	1510	1580	1210	1230	1790	3180	4890	3610	2060	1740	1400	1550
4	1520	1400	1210	1230	1780	3100	4860	3570	2080	1780	1410	1510
5	1530	1450	1240	1230	1560	2980	4440	3790	2100	1700	1390	1500
6	1560	1610	1250	1220	1460	2990	3730	4210	2090	1530	1330	1510
7	1550	1610	1240	1240	1450	3000	3100	4470	1740	1520	1320	1460
8	1560	1610	1160	1690	1450	3490	2940	4660	1360	1610	1330	1420
9	1530	1610	1130	2330	1410	3720	2920	4670	1500	1580	1330	1420
10	1510	1610	1120	2520	1330	4070	2900	4650	1520	1560	1300	1420
11	1510	1600	1120	2540	1320	4250	2890	4620	1460	1560	1300	1430
12	1500	1600	1120	1970	1340	4540	2880	4050	1420	1510	1310	1430
13	1490	1660	1120	1350	1360	4830	2870	3060	1450	1470	1340	1430
14	1490	1700	1130	1470	1370	4930	2870	2630	1410	1430	1340	1410
15	1480	1700	1190	1680	1390	4900	2680	2560	1400	1360	1340	1400
16	1490	1590	1470	1670	1740	4910	2280	2580	1400	1360	1320	1400
17	1490	1390	1610	1670	2150	4920	2200	2520	1400	1360	1310	1400
18	1500	1530	1710	1620	2790	4910	2190	2490	1420	1380	1360	1420
19	1510	1710	1790	1550	3020	4550	2390	2470	1440	1340	1420	1480
20	1390	1520	1810	1580	3170	4290	2950	2400	1460	1340	1390	1490
21	1530	1290	1720	1540	3300	4260	3300	2240	1480	1330	1350	1460
22	1530	1270	1690	1640	3320	3150	3510	2210	1480	1340	1350	1430
23	1470	1260	1690	1700	3440	2210	3550	2200	1420	1360	1400	1450
24	1440	1260	1650	1700	4030	2070	3580	2420	1410	1390	1400	1470
25	1410	1260	1620	1710	4710	2040	3600	2490	1410	1420	1340	1450
26	1400	1260	1630	1610	4740	1960	3610	2340	1410	1440	1360	1460
27	1390	1260	1620	1570	4710	1940	3730	2280	1440	1440	1400	1460
28	1400	1260	1620	1620	4700	1940	3760	2250	1420	1430	1420	1460
29	1410	1270	1610	1680	---	2070	3780	2230	1470	1430	1430	1470
30	1430	1270	1460	1710	---	2430	3720	2230	1430	1380	1530	1470
31	1400	---	1300	1710	---	3960	---	2260	---	1400	1470	---
TOTAL	45950	44040	43700	50440	68380	109030	101720	95500	47280	45740	42530	43690
MEAN	1482	1468	1410	1627	2442	3517	3391	3081	1576	1475	1372	1456
MAX	1560	1710	1810	2540	4740	4930	4890	4670	2130	1780	1530	1550
MIN	1390	1260	1120	1220	1320	1940	2190	2200	1360	1330	1300	1400
AC-FT	91140	87350	86680	100000	135600	216300	201800	189400	93780	90730	84360	86660
CAL YR 1982	TOTAL	678360	MEAN	1859	MAX	5110	MIN	1120	AC-FT	1346000		
WTR YR 1983	TOTAL	738000	MEAN	2022	MAX	4930	MIN	1120	AC-FT	1464000		

## DESCHUTES RIVER BASIN

14088000 LAKE CREEK NEAR SISTERS, OR

LOCATION.--Lat 44°25'35", long 121°43'30", in NE¼SW¼ 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<sup>2</sup>.

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 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.--Records excellent. No regulation or diversion above station.

AVERAGE DISCHARGE.--68 years (water years 1916-83), 52.7 ft<sup>3</sup>/s, 38,180 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum recorded discharge, 446 ft<sup>3</sup>/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, 1.0 ft<sup>3</sup>/s Nov. 4, 5, 1940; minimum daily, 8 ft<sup>3</sup>/s Nov. 5, 1940, Oct. 6, 1942.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 155 ft<sup>3</sup>/s Jan. 8, gage height, 3.49 ft; minimum, 21 ft<sup>3</sup>/s Sept. 18, 19.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1982 TO SEPTEMBER 1983  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	31	38	45	63	56	88	95	71	77	49	38	36
2	30	37	51	66	56	84	105	71	76	45	38	34
3	32	37	56	80	57	83	101	71	72	45	36	34
4	32	39	60	87	55	83	94	73	71	46	38	32
5	31	41	70	100	53	83	90	76	65	47	37	28
6	35	41	99	103	59	85	86	81	63	46	38	31
7	40	39	118	136	59	86	82	81	61	44	38	32
8	39	41	114	142	65	86	80	81	56	44	37	32
9	33	41	110	127	74	86	80	85	54	43	37	32
10	32	38	101	119	65	90	79	81	60	42	36	33
11	33	36	92	110	61	90	74	75	59	43	35	33
12	33	36	83	102	58	97	72	72	56	44	35	33
13	33	34	78	95	59	105	70	72	57	44	36	32
14	33	34	76	88	59	104	65	72	59	42	35	32
15	33	34	77	84	60	102	66	74	56	40	35	32
16	33	35	84	79	61	99	65	72	53	41	35	32
17	34	41	90	77	81	99	63	72	53	48	35	30
18	33	42	93	74	87	96	52	73	54	44	35	29
19	31	42	98	72	85	88	52	73	53	45	33	25
20	31	42	107	69	93	82	62	75	50	41	33	28
21	34	42	99	71	98	81	64	74	50	40	33	30
22	37	40	92	66	100	80	65	73	50	41	34	33
23	46	39	88	64	96	77	67	75	50	42	36	32
24	39	38	84	65	96	74	68	76	48	41	34	33
25	37	37	80	64	96	75	72	76	47	40	36	33
26	41	37	75	61	95	71	71	76	47	38	38	33
27	41	38	72	61	94	73	72	77	47	39	36	33
28	39	44	70	61	90	69	72	79	46	39	36	30
29	59	51	68	61	---	75	74	80	45	39	38	30
30	51	48	66	59	---	99	72	79	45	39	38	30
31	41	---	65	57	---	93	---	76	---	39	36	---
TOTAL	1127	1182	2561	2563	2068	2683	2230	2342	1680	1320	1115	947
MEAN	36.4	39.4	82.6	82.7	73.9	86.5	74.3	75.5	56.0	42.6	36.0	31.6
MAX	59	51	118	142	100	105	105	85	77	49	38	36
MIN	30	34	45	57	53	69	52	71	45	38	33	25
AC-FT	2240	2340	5080	5080	4100	5320	4420	4650	3330	2620	2210	1880
CAL YR 1982	TOTAL	22218	MEAN	60.9	MAX	340	MIN	29	AC-FT	44070		
WTR YR 1983	TOTAL	21818	MEAN	59.8	MAX	142	MIN	25	AC-FT	43280		

DESCHUTES RIVER BASIN

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14090400 WHITEWATER RIVER NEAR CAMP SHERMAN, OR

LOCATION.--Lat 44°43'04", long 121°38'07", in SE¼NE¼ 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<sup>2</sup>.

PERIOD OF RECORD.--July 1982 to current year..

GAGE.--Water-stage recorder. Altitude of gage is 3,230 ft, from topographic map.

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

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 303 ft<sup>3</sup>/s July 13, 1983, gage height, 2.55 ft; minimum, 50 ft<sup>3</sup>/s Nov. 24, 25, 1982.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 220 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Oct. 29	0200	241	2.33	Mar. 29	2330	254	2.38
Dec. 4	0400	220	2.25	May 30	0100	260	2.40
Jan. 8	0430	300	2.54	June 10	1100	265	2.42
Feb. 17	1700	251	2.37	July 13	2300	*303	*2.55

Minimum, 50 ft<sup>3</sup>/s Nov. 24, 25.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1982 TO SEPTEMBER 1983  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP		
1	56	68	56	61	75	120	126	84	213	181	149	106		
2	56	64	67	60	73	116	122	84	192	185	142	107		
3	58	61	135	61	71	123	120	84	185	139	131	94		
4	55	61	182	125	70	127	116	88	176	128	121	85		
5	56	67	141	154	68	122	114	95	172	147	122	83		
6	59	71	169	238	69	121	107	93	167	147	120	80		
7	59	63	135	253	68	124	103	93	170	141	119	77		
8	60	63	116	267	68	134	101	93	196	124	122	78		
9	60	60	98	215	68	151	99	90	199	116	127	75		
10	60	59	85	189	69	169	99	86	238	114	129	73		
11	59	58	82	156	76	153	95	84	190	126	121	76		
12	58	56	79	144	76	159	90	84	170	167	108	88		
13	55	54	77	134	75	167	88	84	165	225	106	82		
14	54	53	76	126	71	151	86	84	151	225	112	81		
15	54	53	100	117	72	141	84	90	163	151	113	78		
16	53	54	139	113	74	132	83	88	153	120	108	76		
17	59	74	105	108	160	128	83	86	149	116	102	73		
18	56	74	91	107	154	122	83	88	151	114	101	72		
19	54	66	89	103	124	116	84	91	136	134	97	74		
20	52	62	88	97	118	112	86	97	122	134	91	72		
21	60	60	87	93	123	110	90	108	118	120	88	68		
22	79	58	83	90	143	107	95	116	118	122	86	65		
23	112	55	79	89	147	103	95	124	116	140	84	64		
24	70	51	75	88	146	103	93	141	114	143	84	64		
25	63	52	74	85	140	99	91	172	118	132	86	64		
26	64	52	73	87	132	97	90	183	124	119	87	65		
27	61	56	70	88	124	95	88	178	126	114	87	68		
28	61	66	67	83	119	93	86	203	128	115	89	69		
29	153	65	67	79	---	130	86	233	139	116	122	64		
30	93	60	65	77	---	176	86	251	139	123	129	61		
31	76	---	63	77	---	143	---	233	---	142	106	---		
TOTAL	2025	1816	2913	3764	2773	3944	2869	3708	4698	4320	3389	2282		
MEAN	65.3	60.5	94.0	121	99.0	127	95.6	120	157	139	109	76.1		
MAX	153	74	182	267	160	176	126	251	238	225	149	107		
MIN	52	51	56	60	68	93	83	84	114	114	84	61		
CFSM	3.12	2.89	4.50	5.79	4.74	6.08	4.57	5.74	7.51	6.65	5.22	3.64		
IN.	3.60	3.23	5.18	6.70	4.94	7.02	5.11	6.60	8.36	7.69	6.03	4.06		
AC-FT	4020	3600	5780	7470	5500	7820	5690	7350	9320	8570	6720	4530		
WTR YR 1983	TOTAL	38501	MEAN	105	MAX	267	MIN	51	CFSM	5.02	IN.	68.53	AC-FT	76370



## DESCHUTES RIVER BASIN

## 14091500 METOLIUS RIVER NEAR GRANDVIEW, OR

LOCATION.--Lat 44°37'33", long 121°28'55", in SE¼SW¼ 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<sup>2</sup>, at cableway 1.0 mi downstream, where all discharge measurements are made. Hydrologic drainage boundary uncertain owing to 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 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.--Records excellent. No regulation. Many small diversions for irrigation above station. Stream is spring fed. Records herein are for measuring site.

AVERAGE DISCHARGE.--63 years (water years 1913, 1922-83), 1,497 ft<sup>3</sup>/s, 1,085,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 7,530 ft<sup>3</sup>/s Dec. 24, 1964, gage height, 6.81 ft; minimum, 1,080 ft<sup>3</sup>/s Feb. 17, 1932, Oct. 2-31, Nov. 6, 7, 10-14, 1942.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 2,820 ft<sup>3</sup>/s Feb. 18, gage height, 3.02 ft; minimum, 1,390 ft<sup>3</sup>/s Nov. 24.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1982 TO SEPTEMBER 1983  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1440	1470	1440	1470	1630	2000	2090	1690	1940	1800	1700	1630
2	1440	1450	1470	1480	1610	1960	2060	1680	1890	1850	1680	1590
3	1440	1440	1700	1500	1610	1960	1990	1680	1860	1770	1660	1570
4	1440	1440	1850	1700	1590	2000	1950	1700	1820	1740	1650	1570
5	1430	1450	1720	1850	1580	1950	1910	1710	1800	1760	1650	1550
6	1450	1480	1870	2160	1590	1960	1890	1700	1800	1770	1650	1540
7	1450	1450	1720	2300	1590	1980	1860	1700	1810	1740	1650	1550
8	1450	1440	1650	2310	1610	1980	1840	1700	1840	1710	1650	1540
9	1450	1430	1610	2170	1670	2020	1830	1680	1860	1690	1650	1540
10	1440	1420	1590	2060	1660	2100	1810	1660	1940	1680	1650	1540
11	1440	1410	1570	1950	1710	2040	1790	1650	1860	1700	1640	1560
12	1430	1410	1550	1910	1710	2060	1770	1650	1790	1740	1620	1540
13	1430	1410	1530	1850	1730	2160	1750	1640	1770	1800	1610	1540
14	1420	1400	1540	1820	1710	2110	1740	1640	1760	1850	1620	1540
15	1410	1400	1600	1780	1720	2040	1730	1660	1780	1740	1610	1540
16	1410	1410	1830	1760	1740	2010	1710	1650	1760	1700	1600	1530
17	1430	1480	1730	1740	2110	1990	1710	1650	1770	1740	1590	1520
18	1410	1490	1700	1730	2730	1960	1700	1650	1790	1710	1590	1530
19	1410	1450	1670	1720	2400	1910	1700	1670	1770	1720	1590	1520
20	1410	1440	1650	1690	2220	1880	1710	1680	1750	1720	1580	1520
21	1430	1440	1660	1670	2170	1860	1720	1710	1720	1700	1570	1520
22	1460	1430	1630	1660	2260	1850	1720	1730	1720	1690	1580	1520
23	1560	1410	1600	1660	2220	1830	1710	1740	1730	1710	1580	1520
24	1470	1400	1570	1670	2160	1810	1700	1790	1710	1720	1570	1520
25	1440	1400	1540	1650	2110	1790	1710	1840	1700	1700	1570	1510
26	1450	1400	1540	1680	2060	1800	1700	1870	1720	1680	1580	1520
27	1440	1420	1520	1680	2020	1780	1690	1860	1730	1670	1580	1520
28	1440	1470	1500	1650	2000	1770	1690	1890	1730	1660	1580	1510
29	1700	1490	1500	1650	---	2150	1700	1970	1740	1670	1650	1510
30	1580	1480	1480	1630	---	2330	1690	2030	1750	1660	1650	1510
31	1510	---	1470	1640	---	2150	---	2000	---	1690	1610	---
TOTAL	45110	43110	50000	55190	52920	61190	53570	53870	53610	53480	50160	46120
MEAN	1455	1437	1613	1780	1890	1974	1786	1738	1787	1725	1618	1537
MAX	1700	1490	1870	2310	2730	2330	2090	2030	1940	1850	1700	1630
MIN	1410	1400	1440	1470	1580	1770	1690	1640	1700	1660	1570	1510
AC-FT	89480	85510	99170	109500	105000	121400	106300	106900	106300	106100	99490	91480

CAL YR 1982 TOTAL 608730 MEAN 1668 MAX 4340 MIN 1400 AC-FT 1207000  
WTR YR 1983 TOTAL 618330 MEAN 1694 MAX 2730 MIN 1400 AC-FT 1226000

DESCHUTES RIVER BASIN

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14092100 LAKE BILLY CHINOOK NEAR METOLIUS, OR

LOCATION.--Lat 44°36'14", long 121°16'40", in SW¼NE¼ 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<sup>2</sup>, 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 FPC 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 observed since first filling, 431,100 acre-ft Feb. 13, 1972, elevation, 1,917.13 ft.

EXTREMES FOR CURRENT YEAR.--Maximum contents observed, 534,300 acre-ft Aug. 16, elevation, 1,944.88 ft; minimum observed, 515,200 acre-ft Feb. 16, elevation, 1,939.97 ft.

MONTHEND ELEVATION AND CONTENTS AT 2400, WATER YEAR OCTOBER 1982 TO SEPTEMBER 1983

Date	Elevation (feet)	Contents (acre-feet)	Change in contents (acre-feet)
Sept. 30.....	1,944.27	531,800	-
Oct. 31.....	1,944.02	530,900	-900
Nov. 30.....	1,944.12	531,200	+300
Dec. 31.....	1,943.24	527,800	-3,400
CAL YR 1982.....	-	-	+6,100
Jan. 31.....	1,943.30	528,000	+200
Feb. 28.....	1,943.62	529,300	+1,300
Mar. 31.....	1,943.34	528,200	-1,100
Apr. 30.....	1,943.44	528,600	+400
May 31.....	1,944.21	531,600	+3,000
June 30.....	1,944.60	533,100	+1,500
July 31.....	1,944.61	533,200	+100
Aug. 31.....	1,944.83	534,100	+900
Sept. 30.....	1,941.20	519,900	-14,200
WTR YR 1983.....	-	-	-11,900

## DESCHUTES RIVER BASIN

14092500 DESCHUTES RIVER NEAR MADRAS, OR

LOCATION.--Lat 44°43'34", long 121°14'45", in SE¼SW¼ 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<sup>2</sup>, 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 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.--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.--60 years, 4,513 ft<sup>3</sup>/s, 3,270,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 22,500 ft<sup>3</sup>/s July 16, 1983, accidental release from Pelton Dam, gage height, 7.70 ft, from floodmarks; minimum, 916 ft<sup>3</sup>/s July 4, 1982, caused by power company testing control gates on dam.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 22,500 ft<sup>3</sup>/s July 16, accidental release from Pelton Dam, gage height, 7.70 ft, from floodmarks; minimum, 2,900 ft<sup>3</sup>/s July 25.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1982 TO SEPTEMBER 1983  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	4360	4400	5130	5430	6000	9160	8940	6800	6180	4860	4320	4690
2	4400	4950	5130	5370	6070	9170	9350	6810	6230	5010	4380	4770
3	4340	5110	5130	5270	6490	9190	9660	6800	5920	5620	4420	4680
4	4350	5360	5130	4940	6730	8840	9860	6800	5730	5650	4410	4500
5	4510	5460	5150	5230	6770	8470	9800	6800	5650	5270	4390	4510
6	4660	5390	5350	6000	6720	8070	9330	6790	5660	4940	4630	4400
7	4530	5390	5430	6400	6260	7720	8690	6920	5350	4620	4720	4170
8	4520	5360	5580	6470	5660	7550	7830	7530	4590	4650	4420	3680
9	4720	5240	5700	6540	5550	8140	7430	8060	4270	4780	4230	3770
10	4710	5210	5260	6900	5710	9270	7430	7820	4320	4790	4220	4400
11	4550	5210	4890	7240	6350	9670	7430	7770	4310	4590	4090	4720
12	4500	4960	4850	7240	6810	9170	7340	7770	4310	4490	3960	4470
13	4510	4730	4860	6840	6830	9050	7270	7170	4490	4520	3970	4100
14	4610	4730	4990	5970	6830	9100	7140	6380	4720	4440	3940	4110
15	4710	4710	5150	5510	6470	9060	7050	6160	4830	4320	4190	4200
16	4690	4700	5110	5550	5850	9060	7050	5930	4940	5300	4510	4210
17	4700	4700	5240	6010	5870	9060	6800	4950	5060	5140	4650	4200
18	4690	4690	5340	6340	7140	9070	6230	4720	5060	4780	4500	4220
19	4720	4650	5350	6270	8620	9090	5730	4730	5020	4230	4210	4230
20	4660	4640	5630	6210	8730	9090	5710	4740	4610	4070	4190	4230
21	4680	4620	5790	6040	8730	8720	6090	4800	4510	4100	4200	4230
22	4870	4630	5790	6120	8640	8190	6570	4830	4580	4270	4170	4570
23	5010	4540	5850	6040	8650	8050	6650	5040	4670	4440	4270	4990
24	5010	4580	5890	5950	8740	7110	6480	5160	4730	4420	4380	5030
25	5110	4570	5950	5880	8730	6540	6520	5340	4720	4390	4380	5060
26	5250	4560	5850	6140	8690	6260	6710	5630	4820	4440	4320	5010
27	5210	4590	5600	6440	8750	6260	6820	5790	4650	4410	4300	5020
28	5230	4610	5410	6200	8890	6260	6750	5780	4530	4440	4310	5070
29	5120	4710	5360	5790	---	6260	6810	5780	4500	4390	4350	5080
30	4820	4990	5390	5800	---	6680	6800	5790	4620	4310	4680	5000
31	4410	---	5430	5920	---	7650	---	6020	---	4310	4730	---
TOTAL	146160	145990	166710	188050	201280	254980	222270	191410	147580	143990	134440	135320
MEAN	4715	4866	5378	6066	7189	8225	7409	6175	4919	4645	4337	4511
MAX	5250	5460	5950	7240	8890	9670	9860	8060	6230	5650	4730	5080
MIN	4340	4400	4850	4940	5550	6260	5710	4720	4270	4070	3940	3680
AC-FT	289900	289600	330700	373000	399200	505800	440900	379700	292700	285600	266700	268400
CAL YR 1982	TOTAL	1930700	MEAN	5290	MAX	14300	MIN	3980	AC-FT	3830000		
WTR YR 1983	TOTAL	2078180	MEAN	5694	MAX	9860	MIN	3680	AC-FT	4122000		

## DESCHUTES RIVER BASIN

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14092500 DESCHUTES RIVER NEAR MADRAS, OR--Continued

## WATER-QUALITY RECORDS

## PERIOD OF DAILY RECORD.--

WATER TEMPERATURES: October 1971 to current year.

INSTRUMENTATION.--Temperature recorder since October 1971.

## EXTREMES FOR PERIOD OF DAILY RECORD.--

WATER TEMPERATURES: 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 TEMPERATURES: Maximum recorded, 15.5°C Sept. 5-8, 10, 12, 13; minimum recorded, 7.5°C on many days during December to February.

## TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1982 TO SEPTEMBER 1983

DAY	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN
	OCTOBER		NOVEMBER		DECEMBER		JANUARY		FEBRUARY		MARCH	
1	---	---	11.5	11.0	9.5	9.5	8.0	7.5	8.0	8.0	---	---
2	---	---	11.0	11.0	9.5	9.5	8.0	7.5	8.0	8.0	8.5	8.5
3	---	---	11.0	10.5	9.5	9.5	8.0	7.5	8.0	7.5	8.5	8.5
4	---	---	11.0	10.5	9.5	9.5	8.0	7.5	8.0	7.5	8.5	8.5
5	---	---	11.0	10.5	9.5	9.5	8.0	8.0	---	---	8.5	8.0
6	---	---	11.0	10.5	9.5	9.5	8.0	8.0	---	---	8.5	8.0
7	13.5	13.0	10.5	10.5	9.5	9.0	8.5	8.0	---	---	8.5	8.0
8	13.5	13.0	---	---	9.0	9.0	8.5	8.0	---	---	8.5	8.5
9	13.5	13.0	---	---	9.0	9.0	8.0	8.0	---	---	8.5	8.0
10	13.5	13.0	---	---	9.0	8.5	8.0	7.5	---	---	8.5	8.0
11	13.5	13.0	---	---	9.0	9.0	8.0	7.5	---	---	8.5	8.0
12	13.5	13.0	---	---	9.0	9.0	8.0	8.0	---	---	8.5	8.0
13	13.5	13.0	---	---	9.0	8.5	8.0	7.5	---	---	9.0	8.5
14	13.5	12.5	---	---	9.0	8.5	8.0	7.5	---	---	8.5	8.5
15	13.0	12.5	---	---	9.0	8.5	7.5	7.5	---	---	8.5	8.5
16	13.0	12.5	10.5	10.5	9.0	8.5	7.5	7.5	---	---	9.0	8.5
17	12.5	12.5	10.5	10.5	8.5	8.5	7.5	7.5	---	---	9.0	9.0
18	13.0	12.5	10.5	10.5	9.0	8.5	8.0	7.5	---	---	9.0	9.0
19	12.5	12.5	10.5	10.5	9.0	9.0	8.0	7.5	---	---	9.0	9.0
20	12.5	12.0	10.5	10.0	9.0	8.5	8.0	7.5	---	---	9.0	9.0
21	12.5	12.0	10.0	10.0	9.0	8.5	7.5	7.5	---	---	9.5	9.0
22	12.0	12.0	10.0	10.0	9.0	8.5	7.5	7.5	---	---	9.0	9.0
23	12.5	12.0	10.0	10.0	9.0	8.5	8.0	7.5	---	---	9.5	9.0
24	12.0	12.0	10.0	9.5	8.5	8.5	8.0	7.5	---	---	9.0	8.5
25	12.0	12.0	10.0	9.5	8.5	8.5	8.0	7.5	---	---	9.0	8.5
26	12.0	11.5	9.5	9.5	8.5	8.0	8.0	8.0	---	---	9.0	8.5
27	12.0	11.5	9.5	9.5	8.5	8.0	8.0	7.5	---	---	9.0	8.5
28	12.0	11.5	9.5	9.5	8.5	8.0	8.0	7.5	---	---	9.0	9.0
29	11.5	11.5	9.5	9.5	8.5	8.0	8.0	8.0	---	---	9.0	9.0
30	11.5	11.0	9.5	9.5	8.0	8.0	8.0	8.0	---	---	9.0	8.5
31	11.5	11.0	---	---	8.0	7.5	8.0	8.0	---	---	9.0	9.0
MONTH	13.5	11.0	11.5	9.5	9.5	7.5	8.5	7.5	8.0	7.5	9.5	8.0

## DESCHUTES RIVER BASIN

14092500 DESCHUTES RIVER NEAR MADRAS, OR--Continued

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1982 TO SEPTEMBER 1983

DAY	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN
	APRIL		MAY		JUNE		JULY		AUGUST		SEPTEMBER	
1	9.0	8.5	10.5	10.0	12.5	12.0	13.0	12.5	14.5	14.0	15.0	14.5
2	9.0	8.5	10.5	10.0	12.5	11.5	13.0	12.5	15.0	14.0	15.0	14.5
3	9.0	9.0	11.0	10.0	12.5	11.5	13.5	12.5	14.5	14.0	15.0	14.5
4	9.0	8.5	10.5	10.0	12.5	11.5	13.5	12.5	15.0	14.0	15.0	14.5
5	9.5	9.0	10.5	10.0	12.5	12.0	13.5	13.0	15.0	14.0	15.5	14.5
6	9.5	9.0	10.5	10.0	12.5	12.0	13.5	13.0	15.0	14.0	15.5	14.5
7	9.5	9.0	10.5	10.0	12.5	12.0	13.5	13.0	15.0	14.0	15.5	14.5
8	9.5	9.0	11.0	10.5	12.5	12.0	13.5	13.0	15.0	14.0	15.5	14.5
9	9.5	9.0	10.5	10.0	12.5	12.0	13.5	13.0	14.5	14.0	15.0	15.0
10	9.5	9.0	11.0	10.0	12.5	12.0	14.0	13.0	14.5	14.0	15.5	14.5
11	9.0	9.0	11.0	10.5	12.5	12.0	14.0	13.0	15.0	14.5	15.0	14.5
12	9.0	9.0	11.0	10.5	12.5	12.0	13.5	13.0	15.0	14.5	15.5	14.5
13	9.5	9.0	11.0	10.5	12.5	12.0	13.5	13.0	---	---	15.5	14.5
14	10.0	9.0	11.0	10.5	12.5	12.0	13.5	13.0	---	---	15.0	14.5
15	9.5	9.0	11.0	10.5	13.0	12.0	13.5	13.0	---	---	15.0	14.5
16	10.0	9.0	11.0	10.5	13.0	12.0	14.0	13.5	---	---	15.0	14.5
17	9.5	9.0	11.0	10.5	13.0	12.5	14.0	13.5	---	---	15.0	14.5
18	10.0	9.5	11.5	10.5	13.0	12.0	14.0	13.5	---	---	15.0	14.5
19	9.5	9.0	11.5	10.5	13.0	12.0	14.0	13.5	---	---	15.0	14.5
20	10.0	9.5	11.5	10.5	12.5	12.0	14.0	13.5	---	---	15.0	14.5
21	10.0	9.5	11.5	10.5	13.0	12.0	14.0	13.5	---	---	14.5	14.0
22	9.5	9.5	11.5	11.0	13.0	12.5	14.5	13.5	---	---	14.5	14.0
23	10.0	9.5	11.5	11.0	13.0	12.5	14.0	13.5	---	---	14.5	14.0
24	10.0	9.5	12.0	11.0	13.0	12.5	14.0	13.5	---	---	14.5	14.0
25	10.0	9.5	12.0	11.0	13.0	12.5	14.5	13.5	---	---	14.5	14.0
26	10.5	10.0	12.0	11.0	13.0	12.5	14.0	13.5	---	---	14.5	14.0
27	10.5	10.0	12.0	11.5	13.0	12.5	14.5	13.5	---	---	14.5	14.0
28	10.0	10.0	12.0	11.5	13.0	12.5	14.5	13.5	---	---	14.5	14.0
29	10.5	10.0	12.5	11.5	13.0	12.5	14.5	14.0	---	---	14.5	14.0
30	10.5	10.0	12.0	11.5	13.0	12.5	14.5	14.0	---	---	14.5	14.0
31	---	---	12.0	11.5	---	---	14.5	14.0	---	---	---	---
MONTH	10.5	8.5	12.5	10.0	13.0	11.5	14.5	12.5	15.0	14.0	15.5	14.0

DESCHUTES RIVER BASIN

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14092750 SHITIKE CREEK AT PETERS PASTURE, NEAR WARM SPRINGS, OR

LOCATION.--Lat 44°45'02", long 121°37'56", in NW¼NE¼ 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 Warm Springs.

DRAINAGE AREA.--22.9 mi<sup>2</sup>.

PERIOD OF RECORD.--July 1982 to current year.

GAGE.--Water-stage recorder. Altitude of gage is 3,580 ft, from topographic map.

REMARKS.--Records good. No regulation or diversion above station.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 690 ft<sup>3</sup>/s Jan. 6, 1983, gage height, 2.67 ft; minimum, 41 ft<sup>3</sup>/s Sept. 27-30, 1983.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 400 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Dec. 4	0800	490	2.39	Jan. 6	2130	*690	*2.67

Minimum, 41 ft<sup>3</sup>/s Sept. 27-30.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1982 TO SEPTEMBER 1983  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP		
1	47	75	57	51	70	132	151	89	259	143	93	64		
2	46	66	62	53	66	127	141	94	223	185	85	59		
3	49	60	199	52	63	124	129	95	203	138	83	57		
4	46	59	419	116	60	133	115	97	178	123	79	55		
5	45	58	255	212	59	141	106	110	164	134	79	53		
6	45	70	312	501	59	138	105	111	166	134	76	52		
7	48	64	188	582	59	141	96	109	173	112	73	52		
8	49	60	137	506	59	144	90	106	214	98	73	50		
9	54	58	112	346	59	152	88	98	214	92	74	50		
10	53	54	96	243	61	227	84	89	254	92	74	50		
11	50	50	84	189	65	222	81	85	210	103	72	53		
12	47	49	80	161	68	200	77	82	161	124	70	50		
13	45	47	74	140	71	213	73	80	144	175	67	49		
14	44	45	72	127	71	197	72	81	139	138	65	48		
15	43	44	85	112	69	179	72	96	149	102	65	48		
16	42	43	164	106	71	152	69	100	132	94	64	47		
17	48	61	147	99	166	139	68	98	132	102	63	46		
18	46	84	121	95	307	129	68	100	147	101	62	46		
19	43	75	106	91	228	128	70	110	132	118	61	48		
20	42	71	99	87	184	107	71	125	121	110	59	47		
21	43	63	94	81	164	104	71	156	107	97	59	46		
22	59	59	87	78	180	100	100	178	104	95	59	46		
23	119	55	80	76	182	96	102	189	109	101	58	45		
24	67	50	72	76	182	91	98	221	103	103	58	45		
25	58	49	68	74	182	89	93	270	97	98	59	44		
26	57	49	67	79	167	85	89	290	105	87	60	43		
27	56	49	63	81	152	83	86	263	117	86	58	41		
28	55	60	59	80	136	80	86	282	113	88	57	41		
29	199	63	56	76	---	95	86	330	119	85	66	41		
30	126	62	53	73	---	195	86	373	118	85	71	41		
31	94	---	50	72	---	177	---	336	---	92	61	---		
TOTAL	1865	1752	3618	4715	3260	4320	2723	4843	4607	3435	2103	1457		
MEAN	60.2	58.4	117	152	116	139	90.8	156	154	111	67.8	48.6		
MAX	199	84	419	582	307	227	151	373	259	185	93	64		
MIN	42	43	50	51	59	80	68	80	97	85	57	41		
CFSM	2.87	2.79	5.59	7.26	5.54	6.64	4.34	7.45	7.35	5.30	3.24	2.32		
IN.	3.31	3.11	6.43	8.38	5.79	7.67	4.84	8.60	8.18	6.10	3.74	2.59		
AC-FT	3700	3480	7180	9350	6470	8570	5400	9610	9140	6810	4170	2890		
WTR YR 1983	TOTAL	38698	MEAN	106	MAX	582	MIN	41	CFSM	5.06	IN.	68.75	AC-FT	76760



## DESCHUTES RIVER BASIN

14092885 SHITIKE CREEK BELOW WOLFORD CANYON, NEAR WARM SPRINGS, OR

LOCATION.--Lat 44°46'20", long 121°18'15", in NW¼SE¼ 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<sup>2</sup>.

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 station 14093000) at sites downstream not equivalent owing to difference in drainage areas.

GAGE.--Water-stage recorder. Altitude of gage is 1,600 ft, from topographic map.

REMARKS.--Records good. No regulation. Some diversion for irrigation and Warm Springs water supply.

AVERAGE DISCHARGE.--9 years, 97.9 ft<sup>3</sup>/s, 17.54 in/yr, 70,930 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,480 ft<sup>3</sup>/s Feb. 21, 1982, gage height, 6.91 ft, from floodmark, from rating curve extended above 620 ft<sup>3</sup>/s; maximum gage height, 7.35 ft Dec. 13, 1977; minimum daily discharge, 17 ft<sup>3</sup>/s Oct. 12-15, 17-22, 24-27, Nov. 12, 1978.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 400 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Jan. 6	2300	*488	*5.01	Feb. 18	0300	484	5.00

Minimum, 52 ft<sup>3</sup>/s Sept. 27-30.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1982 TO SEPTEMBER 1983  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP		
1	64	100	76	71	116	240	246	121	233	150	114	87		
2	62	87	74	76	108	229	236	125	229	203	106	81		
3	65	80	160	83	103	222	214	125	215	175	101	75		
4	64	75	325	122	98	227	199	129	195	150	97	71		
5	62	75	240	196	94	223	188	141	180	151	96	68		
6	61	89	269	374	94	219	178	143	177	164	95	67		
7	67	85	203	457	93	226	169	140	179	139	93	65		
8	68	80	160	434	96	222	162	135	203	122	92	65		
9	71	75	138	335	107	240	155	128	218	111	92	66		
10	70	71	121	273	115	282	148	119	224	105	92	66		
11	68	68	107	233	156	271	141	109	227	114	90	68		
12	64	66	100	206	147	267	134	102	181	134	87	66		
13	62	64	94	185	148	293	129	101	164	151	84	63		
14	61	62	90	169	143	274	123	102	160	200	85	62		
15	60	61	107	157	142	251	118	113	168	137	84	62		
16	58	60	195	149	153	236	114	123	159	113	83	60		
17	63	69	184	140	227	222	111	119	151	118	81	60		
18	65	109	151	140	460	206	111	119	171	119	79	59		
19	61	100	138	140	359	193	115	129	157	124	78	62		
20	59	89	129	127	307	182	119	138	145	137	77	60		
21	60	83	126	117	286	176	123	160	131	125	75	59		
22	71	77	118	112	305	177	135	180	122	114	76	57		
23	114	73	107	109	315	166	142	186	128	119	76	56		
24	99	67	96	121	310	159	140	198	126	126	76	55		
25	79	67	90	114	290	156	136	226	118	124	75	54		
26	79	64	86	135	272	144	130	233	121	111	80	54		
27	75	65	80	139	257	147	124	230	139	105	76	52		
28	70	76	74	130	245	137	123	231	142	108	75	52		
29	170	86	70	124	---	149	122	233	143	108	84	52		
30	161	82	66	118	---	311	121	233	150	102	98	52		
31	120	---	64	122	---	267	---	233	---	106	84	---		
TOTAL	2373	2305	4038	5408	5546	6714	4406	4804	5056	4065	2681	1876		
MEAN	76.5	76.8	130	174	198	217	147	155	169	131	86.5	62.5		
MAX	170	109	325	457	460	311	246	233	233	203	114	87		
MIN	58	60	64	71	93	137	111	101	118	102	75	52		
CFSM	1.01	1.01	1.72	2.30	2.61	2.86	1.94	2.04	2.23	1.73	1.14	.82		
IN.	1.16	1.13	1.98	2.65	2.72	3.29	2.16	2.36	2.48	1.99	1.32	.92		
AC-FT	4710	4570	8010	10730	11000	13320	8740	9530	10030	8060	5320	3720		
CAL YR 1982	TOTAL	50935	MEAN	140	MAX	950	MIN	58	CFSM	1.85	IN.	25.00	AC-FT	101000
WTR YR 1983	TOTAL	49272	MEAN	135	MAX	460	MIN	52	CFSM	1.78	IN.	24.18	AC-FT	97730

DESCHUTES RIVER BASIN

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14097100 WARM SPRINGS RIVER NEAR KAHNEETA HOT SPRINGS, OR

LOCATION.--Lat 44°51'24", long 121°08'55", in SE¼SW¼ 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<sup>2</sup>.

PERIOD OF RECORD.--October 1972 to current year.

GAGE.--Water-stage recorder. Altitude of gage is 1,400 ft, from topographic map.

REMARKS.--Records excellent. No regulation. Diversions above station.

AVERAGE DISCHARGE.--11 years, 455 ft<sup>3</sup>/s, 11.75 in/yr, 329,600 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 6,540 ft<sup>3</sup>/s Dec. 15, 1977, gage height, 8.86 ft; minimum daily, 160 ft<sup>3</sup>/s Jan. 1, 2, 1979.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 1,700 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Jan. 8	1700	2,870	5.43	Mar. 10	1030	1,860	4.22
Feb. 18	1100	*4,600	*7.12	Mar. 13	1530	1,920	4.31
Feb. 22	0630	1,770	4.10	Mar. 30	1330	3,230	5.81

Minimum, 265 ft<sup>3</sup>/s Sept. 16.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1982 TO SEPTEMBER 1983  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP		
1	295	374	345	355	660	1130	1410	580	562	371	306	314		
2	293	350	339	355	603	1070	1380	580	529	393	304	300		
3	293	330	437	370	564	1030	1190	576	502	388	303	291		
4	295	320	645	469	540	1010	1060	582	480	374	304	287		
5	291	320	685	1130	520	981	972	622	462	365	302	285		
6	291	340	711	2170	511	1010	907	616	449	356	301	283		
7	302	320	640	2310	526	1100	859	611	440	351	299	282		
8	315	310	532	2470	543	1070	814	603	435	354	301	281		
9	309	300	476	2000	600	1300	780	590	431	348	294	281		
10	299	300	443	1510	801	1650	754	569	433	342	292	280		
11	295	295	416	1230	1170	1400	726	550	466	339	292	281		
12	292	290	400	1040	1010	1370	695	536	450	335	291	279		
13	290	285	395	920	942	1680	673	522	427	335	290	278		
14	289	285	393	817	785	1600	647	508	407	341	289	275		
15	289	290	415	749	802	1330	625	528	400	340	287	275		
16	288	302	876	720	855	1200	607	556	393	336	285	274		
17	290	321	975	726	1170	1130	595	536	388	344	284	270		
18	297	361	738	701	3620	1040	592	523	391	346	285	271		
19	293	375	637	724	2230	962	596	526	399	340	286	274		
20	291	362	588	680	1640	897	605	528	399	336	286	274		
21	295	348	580	603	1420	867	606	531	395	327	286	282		
22	304	335	648	573	1650	862	616	543	383	323	286	280		
23	330	322	568	564	1480	828	627	550	378	320	284	282		
24	320	311	480	731	1450	783	629	553	374	319	286	280		
25	310	308	436	662	1390	779	614	560	371	322	287	279		
26	313	308	446	843	1370	720	601	569	372	319	299	278		
27	316	311	405	850	1240	755	589	568	373	317	297	276		
28	313	335	370	681	1240	704	595	558	372	316	296	275		
29	387	364	384	642	---	698	612	558	369	312	318	277		
30	474	366	363	611	---	2530	591	559	365	308	319	279		
31	403	---	362	681	---	1780	---	588	---	308	304	---		
TOTAL	9662	9738	16128	28887	31332	35266	22567	17379	12595	10525	9143	8423		
MEAN	312	325	520	932	1119	1138	752	561	420	340	295	281		
MAX	474	375	975	2470	3620	2530	1410	622	562	393	319	314		
MIN	288	285	339	355	511	698	589	508	365	308	284	270		
CFSM	.59	.62	.99	1.77	2.13	2.16	1.43	1.07	.80	.65	.56	.53		
IN.	.68	.69	1.14	2.04	2.22	2.49	1.60	1.23	.89	.74	.65	.60		
AC-FT	19160	19320	31990	57300	62150	69950	44760	34470	24980	20880	18140	16710		
CAL YR 1982	TOTAL	211405	MEAN	579	MAX	4440	MIN	283	CFSM	1.10	IN.	14.95	AC-FT	419300
WTR YR 1983	TOTAL	211645	MEAN	580	MAX	3620	MIN	270	CFSM	1.10	IN.	14.97	AC-FT	419800

## DESCHUTES RIVER BASIN

14101500 WHITE RIVER BELOW TYGH VALLEY, OR

LOCATION.--Lat 45°14'30", long 121°05'38", in NE¼NE¼ 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<sup>2</sup>.

## WATER-DISCHARGE RECORDS

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 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.--Records excellent. No regulation. Diversions above station for irrigation.

AVERAGE DISCHARGE.--66 years, 429 ft<sup>3</sup>/s, 310,800 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 13,300 ft<sup>3</sup>/s Jan. 6, 1923, gage height, about 13.3 ft, site and datum then in use, from rating curve extended above 5,000 ft<sup>3</sup>/s; minimum, 7.5 ft<sup>3</sup>/s Aug. 31, 1961.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 1,600 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Jan. 7	0030	3,980	6.60	Mar. 13	1000	2,390	5.19
Feb. 18	1100	*4,070	*6.68	Mar. 30	0500	2,760	5.53
Feb. 22	0300	2,120	4.92				

Minimum, 117 ft<sup>3</sup>/s Aug. 24, 25.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1982 TO SEPTEMBER 1983  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	147	314	292	340	634	1340	1590	592	529	228	152	179
2	142	283	287	337	606	1260	1520	586	491	269	152	161
3	143	261	681	346	578	1200	1300	561	462	256	150	149
4	139	243	1040	635	552	1160	1150	558	421	232	149	148
5	137	241	829	1440	531	1120	1040	656	395	218	148	145
6	135	301	1010	2830	521	1130	956	625	368	210	146	140
7	153	276	808	3730	517	1250	891	612	356	203	145	138
8	186	255	671	3460	529	1300	821	592	352	199	147	139
9	197	242	592	2590	560	1560	768	551	350	194	145	144
10	169	231	528	2010	702	1950	728	504	366	188	139	139
11	158	222	478	1660	1200	1800	683	467	358	180	137	156
12	152	216	450	1420	1080	1750	637	456	320	175	140	144
13	152	212	432	1250	983	2040	604	452	302	186	138	139
14	159	205	429	1110	899	1780	572	456	289	230	139	135
15	148	198	536	1000	911	1560	549	508	285	207	139	132
16	138	198	1140	933	989	1420	533	487	280	187	133	134
17	143	239	1010	895	1280	1300	532	464	268	185	131	131
18	150	361	802	847	3200	1180	540	471	283	188	131	129
19	143	360	699	848	2310	1080	566	481	291	189	132	140
20	141	318	685	787	1770	998	593	482	281	185	133	129
21	144	295	699	718	1610	942	614	505	242	172	129	126
22	170	276	706	675	2000	920	624	516	228	165	127	127
23	207	259	596	658	1870	883	620	532	221	164	124	132
24	185	242	521	682	1840	832	702	564	218	165	120	132
25	167	247	483	651	1700	801	643	592	212	172	120	130
26	177	241	463	791	1580	760	607	599	218	163	126	130
27	193	242	422	837	1470	773	575	582	217	160	129	128
28	191	267	378	765	1380	723	573	578	205	161	133	126
29	587	304	383	723	---	830	599	609	205	154	165	125
30	530	306	357	678	---	2390	583	615	206	151	201	126
31	361	---	351	665	---	1850	---	586	---	151	170	---
TOTAL	5944	7855	18758	36311	33802	39882	22713	16839	9219	5887	4370	4133
MEAN	192	262	605	1171	1207	1287	757	543	307	190	141	138
MAX	587	361	1140	3730	3200	2390	1590	656	529	269	201	179
MIN	135	198	287	337	517	723	532	452	205	151	120	125
AC-FT	11790	15580	37210	72020	67050	79110	45050	33400	18290	11680	8670	8200
CAL YR 1982	TOTAL	202982	MEAN	556	MAX	4160	MIN	116	AC-FT	402600		
WTR YR 1983	TOTAL	205713	MEAN	564	MAX	3730	MIN	120	AC-FT	408000		

## DESCHUTES RIVER BASIN

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14101500 WHITE RIVER BELOW TYGH VALLEY, OR--Continued

## WATER-QUALITY RECORDS

## PERIOD OF DAILY RECORD.--

SEDIMENT DISCHARGES: October 1981 to September 1983, discontinued.

INSTRUMENTATION.--Automatic pumping sampler since October 1981.

REMARKS.--Supplemental tables for sediment concentration and discharge for greater-than and less-than 0.062 mm are included.

## EXTREMES FOR PERIOD OF DAILY RECORD.--

SEDIMENT CONCENTRATIONS: Maximum daily, 17,900 mg/l Dec. 15, 1981; minimum daily, 2 mg/l July 27, 1983.

SEDIMENT DISCHARGE: Maximum daily, 57,800 tons Dec. 6, 1981; minimum daily, 0.86 tons July 27, 1983.

## EXTREMES FOR CURRENT YEAR.--

SEDIMENT CONCENTRATIONS: Maximum daily, 1,720 mg/l Jan. 6; minimum daily, 2 mg/l July 27.

SEDIMENT DISCHARGE: Maximum daily, 13,100 tons Jan. 6; minimum daily, 0.86 tons July 27.

## WATER QUALITY DATA, WATER YEAR OCTOBER 1982 TO SEPTEMBER 1983

DATE	TIME	STREAM- FLOW, INSTAN- TANEOUS (CFS)	SEDI- MENT, SUS- PENDE (MG/L)	SEDI- MENT, DIS- CHARGE, SUS- PENDE (T/DAY)	SED. SUSP. FALL DIAM. % FINER THAN .002 MM	SED. SUSP. FALL DIAM. % FINER THAN .004 MM	SED. SUSP. FALL DIAM. % FINER THAN .008 MM
JAN							
06...	1230	2780	1600	12000	--	--	--
FEB							
05...	1630	520	17	24	--	--	--
08...	1500	530	24	34	--	--	--
10...	1030	635	38	65	--	--	--
12...	0930	1070	200	578	--	--	--
13...	1700	953	96	247	--	--	--
15...	1400	862	62	144	--	--	--
17...	1630	1450	1180	4620	--	--	--
18...	0830	3730	2570	25900	17	24	32
18...	1700	3310	655	5850	--	--	--
19...	0700	2450	355	2350	--	--	--
20...	1630	1700	175	803	--	--	--
21...	1600	1520	125	513	--	--	--
22...	1700	1950	240	1260	--	--	--
23...	1730	1860	120	603	--	--	--
24...	1430	1910	180	928	--	--	--
26...	1130	1580	100	427	--	--	--
28...	1700	1330	52	187	--	--	--
MAR							
02...	0930	1270	56	192	--	--	--
03...	1100	1200	52	168	--	--	--
06...	1100	1140	60	185	--	--	--
07...	1500	1250	110	371	--	--	--
09...	1500	1500	350	1420	--	--	--
11...	1100	1810	115	562	--	--	--
12...	1100	1780	135	649	--	--	--
13...	1700	2160	195	1140	--	--	--
16...	0900	1430	68	263	--	--	--
17...	1030	1310	43	152	--	--	--
18...	1400	1180	110	350	--	--	--
19...	1800	1050	33	94	--	--	--
20...	1730	980	26	69	--	--	--
21...	1700	933	27	68	--	--	--
23...	1630	868	19	45	--	--	--
25...	1700	788	16	34	--	--	--
28...	1730	701	15	28	--	--	--
30...	1130	2620	460	3250	--	--	--
APR							
01...	1700	1520	96	394	--	--	--
02...	0930	1540	78	324	--	--	--
05...	1030	1050	25	71	--	--	--

## DESCHUTES RIVER BASIN

14101500 WHITE RIVER BELOW TYGH VALLEY, OR--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1982 TO SEPTEMBER 1983

DATE	SED. SUSP. FALL DIAM. % FINER THAN .016 MM	SED. SUSP. FALL DIAM. % FINER THAN .031 MM	SED. SUSP. FALL DIAM. % FINER THAN .062 MM	SED. SUSP. FALL DIAM. % FINER THAN .125 MM	SED. SUSP. FALL DIAM. % FINER THAN .250 MM	SED. SUSP. FALL DIAM. % FINER THAN .500 MM
JAN						
06...	--	--	30	47	72	85
FEB						
05...	--	--	27	--	--	--
08...	--	--	56	--	--	--
10...	--	--	25	--	--	--
12...	--	--	29	--	--	--
13...	--	--	15	--	--	--
15...	--	--	12	--	--	--
17...	--	--	19	--	--	--
18...	42	53	54	65	81	90
18...	--	--	34	--	--	--
19...	--	--	22	--	--	--
20...	--	--	16	--	--	--
21...	--	--	16	--	--	--
22...	--	--	14	--	--	--
23...	--	--	16	--	--	--
24...	--	--	27	--	--	--
26...	--	--	15	--	--	--
28...	--	--	17	--	--	--
MAR						
02...	--	--	18	--	--	--
03...	--	--	18	--	--	--
06...	--	--	19	--	--	--
07...	--	--	14	--	--	--
09...	--	--	6	--	--	--
11...	--	--	16	--	--	--
12...	--	--	20	--	--	--
13...	--	--	28	--	--	--
16...	--	--	17	--	--	--
17...	--	--	25	--	--	--
18...	--	--	14	--	--	--
19...	--	--	22	--	--	--
20...	--	--	25	--	--	--
21...	--	--	24	--	--	--
23...	--	--	26	--	--	--
25...	--	--	36	--	--	--
28...	--	--	43	--	--	--
30...	--	--	23	--	--	--
APR						
01...	--	--	16	--	--	--
02...	--	--	17	--	--	--
05...	--	--	29	--	--	--

DATE	TIME	STREAM- FLOW, INSTAN- TANEOUS (CFS)	SEDI- MENT, SUS- PENDE (MG/L)	SEDI- MENT, DIS- CHARGE, SUS- PENDE (T/DAY)	SED. SUSP. FALL DIAM. % FINER THAN .062 MM
APR					
07...	1200	894	20	48	38
09...	1100	770	15	31	35
12...	1030	646	10	17	46
16...	1100	540	6	8.7	52
MAY					
26...	1200	604	7	11	56
28...	1200	579	6	9.4	60
30...	1100	620	30	50	85
31...	0800	599	34	55	91
JUN					
25...	1100	212	8	4.6	44
28...	0830	205	16	8.9	58
AUG					
07...	1200	145	6	2.3	78
10...	2000	138	185	69	99
12...	1050	140	886	335	100
13...	1000	135	385	140	100
16...	1000	133	190	68	100
18...	1930	133	60	22	89

## 14101500 WHITE RIVER BELOW TYGH VALLEY, OR--Continued

## SUSPENDED-SEDIMENT, WATER YEAR OCTOBER 1982 TO SEPTEMBER 1983

DAY	MEAN CONCENTRATION (MG/L) LOADS (T/DAY)		MEAN CONCENTRATION (MG/L) LOADS (T/DAY)		MEAN CONCENTRATION (MG/L) LOADS (T/DAY)		MEAN CONCENTRATION (MG/L) LOADS (T/DAY)		MEAN CONCENTRATION (MG/L) LOADS (T/DAY)		MEAN CONCENTRATION (MG/L) LOADS (T/DAY)	
	OCTOBER		NOVEMBER		DECEMBER		JANUARY		FEBRUARY		MARCH	
1	6	2.4	55	47	5	3.9	10	9.2	25	43	55	199
2	6	2.3	53	40	8	6.2	8	7.3	20	33	50	170
3	6	2.3	45	32	550	1010	8	7.5	20	31	50	162
4	6	2.3	42	28	1020	2860	376	1090	15	22	50	157
5	6	2.2	34	22	280	627	716	2930	15	22	50	151
6	8	2.9	35	28	430	1170	1720	13100	15	21	55	168
7	6	2.5	20	15	180	393	1240	12500	20	28	100	337
8	14	7.0	8	5.5	109	197	700	6540	25	36	220	772
9	21	11	8	5.2	50	80	500	3500	50	76	395	1660
10	14	6.4	8	5.0	29	41	360	1950	191	467	485	2550
11	8	3.4	8	4.8	26	34	285	1280	636	2060	130	632
12	7	2.9	8	4.7	24	29	250	958	195	569	105	496
13	7	2.9	7	4.0	21	24	200	675	100	265	305	1680
14	7	3.0	6	3.3	14	16	175	524	70	170	85	409
15	8	3.2	6	3.2	63	91	150	405	180	443	60	253
16	8	3.0	7	3.7	1340	4070	130	327	165	441	60	230
17	9	3.5	8	5.2	310	845	120	290	516	1780	50	175
18	9	3.6	17	17	150	325	110	252	1350	11000	40	127
19	9	3.5	17	17	80	151	100	229	330	2060	35	102
20	9	3.4	16	14	50	92	100	212	180	860	25	67
21	9	3.5	15	12	70	132	95	184	260	1130	25	64
22	11	5.0	14	10	90	172	75	137	200	1080	23	57
23	19	11	13	9.1	60	97	50	89	150	757	20	48
24	19	9.5	13	8.5	40	56	55	101	145	720	18	40
25	16	7.2	14	9.3	30	39	50	88	140	643	15	32
26	10	4.8	13	8.5	25	31	410	876	100	427	15	31
27	7	3.6	11	7.2	20	23	100	226	80	318	15	31
28	5	2.6	11	7.9	18	18	70	145	50	186	15	29
29	75	119	10	8.2	8	8.3	60	117	---	---	241	540
30	68	97	7	5.8	10	9.6	35	64	---	---	802	5070
31	60	58	---	---	12	11	30	54	---	---	125	624
TOTAL	---	394.9	---	391.1	---	12662.0	---	48867.0	---	25688	---	17063

DAY	MEAN CONCENTRATION (MG/L) LOADS (T/DAY)		MEAN CONCENTRATION (MG/L) LOADS (T/DAY)		MEAN CONCENTRATION (MG/L) LOADS (T/DAY)		MEAN CONCENTRATION (MG/L) LOADS (T/DAY)		MEAN CONCENTRATION (MG/L) LOADS (T/DAY)		MEAN CONCENTRATION (MG/L) LOADS (T/DAY)	
	APRIL		MAY		JUNE		JULY		AUGUST		SEPTEMBER	
1	100	429	7	11	22	31	8	4.9	6	2.5	40	19
2	75	308	8	13	17	23	8	5.8	6	2.5	25	11
3	55	193	8	12	15	19	8	5.5	6	2.4	25	10
4	38	118	9	14	11	13	8	5.0	6	2.4	25	10
5	25	70	11	19	10	11	7	4.1	6	2.4	35	14
6	25	65	8	13	9	8.9	7	4.0	6	2.4	35	13
7	22	53	6	9.9	9	8.7	6	3.3	6	2.3	30	11
8	20	44	6	9.6	8	7.6	6	3.2	6	2.4	20	7.5
9	15	31	5	7.4	8	7.6	6	3.1	6	2.3	20	7.8
10	14	28	5	6.8	7	6.9	6	3.0	60	23	20	7.5
11	12	22	4	5.0	7	6.8	7	3.4	392	145	18	7.6
12	10	17	4	4.9	6	5.2	8	3.8	790	299	20	7.8
13	9	15	4	4.9	6	4.9	8	4.0	400	149	23	8.6
14	8	12	4	4.9	6	4.7	8	5.0	250	94	25	9.1
15	7	10	4	5.5	6	4.6	8	4.5	200	75	25	8.9
16	6	8.6	4	5.3	6	4.5	8	4.0	170	61	25	9.0
17	6	8.6	4	5.0	5	3.6	7	3.5	115	41	23	8.1
18	7	10	4	5.1	5	3.8	6	3.0	70	25	20	7.0
19	8	12	5	6.5	5	3.9	6	3.1	50	18	18	6.8
20	8	13	7	9.1	5	3.8	6	3.0	45	16	11	3.8
21	8	13	10	14	5	3.3	6	2.8	40	14	15	5.1
22	8	13	10	14	8	4.9	6	2.7	25	8.6	16	5.5
23	8	13	8	11	13	7.8	5	2.2	25	8.4	16	5.7
24	15	28	6	9.1	11	6.5	5	2.2	20	6.5	18	6.4
25	14	24	6	9.6	8	4.6	4	1.9	20	6.5	18	6.3
26	12	20	6	9.7	8	4.7	3	1.3	20	6.8	16	5.6
27	9	14	5	7.9	8	4.7	2	.86	20	7.0	23	7.9
28	8	12	8	12	8	4.4	3	1.3	30	11	32	11
29	7	11	18	30	8	4.4	4	1.7	60	27	40	13
30	6	9.4	30	50	8	4.4	5	2.0	90	49	50	17
31	---	---	32	51	---	---	6	2.4	55	25	---	---
TOTAL	---	1624.6	---	390.2	---	232.2	---	100.56	---	1137.4	---	271.0

## DESCHUTES RIVER BASIN

14103000 DESCHUTES RIVER AT MOODY, NEAR BIGGS, OR  
(National stream-quality accounting network station)

LOCATION.--Lat 45°37'20", long 120°54'05", in SW¼SE¼ 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<sup>2</sup>, 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 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.--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 (see station 14080400), and since 1964 in Lake Billy Chinook (see station 14092100). Large diversions in upper river basin for irrigation.

AVERAGE DISCHARGE.--79 years, 5,846 ft<sup>3</sup>/s, 4,235,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 75,500 ft<sup>3</sup>/s Dec. 22, 1964, gage height, 11.80 ft, from rating curve extended above 47,000 ft<sup>3</sup>/s; minimum, 2,400 ft<sup>3</sup>/s Dec. 5, 1957.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 21,500 ft<sup>3</sup>/s Feb. 18, gage height, 6.57 ft; minimum, 3,830 ft<sup>3</sup>/s Sept. 9.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1982 TO SEPTEMBER 1983  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	4770	5210	6070	6180	8200	13100	12600	8980	7540	5360	4900	5310
2	4920	5480	6080	6170	8090	13000	13400	8970	7540	5620	4880	5360
3	4930	6070	6500	6130	8120	12700	13200	8900	7350	5930	4940	5340
4	4870	6080	7400	6070	8560	12600	13100	8880	6830	6350	4930	5250
5	4890	6420	7100	7370	8520	11900	13000	9200	6680	6190	4910	5070
6	5140	6420	7470	10000	8590	11800	12600	9520	6570	5830	4900	5080
7	5240	6420	7470	13500	8470	11400	11800	9360	6510	5400	5200	4910
8	5120	6420	7470	13200	7740	11300	11100	9480	5980	5260	5250	4650
9	5300	6420	7110	12700	7460	11700	10000	10300	5250	5330	4800	4050
10	5390	6080	7110	11000	8290	13800	9980	10200	5190	5420	4720	4490
11	5360	6080	6430	11000	9690	14400	9940	9870	5260	5410	4700	5130
12	5120	6080	6080	10500	10300	13800	9860	9820	5220	5150	4480	5330
13	5130	5490	5770	10200	9960	14300	9630	9740	5140	5150	4400	4870
14	5130	5480	5780	9320	9590	14600	9560	8680	5320	5230	4400	4600
15	5260	5480	6060	8180	9570	13500	9270	7910	5450	5000	4370	4700
16	5310	5480	7370	7890	9130	12900	9190	7770	5480	5130	4720	4750
17	5310	5480	8410	7930	8930	12600	9160	7120	5620	5740	4990	4740
18	5320	5770	7720	8620	16500	12300	8760	5990	5660	5880	5080	4770
19	5330	5770	7160	8780	16600	12100	8000	5890	5690	5230	4840	4830
20	5330	5770	7040	8710	14300	11800	7840	5890	5630	4840	4650	4780
21	5270	5480	7440	8360	13200	11800	7960	5900	5220	4720	4620	4800
22	5340	5480	7940	8130	14000	11100	8540	5990	5140	4720	4630	4820
23	5700	5480	7540	8110	13700	11100	9010	6050	5200	4980	4610	5350
24	5750	5480	7340	8200	13400	10400	8880	6360	5290	5050	4750	5580
25	5640	5480	7110	8210	13200	9470	8820	6460	5300	5010	4830	5620
26	5800	5480	7060	8190	13000	8940	8780	6770	5310	5070	4860	5620
27	5860	5480	6940	9320	12700	8820	9010	7070	5410	5040	4790	5580
28	5850	5480	6350	9050	12900	8750	8980	7100	5210	5020	4820	5600
29	6180	5480	6250	8250	---	8730	9090	7120	5160	5020	4920	5650
30	6620	5480	6190	7960	---	12500	9060	7170	5140	4920	5030	5620
31	6080	---	6160	7930	---	13100	---	7210	---	4860	5420	---
TOTAL	167260	172700	213920	275160	302710	370310	300120	245670	172290	163860	149340	152250
MEAN	5395	5757	6901	8876	10810	11950	10000	7925	5743	5286	4817	5075
MAX	6620	6420	8410	13500	16600	14600	13400	10300	7540	6350	5420	5650
MIN	4770	5210	5770	6070	7460	8730	7840	5890	5140	4720	4370	4050
AC-FT	331800	342600	424300	545800	600400	734500	595300	487300	341700	325000	296200	302000
CAL YR 1982	TOTAL	2451200	MEAN	6716	MAX	23900	MIN	4190	AC-FT	4862000		
WTR YR 1983	TOTAL	2685590	MEAN	7358	MAX	16600	MIN	4050	AC-FT	5327000		



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 TEMPERATURES: December 1952 to February 1954, November 1954 to September 1958, June 1962 to September 1981.

## WATER QUALITY DATA, WATER YEAR OCTOBER 1982 TO SEPTEMBER 1983

DATE	TIME	STREAM- FLOW, INSTAN- TANEOUS (CFS)	SPE- CIFIC CON- DUCT- ANCE (UMHOS)	PH (STAND- ARD UNITS)	TEMPER- ATURE (DEG C)	OXYGEN, DIS- SOLVED (MG/L)	COLI- FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)	STREP- TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML)	HARD- NESS (MG/L AS CAC03)	CALCIUM DIS- SOLVED (MG/L AS CA)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG)
OCT 13...	1430	5140	130	7.9	14.0	12.2	27	K6	44	9.5	5.0
DEC 13...	1500	5910	130	--	6.0	12.6	K6	120	52	12	5.4
FEB 08...	1400	7680	129	7.7	6.5	12.5	K3	K12	45	9.1	5.5
APR 11...	1430	10100	130	8.3	10.0	--	<1	K11	45	9.7	5.0
JUN 13...	1400	5360	135	8.6	17.5	11.2	26	69	46	10	5.1
AUG 01...	1315	5050	124	8.6	21.0	11.8	43	40	43	8.9	5.1

DATE	SODIUM, DIS- SOLVED (MG/L AS NA)	POTAS- SIUM, DIS- SOLVED (MG/L AS K)	ALKA- LITY FIELD (MG/L AS CAC03)	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)	NITRO- GEN,AM- MONIA + ORGANIC TOTAL (MG/L AS N)	PHOS- PHATE, ORTHO, DIS- SOLVED (MG/L AS P04)
OCT 13...	11	2.1	--	<5.0	2.5	.10	.120	<.100	.90	.15
DEC 13...	11	2.1	59	<5.0	2.4	.20	.060	.100	.30	.09
FEB 08...	11	1.8	57	<5.0	2.4	.10	.080	.160	.50	.28
APR 11...	9.8	1.8	59	4.1	2.8	<.10	.140	.130	.50	.18
JUN 13...	10	1.9	66	4.8	2.4	.10	.240	<.100	.40	.12
AUG 01...	11	1.8	59	3.0	2.1	.20	.090	<.100	.80	.12

## DESCHUTES RIVER BASIN

14103000 DESCHUTES RIVER AT MOODY, NEAR BIGGS, OR--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1982 TO SEPTEMBER 1983

DATE	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 CONSTITUENTS, 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)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM
OCT 13...	.060	.140	28	92	--	1280	2.2	10	139	54
DEC 13...	.080	.120	28	104	--	1660	1.5	8	128	48
FEB 08...	.060	.070	31	86	--	1780	2.8	--	--	--
APR 11...	.050	.080	31	89	100	2430	10	--	--	--
JUN 13...	.050	.070	27	98	100	1420	4.3	--	--	--
AUG 01...	.070	.100	27	76	95	1040	2.6	--	--	--

DATE	ALUM- INUM, DIS- SOLVED (UG/L AS AL)	ARSENIC DIS- SOLVED (UG/L AS AS)	BARIUM, DIS- SOLVED (UG/L AS BA)	BERYL- LIUM, DIS- SOLVED (UG/L AS BE)	CADMIUM DIS- SOLVED (UG/L AS CD)	CHRO- MIUM, DIS- SOLVED (UG/L AS CR)	COBALT, DIS- SOLVED (UG/L AS CO)	COPPER, DIS- SOLVED (UG/L AS CU)	IRON, DIS- SOLVED (UG/L AS FE)	LEAD, DIS- SOLVED (UG/L AS PB)
OCT 13...	10	2	9	<1	<1	<1	<3	2	9	7
FEB 08...	40	1	16	<1	<1	<1	<3	1	27	<1
APR 11...	40	1	17	<1	<1	<1	<3	8	22	2
AUG 01...	20	1	14	<1	<1	<1	<3	1	15	3

DATE	LITHIUM DIS- SOLVED (UG/L AS LI)	MANGA- NESE, DIS- SOLVED (UG/L AS MN)	MERCURY DIS- SOLVED (UG/L AS HG)	MOLYB- DENUM, DIS- SOLVED (UG/L AS MO)	NICKEL, DIS- SOLVED (UG/L AS NI)	SELE- NIUM, DIS- SOLVED (UG/L AS SE)	SILVER, DIS- SOLVED (UG/L AS AG)	STRON- TIUM, DIS- SOLVED (UG/L AS SR)	VANA- DIUM, DIS- SOLVED (UG/L AS V)	ZINC, DIS- SOLVED (UG/L AS ZN)
OCT 13...	13	3	.3	<10	2	<1	<1	41	12	33
FEB 08...	12	2	<.1	<10	<1	<1	<1	48	12	24
APR 11...	8	4	<.1	<10	<1	<1	<1	53	11	10
AUG 01...	13	2	<.1	<10	<1	<1	<1	47	13	8

K - Results based on colony count outside acceptable range (non-ideal colony count).

## COLUMBIA RIVER MAIN STEM

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## 14105700 COLUMBIA RIVER AT THE DALLES, OR

LOCATION.--Lat 45°36'27", long 121°10'20", in SW¼SW¼ 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<sup>2</sup>, approximately.

## WATER-DISCHARGE RECORDS

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.--Water-discharge records excellent. Considerable regulation by many large reservoirs. Diurnal fluctuations caused by powerplant and gates at The Dalles Dam. Many diversions for irrigation above station.

AVERAGE DISCHARGE.--105 years, 193,600 ft<sup>3</sup>/s, 140,300,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge (since 1858), 1,240,000 ft<sup>3</sup>/s June 6, 1894, elevation, 106.5 ft; minimum (since 1878), 12,100 ft<sup>3</sup>/s Apr. 16, 1968 (due to closure of John Day dam, recorded by AVM).

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 426,000 ft<sup>3</sup>/s June 1; maximum elevation, 84.2 ft June 2; minimum daily discharge, 85,000 ft<sup>3</sup>/s Oct. 3.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1982 TO SEPTEMBER 1983  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	112000	156000	162000	165000	205000	317000	342000	292000	426000	203000	197000	182000
2	101000	188000	193000	137000	234000	338000	329000	321000	423000	185000	199000	137000
3	85000	165000	167000	181000	242000	344000	294000	305000	407000	196000	197000	131000
4	98900	151000	132000	168000	258000	366000	275000	312000	381000	214000	205000	116000
5	110000	155000	112000	177000	198000	355000	295000	297000	365000	197000	191000	101000
6	121000	143000	145000	231000	170000	323000	296000	316000	366000	221000	185000	111000
7	126000	124000	171000	237000	224000	348000	286000	335000	363000	240000	196000	172000
8	127000	156000	189000	163000	226000	368000	242000	335000	348000	245000	179000	129000
9	110000	162000	187000	203000	238000	353000	215000	314000	350000	185000	173000	104000
10	96300	159000	173000	153000	251000	336000	250000	343000	336000	147000	179000	138000
11	124000	157000	159000	182000	234000	334000	258000	353000	340000	181000	175000	126000
12	122000	154000	148000	175000	201000	321000	267000	313000	341000	218000	179000	98500
13	127000	145000	147000	229000	167000	345000	284000	321000	323000	225000	172000	102000
14	138000	125000	164000	241000	195000	364000	270000	294000	310000	211000	151000	120000
15	139000	149000	141000	214000	195000	364000	250000	287000	258000	216000	158000	120000
16	118000	163000	157000	179000	228000	369000	246000	289000	265000	256000	154000	110000
17	124000	153000	156000	202000	209000	386000	225000	256000	286000	221000	175000	150000
18	146000	136000	142000	229000	212000	390000	243000	286000	251000	227000	179000	100000
19	158000	139000	141000	225000	233000	386000	241000	270000	235000	225000	191000	112000
20	148000	132000	179000	216000	264000	371000	217000	270000	243000	221000	207000	136000
21	142000	140000	188000	209000	274000	354000	196000	256000	255000	224000	166000	121000
22	127000	157000	164000	185000	280000	342000	214000	268000	247000	217000	177000	132000
23	110000	162000	161000	160000	287000	338000	261000	280000	248000	193000	130000	134000
24	98200	165000	136000	201000	290000	338000	277000	312000	234000	179000	144000	109000
25	115000	123000	147000	195000	267000	340000	339000	331000	194000	194000	133000	98200
26	137000	153000	117000	191000	284000	287000	350000	363000	197000	196000	136000	100000
27	145000	141000	141000	208000	266000	288000	323000	395000	221000	238000	131000	117000
28	158000	128000	153000	212000	314000	326000	337000	404000	220000	213000	115000	130000
29	168000	152000	166000	175000	---	346000	316000	413000	205000	225000	113000	121000
30	169000	154000	163000	138000	---	336000	305000	419000	204000	215000	129000	116000
31	165000	---	165000	188000	---	323000	---	421000	---	212000	155000	---
TOTAL	3965400	4487000	4866000	5969000	6646000	10696000	8243000	9971000	8842000	6540000	5171000	3673700
MEAN	127900	149600	157000	192500	237400	345000	274800	321600	294700	211000	166800	122500
MAX	169000	188000	193000	241000	314000	390000	350000	421000	426000	256000	207000	182000
MIN	85000	123000	112000	137000	167000	287000	196000	256000	194000	147000	113000	98200
AC-FT	7865000	8900000	9652000	11840000	13182000	21216000	16350000	19777000	17538000	12972000	10257000	7287000
CAL YR 1982	TOTAL	84250500	MEAN	230800	MAX	443000	MIN	85000	AC-FT	167111000		
WTR YR 1983	TOTAL	79070100	MEAN	216600	MAX	426000	MIN	85000	AC-FT	156836000		

NOTE.--No velocity-index record July 1 to Aug. 18.

## 14105700 COLUMBIA RIVER AT THE DALLES, OR--Continued

## WATER-QUALITY RECORDS

LOCATION.--Samples collected at The Dalles Dam, 3.2 mi upstream from discharge station.

PERIOD OF RECORD.--Water years 1951 to current year.

PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: December 1950 to current year.

WATER TEMPERATURES: December 1950 to September 1969, October 1973 to September 1976.

REMARKS.--No appreciable inflow between sampling point and gaging station except during periods of heavy local runoff.

EXTREMES FOR PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: Maximum daily, 324 micromhos Dec. 7, 1955; minimum daily, 95 micromhos June 8, 1972.

EXTREMES FOR CURRENT YEAR.--

SPECIFIC CONDUCTANCE: Maximum daily, 230 micromhos Jan. 18, 19; minimum daily, 110 micromhos June 9, 10.

SPECIFIC CONDUCTANCE (MICROMHOS/CM AT 25 DEG. C), WATER YEAR OCTOBER 1982 TO SEPTEMBER 1983  
ONCE-DAILY

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	144	174	192	208	---	198	160	181	163	131	139	144
2	147	170	193	208	184	193	161	186	155	134	138	147
3	149	172	---	207	182	193	159	177	148	130	137	146
4	149	173	191	207	182	194	160	177	137	129	134	146
5	150	174	189	216	185	192	159	174	128	129	136	---
6	152	183	---	223	185	185	161	171	118	131	135	145
7	154	185	---	179	186	175	163	164	114	132	134	146
8	159	184	---	200	191	175	166	163	112	134	134	154
9	159	190	---	181	193	174	165	159	110	133	134	150
10	160	184	183	199	193	175	167	158	110	134	134	154
11	161	189	187	198	193	178	166	158	111	135	134	159
12	163	190	189	195	191	---	168	161	114	135	134	163
13	166	193	191	193	186	182	168	163	117	134	140	160
14	167	192	192	193	181	184	169	165	119	134	138	158
15	170	187	201	196	181	183	171	166	121	132	141	159
16	172	180	208	201	182	185	171	163	123	131	138	155
17	179	178	209	212	183	188	171	162	125	131	138	152
18	170	181	210	230	183	183	173	159	127	130	139	153
19	168	181	207	230	177	180	170	159	128	131	139	154
20	169	184	202	219	180	179	171	159	130	134	140	156
21	173	183	198	210	182	174	185	161	129	132	140	159
22	169	188	193	203	182	175	169	160	130	133	141	159
23	170	---	190	199	180	175	169	161	127	135	143	164
24	169	---	192	194	186	174	168	160	125	135	142	165
25	171	178	197	191	189	171	169	160	125	136	144	168
26	173	183	198	190	189	168	171	160	125	135	144	169
27	174	181	198	195	199	168	173	162	127	135	145	173
28	172	182	199	195	203	167	169	162	128	136	144	171
29	169	182	200	195	---	166	174	162	129	136	146	170
30	172	184	201	189	---	163	176	165	130	138	144	169
31	174	---	207	185	---	---	---	165	---	138	145	---
MEAN	164	182	197	201	186	179	168	165	126	133	139	158

## HOOD RIVER BASIN

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14118500 WEST FORK HOOD RIVER NEAR DEE, OR

LOCATION.--Lat 45°35'55", long 121°38'05", in SE¼ 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<sup>2</sup>.

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 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.--Records excellent. No regulation. Dee Irrigation District canal diverts from right bank about 6 mi above station for irrigation above station and in Middle Fork basin. Diversions from Green Point Creek basin above station for irrigation near Oak Grove; water from two of these diversions is carried in Hood River Irrigation District canal.

AVERAGE DISCHARGE.--52 years (water years 1914, 1933-83), 559 ft<sup>3</sup>/s, 405,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge not determined, Dec. 22, 1964, gage height, 27.0 ft, from floodmarks; maximum daily, 15,000 ft<sup>3</sup>/s Dec. 23, 1964; minimum, 93 ft<sup>3</sup>/s Aug. 22, 1941.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 4,100 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Dec. 4	0030	5,140	8.66	Feb. 17	2000	4,400	7.92
Jan. 6	1730	*7,830	*10.49	Mar. 30	0030	4,940	8.37

Minimum, 137 ft<sup>3</sup>/s Sept. 30.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1982 TO SEPTEMBER 1983  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	180	514	635	315	509	785	1520	491	376	343	243	240
2	181	429	664	311	480	759	1290	483	365	492	229	193
3	183	381	3370	332	455	737	1050	463	343	451	223	174
4	172	371	2910	1810	433	736	904	451	322	381	215	167
5	169	584	1510	3440	413	785	811	487	308	350	209	160
6	186	889	1520	6130	407	837	742	485	301	334	202	152
7	315	657	1020	5800	408	1070	695	538	298	313	203	152
8	389	536	802	4090	401	1470	642	585	313	299	211	151
9	306	455	676	2260	433	1720	609	551	305	280	207	172
10	259	400	585	1820	476	1850	586	509	396	263	205	241
11	233	360	515	1470	618	1410	553	486	351	259	205	351
12	216	332	475	1190	699	1220	522	472	339	291	194	225
13	204	311	483	1020	884	1160	497	457	303	435	184	195
14	195	287	470	890	898	1110	477	468	289	585	189	181
15	188	275	736	791	841	980	463	658	293	463	190	171
16	185	294	1770	732	969	864	457	584	281	393	176	164
17	254	707	1460	689	2610	780	465	528	286	355	171	158
18	260	967	1090	637	2840	711	484	511	391	333	171	179
19	221	871	910	623	1760	652	525	486	473	333	168	190
20	208	801	800	604	1490	608	555	488	423	341	163	163
21	224	652	700	554	1390	582	579	494	360	311	159	155
22	301	538	633	534	2000	577	553	473	332	287	158	155
23	306	462	562	595	1770	576	572	479	340	275	158	158
24	264	413	501	641	1520	551	625	482	348	272	156	168
25	250	376	462	621	1240	554	556	505	318	262	155	164
26	332	347	436	652	1050	537	517	471	303	248	155	159
27	451	335	403	719	917	573	486	439	290	242	156	157
28	519	407	378	678	820	581	481	445	284	260	158	149
29	1670	517	360	622	---	1730	486	471	286	246	208	144
30	850	593	344	578	---	3450	484	431	289	230	229	140
31	595	---	329	545	---	2130	---	401	---	248	193	---
TOTAL	10266	15061	27509	41693	28731	32085	19186	15272	9906	10175	5843	5328
MEAN	331	502	887	1345	1026	1035	640	493	330	328	188	178
MAX	1670	967	3370	6130	2840	3450	1520	658	473	585	243	351
MIN	169	275	329	311	401	537	457	401	281	230	155	140
AC-FT	20360	29870	54560	82700	56990	63640	38060	30290	19650	20180	11590	10570
CAL YR 1982	TOTAL	216783	MEAN	594	MAX	6570	MIN	152	AC-FT	430000		
WTR YR 1983	TOTAL	221055	MEAN	606	MAX	6130	MIN	140	AC-FT	438500		

## HOOD RIVER BASIN

14120000 HOOD RIVER AT TUCKER BRIDGE, NEAR HOOD RIVER, OR

LOCATION.--Lat 45°39'20", long 121°32'50", in SE¼ 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<sup>2</sup>.

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 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.--Records good. Some daily fluctuation caused by diversion dam above station and sawmill at Dee. Diversions for irrigation above station.

AVERAGE DISCHARGE.--23 years (water years 1898-99, 1914, 1916-17, 1966-83), 1,092 ft<sup>3</sup>/s, 791,200 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 22,300 ft<sup>3</sup>/s Dec. 13, 1977, gage height, 15.59 ft; minimum recorded, 136 ft<sup>3</sup>/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<sup>3</sup>/s, from rating curve extended above 1,500 ft<sup>3</sup>/s on basis of slope-area measurement of peak flow.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 4,500 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Dec. 4	0030	7,410	9.25	Feb. 17	2000	7,410	9.25
Jan. 6	1700	*14,000	*12.11	Mar. 30	0200	7,920	9.50

Minimum, 332 ft<sup>3</sup>/s Aug. 25.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1982 TO SEPTEMBER 1983  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	419	868	955	722	1090	1670	2720	980	916	693	629	632
2	417	772	971	719	1030	1600	2440	963	871	841	608	533
3	425	714	4840	745	1000	1530	2090	931	825	750	566	479
4	405	695	4410	2650	960	1490	1860	922	774	676	527	467
5	395	896	2190	5450	930	1530	1710	991	746	658	517	438
6	419	1290	2360	10600	925	1600	1600	962	731	650	511	417
7	574	1000	1620	10400	920	1890	1510	1020	726	619	518	417
8	680	870	1350	7610	925	2460	1400	1070	757	584	551	420
9	594	786	1190	4410	965	2940	1330	1010	762	550	571	429
10	537	724	1070	3480	1030	3320	1280	936	860	533	583	489
11	503	675	980	2850	1300	2650	1200	901	782	542	574	718
12	481	644	930	2380	1350	2440	1130	883	730	628	518	544
13	462	628	925	2040	1570	2360	1070	859	673	887	479	495
14	449	595	931	1790	1580	2210	1030	863	652	1140	503	464
15	445	581	1270	1610	1520	1980	996	1090	671	860	523	440
16	438	606	2820	1520	1720	1800	977	1000	652	731	465	422
17	531	1110	2240	1440	4270	1670	989	929	658	665	440	409
18	532	1420	1700	1360	5170	1550	1010	925	776	633	427	445
19	480	1270	1470	1340	3240	1460	1050	904	824	650	411	461
20	462	1190	1380	1280	2780	1360	1090	904	757	654	390	404
21	495	1030	1260	1190	2570	1320	1120	933	665	603	373	387
22	662	899	1180	1170	3520	1300	1090	917	634	579	361	382
23	696	810	1070	1220	3230	1270	1100	926	639	586	371	389
24	590	751	979	1310	2860	1230	1230	946	634	610	392	403
25	556	711	929	1240	2480	1200	1090	1010	597	580	351	401
26	632	681	895	1330	2160	1150	1020	995	594	540	356	402
27	750	671	843	1400	1940	1190	972	958	580	523	380	409
28	813	762	807	1330	1750	1180	964	992	576	551	388	386
29	2690	870	783	1240	---	2700	973	1090	579	548	565	372
30	1370	941	760	1180	---	5770	967	1080	599	524	672	362
31	975	---	741	1140	---	3480	---	1010	---	584	570	---
TOTAL	19877	25460	45849	78146	54785	61300	39008	29900	21240	20172	15090	13416
MEAN	641	849	1479	2521	1957	1977	1300	965	708	651	487	447
MAX	2690	1420	4840	10600	5170	5770	2720	1090	916	1140	672	718
MIN	395	581	741	719	920	1150	964	859	576	523	351	362
AC-FT	39430	50500	90940	155000	108700	121600	77370	59310	42130	40010	29930	26610
CAL YR 1982	TOTAL	426050	MEAN	1167	MAX	13200	MIN	325	AC-FT	845100		
WTR YR 1983	TOTAL	424243	MEAN	1162	MAX	10600	MIN	351	AC-FT	841500		

14128600 COLUMBIA RIVER AT STEVENSON, WA

LOCATION.--Lat 45°41'58", long 121°52'02", in NW¼SE¼ 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<sup>2</sup>, 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, 78.91 ft June 2; minimum, 72.41 ft Feb. 2.

## GAGE HEIGHT (FEET ABOVE DATUM), WATER YEAR OCTOBER 1982 TO SEPTEMBER 1983

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
OCTOBER			NOVEMBER			DECEMBER			JANUARY			
1	75.81	75.08	75.47	76.06	74.30	74.85	76.00	73.50	74.73	76.29	75.51	75.84
2	76.20	75.33	75.73	75.34	72.68	73.61	76.46	74.58	75.72	76.19	74.48	75.08
3	76.14	75.72	75.88	75.89	75.17	75.61	77.10	74.51	75.86	76.37	72.94	74.61
4	76.44	75.72	76.09	76.46	74.54	75.37	77.03	76.09	76.46	76.79	74.47	75.77
5	76.29	75.87	76.13	76.80	75.58	76.41	76.20	75.07	75.36	76.77	75.13	76.27
6	76.35	75.37	75.80	76.85	75.45	76.09	75.88	74.94	75.41	78.34	75.35	76.33
7	76.67	75.77	76.26	76.57	75.79	76.05	76.90	74.93	75.88	77.51	74.20	75.20
8	76.53	75.71	76.04	76.30	74.72	75.66	75.93	74.14	74.86	76.27	74.24	74.78
9	76.41	75.26	75.84	76.12	73.60	74.76	76.28	74.39	75.52	77.02	75.26	75.94
10	76.72	75.53	75.97	76.74	74.70	75.87	76.20	74.19	75.00	76.93	73.51	74.77
11	76.69	75.85	76.31	76.56	74.74	75.78	76.28	74.61	75.22	75.56	73.86	74.85
12	76.48	76.05	76.31	76.42	74.50	75.62	76.43	74.74	75.71	75.75	72.89	74.25
13	76.52	75.73	76.16	76.09	74.77	75.39	76.28	74.65	75.68	76.81	75.13	75.91
14	76.57	75.30	75.89	76.09	74.19	74.92	76.81	74.73	76.01	76.72	75.72	76.29
15	76.97	75.94	76.45	75.46	73.22	74.30	76.71	74.47	75.39	76.40	74.67	75.56
16	76.76	76.03	76.26	77.06	74.20	75.42	76.85	74.17	75.61	76.25	74.91	75.68
17	76.75	75.93	76.37	77.02	75.23	76.23	76.55	74.06	75.17	76.42	74.43	75.72
18	76.76	75.78	76.43	76.93	74.89	75.93	76.49	75.21	75.71	76.83	74.37	75.61
19	76.86	76.08	76.40	76.60	74.60	75.40	75.50	74.02	74.68	76.57	74.39	75.20
20	76.71	76.03	76.28	74.67	73.82	74.10	75.92	74.03	75.21	76.48	74.22	75.48
21	76.57	75.52	76.15	75.78	73.32	74.19	76.31	73.86	75.14	76.46	74.60	75.44
22	76.56	75.28	75.95	76.22	73.80	75.12	76.09	73.82	74.77	76.98	75.52	76.19
23	76.39	75.83	76.12	76.86	73.40	75.20	76.71	73.09	74.88	76.22	74.03	75.18
24	76.54	76.38	76.44	76.83	73.86	75.38	76.46	74.52	75.29	77.31	73.73	75.36
25	76.64	75.91	76.25	76.82	74.78	75.37	75.71	73.86	74.78	77.31	73.20	75.20
26	76.97	75.58	76.27	76.86	75.04	75.79	75.70	74.26	74.90	76.61	73.38	74.76
27	76.93	75.82	76.48	76.75	75.68	76.08	75.83	73.93	74.84	76.32	74.53	75.62
28	77.05	76.04	76.63	76.28	75.35	75.67	75.40	73.34	74.38	76.86	74.58	75.85
29	77.20	75.68	76.43	76.55	74.59	75.44	75.57	73.76	74.71	76.61	74.55	75.11
30	77.09	76.22	76.64	76.50	74.35	74.98	76.08	74.03	75.15	75.12	73.72	74.33
31	76.53	75.72	76.18	---	---	---	76.32	74.16	75.36	75.35	73.83	74.71
MONTH	77.20	75.08	76.18	77.06	72.68	75.35	77.10	73.09	75.27	78.34	72.89	75.38



GAGE HEIGHT (FEET ABOVE DATUM), WATER YEAR OCTOBER 1982 TO SEPTEMBER 1983

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	FEBRUARY			MARCH			APRIL			MAY		
1	75.45	73.79	74.64	77.05	75.77	76.43	77.69	75.58	76.83	75.61	74.10	74.81
2	76.64	72.41	74.05	76.80	75.94	76.41	77.59	76.25	76.65	76.81	74.58	75.95
3	76.34	73.93	75.01	76.25	75.83	76.05	76.37	75.49	75.97	76.93	75.30	76.33
4	75.70	73.49	74.45	76.44	75.92	76.13	77.18	75.21	75.98	77.33	75.51	76.52
5	76.02	74.97	75.37	76.96	76.16	76.56	77.80	75.17	76.07	76.22	74.40	75.16
6	75.46	73.25	74.63	76.22	75.55	75.82	78.12	76.11	76.78	77.89	75.82	76.52
7	76.08	73.60	74.79	76.18	75.42	75.85	77.25	75.20	76.25	77.58	76.97	77.32
8	76.11	74.50	75.20	76.76	75.47	75.91	76.97	75.20	75.91	78.14	76.44	77.00
9	76.59	73.71	75.17	77.70	76.76	77.29	76.72	74.23	75.31	77.87	76.22	77.01
10	77.11	73.50	75.26	77.12	76.04	76.57	76.32	75.00	75.48	77.56	75.49	76.69
11	77.33	74.62	76.22	77.84	76.66	77.23	75.83	74.45	75.17	76.46	75.27	75.78
12	77.27	75.05	75.49	77.36	75.91	76.80	76.82	74.29	75.32	77.21	75.58	76.58
13	75.29	74.43	74.63	76.04	75.54	75.81	76.53	75.01	75.66	78.36	76.75	77.55
14	76.15	73.32	74.83	76.53	75.79	76.13	76.76	74.65	75.56	78.30	76.26	77.79
15	75.67	73.18	74.45	76.81	76.20	76.53	76.72	74.39	75.63	77.44	75.76	76.65
16	75.86	73.64	74.96	76.33	75.86	76.09	76.97	76.20	76.54	77.78	76.31	76.87
17	77.39	74.04	75.55	76.63	75.97	76.20	76.83	75.55	76.27	77.84	76.11	76.89
18	77.72	75.10	76.18	77.14	76.29	76.68	75.86	74.55	75.19	77.94	76.85	77.31
19	77.32	75.25	76.13	76.67	76.30	76.47	75.58	74.73	75.09	78.28	76.47	77.07
20	77.45	74.93	76.37	76.78	76.39	76.55	75.20	74.57	74.87	78.21	76.76	77.22
21	77.88	77.27	77.56	76.70	76.27	76.51	76.14	74.15	75.10	77.60	76.45	77.02
22	77.88	76.89	77.30	76.76	75.87	76.41	77.53	75.81	76.63	78.18	76.36	77.28
23	77.03	75.97	76.72	76.91	75.97	76.38	77.95	76.42	77.33	77.79	76.38	77.08
24	77.38	76.93	77.24	76.65	75.94	76.31	76.91	75.21	76.35	77.74	76.23	77.13
25	77.58	75.73	77.19	76.79	75.98	76.33	78.37	74.79	76.75	77.49	76.53	77.24
26	77.33	75.44	76.61	77.00	75.50	76.42	78.71	77.31	78.19	78.24	77.15	77.65
27	77.15	76.08	76.81	75.69	74.85	75.26	77.24	74.82	75.63	78.42	77.23	77.71
28	76.51	75.77	76.11	76.43	74.91	75.83	76.05	74.60	75.09	77.88	77.36	77.63
29	---	---	---	77.27	75.51	76.37	76.07	75.13	75.63	78.20	77.07	77.70
30	---	---	---	78.02	76.66	77.15	77.06	75.72	76.40	78.85	77.62	78.26
31	---	---	---	77.34	76.63	76.90	---	---	---	78.63	77.89	78.36
MONTH	77.88	72.41	75.68	78.02	74.85	76.37	78.71	74.15	75.99	78.85	74.10	76.97

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	JUNE			JULY			AUGUST			SEPTEMBER		
1	78.51	77.81	78.07	77.61	76.25	76.97	76.51	75.48	76.11	77.28	75.91	76.55
2	78.91	77.70	78.39	77.58	75.63	76.63	76.54	75.55	76.01	77.01	75.64	76.08
3	78.46	77.84	78.11	77.38	75.79	76.39	76.49	75.48	75.98	77.12	75.86	76.39
4	78.44	77.13	77.90	77.59	76.33	76.87	76.63	75.75	76.25	76.58	76.07	76.38
5	78.21	77.60	77.83	77.45	76.01	76.65	76.46	75.70	76.05	76.57	75.89	76.23
6	77.85	76.89	77.40	77.36	76.55	77.01	76.62	75.09	75.52	76.57	75.58	76.26
7	78.12	77.43	77.81	77.21	76.46	76.94	76.15	75.24	75.58	77.34	75.29	76.22
8	78.22	77.09	77.52	77.44	76.64	77.08	76.16	74.93	75.34	77.03	75.75	76.27
9	77.92	76.75	77.36	77.16	76.20	76.73	75.83	75.23	75.57	76.42	75.47	76.04
10	77.41	75.95	76.90	76.77	76.34	76.47	75.82	75.21	75.44	76.73	75.53	76.29
11	77.76	77.39	77.55	77.29	75.93	76.65	76.08	75.71	75.84	76.50	75.48	76.04
12	77.92	77.47	77.72	77.70	76.51	77.20	76.17	75.00	75.67	76.25	75.49	75.90
13	78.45	76.82	77.73	77.05	76.08	76.42	76.55	75.24	75.74	76.33	75.84	76.09
14	78.36	76.24	77.02	76.78	75.56	76.03	75.98	74.89	75.39	76.90	75.81	76.47
15	78.00	75.78	76.44	76.22	75.35	75.85	75.51	75.10	75.33	76.75	75.60	76.13
16	77.84	76.83	77.40	77.08	75.97	76.47	75.67	73.78	74.65	76.51	75.45	76.07
17	78.10	76.95	77.43	76.44	75.77	76.11	76.38	75.35	75.89	76.97	75.30	76.18
18	77.77	76.86	77.39	76.79	75.89	76.37	76.81	75.79	76.16	76.71	75.99	76.24
19	77.42	76.82	77.19	77.10	75.51	76.35	76.96	75.61	76.44	76.49	75.84	76.14
20	77.41	76.27	76.95	76.60	75.94	76.18	77.03	76.60	76.84	76.54	75.86	76.25
21	77.71	76.74	77.38	76.99	76.15	76.50	76.90	75.89	76.50	76.36	75.93	76.19
22	77.55	76.67	77.01	76.98	76.28	76.50	76.70	75.58	76.18	76.79	76.10	76.42
23	77.50	76.38	77.09	76.74	75.65	76.16	76.58	75.58	76.11	76.70	75.55	76.08
24	76.93	76.20	76.53	76.47	75.20	75.94	76.76	76.37	76.55	76.78	75.33	76.24
25	77.31	76.11	76.71	76.72	75.54	76.14	76.55	75.32	76.04	76.87	75.45	75.99
26	77.39	75.67	76.65	76.68	75.56	76.09	76.84	75.62	76.29	76.62	75.61	76.22
27	76.72	75.53	75.93	76.65	75.53	76.08	77.00	75.65	76.21	76.73	75.57	76.23
28	76.57	75.34	75.97	76.49	75.09	75.81	76.75	75.68	76.04	76.91	75.50	76.36
29	77.15	76.39	76.81	76.37	75.39	75.95	76.40	75.67	76.04	76.67	75.50	76.13
30	77.47	75.97	76.87	76.82	75.78	76.37	76.65	75.82	76.28	76.68	75.55	76.17
31	---	---	---	76.52	75.77	76.13	76.83	75.64	76.05	---	---	---
MONTH	78.91	75.34	77.24	77.70	75.09	76.42	77.03	73.78	75.94	77.34	75.29	76.21
YEAR	78.91	72.41	76.08									

## 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<sup>2</sup>, 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, 76.61 ft May 20, 1981; minimum, 69.65 ft Oct. 25, 1981.

EXTREMES FOR CURRENT YEAR.--Maximum recorded gage height, 76.59 ft Aug. 27; minimum recorded, 71.46 ft Nov. 2, Feb. 4.

## GAGE HEIGHT (FEET ABOVE DATUM), WATER YEAR OCTOBER 1982 TO SEPTEMBER 1983

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
OCTOBER			NOVEMBER			DECEMBER			JANUARY			
1	75.44	74.60	75.00	75.24	73.34	74.00	75.07	72.76	74.58	75.59	74.70	75.13
2	75.85	74.86	75.31	74.77	71.46	72.65	75.49	73.85	74.71	75.62	73.77	74.39
3	75.75	75.32	75.50	75.17	74.44	74.92	76.22	73.43	74.94	75.52	71.91	73.73
4	76.09	75.34	75.71	75.82	73.87	74.72	76.34	75.40	75.73	75.97	73.49	74.86
5	75.87	75.40	75.67	76.11	74.92	75.70	75.46	74.46	74.76	75.95	73.91	75.16
6	75.87	74.84	75.31	76.06	74.65	75.34	75.30	74.27	74.68	76.53	73.20	74.67
7	76.11	75.23	75.75	75.99	75.19	75.50	76.19	74.03	75.10	75.74	71.86	73.03
8	75.98	75.11	75.50	75.75	74.12	75.04	75.13	72.94	73.89	74.76	72.59	73.50
9	75.84	74.70	75.38	75.41	72.70	73.95	75.53	73.43	74.71	75.85	73.96	74.74
10	76.33	75.20	75.64	76.06	74.01	75.25	75.43	73.22	74.16	75.84	71.99	73.72
11	76.26	75.38	75.81	75.94	74.03	75.12	75.74	73.95	74.55	74.69	72.71	73.65
12	76.00	75.51	75.82	75.80	73.79	74.97	75.84	74.08	75.06	74.86	71.78	73.23
13	76.01	75.19	75.63	75.54	74.01	74.74	75.69	73.80	75.01	75.48	73.53	74.57
14	76.05	74.73	75.37	75.60	73.53	74.35	75.99	73.89	75.27	75.48	74.06	74.88
15	76.46	75.38	75.90	74.88	72.48	73.64	75.97	73.54	74.64	75.37	73.21	74.33
16	76.17	75.52	75.73	76.40	73.47	74.76	76.08	73.07	74.75	75.37	73.68	74.72
17	76.25	75.41	75.86	76.39	74.51	75.53	75.79	72.89	74.26	75.47	73.26	74.66
18	76.23	75.15	75.83	76.27	74.28	75.25	75.91	74.38	74.94	75.64	72.96	74.35
19	76.29	75.48	75.79	76.00	73.82	74.65	74.80	73.22	73.93	75.36	72.81	73.82
20	76.12	75.34	75.64	73.92	73.04	73.38	74.96	72.87	74.26	75.39	72.82	74.27
21	76.06	74.85	75.56	75.07	72.61	73.48	75.40	72.72	74.13	---	---	---
22	76.13	74.64	75.39	75.62	73.08	74.45	75.17	72.68	73.82	---	---	---
23	75.99	75.24	75.66	76.26	72.68	74.56	76.07	72.27	74.07	---	---	---
24	76.13	75.94	76.02	76.26	73.03	74.64	75.86	73.72	74.57	---	---	---
25	76.16	75.37	75.76	76.23	74.24	74.86	75.07	73.00	74.05	---	---	---
26	76.37	74.90	75.68	76.30	74.49	75.21	75.07	73.63	74.29	---	---	---
27	76.37	75.13	75.85	76.20	75.11	75.48	75.22	73.24	74.23	---	---	---
28	76.30	75.33	75.95	75.77	74.76	75.12	74.70	72.44	73.61	---	---	---
29	76.44	74.96	75.70	75.77	73.83	74.75	74.84	72.94	73.93	---	---	---
30	76.33	75.42	75.83	75.89	73.62	74.21	75.45	73.24	74.42	---	---	---
31	75.79	74.89	75.37	---	---	---	75.62	73.38	74.66	---	---	---
MONTH	76.46	74.60	75.64	76.40	71.46	74.67	76.34	72.27	74.51	---	---	---

## COLUMBIA RIVER MAIN STEM

14128860 COLUMBIA RIVER AT BONNEVILLE DAM, OR--Continued

GAGE HEIGHT (FEET ABOVE DATUM), WATER YEAR OCTOBER 1982 TO SEPTEMBER 1983

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
FEBRUARY			MARCH			APRIL			MAY			
1	---	---	---									
2	---	---	---									
3	74.75	72.11	73.46									
4	74.28	71.46	72.75									
5	---	---	---									
6	---	---	---									
7	---	---	---									
8	---	---	---									
9	---	---	---									
10	---	---	---									
11	---	---	---									
12	---	---	---									
13	---	---	---									
14	---	---	---									
15	---	---	---									
16	---	---	---									
17	---	---	---									
18	---	---	---									
19	---	---	---									
20	---	---	---									
21	---	---	---									
22	---	---	---									
23	---	---	---									
24	---	---	---									
25	---	---	---									
26	---	---	---									
27	---	---	---									
28	---	---	---									
29	---	---	---									
30	---	---	---									
31	---	---	---									

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
JUNE			JULY			AUGUST			SEPTEMBER			
1	75.34	74.05	74.71	76.53	75.34	76.07	75.38	74.53	75.07	76.28	75.20	75.74
2	75.49	74.18	74.99	76.40	74.84	75.71	75.64	74.59	75.07	76.25	74.95	75.47
3	75.52	74.37	74.88	76.12	74.58	75.25	75.47	74.43	74.98	76.57	75.21	75.82
4	75.45	73.98	74.96	76.51	75.28	75.85	75.66	74.74	75.27	76.11	75.55	75.87
5	75.52	74.53	75.05	76.46	74.63	75.61	75.84	74.80	75.14	76.08	75.36	75.78
6	75.12	73.86	74.63	76.29	75.23	75.84	75.79	74.03	74.54	76.10	74.94	75.74
7	75.51	74.64	75.15	76.00	75.01	75.57	75.60	74.09	74.65	76.52	74.63	75.52
8	75.70	74.46	75.06	76.27	75.43	75.80	75.41	73.78	74.42	76.28	75.10	75.69
9	75.57	73.97	74.76	76.14	75.38	75.79	75.22	74.25	74.71	76.00	74.91	75.60
10	75.23	73.13	74.56	76.23	75.64	75.86	75.19	74.14	74.56	76.10	74.85	75.71
11	75.57	75.01	75.23	76.44	75.08	75.85	75.50	74.71	75.02	76.02	74.88	75.49
12	75.62	75.05	75.41	76.56	75.51	76.08	75.60	73.91	74.83	75.73	74.96	75.48
13	76.04	74.66	75.49	75.83	74.74	75.20	75.98	74.27	74.92	75.94	75.45	75.66
14	76.37	74.00	75.04	75.60	74.31	74.83	75.42	74.14	74.68	76.40	75.38	75.98
15	75.55	74.25	74.78	75.53	74.07	74.65	74.95	74.17	74.57	76.15	75.13	75.61
16	76.23	75.51	75.97	75.74	74.48	75.02	75.11	72.90	73.93	76.08	74.96	75.60
17	76.32	75.22	75.70	75.16	74.61	74.88	75.94	74.70	75.13	76.37	74.58	75.54
18	76.43	75.52	76.03	75.54	74.52	75.09	76.24	74.76	75.32	76.21	75.57	75.79
19	76.17	75.63	75.97	75.76	74.04	75.08	76.28	74.47	75.55	76.06	75.25	75.69
20	76.17	74.90	75.65	75.33	74.56	74.97	76.24	75.25	75.84	76.11	75.07	75.72
21	76.36	75.13	75.93	75.69	74.85	75.25	76.25	75.14	75.75	75.97	75.49	75.74
22	76.22	75.46	75.76	75.78	75.13	75.39	76.05	74.62	75.36	76.21	75.51	75.88
23	76.13	74.95	75.65	75.65	74.36	75.11	76.05	74.95	75.55	76.17	74.98	75.52
24	75.78	74.55	75.24	75.56	74.20	75.03	76.24	75.59	75.92	76.32	74.85	75.76
25	76.26	75.06	75.76	75.84	74.46	75.15	76.19	74.84	75.48	76.46	75.04	75.57
26	76.44	74.54	75.61	75.71	74.36	75.06	76.24	75.08	75.73	76.17	75.17	75.78
27	75.68	74.21	74.70	75.38	74.12	74.82	76.59	75.07	75.66	76.26	75.00	75.72
28	75.56	74.21	74.89	75.30	73.70	74.64	76.18	75.09	75.51	76.38	74.92	75.83
29	76.43	75.23	75.85	75.38	74.08	74.80	75.92	75.17	75.55	76.20	75.00	75.64
30	76.50	74.90	75.91	75.87	74.43	75.33	76.11	75.35	75.76	76.20	75.10	75.70
31	---	---	---	75.56	74.66	75.06	76.18	74.94	75.41	---	---	---
MONTH	76.50	73.13	75.31	76.56	73.70	75.31	76.59	72.90	75.16	76.57	74.58	75.69

## 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<sup>2</sup>, 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, 28.83 ft June 2; minimum, 8.13 ft Oct. 10.

## GAGE HEIGHT (FEET ABOVE DATUM), WATER YEAR OCTOBER 1982 TO SEPTEMBER 1983

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
OCTOBER			NOVEMBER			DECEMBER			JANUARY			
1	12.13	10.10	10.90	17.20	14.74	15.58	17.67	13.89	15.66	15.81	14.66	15.07
2	10.31	9.50	9.94	17.47	14.39	16.41	19.81	15.23	17.44	15.70	13.88	14.55
3	10.05	8.36	9.14	15.35	14.20	14.73	18.55	16.86	17.75	15.88	14.16	15.26
4	10.91	8.57	9.66	15.46	13.48	14.12	18.17	15.92	17.13	16.69	15.75	16.20
5	11.85	10.44	10.83	15.61	13.57	14.35	17.72	14.36	15.41	20.78	16.69	18.34
6	12.31	11.06	11.57	15.63	13.25	14.70	17.06	14.35	15.52	24.67	19.70	21.87
7	12.75	11.56	12.13	14.03	12.44	13.08	18.01	15.79	16.32	25.19	24.12	24.84
8	12.89	12.03	12.40	15.42	12.86	14.00	18.64	15.41	17.59	24.45	20.95	22.22
9	12.61	10.37	11.31	15.65	13.93	14.93	16.83	15.98	16.47	21.63	20.54	21.20
10	10.81	8.13	9.00	14.70	14.14	14.43	16.78	14.77	16.45	21.38	18.46	19.74
11	12.83	9.52	11.09	14.55	14.19	14.37	15.00	14.06	14.64	21.14	18.31	19.59
12	12.38	11.17	11.60	14.61	14.10	14.40	15.23	13.46	14.11	18.97	17.36	17.94
13	12.57	11.59	12.02	14.67	12.95	13.92	15.27	14.09	14.60	21.30	17.30	19.54
14	12.74	11.72	12.23	13.50	12.79	13.04	16.45	13.88	15.04	21.38	19.90	20.64
15	14.06	11.55	12.78	13.74	12.97	13.41	16.38	14.48	15.34	20.02	17.63	19.40
16	13.64	11.53	12.15	14.86	13.04	13.93	18.04	14.97	16.79	18.34	16.95	17.38
17	12.63	11.50	11.97	15.19	14.43	14.73	18.67	16.46	17.80	17.98	17.48	17.77
18	14.38	12.37	13.46	15.18	13.92	14.39	17.47	16.16	17.00	19.49	18.26	18.87
19	14.46	13.48	13.97	16.56	14.13	15.18	17.03	15.93	16.42	19.90	19.35	19.67
20	14.04	13.49	13.71	16.59	13.43	14.21	18.20	15.89	17.43	19.95	18.58	19.06
21	13.87	12.28	13.12	13.92	13.08	13.29	18.60	18.03	18.26	19.31	18.13	18.58
22	13.04	11.37	12.49	14.52	13.08	14.10	18.46	17.02	18.04	18.50	16.32	17.20
23	11.99	9.64	11.03	14.53	13.67	14.09	17.21	15.59	16.32	16.42	15.85	16.15
24	10.02	9.05	9.69	15.07	13.84	14.50	15.80	15.00	15.52	18.26	15.80	17.12
25	11.34	9.90	10.84	13.87	12.01	12.65	15.21	14.54	14.95	18.32	16.85	17.59
26	13.00	11.08	12.38	13.36	11.93	12.52	14.58	13.13	13.73	18.90	17.49	18.29
27	13.78	12.76	13.36	14.15	12.92	13.55	14.57	12.75	13.60	19.35	18.08	18.89
28	15.55	13.16	14.17	14.13	12.43	12.78	15.47	14.51	14.91	19.29	18.53	18.87
29	16.32	14.91	15.45	15.25	12.75	14.43	15.52	14.92	15.17	18.84	17.32	18.08
30	16.29	15.93	16.12	17.38	14.74	15.83	15.30	14.63	15.01	17.60	14.67	15.99
31	16.41	15.42	15.81	---	---	---	15.26	14.53	14.86	18.11	13.82	16.41
MONTH	16.41	8.13	12.14	17.47	11.93	14.19	19.81	12.75	15.98	25.19	13.82	18.46

14128870 COLUMBIA RIVER BELOW BONNEVILLE DAM, OR--Continued

GAGE HEIGHT (FEET ABOVE DATUM), WATER YEAR OCTOBER 1982 TO SEPTEMBER 1983

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	FEBRUARY			MARCH			APRIL			MAY		
1	20.15	16.11	18.69	25.64	24.61	25.03	26.74	25.83	26.41	23.80	22.63	23.17
2	19.88	17.08	18.54	26.27	24.64	25.49	26.76	26.47	26.61	23.57	22.42	23.02
3	20.60	19.26	20.20	26.13	25.74	25.93	26.73	23.62	25.35	24.17	22.23	23.45
4	21.32	19.74	20.60	27.46	25.86	26.32	24.50	22.87	23.70	23.94	22.51	23.11
5	20.54	14.40	18.55	26.89	25.36	26.38	23.18	22.75	22.98	23.97	22.48	23.08
6	17.12	13.55	15.40	25.48	24.84	25.10	24.56	22.48	23.67	23.54	22.32	22.83
7	20.37	16.91	18.38	27.59	24.77	25.55	24.76	22.11	23.57	24.75	22.91	24.09
8	19.99	18.32	19.21	27.16	25.88	26.62	22.54	20.46	21.27	24.98	23.71	24.33
9	21.30	18.49	19.49	27.27	25.97	26.55	20.55	18.58	19.37	25.42	23.57	24.10
10	21.51	19.41	20.39	27.74	25.77	26.99	21.10	19.99	20.74	25.77	23.60	24.65
11	21.73	19.68	20.43	26.74	25.87	26.21	22.09	20.36	21.45	26.12	25.41	25.73
12	21.34	19.27	20.42	26.55	25.58	26.28	22.15	19.99	20.86	26.21	22.76	23.78
13	19.31	17.91	18.27	27.05	26.15	26.64	23.13	21.48	22.44	24.27	22.79	23.37
14	18.68	17.90	18.25	27.53	25.87	27.09	22.12	21.05	21.48	24.01	23.02	23.48
15	19.22	17.91	18.73	27.70	27.14	27.37	21.32	19.99	20.71	23.13	21.28	22.46
16	21.64	19.12	20.09	27.46	27.10	27.26	20.20	19.93	20.05	24.49	20.79	22.26
17	20.44	19.20	19.69	27.89	27.26	27.62	20.07	19.06	19.71	22.55	20.40	21.14
18	21.92	19.51	20.97	28.19	27.63	27.85	20.65	19.11	19.96	22.71	20.14	21.64
19	22.36	21.85	22.22	27.95	27.18	27.65	20.91	19.26	20.51	22.39	20.19	21.17
20	23.25	22.36	22.72	27.37	26.41	27.01	19.43	18.32	18.92	22.63	21.14	21.83
21	24.12	22.66	23.40	26.53	25.83	26.20	17.85	16.73	17.12	21.65	20.16	20.89
22	24.36	24.02	24.17	25.90	25.30	25.60	19.87	16.77	17.20	22.63	18.79	20.88
23	24.58	24.16	24.38	25.42	25.03	25.27	21.57	19.81	20.83	23.01	20.88	22.00
24	24.94	24.41	24.55	25.28	24.93	25.06	24.45	21.28	22.11	24.33	22.00	23.22
25	24.61	23.81	24.20	25.10	24.84	24.96	25.05	21.05	23.15	24.89	22.36	24.00
26	23.83	23.48	23.61	24.53	22.90	23.48	25.83	24.75	25.50	27.04	24.50	25.50
27	24.52	23.23	23.38	23.78	22.77	22.99	25.77	24.17	25.19	27.63	26.46	26.94
28	25.05	23.86	24.48	24.48	23.25	23.87	25.90	22.92	24.60	27.99	26.84	27.51
29	---	---	---	27.09	23.69	25.40	24.93	23.20	24.05	28.22	27.12	27.67
30	---	---	---	27.75	26.37	26.91	23.98	23.02	23.53	28.33	27.28	27.85
31	---	---	---	26.73	25.92	26.45	---	---	---	28.65	28.00	28.24
MONTH	25.05	13.55	20.84	28.19	22.77	26.04	26.76	16.73	22.10	28.65	18.79	23.79
DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
JUNE			JULY			AUGUST			SEPTEMBER			
1	28.79	27.73	28.17	18.06	16.53	17.01	18.06	16.63	17.56	17.54	14.14	15.45
2	28.83	27.83	28.28	18.73	15.44	16.84	17.34	15.82	16.71	15.97	11.83	13.72
3	28.47	26.62	27.82	18.89	17.66	18.07	17.67	16.83	17.10	13.33	11.73	12.45
4	27.64	25.95	26.73	18.64	17.59	17.83	17.74	16.51	17.28	12.94	11.18	11.72
5	27.09	25.37	26.07	19.11	16.03	17.73	17.01	16.12	16.64	11.68	9.75	10.52
6	26.46	25.35	25.96	19.19	16.69	18.44	17.72	15.39	16.72	12.83	9.65	11.37
7	26.14	25.13	25.80	20.43	19.04	20.01	17.57	14.98	16.66	15.84	12.57	14.07
8	25.97	24.62	25.11	20.29	19.10	19.64	17.81	14.04	16.28	15.40	11.83	13.45
9	25.92	24.62	25.25	20.18	15.92	17.69	17.43	13.62	15.75	12.50	9.93	11.02
10	25.50	24.13	24.62	16.10	12.86	14.44	17.34	13.58	15.84	14.30	10.20	12.65
11	24.86	24.19	24.61	16.80	13.76	15.59	16.93	13.48	15.64	13.45	11.51	12.79
12	24.85	24.53	24.71	19.88	16.13	18.11	17.35	13.32	15.73	11.88	9.71	10.53
13	25.74	24.02	24.66	19.64	18.70	19.21	16.96	13.51	15.62	10.50	9.48	9.94
14	24.05	22.50	23.42	20.07	17.82	18.95	15.45	13.39	14.43	11.86	9.75	10.82
15	23.76	20.03	21.75	20.26	16.46	18.33	16.11	13.08	14.65	12.06	11.05	11.80
16	21.94	19.95	20.71	20.73	20.23	20.49	14.64	12.50	13.74	11.17	9.85	10.48
17	23.32	21.18	22.02	20.69	18.34	19.14	16.32	12.45	14.64	13.88	9.98	12.91
18	21.50	19.46	20.56	19.75	18.66	19.38	17.08	12.95	15.35	13.80	10.14	10.98
19	19.82	19.16	19.46	20.21	18.29	19.19	17.37	13.06	15.97	11.33	9.45	10.59
20	19.75	19.47	19.64	19.45	17.55	18.61	18.62	15.28	17.24	14.52	10.27	12.34
21	21.36	19.47	20.48	20.08	18.44	19.25	17.20	14.18	15.61	11.84	10.32	11.00
22	21.15	19.35	19.83	19.23	18.13	18.41	16.54	14.54	15.69	13.27	10.53	12.25
23	20.71	19.95	20.36	19.47	16.39	17.58	14.60	11.63	13.04	13.18	11.28	12.60
24	20.75	18.33	19.72	18.38	14.83	16.34	14.85	11.35	13.33	12.34	10.30	11.15
25	18.50	15.68	17.28	17.34	16.25	16.89	14.56	11.56	12.79	11.88	9.53	10.21
26	17.99	16.76	17.32	18.95	16.88	17.23	13.46	11.69	12.63	11.77	9.49	10.08
27	18.86	17.46	18.42	19.48	17.97	18.96	13.68	11.54	12.41	12.04	9.79	11.28
28	18.79	17.99	18.20	19.43	17.84	18.47	13.44	10.81	12.14	12.78	10.25	11.95
29	18.11	15.96	17.44	19.34	17.95	18.59	11.44	10.31	11.19	12.69	11.48	11.73
30	18.28	16.87	17.51	20.01	17.15	17.78	13.04	10.32	11.74	11.90	9.88	11.23
31	---	---	---	20.14	16.68	17.93	14.15	12.73	13.63	---	---	---
MONTH	28.83	15.68	22.40	20.73	12.86	18.13	18.62	10.31	14.96	17.54	9.45	11.77
YEAR	28.83	8.13	18.39									

## Crest-stage partial-record stations

The following table contains annual maximum discharge for crest-stage stations. A crest-stage gage is a device which will register the peak stage occurring between inspections of the gage. A stage-discharge relation for each gage is developed from discharge measurements made by indirect measurements of peak flow or by current meter. The date of the maximum discharge is not always certain but is usually determined by comparison with nearby continuous-record stations, weather records, or local inquiry. Only the maximum discharge for each water year is given. Information on some lower floods may have been obtained but is not published herein. The years given in the period of record represent water years for which the annual maximum has been determined.

## Annual maximum discharge at crest-stage partial-record stations

						Annual maximum		
Station No.	Station Name	Location	Drainage area (mi <sup>2</sup> )	Period of record	Date	Gage height (ft)	Dis-charge (ft <sup>3</sup> /s)	
WARNER LAKES BASIN								
10378505	MINERS DRAW NEAR PLUSH, OR	Lat 42°29'15", long 119°53'57", in SW¼ sec.33, T.35 S., R.24 E., Lake County, at culvert on Hogback Road, 5.2 miles north of Plush.	15.9	1980-83	3-13-83	12.83	8.0	
SILVER LAKE BASIN								
10390400	BRIDGE CREEK NEAR THOMPSON RESERVOIR, OR (Station discontinued)	Lat 43°01'28", long 121°12'04" in SE¼SW¼ sec.29, T.29 S., R.13 E., Lake County, in Fremont National Forest, at culvert on Forest Service road 2800, 7.2 miles northwest of Thompson Reservoir, and 11 miles southwest of town of Silver Lake.	10.6	1965-83	5-29-83	11.00	106	
KLAMATH RIVER BASIN								
11497800	CURRIER CREEK NEAR PAISLEY, OR (Station discontinued)	Lat 42°42'55", long 120°52'50", in NW¼NW¼ sec.18, T.33 S., R.16 E., Lake County, in Fremont National Forest, at culvert on Forest Service road 337, 100 ft east of junction with road 3313, 1.4 miles upstream from mouth, and 17 miles west of Paisley.	2.46	1965-83	5-29-83	15.27	116	
11499495	WEST FORK WHISKEY CREEK NEAR BEATTY, OR	Lat 42°22'32", long 121°22'52", in SW¼ sec.11, T.37 S., R.11 E., Klamath County, at culvert on Road No. 4083 in Winema of State Highway 66, and 7.2 miles southwest of Beatty.	4.40	1980-83	5-29-83	19.07	130	
11505550	LOST CREEK NEAR ROCKY POINT, OR (Station discontinued)	Lat 42°29'35", long 122°11'30", in SE¼ sec.26, T.35 S., R.5 E., Klamath County, Winema National Forest, at culvert on Forest Service road 3561, 1.5 miles east of Long Lake, and 5.5 miles west of Rocky Point.	13.2	1966-83	5-17-83	10.64	132	
OWYHEE RIVER BASIN								
13177805	TENT CREEK NEAR MCDERMITT, NV	Lat 42°02'00", long 117°16'15", in NW¼ sec.12, T.41 S., R.46 E., Malheur County, at culvert on BLM Star Valley access road, 8 miles southwest of Lookout Lake, and 23 miles east of McDermitt.	11.6	1974-83	6- 1-83	7.07	21	
13182150	LONG GULCH NEAR ROCKVILLE, OR	Lat 43°19'17", long 117°11'42", in NW¼NE¼ sec.10, T.26 S., R.45 E., Malheur County, at culvert on Bureau of Land Management Leslie Gulch road, 1.3 miles upstream from Bannock Gulch, and 4 miles west of Rockville.	1.38	1970-79, 1982-83	5- 1-83	9.72	8.8	
MALHEUR RIVER BASIN								
13213900	MALHEUR RIVER TRIBUTARY NEAR DREWSEY, OR (Station discontinued)	Lat 43°46'51", long 118°21'27", in SE¼SW¼ sec.36, T.20 S., R.35 E., Harney County, at culvert on county road to Drewsey, 200 feet north of U.S. Highway 20, and 2 miles south of Drewsey.	2.28	1964-83	3- 4-83	9.77	50	
13228300	LYTLE CREEK NEAR VALE, OR (Station discontinued)	Lat 43°57'26", long 117°13'33", in SE¼ sec.32, T.18 S., R.45 E., Malheur County, at culvert on Lytle Boulevard, 2 miles south of Vale.	6.46	1968-83	12-23-82	9.52	23	
POWDER RIVER BASIN								
13286300	WATERSPOUT CREEK NEAR BAKER, OR (Station discontinued)	Lat 44°50'08", long 117°32'48", in SW¼SW¼ sec.27, T.8 S., R.42 E., Baker County, at culvert on State Highway 86, 14 miles east of Baker.	.96	1968-83	2- 6-83	12.74	11	

## DISCHARGE AT PARTIAL-RECORD STATIONS AND MISCELLANEOUS SITES

## Annual maximum discharge at crest-stage partial-record stations--Continued

Station No.	Station Name	Location	Drainage area (mi <sup>2</sup> )	Period of record	Date	Annual maximum	
						Gage height (ft)	Dis- charge (ft <sup>3</sup> /s)
GRANDE RONDE RIVER BASIN							
13329700	TROUT CREEK TRIBU- TARY NEAR CHICO, OR (Station discontinued)	Lat 45°35'50", long 117°15'35", in center of sec.1, T.1 N., R.44 E., Wallowa County, at culvert on State Highway 3, 0.2 mile upstream from mouth, 1.0 mile south of Wallowa-Whitman National Forest boundary and 9.5 miles southwest of Chico.	.26	1967-83	3- 4-83	9.45	7.0
WALLA WALLA RIVER BASIN							
14016080	DRY CREEK TRIBUTARY NEAR MILTON- FREEWATER, OR (Station discontinued)	Lat 45°53'05", long 118°23'28", in NE¼ sec.26, T.5 N., R.35 E., Umatilla County, at culvert on State Highway 11, 2.6 miles south of Milton-Freewater.	1.22	1967-83	3- 4-83	18.96	28
JOHN DAY RIVER BASIN							
14040900	BRUIN CREEK NEAR DALE, OR (Station discontinued)	Lat 44°53'51", long 118°47'35", in SW¼ sec.6, T.8 S., R.33 E., Grant County, at culvert on Forest Service road SA-12, 12 miles southeast of Dale.	4.63	1969-83	3- 4-83	11.94	28
14046400	DONNELLY CREEK TRIBU- TARY NEAR SERVICE CREEK, OR (Station discontinued)	Lat 44°46'20", long 120°00'10", in SE¼ sec.19, T.9 S., R.23 E., Wheeler County, at two culverts on State Highway 207, 1.8 miles south of Service Creek.	1.85	1964-83	-	-	0
14047470	JUNIPER CANYON TRIBU- TARY NEAR MIKKALO, OR	Lat 45°27'51", long 120°11'54", in SW¼ sec.21, T.1 S., R.21 E., Gilliam County, at culvert on Mikkalo Road, 0.1 mile upstream from mouth, and 1.7 miles east of Mikkalo.	1.94	1972-83	-	-	0
DESCHUTES RIVER BASIN							
14078200	LIZARD GULCH NEAR HAMPTON, OR (Station discontinued)	Lat 43°35'20", long 119°59'00", in SW¼ sec.8, T.23 S., R.23 E., Lake County, In Glass Mountain conservation area, at culvert on U.S. Highway 20, and 15.5 miles east of Hampton.	19.6	1965-83	1- 6-83	8.99	28
14095200	SAGEBRUSH CREEK TRIBUTARY NEAR GATEWAY, OR (Station discontinued)	Lat 44°45'33", long 121°02'02", in SE¼NE¼ sec.27, T.9 S., R.14 E., Jefferson County, at culvert on former U.S. Highway 97, 1 mile upstream from mouth and 11 miles north of Madras.	10.7	1957-83	5-31-83	14.76	150
FIFTEENMILE CREEK BASIN							
14104100	RAMSEY CREEK NEAR DURFUR, OR (Station discontinued)	Lat 45°24'03", long 121°22'27", in NW¼ sec.13, T.2 S., R.11 E., Wasco County, in Mt. Hood National Forest, at culvert on Forest Service road S207, 12 miles west of Dufur.	3.87	1965-83	2-18-83	12.16	63



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 1983

Stream	Tributary to	Location	Drainage area (mi <sup>2</sup> )	Measured previously (water years)	Measurements Date	Discharge (ft <sup>3</sup> /s)
Part 11						
KLAMATH RIVER BASIN						
Munson Creek	Annie Creek	Lat 42°52'45", long 122°08'15".	-	1967-68, 1977-82	10- 6-82 7- 7-83 8-18-83	*7.14 41.2 *17.1
Part 14						
DESCHUTES RIVER BASIN						
Deschutes River	Columbia River	SE¼SE¼ sec.20, T.21 S., R.8 E., just below Sheep Springs, 15 mi northwest of La Pine.	-	1938-49#, 1950, 1952-57, 1960-82	10- 1-82 12- 7-82 2-10-83 4- 7-83 5-12-83 6-27-83 8-10-83	a831 a364 a430 a329 a506 a1,060 a846

\* Base flow.

‡ Operated as a continuous record gaging station.

a Base flow from intervening springs can be obtained by subtracting flow of Deschutes River below Crane Prairie Reservoir.

## GROUND-WATER LEVELS

## BAKER COUNTY

445116117551601. Local number 8S/39E-22BDD.

LOCATION.--Lat 44°51'16", long 117°55'16", Hydrologic Unit 17050203.

Owner: Baker County

AQUIFER.--Alluvium.

WELL CHARACTERISTICS.--Dug observation well, size 18x18 in, depth 11 ft cribbed with wood to 9 ft, perforated 12-in steel casing 7-11 ft.

DATUM.--Land surface datum is 3,385.78 ft National Geodetic Vertical Datum of 1929. Measuring point: Top of 1½-in pipe, 0.50 ft above datum.

PERIOD OF RECORD.--1936, 1938 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 0.90 ft below datum, Feb. 19, 1982; lowest measured, 9.95 ft below datum, Nov. 10, 1977.

WATER LEVEL, IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 1982 TO SEPTEMBER 1983

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 12	2.63	FEB 4	2.27	MAY 6	2.28	-	-

444813117543401. Local number 9S/39E-2CCC.

LOCATION.--Lat 44°48'13", long 117°54'34", Hydrologic Unit 17050203.

Owner: Warren Spencer.

AQUIFER.--Sand and gravel.

WELL CHARACTERISTICS.--Drilled unused well, diam 12 in, depth 321 ft perforated 0-321 ft.

DATUM.--Altitude of land surface datum is about 3,412 ft. Measuring point: Top of casing, 0.70 ft above datum.

PERIOD OF RECORD.--1949 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 1.37 ft below datum, Feb. 17, 1965; lowest measured, 13.95 ft below datum, Jan. 20, 1955.

WATER LEVEL, IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 1982 TO SEPTEMBER 1983

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 12	8.62	FEB 4	7.89	MAY 6	2.96	-	-

## CROOK COUNTY

442103120545001. Formerly 442100120541701. Local number 14S/15E-15DCB.

LOCATION.--Lat 44°21'03", long 120°54'50", Hydrologic Unit 17070305. Formerly lat 44°12'00", long 120°54'48".

Owner: Evert Hibbitts.

AQUIFER.--Sand and gravel.

WELL CHARACTERISTICS.--Drilled domestic and stock well, diam 4 in, depth 210 ft.

DATUM.--Land surface datum is 2,846.8 ft National Geodetic Vertical Datum of 1929. Measuring point: Center of pressure gage, 6.50 ft above datum.

PERIOD OF RECORD.--1944-79, 1981 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 75.5 ft above datum, Mar. 12, 1964; lowest measured, 34.5 ft above datum, May 13, 1977.

WATER LEVEL, IN FEET ABOVE LAND SURFACE DATUM, WATER YEAR OCTOBER 1982 TO SEPTEMBER 1983

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 16	43.89	-	-	-	-	-	-

## DESCHUTES COUNTY

434400121275801. Formerly 434400121275001. Local number 21S/11E-19CCC.

LOCATION.--Lat 43°44'00", long 121°27'58", Hydrologic Unit 17070302. Formerly lat 43°44'01", long 121°27'57".

Owner: Randy Kellems.

AQUIFER.--Sand and gravel.

WELL CHARACTERISTICS.--Dug domestic and stock well, diam 6 in, depth 100 ft, cased to 70 ft.

DATUM.--Altitude of land surface datum is about 4,220 ft. Measuring point: Top of casing, 0.20 ft above datum.

PERIOD OF RECORD.--1945, 1948 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 10.90 ft below datum, Aug. 14, 1956; lowest measured, 41.63 ft below datum Oct. 23, 1964.

WATER LEVEL, IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 1982 TO SEPTEMBER 1983

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 17	18.38	APR 12	16.50	-	-	-	-

## GRANT COUNTY

442901119342501. Formerly 442845119343001. Local number 12S/26E-34DAA.

LOCATION.--Lat 44°29'01", long 119°34'25", Hydrologic Unit 17070201. Formerly lat 44°28'59", long 119°34'25".

Owner: Dayville Cemetery.

AQUIFER.--Tuffaceous sand and gravel.

WELL CHARACTERISTICS.--Drilled irrigation well, diam 6 in, depth 465 ft, cased to 222 ft, perforated 177-222 ft.

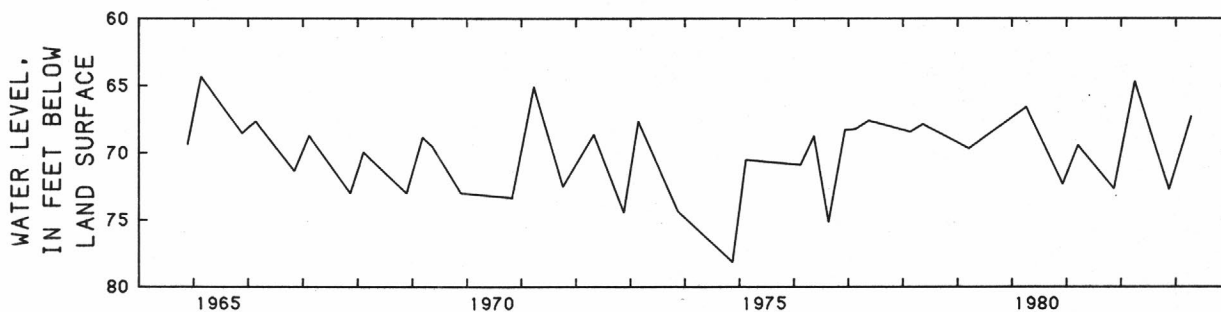
DATUM.--Altitude of land surface datum is about 2,340 ft. Measuring point: Top hole in casing seal 1.50 ft below datum.

PERIOD OF RECORD.--1963 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 64.33 ft below datum, Feb. 19, 1965; lowest measured, 78.14 ft below datum, Nov. 15, 1974.

WATER LEVEL, IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 1982 TO SEPTEMBER 1983

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 16	72.72	APR 11	67.32	-	-	-	-



12S/26E-34DAA

## HARNEY COUNTY

433705118595401. Formerly 433701118595401. Local number 22S/31E-34CCB.

LOCATION.--Lat 43°37'05", long 118°59'54", Hydrologic Unit 17120001. Formerly lat 43°37'01".

Owner: Jay Hoyt.

AQUIFER.--Volcanic or sedimentary rock.

WELL CHARACTERISTICS.--Drilled stock well, diam 18 to 8 in, depth 288 ft, cased to 68 ft.

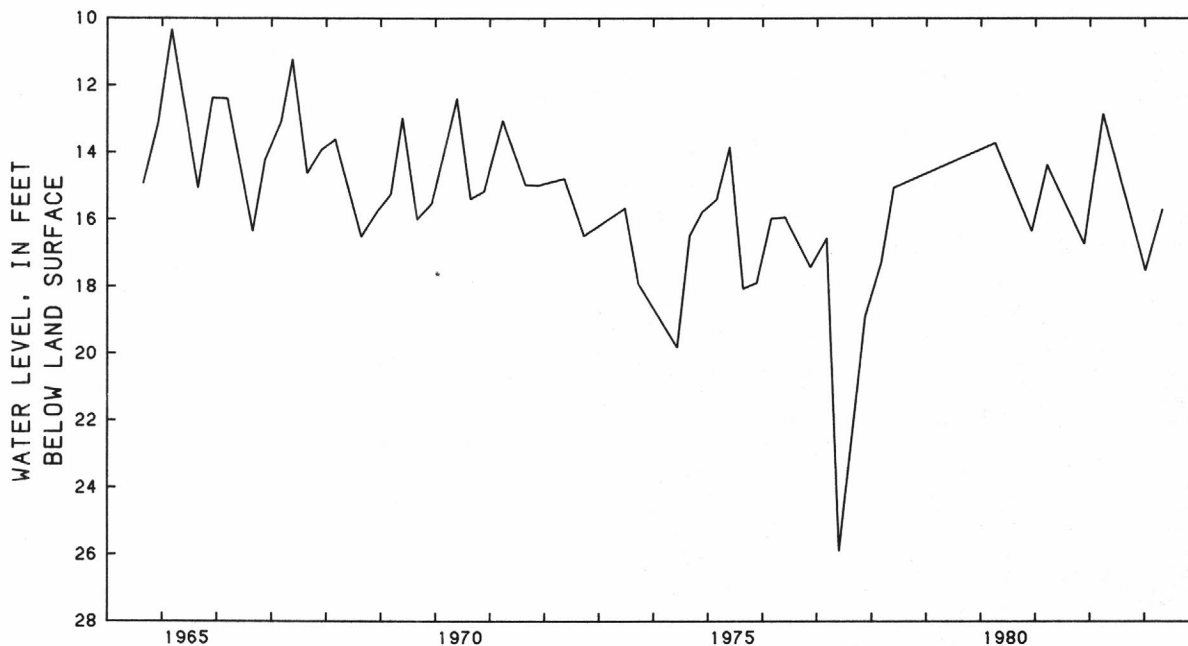
DATUM.--Land surface datum is 4,153.17 ft National Geodetic Vertical Datum of 1929. Measuring point: Top of well cover, 1.00 ft above datum.

PERIOD OF RECORD.--1936 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 1.50 ft below datum, Apr. 21, 1936; lowest measured, 19.82 ft below datum, June 6, 1974.

WATER LEVEL, IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 1982 TO SEPTEMBER 1983

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
JAN 4	17.52	APR 25	15.72	-	-	-	-



22S/31E-34CCB

## HARNEY COUNTY--Continued

433527118560502. Local number 23S/32E-7CAB.

LOCATION.--Lat 43°35'27", long 118°56'05", Hydrologic Unit 17120001.

Owner: Dorland Ray.

AQUIFER.--Alluvium.

WELL CHARACTERISTICS.--Drilled irrigation well, diam 18 in, depth 93 ft, cased to bottom, perforated 38-86 ft.

DATUM.--Land surface datum is 4,135.24 ft National Geodetic Vertical Datum of 1929. Measuring point: Top of casing, 0.36 ft below datum.

PERIOD OF RECORD.--1928 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 2.07 ft below datum, May 19, 1965; lowest measured, 38.37 ft below datum, July 30, 1931.

## WATER LEVEL, IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 1982 TO SEPTEMBER 1983

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
JAN 4	7.23	APR 26	4.16	-	-	-	-

431551118381001. Local number 26S/33E-34CCA.

LOCATION.--Lat 43°15'51", long 118°38'10", Hydrologic Unit 17120001.

Owner: Davis Farms.

AQUIFER.--Clinders.

WELL CHARACTERISTICS.--Drilled irrigation well, diam 14 in, depth 81 ft, cased to 30 ft.

DATUM.--Altitude of land surface datum is 4,120 ft. Measuring point: Top of casing, 0.50 ft above datum.

PERIOD OF RECORD.--1962 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 18.10 ft below datum, Apr. 15, 1983; lowest measured, 23.60 ft below datum, Dec. 15, 1976.

## WATER LEVEL, IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 1982 TO SEPTEMBER 1983

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
DEC 27	22.76	APR 15	18.10	JUL 13	P/	SEP 20	18.83

425437118210601. Local number 31S/35E-1BBB. Formerly 425400118205001. Local number 31S/35E-1BB.

LOCATION.--Lat 42°54'37", long 118°21'06", Hydrologic Unit 17120009. Formerly lat 42°54'00", long 118°20'50".

Owner: Fred Pallock.

AQUIFER.--Alluvium.

WELL CHARACTERISTICS.--Drilled domestic well, diam 8 in, depth 32 ft.

DATUM.--Altitude of land surface datum is 4,270 ft. Measuring point: Top of casing, 0.50 ft above datum.

PERIOD OF RECORD.--1954 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 1.61 ft below datum, Apr. 15, 1983; lowest measured, 18.12 ft below datum, Nov. 20, 1963, May 21, 1964.

## WATER LEVEL, IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 1982 TO SEPTEMBER 1983

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
DEC 31	4.55	APR 15	1.61	-	-	-	-

## KLAMATH COUNTY

423832121524801. Local number 34S/7E-9ADB.

LOCATION.--Lat 42°38'32", long 121°52'48", Hydrologic Unit 18010201.

Owner: State of Oregon.

AQUIFER.--Basalt.

WELL CHARACTERISTICS.--Drilled domestic well, diam 6 in, depth 221 ft, cased to 43 ft.

DATUM.--Altitude of land surface datum is 4,220 ft. Measuring point: Bolt above top of casing, 4.84 ft below datum.

PERIOD OF RECORD.--1955-79, 1981 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 18.3 ft below datum, Apr. 28, 1983; lowest measured, 27.08 ft below datum, Oct. 16, 1980.

## WATER LEVEL, IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 1982 TO SEPTEMBER 1983

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
APR 28	18.3	-	-	-	-	-	-

423408121430901. Local number 35S/8E-1BCC.

LOCATION.--Lat 42°34'08", long 121°43'09", Hydrologic Unit 18010202.

Owner: H.G. Wolff.

WELL CHARACTERISTICS.--Drilled domestic well, diam 6 in, depth 102 ft.

DATUM.--Altitude of land surface datum is 4,305 ft. Measuring point: Top of casing 0.50 ft above datum.

PERIOD OF RECORD.--1954-80, 1982 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 1.45 ft below datum, Apr. 8, 1956; lowest measured, 17.14 ft below datum, Oct. 19, 1977.

## WATER LEVEL, IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 1982 TO SEPTEMBER 1983

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 2	11.25	APR 20	6.80	-	-	-	-

P/ Pumping.

## GROUND-WATER LEVELS

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## KLAMATH COUNTY--Continued

423133121340801. Local number 35S/10E-19ACA.

LOCATION.--Lat 42°31'31", long 121°34'08", Hydrologic Unit 18010202.

Owner: Wolfe Butte Ranch.

AQUIFER.--Volcanic rock.

WELL CHARACTERISTICS.--Drilled domestic well, diam 6 in, depth 360 ft, cased to 70 ft.

DATUM.--Altitude of land surface datum is 4,300 ft. Measuring point: Top of casing, 0.50 ft above datum.

PERIOD OF RECORD.--1954 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 6.80 ft below datum, Apr. 20, 1983; lowest measured, 25.55 ft below datum, Jan. 26, 1977.

## WATER LEVEL, IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 1982 TO SEPTEMBER 1983

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 2	R/ 10.64	APR 20	6.80	-	-	-	-

421920121400001. Local number 37S/10E-29DBB2.

LOCATION.--Lat 42°19'20", long 121°40'00", Hydrologic Unit 18010204.

Owner: Edgewood Ranch.

AQUIFER.--Gravel.

WELL CHARACTERISTICS.--Drilled stock well, diam 18 in, depth 860 ft, cased to 20 ft.

DATUM.--Altitude of land surface datum is 4,186 ft. Measuring point: Top of casing, at datum.

PERIOD OF RECORD.--1949 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 20.78 ft below datum, Apr. 17, 1958; lowest measured, 34.56 ft below datum, Nov. 5, 1981.

## WATER LEVEL, IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 1982 TO SEPTEMBER 1983

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 3	32.91	APR 25	24.65	-	-	-	-

421612121302501. Formerly 421610121303001. Local number 38S/11-1/2E-15DDA.

LOCATION.--Lat 42°16'12", long 121°30'25", Hydrologic Unit 18010204.

Owner: George McCollum.

AQUIFER.--Lava rock and cinders.

WELL CHARACTERISTICS.--Drilled irrigation well, diam 12 in, depth 495 ft.

DATUM.--Altitude of land surface datum is 4,185 ft. Measuring point: Airline hole in pumpbase, 1.05 ft above datum.

PERIOD OF RECORD.--1948, 1950 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 71.26 ft below datum, Apr. 24, 1975; lowest measured, 82.20 ft below datum, Oct. 3, 1979.

## WATER LEVEL, IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 1982 TO SEPTEMBER 1983

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 3	78.76	APR 25	76.60	-	-	-	-

420908121313701. Local number 39S/11-1/2E-28DDD.

LOCATION.--Lat 42°09'08", long 121°31'37", Hydrologic Unit 18010204.

Owner: Lost River Ranch.

AQUIFER.--Diatomite.

WELL CHARACTERISTICS.--Drilled domestic and stock well, diam 6 in, depth 460 ft, cased to 60 ft.

DATUM.--Altitude of land surface datum is 4,105 ft. Measuring point: Top south side of concrete curb, 0.30 ft above datum.

PERIOD OF RECORD.--1954 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 6.50 ft below datum, Aug. 25, 1955; lowest measured, 37.16 ft below datum, July 24, 1975.

## WATER LEVEL, IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 1982 TO SEPTEMBER 1983

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 2	15.73	APR 25	14.05	-	-	-	-

R/ Recently pumped.

## GROUND-WATER LEVELS

## KLAMATH COUNTY--Continued

420844121150801. Local number 39S/12E-35ADD.

LOCATION.--Lat 42°08'44", long 121°15'08", Hydrologic Unit 18010204. Formerly lat 42°08'45", long 121°15'06".

Owner: Quentin Steele.

AQUIFER.--Basalt.

WELL CHARACTERISTICS.--Drilled domestic and stock well, diam 6 in, depth 360 ft.

DATUM.--Altitude of land surface datum is 4,180 ft. Measuring point: Top of casing at datum.

PERIOD OF RECORD.--1954 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 33.26 ft below datum, Aug. 5, 1958; lowest measured, 42.80 ft below datum, Apr. 3, 1962.

## WATER LEVEL, IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 1982 TO SEPTEMBER 1983

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 3	37.18	APR 25	38.20	-	-	-	-

420632121293601. Local number 40S/11E-11BAD.

LOCATION.--Lat 42°06'32", long 121°29'36", Hydrologic Unit 18010204.

Owner: A. W. Shaupp.

AQUIFER.--Basalt.

WELL CHARACTERISTICS.--Drilled irrigation and stock well, diam 12 in, depth 992 ft.

DATUM.--Altitude of land surface datum is 4,150 ft. Measuring point:  $\frac{1}{2}$ -in hole in top of pumpbase flange, 0.60 ft above datum.

PERIOD OF RECORD.--1954 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 8.38 ft below datum, Apr. 7, 1956; lowest measured, 28.83 ft below datum, July 22, 1964.

## WATER LEVEL, IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 1982 TO SEPTEMBER 1983

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 3	20.32	APR 25	17.8	-	-	-	-

420232121241201. Local number 41S/12E-3CBA.

LOCATION.--Lat 42°02'32", long 121°24'12", Hydrologic Unit 18010204.

Owner: Al Prescott.

AQUIFER.--Alluvium.

WELL CHARACTERISTICS.--Drilled domestic well, diam 4 in, depth 76 ft.

DATUM.--Altitude of land surface datum is 4,110 ft. Measuring point: Top of casing, 0.30 ft above datum.

PERIOD OF RECORD.--1954 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 0.75 ft below datum, Feb. 18, 1955; lowest measured, 4.56 ft below datum, July 24, 1968.

## WATER LEVEL, IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 1982 TO SEPTEMBER 1983

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 3	2.78	APR 25	3.80	-	-	-	-

420124121122801. Local number 41S/14E-8CCA.

LOCATION.--Lat 42°01'24", long 121°12'28", Hydrologic Unit 18010204.

Owner: Charles Kilgore.

AQUIFER.--Basalt fragments.

WELL CHARACTERISTICS.--Drilled irrigation well, diam 16 in, depth 210 ft, cased to 8 ft.

DATUM.--Altitude of land surface datum is 4,160 ft. Measuring point: Hole in pumpbase, 1.00 ft above datum.

PERIOD OF RECORD.--1954 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 14.84 ft below datum, Jan. 28, 1965; lowest measured, 21.12 ft below datum, Apr. 25, 1974.

## WATER LEVEL, IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 1982 TO SEPTEMBER 1983

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 3	17.86	APR 25	16.20	-	-	-	-

## LAKE COUNTY

432435121015001. Local number 25S/14E-15BCC.

LOCATION.--Lat 43°24'35", long 121°01'50", Hydrologic Unit 17120005.

Owner: Leroy Surcamp.

AQUIFER.--Basalt.

WELL CHARACTERISTICS.--Drilled well, diam 18 in, depth 220 ft.

DATUM.--Altitude of land surface datum is about 4,350 ft. Measuring point: Top of casing, at datum.

PERIOD OF RECORD.--1932, 1935-36, 1938 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 40.88 ft below datum, Oct 7, 1974; lowest measured, 52.88 ft below datum, Oct. 22, 1948.

## WATER LEVEL, IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 1982 TO SEPTEMBER 1983

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 18	P/ 46.25	MAR 11	45.94	-	-	-	-

431536120563901. Local number 27S/15E-4ACA1.

LOCATION.--Lat 43°15'36", long 120°56'39", Hydrologic Unit 17120005.

Owner: M. Y. Parks.

AQUIFER.--Basaltic fragments.

WELL CHARACTERISTICS.--Drilled irrigation well, diam 16 in, depth 257 ft, cased to 14 ft.

DATUM.--Altitude of land surface datum is about 4,335 ft. Measuring point: Airline entry, 2.00 ft above datum.

PERIOD OF RECORD.--1932, 1935-36, 1938 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 35.30 ft below datum, May 15, 1975; lowest measured, 39.82 ft below datum, Nov. 23, 1981.

## WATER LEVEL, IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 1982 TO SEPTEMBER 1983

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 18	38.35	JAN 12	39.16	FEB 8	39.01	MAR 11	38.73
DEC 14	39.28						

431547120380201. Local number 27S/18E-6BCB.

LOCATION.--Lat 43°15'47", long 120°38'02", Hydrologic Unit 17120005.

Owner: Rose T. Morici.

AQUIFER.--Sand.

WELL CHARACTERISTICS.--Drilled unused well, diam 8 in, depth 93 ft, cased to 10 ft.

DATUM.--Altitude of land surface datum is about 4,317 ft. Measuring point: Top of casing, 0.50 ft above datum.

PERIOD OF RECORD.--1940 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 15.94 ft below datum, Oct. 8, 1974; lowest measured, 25.19 ft below datum, Apr. 1, 1953.

## WATER LEVEL, IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 1982 TO SEPTEMBER 1983

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 18	16.93	MAR 10	16.91	-	-	-	-

431320120350001. Local number 27S/18E-21AAA.

LOCATION.--Lat 43°13'20", long 120°35'00", Hydrologic Unit 17120005.

Owner: Chewaucan Land &amp; Cattle Co.

AQUIFER.--Basalt (?).

WELL CHARACTERISTICS.--Drilled abandoned oil-test well, diam 6-1/2 in, depth 635 ft.

DATUM.--Altitude of land surface datum is about 4,330 ft. Measuring point: Top of casing, at datum.

PERIOD OF RECORD.--1955 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 26.41 ft below datum, Apr. 5, 1967; lowest measured, 30.33 ft below datum, July 22, 1982.

## WATER LEVEL, IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 1982 TO SEPTEMBER 1983

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 17	30.28	MAR 10	29.36	-	-	-	-

430508119582001. Local number 29S/23E-3DAC.

LOCATION.--Lat 43°05'08", long 119°58'20", Hydrologic Unit 17120005.

Owner: U.S. Soil Conservation Service

AQUIFER.--Basalt (?).

WELL CHARACTERISTICS.--Drilled stock well, diam 8 in, depth 177 ft.

DATUM.--Altitude of land surface datum is about 4,225 ft. Measuring point: Top of casing collar, at datum.

PERIOD OF RECORD.--1945, 1947 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 14.42 ft below datum, July 27, 1965; lowest measured, 19.62 ft below datum, Apr. 23, 1974.

## WATER LEVEL, IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 1982 TO SEPTEMBER 1983

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 2	18.39	-	-	-	-	-	-

P/ Pumping.



## GROUND-WATER LEVELS

LAKE COUNTY--Continued

423245119532201. Formerly 423250119531501. Local number 35S/24E-9DBD.

LOCATION.--Lat 42°32'45", long 119°53'22", Hydrologic Unit 17120007.

Owner: U.S. Bureau of Land Management.

AQUIFER.--Basalt.

WELL CHARACTERISTICS.--Drilled well, diam 8 in, depth 376 ft, cased to 22 ft.

DATUM.--Altitude of land surface datum is 4,470 ft. Measuring point: Top of casing collar, 0.50 ft above datum.

REMARKS.--Hogback well on Rabbit Hills SW quadrangle map.

PERIOD OF RECORD.--1949 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 5.76 ft below datum, May 8, 1973; lowest measured, 11.15 ft below datum, July 31, 1979.

WATER LEVEL, IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 1982 TO SEPTEMBER 1983

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 2	8.60	-	-	-	-	-	-

420844120271601. Formerly 420842120271301. Local number 39S/19E-34ADA.

LOCATION.--Lat 42°08'44", long 120°27'16", Hydrologic Unit 18020001. Formerly lat 42°08'42", long 120°27'13".

Owner: Hilltop Dairy. Formerly Daryl Jamison.

WELL CHARACTERISTICS.--Drilled domestic and stock well, diam 6 in, depth 110 ft, cased to 110 ft.

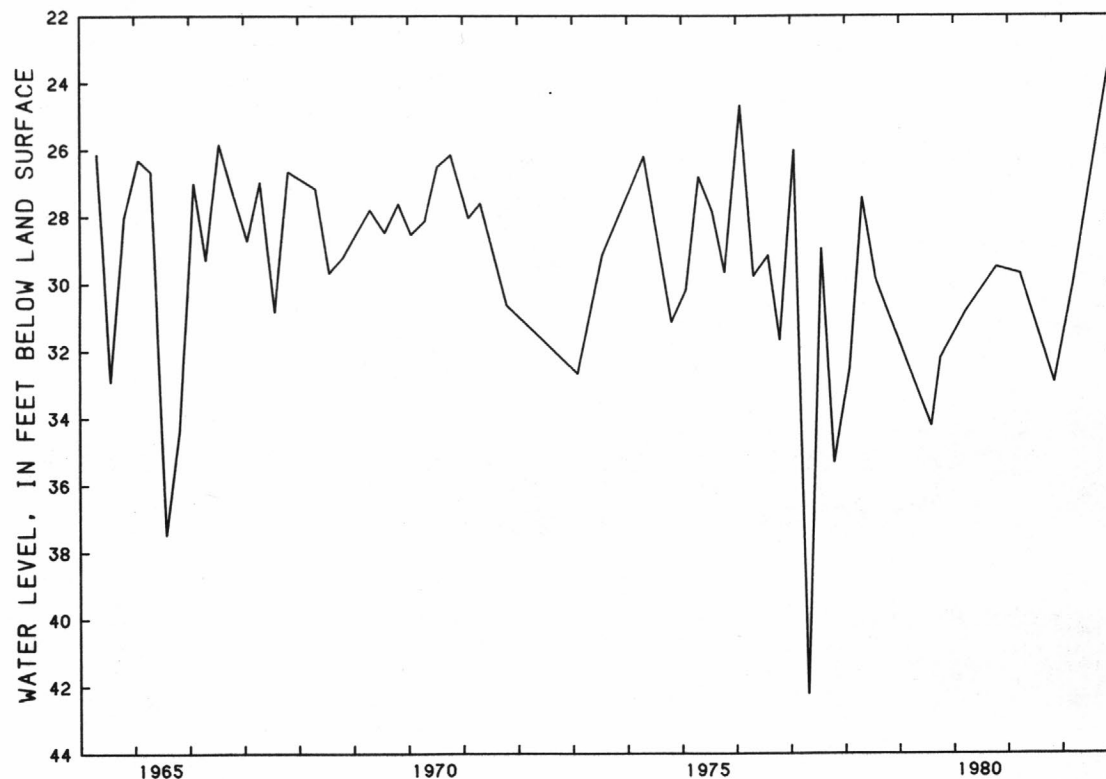
DATUM.--Altitude of land surface datum is 4,792 ft. Measuring point: Top of vent pipe, 2.00 ft above datum.

PERIOD OF RECORD.--1960 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 23.61 ft below datum, Nov. 2, 1982; lowest measured, 34.23 ft below datum, July 31, 1979.

WATER LEVEL, IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 1982 TO SEPTEMBER 1983

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 2	23.61	-	-	-	-	-	-



39S/19E-34ADA

421036119535201. Formerly 421032119535802. Local number 39S/24E-21BDB.

LOCATION.--Lat 42°10'36", long 119°53'52", Hydrologic Unit 17120007. Formerly lat 42°10'34", long 119°53'48".

Owner: E.G. &amp; T.M. Sanford

AQUIFER.--Gravel.

WELL CHARACTERISTICS.--Drilled domestic well, diam 6 in, depth 165 ft.

DATUM.--Altitude of land surface datum is about 4,538 ft. Measuring point: Top of casing, 0.50 ft above datum.

PERIOD OF RECORD.--1948 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 9.00 ft below datum, July 23, 1974; lowest measured, 19.34 ft below datum, Jan. 15, 1960.

WATER LEVEL, IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 1982 TO SEPTEMBER 1983

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 2	17.60	-	-	-	-	-	-

## MALHEUR COUNTY

441710117472301. Local number 15S/40E-2CCB.

LOCATION.--Lat 44°17'11", long 117°47'22", Hydrologic Unit 17050119.

Owner: Rankin Crow.

AQUIFER.--Gravel.

WELL CHARACTERISTICS.--Drilled irrigation well, diam 10 in, depth 310 ft, cased to 170 ft, perforated 80-170 ft.

DATUM.--Altitude of land surface datum is about 3,898.3 ft. Measuring point: Top of port pipe, 1.00 ft above datum.

PERIOD OF RECORD.--1950 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 31.06 ft below datum, Mar. 18, 1951; lowest measured, 60.36 ft below datum, Nov. 10, 1977.

## WATER LEVEL, IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 1982 TO SEPTEMBER 1983

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 12	53.88	APR 7	47.59	-	-	-	-

440036117001301. Formerly 440007117000401. Local number 18S/47E-17BBB.

LOCATION.--Lat 44°00'36", long 117°00'13", Hydrologic Unit 17050115.

Owner: Earl Weaver.

WELL CHARACTERISTICS.--Drilled domestic well, diam 3 in, depth 135 ft, cased to 135 ft.

DATUM.--Altitude of land surface datum is about 2,180 ft. Measuring point: Top of casing, 0.95 ft above datum.

PERIOD OF RECORD.--1950 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 6.91 ft below datum, Sept. 9, 1952; lowest measured, 15.15 ft below datum, Aug. 31, 1976.

## WATER LEVEL, IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 1982 TO SEPTEMBER 1983

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
DEC 30	7.85	APR 8	8.40	-	-	-	-

434446118044201. Formerly 434450118044001. Local number 21S/38E-17DCA.

LOCATION.--Lat 43°44'46", long 118°04'42", Hydrologic Unit 17050116. Formerly lat 43°44'50", long 118°04'40".

Owner: Walter Bodkin.

AQUIFER.--Gravel.

WELL CHARACTERISTICS.--Dug stock well, diam 12 in, depth 14 ft, cribbed to bottom.

DATUM.--Altitude of land surface datum is about 2,960 ft. Measuring point: Top of concrete tile, at land surface datum.

PERIOD OF RECORD.--1945-56, 1958 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 3.07 ft below datum, June 23, 1952; lowest measured, 11.37 ft below datum, May 8, 1972.

## WATER LEVEL, IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 1982 TO SEPTEMBER 1983

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
DEC 28	8.03	APR 1	7.38	-	-	-	-

430722118073601. Local number 28S/37E-24CBD. Formerly 430730118073001. Local number 28S/37E-23DDD.

LOCATION.--Lat 43°07'22", long 118°07'36", Hydrologic Unit 17050110. Formerly lat 43°07'30", long 118°07'30".

Owner: Earl Obenchain.

AQUIFER.--Gravel.

WELL CHARACTERISTICS.--Dug domestic well, diam 4 ft, depth 30 ft, cribbed with rock to bottom.

DATUM.--Altitude of land surface datum is about 4,120 ft. Measuring point: Top of south side of concrete casing, 1.85 ft above datum.

PERIOD OF RECORD.--1950 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 1.95 ft below datum, Mar. 8, 1967; lowest measured, 18.40 ft below datum, Jan. 22, 1955.

## WATER LEVEL, IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 1982 TO SEPTEMBER 1983

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
DEC 27	8.60	APR 15	5.20	-	-	-	-

## GROUND-WATER LEVELS

## MALHEUR COUNTY--Continued

424639117510501. Local number 32S/40E-18ACC.

LOCATION.--Lat 42°46'39", long 117°51'03", Hydrologic Unit 17050109. Formerly lat 42°46'38".

Owner: Clarence J. Eckstein.

AQUIFER.--Volcanic rock.

WELL CHARACTERISTICS.--Drilled domestic and public-supply well, diam 6 in, depth 358 ft, cased to 160 ft.

DATUM.--Altitude of land surface datum is about 3,930 ft. Measuring point: Hole in top of casing, 0.70 ft above datum.

PERIOD OF RECORD.--1950 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 234.17 ft below datum, Apr. 13, 1983; lowest measured, 243.89 ft below datum, June 4, 1974.

## WATER LEVEL, IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 1982 TO SEPTEMBER 1983

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
DEC 21	234.25	APR 13	234.17	-	-	-	-

423527117522501. Local number 34S/39E-13CBC.

LOCATION.--Lat 42°35'27", long 117°52'25", Hydrologic Unit 17050109.

Owner: Civil Aeronautics Administration.

AQUIFER.--Basalt (?).

WELL CHARACTERISTICS.--Drilled observation well, diam 10 in, depth 246 ft.

DATUM.--Altitude of land surface datum is 4,050 ft. Measuring point: Top of casing, at datum.

PERIOD OF RECORD.--1954-56, 1958 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 193.53 ft below datum, Aug. 19, 1975; lowest measured, 207.20 ft below datum, Sept. 13, 1961.

## WATER LEVEL, IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 1982 TO SEPTEMBER 1983

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
DEC 21	193.83	APR 13	193.98	-	-	-	-

422504117515501. Local number 36S/41E-26DAD.

LOCATION.--Lat 42°25'04", long 117°51'55", Hydrologic Unit 17050109.

Owner: U.S. Bureau of Land Management.

AQUIFER.--Basalt (?).

WELL CHARACTERISTICS.--Drilled unused well, diam 8 in, depth 222 ft.

DATUM.--Altitude of land surface datum is 4,200 ft. Measuring point: Top of casing, 1.00 ft above datum.

PERIOD OF RECORD.--1961 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 204.26 ft below datum, Nov. 15, 1966; lowest measured, 219.12 ft below datum, Nov. 16, 1971.

## WATER LEVEL, IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 1982 TO SEPTEMBER 1983

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
DEC 21	209.45	APR 13	210.48	-	-	-	-

420010117431001. Local number 41S/43E-19AA.

LOCATION.--Lat 42°00'10", long 117°43'10", Hydrologic Unit 16040201.

Owner: Victor Albisu.

AQUIFER.--Alluvium.

WELL CHARACTERISTICS.--Drilled domestic well, diam 6 in, depth 98 ft.

DATUM.--Altitude of land surface datum is 4,420 ft. Measuring point: Top of casing, 5.35 ft below datum.

PERIOD OF RECORD.--1955 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 12.23 ft below datum, Sept. 19, 1972; lowest measured, 32.11 ft below datum, Aug. 23, 1966.

## WATER LEVEL, IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 1982 TO SEPTEMBER 1983

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
DEC 22	14.41	APR 13	13.09	-	-	-	-

## UMATILLA COUNTY

454625118330901. Formerly 454639118330901. Local number 3N/34E-3BAC.

LOCATION.--Lat 45°46'25", long 118°33'09", Hydrologic Unit 17070103. Formerly long 118°33'08".

Owner: Berkley Davis.

AQUIFER.--Columbia River Basalt Group.

WELL CHARACTERISTICS.--Drilled irrigation well, diam 12 in, depth 1,263 ft, deepened from 298 ft in 1972; cased to 60 ft.

DATUM.--Altitude of land surface datum is 1,544 ft. Measuring point: Center of air gage, 1.90 ft above datum.

PERIOD OF RECORD.--1953-79, 1981 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 4.0 ft below datum, May 2, 1954; lowest measured, 131.5 ft below datum, Dec. 11, 1980.

## WATER LEVEL, IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 1982 TO SEPTEMBER 1983

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
FEB 7	93.3	-	-	-	-	-	-

455418118333001. Formerly 455420118334001. Local number 5N/34E-16DDC.

LOCATION.--Lat 45°54'18", long 118°33'39", Hydrologic Unit 17070102. Formerly long 118°33'40".

Owner: R.M. Thompson.

AQUIFER.--Basalt.

WELL CHARACTERISTICS.--Drilled domestic and stock well, diam 6 in, depth 228 ft.

DATUM.--Altitude of land surface datum is 2,130 ft. Measuring point: Top of hole in sanitary seal, 0.50 ft above datum.

PERIOD OF RECORD.--1953 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 136.6 ft below datum, Feb. 7, 1983; lowest measured, 162.50 ft below datum, Nov. 30, 1956.

## WATER LEVEL, IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 1982 TO SEPTEMBER 1983

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
FEB 7	136.6	-	-	-	-	-	-

455645118225901. Formerly 455652118230001. Local number 5N/35E-1BAD.

LOCATION.--Lat 45°56'45", long 118°22'59", Hydrologic Unit 17070102. Formerly lat 45°56'52", long 118°23'00".

Owner: W. Bingman.

AQUIFER.--Gravel.

WELL CHARACTERISTICS.--Dug irrigation well, size 6 x 8 ft, depth 37 ft, cased with concrete to 19 ft, curbed with wood.

DATUM.--Land surface datum is 995.60 ft National Geodetic Vertical Datum of 1929. Measuring point: At datum.

PERIOD OF RECORD.--1933 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 13.22 ft below datum, Dec. 19, 1946; lowest measured, dry Sept. 21, 1981.

## WATER LEVEL, IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 1982 TO SEPTEMBER 1983

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 5	24.05	FEB 14	22.00	MAY 19	22.18	AUG 29	28.30
DEC 10	23.65	MAR 14	22.10	JUN 16	26.80	-	-
JAN 10	23.10	APR 19	23.18	JUL 22	25.60	-	-

## GROUND-WATER LEVELS

## UMATILLA COUNTY--Continued

455839118224501. Formerly 455840118244501. Local number 6N/35E-24DCC.

LOCATION.--Lat 45°58'39", long 118°22'45", Hydrologic Unit 17070102. Formerly lat 45°58'40", long 118°24'45".

Owner: G. Ransom.

AQUIFER.--Gravel.

WELL CHARACTERISTICS.--Dug and drilled irrigation well, size 6 x 6 ft to 10-in diam, depth 165 ft, cased to 45 ft.

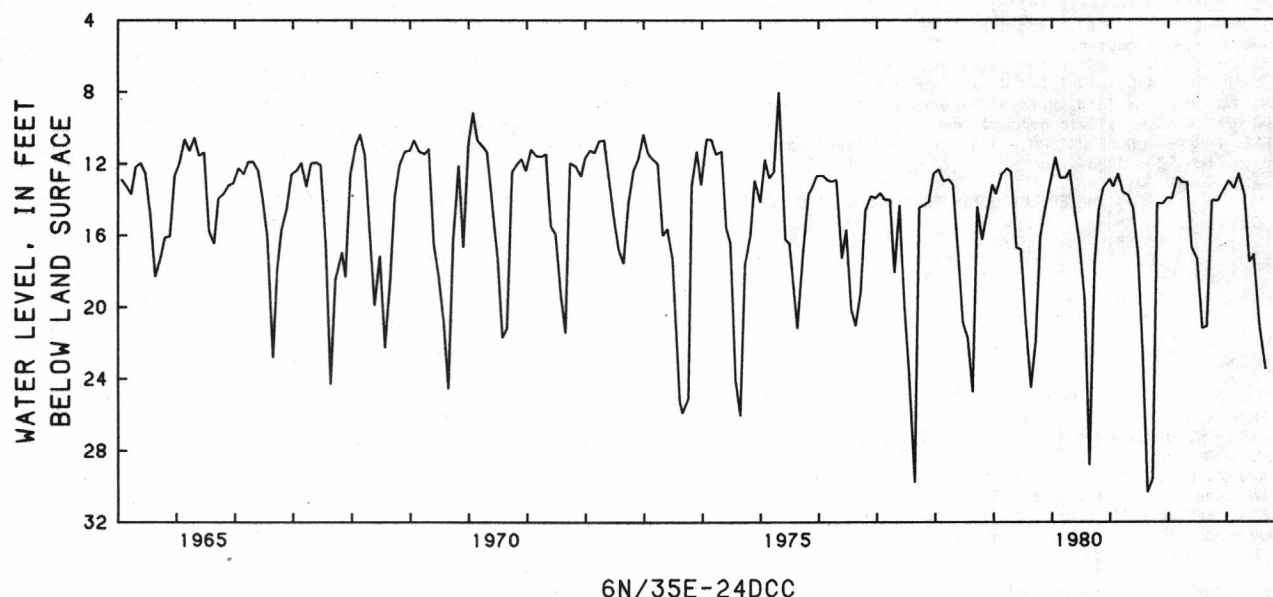
DATUM.--Land surface datum is 864.30 ft National Geodetic Vertical Datum of 1929. Measuring point: Top of 4- x 6-in plank on east side of well curb, 0.50 ft above datum.

PERIOD OF RECORD.--1933 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 7.65 ft below datum, July 29, 1948; lowest measured, 30.35 ft below datum, Aug. 20, 1981.

WATER LEVEL, IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 1982 TO SEPTEMBER 1983

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 5	14.1	FEB 14	13.4	MAY 19	17.50	AUG 29	23.45
DEC 10	13.50	MAR 14	12.60	JUN 16	17.10	-	-
JAN 10	13.00	APR 19	13.80	JUL 22	21.05	-	-



455826118241001. Formerly 455830118241502. Local number 6N/35E-26BAD.

LOCATION.--Lat 45°58'26", long 118°24'10", Hydrologic Unit 17070102. Formerly lat 45°58'30", long 118°24'15".

Owner: Earl Ransom.

AQUIFER.--Gravel.

WELL CHARACTERISTICS.--Dug and drilled irrigation well, size 6 x 6 ft to 8-in diam, depth 110 ft, dug part cased with concrete to 10 ft, cased with steel to 44 ft.

DATUM.--Land surface datum is 867.12 ft National Geodetic Vertical Datum of 1929. Measuring point: 1/2-in pipe in roof of well house, 3.8 ft above datum.

PERIOD OF RECORD.--1933 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 7.81 ft below datum, May 25, 1939; lowest measured, 37.6 ft below datum, Feb. 22, 1980.

WATER LEVEL, IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 1982 TO SEPTEMBER 1983

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 5	27.80	FEB 14	27.51	MAY 19	28.40	AUG 29	23.61
DEC 10	28.0	MAR 14	24.45	JUN 16	17.10	-	-
JAN 10	26.10	APR 19	25.40	JUL 22	24.70	-	-

## GROUND-WATER LEVELS

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## UNION COUNTY

452730117595901. Local number 1S/38E-24DDC1. Formerly local number 1S/38E-24DDC.

LOCATION.--Lat 45°27'26", long 117°59'50", Hydrologic Unit 17060104.

Owner: H. L. Wagner.

AQUIFER.--Basalt.

WELL CHARACTERISTICS.--Drilled irrigation well, diam 12 to 8 in, depth 1,150 ft, cased to 1,105 ft.

DATUM.--Altitude of land surface datum is 2,750 ft. Measuring point: Center line of pressure gage, 6.00 ft above datum.

PERIOD OF RECORD.--1950-74, 1977 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 113.5 ft above datum, Aug. 7, 1974; lowest measured, 53 ft above datum, Aug. 13, 1951.

## WATER LEVEL, IN FEET ABOVE LAND SURFACE DATUM, WATER YEAR OCTOBER 1982 TO SEPTEMBER 1983

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 12	85.70	FEB 4	89.16	MAR 15	89.16	MAY 6	90.32

422834117574501. Formerly 452840117580501. Local number 1S/39E-17CAD.

LOCATION.--Lat 45°28'34", long 117°57'45", Hydrologic Unit 17060104. Formerly lat 45°28'34", long 117°57'48".

Owner: A. F. Furman.

AQUIFER.--Sand.

WELL CHARACTERISTICS.--Drilled domestic well, diam 4 in, depth 44.6 ft.

DATUM.--Altitude of land surface datum is 2,735 ft. Measuring point: Top of coupling on casing, 1.00 ft above datum.

PERIOD OF RECORD.--1940 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 4.07 ft below datum, Feb. 19, 1982; lowest measured, 24.14 ft below datum, June 9, 1945.

## WATER LEVEL, IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 1982 TO SEPTEMBER 1983

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 12	8.60	FEB 4	6.56	MAY 6	5.43	-	-

## WASCO COUNTY

453606121105701. Local number 1N/13E-3BCA.

LOCATION.--Lat 45°36'06", long 121°10'57", Hydrologic Unit 17070105.

Owner: City of The Dalles.

AQUIFER.--Basalt.

WELL CHARACTERISTICS.--Drilled municipal well, diam 12 in, depth 200 ft, cased to 62 ft.

DATUM.--Land surface datum is 99.5 ft National Geodetic Vertical Datum of 1929. Measuring point: Hole in pumpbase, 6.40 ft below datum.

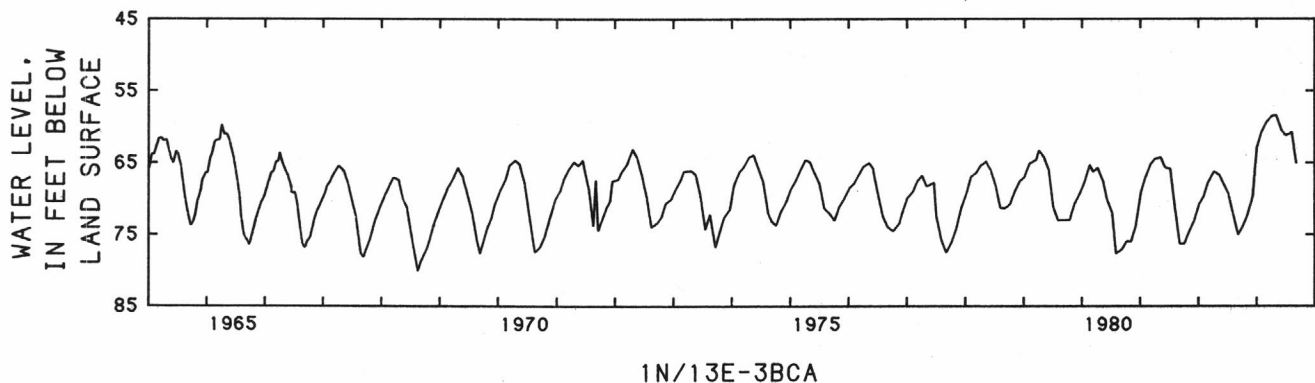
REMARKS.--Water levels published for this well Jan. 2, 1962, to Sept. 5, 1978, did not use proper measuring point correction (Jan. 2, 1962, to June 11, 1971, subtract 0.6 ft from published water levels, Sept. 1, 1971, to Sept. 5, 1978, subtract 6.4 ft from published water levels). Corrected values are available at the district office, Portland, Oregon.

PERIOD OF RECORD.--1926-30, 1960 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 16.90 ft below datum, July 19, 1928; lowest measured, 80.03 ft below datum, Aug. 16, 1968.

## WATER LEVEL, IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 1982 TO SEPTEMBER 1983

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 1	74.09	JAN 1	62.89	APR 4	58.49	JUL 1	61.20
NOV 1	72.50	FEB 1	60.66	MAY 2	58.40	AUG 8	60.75
DEC 6	69.70	MAR 1	59.38	JUN 6	60.55	SEP 6	65.00



## GROUND-WATER LEVELS

## WASCO COUNTY--Continued

453142121125501. Local number 1N/13E-32ACA. Formerly local number 1N/13E-32ACD.  
LOCATION.--Lat 45°31'42", long 121°12'55", Hydrologic Unit 17070105.

Owner: Milton Martin.

AQUIFER.--Basalt.

WELL CHARACTERISTICS.--Drilled irrigation well, diam 6 in, depth 368 ft, cased to 244 ft.

DATUM.--Altitude of land surface datum is about 1,200 ft. Measuring point: Center line of pressure gage, 3.0 ft above datum.

PERIOD OF RECORD.--1946 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 201.5 ft above datum, Jan. 13, 1965; lowest measured, 52.3 ft above datum, July 30, 1958.

## WATER LEVEL, IN FEET ABOVE LAND SURFACE DATUM, WATER YEAR OCTOBER 1982 TO SEPTEMBER 1983

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 26	92.4	APR 8	127.74	-	-	-	-

453715121151801. Local number 2N/12E-25DDC.

LOCATION.--Lat 45°37'15", long 121°15'18", Hydrologic Unit 17070105.

Owner: Ernest A. Kuck.

AQUIFER.--Sandstone of Dalles Formation.

WELL CHARACTERISTICS.--Drilled well, diam 8 in, depth 443 ft, cased to 30 ft.

DATUM.--Altitude of land surface datum is about 520 ft. Measuring point: Airline port in pumpbase, 0.80 ft above datum.

PERIOD OF RECORD.--1947 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 104.93 ft below datum, Mar. 16, 1951; lowest measured, 151.54 ft below datum, Aug. 6, 1953.

## WATER LEVEL, IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 1982 TO SEPTEMBER 1983

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 26	112.84	FEB 8	109.40	APR 6	105.60	-	-



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## 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). This report contains both the inch-pound and SI unit equivalents in the station manuscript descriptions.

Multiply inch-pound units	By	To obtain SI units
<i>Length</i>		
inches (in)	$2.54 \times 10^1$	millimeters (mm)
	$2.54 \times 10^{-2}$	meters (m)
feet (ft)	$3.048 \times 10^{-1}$	meters (m)
miles (mi)	$1.609 \times 10^0$	kilometers (km)
<i>Area</i>		
acres	$4.047 \times 10^3$	square meters (m <sup>2</sup> )
	$4.047 \times 10^{-1}$	square hectometers (hm <sup>2</sup> )
	$4.047 \times 10^{-3}$	square kilometers (km <sup>2</sup> )
square miles (mi <sup>2</sup> )	$2.590 \times 10^0$	square kilometers (km <sup>2</sup> )
<i>Volume</i>		
gallons (gal)	$3.785 \times 10^0$	liters (L)
	$3.785 \times 10^0$	cubic decimeters (dm <sup>3</sup> )
	$3.785 \times 10^{-3}$	cubic meters (m <sup>3</sup> )
million gallons	$3.785 \times 10^3$	cubic meters (m <sup>3</sup> )
	$3.785 \times 10^{-3}$	cubic hectometers (hm <sup>3</sup> )
cubic feet (ft <sup>3</sup> )	$2.832 \times 10^1$	cubic decimeters (dm <sup>3</sup> )
	$2.832 \times 10^{-2}$	cubic meters (m <sup>3</sup> )
cfs-days	$2.447 \times 10^3$	cubic meters (m <sup>3</sup> )
	$2.447 \times 10^{-3}$	cubic hectometers (hm <sup>3</sup> )
acre-feet (acre-ft)	$1.233 \times 10^3$	cubic meters (m <sup>3</sup> )
	$1.233 \times 10^{-3}$	cubic hectometers (hm <sup>3</sup> )
	$1.233 \times 10^{-6}$	cubic kilometers (km <sup>3</sup> )
<i>Flow</i>		
cubic feet per second (ft <sup>3</sup> /s)	$2.832 \times 10^1$	liters per second (L/s)
	$2.832 \times 10^1$	cubic decimeters per second (dm <sup>3</sup> /s)
	$2.832 \times 10^{-2}$	cubic meters per second (m <sup>3</sup> /s)
gallons per minute (gal/min)	$6.309 \times 10^{-2}$	liters per second (L/s)
	$6.309 \times 10^{-2}$	cubic decimeters per second (dm <sup>3</sup> /s)
	$6.309 \times 10^{-5}$	cubic meters per second (m <sup>3</sup> /s)
million gallons per day	$4.381 \times 10^1$	cubic decimeters per second (dm <sup>3</sup> /s)
	$4.381 \times 10^{-2}$	cubic meters per second (m <sup>3</sup> /s)
<i>Mass</i>		
tons (short)	$9.072 \times 10^{-1}$	megagrams (Mg) or metric tons



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