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Water Resources Data Washington Water Year 1981

Volume 2. Eastern Washington

U.S. GEOLOGICAL SURVEY
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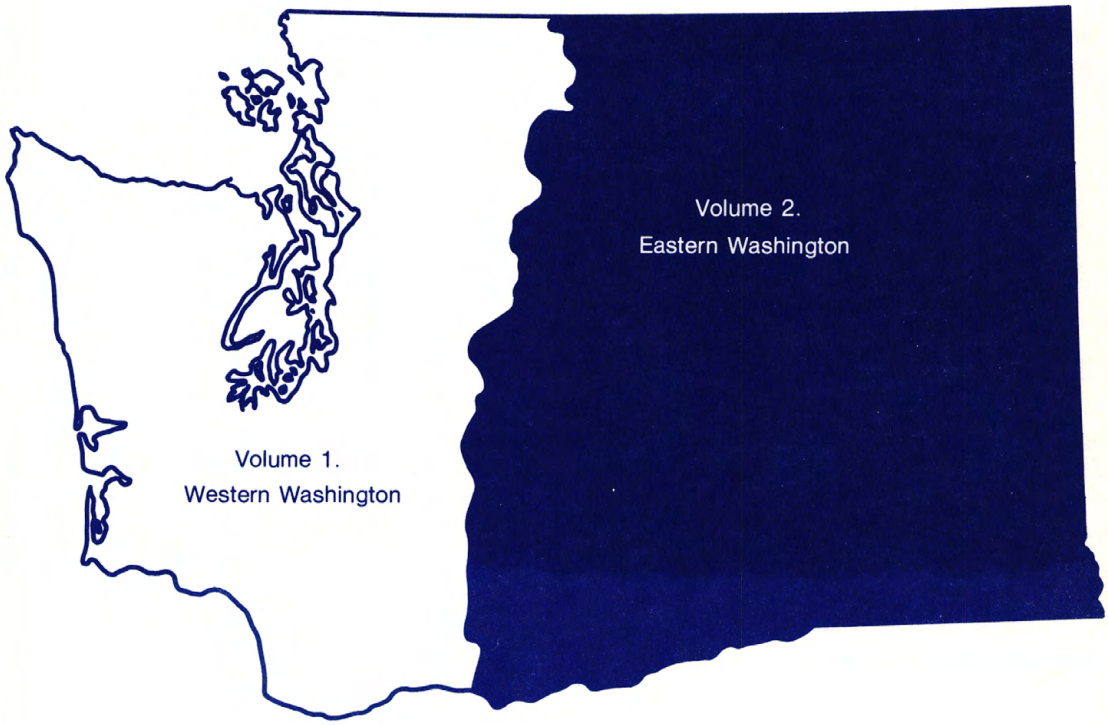

U.S. GEOLOGICAL SURVEY WATER-DATA REPORT WA-81-2
Prepared in cooperation with the State of Washington
and with other agencies

CALENDAR FOR WATER YEAR 1981

1980

OCTOBER

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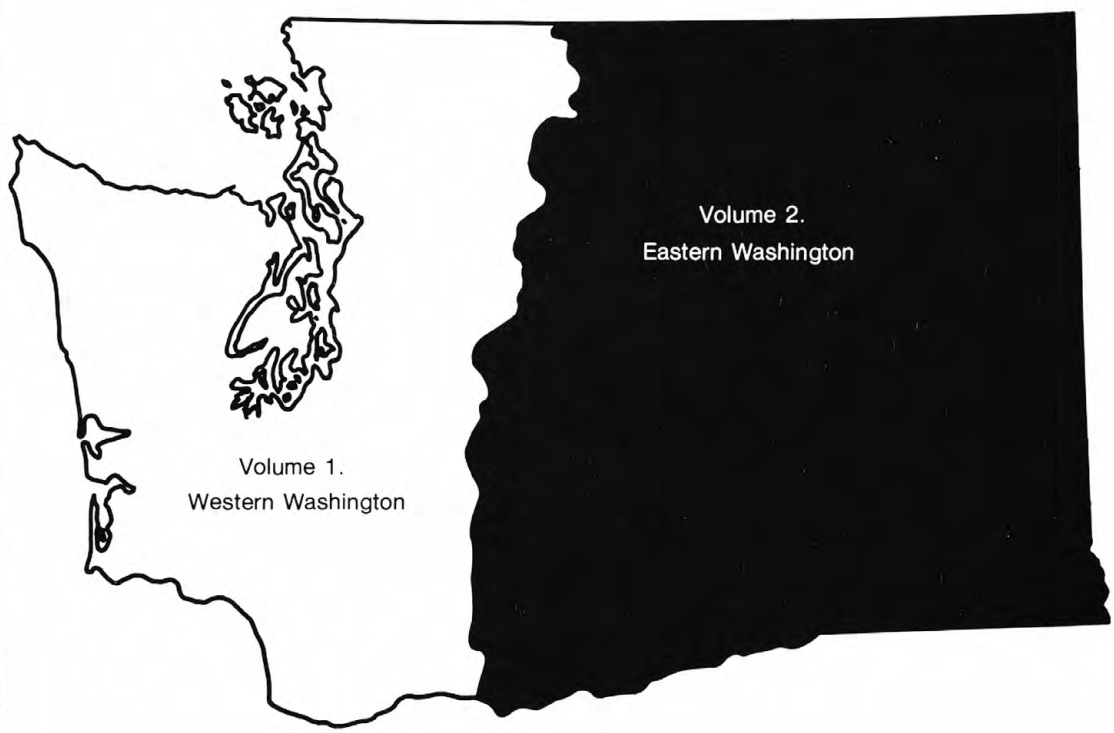
Water Resources Data Washington

Water Year 1981

Volume 2. Eastern Washington



U.S. GEOLOGICAL SURVEY WATER-DATA REPORT WA-81-2
Prepared in cooperation with the State of Washington
and with other agencies

UNITED STATES DEPARTMENT OF THE INTERIOR

JAMES WATT, Secretary

GEOLOGICAL SURVEY

Dallas L. Peck, Director

For additional information write to
District Chief, Water Resources Division
U.S. Geological Survey
1201 Pacific Avenue Suite 600
Tacoma, Washington 98402

1981

PREFACE

This report was prepared by personnel of the Washington district of the Water Resources Division of the U.S. Geological Survey under the supervision of C. R. Collier, District Chief, and J. D. Bredehoeft, Regional Hydrologist, Western Region. It was done in cooperation with the State of Washington and with other agencies.

This report is one of a series issued annually for each State. General direction for the series is by Philip Cohen, Chief Hydrologist, and Robert J. Dingman, Assistant Chief Hudrologist for Scientific Publications and Data Management, U.S. Geological Survey.

Data for the State of Washington are in two volumes as follows:

Volume 1. Western Washington

Volume 2. Eastern Washington

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16. Abstract (Limit: 200 words)

Water-resources data for the 1981 water year for Washington consist of records of stage, discharge, and water quality of streams; stage, contents, and water quality of lakes and reservoirs; and water levels and water quality of ground-water wells. This report, in two volumes, contains records for water discharge at 229 gaging stations; stage only at 5 gaging stations; stage and contents at 39 lakes and reservoirs; water quality at 39 gaging stations (including 6 lakes and reservoirs) and 100 wells; and water levels at 164 observation wells. Also included are data for 14 crest-stage and 28 water-quality partial-record stations. Locations of sites in this volume are on figures 4, 5, 6, and 22. Additional water data were collected at various sites not involved in 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, local, and Federal agencies in Washington.

17. Document Analysis a. Descriptors

*Washington, *Hydrologic data, *Groundwater, *Surface water, *Water Quality, Gaging Stations, Streamflow, Flow rates, Lakes, Reservoirs, Chemical analysis, Sediments, Water temperature, Water analysis, Water levels, Water Wells, Data collections, Sites.

b. Identifiers/Open-Ended Terms

c. COSATI Field/Group

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INTRODUCTION

Water-resources data for the 1981 water year for Washington consist of records of stage, discharge, and water quality of streams; stage, contents, and water quality of lakes and reservoirs; and water levels and water quality of ground-water. This report, in two volumes, contains records for water discharge at 229 gaging stations; stage only at 5 gaging stations; stage and contents at 39 lakes and reservoirs; water quality at 39 gaging stations (including 6 lakes and reservoirs) and 100 wells; and water levels at 164 observation wells. Also included are data for 14 crest-stage and 28 water-quality partial-record stations. Locations of sites in this volume are on figures 4, 5, 6, and 22. Additional water data were collected at various sites not involved in 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, local, and Federal agencies in Washington.

Records of discharge and stage 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 5-year 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 Water 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 South 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 in official Survey reports 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 the volume number. For example, this volume is identified as "U.S. Geological Survey Water-Data Report WA-81-2". For archiving and general distribution, the reports for water years, 1971-74 are also identified as water-data reports. These water-data reports are on 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 district chief at the address given on the back of the title page or by telephone (206) 593-6510.

COOPERATION

The U.S. Geological Survey and organizations of the State of Washington have had cooperative agreements for the systematic collection of surface-water and water-quality records since 1909. Organizations that supplied data are acknowledged in the station descriptions. Organizations that assisted in collecting data through cooperative agreements with the Survey are:

Washington State Department of Ecology, Donald W. Moos, director
Washington State Department of Fisheries, Rollie Schmitten, director
Washington State Department of Transportation, Duane Berentson, secretary
City of Seattle, Department of Lighting, Robert Murray, superintendent
Municipality of Metropolitan Seattle, Neil Peterson, executive director
City of Tacoma, Department of Public Utilities, P. J. Nolan, director
City of Tacoma, Department of Public Works, Ronald M. Button, director
City of Everett, Department of Utilities, Marvin C. Haglund, director
City of Bellevue, Department of Public Works, Clark Douglas, director
Chelan County, P.U.D. No. 1, Howard Elmore, manager
King County, Department of Public Works, James W. Guenther, director
Lewis County, Department of Public Works, Verne Wagar, director
Quileute Tribal Council, Christian Penn, Sr., chairman
Quinault Tribal Council, Joseph B. DeLaCruz, president
Makah Tribal Council, Dale W. Johnson
Yakima Tribal Council, Watson Totus, chairman
Washington State University, Department of Agricultural Engineering, Dr. Larry King, chairman
Hoh Tribal Council, John Leitka, chairman
Clallam County Board of Commissioners, Dick Lotzgesell, chairman

Assistance in the form of funds or services was given by the Corps of Engineers, U.S. Army, in collecting records for 47 gaging stations; the U.S. Environmental Protection Agency, in collecting records for one water-quality station; the U.S. Energy Research and Development Administration, in collecting records for 6 water-quality stations; the Bureau of Reclamation, U.S. Department of Interior, in collecting records for 19 gaging stations; the U.S. Department of State, in collecting records for 15 gaging stations; the Bonneville Power Administration, in collecting records for 4 gaging stations.

The following organizations aided in collecting records: Crown Zellerbach Corporation; City of Fircrest; Intercounty River Improvement; ITT Rayonier; Pacific Power and Light Co.; Public Utility Districts, No. 1 of Cowlitz County, No. 1 of Douglas County, No. 2 of Grant County, No. 1 of Pend Oreille County, No. 1 of Snohomish County; Puget Sound Power and Light Co.; Skagit County Public Works Department; University of Washington, through its Fisheries Research Institute and Civil Engineering Department; Washington Public Power Supply System; Washington Water Power Co.; Whatcom County Engineer.

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, ac-ft) is a 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.

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

Bacteria are microscopic unicellular organisms, typically spherical, rod-like, 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 of plants.

Total coliform bacteria are a particular group of bacteria that are used as indicators of possible sewage pollution. They are characterized as aerobic or facultative anaerobic, gram-negative, nonspore-forming, rod-shaped bacteria which ferment lactose with gas formation with 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 bacteria that are present in the intestines or feces of warm-blooded 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 streptocaccal bacteria are bacteria found alson in intestines of warm-blooded 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 ± 1.0°C on M-enterrococcus medium (nutrient medium for bacterial growth). Their concentrations are expressed as number of colonies per 100 mL of sample.

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

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

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

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

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

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

Bottom material is the unconsolidated material of which a streambed, lake, pond, reservoir, or estuary bottom is composed.

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

Total in bottom material is the total amount of a given constituent in a representative sample of bottom material. 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 judge when the results should be reported as "total in bottom material."

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

Cfs-day is the volume of water represented by flow of 1 cubic foot per second for 24 hours. It is equivalent to 86,400 cubic feet, approximately 1.9835 acre-feet, about 646,000 gallons or 2,447 cubic meters.

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

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

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

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

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

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

Cubic feet per second per square mile (CFSM) is the average number of cubic feet or water flowing per second from each square mile of area drained, assuming that the runoff is distributed uniformly in time and area.

Cubic feet per second (FT^3/s, ft^3/s) is the rate of discharge representing a volume of 1 cubic foot passing a given point during 1 second and is equivalent to 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, volume of fluid plus suspended sediment), that passes a given point within a given period of time.

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

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

Dissolved refers to the amount of substance present in true chemical solution. In practice, however, the term includes all forms of substance that will pass through a 0.45-micrometer membrane filter, and thus may include some very small (coloidal) suspended particles. Analyses are performed on filtered samples.

Diversity index is a numerical expression of evenness of distribution of aquatic organisms. The formula for diversity index is:

$$\bar{d} = -\sum_{i=1}^{s} \frac{n_i}{n} \log_2 \frac{n_i}{n}$$

Where n_i is the number of individuals per taxon, n is the total number of individuals, and s is the total number of taxa in the sample of the community, Diversity index values range from zero, when all the organisms in the sample are the same, to some positive number, when some or all of the organisms in the sample are different.

Drainage area of a stream at a specific 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 river above the specified point. Figures of drainage area given herein include all closed basins, or noncontribution area, within the area unless otherwise noted.

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

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

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

Hardness of water is a physical-chemical characteristic that is commonly recognized by the increased quantity of soap required to produce lather. It is attributable to the presence of alkaline earths (principally calcium and magnesium) and is expressed as equivalent calcium carbonate ($CaCO_3$).

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 gram (*ug/g*) is a unit expressing the concentrations of a chemical element as the mass (micrograms) of the element sorbed per unit mass (gram) of sediment.

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

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

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^2), 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 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 and/or water-quality data are collected systematically over a period of years for use in hydrologic analyses.

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

Particle-size classification used in this report agrees with 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 distribution 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 composition is a unit for expressing the ratio of a particular part of a sample or population to the total sample or population, in terms of types, numbers, mass or volume.

Pesticides are chemical compounds used to control undesirable plants and animals. Major categories of pesticides include insecticides, miticides, fungicides, herbicides, and rodenticides. Insecticides and herbicides, which control insects and plants respectively, are the two categories reported.

Picocurie (PC, pCi) is one trillienth (1×10^{12}) of the amount of radioactivity represented by a curie (Ci). A curied is the amount of radioactivity that yields 3.7×10^{10} radioactive disintegrations per second. A picocurie yields 2.22 dpm (disintegrations per minute).

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

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

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

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

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

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

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

Sediment is solid material that originates mostly from disintegrated rocks and is transported by, suspended in, or deposited from water. It in cludes 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.

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

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

Suspended-sediment discharge (tons/day) is the rate at which dry weight of sediment passes a section of a stream or is the quantity of sediment, as measured by dry weight or volume, that passes a section in a given time. It is computed by multiplying discharge times mg/L times 0.0027.

Suspended-sediment load is quantity of suspended sediment passing a section in a specified period.

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

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

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

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

Substrate is the physical surface upon which an organism lived.

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

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

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

Suspended, recoverable is the amount of a given constituent that is in solution after the part of a representative water-suspended sediment sample that is retained on a 0.45*um* membrane filter has been digested by a method (usually using a dilute acid solution) that results in dissolution of only readily soluble substances. Complete dissolution of all the particulate matter is not achieved by the digestion treatment and thus the determination represents something less than the "total" amount (that is, less than 95 percent) of the constituent present in the sample. To achieve comparability of analytical data, equivalent digestion procedures 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 the total amount of a given constituent in the part of a representative water-suspended sediment sample that is retained on a 0.45 *um* membrane filter. This term is used only when the analytical procedure assures measurement of at least 95 percent of the constituent determined. A knowledge of the expected form of the constituent in the sample, as well as the analytical methodology used, is required to determine when the results should be reported as "suspended, total."

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

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

Tons per acre-foot indicates the dry mass of dissoved 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 substance in solution or suspension that passes a stream section during a 24-hour daty.

Total load (tons) is the total quantity of any individual constituent, as measured by dry mass or volume, that is dissolved in a specific amount of water (discharge) during a given time. It is computed by multiplying the total discharge, times the mg/L of the constituent, times the factor 0.0027, times the number of days.

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.

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.)

Taxonomy is the division of biology concerned with the classification and naming of organisms. The classification of organisms is based upon 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.....Ephemeroptera
Family.....Ephemeridae
Genus.....Hexageria
Species.....Hexagenia limbata

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

WRD is used as an abbreviation for "Water-Resources Data" in the REVISED RECORDS paragraph to refer to State annual basic-data reports published before 1975.

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

DOWNSTREAM ORDER AND STATION NUMBER

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

As an added means of identification, each hydrologic 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 stations and other stations; therefore, the station number for a partial-record station indicates downstream-order position in a list made up of both types of stations. Gaps are left in the series of numbers to allow for new stations that may be established; hence the numbers are not consecutive. The complete 8-digit number for each station such as 12041000, which appears just to the left of the station name, includes the 2-digit part number "12" plus the 6-digit downstream order number "041000."

NUMBERING SYSTEM FOR WELLS AND MISCELLANEOUS SITES

The 8-digit downstream order station numbers are not assigned to wells and miscellaneous sites where only random water-quality samples or discharge measurements are taken.

The well and miscellaneous site numbering system of the U.S. Geological Survey is based on the grid system of latitude and longitude. The system provides the geographic location of the well or miscellaneous site and a unique number for each site. The number consists of 15 digits. The first 6 digits denote the degrees, minutes, and seconds of latitude, the next 7 digits denote degrees, minutes, and seconds of longitude, and the last 2 digits (assigned sequentially) identify the wells or other sites within a 1-second grid. See figure 1 below.

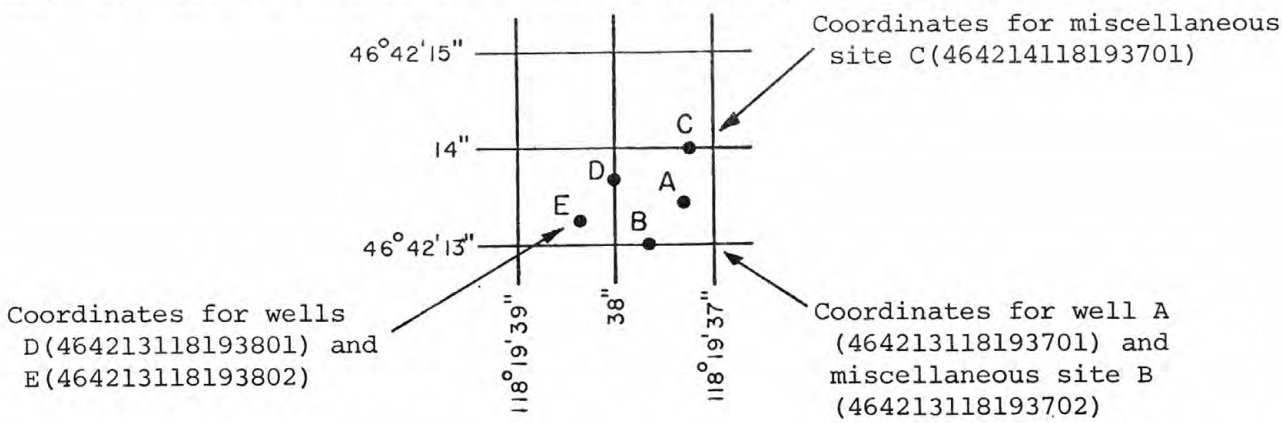

Figure 1. System for numbering wells and miscellaneous sites (latitude and longitude)

Local identifier well-numbering system

Local identifier well numbers used by the Geological Survey in the State of Washington are based on and show locations of wells according to the rectangular system for subdivision of public land, indicating township, range, section, and 40-acre tract within the section. For example, in the well number 25/43E-15M1, the part preceeding the hyphen indicates successively the township and range (T.25 N., R.43 E.) north and east of the Willamette base line and meridian. (Because all townships in Washington are north of the Willamette base line the letter "N", indicating north is omitted; and because most of the State is east of the Willamette meridian the letter "E" is sometimes omitted for those ranges east of the Willamette meridian, but "W" is always included when the range lies west of the Willamette meridian). The first number following the hyphen indicates the section (sec.15) and the letter (M) given the 40-acre subdivision of the section as shown in figure 2. The last number (1) is the serial number of the well in that particular 40-acre tract. Thus, the first well recorded in NW¼SW¼ sec.15, T.25 N., R.43 E., would have the number 25/43-15M1, and the second well would have the number 25/43-15M2 or 25/43E-15M2. See figure 2 below:

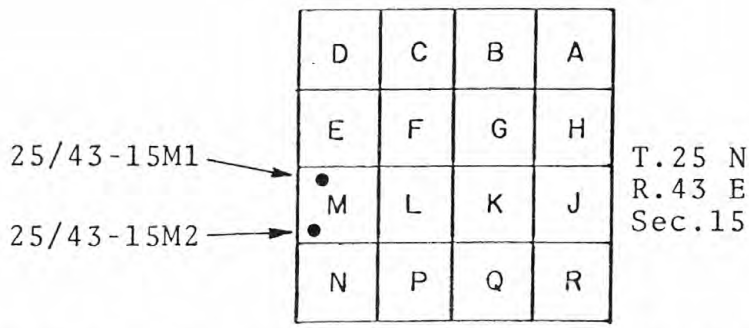

Figure 2. Local identifier well numbering system.

SPECIAL NETWORKS AND PROGRAMS

Hydrologic bench-mark station is one that provides hydrologic data for a basin in which the hydrologic regiment 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 a data collection 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 into the network design. Areal configuration of the network is based on river-basin accounting units (identified by 8-digit hydrologic-unit numbers) designated by the Office of Water Data Coordination in consultation with the Water Resources Council. Primary objectives of the network are (1) to depict area variability of streamflow and water-quality conditions nationwide on a year-by-year basis and (2) to detect and assess long-term changes in streamflow and stream quality.

Pesticide program is a network of regularly sampled water-quality stations where samples are collected to determine the concentration and distribution of pesticides in streams where potential contamination could result from the application of the commonly used insecticides and herbicides. Operation of the network is a Federal interagency activity.

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

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

EXPLANATION OF 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 either direct readings on a nonrecording gage or from a water-stage recorder that gives either a continuous graph of the fluctuations or a tape punched at selected time intervals. Measurements of discharge are made with a current meter, using the general methods adopted by the Geological Survey. These methods are described in standard text-books, in Water-Supply Paper 888, and in U.S. Geological Survey Techniques of Water Resources Investigations, book 3, chapter A6.

For stream-gaging stations, rating tables giving the discharge for any stage are prepared from stage-discharge relation curves. If extensions to the rating curves are necessary to express discharge greater than measured, 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), stepback-water techniques, velocity-area studies, and logarithmic plotting. The daily mean discharge is computed from gage heights and rating tables, then the monthly and yearly mean discharge are computed from the daily figures. 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 computed 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 relation is affected by the backwater from reservoirs, tributary streams, or other sources. This necessitates the use of the slope method in which the slope or fall in a reach of the stream is a factor in computing discharge. The slope or fall is obtained by means of an auxiliary gage set at some distance from the base gage. At some stations the stage-discharge relation is affected by changing stage; at these stations the rate of change in stage is used as a factor in computing discharge.

At some northern 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 gage-height record and occassional winter discharge measurements. Consideration is 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. 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, prior and subsequent records, discharge measurements, weather records, and comparison with records for other stations in the same or nearby basins. Likewise daily contents may be estimated on the basis of operator's log, prior and subsequent records, inflow-outflow studies, and other information.

The data in this report generally comprise a description of the station and tabulations of daily and monthly figures. 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 or revisions of previously published records, type and history of gages, general remarks, average discharge, and extremes of discharge or contents. 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 that determined and used by the Corps of Engineers or other agencies. 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 streamflow 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, 1965 stands for the water year October 1, 1964 to September 30, 1965. If no daily, monthly, or annual figures of discharge are affected by the revision, the fact is brought out by notations after the year dates as follows: "(M)" means that only the instantaneous maximum discharge was revised; "(m)" that only the instantaneous minimum was revised; and "(P)" that only peak discharges were revised. If the drainage area has been revised, the report in which the revised figure was first published is given. It should be noted that for all stations for which cubic feet per second per square mile and runoff in inches are published, a revision of the drainage area necessitates corresponding revision of all figures based on the drainage area. Revised figures of cubic feet per second per square mile and runoff in inches resulting from a revision of the drainage area only are usually not published in the annual series of reports.

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 7.

Information pertaining to the accuracy of the discharge records and to conditions which affect the natural flow of 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 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. In addition, the median of yearly mean discharges is given for stream-gaging stations having 10 or more complete years of record if the median differs from the average by more than 10 percent. Under "EXTREMES" are given first, the extremes for the period of record, second, information available outside the period of record, and last those for the current year. 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 "EXTREMES FOR THE CURRENT YEAR"; if they are, all independent peaks, including the maximum for the year, above the selected base with the time of occurrence and corresponding gage heights are published in tabular format. 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.

Skeleton rating tables are published, immediately following "EXTREMES", for stream-gaging stations where they serve a useful purpose and the dates of applicability can be easily identified.

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 lines headed "MAX" and "MIN" give the maximum and minimum daily discharges, respectively, for the month. Discharge for the month also may 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 regulatiion 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 the table of daily discharge 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-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 a monthly summary table of 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 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 two tables. The first is a table of discharge measurements at low-flow partial-record stations, and the second is a table of annual maximum stage and discharge at crest-stage stations. The tables of partial-record stations are followed by a listing of discharge measurements made at sites other than continuous-record or partial-record stations. 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 field data and computed results

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

The station description under "REMARKS" stages 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" with 15 percent. "Poor" means that daily discharges have less than "fair" accuracy.

Figures of daily mean discharge in this report are shown to the nearest hundredth of a cubic foot per second for discharges of less than 1 cfs; to tenths between 1.0 and 10 cfs; to whole numbers between 10 and 1,000 cfs; and to 3 significant figures above 1,000 cfs. 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.

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

Other data available

Information of a more detailed nature than that published for most of the gaging stations such as observations of water temperatures, discharge measurements, gage-height records, and rating tables is on file in the district office. Also most gaging-station records are available in computer-usable form and many statistical analyses have been made.

Information on the availability of unpublished data or statistical analyses may be obtained from the district office.

EXPLANATION OF WATER-QUALITY RECORDS

Collection and examination of data

Surface water samples for analyses usually are collected at or near gaging stations. The quality-of-water records are given immediately following the discharge records at these stations.

The descriptive heading for water-quality records gives the period of record for all water-quality data, the period of daily record for parameters that are measured on a daily basis (specific conductance, pH, dissolved oxygen, water temperature, sediment discharge, etc.), extremes for the period of daily record, extremes for the current year, and general remarks.

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

Water analysis

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

One sample can define adequately the water quality at a given time if the mixture of solutes throughout the stream cross section is homogeneous. However, the concentration of solutes at different locations in the cross section may vary widely with different rates of water discharge, depending on the sources of material and the turbulence and mixing of the stream. Some streams must be sampled through several vertical sections to obtain a representative sample needed for an accurate mean concentration and for use in calculating load.

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

For chemical-quality stations equipped with digital monitors, the records consist of daily maximum, minimum, and mean values for each constituent measured and are based upon hourly punches beginning at 0100 hours and ending at 2400 hours for the day of record. More detailed records (hourly values) may be obtained from the district office.

Water temperature

Water temperatures are measured at most of the water-quality stations. In addition, water temperatures are taken at time of discharge measurements for water

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

All temperature values in the daily tables are rounded to the nearest 0.5°C. Therefore, temperature values published in conjunction with water samples may be 0.1 to 0.2°C outside the range of the values published in the daily tables.

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 may be obtained at a fixed point and a coefficient applied to determine the mean concentration in the cross sections.

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

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

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

EXPLANATION OF GROUND-WATER LEVEL RECORDS

Collection of the data

Only ground-water level data from a basic network of observation wells are published herein. This basic network contains observation wells so located that the most significant data are obtained from the fewest wells in the most important aquifers.

Each well is identified by means of (1) a 15-digit number that is based on latitude and longitude and (2) a local number that is provided for local needs. See figures 1 and 2.

Measurements are made in many types of wells, under varying conditions of access and at different temperatures, hence, neither the method of measurement nor the equipment can be standardized. At each observation well, however, the equipment and techniques used are those that will ensure that measurements at each well are consistent.

Water-level measurements in this report are given in feet with reference to either mean sea level (msl) or land-surface datum (lsd). Mean sea level is the datum plane on which the national network of precise levels is based; land-surface datum is a datum plane that is approximately at land surface at each well. If known, the altitude of the land-surface datum above mean sea level is given in the well description. The height of the measuring point (MP) above or below land surface datum is given in each well description. Water levels in wells equipped with recording gages are reported for every fifth day and the end of each month (eom).

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 in 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. Accordingly, most measurements are reported to a hundredth of a foot, but some are given only to a tenth of a foot or a larger unit.

HYDROLOGIC CONDITIONS

The annual mean yearly runoff in eastern Washington during the 1981 water year was 90 to 100 percent of normal on the eastern slopes of the Cascade Mountains, 95 to 105 percent of normal in the Okanogan and Spokane River basins, and about 70 percent of normal in the Palouse River basin.

Monthly and annual mean discharges are compared with medians at two gaging stations in figure 3. Unadjusted flows for the Spokane River which is regulated by Coeur d'Alene Lake were below normal for all months except December, January, February and July, and annual runoff was 95 percent of normal. Klickitat River flows were above normal during the months of December to February, and were below normal the rest of the year. Annual runoff was 89 percent of normal.

The ground-water level in the key observation well in eastern Washington was below average each month of the water year. The lowest level was in May at about 5 feet below normal.

Storage in Keechelus, Kachess, Chelan and Franklin D. Roosevelt Lakes increased 214,000 acre-feet during the year, while that at Bumping, Rimrock and Cle Elum Lakes decreased 24,000 acre-feet. Usable storage in Franklin D. Roosevelt Lake was generally normal during the year, and the lowest level occurred on April 22 with 2.8 million acre-feet of usable storage.

PUBLICATIONS ON TECHNIQUES OF WATER-RESOURCES INVESTIGATIONS

Thirty-four 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, 1200 South Eads Street, Arlington, VA 22202 (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. Smoot: USGS--TWRI Book 1, Chapter D1. 1975. 65 pages.
1-D2. *Guidelines for collection and field analysis of ground-water samples for selected unstable constituents*, by W. W. Wood: USGS--TWRI Book 1, Chapter D2. 1976. 24 pages.
2-D1. *Application of surface geophysics to ground-water investigations*, by A. A. R. Zohdy, G. P. Eaton, and D. R. Mabey: USGS--TWRI Book 2, Chapter D1. 1974. 116 pages.
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-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-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-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 determination of inorganic substances in water and fluvial sediments*, by M. W. Skougstad and others, editors: USGS--TWRI Book 5, Chapter A1. 1979. 626 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. Ehlke, 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.
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. 1978. 90 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.

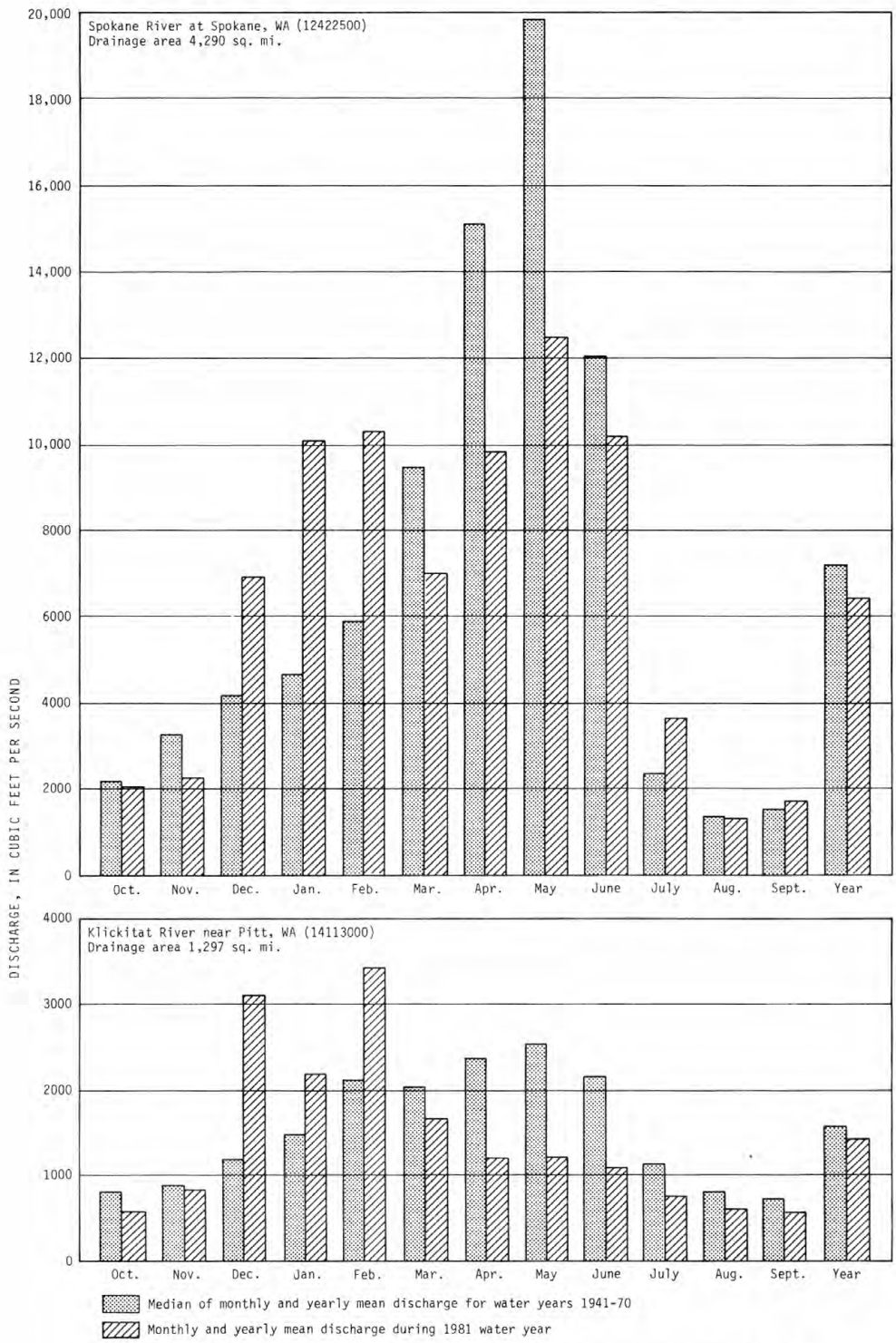

Figure 3. Discharge during 1981 water year compared with median discharge for period 1941-70 for two representative gaging stations.

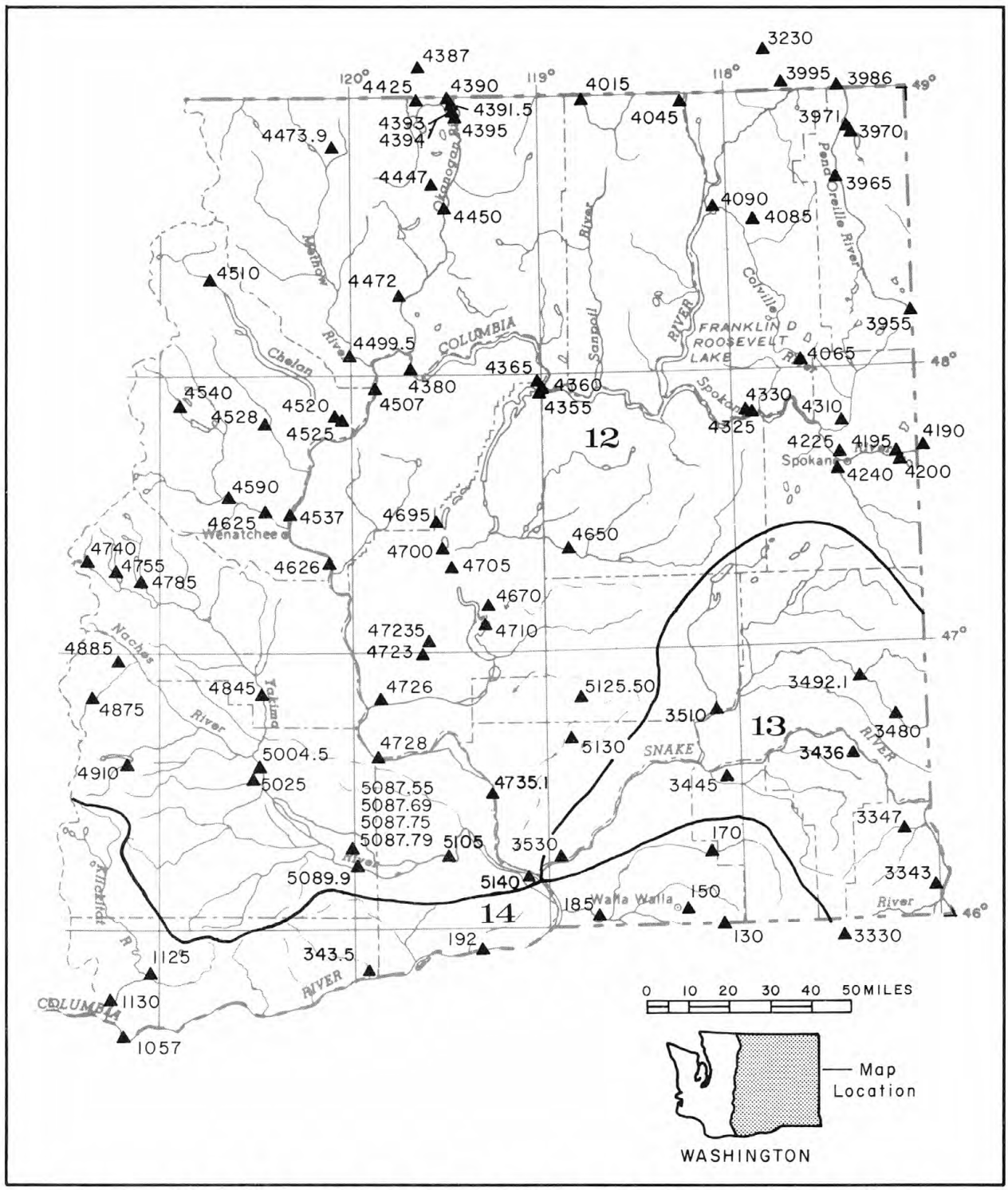

Figure 4. Map of Eastern Washington showing locations of gaging stations operated by the U.S. Geological Survey in cooperation with other agencies. Numbers shown are abbreviated versions of complete station number used in text. Part numbers are the large figures.

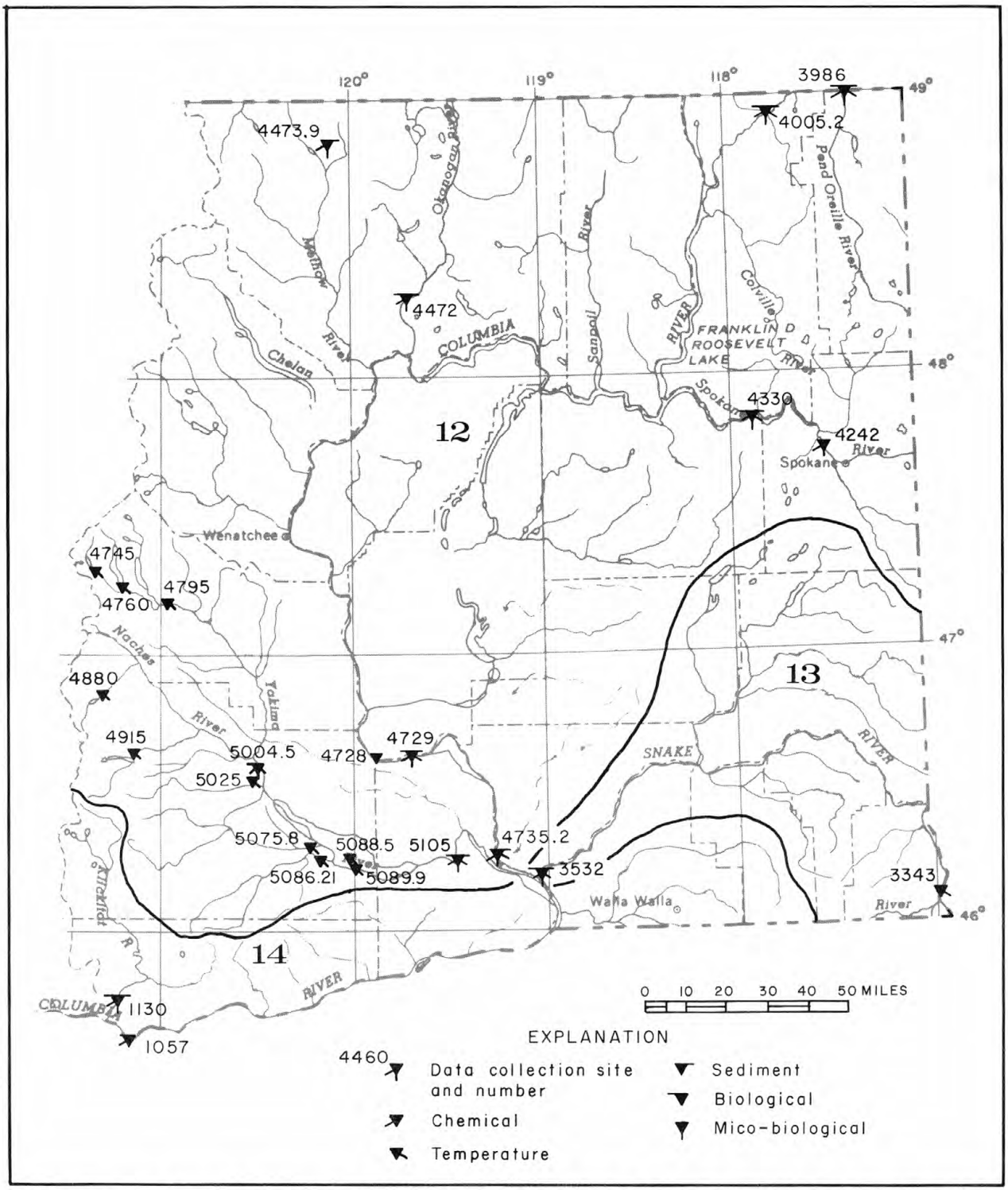

Figure 5. Map of Eastern Washington showing locations of surface-water-quality sampling stations operated by the U.S. Geological Survey in cooperation with other agencies. Numbers shown are abbreviated versions of complete station number used in text. Part numbers are the large figures.

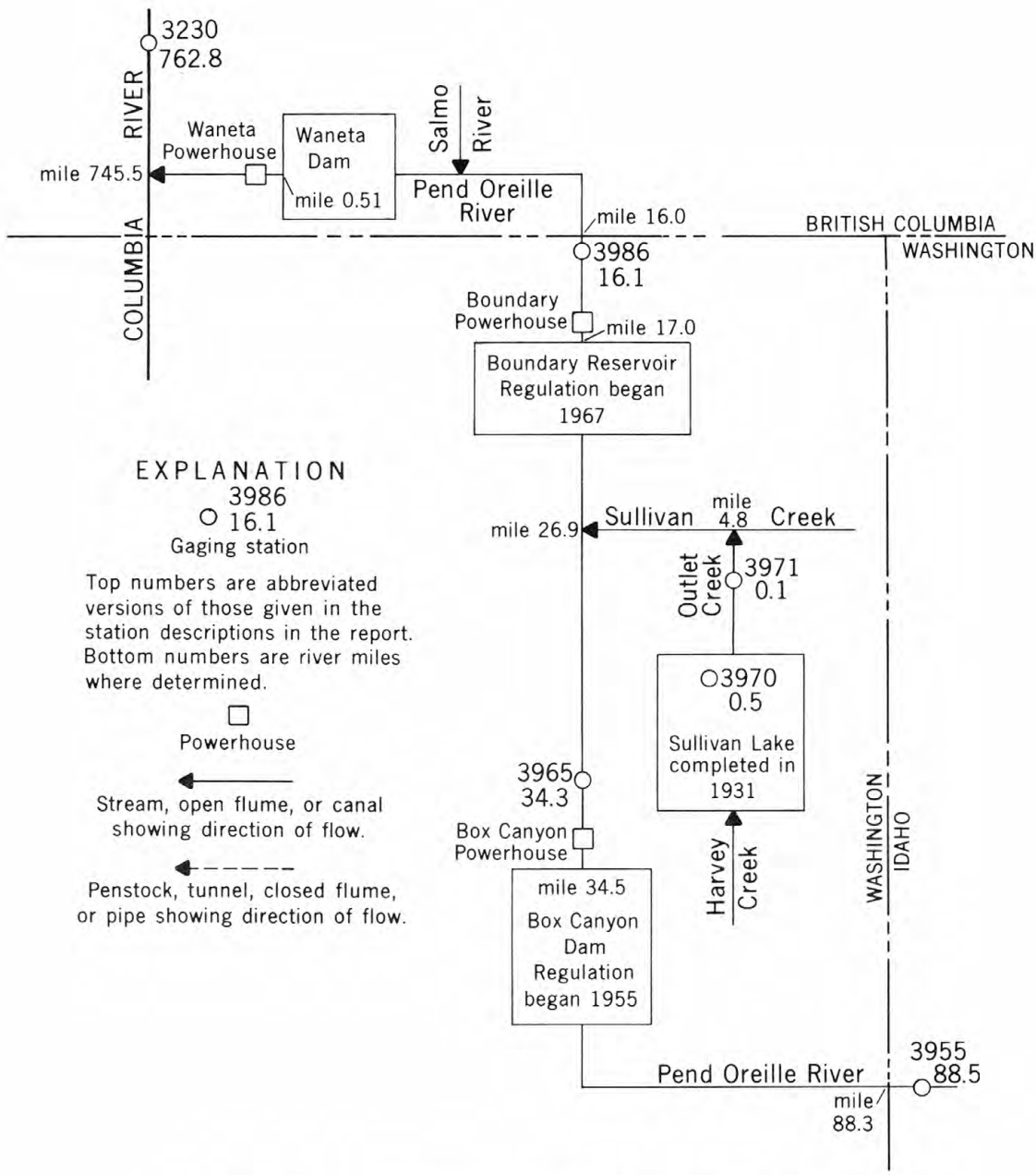

Figure 6. Gaging stations in Pend Oreille River basin and Columbia River above International Boundary.

12323000 COLUMBIA RIVER AT BIRCHBANK, BRITISH COLUMBIA
(International gaging station)

LOCATION.--Lat 49°10'40".long 117°42'59", on right bank at Birchbank, British Columbia, 0.7 mi (1.1 km) downstream from Sullivan Creek, 7 mi (11.3 km) upstream from Trail, 11.7 mi (18.8 km) downstream from Kootenay River, 17.4 mi (28.0 km) upstream from international boundary, and at mile 762.4 (1,226.7 km).

DRAINAGE AREA.--34,000 mi^2 (88,100 km^2), approximately.

PERIOD OF RECORD.-- April 1913 to current year. Published as "at Trail, British Columbia" 1913-37.

REVISED RECORDS.--WSP 982: 1942. WSP 1216: 1949.

GAGE.--Water-stage recorder. Datum of gage is 1,329.90 ft (405.354 m) National Geodetic Vertical Datum of 1929, 1947 international joint adjustment, published as 1,338.00 ft (407.822 m) prior to October 1948. Prior to Oct. 1, 1937, nonrecording gage on highway bridge at site 6.8 mi (10.9 km) downstream at datum 16.27 ft (4.959 m) lower.

REMARKS.--Records excellent. Flow regulated by six major reservoirs, and by numerous small reservoirs and powerplants. Diversions above station for irrigation of about 25,000 acres (101 km^2).

COOPERATION.--This station is maintained by Canada under agreement with the United States.

AVERAGE DISCHARGE.--68 years, 71,060 ft^3/s (2,012 m^3/s), 51,450,000 acre-ft/yr (63,400 hm^3/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 377,000 ft^3/s (10,700 m^3/s) June 9, 1961, gage height, 50.05 ft (15.255 m); maximum gage height, 50.62 ft (15.429 m) June 11, 1948; minimum discharge observed, 8,940 ft^3/s (253 m^3/s) Feb. 3, 1937, gage height, 6.27 ft (1.911 m), site and datum then in use.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 176,000 ft^3/s (4,980 m^3/s) July 7, gage height, 31.33 ft (9.550 m); minimum daily, 19,600 ft^3/s (555 m^3/s) Apr. 18.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	35700	46800	74600	97900	105000	58400	44000	49100	123000	116000	145000	65400
2	36500	46800	81300	96400	108000	66100	43900	52000	121000	116000	148000	62800
3	43600	46900	81500	95200	110000	69600	43800	47600	121000	115000	152000	69800
4	48600	47400	82500	94600	109000	69200	43700	42600	123000	116000	147000	69200
5	44800	46800	86000	96000	103000	68400	37700	42700	123000	126000	140000	67700
6	41600	47700	86000	98100	111000	67300	29800	42500	124000	146000	137000	67400
7	39400	49800	85900	98900	109000	65300	29700	41500	123000	169000	138000	67300
8	39400	52600	84900	102000	109000	61500	29700	41700	120000	164000	143000	67300
9	36700	53300	83300	106000	109000	55900	29700	42000	118000	151000	141000	67600
10	35900	56700	84100	108000	104000	56400	29000	44600	118000	137000	141000	71200
11	36000	63000	83600	104000	110000	56000	28800	55200	118000	120000	138000	72700
12	32600	63500	82400	101000	105000	52500	25900	55300	119000	112000	137000	70000
13	29600	56400	83400	102000	109000	47700	23100	55300	115000	106000	135000	63700
14	28800	47600	84100	101000	110000	47700	23600	55300	115000	129000	131000	62200
15	28900	47400	83100	101000	101000	45700	21600	57800	115000	144000	125000	64900
16	28800	47500	78900	101000	94000	41400	22000	59100	116000	146000	126000	64800
17	28600	50500	79300	101000	91100	38600	19700	66900	116000	145000	124000	64800
18	28500	51100	79800	101000	95900	38400	19600	76600	116000	141000	126000	65200
19	37000	51600	77100	99700	94900	39800	23300	77900	115000	134000	125000	65700
20	48100	53300	74800	99000	94900	42200	29200	80200	116000	133000	117000	62600
21	50100	54100	77700	99300	89300	41900	30400	82700	116000	131000	114000	60000
22	50400	56900	75500	99400	75200	43300	33600	89600	115000	132000	110000	60300
23	49500	59700	75100	100000	64200	45300	33300	90200	115000	128000	108000	60400
24	46200	63300	80600	101000	60300	45200	35700	95400	114000	125000	109000	60100
25	51300	59400	81900	102000	60700	45400	36300	103000	111000	131000	106000	57800
26	43900	59100	83000	105000	56000	45900	38500	106000	112000	130000	101000	55300
27	41500	62600	86100	106000	55700	46400	42800	104000	113000	126000	107000	61900
28	41200	63400	101000	105000	54900	46700	42300	105000	113000	140000	107000	69300
29	41300	64100	109000	101000	---	46000	43500	113000	111000	151000	101000	69400
30	41300	68400	109000	106000	---	44500	44400	116000	111000	155000	99100	69500
31	42700	---	105000	104000	---	44000	---	121000	---	158000	84100	---
TOTAL	1228500	1637700	2620500	3132500	2599100	1582700	978600	2211800	3506000	4173000	3862200	1956300
MEAN	39630	54590	84530	101000	92830	51050	32620	71350	116900	134600	124600	65210
MAX	51300	68400	109000	108000	111000	69600	44400	121000	124000	169000	152000	72700
MIN	28500	46800	74600	94600	54900	38400	19600	41500	111000	106000	84100	55300
AC-FT	2437000	3248000	5198000	6213000	5155000	3139000	1941000	4387000	6954000	8277000	7661000	3880000

CAL YR 1980 TOTAL 21837800 MEAN 59670 MAX 109000 MIN 20200 AC-FT 43320000
WTR YR 1981 TOTAL 29488900 MEAN 80790 MAX 169000 MIN 19600 AC-FT 58490000

12395500 PEND OREILLE RIVER AT NEWPORT, WA

LOCATION.--Lat 48°10'56", long 117°02'00", in SE¼SW¼SW¼ sec.24, T.56 N., R.6 W. (Boise Meridian), Bonner County, Hydrologic Unit 17010216, on left bank at Newport, 0.2 mi (0.3 km) upstream from bridge on U.S. Highway 2, 0.2 mi (0.3 km) east of Idaho-Washington State line, 1.6 mi (2.6 km) downstream from Albeni Falls Dam, and at mile 88.5 (142.4 km).

DRAINAGE AREA.--24,200 mi^2 (62,700 km^2), approximately.

PERIOD OF RECORD.--June 1903 to September 1941, October 1952 to current year. Prior to October 1921, published as "Clark Fork at Newport, Wash.", October 1921 to September 1937, as "Clark Fork at Priest River, Idaho", and October 1937 to September 1941, as "Pend Oreille River at Priest River, Idaho".

REVISED RECORDS.--WSP 532: 1903-11.

GAGE.--Water-stage recorder. Datum of gage is 1,999.7 ft (609.509 m) National Geodetic Vertical Datum of 1929. Prior to Sept. 22, 1928, nonrecording gages at Priest River, Newport, or Metaline Falls at various datums (see description, WSP 532, p. 92). Sept. 22, 1928, to Sept. 30, 1935, at datum 2,040.14 ft (621.835 m) National Geodetic Vertical Datum of 1929, and Oct. 1, 1935, to Sept. 30, 1941, at datum 2,000 ft (609.6 m) National Geodetic Vertical Datum of 1929, water-stage recorder at Priest River. Since December 1952, auxiliary water-stage recorder 2.74 mi (4.41 km) downstream from base gage.

REMARKS.--Records excellent. Flow regulated at Albeni Falls Dam and affected by storage in Pend Oreille Lake (see sta 12392500), Flathead Lake, Hungry Horse Reservoir, and several smaller reservoirs. Diversions above station for irrigation of about 354,000 acres (143,000 hm^2).

AVERAGE DISCHARGE.--67 years (1904-41, 1953-81), 25,970 ft^3/s (735 m^3/s), 18,820,000 acre-ft/yr (23.2 hm^3/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 136,000 ft^3/s (3,850 m^3/s) June 15, 1913, June 21, 1933, June 12, 1972; minimum, 1,280 ft^3/s (36 m^3/s) Sept. 1, 1961.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage known, about 64.0 ft (19.51 m) in June 1894, present site and datum, from water-surface profiles, discharge, about 200,000 ft^3/s (5,660 m^3/s).

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 102,000 ft^3/s (2,889 m^3/s) May 28; maximum gage height, 47.36 ft (14.435 m) May 29; minimum discharge, 4,780 ft^3/s (135 m^3/s) Dec. 27; minimum gage height, 31.04 ft (9.461 m) Aug. 20.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	25100	25700	21000	5730	23900	29900	22200	33300	97900	45700	15200	7320
2	25000	25300	19800	5560	24200	28600	23900	33700	93000	43700	15300	7500
3	25300	25000	23000	5790	24000	28000	23700	33900	88100	42300	15400	7460
4	25100	24400	21700	5820	23700	27600	23300	34000	84600	43000	14500	7980
5	25100	22300	20800	5740	23800	27700	23200	34200	79100	48200	13100	8890
6	25100	20000	21600	5520	25600	27900	18600	34200	78500	47600	13200	8720
7	24900	17600	21800	12900	27300	27900	17500	34400	79600	44200	13000	8820
8	27000	16800	21600	16400	26900	27800	17700	35400	81800	45500	12800	8870
9	29200	16800	21300	24600	26600	27800	19000	36700	88700	48200	12800	13800
10	29100	16800	21300	23500	27000	27800	21000	36800	89000	45600	12900	18300
11	29100	17000	21200	22200	27300	27900	21000	36700	86800	46900	12900	18300
12	29200	17600	21300	22400	27300	28200	18500	36900	85700	41600	13000	18400
13	29700	18800	21300	25900	27000	28600	19200	36800	81400	35200	13000	18600
14	29400	19000	21200	27800	27000	28500	19800	36500	75100	27900	13000	18400
15	29600	19000	21200	25300	27100	28700	20000	36600	69300	23000	10900	17300
16	30000	19000	21200	22400	27000	28500	19700	36400	68500	23700	9350	13400
17	28100	18600	21200	19800	26900	28900	19900	36600	69800	29900	8410	13200
18	25400	18500	21400	19700	22600	29000	19800	39300	70800	32400	7080	13300
19	25400	19000	21300	19600	16400	28800	19400	42100	71400	31700	7120	13300
20	25200	20800	21400	18600	16400	28500	20200	43900	73400	28200	9040	13400
21	25200	20900	21400	17500	16700	28100	22300	51400	78900	24800	13000	17400
22	25200	20700	21300	19800	16900	27800	24800	61500	82400	23000	13100	20300
23	25600	20700	21300	22800	20700	27900	30600	74000	85800	19700	11100	22900
24	25400	21100	17700	24600	24600	28300	30700	86100	89200	17600	9460	18000
25	25100	15100	10800	24500	28800	27900	31100	95200	86700	17500	8230	13600
26	25100	22900	10800	23700	31000	25400	31300	98100	80100	18700	8790	13200
27	25200	23300	9820	23500	29900	21600	28900	99500	71600	22400	10900	13500
28	25200	23200	5510	24100	29700	20500	28300	101000	69800	22700	10100	12800
29	25500	23200	5660	23800	---	18900	27100	101000	59800	20900	8530	12400
30	25500	23700	5730	24100	---	18500	30000	100000	51300	18600	8500	12500
31	25400	---	5700	23900	---	20400	---	98900	---	15200	7970	---
TOTAL	820400	612800	562320	587560	696300	831900	692700	1695100	2368100	995600	351680	411860
MEAN	26460	20430	18140	18950	24870	26840	23090	54680	78940	32120	11340	13730
MAX	30000	25700	23000	27800	31000	29900	31300	101000	97900	48200	15400	22900
MIN	24900	15100	5510	5520	16400	18500	17500	33300	51300	15200	7080	7320
AC-FT	1627000	1215000	1115000	1165000	1381000	1650000	1374000	3362000	4697000	1975000	697600	816900

CAL YR 1980	TOTAL	8573140	MEAN	23420	MAX	98300	MIN	3680	AC-FT	17000000		
WTR YR 1981	TOTAL	10626320	MEAN	29110	MAX	101000	MIN	5510	AC-FT	21080000		

12396500 PEND OREILLE RIVER BELOW BOX CANYON, NEAR IONE, WA

LOCATION.--Lat 48°46'52", long 117°24'55", in SE¼NE¼ sec.19, T.38 N., R.43 E., Pend Oreille County, Hydrologic Unit 17010216, on left bank 1,000 ft (305 m) downstream from Box Canyon Dam, 2.8 mi (4.5 km) north of Ione, and at mile 34.3 (55.2 km).

DRAINAGE AREA.--24,900 mi^2 (64,500 km^2), approximately.

PERIOD OF RECORD.--October 1952 to current year.

REVISED RECORDS.--WSP 1933: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is National Geodetic Vertical Datum of 1929. Prior to Mar. 29, 1954, nonrecording gage at site 300 ft (91 m) upstream at same datum. Mar. 29, to Aug. 25, 1954, nonrecording gage at present site and datum. Since Aug. 20, 1967, auxiliary water-stage recorder 1.2 mi (1.9 km) downstream at same datum.

REMARKS.--Records good except those less than 10,000 ft^3/s (283 m^3/s), which are fair. Flow completely regulated by Box Canyon Reservoir, 1,000 ft (305 m) upstream since June 1955 and by Pend Oreille Lake, Flathead Lake, Hungry Horse Reservoir, and by several smaller reservoirs and powerplants. In 1946 there were diversions for irrigation of 340,000 acres (1,380 km^2) above the station.

AVERAGE DISCHARGE.--29 years, 28,060 ft^3/s (794.7 m^3/s), 20,330,000 acre-ft/yr (25,070 hm^3/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 136,000 ft^3/s (3,850 m^3/s) June 13, 14, 1972; maximum elevation, 2,014.54 ft (614.032 m) June 14, 1972; minimum observed discharge, 125 ft^3/s (3.54 m^3/s) Apr. 23, 1967 (result of regulation).

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of June 1948 reached elevation of 2,018.00 ft (615.086 m), from flood-marks, discharge, 167,000 ft^3/s (4,730 m^3/s).

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 106,000 ft^3/s (3,000 m^3/s) May 26; maximum elevation, 2,008.18 ft (612.093 m) May 30; minimum daily, 6,360 ft^3/s (180 m^3/s) Dec. 28; minimum elevation, 1982.36 ft (604.223 m) Aug. 20.

REVISIONS.--The maximum discharge for water year 1976 has been revised to 103,000 ft^3/s (2,920 m^3/s) May 22, 1976 (instantaneous). Revised daily discharges, in cubic feet per second, for the high-water period in May 1976, are given below. These figures supersede those published in the report for 1976.

May	16	91,500	May	19	90,800	May	22	94,700	May	25	93,400	May 28	93,200
	17	89,000		20	93,400		23	94,500		26	93,300	29	91,800
	18	88,900		21	94,500		24	94,100		27	93,200	30	92,300
												31	90,900

	Total	Mean	Max	Min	Acre-ft
May 1976	2,417,400	77,980	94,700	47,400	4,795,000
Wtr Yr 1976	12,235,340	33,430	94,700	8,900	24,270,000

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	22100	24900	22600	7100	25200	29400	22200	31000	95700	48100	15300	7010
2	22800	25900	20900	7240	23500	29100	22300	33100	92500	45300	15100	7050
3	24500	24300	21900	7370	23400	28300	24300	34200	86600	42100	15100	7070
4	24500	24200	22900	7240	23500	28500	24300	34200	83600	40000	14500	7180
5	24600	22600	22300	7320	24300	28300	24100	34200	78100	41700	13300	7530
6	24500	21100	20500	7820	24500	28100	21200	34200	77700	47100	12900	8170
7	24200	18900	21400	10800	27200	28900	20000	34200	78400	44900	12900	8060
8	25300	17600	22100	15700	27400	28700	19400	35100	82700	42900	12700	7860
9	27400	16300	21500	21300	26800	28500	18800	36400	85300	44700	12500	9750
10	28300	16000	20900	22500	26500	28500	20100	36600	83900	45900	12100	15500
11	28700	15500	22000	23000	25600	27600	20300	36400	82200	44000	12400	17400
12	28900	15800	21500	23300	26200	27700	19600	36200	79200	42700	12100	18500
13	29000	17500	19900	23900	26500	28900	18800	35700	80100	39100	12100	18400
14	29100	18000	20400	25500	27200	28700	18800	36000	73800	27600	11500	17000
15	29200	17900	20500	25700	26900	28400	20100	36400	67600	26800	11800	16800
16	29300	18000	21600	23900	26900	28300	19600	36400	65300	23900	9150	14300
17	28800	18100	21500	22200	26400	28500	20300	36500	65600	26800	9310	12500
18	26000	17700	20100	20100	24800	28900	19400	37700	66100	29400	9080	12300
19	26000	17800	21000	19500	20900	28600	19300	39800	69200	30000	8560	12800
20	25300	19600	20500	19100	18900	28600	19600	41400	71600	29800	8320	12100
21	25300	18600	20700	16400	18600	28100	20300	47600	79300	27200	9760	13400
22	25000	22200	21400	17400	19200	27800	23400	57700	83000	24200	13200	17700
23	25400	20700	21300	21200	18200	27600	26300	71500	88200	21300	11500	21300
24	25200	20500	20300	23800	21900	28100	30000	85400	82600	19400	10700	20600
25	25300	16900	12900	24100	26300	28100	30600	90300	83400	18300	7780	15600
26	25100	19000	11000	24100	29300	27100	32300	93400	78300	18400	8290	13800
27	25100	21700	9540	23300	29300	23600	31900	94700	70000	20500	9200	13000
28	24700	22800	6360	23300	29400	22900	29100	95600	65500	22100	11500	12600
29	25300	23500	6940	23000	---	20100	27900	97200	62800	22300	7920	11700
30	24900	23600	6610	21400	---	18100	29200	96600	57600	19000	7580	11900
31	24700	---	7230	25200	---	21100	---	96400	---	16700	7340	---
TOTAL	804500	597200	570280	583790	694800	843100	693500	1642100	2315900	992200	345490	388880
MEAN	25950	19910	18400	18830	24810	27200	23120	52970	77200	32010	11140	12960
MAX	29300	25900	22900	25700	29400	29400	32300	97200	95700	48100	15300	21300
MIN	22100	15500	6360	7100	18200	18100	18800	31000	57600	16700	7340	7010
AC-FT	1596000	1185000	1131000	1158000	1378000	1672000	1376000	3257000	4594000	1968000	685300	771300

CAL YR 1980 TOTAL 8591800 MEAN 23470 MAX 92900 MIN 5460 AC-FT 17040000
WTR YR 1981 TOTAL 10471740 MEAN 28690 MAX 97200 MIN 6360 AC-FT 20770000

12397000 SULLIVAN LAKE NEAR METALINE FALLS, WA

LOCATION.--Lat 48°50'21", long 117°17'15", in SW¼NE¼ sec.31, T.39 N., R.44 E., Pend Oreille County, Hydrologic Unit 17010216, Colville National Forest, 200 ft (61 m) south of dam at outlet, and 4.0 mi (6.4 km) southeast of Metaline Falls.

DRAINAGE AREA.--51.2 mi^2 (132.6 km^2).

PERIOD OF RECORD.--May 1912 to September 1923, January 1959 to current year (fragmentary).

REVISED RECORDS.--WSP 1933: Drainage area.

GAGE.--Nonrecording gage. Datum of gage is National Geodetic Vertical Datum of 1929 (levels by Pend Oreille County Public Utility District). Prior to Sept. 30, 1923, nonrecording gage on dam at outlet of lake at different datum.

REMARKS.--Lake elevation is controlled by concrete dam. Top of gates is at 2,588.7 ft (789.04 m), bottom of gates is at 2,584.7 ft (787.82 m). Bottom of sluiceway is at 2,564 ft (781.5 m). Some small diversions for domestic use.

COOPERATION.--Elevation record furnished by Public Utility District No. 1 of Pend Oreille County.

EXTREMES FOR PERIOD OF RECORD.--Maximum elevation observed, 2,589.94 ft (789.414 m) July 15, 1975; minimum observed, 2,564.00 ft (781.507 m) on many days during period Jan. 6 to Mar. 25, 1970.

EXTREMES FOR CURRENT YEAR.--Maximum elevation observed, 2,588.90 ft (789.097 m) July 8; minimum observed, 2,565.00 ft (781.812 m) Jan. 23, Feb. 2, 9.

ELEVATION (FEET NGVD), WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981
ONCE-DAILY

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2588.36	---	2566.88	---	---	---	---	2574.10	2587.85	---	---	---
2	---	---	---	---	2565.00	---	---	2574.76	2587.90	---	---	2588.38
3	2587.40	2573.40	---	---	---	---	---	2575.00	2588.00	---	---	---
4	---	---	---	---	---	---	---	2575.42	2588.05	---	2588.40	2588.38
5	---	---	---	---	---	2567.00	---	2576.22	2588.08	---	2588.38	---
6	2586.10	2572.35	---	2565.32	---	---	---	2576.54	---	2588.50	---	---
7	---	2572.20	---	---	---	---	---	2576.76	---	---	2588.36	2588.38
8	---	---	---	---	---	---	---	2577.02	2588.10	2588.90	---	---
9	2584.70	---	---	---	2565.00	---	2569.80	2577.38	2588.20	2588.70	---	2588.36
10	2584.10	---	---	---	---	2569.86	---	2577.64	---	2588.54	2588.36	---
11	---	2570.90	---	---	2565.01	---	---	2578.08	2588.24	2588.40	2588.38	2588.36
12	---	---	---	---	2565.10	2567.48	---	2578.54	---	2588.24	---	---
13	---	---	---	---	---	---	---	2578.90	2588.14	2588.16	2588.38	---
14	2582.00	2569.00	---	---	---	---	2570.20	2579.28	2588.14	2588.10	---	---
15	---	---	---	---	---	---	---	2579.80	---	2588.06	2588.50	---
16	2580.84	---	---	---	---	---	2570.32	2580.30	2588.10	2588.16	2588.50	---
17	2580.40	---	2565.16	---	---	---	2570.40	2580.96	2588.20	---	---	---
18	---	2568.70	---	---	---	---	2570.48	2581.58	---	2588.16	2588.50	---
19	---	---	---	---	---	2567.96	2570.58	2582.12	2588.24	---	---	2588.20
20	---	---	---	---	---	---	2570.70	2582.70	---	2588.24	2588.50	---
21	2578.62	2569.00	---	---	---	---	2570.78	2583.34	2588.24	2588.34	---	2588.16
22	---	---	---	---	---	---	2570.96	2584.04	---	---	---	---
23	2577.72	---	---	2565.00	---	---	2571.16	2584.80	2588.20	---	2588.48	2588.12
24	2577.30	2569.04	---	---	---	---	2571.50	2585.54	2588.16	2588.36	---	---
25	---	---	---	---	---	---	2571.78	2586.25	2588.18	---	---	2588.12
26	---	---	---	---	2566.44	2568.50	2572.08	2587.06	2588.24	---	2588.44	---
27	---	---	---	---	---	---	2572.30	2587.40	2588.24	---	---	---
28	2575.70	---	---	---	---	---	2572.70	2587.56	2588.30	2588.36	---	2588.10
29	---	---	---	---	---	---	2573.00	2587.68	2588.30	---	---	---
30	2574.90	---	---	---	---	---	2573.42	2587.80	2588.26	2588.46	---	2588.10
31	2574.50	---	2565.32	---	---	---	---	2587.90	---	---	2588.36	---
MEAN	---	---	---	---	---	---	---	2581.05	---	---	---	---
MAX	---	---	---	---	---	---	---	2587.90	---	---	---	---
MIN	---	---	---	---	---	---	---	2574.10	---	---	---	---

12397100 OUTLET CREEK NEAR METALINE FALLS, WA

LOCATION.--Lat 48°50'42", long 117°17'12", in SW¼SE¼ sec.30, T.39 N., R.44 E., Pend Oreille County, Hydrologic Unit 17010216, Colville National Forest, on right bank 0.1 mi (0.2 km) upstream from mouth, 0.4 mi (0.6 km) downstream from Sullivan Lake Dam, and 4 mi (6.4 km) east of Metaline Falls.

DRAINAGE AREA.--51.5 mi^2 (133.4 km^2).

PERIOD OF RECORD.--January 1959 to current year.

REVISED RECORDS.--WSP 1933: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 2,540.2 ft (774.25 m) National Geodetic Vertical Datum of 1929.

REMARKS.--Records good. Flow completely regulated by Sullivan Lake 0.4 mi (0.6 km) upstream (see sta 12397000). No diversions.

AVERAGE DISCHARGE.--22 years, 73.5 ft^3/s (2.082 m^3/s), 53,250 acre-ft/yr (65.7 hm^3/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 924 ft^3/s (26.2 m^3/s) May 31, 1969, gage height, 12.26 ft (3.737 m); minimum, 1.6 ft^3/s (0.045 m^3/s) part of each day Apr. 9-12, 1973; minimum gage height, 8.76 ft (2.670 m) part of each day Apr. 9-12, 1973, and Mar. 4-10, 1980.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 480 ft^3/s (13.59 m^3/s) Oct. 9, gage height, 11.04 ft (3.365 m); minimum daily, 2.0 ft^3/s (0.057 m^3/s) Feb. 10, 11.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	162	320	167	68	47	2.4	2.8	4.2	303	141	55	22
2	317	313	162	68	46	2.4	2.8	4.4	250	139	55	22
3	310	306	155	68	30	2.4	2.8	4.7	233	90	59	22
4	303	299	150	68	20	2.4	2.8	5.0	241	25	65	22
5	296	292	139	66	15	2.4	2.8	5.3	244	21	58	22
6	292	286	124	65	10	2.4	2.6	5.3	250	24	49	22
7	289	279	110	63	7.0	2.4	2.6	5.6	250	221	41	21
8	282	272	101	63	5.0	2.4	2.6	6.3	250	346	22	21
9	357	266	90	62	3.0	2.4	2.8	6.6	250	324	22	21
10	476	260	82	60	2.0	2.4	2.8	7.0	256	272	21	21
11	464	256	75	58	2.0	2.4	2.8	7.4	275	221	21	21
12	460	247	69	56	2.3	2.6	3.0	7.4	286	210	21	21
13	460	260	65	55	2.6	2.4	3.0	7.7	279	203	21	21
14	452	279	62	53	2.8	2.6	3.0	8.1	275	167	22	21
15	448	269	58	52	2.4	2.6	3.0	8.5	260	105	22	21
16	420	260	55	51	2.4	2.6	3.0	8.5	203	78	22	21
17	384	247	52	49	2.4	2.6	3.0	8.9	167	74	22	21
18	376	144	51	49	2.4	2.6	3.2	9.3	197	66	22	21
19	369	5.9	50	47	2.4	2.6	3.2	10	224	66	22	21
20	365	5.6	50	47	2.4	2.6	3.2	10	241	66	22	21
21	357	5.3	49	47	2.4	2.4	3.2	11	238	66	22	21
22	350	5.3	49	45	2.4	2.4	3.4	12	235	66	22	21
23	342	5.0	49	38	2.4	2.6	3.4	12	233	65	22	21
24	335	133	47	46	2.2	2.6	3.4	13	192	72	22	21
25	331	235	47	47	2.4	2.6	3.4	14	137	82	22	21
26	328	224	49	47	2.4	2.6	3.7	90	139	82	22	21
27	320	210	55	39	2.4	2.6	3.7	269	144	55	22	21
28	313	200	62	47	2.4	2.6	3.9	317	144	21	22	21
29	306	190	65	49	---	2.4	3.9	299	144	21	22	20
30	313	179	68	45	---	2.4	4.2	320	144	21	22	20
31	328	---	68	47	---	2.6	---	335	---	34	22	---
TOTAL	10905	6253.1	2475	1665	228.1	77.4	94.0	1832.2	6684	3444	906	634
MEAN	352	208	79.8	53.7	8.15	2.50	3.13	59.1	223	111	29.2	21.1
MAX	476	320	167	68	47	2.6	4.2	335	303	346	65	22
MIN	162	5.0	47	38	2.0	2.4	2.6	4.2	137	21	21	20
AC-FT	21630	12400	4910	3300	452	154	186	3630	13260	6830	1800	1260

CAL YR 1980 TOTAL 29783.8 MEAN 81.4 MAX 476 MIN 1.7 AC-FT 59080
WTR YR 1981 TOTAL 35197.8 MEAN 96.4 MAX 476 MIN 2.0 AC-FT 69810

12398600 PEND OREILLE RIVER AT INTERNATIONAL BOUNDARY
(International gaging station)

LOCATION.--Lat 48°59'56", long 117°21'09", in SW¼NE¼ sec.3, T.40 N., R.43 E., Pend Oreille County, Hydrologic Unit 17010216, on left bank 0.1 mi (0.2 km) upstream from international boundary, 0.9 mi (1.4 km) downstream from Boundary Dam, 6.0 mi (9.7 km) downstream from Slate Creek, 9.7 mi (15.6 km) north of Metaline Falls and at mile 16.1 (25.9 km).

DRAINAGE AREA.--25,200 mi^2 (65,300 km^2), approximately.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--November 1908 to September 1910 (gage heights only), October 1912 to current year. Prior to October 1928, published as Clark Fork at Metaline Falls, October 1928 to September 1937 as Clark Fork below Z Canyon, near Metaline Falls, and October 1938 to September 1964 as "below Z Canyon, near Metaline Falls." Concurrent records published for present site December 1962 to September 1964.

REVISED RECORDS.--WSP 442: 1913. WSP 1716: 1919.

GAGE.--Water-stage recorder. Datum of gage is 1,700 ft (518.21 m) city of Seattle Boundary Dam datum. Prior to Dec. 20, 1928, nonrecording gage at Metaline Falls at datum approximately 1,983.4 ft (604.54 m) National Geodetic Vertical Datum of 1929. Dec. 20, 1928, to Sept. 30, 1964, water-stage recorder at site 1.3 mi (2.1 km) upstream at datum 1,721.18 ft (524.616 m) National Geodetic Vertical Datum of 1929, supplementary adjustment of 1947 (levels by Corps of Engineers).

REMARKS.--Water-discharge records good. Flow regulated by Boundary Reservoir 0.9 mi (1.4 km) upstream beginning April 1967 and by Box Canyon Reservoir beginning June 1955, Pend Oreille Lake beginning June 1952 (see sta 12392500), Flathead Lake beginning April 1938 (see sta 12371500), Hungry Horse Reservoir beginning September 1951 (see sta 12362000) and by several smaller reservoirs and powerplants. In 1946 there were diversions for irrigation of 340,000 acres (1,380 km^2) above the station and there probably has not been any appreciable change since that time.

COOPERATION.--This station is maintained by the United States under agreement with Canada.

AVERAGE DISCHARGE.--69 years, 27,270 ft^3/s (772.3 m^3/s), 19,760,000 acre-ft/yr (24,400 hm^3/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 171,300 ft^3/s (4,850 m^3/s) June 13, 1948, gage height, 60.25 ft (18.364 m), site and datum then in use; minimum daily, 200 ft^3/s (5.66 m^3/s) Aug. 12, 1967, result of regulation; minimum observed, 109 ft^3/s (3.09 m^3/s) Apr. 23, 1967, result of regulation.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of June 1894 reached a stage of 69.0 ft (21.03 m), from floodmarks, at site and datum 1.3 mi (2.1 km) upstream.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 112,000 ft^3/s (3,170 m^3/s) May 30, gage height, 40.28 ft (12.277 m); minimum, 2,310 ft^3/s (65.4 m^3/s) Aug. 29, gage height, 15.69 ft (4.782 m).

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	26700	26200	22500	7740	23100	28400	20300	32400	104000	53000	14000	8450
2	24800	24300	22200	9090	25500	27200	23800	33700	103000	47900	16300	7520
3	23400	26000	23000	7550	25400	29000	24000	36900	99400	46000	15800	7380
4	23700	24800	23600	6160	26400	31700	25400	36500	88700	42800	15100	8620
5	24700	24200	23200	9650	26500	30200	24500	36600	82900	44500	14500	7540
6	25400	21200	21200	5110	26900	31200	23800	36600	82800	50400	13300	8370
7	27700	21100	22000	11600	26700	30600	19600	36800	83100	49400	14800	7980
8	29100	18000	22200	17800	24300	29200	20100	37400	88900	46800	12600	9700
9	28100	16100	21900	22300	27400	29900	17900	39600	96400	48300	14200	12600
10	27800	17300	21700	24900	26400	30200	21200	40000	94600	49500	12100	16500
11	27700	16700	22800	22700	25900	30900	20800	39400	94600	47800	13200	17400
12	29500	17500	21900	23000	25300	31100	20300	38700	89900	47200	12800	16700
13	28800	18300	20800	25400	26800	31800	20200	38500	87300	43000	13000	15700
14	29700	19400	21700	27900	29500	27700	20700	38700	82500	33500	12600	17100
15	30000	19500	22600	25300	29300	25500	19900	39900	72500	31100	13100	16300
16	30100	18100	22200	24500	28800	28700	19000	40300	68300	25400	11100	14200
17	29700	19300	21100	20500	29000	29800	22100	40400	72500	27400	12000	13100
18	25700	20800	20800	19700	29100	30000	21500	46000	72200	30300	12200	12500
19	25900	20500	21400	20200	24600	29500	19400	39100	73800	32100	10900	11800
20	26400	21000	21400	19600	18200	31000	20600	42500	76200	32000	10500	12000
21	26600	20400	21100	18200	17300	30000	20200	51700	82800	27400	11300	16100
22	24300	15800	22800	19500	20300	29700	25400	61400	89700	26200	10000	17000
23	26300	20900	22900	22500	21000	28900	27200	75900	92500	23600	4980	20100
24	25800	21600	19800	22000	25000	29300	30200	87000	96000	22800	10500	19600
25	26100	17500	13500	25200	25700	29300	32300	94900	94200	19500	9240	17000
26	25000	20800	12800	26000	30400	29200	32500	101000	83700	16600	8460	12400
27	25400	22000	11000	24000	29400	26500	33100	105000	77200	21100	10200	11700
28	24900	23400	6320	24400	29400	23400	32300	105000	69300	22600	10900	12400
29	24700	24400	9570	25700	---	19400	31700	106000	66400	21800	7780	11700
30	25700	24800	6880	26300	---	22300	32000	106000	61100	20700	7290	11700
31	25400	---	8440	22300	---	22000	---	106000	---	21100	9380	---
TOTAL	825100	621900	595310	606800	723600	883600	722000	1769900	2526500	1071800	364130	391160
MEAN	26620	20730	19200	19570	25840	28500	24070	57090	84220	34570	11750	13040
MAX	30100	26200	23600	27900	30400	31800	33100	106000	104000	53000	16300	20100
MIN	23400	15800	6320	5110	17300	19400	17900	32400	61100	16600	4980	7380
AC-FT	1637000	1234000	1181000	1204000	1435000	1753000	1432000	3511000	5011000	2126000	722300	775900

CAL YR 1980	TOTAL	8968160	MEAN	24500	MAX	99700	MIN	5050	AC-FT	17790000
WTR YR 1981	TOTAL	11101800	MEAN	30420	MAX	106000	MIN	4980	AC-FT	22020000

12398600 PEND OREILLE RIVER AT INTERNATIONAL BOUNDARY, WA--Continued
(National Stream-quality Accounting Network Station)

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1974 to current year.

PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: January 1974 to September 1981 (discontinued).
WATER TEMPERATURE: April 1974 to September 1981 (discontinued).

INSTRUMENTATION.--Water-quality monitor since April 1974.

REMARKS.--Interruptions in the record were due to malfunctions of the instrument. In addition to the water-quality monitor record, samples were collected approximately once a month.

EXTREMES FOR PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: Maximum, 242 micromhos July 17, 1974; minimum, 62 micromhos April 25, 1975.
WATER TEMPERATURES: Maximum, 24.5°C July 28-30, 1975; minimum, 0.0°C at times during winter periods.

EXTREMES FOR CURRENT YEAR.--
SPECIFIC CONDUCTANCE: Maximum, 183 micromhos Dec. 30; minimum, 135 micromhos Jan. 10, 11, May 24.
WATER TEMPERATURES: Maximum, 23.5°C Aug. 17-19; minimum, 0.5°C Feb. 14.

WATER QUALITY DATA, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SPE-CIFIC CON-DUCT-ANCE (UMHOS)	SPE-CIFIC CON-DUCT-ANCE LAB (UMHOS)	PH (UNITS)	PH LAB (UNITS)	TEMPER-ATURE (DEG C)	TUR-BID-ITY (FTU)	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 CACO3)
OCT , 1980												
09...	1345	27200	174	177	8.2	8.1	15.1	1.3	10.2	3	2	86
NOV												
05...	1400	30600	179	183	8.4	8.0	9.5	4.0	10.3	1	<1	83
DEC												
04...	1030	31500	174	178	8.2	7.8	4.7	.60	10.7	2	<1	80
JAN , 1981												
07...	1430	12800	158	165	8.3	7.7	3.3	1.0	11.4	<1	<1	74
FEB												
05...	0800	31500	175	171	8.5	7.7	2.5	1.2	11.6	6	12	79
MAR												
09...	1230	33200	157	165	8.3	8.0	4.4	1.4	12.5	<1	<1	78
APR												
13...	1330	25900	155	168	8.3	7.6	6.0	1.9	11.6	2	<1	75
MAY												
06...	1145	36700	153	155	7.7	8.0	10.1	3.8	11.2	<1	<1	76
JUN												
08...	1200	84900	143	155	7.8	8.1	13.3	6.5	11.6	5	5	71
JUL												
08...	1345	45400	150	152	7.2	7.9	16.3	2.2	11.5	4	2	74
AUG												
06...	1115	20500	154	152	7.4	8.5	20.8	1.8	9.9	13	3	71
SEP												
03...	1045	13600	155	152	7.3	7.8	21.6	.70	8.9	2	4	68

DATE	HARD-NESS NONCAR-BONATE (MG/L AS CACO3)	CALCIUM DIS-SOLVED (MG/L AS CA)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG)	SODIUM, DIS-SOLVED (MG/L AS NA)	PERCENT SODIUM	SODIUM AD-SORP-TION RATIO	POTAS-SIUM, DIS-SOLVED (MG/L AS K)	ALKA-LINITY LAB (MG/L AS CACO3)	SULFATE DIS-SOLVED (MG/L AS SO4)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)	FLUO-RIDE, DIS-SOLVED (MG/L AS F)	SILICA, DIS-SOLVED (MG/L AS SIO2)
OCT , 1980												
09...	2.0	24	6.2	3.2	7	.2	1.0	84	10	1.0	.1	6.4
NOV												
05...	.00	23	6.2	3.1	7	.1	.9	83	9.7	1.1	.1	6.4
DEC												
04...	.00	22	6.0	2.9	7	.1	1.0	81	2.8	.8	.1	6.5
JAN , 1981												
07...	.00	21	5.3	2.9	8	.1	.9	79	11	.7	.1	7.9
FEB												
05...	4.0	22	5.9	2.9	7	.1	1.0	75	10	.9	.1	6.9
MAR												
09...	9.0	22	5.7	3.3	8	.2	.8	69	11	.8	.1	7.3
APR												
13...	1.0	21	5.5	3.0	8	.2	.9	74	9.0	.8	.1	6.9
MAY												
06...	14	21	5.6	3.6	9	.2	.8	62	9.5	.8	.1	7.1
JUN												
08...	3.0	20	5.2	2.7	7	.1	1.0	68	2.7	.7	.1	7.5
JUL												
08...	3.0	21	5.3	2.6	7	.1	.7	71	.6	.5	.1	7.0
AUG												
06...	6.0	20	5.2	2.6	7	.1	.7	65	5.0	2.1	.3	6.3
SEP												
03...	.00	20	4.5	2.2	6	.1	.7	73	4.7	.9	<.1	5.4

12398600 PEND OREILLE RIVER AT INTERNATIONAL BOUNDARY, WA--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L)	SOLIDS, DIS-SOLVED (TONS PER AC-FT)	SOLIDS, DIS-SOLVED (TONS PER DAY)	NITRO-GEN, NO2+NO3 TOTAL (MG/L AS N)	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N)	NITRO-GEN, AMMONIA TOTAL (MG/L AS N)	NITRO-GEN, AMMONIA DIS-SOLVED (MG/L AS N)	NITRO-GEN, ORGANIC TOTAL (MG/L AS N)	NITRO-GEN, ORGANIC DIS-SOLVED (MG/L AS N)	NITRO-GEN, AM-MONIA + ORGANIC TOTAL (MG/L AS N)
OCT, 1980											
09...	97	103	.13	7120	.00	.00	.020	.010	.80	.61	.82
NOV											
05...	98	100	.13	8100	.00	.00	.020	.020	.33	.31	.35
DEC											
04...	106	91	.14	9020	.00	.00	.000	.000	.31	.31	.31
JAN, 1981											
07...	90	98	.12	3110	.09	.11	.000	.020	.42	--	.42
FEB											
05...	88	95	.12	7480	.00	.03	.000	.020	.39	--	.39
MAR											
09...	98	92	.13	8790	.00	.00	.000	.000	.39	--	.39
APR											
13...	92	92	.13	6430	.01	.03	.060	.080	.37	.39	.43
MAY											
06...	92	86	.13	9120	.04	.03	.090	.070	.51	.38	.60
JUN											
08...	91	81	.12	20900	.04	.02	.020	--	.43	--	.45
JUL											
08...	91	81	.12	11200	.02	.02	.070	.080	.72	.43	.79
AUG											
06...	90	81	.12	4980	<.10	<.10	.190	.140	.20	.06	.39
SEP											
03...	97	82	.13	3560	.04	.04	.040	.040	.19	.22	.23

DATE	NITRO-GEN, NH4 + ORG. SUSP. TOTAL (MG/L AS N)	NITRO-GEN, AM-MONIA + ORGANIC DIS. (MG/L AS N)	NITRO-GEN, TOTAL (MG/L AS N)	NITRO-GEN DIS-SOLVED (MG/L AS N)	PHOS-PHORUS, TOTAL (MG/L AS P)	PHOS-PHORUS, DIS-SOLVED (MG/L AS P)	CARBON, ORGANIC TOTAL (MG/L AS C)	CARBON, ORGANIC DIS-SOLVED (MG/L AS C)	CARBON, ORGANIC SUS-PENDED TOTAL (MG/L AS C)	SEDI-MENT, SUS-PENDED (MG/L)	SEDI-MENT, DIS-CHARGE, SUS-PENDED (T/DAY)
OCT, 1980											
09...	.20	.62	.82	.62	.010	.010	--	2.9	.2	5	367
NOV											
05...	.02	.33	.35	.33	.040	.050	3.0	--	--	2	165
DEC											
04...	.00	.31	.31	.31	.040	.040	4.1	--	--	7	595
JAN, 1981											
07...	--	--	.51	.82	.040	.030	--	--	--	2	69
FEB											
05...	--	--	.39	1.4	.020	.020	2.5	--	--	5	425
MAR											
09...	--	--	.39	.72	.000	.000	2.6	--	--	6	538
APR											
13...	.00	.47	.44	.50	.050	.010	--	2.4	.2	4	280
MAY											
06...	.15	.45	.64	.48	.030	.020	1.6	--	--	5	495
JUN											
08...	--	--	.49	.62	.030	.010	6.1	--	--	17	3900
JUL											
08...	.28	.51	.81	.53	.010	.010	--	2.1	--	6	735
AUG											
06...	.19	.20	.50	.20	.250	.030	1.9	--	--	2	111
SEP											
03...	.00	.26	.27	.30	<.010	<.010	1.8	--	--	1	37

DATE	TIME	ARSENIC TOTAL (UG/L AS AS)	ARSENIC SUS-PENDED TOTAL (UG/L AS AS)	ARSENIC DIS-SOLVED (UG/L AS AS)	BARIUM, TOTAL RECOV-ERABLE (UG/L AS BA)	BARIUM, SUS-PENDED RECOV-ERABLE (UG/L AS BA)	BARIUM, DIS-SOLVED (UG/L AS BA)	CADMIUM TOTAL RECOV-ERABLE (UG/L AS CD)	CADMIUM SUS-PENDED RECOV-ERABLE (UG/L AS CD)	CADMIUM DIS-SOLVED (UG/L AS CD)	CHRO-MIUM, TOTAL RECOV-ERABLE (UG/L AS CR)
OCT, 1980											
09...	1345	3	0	3	100	20	80	0	--	<1	0
JAN, 1981											
07...	1430	2	0	2	100	30	70	0	0	2	0
APR											
13...	1330	0	0	1	100	40	60	2	--	<1	20
JUL											
08...	1345	1	0	1	100	0	200	1	--	<1	10

DATE	CHRO-MIUM, SUS-PENDED RECOV. (UG/L AS CR)	CHRO-MIUM, DIS-SOLVED (UG/L AS CR)	COBALT, TOTAL RECOV-ERABLE (UG/L AS CO)	COBALT, DIS-SOLVED (UG/L AS CO)	COPPER, TOTAL RECOV-ERABLE (UG/L AS CU)	COPPER, SUS-PENDED RECOV-ERABLE (UG/L AS CU)	COPPER, DIS-SOLVED (UG/L AS CU)	IRON, TOTAL RECOV-ERABLE (UG/L AS FE)	IRON, SUS-PENDED RECOV-ERABLE (UG/L AS FE)	IRON, DIS-SOLVED (UG/L AS FE)	LEAD, TOTAL RECOV-ERABLE (UG/L AS PB)
OCT, 1980											
09...	0	10	0	<3	18	16	2	110	100	10	21
JAN, 1981											
07...	0	0	1	<3	6	4	2	80	40	40	10
APR											
13...	20	0	0	<3	4	2	2	160	140	20	13
JUL											
08...	10	0	0	<3	9	6	3	130	110	20	43

12398600 PEND OREILLE RIVER AT INTERNATIONAL BOUNDARY, WA--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	LEAD, SUS-PENDED RECOV-ERABLE (UG/L AS PB)	LEAD, DIS-SOLVED (UG/L AS PB)	MANGA-NESE, TOTAL RECOV-ERABLE (UG/L AS MN)	MANGA-NESE, SUS-PENDED RECOV. (UG/L AS MN)	MANGA-NESE, DIS-SOLVED (UG/L AS MN)	MERCURY TOTAL RECOV-ERABLE (UG/L AS HG)	MERCURY SUS-PENDED RECOV-ERABLE (UG/L AS HG)	MERCURY DIS-SOLVED (UG/L AS HG)	NICKEL, TOTAL RECOV-ERABLE (UG/L AS NI)	NICKEL, SUS-PENDED RECOV-ERABLE (UG/L AS NI)
OCT , 1980										
09...	21	0	20	20	3	.0	.0	.1	5	5
JAN , 1981										
07...	0	10	10	6	4	.2	.1	.1	0	0
APR										
13...	11	2	10	5	5	.2	.1	.1	4	4
JUL										
08...	41	2	10	7	3	.1	.0	.1	0	0

DATE	NICKEL, DIS-SOLVED (UG/L AS NI)	SELE-NIUM, TOTAL (UG/L AS SE)	SELE-NIUM, SUS-PENDED TOTAL (UG/L AS SE)	SELE-NIUM, DIS-SOLVED (UG/L AS SE)	SILVER, TOTAL RECOV-ERABLE (UG/L AS AG)	SILVER, SUS-PENDED RECOV-ERABLE (UG/L AS AG)	SILVER, DIS-SOLVED (UG/L AS AG)	ZINC, TOTAL RECOV-ERABLE (UG/L AS ZN)	ZINC, SUS-PENDED RECOV-ERABLE (UG/L AS ZN)	ZINC, DIS-SOLVED (UG/L AS ZN)
OCT , 1980										
09...	0	0	0	0	0	0	0	60	50	6
JAN , 1981										
07...	0	0	0	0	0	0	0	20	0	20
APR										
13...	0	0	0	0	2	2	0	10	0	20
JUL										
08...	2	0	0	0	0	0	0	10	4	6

12398600 PEND OREILLE RIVER AT INTERNATIONAL BOUNDARY, WA--Continued

PHYTOPLANKTON ANALYSES, OCTOBER 1980 TO SEPTEMBER 1981

DATE	NOV 5,80	MAY 6,81	JUN 8,81	JUL 8,81	AUG 6,81	SEP 3,81
TIME	1400	1145	1200	1345	1115	1045
TOTAL CELLS/ML	6000	2100	1300	17000	3700	97
DIVERSITY: DIVISION	0.2	1.3	1.5	0.4	1.1	0.0
.CLASS	0.2	1.3	1.5	0.4	1.1	0.0
..ORDER	0.2	1.7	1.8	0.4	2.2	0.0
...FAMILY	0.2	1.8	2.0	0.4	2.2	0.9
....GENUS	0.2	2.3	2.6	0.4	2.5	0.9

ORGANISM	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT
BACILLARIOPHYTA (DIATOMS)												
.BACILLARIOPHYCEAE												
..ACHNANTHALES												
...ACHNANTHACEAE												
....ACHNANTHES	--	-	--	-	--	-	--	-	*	0	--	-
..BACILLARIALES												
...NITZSCHIACEAE												
....NITZSCHIA	--	-	42	2	13	1	--	-	--	-	--	-
..EPITHEMIALES												
...EPITHEMIACEAE												
....EPITHEMIA	--	-	28	1	--	-	--	-	--	-	--	-
..EUPODISCALES												
...COSCINODISCACEAE												
....CYCLOTELLA	77	1	56	3	350#	27	90	1	220	6	--	-
....MELOSIRA	*	0	--	-	180	14	--	-	360	10	--	-
....STEPHANODISCUS	*	0	--	-	52	4	--	-	--	-	--	-
..FRAGILARIALES												
...FRAGILARIACEAE												
....ASTERIONELLA	--	-	980#	46	--	-	550	3	220	6	--	-
....DIATOMA	--	-	28	1	--	-	--	-	--	-	--	-
....FRAGILARIA	--	-	--	-	--	-	*	0	--	-	--	-
....SYNEDRA	*	0	56	3	26	2	*	0	110	3	--	-
....TABELLARIA	--	-	110	5	--	-	--	-	--	-	--	-
..NAVICULALES												
...NAVICULACEAE												
....NAVICULA	--	-	28	1	--	-	--	-	*	0	--	-
CHLOROPHYTA (GREEN ALGAE)												
.CHLOROPHYCEAE												
..CHLOROCOCCALES												
...CHLOROCOCCACEAE												
....TETRAEDRON	--	-	14	1	--	-	--	-	--	-	--	-
...DICTYOSPHAERIACEAE												
....DICTYOSPHAERIUM	--	-	--	-	--	-	--	-	42	1	--	-
...HYDRODICTYACEAE												
....PEDIASTRUM	--	-	--	-	--	-	170	1	--	-	--	-
...MICRACTINIACEAE												
....MICRACTINIUM	--	-	--	-	180	14	--	-	--	-	--	-
...OOCYSTACEAE												
....ANKISTRODESMUS	*	0	200	9	90	7	*	0	110	3	--	-
....OOCYSTIS	--	-	--	-	--	-	--	-	*	0	69#	71
...SCENEDESMACEAE												
....SCENEDESMUS	--	-	--	-	--	-	--	-	--	-	28#	29
..VOLVOCALES												
...CHLAMYDOMONADACEAE												
....CHLAMYDOMONAS	--	-	--	-	26	2	--	-	*	0	--	-
CYANOPHYTA (BLUE-GREEN ALGAE)												
.CYANOPHYCEAE												
..CHROOCOCCALES												
...CHROOCOCCACEAE												
....ANACYSTIS	--	-	--	-	--	-	--	-	70	2	--	-
..NOSTOCALES												
...NOSTOCACEAE												
....ANABAENA	--	-	--	-	--	-	--	-	980#	27	--	-
..OSCILLATORIALES												
...OSCILLATORIACEAE												
....OSCILLATORIA	5900#	98	570#	27	370#	29	16000#	95	1500#	41	--	-
PYRRHOPHYTA (FIRE ALGAE)												
.DINOPHYCEAE												
..DINOKONTAE												
...GLENODINIACEAE												
....GLENODINIUM	--	-	--	-	--	-	*	0	--	-	--	-

NOTE: # - DOMINANT ORGANISM; EQUAL TO OR GREATER THAN 15%
* - OBSERVED ORGANISM, MAY NOT HAVE BEEN COUNTED; LESS THAN 1/2%

12398600 PEND OREILLE RIVER AT INTERNATIONAL BOUNDARY, WA--Continued

SPECIFIC CONDUCTANCE (MICROMHOS/CM AT 25 DEG. C), WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		OCTOBER			NOVEMBER			DECEMBER			JANUARY	
1	173	171	172	179	178	178	175	173	174	179	173	175
2	173	171	172	179	178	178	175	174	175	180	173	176
3	174	173	173	179	178	178	176	174	175	180	172	175
4	175	173	174	179	178	179	179	174	175	180	171	174
5	175	174	174	180	179	179	176	174	174	179	170	173
6	175	174	175	180	179	179	174	172	174	178	168	171
7	175	174	175	180	179	179	173	172	172	172	163	166
8	175	174	175	180	179	179	173	171	172	164	155	160
9	178	176	176	180	178	179	172	169	170	156	139	147
10	178	177	178	180	178	179	170	168	169	140	135	136
11	178	175	177	179	177	178	170	168	169	137	135	136
12	175	173	174	178	176	177	171	169	170	146	137	140
13	174	172	173	178	175	177	172	171	172	158	147	152
14	173	171	172	177	175	176	173	172	172	162	158	160
15	171	170	171	176	174	175	173	172	173	164	162	163
16	171	170	170	175	174	174	174	173	173	168	164	166
17	171	170	171	175	174	175	175	173	174	170	167	169
18	172	170	171	176	174	175	176	174	175	173	170	172
19	172	171	171	176	175	176	176	174	175	173	172	173
20	172	171	172	177	175	176	176	174	175	173	172	172
21	173	172	173	178	176	177	175	174	175	173	172	172
22	174	172	173	178	177	177	177	175	176	174	172	173
23	175	173	174	178	176	177	177	175	176	174	172	173
24	175	174	174	177	176	176	176	175	176	174	172	173
25	175	174	175	177	175	176	177	175	176	173	171	172
26	176	175	175	177	175	176	181	176	177	172	171	171
27	176	175	176	176	173	174	181	175	177	172	170	171
28	177	176	176	174	172	173	182	176	179	174	172	173
29	178	176	177	173	172	173	177	175	176	175	173	174
30	178	177	178	173	172	173	183	174	177	175	174	174
31	179	177	178	---	---	---	182	174	176	175	174	175
MONTH	179	170	174	180	172	177	183	168	174	180	135	166
DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		FEBRUARY			MARCH			APRIL			MAY	
1	175	174	174	165	162	163	169	166	168	163	161	163
2	175	174	174	167	165	166	168	165	167	162	159	160
3	177	175	176	168	166	167	166	165	166	159	158	159
4	177	176	176	169	166	166	166	164	165	159	157	158
5	177	175	176	168	166	167	167	164	164	159	156	157
6	176	175	176	168	166	167	167	164	165	157	155	155
7	177	176	176	166	165	165	167	166	166	157	155	156
8	176	174	175	167	165	165	170	168	169	160	156	158
9	176	175	175	166	165	165	170	168	169	163	159	161
10	176	175	176	167	165	166	169	168	169	157	153	155
11	177	176	176	168	166	167	170	168	169	153	151	152
12	177	176	176	168	166	167	169	167	168	153	151	152
13	176	174	175	170	168	169	168	167	168	153	152	153
14	177	175	176	170	169	169	168	166	167	153	151	152
15	178	176	177	171	169	170	168	165	166	151	149	150
16	178	176	177	170	169	170	168	166	167	148	146	147
17	177	175	176	170	169	170	169	167	168	147	145	146
18	176	174	175	171	169	170	168	167	167	146	145	146
19	174	172	173	170	169	170	168	167	168	147	146	146
20	173	171	172	171	170	170	169	167	168	146	144	145
21	172	168	170	171	170	170	169	167	168	145	144	145
22	168	166	167	173	170	171	169	168	169	144	140	142
23	167	164	165	173	171	171	170	168	169	140	136	137
24	164	161	163	174	171	172	169	167	168	143	135	138
25	161	155	158	173	170	172	168	166	167	144	143	143
26	156	154	155	171	168	169	167	165	166	143	139	141
27	159	155	157	169	167	168	166	165	166	146	142	144
28	163	159	161	168	167	168	166	164	165	148	145	146
29	---	---	---	169	167	168	166	163	164	147	144	145
30	---	---	---	170	167	168	163	161	162	147	144	146
31	---	---	---	169	167	168	---	---	---	146	143	144
MONTH	178	154	172	174	162	168	170	161	167	163	135	150

12398600 PEND OREILLE RIVER AT INTERNATIONAL BOUNDARY, WA--Continued

SPECIFIC CONDUCTANCE (MICROMHOS/CM AT 25 DEG. C), WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		JUNE			JULY			AUGUST			SEPTEMBER	
1	144	142	142	150	146	148	150	148	149	159	154	155
2	146	143	145	147	143	145	152	150	151	161	155	157
3	149	142	146	144	140	141	153	152	152	160	155	157
4	144	142	143	147	144	145	156	152	153	161	156	157
5	144	142	143	149	145	148	155	152	152	164	155	157
6	146	141	144	153	149	151	154	151	152	---	---	---
7	146	141	144	153	151	152	153	150	151	162	153	156
8	144	141	143	153	151	152	152	150	151	162	153	156
9	146	142	144	155	152	153	151	149	150	159	153	156
10	148	145	146	154	152	153	155	150	151	156	153	155
11	147	142	145	154	153	153	154	149	150	---	---	---
12	148	146	147	156	153	154	158	150	152	---	---	---
13	147	142	144	155	153	154	156	149	151	---	---	---
14	143	141	142	153	152	153	158	150	152	---	---	---
15	144	142	143	153	152	152	152	150	151	---	---	---
16	146	144	145	153	151	152	153	152	152	---	---	---
17	145	141	144	153	152	152	153	151	152	---	---	---
18	142	141	142	153	151	152	159	152	154	---	---	---
19	144	142	143	154	153	153	159	152	154	---	---	---
20	145	144	144	152	151	151	163	153	156	---	---	---
21	144	143	144	153	151	152	162	154	157	---	---	---
22	147	144	145	154	152	153	165	156	159	---	---	---
23	149	146	148	153	151	152	162	156	158	---	---	---
24	152	150	151	153	151	152	160	154	156	---	---	---
25	152	144	149	153	151	153	160	154	156	---	---	---
26	150	148	149	152	151	152	158	153	155	---	---	---
27	150	148	149	152	151	152	157	153	154	---	---	---
28	151	147	150	150	149	150	159	154	155	---	---	---
29	151	148	150	149	148	149	157	153	155	---	---	---
30	150	148	150	148	147	148	158	154	155	---	---	---
31	---	---	---	148	146	147	159	154	155	---	---	---
MONTH	152	141	145	156	140	151	165	148	153			

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		OCTOBER			NOVEMBER			DECEMBER			JANUARY	
1	15.5	15.0	15.5	9.5	9.0	9.5	4.5	4.5	4.5	3.0	2.5	3.0
2	15.5	15.5	15.5	9.5	9.0	9.0	4.5	4.5	4.5	3.0	2.5	3.0
3	15.5	15.0	15.5	9.5	9.0	9.5	4.5	4.5	4.5	3.0	3.0	3.0
4	15.5	15.0	15.0	9.5	9.5	9.5	5.0	4.5	4.5	3.0	3.0	3.0
5	15.0	15.0	15.0	9.5	9.5	9.5	4.5	4.5	4.5	3.5	3.0	3.5
6	15.5	15.0	15.0	9.5	9.5	9.5	4.5	4.0	4.5	3.5	3.5	3.5
7	15.5	15.0	15.0	10.0	9.5	9.5	4.0	4.0	4.0	3.5	3.5	3.5
8	15.5	15.0	15.0	10.0	9.5	9.5	4.0	3.5	3.5	3.5	3.0	3.0
9	15.0	15.0	15.0	10.0	9.5	10.0	3.5	2.5	3.0	3.0	3.0	3.0
10	15.0	14.5	15.0	10.0	9.5	10.0	2.5	2.0	2.0	3.0	2.5	2.5
11	14.5	14.5	14.5	9.5	9.5	9.5	2.0	2.0	2.0	2.5	2.5	2.5
12	14.5	14.0	14.0	9.5	9.5	9.5	2.0	2.0	2.0	3.0	2.5	2.5
13	14.0	14.0	14.0	9.5	9.0	9.0	2.5	2.0	2.5	3.0	2.5	2.5
14	14.0	13.5	14.0	9.0	8.5	8.5	2.5	2.5	2.5	2.5	2.5	2.5
15	13.5	13.0	13.5	8.5	8.0	8.0	2.5	2.0	2.5	2.5	2.0	2.0
16	13.5	12.5	13.0	8.0	7.5	7.5	2.5	2.5	2.5	2.0	1.5	2.0
17	12.5	12.5	12.5	7.5	7.0	7.5	3.0	2.5	2.5	2.0	1.5	1.5
18	12.5	12.5	12.5	7.0	6.5	7.0	3.0	3.0	3.0	2.0	1.5	1.5
19	12.5	12.5	12.5	6.5	6.5	6.5	3.5	3.0	3.0	1.5	1.5	1.5
20	12.5	12.0	12.5	6.5	6.0	6.0	3.5	3.5	3.5	1.5	1.5	1.5
21	12.0	12.0	12.0	6.0	6.0	6.0	3.5	3.0	3.5	1.5	1.5	1.5
22	12.0	12.0	12.0	6.0	6.0	6.0	3.0	3.0	3.0	1.5	1.5	1.5
23	12.0	11.5	11.5	6.0	5.5	6.0	3.0	3.0	3.0	2.0	1.5	1.5
24	11.5	11.0	11.5	6.0	5.5	5.5	3.0	3.0	3.0	2.0	2.0	2.0
25	11.0	11.0	11.0	5.5	5.0	5.0	3.0	3.0	3.0	2.0	2.0	2.0
26	11.0	10.5	10.5	5.0	5.0	5.0	3.0	3.0	3.0	2.0	2.0	2.0
27	10.5	10.5	10.5	5.0	5.0	5.0	3.0	3.0	3.0	2.0	2.0	2.0
28	10.5	10.5	10.5	5.0	5.0	5.0	3.0	3.0	3.0	2.5	2.0	2.0
29	10.5	10.0	10.0	5.0	5.0	5.0	3.0	3.0	3.0	2.5	2.0	2.5
30	10.0	9.5	10.0	5.0	4.5	5.0	3.0	2.5	3.0	2.5	2.5	2.5
31	9.5	9.5	9.5	---	---	---	3.0	2.5	3.0	2.5	2.5	2.5
MONTH	15.5	9.5	13.0	10.0	4.5	7.5	5.0	2.0	3.0	3.5	1.5	2.5

12398600 PEND OREILLE RIVER AT INTERNATIONAL BOUNDARY, WA--Continued

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		FEBRUARY			MARCH			APRIL			MAY	
1	3.0	2.5	3.0	4.0	4.0	4.0	6.5	6.5	6.5	9.5	9.5	9.5
2	3.0	3.0	3.0	4.0	4.0	4.0	6.5	6.0	6.5	10.0	9.5	10.0
3	3.0	3.0	3.0	4.0	4.0	4.0	6.5	6.0	6.0	10.0	10.0	10.0
4	3.0	2.5	2.5	4.0	4.0	4.0	6.0	6.0	6.0	10.0	10.0	10.0
5	2.5	2.5	2.5	4.0	4.0	4.0	6.5	6.0	6.5	10.0	10.0	10.0
6	2.5	2.0	2.0	4.5	4.0	4.0	6.5	6.0	6.5	10.0	10.0	10.0
7	2.0	2.0	2.0	4.0	4.0	4.0	6.0	6.0	6.0	10.0	9.5	10.0
8	2.0	2.0	2.0	4.5	4.0	4.0	6.0	6.0	6.0	9.5	9.5	9.5
9	2.5	2.0	2.0	4.5	4.5	4.5	6.0	6.0	6.0	9.5	9.5	9.5
10	2.5	2.0	2.0	4.5	4.5	4.5	6.0	6.0	6.0	10.0	9.5	10.0
11	2.0	1.5	2.0	5.0	4.5	4.5	6.0	6.0	6.0	10.0	10.0	10.0
12	1.5	1.0	1.5	5.0	4.5	5.0	6.0	6.0	6.0	10.5	10.0	10.0
13	1.0	1.0	1.0	5.0	5.0	5.0	6.0	6.0	6.0	10.0	10.0	10.0
14	1.0	.5	1.0	5.0	5.0	5.0	6.0	6.0	6.0	10.5	10.0	10.0
15	1.5	1.0	1.0	5.5	5.0	5.5	6.5	6.0	6.0	11.0	10.5	11.0
16	1.5	1.5	1.5	5.5	5.5	5.5	6.5	6.5	6.5	11.5	11.0	11.0
17	2.0	1.5	1.5	5.5	5.5	5.5	7.0	6.5	7.0	11.5	11.0	11.5
18	2.0	2.0	2.0	6.0	5.5	5.5	7.5	7.0	7.0	11.5	11.0	11.5
19	2.5	2.0	2.5	5.5	5.5	5.5	8.0	7.5	7.5	11.5	11.5	11.5
20	3.0	2.5	2.5	5.5	5.5	5.5	8.0	8.0	8.0	12.0	11.5	12.0
21	3.0	3.0	3.0	5.5	5.5	5.5	8.5	8.0	8.5	12.0	11.5	12.0
22	3.5	3.0	3.0	5.5	5.5	5.5	8.5	8.5	8.5	12.5	12.0	12.0
23	3.5	3.0	3.5	5.5	5.5	5.5	8.5	8.5	8.5	12.5	12.0	12.0
24	3.5	3.5	3.5	5.5	5.5	5.5	8.5	8.5	8.5	12.5	11.5	12.0
25	3.5	3.5	3.5	5.5	5.5	5.5	9.0	8.5	9.0	12.0	11.5	11.5
26	4.0	3.5	3.5	6.0	5.5	5.5	9.0	8.5	9.0	12.5	12.0	12.0
27	4.0	3.5	3.5	6.0	6.0	6.0	9.5	9.0	9.0	12.5	12.0	12.0
28	4.0	4.0	4.0	6.5	6.0	6.0	9.0	9.0	9.0	12.5	12.0	12.0
29	---	---	---	6.5	6.0	6.5	9.5	9.0	9.0	13.0	12.5	12.5
30	---	---	---	6.5	6.5	6.5	9.5	9.5	9.5	13.0	13.0	13.0
31	---	---	---	6.5	6.5	6.5	---	---	---	13.0	13.0	13.0
MONTH	4.0	.5	2.5	6.5	4.0	5.0	9.5	6.0	7.0	13.0	9.5	11.0
DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		JUNE			JULY			AUGUST			SEPTEMBER	
1	13.0	12.5	13.0	15.0	14.5	15.0	21.0	21.0	21.0	22.0	21.5	22.0
2	13.0	12.5	12.5	15.5	15.0	15.0	21.0	20.5	21.0	22.0	21.5	21.5
3	12.5	12.0	12.5	16.0	15.5	16.0	20.5	20.5	20.5	21.5	21.0	21.5
4	13.0	13.0	13.0	17.0	16.0	16.5	21.0	20.5	20.5	21.5	21.0	21.0
5	13.0	13.0	13.0	17.0	16.5	17.0	21.0	20.5	20.5	21.0	20.5	21.0
6	13.0	13.0	13.0	17.0	16.5	17.0	21.0	20.5	20.5	---	---	---
7	13.0	13.0	13.0	16.5	16.5	16.5	21.0	20.5	21.0	20.5	20.0	20.0
8	13.5	13.0	13.5	16.5	16.0	16.0	21.0	20.5	21.0	20.0	19.5	20.0
9	13.5	12.5	13.0	16.5	16.0	16.0	21.0	21.0	21.0	---	---	---
10	13.0	12.5	13.0	16.5	16.5	16.5	21.5	20.5	21.0	---	---	---
11	13.5	13.0	13.5	16.5	16.0	16.5	22.0	21.0	21.5	---	---	---
12	13.5	13.5	13.5	16.0	16.0	16.0	22.5	21.5	22.0	---	---	---
13	13.5	13.0	13.5	16.5	16.0	16.5	22.5	22.0	22.5	---	---	---
14	13.0	13.0	13.0	17.0	16.5	17.0	22.5	22.0	22.5	---	---	---
15	13.0	13.0	13.0	17.0	17.0	17.0	23.0	22.5	23.0	---	---	---
16	13.0	13.0	13.0	17.5	17.0	17.0	23.0	23.0	23.0	---	---	---
17	13.5	13.0	13.0	17.5	17.0	17.0	23.5	23.0	23.0	---	---	---
18	13.5	13.5	13.5	18.0	17.0	17.5	23.5	22.5	23.0	---	---	---
19	13.5	13.0	13.5	18.5	18.0	18.0	23.5	22.5	23.0	---	---	---
20	13.0	13.0	13.0	19.0	18.5	18.5	23.0	22.5	23.0	---	---	---
21	13.0	13.0	13.0	18.5	18.5	18.5	23.0	22.5	23.0	---	---	---
22	13.0	13.0	13.0	18.5	18.5	18.5	23.0	22.5	22.5	---	---	---
23	13.0	13.0	13.0	19.0	18.5	18.5	23.0	22.0	22.5	---	---	---
24	13.0	13.0	13.0	19.5	19.0	19.0	22.5	22.0	22.5	---	---	---
25	13.5	13.0	13.5	19.5	19.5	19.5	23.0	22.0	22.5	---	---	---
26	14.0	14.0	14.0	19.5	19.5	19.5	23.0	22.0	22.5	---	---	---
27	14.5	14.0	14.5	20.0	19.5	19.5	23.0	22.0	22.5	---	---	---
28	14.5	14.5	14.5	20.5	20.0	20.0	22.5	22.0	22.5	---	---	---
29	15.0	14.5	14.5	21.0	20.5	20.5	22.5	22.0	22.0	---	---	---
30	15.0	15.0	15.0	21.0	21.0	21.0	22.5	22.0	22.0	---	---	---
31	---	---	---	21.0	21.0	21.0	22.5	21.5	22.0	---	---	---
MONTH	15.0	12.0	13.5	21.0	14.5	17.5	23.5	20.5	22.0			

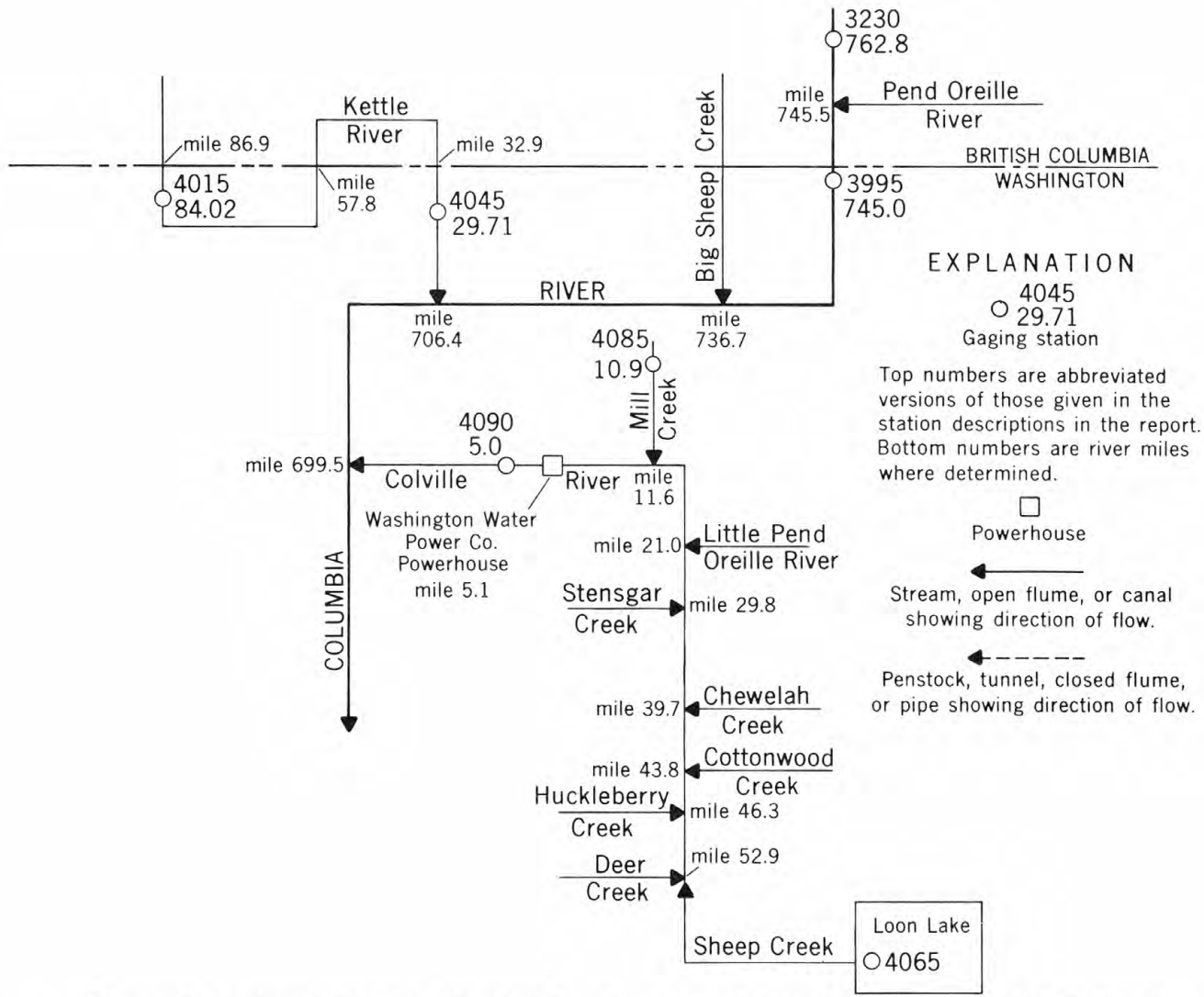

Figure 7. Gaging stations in Columbia River basin from International Boundary to Colville River.

12399500 COLUMBIA RIVER AT INTERNATIONAL BOUNDARY
(International gaging station)

LOCATION.--Lat 49°00'03", long 117°37'42", in NE¼SE¼ sec.4, T.40 N., R.41 E., Stevens County, Hydrologic Unit 17020001, on left bank at international boundary, 0.5 mi (0.8 km) downstream from Pend Oreille River, and at mile 745.0 (1,198.7 km).

DRAINAGE AREA.--59,700 mi^2 (154,600 km^2), approximately.

PERIOD OF RECORD.--October 1937 to current year. Prior to March 1938 monthly discharge only, published in WSP 1316.

REVISED RECORDS.--WSP 932: 1937(m), 1938(M), 1939(m).

GAGE.--Water-stage recorder. Datum of gage is 0.00 ft (0.000 m) Bureau of Reclamation 1937 datum. Prior to Apr. 27, 1939, nonrecording gage at same site and datum. Since May 31, 1942, auxiliary water-stage recorder and Jan. 1 to May 30, 1942, auxiliary nonrecording gage 2.2 mi (3.5 km) downstream from base gage at same datum.

REMARKS.--Records good. Discharge for September 16 to 21 provided by the Water Survey of Canada and N.P.D. Reservoir Control Center. Flow regulated by eight major reservoir and numerous smaller reservoirs and powerplants. It was estimated that 346,700 acres (1,400 km^2) were under irrigation in the United States in 1946 with diversions for irrigation of an additional 35,000 acres (142 km^2) in Canada.

COOPERATION.--This station is maintained by the United States under agreement with Canada.

AVERAGE DISCHARGE.--44 years, 100,200 ft^3/s (2,840 m^3/s), 72,590,000 acre-ft/yr (89,500 hm^3/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 550,100 ft^3/s (15,600 m^3/s) June 12, 1948, elevation, 1,338.13 ft (407.862 m); minimum, 18,000 ft^3/s (510 m^3/s) Feb. 7, 1954, elevation, 1,289.38 ft (393.003 m).

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in June 1894 reached a stage of 1,346 ft (410.3 m), from information by Bureau of Reclamation, discharge, 680,000 ft^3/s (19,300 m^3/s).
A discharge of about 12,900 ft^3/s (365 m^3/s) occurred Jan. 30 or 31, 1937, based on information from other gaging stations, elevation, 1,287.9 ft (392.55 m), from rating curve extended below 1,291.6 ft (393.68 m) and may have been as low sometime in January 1930.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 235,000 ft^3/s (6,660 m^3/s) May 31, elevation, 1,316.32 ft (401.214 m); minimum discharge, 32,000 ft^3/s (906 m^3/s) Apr. 11; minimum elevation, 1,292.57 ft (393.975 m) Apr. 17.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	59300	73700	100000	109000	130000	89600	65300	85900	232000	175000	163000	75000
2	62800	73000	107000	115000	133000	96200	65400	92000	228000	167000	162000	68400
3	66500	72700	108000	103000	136000	96300	67900	91500	224000	165000	171000	78700
4	72100	73500	108000	103000	137000	103000	69600	81800	218000	160000	164000	79000
5	69400	71900	113000	109000	131000	100000	64500	83300	210000	171000	155000	75500
6	66100	71300	112000	107000	138000	101000	54500	81400	212000	197000	154000	73600
7	66600	69600	108000	108000	138000	97500	53700	79800	211000	227000	147000	75000
8	70900	72200	107000	122000	134000	94400	52600	80500	211000	219000	157000	77700
9	65800	72500	110000	132000	136000	88400	50000	83200	220000	209000	154000	78500
10	62500	71500	109000	138000	130000	86900	47900	84900	216000	193000	156000	86400
11	60100	81000	110000	132000	138000	88300	46800	97700	217000	172000	152000	92500
12	63800	81800	104000	127000	131000	85900	47800	96600	215000	164000	151000	91300
13	58500	79800	109000	129000	135000	80300	43800	96400	206000	149000	149000	79900
14	55700	66200	110000	134000	139000	83900	45900	96400	204000	164000	143000	79700
15	58000	66900	109000	131000	133000	76400	43600	101000	191000	181000	138000	82100
16	58900	66800	103000	130000	124000	68000	41000	104000	188000	173000	138000	80800
17	57200	72600	102000	129000	122000	63700	40100	109000	193000	174000	134000	79500
18	57400	71800	103000	126000	126000	71100	41900	124000	191000	176000	138000	79000
19	59500	74600	102000	122000	122000	67700	44100	123000	193000	169000	137000	76700
20	73200	74100	97600	121000	121000	73800	52000	125000	197000	167000	128000	74200
21	77100	76200	103000	122000	112000	72500	51600	137000	202000	163000	127000	76400
22	76300	73800	101000	121000	99100	73800	58300	153000	209000	158000	119000	78400
23	76700	82300	97300	120000	87300	77600	61900	167000	211000	154000	114000	78900
24	72900	87400	106000	124000	85100	74400	69000	181000	215000	148000	117000	85100
25	76700	81100	98700	128000	86600	76900	72700	198000	209000	154000	115000	81900
26	71400	80300	93800	132000	85900	75700	72800	210000	200000	154000	109000	70900
27	65900	88000	101000	132000	89100	75000	79700	212000	195000	142000	114000	70900
28	66900	85500	107000	132000	86300	73000	78700	212000	187000	161000	118000	78800
29	66500	89700	122000	129000	---	72600	79800	219000	182000	176000	109000	81700
30	65500	93500	119000	134000	---	69200	80500	224000	176000	177000	105000	78900
31	67700	---	115000	130000	---	67100	---	233000	---	185000	97700	---
TOTAL	2047900	2295300	3295400	3831000	3365400	2520200	1743400	4063400	6163000	5344000	4235700	2365400
MEAN	66060	76510	106300	123600	120200	81300	58110	131100	205400	172400	136600	78850
MAX	77100	93500	122000	138000	139000	103000	80500	233000	232000	227000	171000	92500
MIN	55700	66200	93800	103000	85100	63700	40100	79800	176000	142000	97700	68400
AC-FT	4062000	4553000	6536000	7599000	6675000	4999000	3458000	8060000	12220000	10600000	8402000	4692000

CAL YR 1980 TOTAL 31169400 MEAN 85160 MAX 164000 MIN 33000 AC-FT 61820000
WTR YR 1981 TOTAL 41270100 MEAN 113100 MAX 233000 MIN 40100 AC-FT 81860000

12400520 COLUMBIA RIVER AT NORTHPORT, WA
(National Stream-Quality Accounting Network Station)

LOCATION.--Lat 48°55'21", long 117°46'32", in SW¼SW¼ sec.33, T.40 N., R.40 E., Stevens County, Hydrologic Unit 17020001, at State Highway 25 bridge at Northport, 9.9 mi (15.9 km) downstream from gaging station at international boundary, and at mile 735.1 (1,182.8 km).

DRAINAGE AREA.--60,200 mi² (155,900 km²), approximately.

PERIOD OF RECORD.--Water years 1910-11, 1952 to current year. Prior to November 1951 published as "at Northport." November 1951 to September 1957 published as 12399500 "at international boundary," October 1957 to September 1963 as "at Northport." October 1963 to September 1973 as "at international boundary."

PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: November 1951 to September 1975, April 1976 to September 1981 (discontinued).
pH: November 1951 to September 1969.
WATER TEMPERATURES: November 1951 to September 1981 (discontinued).
SUSPENDED-SEDIMENT DISCHARGE: February 1910 to January 1911.

INSTRUMENTATION.--Temperature recorder since October 1974; specific conductance recorder since April 1976.

REMARKS.--Interruptions in the record were due to malfunctions of the instrument. In addition to the water-quality monitor record, samples were collected approximately once a month.

EXTREMES FOR PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: Maximum, 285 micromhos Apr. 2, 1972; minimum, 96 micromhos Aug. 7, 1976, Sept. 5, 1978.
WATER TEMPERATURES: Maximum, 21.0°C May 14, 19, 1959; minimum, 0.0°C on several days during January in 1960, 1962 and 1963.

EXTREMES FOR CURRENT YEAR.--
SPECIFIC CONDUCTANCE: Maximum, 177 micromhos Apr. 19; minimum recorded, 107 micromhos Sept. 7.
WATER TEMPERATURES: Maximum recorded, 18.5°C Aug. 21, 22; minimum, 2.5°C Feb. 15, 16.

WATER-QUALITY RECORDS OCTOBER 1980 TO SEPTEMBER 1981

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SPE-CIFIC CON-DUCT-ANCE (UMHOS)	SPE-CIFIC CON-DUCT-ANCE LAB (UMHOS)	PH (UNITS)	PH LAB (UNITS)	TEMPER-ATURE (DEG C)	TUR-BID-ITY (FTU)	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 CACO3)
OCT , 1980												
09...	0830	62800	153	157	8.0	7.8	14.3	1.5	10.5	5	1	72
NOV												
05...	0930	E71900	154	155	8.0	7.8	10.2	.50	11.2	45	<1	68
DEC												
03...	1330	107000	151	154	7.9	7.7	6.2	.60	11.0	34	19	68
JAN , 1981												
08...	1315	129000	146	152	8.1	7.6	4.4	.50	11.4	2	15	70
FEB												
05...	1300	132000	152	148	7.8	7.6	3.7	.50	11.4	8	<1	68
MAR												
10...	0830	90700	154	165	7.8	7.7	3.8	2.2	12.7	3	4	75
APR												
14...	1000	47200	168	178	7.2	7.6	5.8	1.5	11.7	8	<1	78
MAY												
06...	0800	E81400	151	156	7.0	7.5	8.2	2.4	12.3	5	1	73
JUN												
09...	1045	217000	132	143	7.2	--	11.3	4.1	12.5	5	<1	66
JUL												
08...	1000	219000	123	126	7.0	7.5	12.0	1.6	12.0	15	3	60
AUG												
05...	1245	158000	119	125	7.2	--	15.7	1.0	10.2	6	14	57
SEP												
02...	1130	68800	131	122	7.8	7.8	16.4	5.4	10.2	1	280	55

DATE	HARD-NESS NONCAR-BONATE (MG/L AS CACO3)	CALCIUM DIS-SOLVED (MG/L AS CA)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG)	SODIUM, DIS-SOLVED (MG/L AS NA)	PERCENT SODIUM	SODIUM AD-SORP-TION RATIO	POTAS-SIUM, DIS-SOLVED (MG/L AS K)	ALKA-LINITY LAB (MG/L AS CACO3)	SULFATE DIS-SOLVED (MG/L AS SO4)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)	FLUO-RIDE, DIS-SOLVED (MG/L AS F)	SILICA, DIS-SOLVED (MG/L AS SIO2)
OCT , 1980												
09...	8.0	21	4.8	2.2	6	.1	.8	64	13	1.1	.1	4.8
NOV												
05...	6.0	20	4.5	1.9	6	.1	.7	62	14	.8	.1	4.4
DEC												
03...	6.0	20	4.5	1.7	5	.1	.7	62	14	1.5	.1	4.2
JAN , 1981												
08...	5.0	21	4.2	1.7	5	.1	.7	55	16	.6	.1	4.5
FEB												
05...	8.0	20	4.4	2.0	6	.1	.7	60	13	.8	.1	4.5
MAR												
10...	16	22	4.9	2.7	7	.1	.8	59	16	1.0	.1	5.3
APR												
14...	14	23	5.0	2.6	7	.1	.8	64	17	1.2	.3	6.0
MAY												
06...	14	21	5.0	3.7	10	.2	.8	59	18	1.5	.2	6.4
JUN												
09...	.00	19	4.4	2.9	9	.2	.8	66	1.6	1.5	.1	6.1
JUL												
08...	8.0	18	3.7	1.6	5	.1	.6	52	4.3	1.0	.1	4.6
AUG												
05...	10	17	3.5	1.4	5	.1	.7	47	5.0	.6	.1	4.6
SEP												
02...	9.0	17	3.1	1.2	4	.1	.7	46	11	.7	.2	4.1

12400520 COLUMBIA RIVER AT NORTHPORT, WA--Continued

WATER-QUALITY RECORDS OCTOBER 1980 TO SEPTEMBER 1981

DATE	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L)	SOLIDS, DIS-SOLVED (TONS PER AC-FT)	SOLIDS, DIS-SOLVED (TONS PER DAY)	NITRO-GEN, NO2+NO3 TOTAL (MG/L AS N)	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N)	NITRO-GEN, AMMONIA TOTAL (MG/L AS N)	NITRO-GEN, AMMONIA DIS-SOLVED (MG/L AS N)	NITRO-GEN, ORGANIC TOTAL (MG/L AS N)	NITRO-GEN, ORGANIC DIS-SOLVED (MG/L AS N)	NITRO-GEN, AM-MONIA + ORGANIC TOTAL (MG/L AS N)
OCT , 1980											
09...	90	86	.12	15300	.00	.00	.030	.040	.75	.56	.78
NOV											
05...	84	84	.11	--	.00	.00	.030	.000	.29	.20	.32
DEC											
03...	92	84	.13	26600	.08	.11	.050	.080	.15	.12	.20
JAN , 1981											
08...	81	83	.11	28200	--	.18	.070	.070	.27	--	.34
FEB											
05...	78	82	.11	27800	.12	.11	.050	.030	.38	.39	.43
MAR											
10...	--	89	.14	25000	.06	.05	.060	.070	.21	--	.27
APR											
14...	98	95	.13	12500	.06	.11	.120	.140	.42	--	.54
MAY											
06...	--	92	.15	--	.07	.06	.130	.130	.43	--	.56
JUN											
09...	--	76	.12	51600	.05	.07	.160	.170	.20	.15	.36
JUL											
08...	73	66	.10	43200	.06	.06	.090	.090	.53	.41	.62
AUG											
05...	72	61	.10	30700	.16	--	.190	.110	.19	.03	.38
SEP											
02...	--	66	.07	9660	.10	.09	.120	.120	.16	.15	.28

DATE	NITRO-GEN, NH4 + ORG. SUSP. TOTAL (MG/L AS N)	NITRO-GEN, AM-MONIA + ORGANIC DIS. (MG/L AS N)	NITRO-GEN, TOTAL (MG/L AS N)	NITRO-GEN DIS-SOLVED (MG/L AS N)	PHOS-PHORUS, TOTAL (MG/L AS P)	PHOS-PHORUS, DIS-SOLVED (MG/L AS P)	CARBON, ORGANIC TOTAL (MG/L AS C)	CARBON, ORGANIC DIS-SOLVED (MG/L AS C)	CARBON, ORGANIC SUS-PENDED TOTAL (MG/L AS C)	SEDI-MENT, SUS-PENDED (MG/L)	SEDI-MENT, DIS-CHARGE, SUS-PENDED (T/DAY)
OCT , 1980											
09...	.18	.60	.78	.60	.030	.010	--	2.8	.2	3	509
NOV											
05...	.12	.20	.32	.20	.140	.130	5.5	--	--	3	--
DEC											
03...	.00	.20	.28	.31	.050	.050	1.9	--	--	6	1730
JAN , 1981											
08...	.00	--	--	1.1	.050	.050	--	10	.2	6	2090
FEB											
05...	.01	.42	.55	.53	.030	.030	3.3	--	--	6	2140
MAR											
10...	.00	--	.33	.59	.000	.000	3.7	--	--	3	735
APR											
14...	.00	--	.60	.82	.230	.220	--	8.5	.1	9	1150
MAY											
06...	.00	--	.63	.74	.250	.260	1.9	--	--	5	--
JUN											
09...	.04	.32	.41	.39	.040	.040	2.7	--	--	15	8790
JUL											
08...	.12	.50	.68	.56	.010	.020	--	1.6	--	13	7690
AUG											
05...	.24	.14	.54	.14	.270	.040	1.9	--	--	4	1710
SEP											
02...	.01	.27	.38	.36	.030	.030	1.7	--	--	1	186

DATE	TIME	ARSENIC TOTAL (UG/L AS AS)	ARSENIC SUS-PENDED TOTAL (UG/L AS AS)	ARSENIC DIS-SOLVED (UG/L AS AS)	BARIUM, TOTAL RECOV-ERABLE (UG/L AS BA)	BARIUM, SUS-PENDED RECOV-ERABLE (UG/L AS BA)	BARIUM, DIS-SOLVED (UG/L AS BA)	CADMIUM TOTAL RECOV-ERABLE (UG/L AS CD)	CADMIUM SUS-PENDED RECOV-ERABLE (UG/L AS CD)	CADMIUM DIS-SOLVED (UG/L AS CD)	CHRO-MIUM, TOTAL RECOV-ERABLE (UG/L AS CR)
OCT , 1980											
09...	0830	2	0	2	0	0	50	1	--	<1	10
JAN , 1981											
08...	1315	1	0	1	0	0	30	1	0	2	0
APR											
14...	1000	0	0	1	0	0	50	1	0	2	20
JUN											
09...	1045	--	--	--	--	--	--	--	--	--	--
JUL											
08...	1000	1	0	1	0	0	80	1	--	<1	10

12400520 COLUMBIA RIVER AT NORTHPORT, WA--Continued

WATER-QUALITY RECORDS OCTOBER 1980 TO SEPTEMBER 1981

DATE	CHROMIUM, SUSPENDED RECOV. (UG/L AS CR)	CHROMIUM, DISSOLVED (UG/L AS CR)	COBALT, TOTAL RECOVERABLE (UG/L AS CO)	COBALT, DISSOLVED (UG/L AS CO)	COPPER, TOTAL RECOVERABLE (UG/L AS CU)	COPPER, SUSPENDED RECOVERABLE (UG/L AS CU)	COPPER, DISSOLVED (UG/L AS CU)	IRON, TOTAL RECOVERABLE (UG/L AS FE)	IRON, SUSPENDED RECOVERABLE (UG/L AS FE)	IRON, DISSOLVED (UG/L AS FE)	LEAD, TOTAL RECOVERABLE (UG/L AS PB)
OCT , 1980											
09...	10	0	0	<3	11	9	2	100	--	<10	8
JAN , 1981											
08...	0	0	1	<3	20	15	5	380	370	10	10
APR											
14...	20	0	0	<3	18	14	4	500	480	20	20
JUN											
09...	--	--	--	--	--	--	--	--	--	--	--
JUL											
08...	0	10	0	<3	15	11	4	590	580	10	13

DATE	LEAD, SUSPENDED RECOVERABLE (UG/L AS PB)	LEAD, DISSOLVED (UG/L AS PB)	MANGANESE, TOTAL RECOVERABLE (UG/L AS MN)	MANGANESE, SUSPENDED RECOV. (UG/L AS MN)	MANGANESE, DISSOLVED (UG/L AS MN)	MERCURY TOTAL RECOVERABLE (UG/L AS HG)	MERCURY SUSPENDED RECOVERABLE (UG/L AS HG)	MERCURY DISSOLVED (UG/L AS HG)	NICKEL, TOTAL RECOVERABLE (UG/L AS NI)	NICKEL, SUSPENDED RECOVERABLE (UG/L AS NI)
OCT , 1980										
09...	8	0	30	10	20	.0	.0	.1	3	3
JAN , 1981										
08...	7	3	10	3	7	.1	.0	.1	0	0
APR										
14...	18	2	30	10	20	.1	.0	.1	2	2
JUN										
09...	--	--	--	--	--	--	--	--	--	--
JUL										
08...	12	1	20	20	5	.1	.0	.2	3	1

DATE	NICKEL, DISSOLVED (UG/L AS NI)	SELENIUM, TOTAL (UG/L AS SE)	SELENIUM, SUSPENDED TOTAL (UG/L AS SE)	SELENIUM, DISSOLVED (UG/L AS SE)	SILVER, TOTAL RECOVERABLE (UG/L AS AG)	SILVER, SUSPENDED RECOVERABLE (UG/L AS AG)	SILVER, DISSOLVED (UG/L AS AG)	ZINC, TOTAL RECOVERABLE (UG/L AS ZN)	ZINC, SUSPENDED RECOVERABLE (UG/L AS ZN)	ZINC, DISSOLVED (UG/L AS ZN)
OCT , 1980										
09...	0	0	0	0	0	0	0	60	10	50
JAN , 1981										
08...	0	0	0	0	0	0	0	70	20	50
APR										
14...	0	0	0	0	1	1	0	120	50	70
JUN										
09...	--	--	--	--	--	--	--	--	--	10
JUL										
08...	2	0	0	0	0	0	0	90	70	20

12400520 COLUMBIA RIVER AT NORTHPORT, WA--Continued

PHYTOPLANKTON ANALYSES, OCTOBER 1980 TO SEPTEMBER 1981

DATE	NOV 5,80	MAY 6,81	JUN 9,81	JUL 8,81	AUG 5,81	SEP 2,81
TIME	0930	0800	1045	1000	1245	1130
TOTAL CELLS/ML	520	2100	1200	4100	2900	2100
DIVERSITY: DIVISION	0.7	1.1	1.1	0.6	0.8	0.9
.CLASS	0.7	1.1	1.1	0.6	0.8	0.9
..ORDER	0.9	1.3	2.0	0.6	1.5	1.6
...FAMILY	0.9	1.4	2.0	0.6	1.5	1.7
....GENUS	0.9	1.8	2.4	0.6	1.6	1.8

ORGANISM	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT
BACILLARIOPHYTA (DIATOMS)												
.BACILLARIOPHYCEAE												
..BACILLARIALES												
...NITZSCHIACEAE												
....NITZSCHIA	13	2	28	1	--	-	*	0	*	0	31	1
..EUPODISCALES												
...COSCINODISCACEAE												
....CYCLOTELLA	26	5	--	-	170	14	--	-	180	6	1500#	69
..FRAGILARIALES												
...FRAGILARIACEAE												
....ASTERIONELLA	--	-	320#	15	65	5	--	-	*	0	31	1
....FRAGILARIA	--	-	170	8	52	4	*	0	--	-	170	8
....SYNEDRA	26	5	70	3	210#	17	460	11	110	4	--	-
....TABELLARIA	--	-	14	1	--	-	--	-	150	5	15	1
..NAVICULALES												
...GOMPHONEMACEAE												
....GOMPHONEMA	--	-	14	1	--	-	--	-	--	-	--	-
...NAVICULACEAE												
....NAVICULA	--	-	14	1	--	-	--	-	--	-	--	-
CHLOROPHYTA (GREEN ALGAE)												
.CHLOROPHYCEAE												
..CHLOROCOCCALES												
...COCCOMYXACEAE												
....ELAKATOTHRIX	--	-	--	-	--	-	--	-	--	-	62	3
...OOCYSTACEAE												
....ANKISTRODESMUS	--	-	--	-	26	2	*	0	--	-	15	1
...SCENEDESMACEAE												
....SCENEDESMUS	--	-	--	-	--	-	--	-	--	-	62	3
..VOLVOCALES												
...CHLAMYDOMONADACEAE												
....CHLAMYDOMONAS	13	2	42	2	--	-	--	-	28	1	15	1
CYANOPHYTA (BLUE-GREEN ALGAE)												
.CYANOPHYCEAE												
..CHROOCOCCALES												
...CHROOCOCCACEAE												
....AGMENELLUM	--	-	--	-	410#	33	--	-	--	-	--	-
....ANACYSTIS	--	-	42	2	--	-	--	-	2000#	68	93	4
..OSCILLATORIALES												
...OSCILLATORIACEAE												
....LYNGBYA	--	-	--	-	--	-	--	-	--	-	150	7
....OSCILLATORIA	440#	85	1400#	66	310#	25	3600#	87	410	14	--	-
PYRRHOPHYTA (FIRE ALGAE)												
.DINOPHYCEAE												
..DINOKONTAE												
...GLENODINIACEAE												
....GLENODINIUM	--	-	--	-	--	-	26	1	--	-	--	-
...GYMNODINIACEAE												
....GYMNODINIUM	--	-	--	-	--	-	--	-	*	0	--	-
...PERIDINIACEAE												
....PERIDINIUM	--	-	14	1	--	-	--	-	--	-	--	-

NOTE: # - DOMINANT ORGANISM; EQUAL TO OR GREATER THAN 15%
* - OBSERVED ORGANISM, MAY NOT HAVE BEEN COUNTED; LESS THAN 1/2%

12400520 COLUMBIA RIVER AT NORTHPORT, WA--Continued

SPECIFIC CONDUCTANCE (MICROMHOS/CM AT 25 DEG. C), WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		OCTOBER			NOVEMBER			DECEMBER			JANUARY	
1	157	148	153	154	149	152	151	147	150	143	140	142
2	156	154	155	155	148	153	150	144	147	146	142	144
3	154	140	149	154	150	152	152	147	150	145	141	143
4	148	140	146	154	146	151	153	149	151	143	141	142
5	152	148	150	155	148	152	151	146	150	144	141	142
6	156	152	154	155	149	152	154	149	152	145	142	143
7	156	147	152	154	146	151	152	149	150	145	138	142
8	158	149	154	154	148	152	152	143	148	147	142	145
9	160	153	156	155	147	153	154	147	151	149	146	147
10	159	149	156	154	145	150	153	148	151	147	144	146
11	157	149	155	149	134	145	153	151	152	145	140	143
12	160	157	158	149	133	143	152	148	151	144	142	143
13	165	162	163	148	142	146	153	151	152	144	137	141
14	166	153	162	153	144	149	152	150	151	144	139	142
15	163	158	162	154	144	149	154	147	151	147	143	145
16	163	159	160	152	143	150	154	149	151	147	143	145
17	160	154	158	152	149	151	156	146	153	147	145	146
18	163	159	161	151	138	145	156	151	154	147	146	147
19	163	157	161	153	145	150	155	150	153	148	144	146
20	157	144	149	153	149	152	155	147	152	147	142	144
21	149	142	146	157	148	154	155	153	154	147	142	145
22	152	144	149	158	142	153	155	151	153	148	144	146
23	151	148	150	156	152	155	154	144	150	148	144	146
24	152	146	150	154	147	152	154	146	150	149	146	148
25	151	147	150	152	140	147	154	150	152	150	148	149
26	152	150	151	153	147	152	151	147	149	150	147	148
27	154	147	152	153	150	152	153	142	150	148	142	145
28	157	146	151	155	147	152	147	139	145	148	143	147
29	156	146	154	156	151	154	146	144	145	149	146	148
30	156	153	154	156	151	154	146	139	144	148	143	145
31	156	149	154	---	---	---	143	138	140	148	143	147
MONTH	166	140	154	158	133	151	156	138	150	150	137	145
DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		FEBRUARY			MARCH			APRIL			MAY	
1	149	146	148	158	155	157	156	145	152	154	145	150
2	149	146	148	156	152	155	155	153	154	147	141	144
3	149	143	145	154	146	151	156	147	154	145	142	144
4	146	142	144	155	151	153	153	150	153	147	143	145
5	150	146	148	154	151	153	155	152	153	154	147	150
6	149	143	146	155	149	153	159	155	158	159	150	155
7	150	148	149	156	152	154	159	150	155	158	151	156
8	148	145	147	155	153	154	160	150	155	160	151	157
9	148	145	146	156	153	155	164	160	162	161	158	159
10	147	141	144	156	149	153	166	158	164	164	160	162
11	148	143	146	156	151	155	167	155	163	162	154	158
12	148	142	145	157	152	155	165	163	164	155	147	151
13	148	141	146	159	151	155	168	163	166	155	147	152
14	148	145	147	158	154	156	170	159	166	154	150	153
15	149	144	147	159	156	158	171	159	164	151	145	148
16	152	148	150	162	159	161	173	161	169	145	140	142
17	151	145	148	160	151	156	176	168	171	145	139	142
18	150	143	146	160	152	158	175	161	169	144	140	142
19	150	147	149	161	157	159	177	171	173	145	140	142
20	150	148	149	157	152	156	171	165	167	146	142	144
21	152	148	149	161	152	158	167	152	162	143	139	141
22	154	145	150	162	159	161	160	151	155	140	134	138
23	157	153	155	160	150	155	166	161	164	138	136	137
24	159	151	155	158	148	154	164	150	158	138	136	137
25	159	155	158	159	150	157	158	154	156	137	135	136
26	161	158	160	161	156	158	155	148	152	136	131	134
27	160	151	160	160	157	158	155	152	154	136	132	134
28	159	151	160	160	156	158	155	149	152	142	137	140
29	---	---	---	158	155	157	160	149	156	143	139	142
30	---	---	---	157	153	155	159	152	157	143	139	142
31	---	---	---	154	146	151	---	---	---	143	140	141
MONTH	161	141	149	162	146	156	177	145	160	164	131	146

12400520 COLUMBIA RIVER AT NORTHPORT, WA--Continued

SPECIFIC CONDUCTANCE (MICROMHOS/CM AT 25 DEG. C), WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		JUNE			JULY			AUGUST			SEPTEMBER	
1	142	139	141	135	131	133	---	---	---	117	108	113
2	143	140	141	132	129	131	---	---	---	122	114	120
3	144	142	144	132	127	129	---	---	---	119	111	115
4	145	141	143	132	129	130	---	---	---	118	110	113
5	142	140	141	130	128	129	---	---	---	121	111	115
6	145	142	144	127	125	126	125	122	124	116	112	114
7	144	142	143	126	122	124	122	118	120	120	107	114
8	145	142	144	124	122	123	121	117	120	120	115	117
9	145	141	143	128	123	125	121	118	119	125	115	120
10	146	143	145	129	126	127	121	117	119	123	114	118
11	146	143	144	130	128	129	118	116	117	121	118	119
12	143	139	142	131	129	130	119	115	117	121	117	119
13	142	140	141	134	128	132	120	114	117	126	119	122
14	141	138	140	132	123	127	119	114	116	128	116	124
15	140	138	139	127	124	126	119	111	115	123	116	119
16	139	134	136	125	123	124	119	114	117	124	121	122
17	138	136	137	124	120	122	119	116	117	126	121	124
18	137	134	136	126	120	124	119	113	116	125	118	122
19	138	134	136	127	124	126	121	115	118	125	120	122
20	137	133	136	127	124	126	120	115	118	128	121	124
21	138	136	138	124	120	123	122	116	120	129	122	125
22	138	134	136	---	---	---	122	116	119	128	120	123
23	139	134	137	---	---	---	119	117	118	128	116	123
24	139	136	138	---	---	---	117	114	116	---	---	---
25	139	137	138	---	---	---	117	112	114	---	---	---
26	138	134	136	---	---	---	117	112	114	---	---	---
27	137	134	135	---	---	---	119	114	116	---	---	---
28	135	133	135	---	---	---	119	113	116	---	---	---
29	135	133	134	---	---	---	118	113	116	---	---	---
30	135	132	133	---	---	---	116	113	115	---	---	---
31	---	---	---	---	---	---	118	111	115	---	---	---
MONTH	146	132	139	135				111			107	

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

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

12400520 COLUMBIA RIVER AT NORTHPORT, WA--Continued

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

VISIONAL DATA

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		FEBRUARY			MARCH			APRIL			MAY	
1	4.0	3.5	4.0	4.0	4.0	4.0	5.5	5.0	5.5	8.5	8.0	8.0
2	4.0	3.5	3.5	4.0	3.5	4.0	5.5	5.0	5.5	8.0	8.0	8.0
3	4.0	3.5	3.5	4.0	4.0	4.0	5.5	5.0	5.5	8.0	7.5	8.0
4	3.5	3.5	3.5	4.0	4.0	4.0	5.5	5.0	5.5	8.0	8.0	8.0
5	3.5	3.5	3.5	4.0	4.0	4.0	5.5	5.0	5.5	8.5	8.0	8.5
6	3.5	3.5	3.5	4.0	3.5	4.0	6.0	5.5	5.5	8.5	8.0	8.5
7	3.5	3.5	3.5	4.0	3.5	4.0	6.0	5.5	5.5	9.0	8.5	8.5
8	3.5	3.5	3.5	4.0	4.0	4.0	5.5	5.5	5.5	9.0	8.5	8.5
9	3.5	3.0	3.5	4.0	4.0	4.0	5.5	5.5	5.5	8.5	8.5	8.5
10	3.0	3.0	3.0	4.0	4.0	4.0	5.5	5.0	5.5	8.5	8.5	8.5
11	3.0	3.0	3.0	4.5	4.0	4.0	5.5	5.0	5.5	8.5	8.5	8.5
12	3.0	3.0	3.0	4.5	4.0	4.0	5.5	5.0	5.5	9.0	8.5	8.5
13	3.0	3.0	3.0	4.5	4.0	4.5	6.0	5.5	5.5	9.0	8.5	9.0
14	3.0	3.0	3.0	4.5	4.0	4.5	6.0	5.5	6.0	9.5	9.0	9.0
15	3.0	2.5	3.0	4.5	4.5	4.5	6.5	6.0	6.0	9.5	9.0	9.0
16	3.0	2.5	3.0	4.5	4.5	4.5	6.5	6.0	6.5	9.5	9.0	9.5
17	3.0	3.0	3.0	5.0	4.5	4.5	6.5	6.0	6.5	9.5	9.5	9.5
18	3.0	3.0	3.0	5.0	4.5	5.0	7.0	6.5	6.5	9.5	9.0	9.5
19	3.5	3.0	3.0	5.0	4.5	5.0	7.0	6.5	7.0	9.5	9.0	9.0
20	3.5	3.0	3.5	5.0	4.5	5.0	7.0	6.5	7.0	9.5	9.0	9.5
21	3.5	3.5	3.5	5.0	4.5	5.0	7.0	6.5	7.0	10.0	9.5	9.5
22	3.5	3.5	3.5	5.0	4.5	5.0	7.5	7.0	7.0	10.0	9.5	9.5
23	3.5	3.5	3.5	5.0	4.5	5.0	7.5	7.5	7.5	10.5	10.0	10.0
24	4.0	3.5	3.5	5.0	4.5	5.0	7.5	7.5	7.5	10.5	10.0	10.0
25	4.0	3.5	3.5	5.0	5.0	5.0	8.0	7.5	7.5	10.5	10.0	10.0
26	4.0	3.5	4.0	5.0	4.5	5.0	7.5	7.5	7.5	10.5	10.0	10.5
27	4.0	4.0	4.0	5.5	4.5	5.0	7.5	7.5	7.5	11.0	10.5	11.0
28	4.0	4.0	4.0	5.5	5.0	5.0	7.5	7.5	7.5	11.0	10.5	11.0
29	---	---	---	5.5	5.0	5.0	8.0	7.5	8.0	11.5	11.0	11.5
30	---	---	---	5.5	5.0	5.5	8.5	7.5	8.0	12.0	11.5	11.5
31	---	---	---	5.5	5.0	5.5	---	---	---	11.5	11.5	11.5
MONTH	4.0	2.5	3.5	5.5	3.5	4.5	8.5	5.0	6.5	12.0	7.5	9.5

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		JUNE			JULY			AUGUST			SEPTEMBER	
1	12.0	11.5	12.0	13.5	13.0	13.5	---	---	---	17.0	16.5	16.5
2	12.0	12.0	12.0	13.5	13.0	13.5	---	---	---	17.0	16.0	16.5
3	12.0	11.5	11.5	14.0	13.5	13.5	---	---	---	16.5	15.5	16.0
4	11.5	11.0	11.5	14.0	13.5	14.0	---	---	---	16.5	15.5	16.0
5	11.5	11.5	11.5	14.0	13.5	14.0	---	---	---	17.0	15.5	16.0
6	11.5	11.0	11.0	13.5	13.0	13.5	16.5	16.0	16.0	17.0	15.5	16.0
7	11.0	11.0	11.0	13.0	12.0	12.5	16.5	15.5	16.0	17.5	16.0	16.5
8	11.5	11.0	11.5	12.5	12.0	12.0	16.0	15.5	16.0	17.5	16.5	17.0
9	11.5	11.0	11.5	12.5	12.0	12.5	16.0	15.5	16.0	17.5	16.5	17.0
10	11.0	11.0	11.0	13.0	12.5	12.5	16.0	15.5	16.0	18.0	16.5	17.5
11	11.5	11.0	11.0	13.5	13.0	13.5	16.5	15.5	16.0	18.0	17.5	17.5
12	11.5	11.0	11.0	14.0	13.5	14.0	16.5	16.0	16.0	17.5	17.0	17.5
13	11.5	11.0	11.5	14.0	14.0	14.0	16.5	16.0	16.5	17.0	16.5	17.0
14	11.5	11.0	11.5	14.0	13.5	14.0	17.0	16.5	16.5	17.5	17.0	17.0
15	11.5	11.0	11.5	13.5	13.5	13.5	16.5	16.0	16.0	17.5	17.0	17.5
16	11.5	11.0	11.0	14.5	13.5	14.0	16.0	15.5	16.0	17.5	17.5	17.5
17	11.5	11.5	11.5	14.5	14.0	14.5	17.0	15.5	16.0	17.5	17.0	17.5
18	11.5	11.5	11.5	15.0	14.5	14.5	17.5	16.5	17.0	17.5	17.0	17.5
19	11.5	11.0	11.5	15.0	14.5	14.5	17.5	16.5	17.0	17.5	17.0	17.0
20	11.5	11.5	11.5	15.5	14.5	15.0	17.5	17.0	17.5	17.5	16.5	17.0
21	11.5	11.5	11.5	15.5	15.0	15.5	18.5	17.0	17.5	17.0	16.0	16.5
22	11.5	11.5	11.5	---	---	---	18.5	17.5	18.0	16.5	15.5	16.0
23	12.0	11.5	11.5	---	---	---	18.0	17.5	17.5	16.0	15.0	15.5
24	12.0	11.5	12.0	---	---	---	17.5	17.5	17.5	---	---	---
25	12.5	12.0	12.0	---	---	---	18.0	17.5	17.5	---	---	---
26	13.0	12.5	13.0	---	---	---	17.5	16.5	17.0	---	---	---
27	13.5	13.0	13.0	---	---	---	17.0	16.0	16.5	---	---	---
28	13.5	13.5	13.5	---	---	---	16.0	15.5	15.5	---	---	---
29	14.0	13.5	14.0	---	---	---	16.0	15.0	15.5	---	---	---
30	14.0	13.5	13.5	---	---	---	16.0	15.0	15.5	---	---	---
31	---	---	---	---	---	---	17.5	16.0	17.0	---	---	---
MONTH	14.0	11.0	12.0		12.0		18.5	15.0		18.0		

12401500 KETTLE RIVER NEAR FERRY, WA
(International gaging station)

LOCATION.--Lat 48°58'53", long 118°45'55", in SE¼NW¼ sec.10, T.40 N., R.32 E., Ferry County, Hydrologic Unit 17020002, on right bank 0.5 mi (0.8 km) upstream from Catherine Creek, 1.3 mi (2.1 km) south of international boundary and Ferry, 3.2 mi (5.1 km) upstream from Toroda Creek, and at mile 84.02 (135.2 km).

DRAINAGE AREA.--2,220 mi^2 (5,750 km^2), approximately.

PERIOD OF RECORD.--August 1928 to current year.

GAGE.--Water-stage recorder. Datum of gage is 1,836.8 ft (559.86 m) National Geodetic Vertical Datum of 1929, international joint adjustment of 1947. Prior to Nov. 23, 1928, nonrecording gage at same site and datum.

REMARKS.--Records excellent. Several small diversions above station for irrigation. No regulation

COOPERATION.--This station is maintained by the United States under agreement with Canada.

AVERAGE DISCHARGE.--53 years, 1,502 ft^3/s (42.54 m^3/s), 1,088,000 acre-ft/yr (1,340 hm^3/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 21,200 ft^3/s (600 m^3/s) May 29, 1948, gage height, 21.15 ft (6.447 m); minimum, 14 ft^3/s (0.40 m^3/s), discharge measurement, Jan. 23, 1930, but may have been less during period of ice effect Jan. 18-23, 1930.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 14,700 ft^3/s (416 m^3/s) May 26, gage height, 18.91 ft (6.069 m); minimum, 63 ft^3/s (1.78 m^3/s) Dec. 7, gage height, 9.12 ft (2.780 m).

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	335	251	286	540	420	525	1040	5930	8830	4210	2110	588
2	376	254	289	510	331	515	1060	7220	7700	4650	2010	588
3	362	269	288	475	268	515	1050	6530	7520	3800	1870	751
4	340	293	219	430	249	540	1030	5760	7340	3460	2020	702
5	327	295	188	396	230	570	1010	5260	6950	3340	1950	624
6	315	308	123	415	230	552	1020	4750	7280	3210	1720	594
7	299	345	81	445	220	520	998	4400	7780	3200	1560	558
8	291	376	104	440	220	515	974	4150	6520	3820	1420	520
9	284	446	150	425	220	525	990	4070	6480	3810	1310	485
10	276	456	178	415	210	515	966	4280	7520	3560	1220	460
11	276	431	227	400	232	515	942	4480	8200	3860	1120	435
12	276	396	251	296	280	520	926	4650	7140	3620	1050	415
13	273	343	258	268	322	530	894	4960	6550	3180	974	395
14	280	303	258	249	381	552	870	5180	6820	4000	910	381
15	295	294	265	228	410	576	870	6070	6440	4650	849	363
16	298	290	276	212	450	624	926	7140	6180	4020	902	345
17	287	287	288	189	485	695	1010	6990	6020	3600	856	331
18	272	278	293	246	510	730	1090	7300	5390	3340	910	313
19	268	301	291	336	564	723	1250	8350	5490	3270	835	331
20	265	305	287	372	606	723	1480	9360	6210	3180	807	349
21	263	305	291	405	582	730	1800	10800	5800	3180	786	490
22	266	311	284	415	546	744	2040	12200	5200	2930	814	500
23	265	296	292	430	520	751	2390	11100	5180	2640	744	500
24	262	183	298	470	505	765	3500	10700	5030	2650	681	510
25	257	230	317	552	552	758	4860	10900	4620	3080	624	500
26	258	215	324	582	576	765	4550	13500	4620	2800	582	485
27	257	297	336	558	564	779	4200	12200	4500	2390	546	480
28	253	282	375	535	546	800	3900	10100	4180	2150	515	475
29	250	279	459	525	---	849	3710	9230	3800	2000	495	475
30	246	284	517	510	---	942	3930	8980	3720	2170	500	546
31	247	---	544	485	---	990	---	10200	---	2470	540	---
TOTAL	8819	9203	8637	12754	11229	20353	55276	236740	185010	102240	33230	14489
MEAN	284	307	279	411	401	657	1843	7637	6167	3298	1072	483
MAX	376	456	544	582	606	990	4860	13500	8830	4650	2110	751
MIN	246	183	81	189	210	515	870	4070	3720	2000	495	313
AC-FT	17490	18250	17130	25300	22270	40370	109600	469600	367000	202800	65910	28740

CAL YR 1980	TOTAL	532599	MEAN	1455	MAX	13400	MIN 55	AC-FT	1056000
WTR YR 1981	TOTAL	697980	MEAN	1912	MAX	13500	MIN 81	AC-FT	1384000

12404500 KETTLE RIVER NEAR LAURIER, WA
(International gaging station)

LOCATION.--Lat 48°59'04", long 118°12'55", in SW¼NW¼ sec.11, T.40 N., R.36 E., Ferry County, Hydrologic Unit 17020002, on right bank 1,000 ft (305 m) downstream from Deep Creek, 1.1 mi (1.8 km) south of international boundary, 1.1 mi (1.8 km) southeast of Laurier, and at mile 29.71 (47.80 km).

DRAINAGE AREA.--3,800 mi^2 (9,800 km^2), approximately.

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

REVISED RECORDS.--WSP 737: 1930-31. WSP 862: 1937. WSP 882: 1938.

GAGE.--Water-stage recorder. Datum of gage is 1,425.5 ft (434.49 m) National Geodetic Vertical Datum of 1929, international joint adjustment of 1947. Prior to Jan. 3, 1930, nonrecording gage at same site and datum.

REMARKS.--Records excellent. Diversions for irrigation of about 720 acres (290 hm^2) in the United States (for 1946 from United States reports), and 2,090 acres (850 hm^2) in Canada from the Canada Year Book for 1940. Bonneville Power Administration satellite telemeter at station.

COOPERATION.--This station is maintained by the United States under agreement with Canada.

AVERAGE DISCHARGE.--52 years, 2,870 ft^3/s (81.28 m^3/s), 2,079,000 acre-ft/yr (2,560 hm^3/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 35,000 ft^3/s (991 m^3/s) May 29, 1948, gage height, 17.25 ft (5.258 m); minimum, 88 ft^3/s (2.49 m^3/s) Dec. 1, 1936, gage height, 2.20 ft (0.671 m), but was probably less during winter of 1929-30.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in May or June 1894 reached a stage of about 22 ft (6.7 m), from information by local residents.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 23,400 ft^3/s (663 m^3/s) May 27, gage height, 13.89 ft (4.234 m); minimum daily, 250 ft^3/s (7.08 m^3/s) Dec. 7.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	599	464	558	1160	1080	1410	2740	9270	16000	7440	3770	1040
2	604	471	569	1120	929	1390	2760	12500	13700	8260	3470	1080
3	634	487	575	1070	824	1360	2710	11700	13300	7200	3300	1130
4	622	517	583	1010	760	1390	2620	10200	12900	6610	3250	1220
5	599	538	488	971	720	1480	2540	9290	12600	6450	3290	1160
6	582	550	350	957	700	1490	2520	8450	12500	6390	3020	1080
7	567	590	250	985	680	1450	2470	7860	14100	6450	2790	1040
8	548	648	300	992	680	1410	2410	7390	12100	6950	2600	985
9	531	696	361	978	660	1400	2400	7130	11400	6850	2410	929
10	520	769	413	957	660	1400	2340	7280	12000	6550	2270	887
11	512	774	527	936	660	1390	2280	7660	13400	6410	2120	845
12	514	738	594	866	730	1400	2240	7830	12600	6490	1980	810
13	527	692	642	775	780	1430	2170	8140	11400	5870	1860	775
14	532	635	677	674	866	1460	2100	8520	11300	6040	1750	740
15	553	590	594	600	950	1510	2070	9720	11100	7370	1660	728
16	551	566	583	560	1020	1630	2100	12200	10700	6730	1590	698
17	547	551	597	542	1110	1860	2210	12000	10600	6250	1600	680
18	531	555	624	632	1180	1970	2340	12300	9630	5750	1550	662
19	511	557	594	796	1240	1980	2540	13600	9360	5550	1560	638
20	501	573	603	852	1400	1960	2890	15300	10300	5330	1500	656
21	498	585	596	866	1420	1940	3360	17000	10400	5330	1470	728
22	490	588	605	894	1390	1970	3830	20100	9320	5070	1450	838
23	487	603	605	929	1330	1990	4380	19500	8960	4680	1400	859
24	485	524	616	1010	1310	2010	5790	18200	8860	4440	1310	859
25	498	442	643	1150	1350	2020	8090	18200	8330	4750	1220	859
26	494	459	669	1230	1460	2050	7950	21500	8240	4820	1140	845
27	484	483	714	1240	1480	2050	7280	21800	8330	4220	1080	831
28	477	557	985	1210	1450	2080	6910	17600	7810	3840	1020	831
29	470	555	1070	1200	---	2160	6650	16000	7180	3580	978	838
30	465	549	1100	1170	---	2400	6810	15400	6910	3620	957	887
31	461	---	1130	1130	---	2600	---	16900	---	4060	985	---
TOTAL	16394	17306	19215	29462	28819	54040	109500	400540	325330	179350	60350	26158
MEAN	529	577	620	950	1029	1743	3650	12920	10840	5785	1947	872
MAX	634	774	1130	1240	1480	2600	8090	21800	16000	8260	3770	1220
MIN	461	442	250	542	660	1360	2070	7130	6910	3580	957	638
AC-FT	32520	34330	38110	58440	57160	107200	217200	794500	645300	355700	119700	51880

CAL YR 1980 TOTAL 1022013 MEAN 2792 MAX 24200 MIN 150 AC-FT 2027000
WTR YR 1981 TOTAL 1266464 MEAN 3470 MAX 21800 MIN 250 AC-FT 2512000

12406500 LOON LAKE NEAR LOON LAKE, WA

LOCATION.--Lat 48°01'42", long 117°36'14" in SW¼NW¼ sec.11, T.29 N., R.41 E., Stevens County, Hydrologic Unit 17020003, at south end of Loon Lake, 2.7 mi (4.3 km) southeast of town of Loon Lake.

DRAINAGE AREA.--14.1 mi^2 (36.5 km^2).

PERIOD OF RECORD.--April 1950 to June 1980, July 1980 to current year (fragmentary). Chemical analyses October 1970 to September 1971.

REVISED RECORDS.--WSP 1216: 1950. WSP 1933: Drainage area. WDR WA-80-2: 1979.

GAGE.--Nonrecording gage. Datum of gage is National Geodetic Vertical Datum of 1929. Prior to Sept. 29, 1951, water-stage recorder at site 0.2 mi (0.3 km) north at same datum.

REMARKS.--Elevation controlled by dam at lake outlet. Some pumping for domestic use and irrigation.

EXTREMES FOR PERIOD OF RECORD.--Maximum elevation, 2,382.71 ft (726.250 m) May 3, 1950, but may have been higher sometime in 1951 water year while water-stage recorder was not operating; minimum observed, 2,378.14 ft (724.857 m) Nov. 8, 1977, but may have been lower during period when water was below the intakes Aug. 1 to Dec. 14, 1977.

EXTREMES FOR CURRENT YEAR.--Maximum elevation observed, 2,380.64 ft (725.619 m) May 22; minimum observed, 2,379.01 ft (725.122 m) Oct. 31.

ELEVATION (FEET NGVD), WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981
ONCE-DAILY

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	---	---	---	---	---	2380.24	2380.42	---	2380.52	---	2379.76
2	---	---	2379.20	2379.48	---	---	---	---	2380.53	---	---	---
3	2379.17	---	---	---	2379.57	2379.88	---	---	---	2380.49	---	---
4	---	2379.03	---	---	---	---	2380.20	---	---	---	2380.15	2379.70
5	---	---	2379.33	---	---	---	---	2380.42	2380.52	---	---	---
6	---	---	---	2379.49	2379.55	2379.93	---	---	---	---	---	---
7	2379.13	2379.11	---	---	---	---	2380.14	---	---	2380.44	2380.12	---
8	---	---	---	---	---	---	---	2380.37	---	---	---	2379.67
9	---	---	2379.30	2379.47	---	---	---	---	2380.57	---	---	---
10	2379.09	---	---	---	2379.55	2379.94	2380.22	---	---	2380.41	---	---
11	---	2379.10	---	---	---	---	---	---	---	---	2380.07	2379.61
12	---	---	2379.30	---	---	---	---	2380.43	2380.54	---	---	---
13	---	---	---	2379.49	2379.56	2379.97	---	---	---	---	---	---
14	2379.10	2379.07	---	---	---	---	2380.30	---	---	2380.39	2380.04	---
15	---	---	2379.29	---	---	---	---	2380.55	---	---	---	2379.59
16	---	---	2379.30	2379.50	---	---	---	---	2380.54	---	---	---
17	2379.09	---	---	---	2379.68	2379.94	2380.31	---	---	2380.37	---	---
18	---	2379.04	---	---	---	2379.95	---	---	---	---	2379.97	2379.55
19	---	---	2379.30	---	---	---	---	2380.55	2380.58	---	---	---
20	---	---	---	2379.50	2379.78	2379.96	---	---	---	---	---	---
21	2379.06	2379.08	---	---	---	---	2380.33	---	---	2380.33	2379.93	---
22	---	---	---	---	---	---	---	2380.64	---	---	---	2379.54
23	---	---	2379.35	2379.52	---	---	---	---	2380.57	---	---	---
24	2379.04	---	---	---	2379.80	2379.95	2380.36	---	---	2380.30	2379.87	---
25	---	2379.13	---	---	---	---	---	---	---	---	---	2379.51
26	---	---	2379.44	---	---	---	---	2380.55	2380.56	---	---	---
27	---	---	---	2379.55	2379.85	2380.09	---	---	---	---	---	---
28	2379.02	2379.12	---	---	---	---	2380.39	---	---	2380.26	2379.80	---
29	---	---	---	---	---	---	---	2380.60	---	---	---	2379.50
30	---	---	2379.47	2379.61	---	---	---	---	---	---	---	---
31	2379.01	---	---	---	---	---	---	---	---	2380.20	---	---
MEAN	---	---	---	---	---	---	---	---	---	---	---	---
MAX	---	---	---	---	---	---	---	---	---	---	---	---
MIN	---	---	---	---	---	---	---	---	---	---	---	---

12408500 MILL CREEK NEAR COLVILLE, WA

LOCATION.--Lat 48°34'44", long 117°51'56", in SW¼NW¼ sec.35, T.36 N., R.39 E., Stevens County, Hydrologic Unit 17020003, on right bank 3.0 mi (4.9 km) northeast of Colville, 5.3 mi (8.5 km) downstream from North Fork, and at mile 10.9 (17.5 km).

DRAINAGE AREA.--83.0 mi^2 (215 km^2).

PERIOD OF RECORD.--October 1939 to September 1972, October 1977 to current year.

REVISED RECORDS.--WSP 1042: 1940, 1942. WSP 1933: Drainage area.

GAGE.--Water-stage recorder. Altitude of gage is 1,950 ft (594 m), from topographic map. Prior to Mar. 2, 1940, nonrecording gage and Mar. 2, 1940, to Oct. 5, 1959, water-stage recorder at site 0.5 mi (0.8 km) upstream at different datum (used as supplementary gage Nov. 2, 1952, to Oct. 5, 1959). Nov. 2, 1952, to Oct. 5, 1959, nonrecording gage and crest-stage gage at site 300 ft (90 m) upstream at datum 0.47 ft (0.143 m) higher.

REMARKS.--Records good. No regulation. Diversions for irrigation of about 50 acres (20 hm^2) above station.

AVERAGE DISCHARGE.--37 years (water years 1940-72, 1978-81), 46.9 ft^3/s (1.328 m^3/s), 7.67 in/yr (195 mm/yr), 33,980 acre-ft/yr (41.9 hm^3/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 694 ft^3/s (19.7 m^3/s) Apr. 24, 1969, gage height, 5.37 ft (1.637 m); maximum gage height, 5.65 ft (1.722 m) May 10, 1961 (backwater from bridge); minimum discharge, 3.2 ft^3/s (0.091 m^3/s) Jan. 10, 1962, result of freezeup, but may have been less during period of no gage-height record Feb. 1-4, 1940.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 166 ft^3/s (4.70 m^3/s) May 25, gage height, 3.51 ft (1.070 m); minimum, 9.8 ft^3/s (0.28 m^3/s) part or all of each day Oct. 7-10, Nov. 16, gage height 2.25 ft (0.686 m).

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	11	12	13	47	26	84	145	137	107	60	39	23
2	11	13	13	43	23	82	125	135	103	58	37	28
3	11	13	15	41	21	80	117	128	101	56	36	23
4	11	13	48	39	20	90	108	133	97	54	35	21
5	11	13	40	36	23	111	112	129	93	55	34	21
6	11	13	20	34	26	97	112	121	102	79	33	20
7	10	18	13	34	26	92	104	114	92	122	31	19
8	9.8	17	14	32	26	88	104	108	98	109	30	19
9	9.8	15	16	30	22	86	125	104	109	85	29	18
10	10	16	18	29	20	84	111	119	97	77	28	18
11	10	15	19	25	18	82	108	116	93	72	27	17
12	11	14	20	24	21	81	106	116	88	67	26	17
13	12	14	18	21	25	80	101	107	88	66	26	16
14	13	13	18	20	42	80	97	105	92	70	26	16
15	14	12	18	18	44	79	97	138	94	64	26	16
16	13	12	18	17	97	97	97	146	86	60	25	15
17	13	12	18	18	88	99	97	140	84	56	25	15
18	12	12	18	24	82	93	98	134	88	54	24	15
19	12	12	18	24	112	90	100	132	103	52	24	16
20	12	13	17	24	114	89	105	132	92	56	24	17
21	12	15	17	24	94	86	113	132	86	56	24	17
22	13	28	20	24	86	89	124	146	86	53	23	18
23	12	18	23	27	84	91	132	139	86	53	22	19
24	12	14	23	42	83	89	139	134	82	54	21	18
25	14	14	35	36	104	94	138	145	76	50	21	17
26	15	14	61	34	94	103	133	147	73	46	21	16
27	14	14	74	32	90	98	128	134	70	44	20	17
28	13	13	64	32	87	96	130	127	67	44	20	21
29	13	14	53	34	---	97	129	120	64	43	20	19
30	12	14	48	32	---	98	129	116	62	43	21	18
31	12	---	48	31	---	110	---	111	---	41	20	---
TOTAL	369.6	430	858	928	1598	2815	3464	3945	2659	1899	818	550
MEAN	11.9	14.3	27.7	29.9	57.1	90.8	115	127	88.6	61.3	26.4	18.3
MAX	15	28	74	47	114	111	145	147	109	122	39	28
MIN	9.8	12	13	17	18	79	97	104	62	41	20	15
CFSM	.14	.17	.33	.36	.69	1.09	1.39	1.53	1.07	.74	.32	.22
IN.	.17	.19	.38	.42	.72	1.26	1.55	1.77	1.19	.85	.37	.25
AC-FT	733	853	1700	1840	3170	5580	6870	7820	5270	3770	1620	1090

CAL YR 1980	TOTAL	15282.1	MEAN 41.8	MAX 288	MIN 4.5	CFSM .50	IN 6.85	AC-FT	30310	
WTR YR 1981	TOTAL	20333.6	MEAN 55.7	MAX 147	MIN 9.8	CFSM .67	IN 9.11	AC-FT	40330	

12409000 COLVILLE RIVER AT KETTLE FALLS, WA

LOCATION.--Lat 48°35'40", long 118°03'41", in NE¼NE¼ sec.30, T.36 N., R.38 E., Stevens County, Hydrologic Unit 17020003, on right bank 600 ft (180 m) downstream from Washington Water Power Co.'s hydroelectric plant at foot of Meyers Falls, 1.0 mi (1.6 km) south of town of Kettle Falls, and at mile 5.0 (8.0 km).

DRAINAGE AREA.--1,007 mi^2 (2,608 km^2).

PERIOD OF RECORD.--October 1922 to current year. Published as "at Meyers Falls" 1922-38. Chemical analyses October 1960 to September 1970, October 1971 to September 1972, October 1974 to September 1976, October 1978 to June 1980. Water temperatures November 1969 to June 1971.

REVISED RECORDS.--WSP 1316: 1938(M), 1941(M), 1948(M). WSP 1636: Drainage area.

GAGE.--Water-stage recorder. Altitude of gage is 1,400 ft (427 m), from topographic map. Prior to Oct. 21, 1932, nonrecording gage at site 500 ft (150 m) upstream at different datum. Oct. 21, 1932, to Sept. 19, 1938, nonrecording gages at site 200 ft (60 m) upstream at different datum. Sept. 20, 1938, to Mar. 20, 1949, nonrecording gage at present site and datum.

REMARKS.--Records good. Several ditches above station divert water for irrigation. Regulation at low flow by powerplant. Bonneville Power Administration satellite telemeter at station.

AVERAGE DISCHARGE.--59 years, 301 ft^3/s (8.524 m^3/s), 218,100 acre-ft/yr (269 hm^3/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 3,440 ft^3/s (97.4 m^3/s) Jan. 21, 1974, gage height, 9.84 ft (2.999 m); maximum gage height, 10.17 ft (3.100 m) Apr. 23, 1956; minimum discharge observed, 0.5 ft^3/s (0.014 m^3/s) Aug. 15, 1930.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 814 ft^3/s (23.1 m^3/s) Mar. 25, gage height, 6.82 ft (2.079 m); minimum, 21 ft^3/s (0.59 m^3/s) Oct. 22, gage height, 4.85 ft (1.478 m), result of regulation by powerplant.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	87	106	143	320	241	487	569	548	500	291	191	102
2	84	106	143	306	222	468	632	541	481	282	184	124
3	84	113	152	291	211	449	625	527	474	274	180	140
4	85	113	229	282	197	455	597	534	461	261	174	124
5	87	118	340	269	187	541	569	569	437	252	177	116
6	87	124	291	261	194	569	569	562	449	274	161	109
7	80	118	132	257	208	541	555	534	461	419	152	111
8	81	152	104	257	208	500	534	513	449	468	146	104
9	81	161	126	252	208	481	576	487	500	407	138	100
10	82	149	158	244	155	461	604	487	500	356	132	87
11	84	135	180	226	97	449	597	507	474	335	116	89
12	84	129	191	215	162	437	583	555	437	306	116	89
13	100	126	184	211	177	431	569	555	431	291	118	91
14	87	116	180	201	222	419	548	513	437	311	118	93
15	109	118	177	184	282	413	527	534	443	315	126	93
16	111	102	174	165	335	425	513	618	443	287	124	89
17	109	109	174	149	449	474	513	639	425	269	118	89
18	106	116	177	201	449	474	507	611	407	252	116	89
19	95	126	177	215	481	449	500	583	449	237	109	89
20	93	118	171	204	604	437	507	576	455	233	111	93
21	102	126	168	197	597	425	520	583	425	252	113	106
22	100	168	174	204	590	425	541	625	401	244	111	109
23	106	204	218	215	555	437	583	646	407	248	104	109
24	102	161	244	252	520	437	604	625	401	244	104	118
25	109	140	248	291	541	419	604	611	378	248	97	118
26	118	140	325	269	562	468	583	653	351	233	95	109
27	118	138	437	252	541	513	562	646	340	222	91	124
28	113	140	449	248	520	507	555	604	325	211	91	124
29	109	135	401	252	---	487	555	562	315	204	93	132
30	106	132	351	269	---	481	548	534	301	201	93	126
31	106	---	330	265	---	481	---	513	---	201	97	---
TOTAL	3005	3939	6948	7424	9715	14440	16849	17595	12757	8628	3896	3196
MEAN	96.9	131	224	239	347	466	562	568	425	278	126	107
MAX	118	204	449	320	604	569	632	653	500	468	191	140
MIN	80	102	104	149	97	413	500	487	301	201	91	87
AC-FT	5960	7810	13780	14730	19270	28640	33420	34900	25300	17110	7730	6340

CAL YR 1980 TOTAL 94549 MEAN 258 MAX 1020 MIN 49 AC-FT 187500
WTR YR 1981 TOTAL 108392 MEAN 297 MAX 653 MIN 80 AC-FT 215000

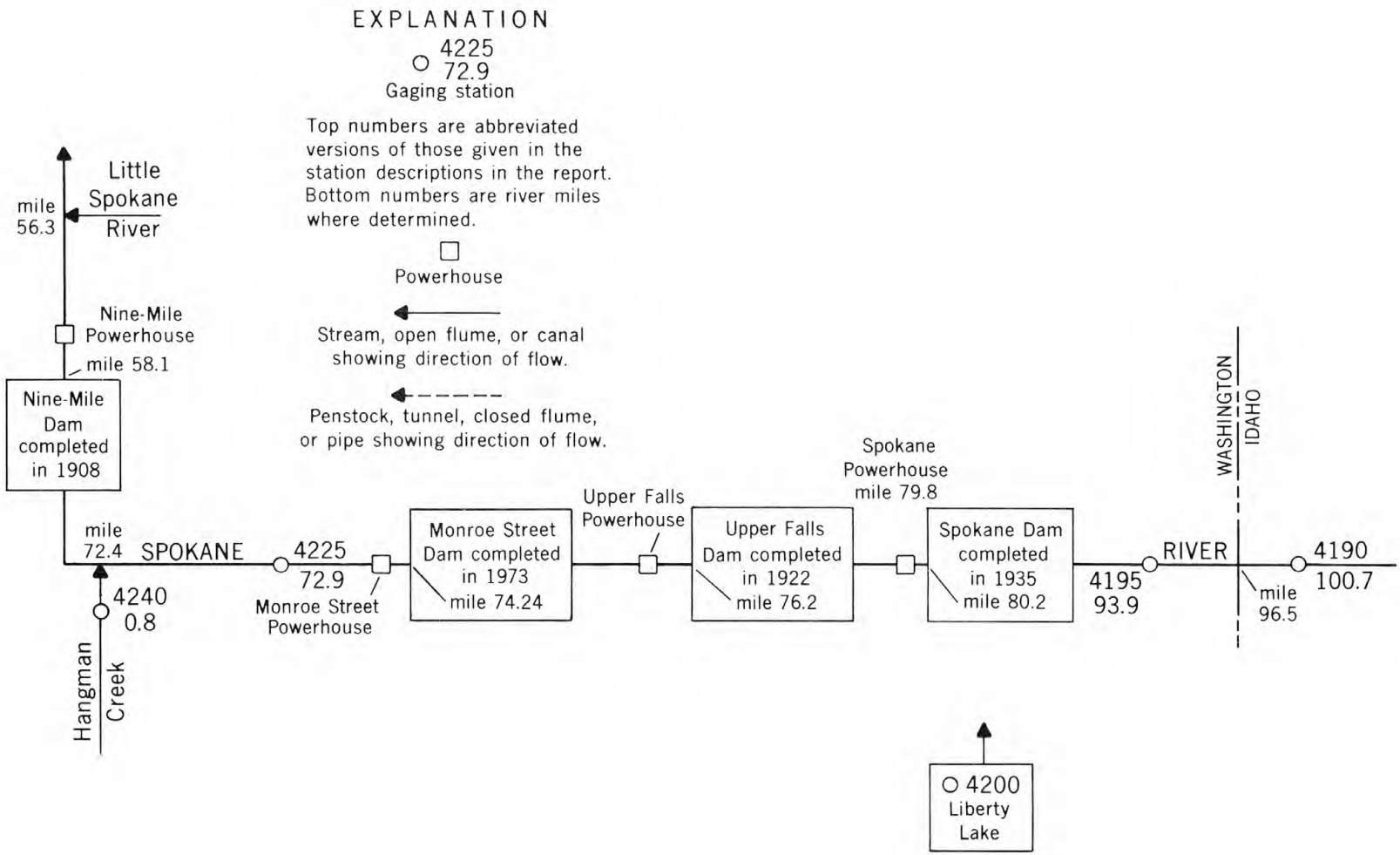

Figure 8. Gaging stations in Spokane River basin above Little Spokane River.

12419000 SPOKANE RIVER NEAR POST FALLS, ID

LOCATION.--Lat 47°42'10", long 116°58'40", in SW¼SW¼ sec.4, T.50 N., R.5 W., Kootenai County, Hydrologic Unit 17010305, on right bank 1 mi (1.6 km) downstream from powerplant of Washington Water Power Co., 1.5 mi (2.4 km) southwest of Post Falls, and at mile 100.7 (162.0 km).

DRAINAGE AREA.--3,840 mi^2 (9,946 km^2), approximately, of which about 122 mi^2 (316 km^2) in the vicinity of Hayden Lake is noncontributing to this station.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1912 to current year (prior to January 1913 monthly discharge only, published in WSP 870 and 1736). Prior to October 1949, published as "at Post Falls".

GAGE.--Water-stage recorder. Datum of gage is 2,050 ft (624.840 m) referred to originally accepted elevation of 2,157.40 ft (657.575 m) for the Geological Survey bench mark in southeast corner of Idaho First National Bank Building (see WSP 882). National Geodetic Vertical Datum of 1929 is at 2,047.00 ft (623.92 m) gage datum. Jan. 1, 1913, to Nov. 21, 1920, nonrecording gage and Nov. 22, 1920, to Sept. 15, 1934, recording gage 0.6 mi (1.0 km) upstream. From Sept. 16, 1934, to Nov. 15, 1949, recording gage 0.8 mi (1.3 km) upstream. From Nov. 16, 1949, at present site. Datum of all gages prior to Sept. 30, 1964, 50 ft (15.2 m) lower.

REMARKS.--Records good. Rathdrum Prairie Canal (see sta 12418000) diverts water above gage for irrigation. Figures of daily discharge do not include water diverted by this canal. Flow regulated by dam at Post Falls and affected by storage in Coeur d'Alene Lake (see sta 12415500).

AVERAGE DISCHARGE.--River only, 69 years, 6,264 ft^3/s (177 m^3/s), 4,538,000 acre-ft/yr (5,595 hm^3/yr); combined river and diversions above gage, 69 years, 6,349 ft^3/s (180 m^3/s), 4,600,000 acre-ft/yr (5,672 hm^3/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 50,100 ft^3/s (1,419 m^3/s) when recorder was not operating Dec. 25, 1933 (determined from unpublished records collected by Washington Water Power Co. for station at Liberty Bridge); minimum, 65 ft^3/s (1.84 m^3/s) July 25, 30, 1973; minimum gage height, 4.68 ft (1.426 m) July 20, 21, 1977.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 27,300 ft^3/s (773 m^3/s) Dec. 30, gage height, 20.32 ft (6.194 m); minimum, 564 ft^3/s (16.0 m^3/s) Sept. 1, gage height, 6.04 ft (1.841 m).

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1760	1780	1780	24400	5620	10900	6700	17400	9260	4730	1550	612
2	1750	1800	1930	23300	5620	10800	8260	17800	8770	4940	1550	602
3	1750	1800	1800	22000	5620	10100	9210	18100	7170	5360	1550	607
4	1750	1710	2420	20800	5620	9490	9220	18000	6500	5350	1490	1020
5	1760	1620	3010	19400	5560	8560	9200	17600	5690	5310	1460	1490
6	1780	1630	3320	18300	5870	6720	8940	16800	7830	5460	1400	1730
7	1780	1630	3420	17200	6580	5690	7910	16200	9020	7480	1020	1710
8	1780	1640	3420	16100	6540	5690	6480	15300	9760	7190	925	1760
9	1780	1630	3110	10300	6470	5700	5680	14600	10700	4220	923	1730
10	1780	1830	3100	6900	6410	5320	5670	13200	11800	2630	748	1740
11	1800	2090	2960	6880	6360	5170	5680	12500	11700	2210	697	1730
12	1790	2080	3100	6600	6010	5680	6060	12100	10600	2180	735	1720
13	1760	2060	3100	6570	5690	5680	6880	11800	11500	3030	738	1720
14	1790	2060	3090	6860	5540	5680	7490	8310	11700	3520	960	1730
15	1790	2060	3180	6350	5540	5610	8760	5670	11700	2970	1200	1720
16	1790	2050	3260	5920	7210	5630	8690	5560	11000	2840	1200	1680
17	1780	2060	3250	5950	12000	5690	8680	5670	10600	2870	1200	1700
18	1770	2070	3270	5890	15500	6300	8390	5660	10700	2860	1170	1720
19	1770	2060	3380	5870	16600	6750	8320	6960	11900	2860	1010	1690
20	1770	2060	3640	5870	17500	6750	9230	9930	12700	2400	876	1730
21	1780	2060	3650	5850	18000	6740	9530	11600	12700	2080	862	1730
22	1790	2070	4030	5680	18200	6720	9570	12600	12900	2120	716	1710
23	1780	2070	4700	5580	17900	6690	10500	12800	13400	1730	599	1720
24	1770	2070	5240	5010	17300	6670	13400	12800	12400	1470	597	1710
25	1780	2060	6750	4640	16900	6640	16100	12900	10600	1490	597	1700
26	1780	2060	15300	5510	16000	7630	16600	13200	9220	1490	600	1680
27	1770	2070	18900	5600	12200	7450	16900	13200	9340	1750	608	1710
28	1770	2060	22700	5590	10600	5610	16800	12900	8820	2040	622	1710
29	1770	2060	25200	5610	---	5620	16700	10100	6040	2040	598	1700
30	1770	2060	25700	5520	---	5630	17000	7730	5290	1950	607	1700
31	1770	---	25300	5610	---	5630	---	8230	---	1550	626	---
TOTAL	55010	58360	217010	301660	284960	208940	298550	377220	301310	100120	29434	47211
MEAN	1775	1945	7000	9731	10180	6740	9952	12170	10040	3230	949	1574
MAX	1800	2090	25700	24400	18200	10900	17000	18100	13400	7480	1550	1760
MIN	1750	1620	1780	4640	5540	5170	5670	5560	5290	1470	597	602
AC-FT	109100	115800	430400	598300	565200	414400	592200	748200	597600	198600	58380	93640

CAL YR 1980 TOTAL 1855502 MEAN 5070 MAX 25700 MIN 696 AC-FT 3680000
WTR YR 1981 TOTAL 2279785 MEAN 6246 MAX 25700 MIN 597 AC-FT 4522000

12419500 SPOKANE RIVER ABOVE LIBERTY BRIDGE, NEAR OTIS ORCHARDS, WA

LOCATION.--Lat 47°40'56", long 117°05'05", in NW¼ sec.11, T.25 N., R.45 E., Spokane County, Hydrologic Unit 17010305, on left bank 1.2 mi (1.9 km) upstream from Liberty Bridge, 1.8 mi (2.9 km) southeast of Otis Orchards, 3.3 mi (5.3 km) northeast of Greenacres, and at mile 93.9 (151.1 km).

DRAINAGE AREA.--3,880 mi^2 (10,050 km^2), approximately.

PERIOD OF RECORD.--January 1929 to December 1936, March 1937, August 1937 to August 1941, October 1941 to October 1942, February to May 1943, August 1943 to November 1946, February to July 1947, September 1947 to February 1948; May to November 1948, March to November 1949, and April to September 1950 (monthly discharge only); October 1950 to current year. Chemical analyses July 1959 to September 1971, water temperatures December 1963 to September 1965.

GAGE.--Water-stage recorder. Datum of gage is 2,000 ft (609.6 m) National Geodetic Vertical Datum of 1929 (levels by Washington Water Power Co.).

REMARKS.--Records excellent. Flow partly regulated by dam at Post Falls, Idaho, 8.2 mi (13.2 km) upstream and affected by storage in Coeur d'Alene Lake. Rathdrum Prairie Canal, 12.7 mi (20.4 km) upstream, diverts water for irrigation of about 3,000 acres (12 km^2) above station.

AVERAGE DISCHARGE.--45 years (water years 1930-36, 1938-40, 1942, 1944-46, 1951-81), 6,103 ft^3/s (172.8 m^3/s), 4,422,000 acre-ft/yr (5,450 hm^3/yr), unadjusted.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 50,100 ft^3/s (1,420 m^3/s) Dec. 25, 1933, gage height, 22.24 ft (6.779 m); minimum daily discharge, 38 ft^3/s (1.08 m^3/s) July 20, 1977.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 27,000 ft^3/s (765 m^3/s) Dec. 30, gage height, 18.25 ft (5.563 m); minimum, 473 ft^3/s (13.4 m^3/s) Aug. 30, gage height, 8.60 ft (2.621 m).

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1700	1740	1740	24600	5510	10500	6150	17500	8670	4630	1340	527
2	1680	1760	1960	23600	5510	10400	7700	18000	8170	4670	1340	509
3	1680	1770	1720	22400	5510	9600	8610	18200	6750	5130	1340	515
4	1680	1680	2370	21200	5490	8940	8610	18200	6070	5130	1340	800
5	1700	1560	2960	20000	5450	8120	8610	17800	5290	5090	1310	1270
6	1720	1580	3270	18800	5700	6370	8370	16800	7100	5190	1270	1540
7	1720	1590	3370	17500	6470	5370	7450	16100	8350	6900	1000	1530
8	1720	1590	3370	16300	6400	5370	6150	15000	9060	6970	900	1560
9	1720	1580	3090	10700	6320	5370	5330	14200	10200	4190	900	1550
10	1710	1730	3050	6820	6300	5070	5330	12800	11400	2580	800	1540
11	1730	2060	2930	6820	6220	4870	5330	12100	11400	2100	700	1540
12	1730	2060	3070	6550	5870	5350	5590	11800	10100	2090	750	1530
13	1700	2020	3050	6470	5570	5350	6450	11500	11100	2790	750	1530
14	1720	2030	3050	6770	5430	5330	6950	7920	11400	3340	776	1540
15	1730	2030	3120	6280	5450	5290	8220	5310	11400	2860	1040	1530
16	1730	2030	3220	5770	7020	5290	8150	5210	10700	2690	1040	1500
17	1730	2030	3200	5820	11800	5330	8150	5290	10300	2720	1040	1520
18	1720	2030	3220	5750	15400	5820	7920	5290	10300	2710	1010	1530
19	1720	2030	3320	5750	16600	6350	7770	6450	11500	2710	894	1500
20	1720	2030	3600	5720	17500	6320	8640	9390	12500	2300	744	1530
21	1730	2030	3610	5720	18100	6320	9000	11200	12500	1950	720	1550
22	1740	2050	3910	5570	18200	6300	9060	12200	12700	2000	631	1520
23	1720	2050	4530	5490	17900	6280	9990	12500	13200	1670	503	1530
24	1720	2050	5170	5010	17400	6250	12900	12500	12300	1340	497	1530
25	1730	2030	6220	4530	16900	6220	15900	12500	10500	1350	503	1530
26	1730	2030	15200	5410	15900	7100	16600	12900	8760	1340	503	1520
27	1730	2030	19200	5490	12000	7100	17000	12900	8880	1540	509	1540
28	1730	2050	22900	5490	10200	5270	16900	12600	8460	1970	521	1550
29	1730	2030	25300	5490	---	5270	16700	9870	5900	2000	509	1530
30	1730	2030	25900	5430	---	5290	17100	7200	5050	1910	503	1530
31	1730	---	25500	5490	---	5290	---	7600	---	1340	527	---
TOTAL	53280	57310	216120	302740	282120	197100	286630	368830	290010	95200	26210	41921
MEAN	1719	1910	6972	9766	10080	6358	9554	11900	9667	3071	845	1397
MAX	1740	2060	25900	24600	18200	10500	17100	18200	13200	6970	1340	1560
MIN	1680	1560	1720	4530	5430	4870	5330	5210	5050	1340	497	509
AC-FT	105700	113700	428700	600500	559600	390900	568500	731600	575200	188800	51990	83150

CAL YR 1980 TOTAL 1829790 MEAN 4999 MAX 25900 MIN 597 AC-FT 3629000
WTR YR 1981 TOTAL 2217471 MEAN 6075 MAX 25900 MIN 497 AC-FT 4398000

12420000 LIBERTY LAKE AT LIBERTY LAKE, WA

LOCATION.--Lat 47°39'09", long 117°05'20", in NE¼ sec.22, T.25 N., R.45 E., Spokane County, Hydrologic Unit 17010305, on right wall of concrete outlet flume at town of Liberty Lake, 15 mi (24.1 km) east of Spokane.

DRAINAGE AREA.--13.3 mi^2 (34.4 km^2).

PERIOD OF RECORD.--December 1950 to December 1955 (fragmentary), January 1956 to July 1966, August 1966 to current year (fragmentary). Chemical analyses October 1970 to September 1971.

REVISED RECORDS.--WSP 1933: Drainage area.

GAGE.--Nonrecording gage. Datum of gage is National Geodetic Vertical Datum of 1929. Prior to Oct. 1, 1958, published at datum 2,046.48 ft (623.767 m) higher.

REMARKS.--Stage controlled by gates at outlet. Some pumping from lake for domestic use.

EXTREMES FOR PERIOD OF RECORD.--Maximum elevation, 2,051.81 ft (625.392 m), from high-water mark, occurred during period Jan. 19 to Feb. 5, 1974; minimum observed, 2,045.56 ft (623.487 m) Nov. 11, 15, 1977.

EXTREMES FOR CURRENT YEAR.--Maximum elevation observed, 2,049.90 ft (624.810 m), Apr. 20, 24; minimum observed, 2,046.80 ft (623.865 m) Oct. 29, Nov. 3, 10.

ELEVATION (FEET NGVD), WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981
ONCE-DAILY

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	---	2046.88	---	---	---	2049.56	---	2049.58	---	2048.84	---
2	---	---	---	---	2048.06	---	---	---	---	---	---	---
3	---	2046.80	---	---	---	2049.20	---	2049.70	---	2049.46	2048.78	2048.10
4	---	---	---	---	---	---	---	---	---	---	---	---
5	---	---	2046.90	---	---	---	2049.60	---	2049.56	---	---	---
6	2046.96	---	---	---	2048.16	2049.30	---	---	---	---	---	---
7	---	---	2046.90	---	---	---	---	2049.68	---	2049.40	2048.68	2048.00
8	---	---	---	---	---	---	---	---	2049.56	---	---	---
9	---	---	2046.90	2047.70	2048.20	2049.34	---	---	---	---	---	---
10	---	2046.80	---	---	---	---	2049.70	---	---	2049.36	2048.60	---
11	2046.90	---	2046.92	---	---	---	---	2049.68	---	---	---	2047.92
12	---	---	---	2047.74	---	---	---	---	2049.56	---	---	---
13	---	---	---	---	---	2049.38	2049.76	---	---	2049.20	---	---
14	---	---	---	---	2048.30	---	---	2049.60	---	---	2048.50	2047.80
15	---	---	---	---	---	---	---	2049.64	2049.54	---	---	---
16	2046.86	---	---	2047.76	---	2049.40	2049.80	---	---	2049.20	---	---
17	---	2046.82	---	---	2048.42	---	---	---	---	---	2048.40	---
18	---	---	2046.94	2047.80	---	---	---	2049.62	---	---	---	2047.74
19	---	---	---	---	---	---	---	---	2049.52	---	---	---
20	2046.84	---	---	---	---	---	2049.90	---	---	2049.15	2048.30	---
21	---	2046.84	---	2047.86	2048.70	---	---	---	---	---	---	2047.70
22	---	---	---	---	---	---	---	2049.60	2049.50	---	---	---
23	---	---	2047.00	2047.82	---	2049.46	---	---	---	---	---	2047.60
24	2046.84	2046.86	---	---	2049.02	---	2049.90	---	---	2049.04	2048.24	---
25	---	---	---	2047.90	---	---	---	2049.58	---	---	---	2047.64
26	---	---	---	---	---	---	2049.86	---	2049.48	---	---	---
27	---	---	---	---	---	---	---	---	---	---	---	---
28	---	2046.86	---	---	2049.10	2049.50	---	---	---	2048.91	2048.18	2047.62
29	2046.80	---	---	---	---	---	---	2049.60	---	---	---	---
30	---	---	---	2048.00	---	---	2049.80	---	---	---	---	---
31	---	---	---	---	---	---	---	---	---	---	2048.14	---
MEAN	---	---	---	---	---	---	---	---	---	---	---	---
MAX	---	---	---	---	---	---	---	---	---	---	---	---
MIN	---	---	---	---	---	---	---	---	---	---	---	---

12422500 SPOKANE RIVER AT SPOKANE, WA

LOCATION.--Lat 47°39'34", long 117°26'53", in SW¼SW¼ sec.13, T.25 N., R.42 E., Spokane County, Hydrologic Unit 17010305, on right bank at Cochran Street in Spokane, 0.5 mi (0.8 km) upstream from Hangman Creek, and at mile 72.9 (117.3 km).

DRAINAGE AREA.--4,290 mi^2 (11,100 km^2), approximately.

PERIOD OF RECORD.--April 1891 to current year. Chemical analyses October 1972 to September 1973.

REVISED RECORDS.--WSP 532: 1891-1904. WSP 1246: Drainage area. WSP 1286: 1907-9.

GAGE.--Water-stage recorder. Datum of gage is 1,696.6 ft (517.12 m) National Geodetic Vertical Datum of 1929 (river-profile survey). Prior to July 1, 1921, water-stage recorders and nonrecording gages at several sites within 4 mi (6 km) of present site at various datums.

REMARKS.--Records excellent. Discharge for Nov. 22 to Dec. 9 provided by Washington Water Power Co. Flow partly regulated by powerplants of Washington Water Power Co. at Post Falls, Idaho, 28.8 mi (46.3 km) upstream and at Spokane, 1.3 mi (2.1 km) upstream, and by Coeur d'Alene Lake, Idaho. Rathdrum Prairie Canal diverts water above station for irrigation. In 1946, approximately 22,600 acres (91 km^2), of which about 15,000 acres (61 km^2) utilized surface water, were under irrigation upstream from Spokane. Since 1966 irrigation has been from many wells in the valley near the river with only about 3,000 acres (12 km^2) irrigated from the river.

AVERAGE DISCHARGE.--90 years, 6,843 ft^3/s (193.8 m^3/s), 4,958,000 acre-ft/yr (6,110 hm^3/yr), unadjusted.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 49,000 ft^3/s (1,390 m^3/s), estimated, May 31, 1894 (see WSP 532); minimum, 95 ft^3/s (2.69 m^3/s) Sept. 19, 1956, gage height, 15.60 ft (4.755 m).

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 26,600 ft^3/s (753 m^3/s) Dec.30, gage height, 25.80 ft (7.864 m); minimum daily, 960 ft^3/s (27.2 m^3/s) Sept. 2.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2020	2110	2400	24600	5860	10900	6450	17600	9380	5480	1900	1020
2	1930	2100	2500	23600	5860	11100	7860	18100	8840	5220	1900	960
3	2000	2110	2200	22500	5860	10300	8960	18500	7780	5720	1940	998
4	1940	2130	2800	21300	5860	9620	9020	18500	7020	5700	1910	1060
5	2000	1950	2500	20100	5790	9020	9040	18100	6130	5640	1780	1510
6	2030	1970	3500	18900	5880	7470	8920	17300	7210	5750	1820	1850
7	1990	2010	3600	17700	6620	6230	8080	16700	8930	6960	1580	1840
8	1990	1990	3600	16500	6620	6160	7040	15800	9370	7650	1340	1830
9	2000	1970	3600	12200	6590	6130	6010	15000	10500	5260	1350	1880
10	2010	2000	3230	7400	6550	5910	6000	13700	11500	3460	1320	1860
11	2010	2320	3170	7260	6510	5450	5970	12800	11900	2940	1100	1870
12	2050	2350	3270	7030	6310	6050	6090	12500	10500	2840	1140	1860
13	2050	2350	3270	6810	6030	6020	6940	12100	11400	3220	1170	1870
14	2140	2360	3260	7050	5800	6010	7180	9670	11800	3910	1170	1870
15	1990	2370	3290	6750	5800	5940	8610	6370	11800	3550	1440	1890
16	2050	2360	3400	6250	6680	5920	8570	6200	11200	3270	1450	1840
17	2050	2360	3390	6310	10800	5980	8600	6160	10600	3300	1460	1830
18	2060	2360	3410	6210	14900	6300	8510	6160	10700	3240	1450	1890
19	2030	2410	3460	6190	16400	6860	8110	6830	11500	3230	1360	1880
20	2060	2350	3730	6170	17400	6860	8930	9300	12800	3010	1220	1820
21	2060	2400	3780	6140	18200	6850	9300	11400	12800	2570	1190	1910
22	2090	2500	4000	6030	18500	6830	9450	12400	13000	2580	1180	1900
23	2060	2500	4340	5910	18300	6810	10100	12900	13500	2400	1010	1900
24	2070	2500	5280	5780	17800	6800	12500	12900	12800	1980	997	1880
25	2100	2500	5560	4740	17300	6780	15700	12900	11100	2020	989	1910
26	2080	2500	13200	5750	16500	7400	16700	13400	9340	1990	1010	1920
27	2080	2500	18000	5860	13300	7870	17000	13300	9400	2000	976	1930
28	2090	2500	21800	5870	10800	5990	17000	13300	9130	2440	995	1950
29	2100	2500	24500	5870	---	5910	16900	11200	6890	2430	984	1940
30	2100	2500	25500	5780	---	5900	17200	8010	5750	2440	961	1950
31	2070	---	25400	5850	---	5920	---	8070	---	1990	982	---
TOTAL	63300	68830	214940	314410	288820	217290	296740	387170	304570	114190	41074	52618
MEAN	2042	2294	6934	10140	10320	7009	9891	12490	10150	3684	1325	1754
MAX	2140	2500	25500	24600	18500	11100	17200	18500	13500	7650	1940	1950
MIN	1930	1950	2200	4740	5790	5450	5970	6160	5750	1980	961	960
AC-FT	125600	136500	426300	623600	572900	431000	588600	768000	604100	226500	81470	104400

CAL YR 1980 TOTAL 1924020 MEAN 5257 MAX 25500 MIN 1080 AC-FT 3816000
WTR YR 1981 TOTAL 2363952 MEAN 6477 MAX 25500 MIN 960 AC-FT 4689000

12424000 HANGMAN CREEK AT SPOKANE, WA

LOCATION.--Lat 47°39'10", long 117°26'55", in NW¼ sec.24, T.25 N., R.42 E., Spokane County, Hydrologic Unit 17010306, on left bank 0.3 mi (0.5 km) downstream from bridge on Interstate 90 in Spokane, and at mile 0.8 (1.3 km).

DRAINAGE AREA.--689 mi^2 (1,785 km^2).

PERIOD OF RECORD.--April 1948 to September 1977; October 1977 to September 1978 (discharges above 20 ft^3/s (0.57 m^3/s) only), October 1978 to current year. Prior to October 1958, published as Latah Creek at Spokane.

REVISED RECORDS.--WSP 1933: Drainage area. WSP 2133: 1965(P).

GAGE.--Water-stage recorder. Datum of gage is 1,717.42 ft (523.470 m) National Geodetic Vertical Datum of 1929 (levels by Corps of Engineers). Prior to Nov. 22, 1948, nonrecording gage at site 0.5 mi (0.8 km) upstream at different datum.

REMARKS.--Records fair. No regulation. Some diversions for irrigation above station. National Weather Service telemeter at station.

AVERAGE DISCHARGE.--32 years (water years 1949-77, 1979-81), 244 ft^3/s (6.910 m^3/s), 4.81 in/yr (122 mm/yr), 176,800 acre-ft/yr (218 hm^3/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 20,600 ft^3/s (583 m^3/s) Feb. 3, 1963, gage height, 13.35 ft (4.069 m); minimum, 1.4 ft^3/s (0.040 m^3/s) Sept. 6, 7, 9, 10, 14-17, 1973; minimum gage height, 1.43 ft (0.436 m) part or all of each day Aug. 19, 20, 28, Sept. 14, 15, 17-22, 1981.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 2,500 ft^3/s (70.8 m^3/s) and maximum (*):

Date	Time	Discharge (ft^3/s)	Discharge (m^3/s)	Gage height (ft)	Gage height (m)	Date	Time	Discharge (ft^3/s)	Discharge (m^3/s)	Gage height (ft)	Gage height (m)
Feb. 14	2015	4,430	125	7.52	2.292	Feb. 16	2015	*6,400	181	*8.60	2.621

Minimum discharge, 3.9 ft^3/s (0.11 m^3/s) part or all of each day Aug. 19, 20, 28, Sept. 14, 15, 17-22, gage height, 1.43 ft (0.436 m).

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	6.5	12	18	485	237	264	858	195	104	38	8.9	7.1
2	6.5	12	21	308	180	250	626	161	94	35	8.9	6.2
3	6.8	12	29	261	145	237	422	158	90	34	8.5	6.2
4	7.1	12	42	189	125	223	399	158	86	29	8.5	6.2
5	6.8	12	47	151	111	220	320	172	82	30	8.9	6.5
6	6.5	14	35	140	113	230	294	177	76	28	8.5	5.9
7	6.8	16	30	122	100	201	293	155	88	30	8.5	5.5
8	6.8	20	25	111	90	189	264	153	127	32	7.8	5.5
9	6.5	18	27	102	80	174	565	161	177	32	7.1	5.2
10	6.5	16	28	94	40	163	590	150	344	34	6.2	5.5
11	6.8	15	30	82	44	153	382	135	195	37	5.9	5.2
12	7.5	16	28	67	48	142	352	127	145	32	5.9	4.9
13	7.5	18	31	69	53	135	312	130	132	29	6.2	4.2
14	7.8	16	27	64	2770	123	243	132	123	25	6.2	3.9
15	8.5	14	28	59	2920	120	210	404	113	24	5.9	4.6
16	9.2	14	32	56	4550	125	195	540	96	21	5.9	4.9
17	9.2	13	32	50	3460	207	166	336	84	20	5.9	4.2
18	8.9	13	32	60	1720	254	150	271	82	20	5.2	3.9
19	8.5	14	32	56	1840	180	142	230	86	19	4.6	3.9
20	8.5	14	34	50	1400	150	132	207	145	17	5.2	3.9
21	9.6	18	40	53	837	142	125	204	127	16	5.5	4.6
22	9.6	16	59	60	626	125	125	217	102	15	5.9	4.2
23	9.6	18	305	69	545	123	153	254	94	14	5.9	4.2
24	9.6	18	210	991	465	155	525	186	94	13	5.9	4.2
25	10	19	594	1130	445	169	565	177	90	12	5.9	4.2
26	11	25	1780	413	404	233	328	207	69	12	5.5	4.6
27	11	22	956	261	328	674	261	284	57	11	5.2	7.1
28	11	19	495	258	290	445	214	210	50	11	4.6	7.1
29	11	18	297	480	---	348	207	150	47	10	4.6	7.8
30	11	18	268	480	---	336	214	120	42	10	4.9	8.2
31	11	---	844	316	---	340	---	111	---	9.2	5.5	---
TOTAL	263.6	482	6456	7087	23966	6830	9632	6272	3241	699.2	198.1	159.6
MEAN	8.50	16.1	208	229	856	220	321	202	108	22.6	6.39	5.32
MAX	11	25	1780	1130	4550	674	858	540	344	38	8.9	8.2
MIN	6.5	12	18	50	40	120	125	111	42	9.2	4.6	3.9
CFSM	.01	.02	.30	.33	1.24	.32	.47	.29	.16	.03	.009	.008
IN.	.01	.03	.35	.38	1.29	.37	.52	.34	.17	.04	.01	.01
AC-FT	523	956	12810	14060	47540	13550	19110	12440	6430	1390	393	317

CAL YR 1980	TOTAL	47839.7	MEAN 131	MAX 1840	MIN 6.4	CFSM .19	IN 2.58	AC-FT	94890	
WTR YR 1981	TOTAL	65286.5	MEAN 179	MAX 4550	MIN 3.9	CFSM .26	IN 3.52	AC-FT	129500	

12424200 SPOKANE RIVER AT RIVERSIDE STATE PARK, AT SPOKANE, WA
(National Water Quality Surveillance System)

LOCATION.--Lat 47°41'48", long 117°29'48", in SE¼NE¼ sec.4, T.25 N., R.42 E., Spokane County, Hydrologic Unit 17010307, at Riverside State Park on west edge of Spokane, and at mile 66.1 (106.4 km).

DRAINAGE AREA.--5,010 mi^2 (12,980 km^2), approximately.

PERIOD OF RECORD.--Water years 1973 to September 1981 (discontinued).

WATER QUALITY DATA, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SPE-CIFIC CON-DUCT-ANCE (UMHOS)	SPE-CIFIC CON-DUCT-ANCE LAB (UMHOS)	PH (UNITS)	PH LAB (UNITS)	TEMPER-ATURE (DEG C)	TUR-BID-ITY (FTU)	OXYGEN, DIS-SOLVED (MG/L)	OXYGEN DEMAND, CHEM-ICAL (HIGH LEVEL) (MG/L)	COLI-FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)	HARD-NESS (MG/L AS CACO3)
OCT, 1980												
21...	1230	2210	150	152	8.1	7.8	11.4	.40	9.7	7	31	59
NOV												
19...	1300	2480	138	139	8.0	7.5	7.8	.80	11.2	5	42	55
DEC												
17...	1245	3430	111	120	8.0	7.9	6.0	.40	11.9	18	20	--
JAN, 1981												
21...	1300	6280	104	110	7.8	7.6	5.0	.80	12.4	18	12	44
FEB												
23...	1200	19000	76	77	8.0	7.3	4.0	3.9	13.4	0	K5	29
MAR												
17...	1030	6240	97	102	8.0	7.6	5.8	2.0	12.7	13	K15	42
APR												
22...	1100	9710	80	85	7.3	7.2	7.3	1.7	11.8	56	K1400	36
MAY												
20...	1330	10900	83	87	7.1	7.4	11.5	1.6	10.8	3	740	35
JUN												
16...	1230	11900	70	71	7.1	7.5	14.3	1.5	10.3	14	200	28
JUL												
22...	1315	2690	138	147	7.1	8.0	18.5	1.5	9.0	17	8	64
AUG												
18...	1215	1300	--	181	7.6	8.1	19.4	1.0	8.5	35	50	80
SEP												
17...	0930	2020	150	152	7.9	7.4	16.9	1.5	8.5	29	K44	64

DATE	HARD-NESS NONCAR-BONATE (MG/L AS CACO3)	CALCIUM TOTAL RECOV-ERABLE (MG/L AS CA)	CALCIUM SUS-PENDED (MG/L AS CA)	CALCIUM DIS-SOLVED (MG/L AS CA)	MAGNE-SIUM, TOTAL RECOV-ERABLE (MG/L AS MG)	MAGNE-SIUM, SUS-PENDED TOTAL (MG/L AS MG)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG)	SODIUM, TOTAL RECOV-ERABLE (MG/L AS NA)	SODIUM, DIS-SOLVED (MG/L AS NA)	PERCENT SODIUM	SODIUM AD-SORP-TION RATIO
OCT, 1980											
21...	4.0	--	--	15	--	--	5.3	--	4.3	13	.2
NOV											
19...	21	--	--	14	--	--	4.8	--	3.7	13	.2
DEC											
17...	--	12	--	--	4.8	--	--	3.0	--	--	--
JAN, 1981											
21...	.00	--	--	12	--	--	3.5	--	3.2	13	.2
FEB											
23...	11	--	--	7.8	--	--	2.4	--	2.3	14	.2
MAR											
17...	15	7.8	.00	11	2.9	.0	3.5	1.6	3.0	13	.2
APR											
22...	9.0	--	--	10	--	--	2.6	--	2.5	13	.2
MAY											
20...	7.0	--	--	9.1	--	--	3.0	--	2.8	14	.2
JUN											
16...	3.0	6.4	.00	7.4	2.1	.0	2.2	1.7	2.0	13	.2
JUL											
22...	8.0	--	--	16	--	--	5.8	--	3.7	11	.2
AUG											
18...	12	--	--	20	--	--	7.3	--	4.6	11	.2
SEP											
17...	3.0	11	.00	16	4.7	.0	5.9	2.6	3.6	11	.2

K Results based on colony counts outside the acceptable range.

12424200 SPOKANE RIVER AT RIVERSIDE STATE PARK, AT SPOKANE, WA--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	POTASSIUM, TOTAL RECOVERABLE (MG/L AS K)	POTASSIUM, DISSOLVED (MG/L AS K)	ALKALINITY LAB (MG/L AS CACO3)	SULFATE DISSOLVED (MG/L AS SO4)	CHLORIDE, DISSOLVED (MG/L AS CL)	SILICA, DISSOLVED (MG/L AS SIO2)	SOLIDS, RESIDUE AT 180 DEG. C DISSOLVED (MG/L)	SOLIDS, SUM OF CONSTITUENTS, DISSOLVED (MG/L)	SOLIDS, DISSOLVED (TONS PER AC-FT)	SOLIDS, DISSOLVED (TONS PER DAY)	SOLIDS, RESIDUE AT 105 DEG. C, SUSPENDED (MG/L)
OCT											
21...	--	1.4	55	13	3.5	8.0	87	84	.12	519	3
NOV											
19...	--	1.3	50	13	3.2	8.4	84	79	.11	562	--
DEC											
17...	1.0	--	32	13	2.2	8.3	64	55	.09	593	2
JAN											
21...	--	.9	32	14	1.6	8.2	64	65	.09	1090	2
FEB											
23...	--	.9	18	14	2.0	9.2	51	50	.07	2620	1
MAR											
17...	.7	1.1	27	14	1.6	8.9	58	59	.08	977	0
APR											
22...	--	.9	27	13	1.5	8.8	61	56	.08	1600	0
MAY											
20...	--	.9	28	10	1.6	9.5	57	54	.08	1680	1
JUN											
16...	.8	.8	25	4.9	.9	8.6	43	42	.06	1380	1
JUL											
22...	--	1.4	56	9.7	2.9	13	84	88	.11	610	4
AUG											
18...	--	1.4	68	11	4.5	9.6	102	102	.14	358	0
SEP											
17...	1.2	1.4	61	12	3.0	8.8	86	87	.12	469	0

DATE	SOLIDS, RESIDUE AT 105 DEG. C, TOTAL (MG/L)	NITROGEN, NITRATE DISSOLVED (MG/L AS N)	NITROGEN, NO2+NO3 TOTAL (MG/L AS N)	NITROGEN, NO2+NO3 DISSOLVED (MG/L AS N)	NITROGEN, AMMONIA TOTAL (MG/L AS N)	NITROGEN, ORGANIC TOTAL (MG/L AS N)	NITROGEN, AMMONIA + ORGANIC TOTAL (MG/L AS N)	NITROGEN, TOTAL (MG/L AS N)	PHOSPHORUS, TOTAL (MG/L AS P)	PHOSPHORUS, ORTHO, DISSOLVED (MG/L AS P)	CARBON, ORGANIC TOTAL (MG/L AS C)
OCT											
21...	--	--	.50	--	.100	.85	.95	1.5	.040	.020	4.3
NOV											
19...	--	--	.52	--	.040	.33	.37	.89	.060	.020	--
DEC											
17...	75	--	.42	--	.030	.61	.64	1.1	.030	.010	3.0
JAN											
21...	--	--	.51	.39	.060	.54	.60	1.1	.030	.010	2.0
FEB											
23...	--	--	.17	--	.000	.55	.55	.72	.120	.010	2.1
MAR											
17...	--	--	.32	--	.040	.30	.34	.66	.050	.010	2.0
APR											
22...	--	--	.22	--	.100	.49	.59	.81	.040	.010	2.3
MAY											
20...	--	--	.16	--	.180	.32	.50	.66	.060	.040	2.8
JUN											
16...	--	--	.12	--	.070	.75	.82	.94	.030	.020	1.4
JUL											
22...	--	.41	.44	.43	.180	.22	.40	.84	.040	.030	1.5
AUG											
18...	--	--	.61	.62	.160	.22	.38	.99	.030	<.010	1.3
SEP											
17...	--	--	.71	--	.060	.80	.86	1.6	.080	.020	1.6

DATE	TIME	ARSENIC TOTAL (UG/L AS AS)	ARSENIC DISSOLVED (UG/L AS AS)	BARIUM, DISSOLVED (UG/L AS BA)	CADMIUM TOTAL RECOVERABLE (UG/L AS CD)	CADMIUM DISSOLVED (UG/L AS CD)	CHROMIUM, TOTAL RECOVERABLE (UG/L AS CR)	CHROMIUM, DISSOLVED (UG/L AS CR)	COPPER, TOTAL RECOVERABLE (UG/L AS CU)	COPPER, DISSOLVED (UG/L AS CU)
OCT										
21...	1230	--	1	30	--	<1	--	0	--	2
NOV										
19...	1300	--	1	20	--	<1	--	10	--	3
DEC										
17...	1245	1	--	--	0	--	0	--	30	--
JAN										
21...	1300	--	5	30	--	3	--	10	--	4
FEB										
23...	1200	--	1	30	--	3	--	0	--	3
MAR										
17...	1030	1	--	--	1	--	20	--	5	--
APR										
22...	1100	--	1	10	--	2	--	10	--	2
MAY										
20...	1330	--	1	20	--	<1	--	10	--	3
JUN										
16...	1230	1	--	--	2	--	10	--	8	--
JUL										
22...	1315	--	1	20	--	<1	--	0	--	0
AUG										
18...	1215	--	1	30	--	<1	--	0	--	2
SEP										
17...	0930	1	--	--	1	--	10	--	10	--

12424200 SPOKANE RIVER AT RIVERSIDE STATE PARK, AT SPOKANE, WA--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	IRON, TOTAL RECOV-ERABLE (UG/L AS FE)	IRON, DIS-SOLVED (UG/L AS FE)	LEAD, TOTAL RECOV-ERABLE (UG/L AS PB)	LEAD, DIS-SOLVED (UG/L AS PB)	MERCURY TOTAL RECOV-ERABLE (UG/L AS HG)	SELE-NIUM, TOTAL (UG/L AS SE)	SELE-NIUM, DIS-SOLVED (UG/L AS SE)	SILVER, DIS-SOLVED (UG/L AS AG)	ZINC, TOTAL RECOV-ERABLE (UG/L AS ZN)	ZINC, DIS-SOLVED (UG/L AS ZN)
OCT , 1980										
21...	--	--	--	0	.0	--	0	0	--	90
NOV										
19...	--	--	--	2	.0	--	0	0	--	100
DEC										
17...	--	--	0	--	.0	0	--	--	130	--
JAN , 1981										
21...	--	--	--	3	.1	--	0	0	--	170
FEB										
23...	--	--	--	2	.1	--	0	0	--	160
MAR										
17...	160	--	12	--	.2	0	--	--	160	--
APR										
22...	--	--	--	0	.3	--	0	0	--	180
MAY										
20...	--	--	--	5	.1	--	0	0	--	90
JUN										
16...	160	--	25	--	.2	0	--	--	120	--
JUL										
22...	--	20	--	3	.0	--	0	0	--	60
AUG										
18...	--	--	--	4	.3	--	0	0	--	34
SEP										
17...	60	--	72	--	.2	0	--	--	70	--

12431000 LITTLE SPOKANE RIVER AT DARTFORD, WA

LOCATION.--Lat 47°47'05", long 117°24'12", in NE¼NW¼ sec.5, T.26 N., R.43 E., Spokane County, Hydrologic Unit 17010308, on left bank 50 ft (15 m) upstream from county bridge, 0.5 mi (0.8 km) east of Dartford, 1.7 mi (2.7 km) douwnstream from Deadman Creek, 7.5 mi (12.1 km) north of Spokane, and at mile 11.4 (18.3 km).

DRAINAGE AREA.--665 mi^2 (1,722 km^2).

PERIOD OF RECORD.--April 1929 to September 1932, December 1946 to current year. Chemical analyses July 1960 to September 1970, water temperatures July 1968 to September 1970.

REVISED RECORDS.--WSP 1216: Drainage area. WSP 1286: 1930, 1932(M), 1947-49(M). WSP 1446: 1951(M).

GAGE.--Water-stage recorder. Altitude of gage is 1,590 ft (485 m), from topographic map. Prior to Mar. 16, 1951, nonrecording gage and Mar. 16, 1951, to July 5, 1961, water-stage recorder, at site 0.5 mi (0.8 km) downstream at different datum.

REMARKS.--Records excellent. No regulation. Small diversions for irrigation above station.

AVERAGE DISCHARGE.--37 years (water years 1930-32, 1948-81), 307 ft^3/s (8.694 m^3/s), 6.27 in/yr (159 mm/yr), 222,400 acre-ft/yr (274 hm^3/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 3,170 ft^3/s (89.8 m^3/s) Feb. 17, 1970, gage height, 7.29 ft (2.222 m); minimum observed, 63 ft^3/s (1.78 m^3/s) July 24, 1930, gage height, 1.07 ft (0.326 m), site and datum then in use.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 776 ft^3/s (22.0 m^3/s) Feb. 16, gage height, 4.06 ft (1.238 m); minimum, 104 ft^3/s (2.95 m^3/s) Aug. 26, gage height, 1.82 ft (0.555 m).

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	119	135	165	308	234	422	543	333	286	224	135	116
2	119	141	171	294	227	405	495	321	269	219	132	121
3	119	144	200	282	222	392	457	312	264	212	132	121
4	119	144	295	274	209	389	454	324	259	205	132	121
5	119	146	315	267	212	412	436	333	248	200	130	121
6	119	146	251	260	210	395	429	318	264	203	128	121
7	121	167	212	254	206	373	419	303	253	214	123	118
8	123	185	175	249	204	357	412	292	275	209	119	118
9	121	167	207	243	201	345	523	283	383	200	116	116
10	121	165	205	234	160	336	531	286	351	198	116	114
11	123	165	205	222	170	324	471	303	318	198	116	114
12	126	159	200	217	186	315	471	345	300	192	114	116
13	130	155	194	214	194	312	461	321	295	189	113	114
14	135	152	192	208	276	306	443	306	292	192	113	114
15	137	152	189	204	377	297	436	367	342	187	114	114
16	139	148	192	190	587	315	422	367	315	183	114	114
17	139	148	194	189	683	357	408	342	292	177	113	114
18	135	150	192	200	587	330	399	333	289	171	113	113
19	135	152	189	198	675	318	392	324	333	167	113	114
20	135	154	187	197	727	306	386	327	321	163	113	118
21	139	159	196	195	627	300	376	342	306	163	109	119
22	137	212	248	196	579	300	379	339	303	157	109	119
23	139	200	280	205	551	297	402	324	336	155	108	121
24	137	177	256	293	531	295	412	315	312	152	109	123
25	137	171	314	288	523	306	392	312	289	148	108	123
26	137	169	370	252	507	389	376	339	272	144	108	126
27	135	167	377	243	468	399	361	318	259	144	109	133
28	135	165	337	245	440	364	354	300	251	142	109	135
29	135	167	312	258	---	351	354	283	243	141	109	133
30	135	167	322	258	---	348	342	278	233	139	111	130
31	135	---	327	244	---	367	---	306	---	137	109	---
TOTAL	4035	4829	7469	7381	10773	10722	12736	9896	8753	5525	3597	3594
MEAN	130	161	241	238	385	346	425	319	292	178	116	120
MAX	139	212	377	308	727	422	543	367	383	224	135	135
MIN	119	135	165	189	160	295	342	278	233	137	108	113
CFSM	.20	.24	.36	.36	.58	.52	.64	.48	.44	.27	.17	.18
IN.	.23	.27	.42	.41	.60	.60	.71	.55	.49	.31	.20	.20
AC-FT	8000	9580	14810	14640	21370	21270	25260	19630	17360	10960	7130	7130

CAL YR 1980 TOTAL 78811 MEAN 215 MAX 667 MIN 100 CFSM .32 IN 4.41 AC-FT 156300
WTR YR 1981 TOTAL 89310 MEAN 245 MAX 727 MIN 108 CFSM .37 IN 5.00 AC-FT 177100

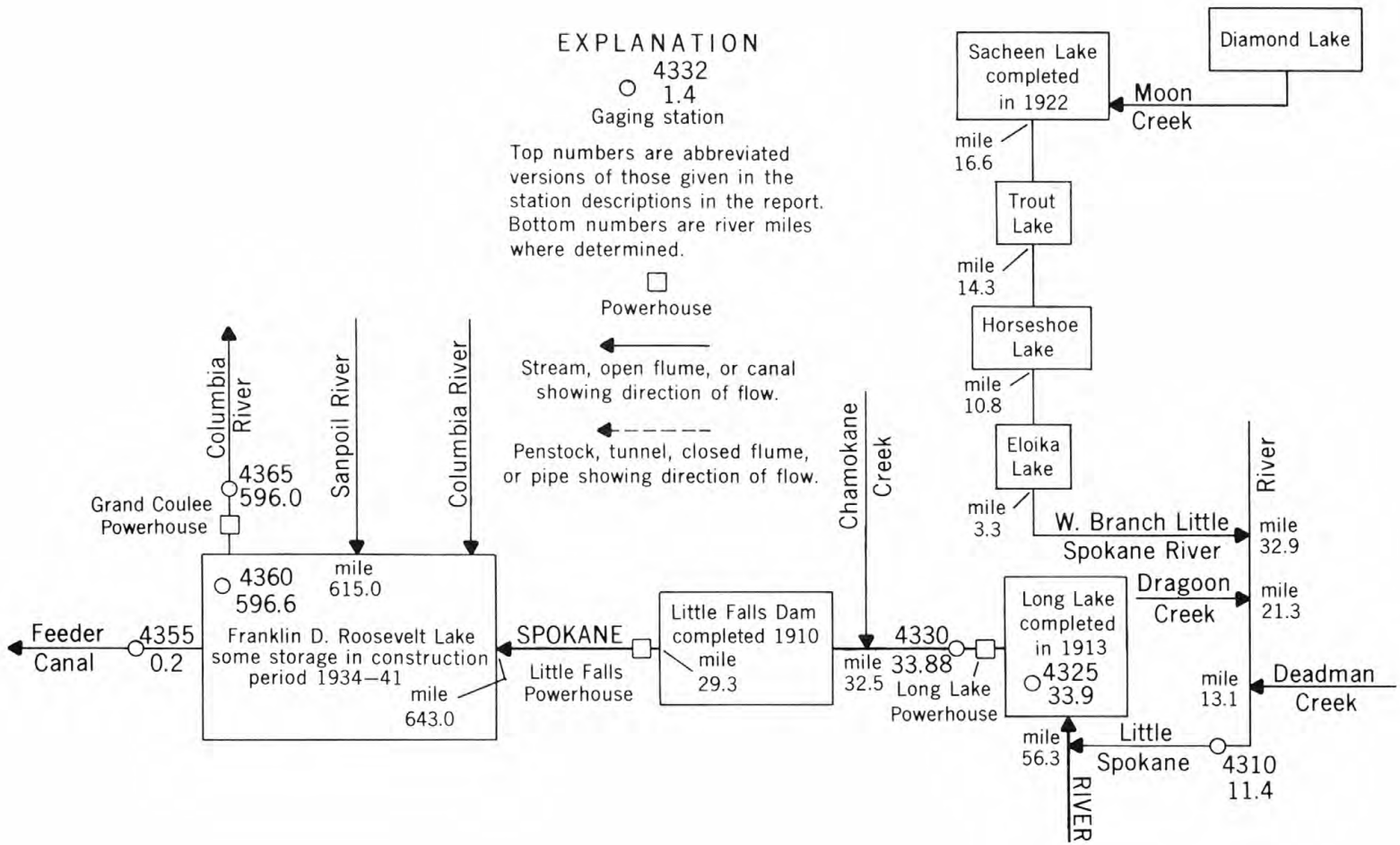

Figure 9. Gaging stations in Spokane River basin from Little Spokane River downstream and at Grand Coulee Dam.

12432500 LONG LAKE AT LONG LAKE, WA

LOCATION.--Lat 47°50'12", long 117°50'20", in NW¼SW¼ sec.13, T.27 N., R.39 E., Lincoln County, Hydrologic Unit 17010307, at left end of spillway at Long Lake Dam on Spokane River, 12 mi (19 km) north of Reardan, and at mile 33.9 (54.5 km).

DRAINAGE AREA.--6,020 mi^2 (15,600 km^2), approximately.

PERIOD OF RECORD.--October 1913 to current year. Prior to October 1950 monthend contents only, published in WSP 1316. October 1950 to September 1977 monthend stage and contents only.

REVISED RECORDS.--WSP 1736: Monthend contents for 1916-33 corrected. WSP 1933: Drainage area.

GAGE.--Water-stage recorder with remote indicator in powerhouse. Datum of gage is National Geodetic Vertical Datum of 1929 (levels by Washington Water Power Co.).

REMARKS.--Reservoir is formed by concrete dam, completed in 1913 and raised in 1950. Capacity, 104,200 acre-ft (128 hm^3) between elevations 1,512 ft (460.9 m) and 1,536 ft (468.2 m), normal limits of operation. Contents at elevation 1,512 ft (460.9 m) by capacity table used prior to October 1915, 148,600 acre-ft (183 hm^3). Records given herein represent usable contents. Water used for power. About 25,000 acres (100 km^2) irrigated above station, largely from wells in the Spokane Valley. Flow regulated by Coeur d'Alene Lake (see sta 12415500) and powerplants along Spokane River.

COOPERATION.--Lake elevations and capacity table furnished by Washington Water Power Co.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 107,600 acre-ft (133 hm^3) Jan. 16, 1974, elevation, 1,536.67 ft (468.377 m); minimum, since filling reservoir in 1920, 5,400 acre-ft (6.66 hm^3) Mar. 8, 1966, elevation, 1,513.50 ft (461.315 m).

EXTREMES FOR CURRENT YEAR.--Maximum contents, 104,163 acre-ft (128 hm^3) May 16, elevation, 1,535.99 (468.170 m); minimum, 86,706 acre-ft (107 hm^3) Feb. 20, elevation, 1,532.45 ft (467.091 m).

Capacity table (elevation, in feet and usable contents, in acre-feet)
(Based on data furnished by Washington Water Power Company)

1,513	3,570	1,528	65,460	1,534	94,240
1,517	18,640	1,531	79,740	1,535	99,190
1,520	30,550	1,532	84,540	1,536	104,200
1,522	38,880	1,533	89,360	1,537	109,300
1,526	56,330				

ELEVATION (FEET NGVD), WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981
INSTANTANEOUS OBSERVATIONS AT 2400

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1535.16	1535.36	1535.34	1534.39	1535.54	1535.57	1535.75	1534.18	1535.83	1535.81	1535.63	1535.63
2	1535.30	1535.35	1535.52	1534.43	1535.48	1535.68	1535.51	1534.18	1535.75	1535.66	1535.59	1535.54
3	1535.26	1535.53	1535.22	1534.37	1535.37	1535.54	1535.54	1534.23	1535.65	1535.76	1535.52	1535.61
4	1535.30	1535.44	1535.13	1534.48	1535.28	1535.53	1535.56	1534.33	1535.70	1535.84	1535.51	1535.56
5	1535.51	1535.53	1535.10	1534.46	1535.16	1535.39	1535.55	1534.50	1535.72	1535.84	1535.44	1535.52
6	1535.39	1535.49	1535.12	1534.38	1535.04	1535.35	1535.48	1534.94	1535.84	1535.82	1535.67	1535.41
7	1535.46	1535.54	1535.36	1534.47	1535.12	1535.54	1535.45	1535.07	1535.67	1535.69	1535.74	1535.41
8	1535.49	1535.53	1535.43	1534.40	1535.29	1535.61	1535.43	1535.10	1535.61	1535.71	1535.54	1535.48
9	1535.46	1535.53	1535.44	1534.20	1535.38	1535.71	1535.56	1535.22	1535.50	1535.67	1535.72	1535.41
10	1535.46	1535.41	1535.44	1534.52	1535.45	1535.73	1535.74	1535.27	1535.55	1535.49	1535.69	1535.36
11	1535.44	1535.24	1535.62	1534.58	1535.52	1535.57	1535.74	1535.46	1535.49	1535.48	1535.62	1535.30
12	1535.45	1535.06	1535.41	1534.99	1535.54	1535.54	1535.72	1535.50	1535.45	1535.34	1535.48	1535.30
13	1535.46	1535.00	1535.45	1535.07	1535.48	1535.56	1535.80	1535.44	1535.53	1535.23	1535.57	1535.64
14	1535.55	1534.90	1535.30	1535.42	1535.52	1535.52	1535.69	1535.62	1535.53	1535.40	1535.50	1535.77
15	1535.40	1534.88	1535.29	1535.72	1535.37	1535.47	1535.59	1535.94	1535.53	1535.54	1535.47	1535.51
16	1535.45	1534.96	1535.36	1535.80	1535.55	1535.41	1535.62	1535.79	1535.47	1535.70	1535.67	1535.45
17	1535.41	1535.23	1535.48	1535.79	1534.45	1535.39	1535.53	1535.79	1535.56	1535.66	1535.67	1535.32
18	1535.40	1535.45	1535.55	1535.80	1533.64	1535.41	1535.41	1535.82	1535.64	1535.55	1535.69	1535.35
19	1535.59	1535.60	1535.66	1535.80	1533.09	1535.51	1535.36	1535.77	1535.54	1535.57	1535.66	1535.25
20	1535.48	1535.45	1535.64	1535.79	1532.54	1535.58	1535.60	1535.48	1535.60	1535.62	1535.55	1535.47
21	1535.37	1535.29	1535.49	1535.77	1532.91	1535.69	1535.69	1535.57	1535.56	1535.60	1535.43	1535.60
22	1535.40	1535.02	1535.37	1535.74	1533.90	1535.74	1535.62	1535.44	1535.56	1535.53	1535.35	1535.61
23	1535.37	1534.99	1535.28	1535.71	1534.63	1535.77	1535.64	1535.38	1535.52	1535.56	1535.43	1535.57
24	1535.46	1534.93	1535.23	1535.71	1535.07	1535.80	1535.52	1535.54	1535.44	1535.58	1535.46	1535.51
25	1535.52	1534.81	1535.25	1535.51	1534.98	1535.73	1534.93	1535.63	1535.52	1535.61	1535.51	1535.44
26	1535.52	1534.96	1534.33	1535.52	1534.88	1535.70	1534.62	1535.67	1535.72	1535.48	1535.57	1535.39
27	1535.52	1535.12	1533.70	1535.54	1535.24	1535.81	1534.94	1535.59	1535.63	1535.50	1535.61	1535.38
28	1535.50	1535.27	1534.13	1535.52	1535.51	1535.68	1535.02	1535.48	1535.67	1535.68	1535.62	1535.35
29	1535.43	1535.30	1534.69	1535.53	---	1535.70	1534.87	1535.62	1535.79	1535.69	1535.68	1535.35
30	1535.48	1535.44	1534.47	1535.60	---	1535.69	1534.61	1535.72	1535.72	1535.53	1535.73	1535.39
31	1535.53	---	1534.52	1535.57	---	1535.74	---	1535.86	---	1535.59	1535.56	---
MEAN	1535.44	1535.25	1535.17	1535.18	1534.89	1535.60	1535.44	1535.33	1535.61	1535.60	1535.58	1535.46
MAX	1535.59	1535.60	1535.66	1535.80	1535.55	1535.81	1535.80	1535.94	1535.84	1535.84	1535.74	1535.77
MIN	1535.16	1534.81	1533.70	1534.20	1532.54	1535.35	1534.61	1534.18	1535.44	1535.23	1535.35	1535.25
†	101,855	101,403	96,815	102,055	101,754	102,908	97,261	103,511	102,808	102,156	102,005	101,152
‡	+1,155	-452	-4,588	+5,240	-301	+1,154	-5,647	+6,250	-703	-652	-151	-853

CAL YR 1980.....‡ -4,939
WTR YR 1981.....† +452

† Total contents, in acre-feet, at end of month.
‡ Change in contents, in acre-feet.

12433000 SPOKANE RIVER AT LONG LAKE, WA
(National Stream Quality Accounting Network Station)

LOCATION.--Lat 47°50'12", long 117°50'25", in NW¼SW¼ sec.13, T.27 N., R.39 E., Lincoln County, Hydrologic Unit 17010307, on left bank at Long Lake powerhouse, 1.4 mi (2.3 km) upstream from Chamokane Creek, 12 mi (19 km) north of Reardan, and at mile 33.88 (54.51 km).

DRAINAGE AREA.--6,020 mi^2 (15,590 km^2), approximately.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--April 1939 to current year.

REVISED RECORDS.--WSP 1933: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 1,299.00 ft (395.935 m) National Geodetic Vertical Datum of 1929.

REMARKS.--Flow regulated by Coeur d'Alene Lake (see sta 12415500) and Long Lake (see sta 12432500) for powerplants of Washington Water Power Co. About 25,000 acres (100 km^2) irrigated above station, largely from wells in the Spokane Valley.

COOPERATION.--Discharge records furnished by Washington Water Power Co.; one discharge measurement made by Geological Survey.

AVERAGE DISCHARGE.--42 years, 7,935 ft^3/s (224.7 m^3/s), 5,749,000 acre-ft/yr (7,090 hm^3), adjusted for storage in Long Lake.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 49,700 ft^3/s (1,410 m^3/s) Jan. 19, 1974, gage height, 78.40 ft (23,896 m); maximum recorded gage height, 78.66 ft (23.976 m) May 24, 1948; minimum daily discharge, 114 ft^3/s (3.23 m^3/s) Sept. 2, 1956.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 26,500 ft^3/s (750 m^3/s) Dec. 31, elevation, 1,370.99 ft (417.878 m); minimum, 1200 ft^3/s (34.0 m^3/s) Sept. 3, elevation, 1,361.12 ft (414.869 m).

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2760	3210	3210	25500	7240	11900	7960	19600	10600	6400	1580	1430
2	2740	2780	3130	24100	7400	12300	10400	18900	10300	6410	2710	2000
3	2660	2400	4620	23300	7150	12300	10500	19100	9580	6340	2660	1340
4	2060	2810	4070	21800	7230	11200	10600	19300	7890	6400	2720	1740
5	2050	2630	4020	20600	7450	11200	10800	18400	7270	6620	2550	2290
6	2730	2760	4000	20000	7120	9280	10700	17600	7480	6690	1660	2720
7	2660	2770	3400	18400	7260	7120	9880	17500	10500	7670	2130	2550
8	2660	2770	3660	17500	7240	7040	8950	16800	10800	9090	2470	2260
9	2570	2790	4010	14900	7270	7080	7330	15900	12000	6810	1360	2600
10	2660	2940	3990	7820	7130	7090	7310	15500	12600	5240	1990	2630
11	2710	3350	3470	8500	7260	7000	7670	13400	13200	3980	1990	2660
12	2720	3290	4570	6890	7230	7060	7560	13700	12100	4090	2040	2520
13	2730	3340	3910	7730	7290	6970	8040	13600	12400	4310	1320	1360
14	2710	3320	4570	6950	8380	7470	8820	11700	12900	4210	2050	2200
15	2910	3010	3940	7020	10600	7170	10300	7120	12900	4240	2050	3130
16	2620	2900	3970	7020	10400	7250	9980	8540	12600	3600	1490	2660
17	2790	2310	3890	7040	18200	7280	10400	7520	11500	4270	1990	2890
18	2700	2440	3960	7130	19800	7340	10300	7330	11600	4350	2040	2460
19	2200	2910	3930	7000	20300	7820	9720	8060	12400	3930	2090	2730
20	2910	3340	4750	7060	21100	7760	9440	11200	13400	3690	2160	1640
21	3090	3880	5170	7070	19700	7790	10500	11900	14000	3530	2100	2100
22	2910	3720	5240	7020	17500	7800	11000	13900	14100	3520	2070	2420
23	2600	3490	5760	7030	17900	7750	11000	14200	14500	3070	1430	2640
24	2470	3360	6160	7260	18000	7830	13700	13700	14400	2710	1450	2690
25	2730	3380	6680	8070	19700	8310	18600	14000	12000	2680	1450	2690
26	2740	2690	16700	7250	18300	8580	18200	14200	10800	3240	1420	2700
27	2740	2800	21000	6920	14500	9480	17400	14700	10600	3100	1430	2670
28	2920	2710	20800	7050	11600	8010	17800	14500	10700	2640	1530	2640
29	2610	3010	23100	7270	---	7120	18600	12800	8150	3190	1430	2650
30	2610	2790	25900	7160	---	7040	18800	9340	6830	3740	1420	2610
31	2660	---	26200	7260	---	7080	---	8810	---	2120	2040	---
TOTAL	82630	89900	241780	345620	340250	256420	342260	422820	340100	141880	58820	71620
MEAN	2665	2997	7799	11150	12150	8272	11410	13640	11340	4577	1897	2387
MAX	3090	3880	26200	25500	21100	12300	18800	19600	14500	9090	2720	3130
MIN	2050	2310	3130	6890	7120	6970	7310	7120	6830	2120	1320	1340
AC-FT	163900	178300	479600	685500	674900	508600	678900	838700	674600	281400	116700	142100
†	+1,155	-452	-4,588	+5,240	-301	+1,154	-5,647	+6,250	-703	-652	-151	-853
MEAN‡	2,684	2,989	7,725	11,234	12,145	8,270	11,314	13,742	11,325	4,566	1,895	2,374
AC-FT‡	165,100	177,800	475,000	690,700	674,600	509,800	673,300	845,000	673,900	280,700	116,500	141,200

CAL YR 1980: TOTAL 2,268,830 MEAN 6,199 MAX 26,200 MIN 780 AC-FT 4,500,000
DO...: MEAN‡ 6,192 CFSM‡ 1.03 IN‡ 13.97 AC-FT‡ 4,495,000
WTR YR 1981: TOTAL 2,734,100 MEAN 7,491 MAX 26,200 MIN 1,320 AC-FT 5,423,000
DO...: MEAN‡ 7,491 CFSM‡ 1.24 IN‡ 16.90 AC-FT‡ 5,424,000

† Change in contents, in acre-feet, in Long Lake.
‡ Adjusted for change in contents, in Long Lake.

12433000 SPOKANE RIVER AT LONG LAKE, WA--Continued
(National Stream-Quality Accounting Network Station)

WATER-QUALITY RECORDS

LOCATION.--Water-quality monitor, lat 47°50'26", long 117°51'11", in SE¼NW¼ sec.14, T.27 N., R.39 E., Lincoln County, Hydrologic Unit 17010307, on right bank 0.7 mi (1.1 km) downstream from Long Lake Dam, and 13 mi (21 km) north of Reardan.

PERIOD OF RECORD.--Water years 1959 to current year.

PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: March 1973 to September 1981 (discontinued).
WATER TEMPERATURES: July 1959 to September 1962, October 1966 to September 1970, March 1973 to September 1981 (discontinued).

INSTRUMENTATION.--Water-quality monitor from March 1973 to September 1981 (discontinued).

REMARKS.--Interruptions in the record were due to malfunctions of the instrument. In addition to the water-quality monitor record, samples were collected approximately once a month.

EXTREMES FOR PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: Maximum, 235 micromhos Sept. 8, 1973; minimum, 50 micromhos May 19, 1976.
WATER TEMPERATURES: Maximum, 24.5°C Aug. 18, 1959; minimum, 0.0°C Jan. 21, Feb. 26, 1960.

EXTREMES OUTSIDE PERIOD OF DAILY RECORD.--Specific conductance: Maximum, 238 micromhos Oct. 2-3, 1961.

EXTREMES FOR CURRENT YEAR.--
SPECIFIC CONDUCTANCE: Maximum, 202 micromhos Sept. 20; minimum, 73 micromhos May 10-12.
WATER TEMPERATURES: Maximum, 21.5°C Aug. 9, 10, 19; minimum, 4.0°C Dec. 20-22, 25, 26, Feb. 11-16.

WATER-QUALITY DATA OCTOBER 1980 TO SEPTEMBER 1981

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SPE-CIFIC CON-DUCT-ANCE (UMHOS)	SPE-CIFIC CON-DUCT-ANCE LAB (UMHOS)	PH (UNITS)	PH LAB (UNITS)	TEMPER-ATURE (DEG C)	TUR-BID-ITY (FTU)	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 CACO3)
OCT , 1980												
21...	0930	3830	180	179	7.9	7.8	13.8	.40	7.7	<1	<1	76
NOV												
19...	1030	3910	180	179	7.8	7.7	9.4	.80	9.5	<1	1	77
DEC												
17...	0930	3890	175	175	7.6	7.6	5.1	.50	11.2	<1	1	77
JAN , 1981												
20...	1300	7070	89	94	7.8	7.6	4.7	.50	12.6	1	<1	37
FEB												
17...	1115	35000	123	124	7.8	7.9	4.1	2.7	13.4	5	<1	51
MAR												
18...	1245	7270	99	102	7.7	7.6	5.9	2.1	12.2	<1	<1	42
APR												
21...	1130	10500	107	114	7.8	7.5	7.8	3.7	12.5	<1	1	45
MAY												
21...	1300	11900	83	87	7.1	7.5	11.4	2.7	11.9	4	1	35
JUN												
15...	1245	12900	90	97	7.4	7.8	15.3	1.2	11.3	3	1	39
JUL												
21...	1030	3920	99	110	7.2	7.7	18.2	.50	8.9	<1	1	46
AUG												
18...	1130	2610	154	160	7.8	7.9	20.3	.70	8.0	<1	<1	71
SEP												
16...	1130	3790	184	187	7.6	7.6	18.3	.90	7.9	<1	--	82

DATE	HARD-NESS NONCAR-BONATE (MG/L AS CACO3)	CALCIUM DIS-SOLVED (MG/L AS CA)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG)	SODIUM, DIS-SOLVED (MG/L AS NA)	PERCENT SODIUM	SODIUM AD-SORP-TION RATIO	POTAS-SIUM, DIS-SOLVED (MG/L AS K)	ALKA-LINITY LAB (MG/L AS CACO3)	SULFATE DIS-SOLVED (MG/L AS SO4)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)	FLUO-RIDE, DIS-SOLVED (MG/L AS F)	SILICA, DIS-SOLVED (MG/L AS SIO2)
OCT , 1980												
21...	5.0	19	6.9	4.1	10	.2	1.5	71	11	3.3	.2	8.1
NOV												
19...	6.0	19	7.2	3.5	9	.2	1.6	71	13	3.1	.1	7.5
DEC												
17...	7.0	19	7.2	4.0	10	.2	1.5	70	14	3.0	.2	8.8
JAN , 1981												
20...	7.0	10	2.8	2.8	14	.2	.9	30	12	1.0	.1	8.3
FEB												
17...	8.0	13	4.5	3.5	13	.2	1.2	43	14	1.8	.1	10
MAR												
18...	8.0	11	3.5	3.0	13	.2	1.1	34	13	1.6	.1	9.5
APR												
21...	7.0	12	3.7	2.9	12	.2	1.2	38	14	.8	.1	10
MAY												
21...	8.0	9.4	2.9	2.7	14	.2	.8	27	12	1.2	.0	9.1
JUN												
15...	3.0	10	3.4	2.5	12	.2	1.0	36	8.0	1.6	.1	7.6
JUL												
21...	4.0	12	4.0	2.5	10	.2	1.0	42	9.5	2.9	.0	7.8
AUG												
18...	10	18	6.4	3.6	10	.2	1.2	61	5.0	3.8	.1	8.0
SEP												
16...	8.0	20	7.9	4.2	10	.2	1.7	74	8.0	3.3	.0	9.8

12433000 SPOKANE RIVER AT LONG LAKE, WA--Continued

WATER-QUALITY DATA OCTOBER 1980 TO SEPTEMBER 1981

DATE	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L)	SOLIDS, DIS-SOLVED (TONS PER AC-FT)	SOLIDS, DIS-SOLVED (TONS PER DAY)	NITRO-GEN, NITRATE DIS-SOLVED (MG/L AS N)	NITRO-GEN, NO2+NO3 TOTAL (MG/L AS N)	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N)	NITRO-GEN, AMMONIA TOTAL (MG/L AS N)	NITRO-GEN, AMMONIA DIS-SOLVED (MG/L AS N)	NITRO-GEN, ORGANIC TOTAL (MG/L AS N)	NITRO-GEN, ORGANIC DIS-SOLVED (MG/L AS N)	NITRO-GEN, AM-MONIA + ORGANIC TOTAL (MG/L AS N)
OCT , 1980												
21...	103	99	.14	1070	--	.51	.45	.060	.040	.66	.62	.72
NOV												
19...	101	100	.14	1070	--	.54	.53	.050	.050	1.4	.45	1.40
DEC												
17...	113	103	.15	1190	--	.64	.63	.060	.060	.49	.43	.55
JAN , 1981												
20...	60	57	.08	1150	--	.28	.29	.040	.050	.73	.63	.77
FEB												
17...	74	76	.10	6990	--	.52	.50	.020	.030	1.1	.36	1.10
MAR												
18...	63	65	.09	1240	--	.31	.29	.040	.030	.41	.44	.45
APR												
21...	76	68	.10	2160	--	.25	--	.070	.100	1.5	.35	1.60
MAY												
21...	55	55	.07	1770	--	.23	.17	.150	.130	.63	.32	.78
JUN												
15...	60	56	.08	2090	--	--	.12	.090	.110	.31	.45	.40
JUL												
21...	61	66	.08	646	.16	.21	.18	.120	.120	.28	.33	.40
AUG												
18...	85	85	.12	599	--	.44	.44	.200	.140	.26	.29	.46
SEP												
16...	109	102	.15	1120	--	.51	.49	.070	.100	.77	.42	.84

DATE	NITRO-GEN, NH4 + ORG. SUSP. TOTAL (MG/L AS N)	NITRO-GEN, AM-MONIA + ORGANIC DIS. (MG/L AS N)	NITRO-GEN, TOTAL (MG/L AS N)	NITRO-GEN DIS-SOLVED (MG/L AS N)	PHOS-PHORUS, TOTAL (MG/L AS P)	PHOS-PHORUS, DIS-SOLVED (MG/L AS P)	PHOS-PHORUS, ORTHO, DIS-SOLVED (MG/L AS P)	CARBON, ORGANIC TOTAL (MG/L AS C)	CARBON, ORGANIC DIS-SOLVED (MG/L AS C)	CARBON, ORGANIC SUS-PENDED TOTAL (MG/L AS C)	SEDI-MENT, SUS-PENDED (MG/L)	SEDI-MENT, DIS-CHARGE, SUS-PENDED (T/DAY)
OCT , 1980												
21...	.06	.66	1.2	1.1	.020	.020	--	--	4.5	.2	5	52
NOV												
19...	.90	.50	1.9	1.0	.040	.040	--	1.5	--	--	3	32
DEC												
17...	.06	.49	1.2	1.1	.210	.030	--	4.1	--	--	3	32
JAN , 1981												
20...	.09	.68	1.1	.97	.030	.030	--	--	1.7	.2	4	76
FEB												
17...	.71	.39	1.6	.89	.040	.020	--	13	--	--	5	472
MAR												
18...	.00	.47	.76	.76	.030	.020	--	2.2	--	--	5	98
APR												
21...	1.2	.45	1.9	.45	.040	.020	--	--	2.7	.3	7	198
MAY												
21...	.33	.45	1.0	.62	.030	.020	--	4.1	--	--	10	321
JUN												
15...	.00	.56	--	.68	.030	.020	--	2.3	--	--	5	174
JUL												
21...	.00	.45	.61	.63	.030	.010	.030	1.9	1.9	.1	2	21
AUG												
18...	.03	.43	.90	.87	.020	.030	--	1.6	--	--	1	7.0
SEP												
16...	.32	.52	1.4	1.0	.070	.030	--	1.6	--	--	1	10

DATE	TIME	ARSENIC TOTAL (UG/L AS AS)	ARSENIC SUS-PENDED TOTAL (UG/L AS AS)	ARSENIC DIS-SOLVED (UG/L AS AS)	BARIUM, TOTAL RECOV-ERABLE (UG/L AS BA)	BARIUM, SUS-PENDED RECOV-ERABLE (UG/L AS BA)	BARIUM, DIS-SOLVED (UG/L AS BA)	CADMIUM TOTAL RECOV-ERABLE (UG/L AS CD)	CADMIUM SUS-PENDED RECOV-ERABLE (UG/L AS CD)	CADMIUM DIS-SOLVED (UG/L AS CD)	CHRO-MIUM, TOTAL RECOV-ERABLE (UG/L AS CR)
OCT , 1980											
21...	0930	1	0	2	0	0	40	0	--	<1	0
JAN , 1981											
20...	1300	1	0	1	0	0	20	1	--	<1	0
APR											
21...	1130	1	0	1	100	80	20	0	0	1	10
JUL											
21...	1030	1	0	1	100	80	20	1	--	<1	10

DATE	CHRO-MIUM, SUS-PENDED RECOV. (UG/L AS CR)	CHRO-MIUM, DIS-SOLVED (UG/L AS CR)	COBALT, TOTAL RECOV-ERABLE (UG/L AS CO)	COBALT, DIS-SOLVED (UG/L AS CO)	COPPER, TOTAL RECOV-ERABLE (UG/L AS CU)	COPPER, SUS-PENDED RECOV-ERABLE (UG/L AS CU)	COPPER, DIS-SOLVED (UG/L AS CU)	IRON, TOTAL RECOV-ERABLE (UG/L AS FE)	IRON, SUS-PENDED RECOV-ERABLE (UG/L AS FE)	IRON, DIS-SOLVED (UG/L AS FE)	LEAD, TOTAL RECOV-ERABLE (UG/L AS PB)
OCT , 1980											
21...	0	0	1	<3	8	6	2	110	--	<10	19
JAN , 1981											
20...	0	0	1	<3	19	17	2	160	150	10	21
APR											
21...	0	10	0	<3	21	18	3	230	200	30	10
JUL											
21...	0	10	0	<3	4	2	2	50	10	40	1

12433000 SPOKANE RIVER AT LONG LAKE, WA--Continued

WATER-QUALITY DATA OCTOBER 1980 TO SEPTEMBER 1981

DATE	LEAD, SUS-PENDED RECOV-ERABLE (UG/L AS PB)	LEAD, DIS-SOLVED (UG/L AS PB)	MANGA-NESE, TOTAL RECOV-ERABLE (UG/L AS MN)	MANGA-NESE, SUS-PENDED RECOV. (UG/L AS MN)	MANGA-NESE, DIS-SOLVED (UG/L AS MN)	MERCURY TOTAL RECOV-ERABLE (UG/L AS HG)	MERCURY SUS-PENDED RECOV-ERABLE (UG/L AS HG)	MERCURY DIS-SOLVED (UG/L AS HG)	NICKEL, TOTAL RECOV-ERABLE (UG/L AS NI)	NICKEL, SUS-PENDED RECOV-ERABLE (UG/L AS NI)
OCT , 1980										
21...	19	0	60	60	2	.0	.0	.1	3	3
JAN , 1981										
20...	20	1	90	90	2	.1	.1	.0	1	0
APR										
21...	9	1	20	10	8	.2	.1	.1	3	1
JUL										
21...	0	3	10	7	3	.1	.0	.1	0	0

DATE	NICKEL, DIS-SOLVED (UG/L AS NI)	SELE-NIUM, TOTAL (UG/L AS SE)	SELE-NIUM, SUS-PENDED TOTAL (UG/L AS SE)	SELE-NIUM, DIS-SOLVED (UG/L AS SE)	SILVER, TOTAL RECOV-ERABLE (UG/L AS AG)	SILVER, SUS-PENDED RECOV-ERABLE (UG/L AS AG)	SILVER, DIS-SOLVED (UG/L AS AG)	ZINC, TOTAL RECOV-ERABLE (UG/L AS ZN)	ZINC, SUS-PENDED RECOV-ERABLE (UG/L AS ZN)	ZINC, DIS-SOLVED (UG/L AS ZN)
OCT , 1980										
21...	0	0	0	0	1	1	0	30	20	6
JAN , 1981										
20...	3	0	0	0	1	0	1	190	60	130
APR										
21...	2	0	0	0	0	0	0	150	60	90
JUL										
21...	0	0	0	0	0	0	0	50	0	50

DATE	TIME	PERI-PHYTON BIOMASS ASH WEIGHT G/SQ M	PERI-PHYTON BIOMASS TOTAL DRY WEIGHT G/SQ M	CHLOR-A PERI-PHYTON CHROMO-GRAPHIC FLUOROM (MG/M2)	CHLOR-B PERI-PHYTON CHROMO-GRAPHIC FLUOROM (MG/M2)	BIOMASS CHLORO-PHYLL RATIO PERI-PHYTON (UNITS)
OCT , 1980						
21...	0930	4.09	6.69	13.8	7.43	188

12433000 SPOKANE RIVER AT LONG LAKE, WA--Continued

PHYTOPLANKTON ANALYSES. OCTOBER 1980 TO SEPTEMBER 1981

DATE	NOV 19,80		MAR 18,81		MAY 21,81		JUN 15,81	
TIME	1030		1245		1300		1245	
TOTAL CELLS/ML	480		2700		20000		18000	
DIVERSITY: DIVISION	0.2		0.0		0.6		0.5	
.CLASS	0.2		0.0		0.6		0.5	
..ORDER	0.5		0.2		0.9		0.6	
...FAMILY	0.5		0.2		0.9		0.7	
....GENUS	1.4		0.3		1.7		0.7	
ORGANISM	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT
BACILLARIOPHYTA (DIATOMS)								
.BACILLARIOPHYCEAE								
..ACHNANTHALES								
...ACHNANTHACEAE								
....ACHNANTHES	--	-	--	-	--	-	--	-
..BACILLARIALES								
...NITZSCHIACEAE								
....NITZSCHIA	13	3	26	1	--	-	200	1
..EUPODISCALES								
...COSCINODISCACEAE								
....CYCLOTELLA	13	3	26	1	--	-	--	-
....MELOSIRA	--	-	39	1	690	3	200	1
..FRAGILARIALES								
...FRAGILARIACEAE								
....ASTERIONELLA	170#	35	2600#	97	14000#	68	16000#	90
....DIATOMA	--	-	--	-	2500	12	--	-
....FRAGILARIA	270#	57	--	-	--	-	--	-
....SYNEDRA	--	-	--	-	920	4	--	-
....TABELLARIA	--	-	--	-	--	-	--	-
..NAVICULALES								
...CYMBELLACEAE								
....CYMBELLA	--	-	--	-	110	1	--	-
...NAVICULACEAE								
....NAVICULA	--	-	--	-	110	1	--	-
CHLOROPHYTA (GREEN ALGAE)								
.CHLOROPHYCEAE								
..CHLOROCOCCALES								
...OOCYSTACEAE								
....ANKISTRODESMUS	--	-	--	-	460	2	300	2
....FRANCEIA	--	-	--	-	--	-	--	-
....KIRCHNERIELLA	--	-	--	-	--	-	--	-
....OOCYSTIS	--	-	--	-	--	-	--	-
...PALMELLACEAE								
....SPHAEROCYSTIS	--	-	--	-	--	-	--	-
...SCENEDESMACEAE								
....COELASTRUM	--	-	--	-	--	-	--	-
....SCENEDESMUS	--	-	--	-	--	-	200	1
..VOLVOCALES								
...CHLAMYDOMONADACEAE								
....CHLAMYDOMONAS	--	-	--	-	110	1	--	-
...VOLVOCACEAE								
....PANDORINA	--	-	--	-	--	-	--	-
..ZYGNEMATALES								
...DESMIDIACEAE								
....STAURASTRUM	--	-	--	-	--	-	--	-
CRYPTOPHYTA (CRYPTOMONADS)								
.CRYPTOPHYCEAE								
..CRYPTOMONADALES								
...CRYPTOCHRYSIDACEAE								
....CHROOMONAS	13	3	--	-	--	-	--	-
CYANOPHYTA (BLUE-GREEN ALGAE)								
.CYANOPHYCEAE								
..CHROOCOCCALES								
...CHROOCOCCACEAE								
....ANACYSTIS	--	-	--	-	--	-	--	-
....GOMPHOSPHAERIA	--	-	--	-	--	-	--	-
..NOSTOCALES								
...NOSTOCACEAE								
....ANABAENA	--	-	--	-	--	-	900	5
..OSCILLATORIALES								
...OSCILLATORIACEAE								
....OSCILLATORIA	--	-	--	-	1600	8	--	-
EUGLENOPHYTA (EUGLENOIDS)								
.EUGLENOPHYCEAE								
..EUGLENALES								
...EUGLENACEAE								
....TRACHELOMONAS	--	-	--	-	--	-	--	-

NOTE: # - DOMINANT ORGANISM: EQUAL TO OR GREATER THAN 15%
° - OBSERVED ORGANISM, MAY NOT HAVE BEEN COUNTED: LESS THAN 1/2%

12433000 SPOKANE RIVER AT LONG LAKE, WA--Continued

PHYTOPLANKTON ANALYSES, OCTOBER 1980 TO SEPTEMBER 1981

DATE	JUL 21,81	AUG 18,81	SEP 16,81
TIME	1030	1130	1130
TOTAL CELLS/ML	2700	6600	1400
DIVERSITY: DIVISION	1.0	1.1	1.1
.CLASS	1.0	1.1	1.1
..ORDER	1.2	1.4	1.1
...FAMILY	1.2	2.2	2.0
....GENUS	1.4	2.3	2.0

ORGANISM	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT
BACILLARIOPHYTA (DIATOMS)						
.BACILLARIOPHYCEAE						
..ACHNANTHALES						
...ACHNANTHACEAE						
....ACHNANTHES	17	1	*	0	--	-
..BACILLARIALES						
...NITZSCHIACEAE						
....NITZSCHIA	33	1	*	0	--	-
..EUPODISCALES						
...COSCINODISCACEAE						
....CYCLOTELLA	--	-	*	0	--	-
....MELOSIRA	--	-	*	0	--	-
..FRAGILARIALES						
...FRAGILARIACEAE						
....ASTERIONELLA	--	-	--	-	--	-
....DIATOMA	--	-	--	-	--	-
....FRAGILARIA	50	2	2400#	36	310#	22
....SYNEDRA	50	2	--	-	--	-
....TABELLARIA	130	5	--	-	--	-
..NAVICULALES						
...CYMBELLACEAE						
....CYMBELLA	--	-	*	0	--	-
...NAVICULACEAE						
....NAVICULA	--	-	--	-	--	-
CHLOROPHYTA (GREEN ALGAE)						
.CHLOROPHYCEAE						
..CHLOROCOCCALES						
...OOCYSTACEAE						
....ANKISTRODESMUS	100	4	--	-	--	-
....FRANCEIA	--	-	--	-	14	1
....KIRCHNERIELLA	--	-	*	0	--	-
....OOCYSTIS	--	-	530	8	190	14
...PALMELLACEAE						
....SPHAEROCYSTIS	--	-	1400#	21	650#	47
...SCENEDESMACEAE						
....COELASTRUM	--	-	1900#	29	110	8
....SCENEDESMUS	--	-	*	0	--	-
..VOLVOCALES						
...CHLAMYDOMONADACEAE						
....CHLAMYDOMONAS	--	-	70	1	--	-
...VOLVOCACEAE						
....PANDORINA	270	10	--	-	--	-
..ZYGNEMATALES						
...DESMIDIACEAE						
....STAURASTRUM	--	-	*	0	--	-
CRYPTOPHYTA (CRYPTOMONADS)						
.CRYPTOPHYCEAE						
..CRYPTOMONADALES						
...CRYPTOCHRYSIDACEAE						
....CHROOMONAS	--	-	--	-	--	-
CYANOPHYTA (BLUE-GREEN ALGAE)						
.CYANOPHYCEAE						
..CHROOCOCCALES						
...CHROOCOCCACEAE						
....ANACYSTIS	2000#	76	200	3	--	-
....GOMPHOSPHAERIA	--	-	--	-	97	7
..NOSTOCALES						
...NOSTOCACEAE						
....ANABAENA	--	-	--	-	--	-
..OSCILLATORIALES						
...OSCILLATORIACEAE						
....OSCILLATORIA	--	-	--	-	--	-
EUGLENOPHYTA (EUGLENOIDS)						
.EUGLENOPHYCEAE						
..EUGLENALES						
...EUGLENACEAE						
....TRACHELOMONAS	--	-	*	0	--	-

NOTE: # - DOMINANT ORGANISM; EQUAL TO OR GREATER THAN 15%
* - OBSERVED ORGANISM, MAY NOT HAVE BEEN COUNTED; LESS THAN 1/2%

RADIOCHEMICAL ANALYSES

DATE	TIME	GROSS ALPHA, DIS-SOLVED (PCI/L AS U-NAT)	GROSS ALPHA, SUSP. TOTAL (PCI/L AS U-NAT)	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, SUSP. TOTAL (PCI/L AS CS-137)	GROSS BETA, DIS-SOLVED (PCI/L AS SR/YT-90)	GROSS BETA, SUSP. TOTAL (PCI/L AS SR/YT-90)	RADIUM 226, DIS-SOLVED, RADON METHOD (PCI/L)	URANIUM NATURAL DIS-SOLVED (UG/L AS U)
OCT, 1980											
21...	0930	1.2	<.3	1.7	<.4	1.4	<.4	1.4	<.4	.05	1.2

12433000 SPOKANE RIVER AT LONG LAKE, WA--Continued

SPECIFIC CONDUCTANCE (MICROMHOS/CM AT 25 DEG. C), WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		OCTOBER			NOVEMBER			DECEMBER			JANUARY	
1	178	172	175	177	175	176	177	175	176	94	88	91
2	180	175	177	177	175	176	177	176	176	88	85	87
3	179	176	178	177	176	177	177	176	176	86	75	85
4	180	177	178	177	176	176	178	177	177	84	83	84
5	179	177	178	177	176	176	178	177	177	84	83	83
6	178	174	176	177	175	176	178	176	177	83	82	82
7	177	175	176	178	176	177	177	176	177	83	81	81
8	176	174	175	178	177	177	177	176	177	83	81	83
9	176	174	175	178	176	177	178	176	177	82	81	82
10	177	175	176	178	177	178	178	176	177	83	81	82
11	176	174	175	178	177	177	178	176	177	82	81	81
12	176	175	175	178	177	177	177	176	177	82	81	81
13	176	174	175	178	177	177	177	176	176	82	81	82
14	175	173	174	179	178	178	176	175	176	83	82	82
15	175	174	175	180	178	178	176	175	176	82	81	82
16	175	174	175	180	178	179	175	174	175	83	81	82
17	173	170	172	180	178	178	175	174	175	83	82	82
18	173	169	171	181	179	179	175	174	174	83	82	83
19	174	172	173	180	178	179	174	172	173	85	82	83
20	173	172	173	180	178	179	173	164	168	92	85	90
21	173	172	173	180	178	179	165	163	164	95	92	94
22	173	172	173	180	179	179	168	164	166	99	96	98
23	174	173	174	180	178	179	167	166	166	102	99	100
24	174	173	173	179	177	178	167	165	166	109	102	106
25	174	173	173	178	177	178	165	161	163	110	104	108
26	174	173	174	178	177	178	161	156	159	105	103	104
27	175	174	175	177	176	177	158	155	157	107	105	106
28	175	174	174	177	176	176	155	149	152	109	105	107
29	175	174	174	176	175	176	149	137	143	111	102	110
30	175	174	174	177	175	176	139	107	125	114	109	112
31	176	175	176	---	---	---	105	95	98	115	111	113
MONTH	180	169	175	181	175	177	178	95	167	115	75	91

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		FEBRUARY			MARCH			APRIL			MAY	
1	117	115	116	76	75	76	114	112	113	84	80	82
2	119	116	117	76	75	76	114	112	113	80	79	80
3	120	118	119	77	76	77	113	112	112	80	78	80
4	120	119	120	77	76	77	112	110	111	79	77	78
5	121	120	121	79	77	78	110	108	109	78	77	77
6	123	122	122	80	78	79	110	108	109	77	76	77
7	123	122	123	82	80	81	111	109	110	76	75	76
8	124	123	123	83	81	82	112	111	111	76	75	75
9	124	123	123	87	84	85	114	111	112	75	74	75
10	124	124	124	89	87	88	114	112	113	74	73	74
11	125	124	125	90	88	89	113	112	112	74	73	74
12	125	124	125	92	90	91	112	109	111	75	73	74
13	125	124	125	93	91	92	110	108	109	75	74	75
14	125	124	125	95	93	94	107	104	105	76	74	75
15	125	123	124	95	94	94	104	103	104	76	75	76
16	125	124	125	100	96	98	103	99	101	77	76	76
17	---	---	---	101	97	100	100	97	99	78	76	77
18	---	---	---	104	100	102	102	99	101	79	77	78
19	---	---	---	108	105	107	105	101	103	80	78	79
20	---	---	---	114	108	111	107	105	106	81	79	80
21	---	---	---	115	113	115	108	106	107	83	80	82
22	---	---	---	117	115	116	107	103	106	88	82	84
23	---	---	---	117	115	116	106	103	105	95	87	92
24	---	---	---	117	115	116	105	102	104	99	96	98
25	---	---	---	118	116	117	103	100	102	99	96	98
26	---	---	---	118	117	118	99	96	98	97	94	95
27	77	75	76	119	117	118	97	95	96	94	90	93
28	76	75	75	118	116	117	95	92	93	90	86	88
29	---	---	---	117	116	116	92	88	90	87	85	86
30	---	---	---	117	115	116	88	83	86	85	82	84
31	---	---	---	115	113	114	---	---	---	84	81	82
MONTH				119	75	99	114	83	105	99	73	81

12433000 SPOKANE RIVER AT LONG LAKE, WA--Continued

SPECIFIC CONDUCTANCE (MICROMHOS/CM AT 25 DEG. C), WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		JUNE			JULY			AUGUST			SEPTEMBER	
1	83	81	82	85	82	83	132	128	130	171	168	170
2	83	81	82	85	83	84	131	129	130	178	168	173
3	81	80	80	86	84	85	135	131	133	174	169	172
4	82	80	81	88	86	87	137	135	136	172	166	170
5	83	82	82	89	87	87	139	134	136	168	165	167
6	84	83	83	90	88	89	141	137	139	168	166	167
7	85	84	85	96	90	92	140	138	139	171	167	169
8	85	84	85	98	95	96	141	139	140	172	168	170
9	87	85	86	99	97	98	143	140	141	171	168	170
10	90	88	89	102	98	101	143	138	140	174	167	171
11	93	90	92	102	99	101	147	142	144	179	172	175
12	93	91	92	104	101	102	150	147	148	182	178	180
13	92	89	91	106	103	104	153	148	151	184	183	184
14	91	89	90	108	104	107	153	150	152	185	181	183
15	91	89	90	108	106	107	154	149	152	186	182	183
16	89	84	86	108	107	108	156	153	155	189	182	186
17	86	83	85	108	106	107	157	151	154	193	185	188
18	85	84	85	109	107	108	157	152	154	193	190	191
19	86	85	86	110	108	109	156	149	153	195	183	191
20	85	82	84	110	109	109	157	150	153	202	196	199
21	83	81	82	111	109	110	161	155	158	196	192	194
22	84	82	83	112	109	111	161	158	159	200	193	197
23	84	83	83	113	111	112	163	160	161	195	191	194
24	85	84	85	114	112	112	160	158	159	194	191	192
25	85	83	84	115	113	114	163	160	162	191	188	190
26	84	82	83	116	113	114	167	164	166	191	189	190
27	83	81	82	120	115	118	170	165	168	192	189	191
28	83	81	82	122	118	121	168	165	166	189	183	186
29	84	82	83	126	119	123	166	164	165	182	173	176
30	84	82	83	136	124	129	174	164	170	178	168	173
31	---	---	---	130	126	128	172	166	169	---	---	---
MONTH	93	80	85	136	82	105	174	128	151	202	165	181

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

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

12433000 SPOKANE RIVER AT LONG LAKE, WA--Continued

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		FEBRUARY			MARCH			APRIL			MAY	
1	5.0	4.5	4.5	5.0	4.5	4.5	7.5	7.0	7.0	10.0	9.0	9.5
2	5.0	5.0	5.0	5.0	4.5	4.5	7.5	7.0	7.0	9.5	9.0	9.0
3	5.0	5.0	5.0	5.0	4.5	5.0	7.5	7.0	7.0	10.0	9.5	10.0
4	5.0	5.0	5.0	5.0	4.5	5.0	7.5	7.0	7.0	10.0	10.0	10.0
5	5.0	5.0	5.0	5.0	4.5	5.0	7.5	7.0	7.5	10.0	10.0	10.0
6	5.0	5.0	5.0	5.0	4.5	5.0	7.5	7.0	7.5	10.0	10.0	10.0
7	5.0	5.0	5.0	5.0	5.0	5.0	7.5	7.0	7.5	10.0	10.0	10.0
8	5.0	4.5	5.0	5.0	5.0	5.0	7.5	7.5	7.5	10.0	9.5	10.0
9	5.0	4.5	5.0	5.0	5.0	5.0	7.5	7.0	7.5	10.0	9.5	10.0
10	4.5	4.5	4.5	5.0	5.0	5.0	7.5	7.0	7.5	10.5	10.0	10.0
11	4.5	4.0	4.0	5.0	5.0	5.0	7.5	7.0	7.5	10.0	10.0	10.0
12	4.5	4.0	4.0	5.5	5.0	5.0	7.5	7.0	7.0	10.5	10.0	10.0
13	4.0	4.0	4.0	5.5	5.0	5.0	7.0	7.0	7.0	10.5	10.0	10.5
14	4.5	4.0	4.0	5.5	5.0	5.0	7.5	7.0	7.5	11.0	10.0	10.5
15	4.0	4.0	4.0	5.5	5.0	5.5	7.5	7.0	7.5	10.5	10.0	10.5
16	4.0	4.0	4.0	5.5	5.0	5.5	7.0	7.0	7.0	11.0	10.0	10.5
17	---	---	---	5.5	5.0	5.5	7.0	7.0	7.0	11.5	10.5	11.0
18	---	---	---	6.0	5.5	6.0	7.5	7.0	7.5	11.5	11.0	11.0
19	---	---	---	6.5	6.0	6.5	8.0	8.0	8.0	11.5	11.0	11.0
20	---	---	---	6.5	6.5	6.5	8.0	8.0	8.0	11.0	11.0	11.0
21	---	---	---	6.5	6.5	6.5	8.0	7.5	8.0	12.0	11.0	11.5
22	---	---	---	6.5	6.5	6.5	9.0	8.0	8.5	12.0	11.5	12.0
23	---	---	---	6.5	6.5	6.5	10.0	8.5	9.0	12.0	11.5	12.0
24	---	---	---	6.5	6.5	6.5	10.0	8.5	9.0	12.0	12.0	12.0
25	---	---	---	7.0	6.5	7.0	9.5	9.0	9.0	12.0	12.0	12.0
26	4.5	4.5	4.5	7.0	7.0	7.0	9.5	9.0	9.5	13.0	12.0	12.5
27	4.5	4.5	4.5	7.0	7.0	7.0	10.0	9.5	9.5	13.0	12.5	13.0
28	5.0	4.5	4.5	7.0	7.0	7.0	9.5	9.5	9.5	13.0	12.5	13.0
29	---	---	---	7.0	7.0	7.0	9.5	9.0	9.5	13.5	13.0	13.0
30	---	---	---	7.5	7.0	7.0	10.0	9.5	9.5	14.5	13.0	13.5
31	---	---	---	7.5	7.0	7.0	---	---	---	13.5	13.0	13.5
MONTH				7.5	4.5	6.0	10.0	7.0	8.0	14.5	9.0	11.0

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		JUNE			JULY			AUGUST			SEPTEMBER	
1	14.5	13.0	13.5	16.0	15.0	15.5	20.0	19.0	19.5	19.5	18.0	19.0
2	14.5	14.5	14.5	16.5	16.0	16.0	19.5	19.0	19.0	19.5	18.0	18.5
3	14.5	14.5	14.5	17.0	16.0	16.5	19.0	18.5	19.0	19.5	19.0	19.5
4	14.5	14.5	14.5	17.5	16.5	17.0	19.5	18.5	19.0	19.5	19.0	19.0
5	15.5	14.0	14.5	17.0	16.0	16.5	19.5	19.0	19.5	19.0	18.5	18.5
6	15.0	14.5	14.5	17.5	16.5	17.0	20.0	19.5	19.5	19.0	18.5	18.5
7	15.0	14.5	14.5	16.5	16.0	16.0	20.0	19.5	19.5	19.0	18.5	19.0
8	15.0	14.5	15.0	17.5	16.0	16.5	21.0	19.5	20.0	19.0	18.5	19.0
9	15.0	14.5	15.0	17.5	17.0	17.0	21.5	20.5	21.0	19.0	18.5	18.5
10	15.5	15.0	15.0	17.5	17.0	17.5	21.5	20.5	20.5	19.0	18.0	18.5
11	15.5	15.0	14.5	17.5	17.0	17.0	20.5	20.0	20.0	19.0	18.5	19.0
12	15.0	15.0	15.0	17.5	17.0	17.5	20.5	19.5	20.0	19.0	19.0	19.0
13	15.0	14.5	15.0	17.5	17.0	17.0	20.5	20.0	20.0	19.5	19.0	19.0
14	15.0	14.5	15.0	17.5	17.0	17.0	21.0	20.0	20.5	19.0	18.5	18.5
15	15.5	15.0	15.5	17.5	17.0	17.0	21.0	20.0	20.5	19.0	18.5	18.5
16	15.0	14.5	15.0	18.0	17.5	17.5	20.5	20.0	20.5	19.0	18.5	18.5
17	15.0	14.5	14.5	18.0	17.0	17.5	20.5	20.0	20.5	19.0	18.5	18.5
18	15.0	14.5	15.0	18.5	17.5	18.0	20.5	20.0	20.5	19.5	18.5	19.0
19	15.0	15.0	15.0	18.0	17.0	17.5	21.5	20.0	20.5	19.5	17.5	18.0
20	15.0	15.0	15.0	18.0	17.5	17.5	21.0	20.0	20.5	18.5	17.5	18.0
21	15.0	14.5	15.0	18.5	18.0	18.0	20.5	19.5	20.0	18.5	17.5	18.0
22	15.0	15.0	15.0	19.0	17.5	18.5	20.5	19.5	20.0	18.0	17.0	17.5
23	15.0	15.0	15.0	19.0	18.5	19.0	20.5	20.0	20.0	17.5	17.5	17.5
24	15.0	15.0	15.0	20.0	19.0	19.0	21.0	20.0	20.5	17.5	17.5	17.5
25	15.0	15.0	15.0	20.5	18.5	19.5	20.5	19.5	20.0	17.5	17.0	17.0
26	15.0	14.5	14.5	20.0	19.0	19.5	20.0	19.0	19.5	17.0	17.0	17.0
27	15.0	14.5	14.5	20.0	19.0	19.5	20.0	19.0	19.5	17.0	17.0	17.0
28	15.5	14.5	15.0	19.5	18.5	19.0	20.0	19.5	19.5	17.0	16.5	16.5
29	16.0	15.0	15.5	19.5	18.0	18.5	20.5	19.5	20.0	16.5	16.0	16.0
30	16.0	15.0	15.5	19.5	17.5	18.5	19.5	18.5	19.0	16.0	16.0	16.0
31	---	---	---	20.0	19.0	19.5	20.0	19.0	19.5	---	---	---
MONTH	16.0	13.0	15.0	20.5	15.0	17.5	21.5	18.5	20.0	19.5	16.0	18.0

DIVERSION AT GRAND COULEE DAM

12435500 FEEDER CANAL AT GRAND COULEE, WA

LOCATION.--Lat 47°57'05", long 118°59'40", on line between secs.1 and 2, T.28 N., R.30 E., Grant County, Hydrologic Unit 17020001, on left bank at Grand Coulee, 0.2 mi (0.3 km) downstream from intake, and 0.5 mi (0.8 km) southwest of Grand Coulee Dam.

PERIOD OF RECORD.--October 1951 to current year.

GAGE.--Recording flowmeters on rated pumps. Prior to Jan. 10, 1978, water stage recorder.

REMARKS.--Since May 1951, water is pumped from Franklin D. Roosevelt Lake, through a lift of about 280 ft (85 m), into Feeder Canal for a distance of 2 mi (3.2 km), into Banks Lake. From Banks Lake it is distrubuted through a system of canals to the Columbia Basin project. On Dec. 23, 1974, two pump flash-generators were added which can also generate power during peak demand periods in winter months by returning water from Banks Lake via the Feeder Canal to Franklin D. Roosevelt Lake. Daily discharge computed from pump rating and head elevation.

COOPERATION.--Discharge records furnished by U.S. Bureau of Reclamation; records reviewed by U.S. Geological Survey.

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 13,600 ft^3/s (385 m^3/s) Feb. 17-24, 1981; minimum daily discharge, 1,920 ft^3/s (54.4 m^3/s) Feb. 24, 1975, reverse flow from Banks Lake.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 13,600 ft^3/s (385 m^3/s) Feb. 17-24; no flow except during pumping season.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.00	.00	.00	.0	13400	1550	7700	4520	8320	4780	4770
2	.00	.00	.00	.00	.0	13400	1540	7710	6360	8320	4790	4760
3	.00	.00	.00	.00	.0	12800	559	7730	6360	8320	4790	4080
4	.00	.00	.00	.00	.0	11400	1540	7740	7390	8320	5430	4760
5	.00	.00	.00	.00	.0	11400	1540	7920	9540	8320	7980	4760
6	.00	.00	.00	.00	.0	11400	1540	9300	9520	6440	7980	4770
7	.00	.00	.00	.00	.0	10500	4220	8900	9520	8090	7970	4770
8	.00	.00	.00	.00	.0	8870	4590	8870	8470	9580	7980	4770
9	.00	.00	.00	.00	.0	1200	4570	8860	7930	9580	7970	4770
10	.00	.00	.00	.00	.0	.0	4550	8840	6660	9590	7970	4770
11	.00	.00	.00	.00	.0	.0	4530	8830	4760	9570	7970	4770
12	.00	.00	.00	.00	3550	.0	4510	7890	4770	9440	7970	4770
13	.00	.00	.00	.00	9470	.0	4490	7320	4770	7110	7970	4680
14	.00	.00	.00	.00	13500	765	4480	7300	4760	6370	7970	4770
15	.00	.00	.00	.00	13500	1570	4450	6800	4760	6380	7240	4770
16	.00	.00	.00	.00	13500	1570	5890	5820	4760	6380	6380	4770
17	.00	.00	.00	.00	13600	1570	9040	5830	4760	6380	6380	4760
18	.00	.00	.00	.00	13600	1570	8990	5840	4770	6380	6380	4760
19	.00	.00	.00	.00	13600	1570	8960	5200	5300	6380	6380	4760
20	.00	.00	.00	.00	13600	1560	1480	4390	6360	6380	6380	4760
21	.00	.00	.00	.00	13600	1560	.0	4410	6360	6380	6380	4360
22	.00	.00	.00	.00	13600	1560	.0	4430	6360	6380	6380	3170
23	.00	.00	.00	.00	13600	1560	.0	4460	6360	6390	6380	3170
24	.00	.00	.00	.00	13600	1560	1090	4510	6370	6680	6380	3170
25	.00	.00	.00	.00	13500	1560	5860	4560	6370	7980	6380	3170
26	.00	.00	.00	.00	13500	1550	5900	4610	7250	7980	6380	3170
27	.00	.00	.00	.00	13500	1550	5930	3770	8290	7980	6380	3180
28	.00	.00	.00	.00	13400	1550	5950	3130	8290	7970	6380	3180
29	.00	.00	.00	.00	---	1550	5960	3140	8290	7970	6380	3180
30	.00	.00	.00	.00	---	1550	6320	3150	8300	7970	6380	3180
31	.00	---	.00	.00	---	1550	---	3160	---	5790	4840	---
TOTAL	.00	.00	.00	.00	216220.0	121645.0	120029.0	192120	198280	235120	207300	127480
MEAN	.000	.000	.000	.000	7722	3924	4001	6197	6609	7585	6687	4249
MAX	.00	.00	.00	.00	13600	13400	9040	9300	9540	9590	7980	4770
MIN	.00	.00	.00	.00	.00	.00	.00	3130	4520	5790	4780	3170
AC-FT	.00	.00	.00	.00	428900	241300	238100	381100	393300	466400	411200	252900

CAL YR 1980	TOTAL	733078.00	MEAN	2003	MAX	13200	MIN	.00	AC-FT	1454000
WTR YR 1981	TOTAL	1418194.00	MEAN	3885	MAX	13600	MIN	.00	AC-FT	2813000

12436000 FRANKLIN D. ROOSEVELT LAKE AT GRAND COULEE DAM, WA

LOCATION.--Lat 47°57'20", long 118°59'02", near center of sec.1, T.28 N., R.30 E., Grant County, Hydrologic Unit 17020001, in block 12 of Grand Coulee Dam on Columbia River, and at mile 596.6 (959.9 km).

DRAINAGE AREA.--74,700 mi^2 (193,500 km^2) approximately.

PERIOD OF RECORD.--April 1938 to current year. Prior to October 1943, published as Columbia River Reservoir at Grand Coulee Dam.

REVISED RECORDS.--WSP 1286: 1942, 1945(M). WSP 1316: 1942 (May monthend contents). WSP 1933: Drainage area.

CORRECTIONS.--WRD Wash. 1973: 1965, 1967. WDR WA-75-1: 1974 monthend contents.

GAGE.--Water-stage recorder. Datum of gage is at 0.00 ft (0.000 m), Bureau of Reclamation datum, adjustment of 1937, or 1.425 ft (0.434 m) National Geodetic Vertical Datum of 1929 (levels by Bureau of Reclamation). Prior to Apr. 24, 1942, nonrecording gage at site 2,000 ft (610 m) upstream at same datum.

REMARKS.--Reservoir is formed by concrete dam; construction of dam began in 1934; completed in 1941; storage began early in construction period. Capacity, 5,022,179 acre-ft (6,190 hm^3) between elevations, 1,208 ft (368.2 m), proposed lower limit of operation, and 1,288 ft (392.6 m), top of gates. Capacity increased to 5,185,452 acre-ft (6,390 hm^3) by use of 2 ft (0.6 m) flashboards installed after high-water period each year beginning August 1961. Storage below 1,208 ft (368.2 m), 4,209,207 acre-ft (5,190 hm^3). Figures given herein represent total contents. Water is used for power development and irrigation. Flow is regulated by nine major reservoirs and numerous smaller reservoirs and powerplants. Diversions by Feeder Canal (see (12435500) and for irrigation of about 350,000 acres (141,700 hm^2) in the United States plus an additional 37,000 acres (15,000 hm^2) in Canada.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents recorded, 9,586,200 acre-ft (11,800 hm^3) July 17, 1942, June 3, 1945, elevation, 1,290.3 ft (393.28 m); maximum elevation, 1,290.36 ft (393.302 m), Aug. 6, 1976; minimum contents observed, 16,200 acre-ft (20.0 hm^3) Aug. 29, 1938, elevation 956.1 ft (291.42 m).

EXTREMES FOR CURRENT YEAR.--Maximum contents, 9,401,240 acre-ft (11,600 hm^3) Aug. 14, elevation, 1,290.08 ft (393.216 m); minimum, 6,986,775 acre-ft (8,610 hm^3) Apr. 22, elevation, 1,257.40 ft (383.256 m).

Capacity table dated October 24, 1975 (elevation, in feet, and contents, in acre-feet)
(Prepared by Geological Survey from data furnished by Bureau of Reclamation)

1,210.0	4,301,035	1,270.0	7,864,082
1,230.0	5,308,657	1,291.0	9,477,261
1,250.0	6,501,603		

ELEVATION (FEET NGVD), WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981
INSTANTANEOUS OBSERVATIONS AT 2400

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1285.75	1287.40	1285.79	1289.88	1284.42	1285.70	1277.02	1263.69	1287.00	1289.78	1289.98	1288.39
2	1285.79	1288.17	1285.82	1289.70	1284.12	1285.59	1275.92	1264.40	1287.43	1289.68	1290.05	1287.86
3	1285.92	1288.33	1286.06	1289.22	1284.14	1285.44	1275.44	1265.10	1287.82	1289.82	1289.93	1287.52
4	1286.61	1288.66	1285.88	1289.05	1284.04	1285.24	1275.30	1265.07	1287.90	1289.85	1289.89	1287.36
5	1287.29	1288.53	1286.02	1288.93	1283.99	1285.02	1275.00	1264.61	1287.44	1289.97	1289.94	1287.81
6	1287.27	1288.40	1286.36	1289.27	1283.97	1284.92	1274.20	1263.69	1287.29	1290.07	1288.89	1288.35
7	1287.29	1288.20	1286.43	1289.90	1283.71	1284.59	1273.27	1262.68	1287.33	1289.87	1289.83	1288.52
8	1287.00	1288.50	1286.18	1288.99	1283.41	1284.81	1272.08	1261.88	1287.37	1289.92	1289.90	1288.39
9	1287.13	1289.00	1286.02	1289.13	1283.05	1284.49	1270.85	1261.57	1287.67	1289.85	1289.95	1288.19
10	1286.97	1288.75	1285.99	1289.18	1282.81	1284.34	1269.39	1261.55	1287.92	1289.84	1289.89	1288.19
11	1287.00	1288.53	1285.90	1289.08	1282.72	1284.17	1268.12	1261.05	1287.14	1289.94	1289.90	1288.09
12	1287.50	1288.40	1285.86	1288.68	1282.58	1283.86	1267.19	1260.40	1288.37	1289.77	1290.07	1288.49
13	1287.19	1288.10	1286.03	1288.47	1282.80	1283.52	1265.87	1259.89	1288.20	1289.52	1289.04	1288.65
14	1287.00	1287.18	1286.55	1288.37	1283.66	1283.74	1264.80	1259.19	1288.10	1289.68	1289.87	1288.66
15	1286.65	1287.04	1286.77	1288.13	1284.43	1283.79	1263.26	1258.59	1287.67	1289.95	1289.93	1288.25
16	1286.40	1287.06	1286.88	1287.72	1285.30	1283.11	1261.99	1258.52	1287.58	1289.94	1289.89	1288.06
17	1286.00	1286.50	1286.73	1287.20	1286.24	1282.34	1260.81	1259.15	1287.86	1289.94	1289.77	1287.78
18	1286.16	1286.27	1286.63	1287.05	1287.02	1281.93	1259.64	1259.55	1287.99	1289.93	1289.86	1287.43
19	1286.52	1286.00	1286.46	1286.42	1287.41	1281.29	1259.23	1259.95	1288.00	1289.91	1289.80	1287.66
20	1286.78	1285.63	1286.97	1286.05	1287.46	1280.74	1258.50	1260.43	1288.10	1289.88	1289.64	1287.73
21	1286.87	1285.30	1287.88	1285.60	1287.59	1280.34	1257.88	1261.43	1288.19	1289.94	1289.46	1287.54
22	1286.74	1285.17	1288.52	1285.45	1287.72	1280.73	1257.59	1262.86	1288.25	1289.91	1289.51	1287.39
23	1286.83	1284.88	1288.33	1284.98	1287.19	1279.05	1257.84	1265.55	1288.32	1289.90	1289.78	1287.23
24	1286.68	1284.44	1288.61	1284.75	1286.23	1279.20	1258.40	1269.10	1288.52	1289.98	1289.77	1287.24
25	1287.10	1284.12	1289.30	1285.10	1285.41	1279.01	1259.89	1272.67	1288.51	1289.92	1289.75	1287.28
26	1287.48	1283.97	1289.78	1284.86	1285.08	1278.66	1261.58	1276.46	1288.34	1289.89	1289.54	1287.28
27	1287.38	1284.68	1289.90	1284.70	1285.10	1278.34	1262.65	1279.96	1288.43	1289.91	1289.69	1287.81
28	1287.33	1285.43	1289.80	1284.45	1285.35	1278.49	1263.29	1281.87	1288.47	1289.97	1289.74	1287.93
29	1287.12	1285.38	1289.72	1284.22	---	1278.78	1263.50	1283.25	1288.67	1289.87	1289.81	1287.93
30	1286.93	1285.78	1289.92	1284.13	---	1278.15	1263.55	1284.44	1289.14	1289.87	1289.70	1288.06
31	1286.94	---	1289.80	1284.27	---	1277.75	---	1285.82	---	1289.82	1289.14	---
MEAN	1286.83	1286.79	1287.32	1287.19	1284.89	1282.17	1265.80	1266.27	1287.97	1289.87	1289.74	1287.90
MAX	1287.50	1289.00	1289.92	1289.90	1287.72	1285.70	1277.02	1285.82	1289.14	1290.07	1290.07	1288.66
MIN	1285.75	1283.97	1285.79	1284.13	1282.58	1277.75	1257.59	1258.52	1287.00	1289.52	1288.89	1287.23
†	9,145,890	9,053,149	9,378,216	8,933,703	9,018,988	8,433,812	7,407,611	9,056,333	9,324,137	9,379,859	9,324,137	9,236,247
‡	+83,187	-92,741	+325,067	-444,513	+85,285	-585,176	-1,026,201	+1,648,722	+267,804	+55,722	-55,722	-87,890

CAL YR 1980.....‡ +766,174
WTR YR 1981.....‡ +173,544

† Total contents, in acre-feet, at end of month.
‡ Change in contents in acre-feet.

12436500 COLUMBIA RIVER AT GRAND COULEE DAM, WA

LOCATION.--Lat 47°57'56", long 118°58'54", in SW¼SE¼ sec.36, T.29 N., R.30 E., Douglas County, Hydrologic Unit 17020005, in pier 3 on west side of bridge on State Highway 155, 3,200 ft (975 m) downstream from Grand Coulee Dam, 14.2 mi (22.8 km) upstream from Nespelem River, and at mile 596.3 (959.4 km).

DRAINAGE AREA.--74,700 mi^2 (193,500 km^2), approximately.

PERIOD OF RECORD.--April 1913 to June 1923 (monthly discharge only), July to December 1923, January 1924 to May 1928 (monthly discharge only), June 1928 to current year. Published as "at Grand Coulee near Nespelem" prior to 1936 and as "at Grand Coulee" 1936-42. Specific conductance November 1950 to September 1958. pH November 1950 to September 1953. Water temperature November 1950 to September 1958, July 1974 to September 1979. Chemical analyses November 1950 to September 1958, October 1971 to September 1972, October 1974 to August 1975 (fragmentary), October 1975 to September 1976, October 1977 to June 1980 (monthly).

REVISED RECORDS.--WSP 1286: 1942, 1947. WSP 1933: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is at 0.00 ft (0.000 m) Bureau of Reclamation datum, adjustment of 1937. June 27 to Dec. 31, 1923, June 12, 1928, to Mar. 31, 1931, nonrecording gage at site 0.5 mi (0.8 km) upstream at datum 2.4 ft (0.7 m) lower. Apr. 1, 1931, to Dec. 31, 1935, water-stage recorder at site 850 ft (259 m) downstream at present datum. Since June 12, 1955, auxiliary water-stage recorder 5.3 mi (8.5 km) downstream from base gage at datum 1.42 ft (0.433 m) lower.

REMARKS.--Records good. Flow is regulated by nine major reservoirs and numerous smaller reservoirs and powerplants. Diversions by Feeder Canal for Columbia Basin project (see sta 12435500) and for irrigation of about 380,000 acres (1,540 km^2) in the United States and an additional 35,000 acres (142 km^2) in Canada.

AVERAGE DISCHARGE.--68 years, 110,000 ft^3/s (3,115 m^3/s), 79,700,000 acre-ft/yr (98,300 hm^3/yr), unadjusted.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 637,800 ft^3/s (18,100 m^3/s) June 12, 1948, elevation, 987.90 ft (301.112 m); minimum, 14,900 ft^3/s (422 m^3/s) Dec. 17, 1956, elevation, 934.37 ft (284.796 m); minimum daily, 15,300 ft^3s (433 m^3/s) Feb. 1, 1937.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in June 1894 reached a discharge of 725,000 ft^3/s (20,500 m^3/s), estimated.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 261,000 ft^3/s (7,390 m^3/s) June 12; maximum elevation, 973.08 ft (296.595 m) July 7; minimum daily discharge, 24,200 ft^3/s (685 m^3/s) Apr. 26.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	67900	56100	103000	131000	134000	76700	106000	103000	205000	146000	160000	105000
2	67600	46500	106000	154000	159000	103000	119000	86600	222000	178000	163000	87100
3	64000	68800	102000	150000	146000	101000	99800	91700	218000	158000	175000	91600
4	46300	62700	122000	139000	153000	107000	86300	114000	226000	157000	167000	85400
5	41900	75100	110000	130000	151000	112000	86000	116000	232000	165000	153000	53700
6	70000	88000	98200	120000	155000	105000	101000	130000	228000	196000	156000	53400
7	70700	77900	105000	140000	155000	101000	97800	133000	221000	227000	148000	66500
8	77700	62300	120000	140000	163000	86900	103000	126000	221000	222000	151000	84600
9	69300	52300	117000	140000	166000	107000	107000	106000	219000	210000	150000	82400
10	71700	86400	113000	148000	156000	98500	110000	97700	218000	190000	153000	83000
11	59400	91800	116000	147000	157000	102000	95400	129000	226000	165000	148000	93500
12	47000	91700	114000	154000	147000	104000	95200	133000	220000	169000	144000	76800
13	78300	96100	100000	144000	132000	102000	100000	130000	227000	160000	152000	64500
14	67700	110000	96600	151000	97300	79100	91700	133000	228000	162000	146000	85500
15	79300	74200	101000	153000	96300	79700	107000	135000	222000	166000	136000	95400
16	73400	71200	101000	156000	83500	103000	94700	123000	204000	177000	139000	89300
17	74800	100000	111000	163000	87500	101000	92400	98500	196000	171000	136000	87900
18	56000	86900	110000	142000	103000	98600	87100	125000	199000	175000	135000	81600
19	46700	87000	113000	159000	110000	97800	64500	124000	203000	169000	135000	73300
20	66800	92800	77100	153000	132000	98700	89000	129000	206000	169000	134000	70500
21	73500	93200	70100	154000	115000	94400	89000	126000	212000	160000	132000	82100
22	88200	86100	81500	139000	98400	70700	82700	129000	217000	161000	114000	84900
23	77500	89900	108000	150000	113000	113000	68800	99000	222000	160000	100000	85300
24	79800	108000	98500	148000	131000	109000	70300	79300	219000	148000	110000	84100
25	61300	99100	76400	123000	128000	97400	38700	96400	218000	159000	112000	80200
26	59500	93300	90100	157000	104000	95200	24200	101000	212000	158000	112000	69500
27	75500	59200	116000	157000	90500	97500	62400	106000	197000	142000	106000	50900
28	73700	60200	134000	155000	72200	73900	81900	156000	192000	159000	113000	75000
29	78000	85800	152000	152000	---	67600	94300	186000	175000	183000	102000	85700
30	78700	80300	140000	148000	---	107000	98000	195000	152000	177000	104000	75900
31	70000	---	148000	136000	---	93000	---	194000	---	199000	123000	---
TOTAL	2112200	2432900	3350500	4533000	3535700	2982700	2643200	3831200	6357000	5338000	4209000	2384600
MEAN	68140	81100	108100	146200	126300	96220	88110	123600	211900	172200	135800	79490
MAX	88200	110000	152000	163000	166000	113000	119000	195000	232000	227000	175000	105000
MIN	41900	46500	70100	120000	72200	67600	24200	79300	152000	142000	100000	50900
AC-FT	4190000	4826000	6646000	8991000	7013000	5916000	5243000	7599000	12610000	10590000	8349000	4730000

CAL YR 1980 TOTAL 34092000 MEAN 93150 MAX 179000 MIN 36900 AC-FT 67620000
WTR YR 1981 TOTAL 43710000 MEAN 119800 MAX 232000 MIN 24200 AC-FT 86700000

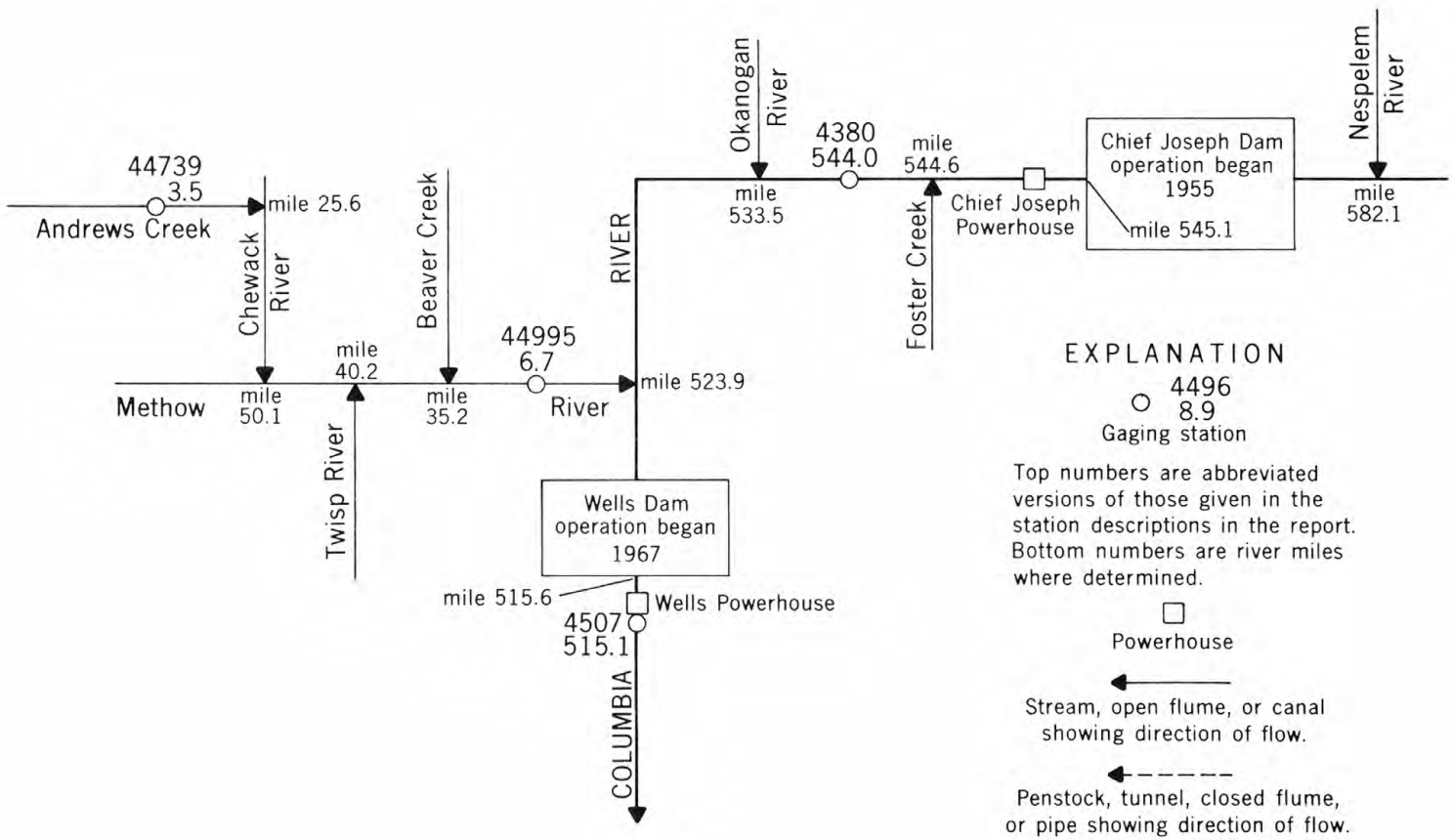

Figure 10. Gaging stations in Columbia River basin from Chief Joseph to Wells Dam.

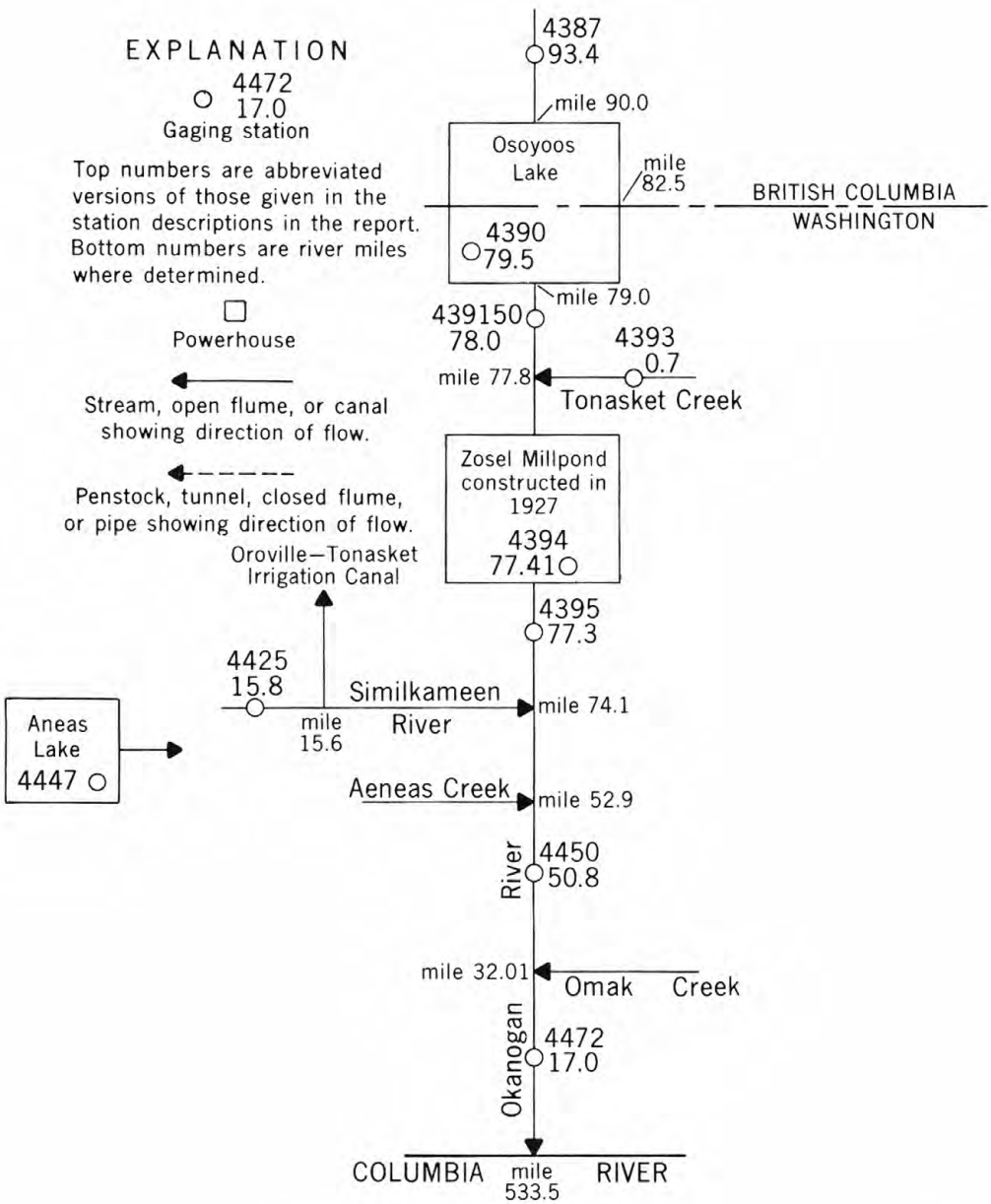

Figure 11. Gaging stations in Okanogan River basin.

12438000 COLUMBIA RIVER AT BRIDGEPORT, WA

LOCATION.--Lat 48°00'24", long 119°39'51", in SW¼SW¼ sec.14, T.29 N., R.25 E., Douglas County, Hydrologic Unit 17020005, on left bank at Bridgeport, 1.0 mi (1.6 km) downstream from Foster Creek, 1.6 mi (2.6 km) downstream from Chief Joseph Dam, and at mile 543.9 (875.1 km).

DRAINAGE AREA.--75,700 mi^2 (196,100 km^2), approximately.

PERIOD OF RECORD.--April 1952 to current year.

REVISED RECORDS.--WSP 1933: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is National Geodetic Vertical Datum of 1929 (levels by Corps of Engineers). Since May 26, 1967, auxiliary water-stage recorder 4,800 ft (1,460 m) upstream from base gage at same datum.

REMARKS.--Records fair. Discharge for Oct. 1, 10, Nov. 1, 2, 4, Dec. 4-8, Feb. 4, 6, 7, 9-12, Mar. 3, 19, 21, 30, Apr. 5, 7, 8, 10-13, 25, 26, 28, 29, May 21, June 5 to July 11, July 16, Aug. 5-23, 26-31, and Sept. 16, 25, 27, and 29 provided by N.P.D. Reservoir Control Center. Flow regulated by nine major reservoirs and numerous smaller reservoirs and powerplants. Diversion by Feeder Canal for Columbia Basin project (see sta 12435500) and for irrigation of about 380,000 acres (1,540 km^2) in the United States and an additional 35,000 acres (142 km^2) in Canada.

AVERAGE DISCHARGE.--29 years, 113,200 ft^3/s (3,206 m^3/s), 82,010,000 acre-ft/yr (101,100 hm^3/yr), unadjusted.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 495,800 ft^3s (14,000 m^3/s) June 11, 1961; maximum elevation, 792.20 ft (241.463 m) June 7, 1956; minimum observed discharge, 4,200 ft^3/s (120 m^3/s) Mar. 22, 1966, elevation, 746.91 ft (227.658 m); minimum daily discharge, 22,300 ft^3/s (632 m^3/s) Nov. 11, 1973.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 242,000 ft^3/s (6,850 m^3/s) June 5; maximum elevation, 786.53 ft (239.734 m) June 12; minimum daily, 29,100 ft^3/s (824 m^3/s) Apr. 26; minimum elevation, 776.08 ft (236.549 m) Nov. 13.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	69100	53600	105000	146000	128000	80100	105000	104000	209000	147000	155000	106000
2	64800	43100	107000	153000	154000	102000	115000	91100	237000	177000	148000	88100
3	65400	72400	103000	150000	139000	102000	98100	92600	231000	159000	172000	87000
4	43000	62900	120000	148000	148000	106000	87000	112000	232000	161000	179000	82900
5	41000	78000	108000	126000	143000	105000	87200	118000	242000	165000	158000	51600
6	69800	89900	95200	118000	148000	106000	100000	130000	229000	198000	144000	55300
7	70500	80700	101000	139000	148000	101000	101000	131000	220000	224000	156000	71100
8	78600	65000	122000	135000	154000	88400	107000	125000	227000	222000	136000	95400
9	71100	61600	120000	139000	158000	104000	108000	106000	222000	214000	148000	78200
10	69000	86900	112000	146000	152000	103000	112000	99600	219000	192000	145000	89400
11	56800	93500	116000	151000	151000	100000	98700	130000	226000	175000	165000	96500
12	49200	95000	114000	139000	135000	108000	98900	135000	223000	170000	152000	78500
13	74100	97800	105000	143000	127000	103000	102000	130000	229000	170000	153000	67100
14	66400	103000	96200	149000	98300	78900	90900	138000	225000	169000	157000	88600
15	77800	80700	103000	146000	93500	80700	106000	142000	223000	168000	124000	98300
16	74600	70700	101000	151000	85200	103000	97500	107000	205000	184000	112000	93600
17	74000	95100	112000	160000	91200	98500	91200	95800	193000	170000	140000	84200
18	54700	87400	113000	132000	108000	96100	88400	122000	199000	184000	133000	86600
19	44500	88300	113000	153000	108000	99100	66500	125000	202000	174000	131000	75800
20	68600	93000	78900	140000	103000	101000	91700	129000	206000	177000	126000	64200
21	77300	95300	73200	146000	109000	95500	91800	133000	210000	175000	128000	83600
22	85700	83700	80600	131000	99200	73500	82000	121000	216000	177000	104000	86900
23	75600	88400	107000	143000	113000	111000	70200	96700	221000	157000	98700	83200
24	77200	106000	100000	141000	123000	108000	75800	81900	218000	147000	112000	88300
25	62800	101000	79600	119000	115000	102000	41700	93300	217000	154000	115000	80000
26	62100	95300	87500	149000	108000	97200	29100	96200	213000	149000	114000	73400
27	77400	58900	116000	149000	88000	100000	65400	113000	194000	163000	106000	50300
28	77200	62300	133000	146000	77900	79200	80400	151000	193000	156000	113000	78100
29	78600	88300	160000	141000	---	65600	90200	184000	179000	180000	103000	81200
30	77300	78800	132000	139000	---	109000	102000	203000	157000	193000	104000	74400
31	71100	---	150000	127000	---	91300	---	205000	---	169000	126000	---
TOTAL	2105300	2456600	3364200	4395000	3405300	2998100	2680700	3841200	6417000	5420000	4157700	2417800
MEAN	67910	81890	108500	141800	121600	96710	89360	123900	213900	174800	134100	80590
MAX	85700	106000	160000	160000	158000	111000	115000	205000	242000	224000	179000	106000
MIN	41000	43100	73200	118000	77900	65600	29100	81900	157000	147000	98700	50300
AC-FT	4176000	4873000	6673000	8717000	6754000	5947000	5317000	7619000	12730000	10750000	8247000	4796000

CAL YR 1980	TOTAL	33740500	MEAN	92190	MAX	161000	MIN	36900	AC-FT	66920000
WTR YR 1981	TOTAL	43658900	MEAN	119600	MAX	242000	MIN	29100	AC-FT	86600000

12438700 OKANAGAN RIVER NEAR OLIVER, BRITISH COLUMBIA
(International gaging station)

LOCATION.--Lat 49°06'53", long 119°33'50", approximately 75 ft (23 m) upstream from drop structure No. 3, 0.8 mi (1.3 km) downstream from Testalinden Creek, 4.2 mi (6.8 km) south of Oliver, and at mile 93.4 (150.3 km).

DRAINAGE AREA.--2,930 mi^2 (7,590 km^2).

PERIOD OF RECORD.--October 1961 to current year in reports of Geological Survey. March 1944 to December 1948 and April 1952 to September 1961 in reports of Department of Northern Affairs and National Resources, Canada.

GAGE.--Water-stage recorder.

REMARKS.--Records good. Regulation by control dams at outlets of Okanagan and Skaha Lakes. Diversion for irrigation.

COOPERATION.--This station is maintained by Canada under agreement with the United States subsequent to Feb. 14, 1965.

AVERAGE DISCHARGE.--31 years (water years 1945-47, 1953-56, 1958-81), 603 ft^3/s (17.07 m^3/s), 436,600 acre-ft/yr (538 hm^3/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 3,130 ft^3/s (88.6 m^3/s) May 27, 1974, gage height, 7.07 ft (2.155 m); minimum, 55.9 ft^3/s (1.58 m^3/s) Jan. 30, 1963, gage height, 0.63 ft (0.192 m).

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 2,580 ft^3/s (73.2 m^3/s) June 14, gage height, 6.38 ft (1.945 m); minimum daily, 173 ft^3/s (4.90 m^3/s) Feb. 17.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	415	473	435	399	296	234	253	403	2280	2030	1350	816
2	421	471	471	392	263	234	250	381	2440	1950	1350	650
3	433	458	468	388	263	238	250	338	2440	1820	1340	572
4	485	447	444	388	248	242	247	352	2430	1750	1340	523
5	486	452	409	388	242	241	248	357	2390	1730	1360	508
6	494	393	386	388	238	226	244	343	2270	1740	1350	505
7	498	397	295	388	219	201	238	445	2170	1790	1360	501
8	513	398	326	388	214	199	201	742	2200	1830	1350	494
9	520	399	365	381	208	196	201	1060	2260	1850	1330	494
10	516	399	370	385	191	195	202	1200	2340	1810	1200	494
11	516	396	375	385	198	181	211	1200	2500	1800	734	491
12	511	404	380	388	197	188	216	1170	2500	1760	607	498
13	508	397	382	392	198	189	233	1160	2560	1760	618	508
14	507	396	381	378	199	188	246	1150	2570	1830	1060	516
15	535	400	383	374	196	188	239	1320	2530	1720	1270	501
16	529	398	384	378	193	188	237	1340	2490	1620	1310	501
17	480	399	384	378	173	187	236	1360	2460	1570	1330	501
18	469	396	384	381	180	183	238	1400	2400	1570	1320	501
19	463	397	381	381	208	185	239	1480	2410	1580	1330	519
20	468	396	380	381	215	182	243	1560	2380	1560	1350	523
21	460	396	382	385	217	180	233	1940	2360	1530	1360	523
22	460	404	387	388	223	181	211	2150	2360	1510	1340	530
23	453	399	385	392	224	193	201	2360	2380	1480	1320	547
24	432	434	383	395	227	207	282	2410	2350	1500	1190	565
25	416	471	389	392	238	233	307	2380	2310	1520	798	568
26	424	462	389	388	235	236	303	1490	2290	1500	1090	565
27	442	464	389	388	236	237	290	1340	2260	1480	1190	561
28	487	476	390	321	235	246	267	1650	2260	1440	1250	568
29	479	400	388	195	---	250	246	2120	2250	1380	1270	576
30	479	401	387	256	---	251	264	2290	2140	1370	1300	576
31	476	---	392	374	---	250	---	2280	---	1350	1230	---
TOTAL	14775	12573	12044	11575	6174	6529	7276	41171	70980	51130	37597	16195
MEAN	477	419	389	373	221	211	243	1328	2366	1649	1213	540
MAX	535	476	471	399	296	251	307	2410	2570	2030	1360	816
MIN	415	393	295	195	173	180	201	338	2140	1350	607	491
AC-FT	29310	24940	23890	22960	12250	12950	14430	81660	140800	101400	74570	32120

CAL YR 1980 TOTAL 148603 MEAN 406 MAX 945 MIN 134 AC-FT 294800
WTR YR 1981 TOTAL 288019 MEAN 789 MAX 2570 MIN 173 AC-FT 571300

12439000 OSOYOOS LAKE NEAR OROVILLE, WA
(International gaging station)

LOCATION.--Lat 48°57'24", long 119°26'18", in NW¼NE¼ sec.21, T.40 N., R.27 E., Okanogan County, Hydrologic Unit 17020006, on west shore 1 mi (1.6 km) north of Oroville, 3 mi (4.8 km) south of international boundary, and at mile 79.5 (127.9 km).

DRAINAGE AREA.--3,132 mi² (8,112 km²).

PERIOD OF RECORD.--July 1928 to current year.

REVISED RECORDS.--WSP 1346: Drainage area. WRD WA-75-1: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is National Geodetic Vertical Datum of 1929. Prior to Sept. 2, 1928, nonrecording gage and Sept. 2, 1928, to Nov. 9, 1929, water-stage recorder, 100 ft (30 m) south of international boundary, Nov. 10, 1929, to Sept. 7, 1930, Mar. 22, 1952, to Sept. 23, 1953, June 25, 1955, to Apr. 11, 1956, non-recording gage and Sept. 8, 1930, to Mar. 21, 1952, Sept. 24, 1953, to June 24, 1955, Apr. 12, 1956, to Feb. 7, 1969, water-stage recorder at site 1 mi (1.6 km) south of international boundary. All elevations prior to Oct. 1, 1944, at datum 2.39 ft (0.728 m) lower. To convert from present datum to Geodetic Survey of Canada 1934 datum, subtract 1.63 ft (0.497 m); to convert from present datum to 1947 joint adjustment of U.S. Coast and Geodetic Survey and Geodetic Survey of Canada, subtract 0.26 ft (0.079 m).

REMARKS.--Approximately 44,000 acres (1,780 hm²) are irrigated above station in Canada. Elevation may occasionally be affected by dam at Zosel's mill in Oroville.

COOPERATION.--This station is maintained by the United States under agreement with Canada.

EXTREMES FOR PERIOD OF RECORD.--Maximum elevation, 917.11 ft (279.535 m) June 2, 3, 1972; minimum 908.82 ft (277.008 m), present datum, Oct. 14, 1929.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of May 29, 1894, reached an elevation of 918.8 ft ±0.5 ft (280.05 m ±0.15 m), present datum, 1 mi (1.6 km) below present lake outlet, from floodmark on old Okanogan Hotel Building, pointed out in 1930 by Mr. and Mrs. Stansbury, who kept a diary and operated the hotel in 1894.

EXTREMES FOR CURRENT YEAR.--Maximum elevation, 913.67 ft (278.487 m) June 16; minimum, 909.68 ft (277.270 m) Feb. 18.

ELEVATION (FEET NGVD), WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	911.07	911.05	910.99	910.36	910.08	909.98	910.64	910.91	912.95	913.23	912.22	911.77
2	911.06	911.06	911.04	910.33	910.06	909.99	910.68	910.96	913.02	913.17	912.18	911.63
3	911.04	911.06	911.09	910.32	910.04	910.00	910.72	910.98	913.12	913.09	912.14	911.49
4	911.05	911.06	911.12	910.30	910.02	910.05	910.75	911.03	913.21	913.00	912.12	911.35
5	911.05	911.05	911.08	910.29	910.01	910.07	910.78	911.08	913.26	912.91	912.14	911.22
6	911.06	911.04	911.02	910.27	909.99	910.07	910.82	911.07	913.32	912.85	912.15	911.12
7	911.09	911.05	910.88	910.26	909.96	910.07	910.84	911.03	913.30	912.81	912.16	911.03
8	911.11	911.05	910.81	910.25	909.93	910.07	910.86	910.96	913.27	912.78	912.17	910.96
9	911.11	911.04	910.77	910.24	909.93	910.06	910.88	910.97	913.27	912.79	912.17	910.96
10	911.13	911.04	910.75	910.23	909.89	910.05	910.88	911.09	913.29	912.79	912.16	910.98
11	911.15	911.03	910.72	910.22	909.85	910.05	910.91	911.19	913.35	912.78	912.07	910.99
12	911.16	911.02	910.70	910.20	909.82	910.04	910.94	911.27	913.43	912.78	911.90	910.90
13	911.18	911.00	910.67	910.19	909.79	910.06	910.96	911.33	913.51	912.78	911.73	910.81
14	911.21	910.98	910.65	910.18	909.79	910.08	910.97	911.39	913.60	912.82	911.61	910.74
15	911.23	910.98	910.62	910.17	909.76	910.10	911.00	911.54	913.64	912.84	911.62	910.68
16	911.21	910.95	910.58	910.16	909.75	910.15	911.02	911.65	913.64	912.81	911.69	910.61
17	911.21	910.95	910.57	910.14	909.74	910.17	911.02	911.73	913.60	912.76	911.75	910.58
18	911.20	910.94	910.57	910.13	909.71	910.18	911.00	911.83	913.55	912.71	911.79	910.54
19	911.19	910.93	910.52	910.13	909.75	910.20	911.00	911.90	913.53	912.66	911.82	910.54
20	911.18	910.92	910.49	910.12	909.77	910.22	910.99	911.95	913.51	912.64	911.87	910.49
21	911.16	910.92	910.46	910.12	909.77	910.24	910.97	912.07	913.48	912.59	911.91	910.48
22	911.14	910.93	910.46	910.12	909.78	910.25	910.95	912.22	913.46	912.55	911.93	910.49
23	911.12	910.92	910.44	910.12	909.79	910.27	910.91	912.41	913.45	912.51	911.95	910.50
24	911.10	910.91	910.42	910.13	909.81	910.30	910.91	912.60	913.44	912.48	911.95	910.51
25	911.08	910.92	910.42	910.13	909.89	910.33	910.91	912.82	913.41	912.45	911.85	910.52
26	911.06	910.93	910.41	910.12	909.92	910.39	910.92	912.94	913.40	912.42	911.75	910.52
27	911.04	910.95	910.40	910.12	909.95	910.42	910.90	912.82	913.36	912.40	911.71	910.53
28	911.03	910.98	910.40	910.13	909.97	910.45	910.91	912.70	913.31	912.39	911.70	910.54
29	911.03	911.00	910.39	910.13	---	910.51	910.91	912.67	913.29	912.34	911.73	910.57
30	911.04	911.00	910.37	910.08	---	910.55	910.89	912.77	913.28	912.28	911.77	910.57
31	911.04	---	910.37	910.07	---	910.58	---	912.88	---	912.24	911.78	---
MEAN	911.11	910.99	910.65	910.19	909.88	910.19	910.89	911.77	913.38	912.70	911.92	910.82
MAX	911.23	911.06	911.12	910.36	910.08	910.58	911.02	912.94	913.64	913.23	912.22	911.77
MIN	911.03	910.91	910.37	910.07	909.71	909.98	910.64	910.91	912.95	912.24	911.61	910.48

WTR YR 1981 MEAN 911.21 MAX 913.64 MIN 909.71

12439150 OKANOGAN RIVER AT BRIDGE STREET, AT OROVILLE, WA
(International gaging station)

LOCATION.--Lat 48°56'20", long 119°25'36", in SW¼NW¼ sec.27, T.40 N., R.27 E., Okanogan County, Hydrologic Unit 17020006, on right bank 15 ft (5 m) upstream from Cherry Street bridge in Oroville, 700 ft (213 m) upstream from Tonasket Creek, 1.0 mi (1.6 km) downstream from Osoyoos Lake, and at mile 78.0 (125.5 km).

DRAINAGE AREA.--3,133 m^2 (8,114 km^2).

WATER-ELEVATION RECORDS

PERIOD OF RECORD.-- October 1942 to September 1964 (annual maximum and minimum gage heights only published in WSP 1933), October 1964 to current year (gage heights only). April 1939 to November 1944 (fragmentary) and December 1944 to September 1964 gage heights available in file of district office.

GAGE.--Water-stage recorder. Datum of gage is National Geodetic Vertical Datum of 1929. Prior to Nov. 14, 1944, nonrecording gage and Nov. 15, 1944 to Sept. 30, 1945, water-stage recorder at present site at datum 897.61 ft (273.592 m) higher and Oct. 1, 1945 to Sept. 30, 1975, at datum 900.00 ft (274.320 m) higher. To convert to Geodetic Survey of Canada 1934 datum, subtract 1.63 ft (0.497 m); to convert to 1947 joint adjustment of U.S Coast and Geodetic Survey and Geodetic Survey of Canada, subtract 0.26 ft (0.079 m).

COOPERATION.--This station is maintained by the United States under agreement with Canada.

EXTREMES FOR PERIOD OF RECORD.--Maximum elevation recorded, 916.99 ft (279.499 m) June 2, 1972; minimum recorded, 907.30 ft (276.545 m) Mar. 3, 4, 1948.

EXTREMES FOR CURRENT YEAR.--Maximum elevation, 913.05 ft (278.298 m) June 14, 15; minimum, 909.49 ft (277.213 m), Feb. 17.

ELEVATION (FEET NGVD), WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	910.92	910.88	910.85	910.11	909.90	909.90	910.61	910.86	912.42	912.66	911.77	911.34
2	910.92	910.89	910.90	910.08	909.88	909.91	910.64	910.91	912.49	912.60	911.73	911.20
3	910.90	910.90	910.97	910.05	909.89	909.92	910.70	910.93	912.57	912.53	911.68	911.06
4	910.90	910.89	911.00	910.04	909.89	909.98	910.71	910.99	912.65	912.45	911.71	910.96
5	910.90	910.88	910.91	910.02	909.87	909.98	910.74	911.02	912.69	912.36	911.75	910.85
6	910.91	910.87	910.87	910.00	909.85	909.99	910.78	911.00	912.74	912.32	911.77	910.75
7	910.94	910.89	910.67	909.99	909.81	909.98	910.81	910.84	912.73	912.28	911.77	910.65
8	910.98	910.89	910.58	909.97	909.78	909.98	910.81	910.67	912.70	912.25	911.78	910.68
9	910.97	910.90	910.55	909.96	909.85	909.98	910.83	910.69	912.70	912.27	911.78	910.80
10	910.99	910.90	910.52	909.95	909.78	909.98	910.84	910.81	912.73	912.29	911.77	910.85
11	911.01	910.89	910.50	909.95	909.69	909.97	910.86	910.90	912.78	912.29	911.69	910.72
12	911.02	910.88	910.48	909.93	909.65	909.97	910.91	910.98	912.85	912.28	911.52	910.48
13	911.04	910.86	910.44	909.92	909.61	910.01	910.92	911.03	912.93	912.28	911.35	910.38
14	911.09	910.84	910.41	909.91	909.61	910.02	910.93	911.09	913.01	912.31	911.23	910.31
15	911.11	910.84	910.37	909.90	909.59	910.05	910.96	911.23	913.01	912.33	911.23	910.24
16	911.07	910.80	910.35	909.88	909.57	910.10	910.98	911.34	912.97	912.31	911.30	910.20
17	911.07	910.80	910.35	909.86	909.55	910.15	910.97	911.42	912.94	912.27	911.35	910.19
18	911.05	910.79	910.37	909.83	909.57	910.15	910.96	911.44	912.90	912.22	911.39	910.15
19	911.03	910.79	910.28	909.85	909.62	910.17	910.96	911.45	912.89	912.18	911.41	910.16
20	911.02	910.76	910.23	909.84	909.65	910.19	910.95	911.50	912.88	912.17	911.45	910.11
21	911.02	910.79	910.21	909.83	909.65	910.19	910.92	911.62	912.85	912.12	911.49	910.12
22	910.98	910.79	910.20	909.85	909.66	910.21	910.89	911.75	912.83	912.07	911.50	910.15
23	910.96	910.78	910.19	909.87	909.69	910.23	910.86	911.92	912.83	912.03	911.52	910.15
24	910.93	910.76	910.17	909.87	909.71	910.26	910.88	912.10	912.82	912.02	911.51	910.16
25	910.92	910.77	910.16	909.87	909.79	910.29	910.86	912.31	912.80	911.98	911.42	910.16
26	910.89	910.79	910.14	909.86	909.84	910.36	910.88	912.49	912.79	911.95	911.32	910.16
27	910.87	910.79	910.15	909.86	909.87	910.38	910.84	912.36	912.77	911.93	911.29	910.16
28	910.86	910.83	910.17	909.89	909.89	910.42	910.86	912.21	912.72	911.92	911.28	910.18
29	910.86	910.85	910.12	909.95	---	910.47	910.86	912.17	912.70	911.88	911.30	910.21
30	910.88	910.86	910.11	909.91	---	910.51	910.84	912.27	912.70	911.82	911.33	910.21
31	910.87	---	910.11	909.90	---	910.54	---	912.37	---	911.79	911.35	---
MEAN	910.96	910.84	910.43	909.93	909.74	910.14	910.85	911.44	912.78	912.20	911.51	910.46
MAX	911.11	910.90	911.00	910.11	909.90	910.54	910.98	912.49	913.01	912.66	911.78	911.34
MIN	910.86	910.76	910.11	909.83	909.55	909.90	910.61	910.67	912.42	911.79	911.23	910.11

WTR YR 1981 MEAN 910.95 MAX 913.01 MIN 909.55

12439300 TONASKET CREEK AT OROVILLE, WA

LOCATION.--Lat 48°56'35", long 119°24'45", in NW¼NE¼ sec.27, T.40 N., R.27 E., Okanogan County, Hydrologic Unit 17020006, on left bank 7 ft (2.1 m) downstream from road bridge, 1.0 mi (1.6 km) northeast of Oroville, and 0.7 mi (1.1 km) above mouth.

DRAINAGE AREA.--60.1 mi^2 (155.7 km^2).

PERIOD OF RECORD.--March 1967 to current year.

REVISED RECORDS.--WRD Wash. 1973: 1972(M).

GAGE.--Water-stage recorder. Altitude of gage is 960 ft (293 m), from topographic map.

REMARKS.--Records fair. Two small diversions for irrigation of 45 acres (182,000 m^2) above station.

AVERAGE DISCHARGE.--14 years, 2.68 ft^3/s (0.0759 m^3/s) 0.61 in/yr (15 mm/yr), 1,940 acre-ft/yr (2.39 hm^3/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 455 ft^3/s (12.9 m^3/s) Feb. 27, 1973, gage height, 5.47 ft (1.667 m), from rating curve extended above 50 ft^3/s (1.42 m^3/s) on basis of slope-area measurement of peak flow; no flow for many days each year.

EXTREMES OUTSIDE PERIOD OF RECORD.--Peak of Apr. 12, 1950 was 484 ft^3/s (13.7 m^3/s) at site 0.5 mi (0.8 km) upstream.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 30 ft^3/s (0.850 m^3/s) and maximum (*):

Date	Time	Discharge (ft^3/s)	Discharge (m^3/s)	Gage height (ft)	Gage height (m)	Date	Time	Discharge (ft^3/s)	Discharge (m^3/s)	Gage height (ft)	Gage height (m)
Dec. 11	1345	†		*3.61	1.100	Feb. 16	1730	*49	1.39	3.08	0.939

† Ice jam.

Minimum discharge, no flow part or all of each day Oct. 29-31, Sept. 4, 5.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.2	.20	1.1	2.6	.96	4.2	10	11	5.0	2.9	3.6	.50
2	2.8	.30	1.5	2.5	1.9	4.0	9.8	11	5.4	2.9	3.2	.70
3	3.3	.40	.80	2.2	1.2	4.1	13	12	6.1	2.7	2.6	1.3
4	3.6	.40	.30	2.0	1.7	6.1	13	15	4.9	2.5	2.0	.02
5	3.6	.40	.50	1.8	1.0	6.4	14	12	4.7	3.1	1.4	.51
6	2.8	.68	.60	1.8	1.2	4.7	15	9.1	7.2	2.6	1.5	1.4
7	1.7	2.2	.40	1.6	1.4	4.4	11	12	5.2	2.5	1.4	2.2
8	.80	2.2	.40	1.6	.93	4.2	9.7	13	6.8	2.8	2.7	3.5
9	.70	2.0	.60	1.5	.70	4.1	15	9.3	10	2.2	1.1	4.1
10	.60	1.7	.70	1.5	.60	4.1	12	7.0	9.7	1.8	.87	4.5
11	.60	1.6	.90	1.4	.40	4.3	8.8	9.1	6.5	1.9	.50	4.2
12	.70	1.5	.80	1.2	.60	4.8	7.3	9.9	5.1	1.6	.40	3.0
13	.80	1.2	.80	1.1	.80	5.1	5.6	6.9	6.5	1.8	.40	2.4
14	.70	1.4	.90	.84	.86	5.2	5.2	7.5	6.0	3.1	.30	2.8
15	.90	1.4	.90	.84	1.4	5.4	5.6	21	5.6	2.9	.40	2.9
16	1.9	1.2	.80	.76	23	11	5.9	13	4.8	2.6	.80	3.3
17	3.0	1.4	.70	.76	28	8.9	6.4	9.5	4.3	1.9	2.1	4.0
18	1.7	1.1	.70	1.0	15	6.0	8.8	8.9	3.4	2.3	2.2	4.0
19	.80	1.2	.70	.84	21	5.3	12	11	4.6	3.3	1.9	4.0
20	.70	1.4	.80	.84	17	5.2	12	11	4.6	2.7	1.3	3.5
21	.60	1.7	.80	.84	6.9	4.8	14	15	4.2	2.1	1.2	3.7
22	.50	2.1	.90	1.3	4.7	4.8	14	11	4.9	1.5	.40	5.0
23	.40	2.1	.90	2.1	4.4	5.0	17	8.6	7.5	1.3	.40	3.7
24	.40	1.5	1.0	2.8	4.3	5.3	20	6.2	5.8	1.9	1.3	3.7
25	.30	1.4	1.0	2.3	6.5	5.6	14	11	4.3	2.4	1.0	3.7
26	.40	1.0	1.5	2.0	5.8	6.1	15	17	3.5	2.2	1.0	3.9
27	.30	1.0	3.8	1.8	4.7	6.0	13	12	3.7	1.5	.98	4.1
28	.20	1.0	3.3	1.8	4.4	6.4	16	9.0	3.7	.90	.87	4.1
29	.00	1.2	2.8	1.8	---	7.3	18	7.1	2.8	.79	1.3	4.4
30	.00	1.1	2.5	1.5	---	10	12	6.2	2.5	1.2	1.5	4.4
31	.00	---	2.5	1.4	---	11	---	6.0	---	2.6	.70	---
TOTAL	37.00	37.98	35.90	48.32	160.95	179.8	353.1	328.3	161.3	68.49	41.32	93.53
MEAN	1.19	1.27	1.16	1.56	5.75	5.80	11.8	10.6	5.38	2.21	1.33	3.12
MAX	3.6	2.2	3.8	2.8	28	11	20	21	10	3.3	3.6	5.0
MIN	.00	.20	.30	.76	.20	4.0	5.2	6.0	2.5	.79	.30	.02
CFSM	.02	.02	.02	.03	.10	.10	.20	.18	.09	.04	.02	.05
IN.	.02	.02	.02	.03	.10	.11	.22	.20	.10	.04	.03	.06
AC-FT	73	75	71	96	319	357	700	651	320	136	82	186

CAL YR 1980 TOTAL 1108.26 MEAN 3.03 MAX 70 MIN .00 CFSM .05 IN .69 AC-FT 2200
WTR YR 1981 TOTAL 1545.99 MEAN 4.24 MAX 28 MIN .00 CFSM .07 IN .96 AC-FT 3070

12439400 OKANOGAN RIVER AT ZOSEL MILLPOND, AT OROVILLE, WA
(International gaging station)

LOCATION.--Lat 48°55'55", long 119°25'05", in SE¼SW¼ sec.27, T.40 N., R.27 E., Okanogan County, Hydrologic Unit 17020006, on left bank in Oroville, 0.4 mi (0.6 km) downstream from Tonasket Creek, 1.6 mi (2.6 km) downstream from Osoyoos Lake and at mile 77.41 (124.55 km).

DRAINAGE AREA.--3,195 mi^2 (8,275 km^2).

PERIOD OF RECORD.--October 1942 to September 1964 (annual maximum and minimum gage heights only, published in WSP 1933), October 1964 to current year (gage heights only). April 1939 to March 1944 (fragmentary) and April 1944 to September 1964 gage heights available in file of district office.

REVISED RECORDS.--WRD WA-75-1: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is National Geodetic Vertical Datum of 1929. Prior to Mar. 27, 1944, nonrecording gage and Mar. 28, 1944 to Sept. 30, 1945 water-stage recorder at present site at datum 897.61 ft (273.592 m) higher and Oct. 1, 1945 to Sept. 30, 1975, at datum 900.00 ft (274.320 m) higher. To convert to Geodetic Survey of Canada 1934 datum, subtract 1.63 ft (0.497 m); to convert to 1947 joint adjustment of U.S. Coast and Geodetic Survey and Geodetic Survey of Canada, subtract 0.26 ft (0.079 m).

COOPERATION.--This station is maintained by the United States under agreement with Canada.

EXTREMES FOR PERIOD.--Maximum elevation recorded, 916.91 ft (279.474 m) June 2, 1972; minimum recorded, 905.90 ft (276.118 m) Jan. 3, 1959, but may have been lower during period of no gage-height record Mar. 3 or 4, 1948.

EXTREMES FOR CURRENT YEAR.--Maximum elevation, 912.13 ft (278.017 m) June 14, 15; minimum, 909.10 ft (277.094 m) Jan. 28.

ELEVATION (FEET NGVD), WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	910.72	910.72	910.73	909.80	909.71	909.85	910.60	910.84	911.67	911.41	910.48	910.57
2	910.71	910.74	910.78	909.76	909.69	909.85	910.63	910.89	911.77	911.34	910.45	910.45
3	910.69	910.74	910.86	909.73	909.72	909.85	910.69	910.91	911.83	911.26	910.44	910.31
4	910.69	910.73	910.86	909.71	909.75	909.92	910.70	910.97	911.88	911.18	910.62	910.31
5	910.69	910.72	910.70	909.70	909.74	909.95	910.73	910.99	911.87	911.09	910.75	910.25
6	910.69	910.71	910.66	909.67	909.71	909.96	910.78	910.95	911.91	911.05	910.78	910.14
7	910.73	910.74	910.43	909.66	909.66	909.94	910.81	910.64	911.89	910.99	910.79	910.03
8	910.78	910.77	910.34	909.64	909.63	909.94	910.81	910.34	911.85	910.97	910.80	910.28
9	910.77	910.77	910.30	909.63	909.74	909.94	910.83	910.36	911.84	910.98	910.83	910.61
10	910.79	910.77	910.27	909.62	909.67	909.93	910.83	910.49	911.86	910.94	910.83	910.74
11	910.81	910.77	910.24	909.62	909.53	909.93	910.85	910.58	911.90	910.92	910.76	910.34
12	910.82	910.76	910.23	909.60	909.49	909.94	910.90	910.65	911.97	910.91	910.60	909.72
13	910.84	910.74	910.19	909.59	909.44	910.00	910.91	910.71	912.03	910.91	910.44	909.62
14	910.90	910.72	910.14	909.58	909.45	910.01	910.92	910.77	912.09	910.95	910.33	909.53
15	910.91	910.71	910.11	909.57	909.42	910.04	910.95	910.92	912.01	910.96	910.36	909.46
16	910.84	910.67	910.09	909.55	909.41	910.10	910.97	911.02	911.85	910.93	910.44	909.47
17	910.83	910.67	910.08	909.52	909.38	910.14	910.95	911.09	911.81	910.88	910.51	909.57
18	910.81	910.66	910.11	909.49	909.42	910.14	910.95	910.95	911.77	910.84	910.55	909.54
19	910.79	910.66	909.97	909.51	909.52	910.17	910.94	910.85	911.74	910.81	910.59	909.54
20	910.81	910.63	909.92	909.51	909.56	910.18	910.93	910.90	911.72	910.81	910.62	909.48
21	910.85	910.65	909.89	909.50	909.56	910.18	910.90	911.01	911.69	910.77	910.67	909.59
22	910.82	910.66	909.89	909.51	909.56	910.21	910.87	911.12	911.66	910.73	910.69	909.68
23	910.79	910.65	909.88	909.53	909.60	910.22	910.83	911.28	911.65	910.69	910.72	909.67
24	910.77	910.63	909.86	909.53	909.63	910.26	910.86	911.45	911.64	910.68	910.71	909.64
25	910.75	910.64	909.84	909.54	909.71	910.29	910.84	911.67	911.61	910.65	910.64	909.62
26	910.73	910.66	909.82	909.52	909.76	910.37	910.86	911.94	911.59	910.62	910.54	909.63
27	910.71	910.66	909.84	909.53	909.80	910.38	910.82	911.76	911.56	910.61	910.51	909.63
28	910.70	910.70	909.91	909.55	909.82	910.42	910.84	911.54	911.50	910.60	910.50	909.65
29	910.71	910.73	909.80	909.76	---	910.48	910.84	911.46	911.47	910.56	910.53	909.70
30	910.72	910.74	909.80	909.72	---	910.51	910.82	911.55	911.47	910.50	910.56	909.69
31	910.71	---	909.80	909.69	---	910.53	---	911.66	---	910.48	910.58	---
MEAN	910.77	910.70	910.17	909.61	909.61	910.12	910.84	911.04	911.77	910.87	910.60	909.88
MAX	910.91	910.77	910.86	909.80	909.82	910.53	910.97	911.94	912.09	911.41	910.83	910.74
MIN	910.69	910.63	909.80	909.49	909.38	909.85	910.60	910.34	911.47	910.48	910.33	909.46

WTR YR 1981 MEAN 910.50 MAX 912.09 MIN 909.38

12439500 OKANOGAN RIVER AT OROVILLE, WA
(International gaging station)

LOCATION.--Lat 48°55'51", long 119°25'09", in SE¼SW¼ sec.27, T.40 N., R.27 E., Okanogan County, Hydrologic Unit 17020006, on left bank in Oroville, 20 ft (6 m) downstream from Burlington Northern trestle, 0.5 mi (0.8 km) downstream from Tonasket Creek, 1.7 mi (2.7 km) downstream from Osoyoos Lake, 3.2 mi (5.1 km) upstream from Similkameen River, and at mile 77.3 (124.4 km).

DRAINAGE AREA.--3,195 mi^2 (8,275 km^2).

PERIOD OF RECORD.--October 1942 to current year.

REVISED RECORDS.--WRD WA-75-1: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 900.00 ft (274.320 m), National Geodetic Vertical Datum of 1929. Prior to Oct. 26, 1944, nonrecording gage at Zosel milldam 200 ft (61 m) upstream at same datum. Oct. 26, 1944, to Mar. 6, 1948, water-stage recorder on railroad trestle 20 ft (6 m) upstream at same datum. Auxiliary water-stage recorder 0.5 mi (0.8 km) downstream used during high-water periods since Apr. 10, 1948. May 15, 1946, to Apr. 9, 1948, auxiliary nonrecording gage at same site and datum. To convert to 1947 joint adjustment of U.S. Coast and Geodetic Survey and Geodetic Survey of Canada, subtract 0.26 ft (0.074 m).

REMARKS.--Records excellent. Diversions made to irrigate approximately 44,000 acres (17,800 hm^2) in Canada and minor diversions in the United States above station. Natural regulation in several large lakes and artificial regulation in Okanagan Lake 46.7 mi (75.1 km) upstream for flood control and irrigation; also regulated by Zosel milldam at Oroville, 200 ft (61 m) above gage.

COOPERATION.--This station is maintained by the United States under agreement with Canada.

AVERAGE DISCHARGE.--39 years, 661 ft^3/s (18.72 m^3/s), 479,000 acre-ft/yr (591 hm^3/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 3,730 ft^3/s (106 m^3/s) June 14, 1972; maximum gage height, 16.89 ft (5.148 m) June 2, 1972 (backwater from Similkameen River); minimum daily discharge, 2,270 ft^3/s (64.3 m^3/s) reverse flow May 29, 1948; minimum gage height, 3.98 ft (1.213 m) Mar. 1, 1948.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 2,680 ft^3/s) (75.9 m^3/s) June 15, maximum gage height, 11.33 ft (3.453 m) May 26 (backwater from Similkameen River); minimum discharge, 0.5 ft^3/s (0.014 m^3/s) Feb. 10, gage height, 5.23 ft (1.594 m), due to regulation.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	450	493	440	497	370	250	161	280	2130	2220	1410	1160
2	450	495	447	490	375	250	161	290	2130	2160	1390	1100
3	448	495	459	487	340	250	165	285	2180	2080	1380	1030
4	448	493	518	482	320	250	165	290	2270	2020	1280	923
5	449	493	610	481	325	255	169	340	2330	1940	1240	835
6	451	491	604	476	320	255	169	395	2390	1900	1250	799
7	460	493	570	474	315	255	174	673	2370	1860	1250	757
8	459	459	555	471	315	250	174	853	2380	1830	1250	597
9	457	457	548	470	325	250	174	859	2360	1840	1270	416
10	460	455	542	467	219	250	169	904	2360	1800	1270	350
11	463	454	537	465	315	246	174	943	2370	1780	1230	553
12	466	450	532	465	310	210	183	976	2400	1770	1150	745
13	469	449	526	461	310	144	183	1000	2430	1770	1070	709
14	478	445	518	460	310	144	183	1030	2480	1800	1020	685
15	497	443	512	460	310	140	183	1090	2560	1810	1030	661
16	515	440	507	458	310	144	223	1140	2630	1780	1070	619
17	515	438	504	452	310	144	280	1180	2590	1740	1100	586
18	510	438	519	448	280	144	280	1390	2540	1710	1130	570
19	509	435	522	449	260	140	285	1540	2520	1680	1150	564
20	512	432	518	449	260	140	285	1590	2520	1670	1170	548
21	517	435	514	448	260	140	280	1620	2490	1630	1200	509
22	515	433	514	449	260	144	280	1690	2460	1600	1210	504
23	510	432	512	449	255	144	275	1800	2430	1580	1230	515
24	504	431	509	449	255	144	275	1920	2420	1560	1230	543
25	504	432	506	449	250	144	275	2060	2390	1540	1180	553
26	500	432	504	449	250	149	280	1980	2360	1520	1140	553
27	497	433	478	449	255	153	280	1920	2350	1510	1120	553
28	493	438	484	438	250	153	280	1900	2300	1500	1120	559
29	493	441	522	375	---	153	275	1930	2260	1470	1130	564
30	493	443	500	370	---	157	275	2000	2250	1430	1150	564
31	493	---	498	370	---	153	---	2040	---	1410	1160	---
TOTAL	14985	13598	16029	14057	8234	5745	6715	37908	71650	53910	36980	19624
MEAN	483	453	517	453	294	185	224	1223	2388	1739	1193	654
MAX	517	495	610	497	375	255	285	2060	2630	2220	1410	1160
MIN	448	431	440	370	219	140	161	280	2130	1410	1020	350
AC-FT	29720	26970	31790	27880	16330	11400	13320	75190	142100	106900	73350	38920

CAL YR 1980 TOTAL 155250 MEAN 424 MAX 806 MIN 82 AC-FT 307900
WTR YR 1981 TOTAL 299435 MEAN 820 MAX 2630 MIN 140 AC-FT 593900

12442500 SIMILKAMEEN RIVER NEAR NIGHTHAWK, WA
(International gaging station)

LOCATION.--Lat 48°59'05", long 119°37'02", in NW¼ sec.7, T.40 N., R.26 E., Okanogan County, Hydrologic Unit 17020007, on left bank 1,000 ft (305 m) upstream from Oroville-Tonasket Irrigation District canal intake, 1.6 mi (2.6 km) northeast of Nighthawk, 3.8 mi (6.1 km) downstream from Palmer Creek, and at mile 15.8 (25.4 km).

DRAINAGE AREA.--3,550 mi^2 (9,190 km^2), approximately.

PERIOD OF RECORD.--May 1911 to current year (prior to September 1928, mean monthly discharge included Oroville-Tonasket Irrigation District canal). Published as "near Oroville" 1911-28. Water temperatures January 1949 to September 1950, November 1961 to September 1970, at site 1.7 mi (2.7 km) upstream.

REVISED RECORDS.--WSP 1183: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 1,137.70 ft (346.771 m) National Geodetic Vertical Datum of 1929, international joint adjustment of 1947. Prior to Sept. 11, 1928, staff gages at sites 7 mi (11.3 km) downstream (below Oroville-Tonasket Irrigation District canal) at various datums.

REMARKS.--Records excellent. Flow at high stages regulated by natural diversion into and release from Palmer Lake. Several small diversions above station for irrigation of about 2,900 acres (1,170 hm^2) in the United States in 1946 and approximately 10,500 acres (4,250 hm^2) in Canada in 1957.

COOPERATION.--This station is maintained by the United States under agreement with Canada.

AVERAGE DISCHARGE.--70 years, 2,297 ft^3/s (65.05 m^3/s), 1,664,000 acre-ft/yr (2,050 hm^3/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 45,800 ft^3/s (1,300 m^3/s) June 1, 1972; maximum gage height, 18.78 ft (5.724 m) May 31, 1972; minimum discharge, 65 ft^3/s (1.84 m^3/s) Jan. 3, 1974, gage height, 1.59 ft (0.485 m), result of freezeup.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 14,800 ft^3/s (419 m^3/s) May 26, gage height, 11.10 ft (3.383 m); minimum, 300 ft^3/s (8.50 m^3/s) Dec. 6, gage height, 2.31 ft (0.704 m).

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	683	528	1010	4690	1140	1030	1030	5810	10600	4890	2120	734
2	909	528	958	4220	1020	1000	1010	6660	9750	4650	1970	740
3	828	550	845	3800	899	980	993	5580	9330	4330	1920	867
4	767	711	657	3450	851	1020	979	4940	8780	4140	1990	830
5	720	709	478	3180	839	999	972	4520	8420	4120	1930	764
6	680	806	342	2990	811	953	965	4180	8300	3960	1770	728
7	647	830	334	2790	799	908	958	3910	8240	3640	1650	698
8	619	977	384	2570	796	904	944	3670	7320	3500	1540	662
9	600	1280	397	2390	780	912	930	3590	6860	3410	1450	626
10	590	1260	521	2320	650	883	923	3730	6780	3250	1370	600
11	587	1090	616	2180	580	871	916	3740	6490	3360	1300	580
12	579	945	789	2000	612	871	909	3710	6080	3230	1240	565
13	573	794	1140	1910	670	874	902	3810	5920	3040	1170	545
14	570	687	1150	1790	856	895	874	4060	5990	3250	1110	530
15	565	662	1070	1670	981	923	860	4550	6080	3350	1090	515
16	557	740	1160	1500	1020	958	881	4920	6030	3180	1130	505
17	548	739	2000	1380	1050	986	944	4900	5950	3130	1130	490
18	539	686	1870	1360	1340	986	979	5180	5680	3370	1130	470
19	528	699	1590	1520	1390	972	1010	5900	5810	3980	1030	470
20	522	706	1360	1550	1350	972	1130	7120	6190	3680	1010	485
21	512	702	1330	1480	1330	965	1380	8540	6100	3480	1020	525
22	512	740	1360	1450	1220	972	1440	9140	5830	3250	979	535
23	522	991	1670	1430	1150	972	1530	9240	5590	3100	916	530
24	512	855	1720	1440	1140	979	2270	10000	5540	3100	860	540
25	506	768	1590	1410	1200	972	3510	11300	5250	3210	812	550
26	512	724	1860	1360	1150	972	3150	14100	5160	3060	776	550
27	517	747	11600	1290	1110	972	2870	13200	5250	2830	746	555
28	512	751	10600	1250	1060	986	2730	11900	5200	2640	722	555
29	506	1150	6750	1250	---	993	3030	11200	4820	2490	698	560
30	512	1120	5550	1260	---	1010	3990	11500	4840	2370	722	580
31	522	---	5030	1200	---	1030	---	11800	---	2260	740	---
TOTAL	18256	24475	67731	64080	27794	29720	45009	216400	198180	105250	38041	17884
MEAN	589	816	2185	2067	993	959	1500	6981	6606	3395	1227	596
MAX	909	1280	11600	4690	1390	1030	3990	14100	10600	4890	2120	867
MIN	506	528	334	1200	580	871	860	3590	4820	2260	698	470
AC-FT	36210	48550	134300	127100	55130	58950	89280	429200	393100	208800	75450	35470

CAL YR 1980 TOTAL 904970 MEAN 2473 MAX 13900 MIN 230 AC-FT 1795000
WTR YR 1981 TOTAL 852820 MEAN 2336 MAX 14100 MIN 334 AC-FT 1692000

12444700 AENEAS LAKE NEAR TONASKET, WA

LOCATION.--Lat 48°40'32", long 119°30'35", in SE¼SW¼ sec.25, T.37 N., R.26 E., Okanogan County, Hydrologic Unit 17020006, at Mr. R. C. Wolfe's residence on south shore 4.0 mi (6.4 km) southwest of Tonasket.

DRAINAGE AREA.--32.4 mi^2 (83.9 km^2).

PERIOD OF RECORD.--February 1964 to current year (fragmentary).

GAGE.--Nonrecording gage. Datum of gage is 1,346 ft (410.3 m) National Geodetic Vertical Datum of 1929. Prior to Aug. 25, 1978, recording or nonrecording gages at several locations near present site, all at present datum.

REMARKS.--Pumping from lake and nearby ground-water wells during irrigation season. Diversion from Okanogan River into lake by pumping during irrigation season beginning June 1970.

EXTREMES FOR PERIOD OF RECORD.--Maximum gage height observed, 11.78 ft (3.590 m) Oct. 21, 1976; minimum observed, -10.68 ft (-3.255 m) Oct. 10, 16, 1969.

EXTREMES FOR CURRENT YEAR.--Maximum gage height observed, 9.41 ft (2.868 m) Nov. 6; minimum, 3.94 ft (1.201 m) Sept. 22.

GAGE HEIGHT (FEET ABOVE DATUM), WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981
ONCE-DAILY

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	---	---	8.36	---	8.22	---	---	7.48	7.09	---	4.45
2	---	9.06	---	---	---	---	8.09	7.93	---	---	4.67	---
3	---	---	8.67	8.34	8.19	---	---	7.89	7.60	---	---	---
4	7.10	---	---	---	---	---	---	---	---	---	---	---
5	---	---	8.65	---	---	8.25	---	---	7.73	---	---	---
6	---	9.41	---	8.30	8.17	---	8.06	---	---	6.63	---	---
7	7.16	---	---	---	---	8.22	---	---	---	6.70	4.21	---
8	---	---	8.55	---	---	8.20	---	7.63	---	---	---	4.34
9	---	---	8.54	8.28	---	---	---	---	8.19	6.31	---	---
10	---	9.35	---	---	8.15	---	8.04	7.59	---	---	---	4.20
11	7.36	---	---	---	---	---	---	---	---	---	4.13	---
12	---	---	8.51	---	---	8.17	---	7.50	8.27	---	---	4.15
13	---	---	---	8.25	---	---	8.03	---	---	6.05	4.26	---
14	7.50	---	8.48	---	---	8.16	---	---	---	---	---	---
15	7.48	9.04	---	8.23	8.16	---	---	7.53	---	5.86	---	---
16	---	---	8.46	---	---	8.16	8.02	---	8.17	---	---	---
17	7.77	8.98	---	---	---	8.14	---	---	---	---	4.55	---
18	---	---	---	---	---	---	---	---	---	---	---	---
19	---	---	---	---	---	---	---	7.70	---	---	---	3.95
20	7.89	8.92	---	8.20	8.19	8.13	8.00	---	7.83	5.43	---	---
21	---	---	---	---	---	---	---	---	---	---	4.63	---
22	---	---	8.42	8.21	8.16	---	---	7.55	7.68	5.22	---	3.94
23	---	---	---	---	---	---	7.86	---	---	---	---	---
24	---	8.74	---	8.21	---	---	---	---	---	---	---	---
25	8.30	---	8.42	---	---	---	7.91	---	---	---	4.49	---
26	---	8.68	---	---	---	8.11	---	7.55	---	5.06	---	4.28
27	---	---	8.40	---	8.25	---	---	---	7.34	---	---	4.43
28	8.63	---	---	8.21	---	8.10	7.90	---	---	---	4.48	---
29	---	8.66	---	---	---	---	---	7.52	---	4.87	---	4.77
30	8.81	---	8.37	8.24	---	---	---	---	---	---	---	---
31	---	---	---	8.22	---	8.09	---	---	---	4.73	4.50	---
MEAN	---	---	---	---	---	---	---	---	---	---	---	---
MAX	---	---	---	---	---	---	---	---	---	---	---	---
MIN	---	---	---	---	---	---	---	---	---	---	---	---

12445000 OKANOGAN RIVER NEAR TONASKET, WA

LOCATION.--Lat 48°37'57", long 119°27'38", in lot 3, sec.8, T.36 N., R.27 E., Okanogan County, Hydrologic Unit 17020006, on right bank 1,000 ft (305 m) upstream from Chewiliken Creek, 5.2 mi (8.4 km) south of Tonasket, and at mile 50.8 (81.7 km).

DRAINAGE AREA.--7,260 mi^2 (18,000 km^2), approximately.

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

REVISED RECORDS.--WSP 862: 1937. WSP 1316: 1934(M), 1938(M). WSP 1933: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 860.78 ft (262.366 m) National Geodetic Vertical Datum of 1929.

REMARKS.--Records excellent. Diversions above station for irrigation of about 10,700 acres (43 km^2) in the United States and 55,000 acres (220 km^2) in Canada. Flow affected by regulation of Okanagan and Skaha Lakes and by natural storage in other lakes.

AVERAGE DISCHARGE.--52 years, 2,938 ft^3/s (83.20 m^3/s), 2,129,000 acre-ft/yr (2,630 hm^3/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 44,700 ft^3/s (1,270 m^3/s) June 2, 1972, gage height, 22.54 ft (6.870 m); minimum recorded, 126 ft^3/s (3.57 m) Sept. 5, 1931, gage height, 3.43 ft (1.045 m).

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 15,700 ft^3/s (445 m^3/s) May 27, gage height, 13.60 ft (4.145 m); minimum, 822 ft^3/s (23.3 m^3/s) Dec. 6, gage height, 4.67 ft (1.423 m).

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1020	1060	1510	5220	1550	1290	1140	4580	13700	6910	3490	1780
2	1090	1060	1450	4810	1490	1260	1120	6360	12400	6740	3340	1740
3	1240	1050	1410	4390	1370	1240	1130	5890	11900	6390	3200	1710
4	1180	1090	1250	4040	1240	1250	1090	5360	11200	6070	3190	1760
5	1120	1200	1100	3740	1200	1260	1100	4940	10900	5940	3100	1590
6	1070	1210	1020	3560	1190	1230	1090	4660	10400	5830	3000	1500
7	1040	1330	950	3350	1150	1190	1070	4440	10700	5550	2870	1430
8	1020	1310	900	3150	1140	1160	1070	4420	9980	5280	2750	1320
9	991	1480	940	2940	1140	1170	1060	4400	9150	5180	2670	1110
10	973	1690	940	2810	1110	1160	1030	4400	8990	5020	2580	934
11	973	1640	1090	2710	1030	1140	1040	4420	8750	4940	2490	890
12	979	1500	1200	2570	1080	1130	1030	4560	8460	4960	2340	1160
13	985	1360	1330	2410	1060	1070	1010	4520	8160	4770	2190	1190
14	985	1230	1580	2320	1120	1040	995	4760	8260	4740	2050	1150
15	982	1160	1650	2200	1220	1050	983	5010	8290	5050	1980	1110
16	1000	1140	1600	2040	1290	1080	974	5720	8470	4890	2030	1070
17	1060	1200	1880	1900	1330	1090	1040	5830	8390	4750	2090	1020
18	1170	1180	2410	1800	1380	1100	1120	6000	8170	4710	2100	990
19	1190	1150	2200	1840	1610	1100	1140	6660	7940	5310	2090	997
20	1170	1150	2080	1960	1570	1080	1190	7600	8300	5320	2090	988
21	1170	1160	1890	1970	1560	1070	1300	9030	8410	5080	2090	1010
22	1150	1150	1850	1910	1510	1070	1520	10400	8190	4800	2110	1010
23	1130	1230	1960	1880	1420	1080	1550	10600	7890	4580	2070	1040
24	1130	1370	2150	1870	1370	1080	1730	11200	7770	4460	2010	1050
25	1120	1270	2150	1860	1410	1080	2910	12300	7540	4530	1930	1080
26	1100	1200	2020	1830	1430	1080	3460	14300	7290	4510	1820	1090
27	1090	1170	5990	1780	1380	1070	3130	15500	7310	4290	1750	1110
28	1080	1190	11700	1730	1340	1090	2930	14900	7310	4080	1710	1120
29	1070	1290	8360	1650	---	1110	2840	13700	7050	3900	1700	1130
30	1060	1560	6300	1630	---	1120	3530	13400	6770	3760	1710	1140
31	1060	---	5540	1600	---	1120	---	13800	---	3620	1750	---
TOTAL	33398	37780	78400	79470	36690	35060	46322	243660	268040	155960	72290	36219
MEAN	1077	1259	2529	2564	1310	1131	1544	7860	8935	5031	2332	1207
MAX	1240	1690	11700	5220	1610	1290	3530	15500	13700	6910	3490	1780
MIN	973	1050	900	1600	1030	1040	974	4400	6770	3620	1700	890
AC-FT	66240	74940	155500	157600	72770	69540	91880	483300	531700	309300	143400	71840

CAL YR 1980 TOTAL 1014864 MEAN 2773 MAX 13300 MIN 460 AC-FT 2013000
WTR YR 1981 TOTAL 1123289 MEAN 3078 MAX 15500 MIN 890 AC-FT 2228000

12447200 OKANOGAN RIVER AT MALOTT, WA
(National Stream-quality Accounting Network Station)

LOCATION.--Lat 48°16'53", long 119°42'12", in SW¼ sec.9, T.32 N., R.25 E., Okanogan County, Hydrologic Unit 170020006, on right bank 75 ft (23 m) upstream from highway bridge at Malott, 0.1 mi (0.2 km) upstream from Loup Loup Creek, and at mile 17.0 (27.4 km).

DRAINAGE AREA.--8,080 mi^2 (20,930 km^2), approximately.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--April 1958 to current year. April 1958 to September 1965, published as "near Malott." Records published for both sites December 1965 to July 1967.

REVISED RECORDS.--WDR WA-75-1: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 783.55 ft (238.826 m) National Geodetic Vertical Datum of 1929. April 1958 to November 1965, water-stage recorder at site 3.9 mi (6.3 km) downstream at National Geodetic Vertical Datum of 1929.

REMARKS.--Water-discharge records excellent. Diversions above station for irrigation of about 22,000 acres (89 km^2) in the United States and 55,000 acres (220 km^2) in Canada. Flow regulated by Okanagan and Skaha Lakes and by natural storage in other lakes.

AVERAGE DISCHARGE.--23 years, 3,061 ft^3/s (86.69 m^3/s), 2,218,000 acre-ft/yr (2,730 hm^3/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 45,600 ft^3/s (1,290 m^3/s) June 3, 1972, gage height, 22.16 ft (6.754 m); minimum observed, 288 ft^3/s (8.16 m^3/s) Sept. 4, 1970, gage height, 2.03 ft (0.619 m).

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 15,100 ft^3/s (428 m^3/s) May 27, gage height, 11.44 ft (3.487 m); minimum, 915 ft^3/s (25.9 m^3/s) Sept. 12, gage height, 3.05 ft (0.930 m).

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1100	1150	1640	5280	1700	1470	1340	3890	13700	6910	3430	1760
2	1080	1140	1580	4940	1640	1430	1330	5740	12600	6870	3280	1760
3	1210	1150	1540	4520	1570	1400	1320	6420	11800	6580	3140	1710
4	1290	1150	1470	4140	1440	1440	1290	5500	11300	6230	3050	1720
5	1230	1200	1200	3830	1340	1470	1280	4890	10900	6030	3010	1700
6	1180	1300	1100	3600	1310	1440	1290	4500	10500	5940	2940	1560
7	1140	1390	1040	3420	1280	1400	1260	4230	10500	5740	2810	1490
8	1110	1430	1010	3230	1260	1370	1250	4230	10300	5400	2690	1420
9	1080	1420	1040	3030	1240	1340	1250	4100	9440	5210	2600	1300
10	1060	1660	1160	2870	1250	1350	1230	3970	9050	5090	2530	1100
11	1050	1760	1290	2790	1140	1340	1210	4100	8930	4890	2440	951
12	1050	1660	1430	2670	1310	1330	1220	4200	8670	4950	2340	946
13	1060	1540	1530	2520	1430	1320	1200	4240	8360	4840	2210	1200
14	1060	1420	1620	2420	1380	1250	1180	4360	8310	4660	2070	1190
15	1060	1300	1770	2330	1310	1240	1170	4770	8350	4880	1980	1160
16	1060	1240	1710	2220	1380	1270	1160	5300	8500	4970	1950	1120
17	1080	1240	1670	2070	1440	1290	1130	5700	8460	4750	2010	1090
18	1170	1290	2100	1960	1460	1280	1210	5770	8310	4660	2030	1030
19	1260	1250	2500	1900	1620	1310	1260	6370	8060	4900	2050	1030
20	1270	1240	2400	2000	1770	1290	1280	7160	8190	5420	2040	1030
21	1260	1240	2210	2060	1680	1270	1330	8330	8430	5150	2010	1010
22	1240	1250	2080	2040	1680	1260	1460	9680	8320	4890	2050	1050
23	1230	1240	1990	2010	1590	1270	1600	10300	8030	4610	2030	1070
24	1220	1380	2110	1980	1540	1270	1640	10600	7820	4420	1990	1090
25	1220	1420	2300	1980	1550	1280	2020	11600	7680	4400	1920	1110
26	1210	1340	2180	1960	1580	1280	3260	13200	7420	4480	1850	1130
27	1190	1280	2730	1920	1560	1260	3150	14900	7320	4330	1770	1160
28	1180	1270	10400	1880	1510	1260	2920	14700	7340	4080	1720	1190
29	1170	1300	9490	1870	---	1280	2800	13800	7220	3870	1690	1190
30	1160	1470	6810	1760	---	1290	2980	13200	6880	3730	1690	1200
31	1150	---	5750	1750	---	1290	---	13400	---	3570	1710	---
TOTAL	35830	40120	78850	82950	40960	41040	48020	233150	270690	156450	71030	37467
MEAN	1156	1337	2544	2676	1463	1324	1601	7521	9023	5047	2291	1249
MAX	1290	1760	10400	5280	1770	1470	3260	14900	13700	6910	3430	1760
MIN	1050	1140	1010	1750	1140	1240	1130	3890	6880	3570	1690	946
AC-FT	71070	79580	156400	164500	81240	81400	95250	462500	536900	310300	140900	74320

CAL YR 1980 TOTAL 1049784 MEAN 2868 MAX 13200 MIN 520 AC-FT 2082000
WTR YR 1981 TOTAL 1136557 MEAN 3114 MAX 14900 MIN 946 AC-FT 2254000

12447200 OKANOGAN RIVER AT MALOTT, WA--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1959-62, 1963-70 (partial-record station), 1972, 1975 to current year.

PERIOD OF DAILY RECORD.--
WATER TEMPERATURE: November 1969 to June 1971.

REMARKS.--Water years 1959 to 1963 published as 12447300 "near Brewster", 1964 to 1966 published as 12447300 "near Malott."

WATER QUALITY DATA, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SPE-CIFIC CON-DUCT-ANCE (UMHOS)	SPE-CIFIC CON-DUCT-ANCE LAB (UMHOS)	PH (UNITS)	PH LAB (UNITS)	TEMPER-ATURE (DEG C)	TUR-BID-ITY (FTU)	OXYGEN, DIS-SOLVED (MG/L)	COLI-FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)
OCT , 1980										
06...	1330	1180	271	265	8.4	8.0	16.2	1.2	9.6	15
DEC										
01...	1200	1640	250	257	8.2	8.0	3.1	1.5	12.7	22
FEB , 1981										
02...	1315	1650	245	243	8.2	7.8	2.8	1.6	13.0	3
APR										
06...	1430	1240	250	258	8.4	7.9	9.6	2.0	12.3	4
JUN										
01...	1500	13800	106	113	7.5	7.6	13.2	19	10.3	35
AUG										
03...	1230	3130	211	206	7.4	8.2	21.2	2.0	8.9	77

DATE	STREP-TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML)	HARD-NESS (MG/L AS CACO3)	HARD-NESS NONCAR-BONATE (MG/L AS CACO3)	CALCIUM DIS-SOLVED (MG/L AS CA)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG)	SODIUM, DIS-SOLVED (MG/L AS NA)	PERCENT SODIUM	SODIUM AD-SORP-TION RATIO	POTAS-SIUM, DIS-SOLVED (MG/L AS K)	ALKA-LINITY LAB (MG/L AS CACO3)
OCT , 1980										
06...	<1	120	6.0	32	8.7	8.2	13	.3	2.2	110
DEC										
01...	10	110	11	31	8.1	7.9	13	.3	1.8	100
FEB , 1981										
02...	8	110	13	30	7.7	7.6	13	.3	1.5	94
APR										
06...	1	110	19	32	8.2	8.2	13	.3	1.6	95
JUN										
01...	66	47	1.0	14	3.0	3.8	15	.2	1.1	46
AUG										
03...	25	89	9.0	25	6.4	6.7	14	.3	1.5	80

DATE	SULFATE DIS-SOLVED (MG/L AS SO4)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)	FLUO-RIDE, DIS-SOLVED (MG/L AS F)	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 AC-FT)	SOLIDS, DIS-SOLVED (TONS PER DAY)	NITRO-GEN, NITRATE TOTAL (MG/L AS N)	NITRO-GEN, NITRITE TOTAL (MG/L AS N)
OCT , 1980										
06...	28	2.1	.1	8.6	162	156	.22	516	--	--
DEC										
01...	27	1.7	.2	7.8	153	146	.21	677	--	--
FEB , 1981										
02...	28	1.4	.2	9.7	149	143	.20	664	.03	.010
APR										
06...	29	1.7	.2	9.6	149	148	.20	499	--	--
JUN										
01...	1.0	.7	.1	8.3	74	60	.10	2760	--	--
AUG										
03...	14	1.5	.1	8.9	120	113	.16	1010	--	--

DATE	NITRO-GEN, NO2+NO3 TOTAL (MG/L AS N)	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N)	NITRO-GEN, AMMONIA TOTAL (MG/L AS N)	NITRO-GEN, AMMONIA DIS-SOLVED (MG/L AS N)	NITRO-GEN, ORGANIC TOTAL (MG/L AS N)	NITRO-GEN, ORGANIC DIS-SOLVED (MG/L AS N)	NITRO-GEN, AM-MONIA + ORGANIC TOTAL (MG/L AS N)	NITRO-GEN, NH4 + ORG. SUSP. TOTAL (MG/L AS N)	NITRO-GEN, AM-MONIA + ORGANIC DIS. (MG/L AS N)	NITRO-GEN, TOTAL (MG/L AS N)
OCT , 1980										
06...	.00	.00	.030	.000	.84	.55	.87	.32	.55	.87
DEC										
01...	.02	.00	.050	.060	.40	.31	.45	.08	.37	.47
FEB , 1981										
02...	.04	.06	.020	.000	.24	.28	.26	.00	.28	.30
APR										
06...	--	.03	.060	.050	.64	.64	.70	.01	.69	--
JUN										
01...	--	.06	.070	.090	.64	.48	.71	.14	.57	--
AUG										
03...	--	.15	.180	.090	.45	--	.63	--	--	--

12447200 OKANOGAN RIVER AT MALOTT, WA--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	NITROGEN DISSOLVED (MG/L AS N)	PHOSPHORUS, TOTAL (MG/L AS P)	PHOSPHORUS, DISSOLVED (MG/L AS P)	PHOSPHORUS, ORTHO, TOTAL (MG/L AS P)	CARBON, ORGANIC TOTAL (MG/L AS C)	CARBON, ORGANIC DISSOLVED (MG/L AS C)	CARBON, ORGANIC SUSPENDED TOTAL (MG/L AS C)	SEDIMENT, SUSPENDED (MG/L)	SEDIMENT, DISCHARGE, SUSPENDED (T/DAY)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM
OCT , 1980										
06...	.55	.020	.010	--	--	5.7	.2	6	19	--
DEC										
01...	.37	.050	.040	--	--	5.8	.4	26	115	--
FEB , 1981										
02...	.34	.040	.020	.020	--	8.6	.6	55	245	--
APR										
06...	.72	.040	.020	--	7.4	--	--	7	23	--
JUN										
01...	.63	.090	.020	--	--	5.6	1.3	186	6930	43
AUG										
03...	1.2	.020	.030	--	--	4.4	.1	10	85	--

DATE	TIME	ARSENIC TOTAL (UG/L AS AS)	ARSENIC SUSPENDED TOTAL (UG/L AS AS)	ARSENIC DISSOLVED (UG/L AS AS)	BARIUM, TOTAL RECOVERABLE (UG/L AS BA)	BARIUM, SUSPENDED RECOVERABLE (UG/L AS BA)	BARIUM, DISSOLVED (UG/L AS BA)	CADMIUM TOTAL RECOVERABLE (UG/L AS CD)	CADMIUM SUSPENDED RECOVERABLE (UG/L AS CD)	CADMIUM DISSOLVED (UG/L AS CD)	CHROMIUM, TOTAL RECOVERABLE (UG/L AS CR)
OCT , 1980											
06...	1330	6	0	6	0	0	40	1	--	<1	0
DEC											
01...	1200	3	1	2	100	60	40	0	--	<1	0
FEB , 1981											
02...	1315	3	0	3	100	60	40	0	0	0	10
JUN											
01...	1500	8	5	3	100	0	200	0	--	<1	20
AUG											
03...	1230	5	1	4	100	70	30	1	--	<1	0

DATE	CHROMIUM, SUSPENDED RECOV. (UG/L AS CR)	CHROMIUM, DISSOLVED (UG/L AS CR)	COBALT, TOTAL RECOVERABLE (UG/L AS CO)	COBALT, SUSPENDED RECOVERABLE (UG/L AS CO)	COBALT, DISSOLVED (UG/L AS CO)	COPPER, TOTAL RECOVERABLE (UG/L AS CU)	COPPER, SUSPENDED RECOVERABLE (UG/L AS CU)	COPPER, DISSOLVED (UG/L AS CU)	IRON, TOTAL RECOVERABLE (UG/L AS FE)	IRON, SUSPENDED RECOVERABLE (UG/L AS FE)	IRON, DISSOLVED (UG/L AS FE)
OCT , 1980											
06...	0	0	0	--	<3	15	13	2	130	--	<10
DEC											
01...	0	0	1	--	<3	7	5	2	300	--	<10
FEB , 1981											
02...	10	0	2	2	0	5	2	3	570	550	20
JUN											
01...	20	0	0	--	<3	18	11	7	2900	2900	30
AUG											
03...	0	0	3	--	<3	7	5	2	340	330	11

DATE	LEAD, TOTAL RECOVERABLE (UG/L AS PB)	LEAD, SUSPENDED RECOVERABLE (UG/L AS PB)	LEAD, DISSOLVED (UG/L AS PB)	MANGANESE, TOTAL RECOVERABLE (UG/L AS MN)	MANGANESE, SUSPENDED RECOV. (UG/L AS MN)	MANGANESE, DISSOLVED (UG/L AS MN)	MERCURY TOTAL RECOVERABLE (UG/L AS HG)	MERCURY SUSPENDED RECOVERABLE (UG/L AS HG)	MERCURY DISSOLVED (UG/L AS HG)	NICKEL, TOTAL RECOVERABLE (UG/L AS NI)	NICKEL, SUSPENDED RECOVERABLE (UG/L AS NI)
OCT , 1980											
06...	11	9	2	30	20	10	.1	.0	.1	4	4
DEC											
01...	12	7	5	30	20	6	.0	.0	.0	3	3
FEB , 1981											
02...	6	4	2	30	20	8	.1	.1	.0	5	5
JUN											
01...	5	2	3	90	90	4	.2	.2	.0	2	1
AUG											
03...	15	10	5	30	30	5	.2	.1	.1	1	1

DATE	NICKEL, DISSOLVED (UG/L AS NI)	SELENIUM, TOTAL (UG/L AS SE)	SELENIUM, SUSPENDED TOTAL (UG/L AS SE)	SELENIUM, DISSOLVED (UG/L AS SE)	SILVER, TOTAL RECOVERABLE (UG/L AS AG)	SILVER, SUSPENDED RECOVERABLE (UG/L AS AG)	SILVER, DISSOLVED (UG/L AS AG)	ZINC, TOTAL RECOVERABLE (UG/L AS ZN)	ZINC, SUSPENDED RECOVERABLE (UG/L AS ZN)	ZINC, DISSOLVED (UG/L AS ZN)
OCT , 1980										
06...	0	0	0	0	0	0	0	30	--	<3
DEC										
01...	0	0	0	0	0	0	0	10	5	5
FEB , 1981										
02...	0	0	0	0	0	0	0	20	10	7
JUN										
01...	1	0	0	0	0	0	0	30	20	6
AUG										
03...	0	0	0	0	0	0	0	50	40	10

12447200 OKANOGAN RIVER AT MALOTT, WA--Continued

PHYTOPLANKTON ANALYSES, OCTOBER 1980 TO AUGUST 1981

DATE	JUN 1,81	AUG 3,81
TIME	1500	1230
TOTAL CELLS/ML	360	5100
DIVERSITY: DIVISION	0.9	0.7
.CLASS	0.9	0.7
..ORDER	1.0	1.0
...FAMILY	1.0	1.1
....GENUS	1.0	1.4

ORGANISM	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT
BACILLARIOPHYTA (DIATOMS)				
.BACILLARIOPHYCEAE				
..ACHNANTHALES				
...ACHNANTHACEAE				
....ACHNANTHES	--	-	*	0
..BACILLARIALES				
...NITZSCHIACEAE				
....NITZSCHIA	--	-	84	2
..EUPODISCALES				
...COSCINODISCACEAE				
....CYCLOTELLA	13	4	42	1
....MELOSIRA	--	-	28	1
..FRAGILARIALES				
...FRAGILARIACEAE				
....ASTERIONELLA	52	14	--	-
....DIATOMA	--	-	310	6
..NAVICULALES				
...CYMBELLACEAE				
....CYMBELLA	--	-	*	0
...NAVICULACEAE				
....NAVICULA	--	-	28	1
CHLOROPHYTA (GREEN ALGAE)				
.CHLOROPHYCEAE				
..CHLOROCOCCALES				
...CHLOROCOCCACEAE				
....SCHROEDERIA	--	-	*	0
....TETRAEDRON	--	-	*	0
...COCCOMYXACEAE				
....ELAKATOTHRIX	--	-	28	1
...OOCYSTACEAE				
....KIRCHNERIELLA	--	-	*	0
..VOLVOCALES				
...CHLAMYDOMONADACEAE				
....CHLAMYDOMONAS	13	4	42	1
..ZYGNEMATALES				
...DESMIDIACEAE				
....COSMARIUM	--	-	*	0
CHRYSOPHYTA				
.CHRYSOPHYCEAE				
..OCHROMONADALES				
...OCHROMONADACEAE				
....OCHROMONAS	--	-	*	0
CYANOPHYTA (BLUE-GREEN ALGAE)				
.CYANOPHYCEAE				
..CHROOCOCCALES				
...CHROOCOCCACEAE				
....ANACYSTIS	--	-	140	3
..NOSTOCALES				
...NOSTOCACEAE				
....ANABAENOPSIS	280#	79	--	-
..OSCILLATORIALES				
...OSCILLATORIACEAE				
....LYNGBYA	--	-	280	6
....OSCILLATORIA	--	-	4000#	79

NOTE: # - DOMINANT ORGANISM; EQUAL TO OR GREATER THAN 15%
* - OBSERVED ORGANISM, MAY NOT HAVE BEEN COUNTED; LESS THAN 1/2%

12447390 ANDREWS CREEK NEAR MAZAMA, WA
(Hydrologic bench-mark station)

LOCATION.--Lat 48°49'23", long 120°08'41", in NE¼ sec.1, T.38 N., R.21 E., Okanogan County, Hydrologic Unit 17020008, Okanogan National Forest, on left bank 50 ft (15 m) upstream from Blizzard Creek, 3.5 mi (5.6 km) upstream from mouth, and 20 mi (32 km) northeast of Mazama.

DRAINAGE AREA.--22.1 mi^2 (57.2 km^2).

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--June 1968 to current year.

REVISED RECORDS.--WDR WA-76-2: 1975. WDR WA-77-2: 1976.

GAGE.--Water-stage recorder. Altitude of gage is 4,300 ft (1,310 m), from topographic map.

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

AVERAGE DISCHARGE.--13 years, 32.6 ft^3/s (0.923 m^3/s), 20.03 in/yr (509 mm/yr), 23,620 acre-ft/yr (29.1 hm^3/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,120 ft^3/s (31.7 m^3/s) June 10, 1972, gage height, 4.00 ft (1.219 m), from rating curve extended above 440 ft^3/s (12.5 m^3/s); minimum, 1.2 ft^3/s (0.034 m^3/s) Nov. 4, 1968, Nov. 20, 1970, Apr. 7, 1975; minimum gage height, 0.27 ft (0.082 m) Mar. 25-29, Apr. 6, 7, 1975.

EXTREMES FOR CURRENT YEAR.--Peak discharge above base of 200 ft^3/s (5.66 m^3/s) and maximum (*):

Date	Time	Discharge (ft^3/s)	Discharge (m^3/s)	Gage height (ft)	Gage height (m)
May 25	1400	*605	17.1	*3.10	0.945

Minimum discharge, 2.2 ft^3/s (0.062 m^3/s) Nov. 11, gage height 0.30 ft (0.091 m).

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	8.7	5.9	4.2	9.2	5.0	4.4	5.7	74	211	57	24	12
2	8.7	6.0	4.2	8.7	6.0	4.1	5.7	63	193	53	23	10
3	8.7	5.6	4.4	7.9	5.7	4.1	5.7	53	152	53	22	9.2
4	8.1	5.9	4.3	7.9	5.5	4.1	5.7	48	137	53	22	8.7
5	7.6	6.4	4.2	7.9	5.5	4.1	6.0	42	127	49	20	8.7
6	7.0	6.7	4.1	7.6	5.3	4.1	5.7	39	135	45	20	8.1
7	6.5	7.6	4.1	7.0	5.3	3.9	5.7	36	108	44	19	7.6
8	6.4	7.8	4.1	7.0	5.0	3.9	5.7	36	95	41	18	7.3
9	6.3	6.5	4.1	7.0	5.0	3.9	5.7	37	87	37	17	7.0
10	6.3	6.2	4.1	6.8	4.4	3.9	5.7	38	81	36	17	6.5
11	6.2	4.3	4.1	6.8	4.1	3.9	5.7	39	76	35	16	6.5
12	6.8	3.7	4.0	6.5	4.6	4.1	5.5	38	75	33	15	6.0
13	7.8	3.9	3.9	6.2	4.8	4.1	5.5	42	68	36	15	5.7
14	7.3	4.6	3.9	6.2	4.6	4.4	5.7	44	67	35	15	5.5
15	6.7	5.3	4.7	6.0	4.6	4.6	6.2	45	69	33	16	5.3
16	6.3	4.6	6.5	5.7	4.8	4.8	6.5	44	74	35	14	5.0
17	6.3	4.3	5.8	5.5	5.0	4.6	6.2	47	69	34	15	4.8
18	6.3	4.6	5.2	5.5	4.8	4.6	7.0	58	65	53	14	4.6
19	6.3	4.8	5.0	5.5	4.8	4.8	8.4	88	67	42	13	7.0
20	6.6	4.9	4.8	5.5	4.6	4.8	11	112	66	38	13	6.0
21	6.3	5.0	4.8	5.7	4.6	4.8	10	160	61	35	12	5.7
22	5.8	4.7	4.7	8.4	4.6	5.0	11	175	60	34	12	6.2
23	5.3	4.5	4.7	8.7	4.6	5.0	17	207	58	36	11	6.0
24	6.0	4.4	4.6	7.9	4.6	5.0	30	233	57	34	10	6.0
25	5.8	4.4	5.1	7.3	4.6	5.3	26	395	61	32	10	5.7
26	5.6	4.2	7.5	7.0	4.4	5.3	26	305	68	30	9.5	5.7
27	5.3	4.3	12	6.0	4.4	5.3	26	261	66	29	9.2	6.8
28	5.6	4.3	14	7.0	4.4	5.5	26	237	61	27	8.9	10
29	5.4	4.4	11	6.5	---	5.7	32	257	60	26	9.2	8.1
30	5.6	4.3	9.5	6.2	---	5.7	51	296	60	27	9.8	7.0
31	5.7	---	9.5	6.0	---	5.7	---	245	---	25	9.2	---
TOTAL	203.3	154.1	177.1	213.1	135.6	143.5	380.0	3794	2634	1177	458.8	208.7
MEAN	6.56	5.14	5.71	6.87	4.84	4.63	12.7	122	87.8	38.0	14.8	6.96
MAX	8.7	7.8	14	9.2	6.0	5.7	51	395	211	57	24	12
MIN	5.3	3.7	3.9	5.5	4.1	3.9	5.5	36	57	25	8.9	4.6
CFSM	.30	.23	.26	.31	.22	.21	.58	5.52	3.97	1.72	.67	.32
IN.	.34	.26	.30	.36	.23	.24	.64	6.39	4.43	1.98	.77	.35
AC-FT	403	306	351	423	269	285	754	7530	5220	2330	910	414

CAL YR 1980 TOTAL 12255.6 MEAN 33.5 MAX 280 MIN 3.0 CFSM 1.52 IN 20.63 AC-FT 24310
WTR YR 1981 TOTAL 9679.2 MEAN 26.5 MAX 395 MIN 3.7 CFSM 1.20 IN 16.29 AC-FT 19200

12447390 ANDREWS CREEK NEAR MAZAMA, WA--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1972 to current year.

WATER QUALITY DATA, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SPE-CIFIC CON-DUCT-ANCE (UMHOS)	SPE-CIFIC CON-DUCT-ANCE LAB (UMHOS)	PH (UNITS)	PH LAB (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 CACO3)	HARD-NESS NONCAR-BONATE (MG/L AS CACO3)
OCT , 1980												
07...	1200	6.5	53	59	7.7	7.6	6.3	11.4	<1	1	24	.00
NOV												
04...	1000	5.7	55	60	7.8	7.5	3.1	11.6	<1	<1	22	.00
DEC												
02...	1230	4.4	59	62	7.8	7.1	.5	10.1	<1	<1	21	.00
JAN , 1981												
06...	1155	7.8	52	55	8.2	7.4	.4	12.2	1	1	21	.00
FEB												
03...	1100	5.5	57	55	7.7	7.2	.3	--	<1	<1	24	2.0
MAR												
03...	0945	4.1	54	53	7.8	7.4	1.0	12.3	<1	<1	23	1.0
APR												
07...	0900	5.5	54	58	6.4	7.1	.5	12.4	<1	<1	23	.00
MAY												
05...	0900	44	33	38	7.2	7.2	.2	12.6	<1	<1	16	.00
JUN												
02...	1400	184	18	24	7.1	7.3	3.6	11.6	<1	K1	9	.00
JUL												
07...	0945	43	28	31	7.1	7.2	5.0	11.0	1	1	13	.00
AUG												
04...	1100	22	41	41	7.4	7.7	6.1	10.4	<1	36	16	.00
SEP												
01...	0900	12	52	50	7.4	7.7	7.7	10.2	<1	73	20	.00

DATE	CALCIUM DIS-SOLVED (MG/L AS CA)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG)	SODIUM, DIS-SOLVED (MG/L AS NA)	PERCENT SODIUM	SODIUM AD-SORP-TION RATIO	POTAS-SIUM, DIS-SOLVED (MG/L AS K)	ALKA-LINITY LAB (MG/L AS CACO3)	SULFATE DIS-SOLVED (MG/L AS SO4)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)	FLUO-RIDE, DIS-SOLVED (MG/L AS F)	SILICA, DIS-SOLVED (MG/L AS SIO2)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L)
OCT , 1980												
07...	7.5	1.2	3.1	21	.3	.8	28	6.5	1.0	.0	11	51
NOV												
04...	7.0	1.0	2.4	19	.2	.6	26	.2	.1	.1	11	39
DEC												
02...	6.9	1.0	2.9	22	.3	.6	29	.6	.4	.1	11	43
JAN , 1981												
06...	7.1	.9	2.6	20	.2	.5	30	.1	.1	.1	10	38
FEB												
03...	7.5	1.2	2.9	21	.3	.6	22	.3	.1	.1	11	46
MAR												
03...	7.3	1.1	2.4	18	.2	.6	22	2.1	.3	<.1	11	38
APR												
07...	7.6	1.0	2.9	21	.3	.6	27	.2	.3	.1	11	41
MAY												
05...	5.0	.8	2.2	23	.2	.5	16	3.0	.2	.0	9.6	27
JUN												
02...	2.8	.5	1.5	26	.2	.4	9.0	1.5	.1	.1	7.4	23
JUL												
07...	4.1	.6	1.8	23	.2	.3	14	.6	.6	.0	8.6	27
AUG												
04...	5.4	.7	2.3	23	.3	.5	21	<1.0	.1	.0	9.7	31
SEP												
01...	6.6	.9	2.0	17	.2	.6	26	.9	.2	<.1	9.6	57

DATE	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L)	SOLIDS, DIS-SOLVED (TONS PER AC-FT)	SOLIDS, DIS-SOLVED (TONS PER DAY)	NITRO-GEN, NO2+NO3 TOTAL (MG/L AS N)	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N)	NITRO-GEN, AMMONIA TOTAL (MG/L AS N)	NITRO-GEN, AMMONIA DIS-SOLVED (MG/L AS N)	NITRO-GEN, ORGANIC TOTAL (MG/L AS N)	NITRO-GEN, ORGANIC DIS-SOLVED (MG/L AS N)	NITRO-GEN, AM-MONIA + ORGANIC TOTAL (MG/L AS N)	NITRO-GEN, NH4 + ORG. SUSP. TOTAL (MG/L AS N)	NITRO-GEN, AM-MONIA + ORGANIC DIS. (MG/L AS N)
OCT , 1980												
07...	48	.07	.90	.00	.00	--	--	--	--	--	--	--
NOV												
04...	38	.05	.60	.00	.00	.040	.050	.42	.24	.46	.17	.29
DEC												
02...	41	.06	.51	.02	.05	.000	.000	.39	.30	.39	.09	.30
JAN , 1981												
06...	40	.05	.80	.09	.08	.000	.010	.21	.87	.21	.00	.88
FEB												
03...	37	.06	.68	.03	.05	.020	.000	.60	.60	.62	.02	.60
MAR												
03...	38	.05	.42	.05	.05	.010	<.010	.10	--	.11	.01	.10
APR												
07...	40	.06	.61	.07	.07	.090	.060	--	--	--	--	--
MAY												
05...	32	.04	3.2	--	--	.110	.080	2.3	1.4	2.40	.90	1.5
JUN												
02...	20	.03	11.4	.01	.01	.060	.110	.55	.31	.61	.19	.42
JUL												
07...	25	.04	3.1	.04	.07	.090	.100	.37	.25	.46	.11	.35
AUG												
04...	32	.04	1.8	<.10	<.10	.190	.170	.13	.01	.32	.14	.18
SEP												
01...	37	.08	1.9	.05	.08	.020	.060	.18	.23	.20	.00	.29

K Results based on colony counts outside the acceptable range.

12447390 ANDREWS CREEK NEAR MAZAMA, WA--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	NITROGEN, TOTAL (MG/L AS N)	NITROGEN DISSOLVED (MG/L AS N)	PHOSPHORUS, TOTAL (MG/L AS P)	PHOSPHORUS, DISSOLVED (MG/L AS P)	PHOSPHORUS, ORTHO, TOTAL (MG/L AS P)	PHOSPHORUS, ORTHO, DISSOLVED (MG/L AS P)	CARBON, ORGANIC TOTAL (MG/L AS C)	CARBON, ORGANIC DISSOLVED (MG/L AS C)	CARBON, ORGANIC SUSPENDED TOTAL (MG/L AS C)	CYANIDE TOTAL (MG/L AS CN)	SEDIMENT, SUSPENDED (MG/L)	SEDIMENT, DISCHARGE, SUSPENDED (T/DAY)
OCT , 1980												
07...	--	--	.010	--	--	.000	--	--	--	--	1	.02
NOV												
04...	.46	.29	.040	.040	--	--	2.0	--	--	--	1	.02
DEC												
02...	.41	.35	.050	.040	--	--	5.1	--	--	--	1	.01
JAN , 1981												
06...	.30	.96	.020	.010	--	--	1.8	--	--	--	0	.00
FEB												
03...	.65	.65	.030	.010	.000	--	--	2.6	.2	.00	1	.01
MAR												
03...	.16	.15	.100	<.010	--	--	1.4	--	--	--	1	.01
APR												
07...	--	2.1	.020	.020	--	--	1.4	--	--	--	0	.00
MAY												
05...	--	1.6	.020	.000	--	--	3.3	--	--	--	1	.12
JUN												
02...	.62	.43	.020	.020	--	--	--	5.8	.2	.00	4	2.0
JUL												
07...	.50	.42	.000	.020	--	--	2.6	--	--	--	4	.46
AUG												
04...	--	1.6	--	.020	--	--	1.7	--	--	--	2	.12
SEP												
01...	.25	.37	<.010	.050	--	--	1.8	--	--	--	0	.00

DATE	TIME	ARSENIC TOTAL (UG/L AS AS)	ARSENIC SUSPENDED TOTAL (UG/L AS AS)	ARSENIC DISSOLVED (UG/L AS AS)	BARIUM, TOTAL RECOVERABLE (UG/L AS BA)	BARIUM, SUSPENDED RECOVERABLE (UG/L AS BA)	BARIUM, DISSOLVED (UG/L AS BA)	BERYLLIUM, DISSOLVED (UG/L AS BE)	CADMIUM TOTAL RECOVERABLE (UG/L AS CD)	CADMIUM DISSOLVED (UG/L AS CD)
FEB , 1981										
03...	1100	0	0	1	0	0	30	<1	0	<1
JUN										
02...	1400	0	0	0	100	0	140	<1	0	<1

DATE	CHROMIUM, TOTAL RECOVERABLE (UG/L AS CR)	CHROMIUM, SUSPENDED RECOV, (UG/L AS CR)	CHROMIUM, DISSOLVED (UG/L AS CR)	COBALT, DISSOLVED (UG/L AS CO)	COPPER, TOTAL RECOVERABLE (UG/L AS CU)	COPPER, DISSOLVED (UG/L AS CU)	IRON, TOTAL RECOVERABLE (UG/L AS FE)	IRON, SUSPENDED RECOVERABLE (UG/L AS FE)	IRON, DISSOLVED (UG/L AS FE)	LEAD, TOTAL RECOVERABLE (UG/L AS PB)
FEB , 1981										
03...	10	9	1	<3	5	<10	90	80	13	4
JUN										
02...	10	7	3	<3	3	<10	50	30	16	3

DATE	LEAD, DISSOLVED (UG/L AS PB)	LITHIUM DISSOLVED (UG/L AS LI)	MANGANESE, TOTAL RECOVERABLE (UG/L AS MN)	MANGANESE, SUSPENDED RECOV, (UG/L AS MN)	MANGANESE, DISSOLVED (UG/L AS MN)	MERCURY TOTAL RECOVERABLE (UG/L AS HG)	MERCURY SUSPENDED RECOVERABLE (UG/L AS HG)	MERCURY DISSOLVED (UG/L AS HG)	MOLYBDENUM, DISSOLVED (UG/L AS MO)	SELENIUM, TOTAL (UG/L AS SE)
FEB , 1981										
03...	<10	<4	20	0	65	.1	.1	.0	<10	0
JUN										
02...	<10	<4	10	8	2	.2	.1	.1	<10	0

DATE	SELENIUM, SUSPENDED TOTAL (UG/L AS SE)	SELENIUM, DISSOLVED (UG/L AS SE)	SILVER, TOTAL RECOVERABLE (UG/L AS AG)	SILVER, SUSPENDED RECOVERABLE (UG/L AS AG)	SILVER, DISSOLVED (UG/L AS AG)	STRONTIUM, DISSOLVED (UG/L AS SR)	VANADIUM, DISSOLVED (UG/L AS V)	ZINC, TOTAL RECOVERABLE (UG/L AS ZN)	ZINC, SUSPENDED RECOVERABLE (UG/L AS ZN)	ZINC, DISSOLVED (UG/L AS ZN)
FEB , 1981										
03...	0	0	0	0	0	84	6.0	30	30	3
JUN										
02...	0	0	0	0	0	34	<6.0	10	2	8

12447390 ANDREWS CREEK NEAR MAZAMA, WA--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	TIME	PCB, TOTAL (UG/L)	PCB, TOTAL IN BOTTOM MATERIAL (UG/KG)	ALDRIN, TOTAL (UG/L)	ALDRIN, TOTAL IN BOTTOM MATERIAL (UG/KG)	CHLORDANE, TOTAL (UG/L)	CHLORDANE, TOTAL IN BOTTOM MATERIAL (UG/KG)	DDD, TOTAL (UG/L)	DDD, TOTAL IN BOTTOM MATERIAL (UG/KG)	DDE, TOTAL (UG/L)	DDE, TOTAL IN BOTTOM MATERIAL (UG/KG)	DDT, TOTAL (UG/L)
JUN , 1981 02...	1400	.00	0	.00	.0	.00	.0	.00	.0	.00	.2	.00

DATE	DDT, TOTAL IN BOTTOM MATERIAL (UG/KG)	DIAZINON, TOTAL (UG/L)	DIELDRIN TOTAL (UG/L)	DIELDRIN, TOTAL IN BOTTOM MATERIAL (UG/KG)	ENDOSULFAN, TOTAL (UG/L)	ENDOSULFAN, TOTAL IN BOTTOM MATERIAL (UG/KG)	ENDRIN, TOTAL (UG/L)	ENDRIN, TOTAL IN BOTTOM MATERIAL (UG/KG)	ETHION, TOTAL (UG/L)	HEPTACHLOR, TOTAL (UG/L)	HEPTACHLOR, TOTAL IN BOTTOM MATERIAL (UG/KG)	HEPTACHLOR EPOXIDE TOTAL (UG/L)
JUN , 1981 02...	.0	.00	.00	.0	.00	.0	.00	.0	.00	.00	.0	.00

DATE	HEPTACHLOR EPOXIDE TOT. IN BOTTOM MATL. (UG/KG)	LINDANE TOTAL (UG/L)	LINDANE TOTAL IN BOTTOM MATERIAL (UG/KG)	MALATHION, TOTAL (UG/L)	METHOXYCHLOR, TOTAL (UG/L)	METHOXYCHLOR, TOT. IN BOTTOM MATL. (UG/KG)	METHYL PARATHION, TOTAL (UG/L)	METHYL TRITHION, TOTAL (UG/L)	MIREX, TOTAL (UG/L)	NAPHTHALENES, POLYCHLOR. TOTAL (UG/L)	PARATHION, TOTAL (UG/L)
JUN , 1981 02...	.0	.00	.0	.00	.00	.0	.00	.00	.00	.00	.00

DATE	PCN, TOTAL IN BOTTOM MATERIAL (UG/KG)	PERTHANE TOTAL (UG/L)	PERTHANE IN BOTTOM MATERIL (UG/KG)	TOXAPHENE, TOTAL (UG/L)	TOXAPHENE, TOTAL IN BOTTOM MATERIAL (UG/KG)	TOTAL TRITHION (UG/L)	2,4-D, TOTAL (UG/L)	2, 4-DP TOTAL (UG/L)	2,4,5-T TOTAL (UG/L)	MIREX, TOTAL IN BOTTOM MATERIAL (UG/KG)	SILVEX, TOTAL (UG/L)
JUN , 1981 02...	.0	.00	.00	0	.0	.00	.00	.00	.00	.0	.00

DATE	TIME	GROSS ALPHA, DISSOLVED (PCI/L AS U-NAT)	GROSS ALPHA, SUSP. TOTAL (PCI/L AS U-NAT)	GROSS ALPHA, DISSOLVED (UG/L AS U-NAT)	GROSS ALPHA, SUSP. TOTAL (UG/L AS U-NAT)	GROSS BETA, DISSOLVED (PCI/L AS CS-137)	GROSS BETA, SUSP. TOTAL (PCI/L AS CS-137)	GROSS BETA, DISSOLVED (PCI/L AS SR/YT-90)	GROSS BETA, SUSP. TOTAL (PCI/L AS SR/YT-90)	RADIUM 226, DISSOLVED, RADON METHOD (PCI/L)	URANIUM DISSOLVED, EXTRACTION (UG/L)
FEB , 1981 03...	1100	.5	.3	<.7	<.4	.9	<.4	.9	<.4	.04	.22

12449950 METHOW RIVER NEAR PATEROS, WA

LOCATION.--Lat 48°04'39", long 119°59'02", in SE¼SW¼ sec.20, T.30 N., R.23 E., Okanogan County, Hydrologic Unit 17020008, on right bank 1.4 mi (2.3 km) downstream from Black Canyon Creek, 4.3 mi (6.9 km) northwest of Pateros, and at mile 6.7 (10.8 km).

DRAINAGE AREA.--1,772 mi^2 (4,589 km^2).

PERIOD OF RECORD.--April 1959 to current year. Water temperatures October 1968 to October 1970.

REVISED RECORDS.--WSP 1933: Drainage area.

GAGE.--Water-stage recorder. Altitude of gage is 900 ft (274 m), from topographic map. Prior to Dec. 17, 1964, nonrecording gage at same site and datum.

REMARKS.--Records good. Diversions for irrigation of about 11,000 acres (45 km^2) above station (1959 Bureau of Reclamation land classification). National Weather Service gage-height telemeter at station.

AVERAGE DISCHARGE.--22 years, 1,587 ft^3/s (44.94 m^3/s), 1,150,000 acre-ft/yr (1,420 hm^3/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 28,800 ft^3/s (816 m^3/s) May 31, 1972, gage height, 12.25 ft (3.734 m); minimum daily, 150 ft^3/s (4.25 m^3/s) Jan. 8, 9, 10, 1974, result of freezeup.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum discharge since 1920, 46,700 ft^3/s (1,320 m^3/s) May 29, 1948, by slope-area measurement of peak flow at site 1 mi (1.6 km) downstream.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 11,500 ft^3/s (326 m^3/s) May 26, gage height, 7.76 ft (2.365 m); minimum daily, 280 ft^3/s (7.93 m^3/s) Dec. 7.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	470	416	397	1690	666	672	1030	4680	6850	2990	1100	411
2	490	421	421	1560	630	672	1010	5110	6520	2800	1050	416
3	485	421	430	1450	630	672	978	4370	6200	2710	1000	426
4	475	421	421	1320	594	690	946	3840	5820	2830	986	411
5	465	421	392	1260	606	708	930	3380	5380	3010	962	397
6	460	430	369	1200	600	696	938	3050	5570	2840	902	383
7	450	523	280	1130	578	690	895	2800	5260	2480	860	374
8	445	539	290	1080	589	684	874	2600	4790	2210	825	360
9	435	517	300	1040	572	672	846	2470	4430	1970	797	351
10	435	490	326	1000	506	666	825	2450	4040	1860	776	343
11	435	470	392	954	440	672	811	2450	3790	1840	741	334
12	450	450	406	909	495	684	790	2440	3550	1710	702	330
13	460	430	421	881	545	708	762	2430	3440	1630	684	318
14	460	426	426	839	561	741	734	2510	3280	1840	654	318
15	455	426	426	797	550	790	727	2710	3220	1820	666	318
16	445	426	426	748	561	853	734	2740	3200	1770	684	313
17	445	421	426	748	600	895	734	2680	3190	1800	642	313
18	435	421	435	762	654	916	741	2870	3080	2020	606	309
19	435	421	445	734	720	923	762	4100	3050	2170	578	305
20	435	416	455	720	748	916	839	5420	3100	1980	583	305
21	435	416	460	714	702	909	946	6410	3050	1830	578	318
22	430	430	465	748	672	909	1000	6780	2900	1680	556	318
23	430	416	460	783	660	923	1120	6960	2810	1660	534	318
24	430	397	465	790	660	930	1570	7320	2710	1760	512	318
25	426	392	475	776	720	946	2050	8600	2720	1720	490	322
26	421	402	697	762	708	970	2040	10700	3010	1620	480	322
27	416	392	3280	748	702	970	1970	8830	3320	1500	465	326
28	416	402	2860	748	684	978	1960	7750	3140	1420	445	339
29	416	406	2210	762	---	1010	2220	7470	2900	1350	435	347
30	411	402	1930	720	---	1030	2960	7700	3070	1280	406	360
31	411	---	1790	696	---	1030	---	7750	---	1190	411	---
TOTAL	13707	12961	22976	29069	17353	25525	34742	151370	117390	61290	21110	10323
MEAN	442	432	741	938	620	823	1158	4883	3913	1977	681	344
MAX	490	539	3280	1690	748	1030	2960	10700	6850	3010	1100	426
MIN	411	392	280	696	440	666	727	2430	2710	1190	406	305
AC-FT	27190	25710	45570	57660	34420	50630	68910	300200	232800	121600	41870	20480

CAL YR 1980 TOTAL 624689 MEAN 1707 MAX 10700 MIN 270 AC-FT 1239000
WTR YR 1981 TOTAL 517816 MEAN 1419 MAX 10700 MIN 280 AC-FT 1027000

12450700 COLUMBIA RIVER BELOW WELLS DAM, WA

LOCATION.--Lat 47°56'48", long 119°51'56", in SW¼SE¼ sec.6, T.28 N., R.24 E., Chelan County, Hydrologic Unit 17020005, at powerhouse of Wells Dam, 0.7 mi (1.1 km) northeast of Azwell, and at mile 515.9 (830.1 km).

DRAINAGE AREA.--86,100 mi^2 (223,000 km^2), approximately.

PERIOD OF RECORD.--October 1967 to current year. October 1953 to September 1967 (monthly discharge only) on file in District office.

GAGE.--Water-stage recorder. Datum of gage is National Geodetic Vertical Datum of 1929 (levels by Bechtel Corporation). Prior to Oct. 1, 1970, at site 0.8 mi (1.3 km) downstream at same datum. Auxiliary water-stage recorder 6.8 mi (10.9 km) downstream from base gage at same datum.

REMARKS.--Records good. Discharge for Oct. 23, Oct. 27 to Nov. 21, Nov. 27 to Dec. 11, Apr. 26, and Sept. 6 provided by N.P.D. Reservoir Control Center. Flow regulated by nine major reservoirs and numerous smaller reservoirs and powerplants. Diversion by Feeder Canal for Columbia Basin project (see sta 12435500) and for irrigation of about 380,000 acres (1,540 km^2) in the United States and an additional 35,000 acres (142 km^2) in Canada.

AVERAGE DISCHARGE.--28 years, 118,300 ft^3/s (3,350 m^3/s), 85,710,000 acre-ft/yr (105,700 hm^3/yr), unadjusted.

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 402,000 ft^3/s (11,400 m^3/s) June 15, 1972; maximum elevation, 731.92 ft (223.089 m) June 16, 1972; minimum discharge, 17,900 ft^3/s (507 m^3/s) Oct. 5, 1970 (from powerplant records); minimum elevation, 703.55 ft (214.442 m) Sept. 28, 1980.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 273,000 ft^3/s (7,730 m^3/s) June 4; maximum elevation, 724.09 ft (220.703 m) July 8; minimum daily, 33,400 ft^3/s (946 m^3/s) Apr. 26; minimum elevation, 705.90 ft (215.158 m) Apr. 26.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	75000	59700	107000	147000	131000	81700	112000	117000	221000	162000	172000	107000
2	64800	43800	106000	142000	157000	109000	125000	102000	240000	187000	149000	93600
3	66600	72400	105000	156000	143000	106000	109000	105000	237000	173000	157000	95800
4	49200	67200	120000	151000	151000	113000	97000	123000	237000	173000	181000	89600
5	39300	77300	109000	135000	139000	111000	94000	130000	246000	180000	166000	54700
6	77400	89500	96700	127000	149000	113000	109000	139000	244000	196000	150000	58700
7	73200	78800	102000	142000	149000	107000	103000	142000	234000	229000	156000	65800
8	76400	62500	121000	142000	158000	92000	112000	132000	232000	231000	143000	91900
9	76200	60900	118000	143000	164000	111000	114000	114000	238000	219000	149000	84000
10	72100	89000	112000	146000	156000	107000	114000	107000	230000	198000	148000	87700
11	59100	93800	114000	152000	149000	103000	105000	142000	236000	183000	168000	96500
12	47500	96700	117000	152000	140000	109000	103000	140000	231000	176000	160000	79200
13	74700	98700	103000	148000	135000	106000	104000	135000	237000	173000	154000	67700
14	76500	97900	96700	152000	107000	84200	102000	145000	239000	177000	160000	92700
15	81100	76000	109000	146000	103000	86000	113000	146000	235000	171000	128000	96700
16	76600	74400	104000	156000	93600	108000	101000	119000	220000	184000	118000	97100
17	79700	96700	112000	154000	85700	106000	93000	111000	205000	176000	142000	84800
18	46400	90300	113000	139000	106000	106000	91500	138000	212000	182000	136000	91200
19	46800	88600	117000	157000	119000	103000	67000	140000	214000	179000	134000	79400
20	61000	96100	84800	147000	110000	104000	97000	146000	217000	179000	130000	61300
21	77800	96700	74800	149000	118000	98400	94600	147000	220000	183000	132000	88600
22	87900	86300	85400	137000	106000	78600	89400	142000	228000	185000	108000	87100
23	76400	94500	111000	147000	118000	115000	74700	115000	236000	177000	105000	84800
24	80300	110000	103000	144000	127000	112000	78200	102000	229000	147000	120000	87200
25	59200	101000	83700	126000	120000	106000	43100	120000	229000	153000	120000	82500
26	62100	95200	98800	153000	116000	99400	33400	125000	225000	159000	115000	73800
27	80700	59400	116000	150000	97500	101000	69100	144000	208000	167000	110000	49600
28	76600	63800	136000	149000	82600	81400	85500	169000	204000	168000	116000	79800
29	79400	88900	166000	144000	---	69400	99000	198000	195000	176000	108000	83600
30	77600	81100	142000	143000	---	111000	105000	215000	163000	193000	109000	72500
31	67600	---	150000	135000	---	97900	---	221000	---	177000	132000	---
TOTAL	2145200	2487200	3433900	4511000	3530400	3136000	2837500	4271000	6742000	5613000	4276000	2464900
MEAN	69200	82910	110800	145500	126100	101200	94580	137800	224700	181100	137900	82160
MAX	87900	110000	166000	157000	164000	115000	125000	221000	246000	231000	181000	107000
MIN	39300	43800	74800	126000	82600	69400	33400	102000	163000	147000	105000	49600
AC-FT	4255000	4933000	6811000	8948000	7003000	6220000	5628000	8472000	13370000	11130000	8481000	4889000

CAL YR 1980 TOTAL 35003500 MEAN 95640 MAX 194000 MIN 39300 AC-FT 69430000
WTR YR 1981 TOTAL 45448100 MEAN 124500 MAX 246000 MIN 33400 AC-FT 90150000

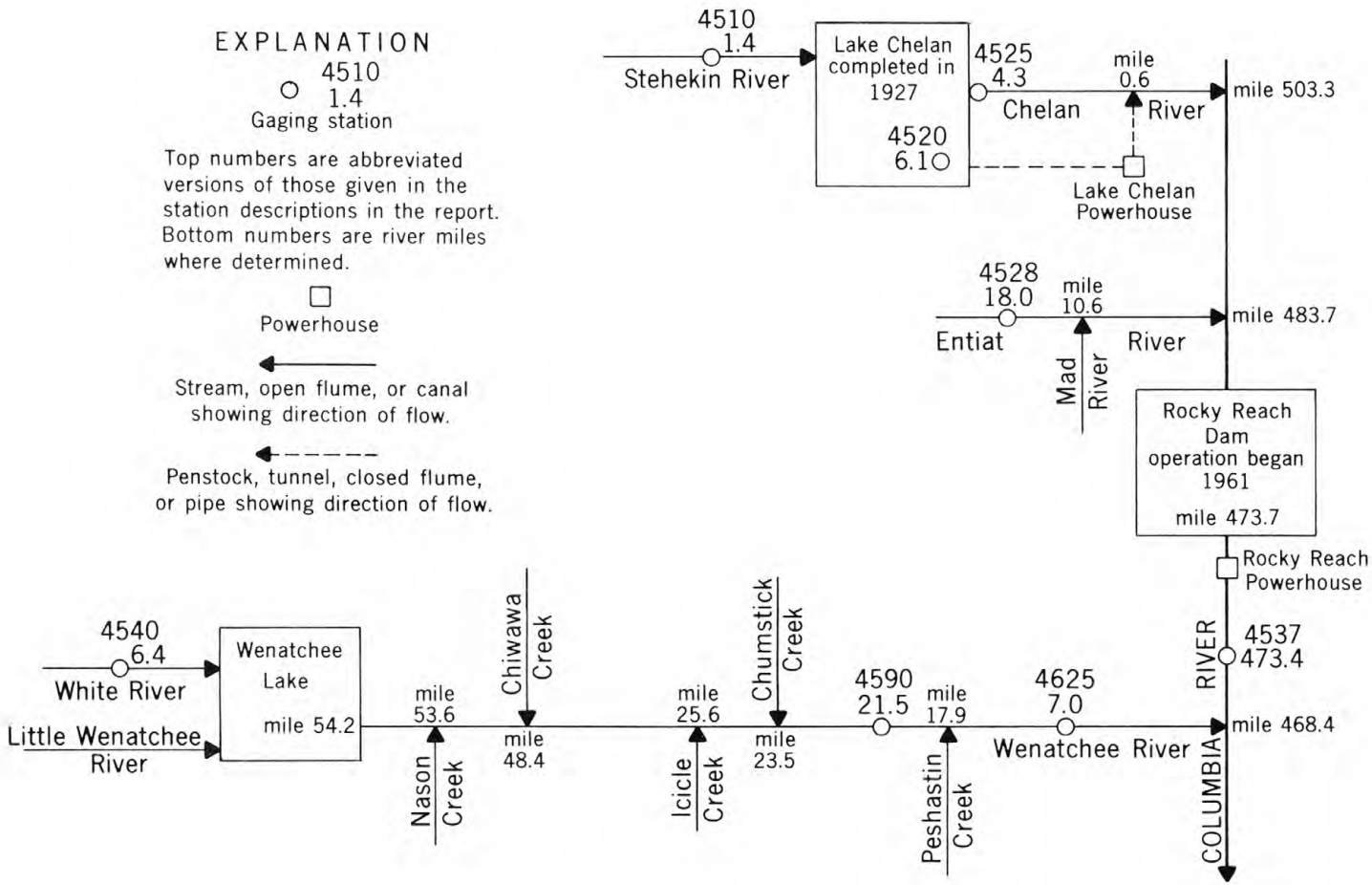

Figure 12. Gaging stations in Columbia River basin from Chelan to Wenatchee Rivers.

12451000 STEHEKIN RIVER AT STEHEKIN, WA

LOCATION.--Lat 48°19'47", long 120°41'26", in NE¼SE¼ sec.26, T.33 N., R.17 E., Chelan County, Hydrologic Unit 17020009, Lake Chelan National Recreation Area, on left bank 1,100 ft (335 m) upstream from Boulder Creek, 1.4 mi (2.3 km) upstream from Lake Chelan, and 2.1 mi (3.4 km) northwest of Stehekin.

DRAINAGE AREA.--321 mi^2 (831 km^2).

PERIOD OF RECORD.--October 1910 to October 1915, October 1926 to current year. Monthly discharge only for some periods, published in WSP 1316.

REVISED RECORDS.--WSP 412: 1914. WSP 1316: 1911(M), 1914-15(M). WSP 1446: 1912(M). WSP 1933: Drainage area. WDR-80-2: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 1,098.5 ft (334.82 m) National Geodetic Vertical Datum of 1929. Prior to Aug. 17, 1911, nonrecording gage 0.4 mi (0.6 km) upstream from mouth at Lake Chelan at different datums (datum change made June 13, 1911). Aug. 17, 1911, to Oct. 31, 1915, nonrecording gage 0.2 mi (0.3 km) downstream from Boulder Creek at different datum.

REMARKS.--Records good. No known regulation or diversion.

AVERAGE DISCHARGE.--60 years, 1,416 ft^3/s (40.10 m^3/s), 55.90 in/yr (1,420 mm/yr), 1,026,000 acre-ft/yr (1,270 hm^3/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 18,900 ft^3/s (535 m^3/s) May 29, 1948, gage height, 29.00 ft (8.839 m), from rating curve extended above 11,000 ft^3/s (312 m^3/s) on basis of slope-area measurement of peak flow; minimum, 56 ft^3/s (1.59 m^3/s) Jan. 21, 1930.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 6,500 ft^3/s (184 m^3/s) and maximum (*), from rating curve extended as explained above:

Date	Time	Discharge (ft^3/s)	Discharge (m^3/s)	Gage height (ft)	Gage height (m)
Dec. 26	1430	*17,300	490	*28.47	8.678

Minimum discharge, 218 ft^3/s (6.17 m^3/s) Oct. 28, 29, 30, gage height, 17.92 ft (5.462 m).

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	560	292	455	2510	642	738	786	5100	3530	2870	1420	1480
2	480	485	455	2160	630	720	762	3710	3480	2820	1480	952
3	500	446	450	1920	612	708	744	2900	3320	3020	1530	762
4	520	1500	437	1740	595	708	714	2440	3550	3660	1430	720
5	540	889	410	1590	578	690	738	2100	3380	3790	1400	654
6	560	840	380	1460	562	666	720	1880	4320	3050	1490	630
7	600	1020	344	1340	556	648	690	1710	3290	2260	1630	708
8	540	1240	363	1250	540	624	684	1600	2650	1770	1790	780
9	500	959	363	1160	525	606	666	1620	2360	1590	1840	804
10	460	812	401	1080	473	600	642	1670	2240	1620	1780	720
11	420	710	510	1010	486	600	636	1660	2080	1550	1780	666
12	420	635	495	945	510	624	606	1630	2000	1500	1690	648
13	540	590	455	896	525	654	589	1750	1830	1840	1660	567
14	400	565	505	854	525	696	578	1860	1680	1890	1680	545
15	340	545	1340	810	556	744	578	1900	1710	2220	1670	612
16	320	510	1830	780	847	780	584	1790	2020	2400	1560	642
17	300	495	1320	756	1130	774	600	1860	2050	2630	1450	726
18	280	470	1110	744	1170	762	630	2060	1900	2760	1370	798
19	280	480	966	714	1280	750	696	2630	2530	2470	1280	903
20	380	455	889	690	1160	744	840	3280	2790	2300	1200	636
21	380	615	840	702	1030	738	875	3660	2400	2050	1040	562
22	280	575	882	762	959	744	1050	3310	2220	2030	945	515
23	272	505	924	798	903	750	1700	3540	2260	2250	938	459
24	262	465	882	792	889	738	2480	4070	2170	2230	1000	432
25	249	455	1410	774	882	750	2100	5260	2450	2240	938	410
26	246	428	10900	768	828	750	1810	4710	3120	2230	810	385
27	230	500	9270	738	786	750	1650	3970	3060	2350	762	381
28	227	505	4700	732	762	756	2130	3620	2480	2280	714	500
29	224	505	3520	714	---	786	3040	3930	2620	1940	744	441
30	221	480	3000	690	---	780	4060	4760	3120	1580	702	410
31	224	---	2870	672	---	810	---	4200	---	1440	666	---
TOTAL	11755	18971	52676	32551	20941	22188	34378	90180	78610	70630	40389	19448
MEAN	379	632	1699	1050	748	716	1146	2909	2620	2278	1303	648
MAX	600	1500	10900	2510	1280	810	4060	5260	4320	3790	1840	1480
MIN	221	292	344	672	473	600	578	1600	1680	1440	666	381
CFSM	1.18	1.97	5.29	3.27	2.33	2.23	3.57	9.06	8.16	7.10	4.06	2.02
IN.	1.36	2.20	6.10	3.77	2.43	2.57	3.98	10.45	9.11	8.19	4.68	2.25
AC-FT	23320	37630	104500	64560	41540	44010	68190	178900	155900	140100	80110	38580

CAL YR 1980 TOTAL 499510 MEAN 1365 MAX 10900 MIN 221 CFSM 4.25 IN 57.89 AC-FT 990800
WTR YR 1981 TOTAL 492717 MEAN 1350 MAX 10900 MIN 221 CFSM 4.21 IN 57.10 AC-FT 977300

12452000 LAKE CHELAN AT CHELAN, WA

LOCATION.--Lat 47°50'11", long 120°03'37", near center of sec.15, T.27 N., R.22 E., Chelan County, Hydrologic Unit 17020009, on south shore of Lake Chelan at Lakeside, 2.1 mi (3.4 km) west of Chelan.

DRAINAGE AREA.--924 mi^2 (2,393 km^2).

PERIOD OF RECORD.--September 1897 to December 1899, January to June 1905 and December 1910 to September 1911 (fragmentary gage heights only); October 1911 to current year. Records of change in contents prior to October 1911, published in WSP 482 and 492 in conjunction with records for Chelan River near Chelan, have been found to be unreliable and should not be used. Month-end contents October 1911 to September 1950 published in WSP 1316. Chemical analyses June 1971 to August 1972.

REVISED RECORDS.--WSP 1246: 1951. WSP 1286: 1952. WSP 1933: Drainage area. See also PERIOD OF RECORD.

GAGE.--Water-stage recorder. Datum of gage is at mean sea level, datum of 1912. To convert to National Geodetic Vertical Datum of 1929, subtract 1.73 ft (0.527 m). Prior to Jan. 1, 1900, nonrecording gage at Lakeside about 1 mi (1.6 km) west of Chelan at datum 1,070.18 ft (326.191 m) National Geodetic Vertical Datum of 1912. Jan. 1 to June 30, 1905, nonrecording gage at upper highway bridge at Chelan at different datum. Dec. 5, 1910, to Nov. 13, 1927, nonrecording gage at Forest Service boat landing at Chelan at datum 1,076.07 ft (327.986 m) National Geodetic Vertical Datum of 1912.

REMARKS.--Reservoir is formed by low concrete dam at lake outlet completed Sept. 3, 1927. Usable capacity between elevations 1,079 (328.9 m) and 1,100 ft (335.3 m) 677,400 acre-ft (835 hm^3). Regulation between these elevations is allowed by stipulation of the Federal Power Commission. Water is used for power development. Elevation of lake maintained between 1,092 (332.8 m) and 1,100 ft (335.3 m) during period Aug. 16 to Sept. 15 for scenic effect and recreational purposes. Diversions for irrigation of about 6,280 acres (25 km^2) with an annual depletion of about 11,000 acre-ft (13.6 hm^3), 1946 estimated.

COOPERATION.--Gage-height record collected in cooperation with Public Utility District No. 1 of Chelan County.

EXTREMES FOR PERIOD OF RECORD.--Maximum elevation, 1,100.16 ft (335.329 m) June 30, 1981.

EXTREMES FOR PERIOD OF RECORD.--Maximum elevation, 1,100.16 ft (335.329 m) June 30, 1981 (affected by seiche action): maximum contents, 679,300 acre-ft (838 hm^3) June 30, 1981, elevation, 1,100.06 ft (335.298 m), mean of seiche; minimum since completion of dam in 1927, 1,079.68 ft (329.086 m) Apr. 3,4, 1937, Apr. 3, 1970, contents, 21,350 acre-ft (26.3 hm^3); minimum elevation, 1,076.78 ft (328.203 m), Jan. 27, 28, Dec. 2-5, 1898.

EXTREMES FOR CURRENT YEAR.--Maximum elevation, 1,100.16 ft (335.329 m) June 30 (affected by seiche action): maximum contents, 679,300 acre-ft (838 hm^3) elevation, 1,100.06 ft (335.298 m), mean of seiche; minimum elevation, 1,091.53 ft (332.698 m) part of each day Mar. 19, 20 (affected by seiche action), contents, 400,500 acre-ft (494 hm^3).

Capacity table (elevation in feet, and usable contents, in acre-feet)
(Based on data by the Pacific Northwest Coordination Agreement)

1,080	31,540	1,090	350,900	1,100	677,400
1,085	190,200	1,095	513,300		

ELEVATION (FEET NGVD), WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1097.43	1095.24	1093.97	1095.03	1093.96	1092.67	1091.77	1093.18	1099.37	1099.88	1099.78	1099.54
2	1097.37	1095.19	1093.94	1095.10	1093.87	1092.62	1091.77	1093.50	1099.58	1099.83	1099.75	1099.56
3	1097.32	1095.15	1093.91	1095.17	1093.78	1092.55	1091.81	1093.66	1099.68	1099.92	1099.76	1099.54
4	1097.26	1095.12	1093.81	1095.19	1093.73	1092.51	1091.78	1093.85	1099.76	1099.94	1099.74	1099.56
5	1097.20	1095.11	1093.73	1095.21	1093.66	1092.43	1091.82	1093.92	1099.83	1099.91	1099.72	1099.47
6	1097.16	1095.11	1093.64	1095.20	1093.59	1092.33	1091.83	1094.06	1099.88	1099.90	1099.70	1099.37
7	1097.10	1095.20	1093.53	1095.20	1093.52	1092.28	1091.82	1094.20	1099.84	1099.80	1099.70	1099.30
8	1097.06	1095.22	1093.43	1095.19	1093.43	1092.21	1091.84	1094.27	1099.79	1099.68	1099.70	1099.25
9	1096.98	1095.20	1093.33	1095.20	1093.36	1092.14	1091.85	1094.42	1099.75	1099.68	1099.70	1099.20
10	1096.89	1095.14	1093.25	1095.18	1093.26	1092.05	1091.83	1094.60	1099.81	1099.70	1099.72	1099.15
11	1096.84	1095.11	1093.17	1095.14	1093.15	1092.00	1091.83	1094.71	1099.88	1099.70	1099.74	1099.05
12	1096.77	1095.05	1093.07	1095.08	1093.11	1091.94	1091.83	1094.78	1099.93	1099.69	1099.76	1099.01
13	1096.70	1094.97	1093.98	1095.01	1093.03	1091.86	1091.81	1094.88	1099.95	1099.75	1099.79	1098.95
14	1096.64	1094.92	1092.91	1094.95	1092.99	1091.79	1091.80	1095.01	1099.94	1099.78	1099.80	1098.88
15	1096.58	1094.86	1092.85	1094.91	1092.92	1091.75	1091.78	1095.13	1099.86	1099.81	1099.81	1098.82
16	1096.48	1094.80	1092.86	1094.87	1092.87	1091.71	1091.79	1095.25	1099.85	1099.85	1099.81	1098.78
17	1096.39	1094.73	1092.89	1094.80	1092.88	1091.65	1091.78	1095.34	1099.84	1099.94	1099.81	1098.74
18	1096.33	1094.69	1092.85	1094.75	1092.91	1091.60	1091.77	1095.48	1099.84	1099.87	1099.81	1098.70
19	1096.26	1094.62	1092.82	1094.68	1092.94	1091.58	1091.78	1095.67	1099.87	1099.88	1099.80	1098.74
20	1096.19	1094.54	1092.78	1094.61	1092.95	1091.60	1091.80	1095.89	1099.94	1099.95	1099.81	1098.62
21	1096.15	1094.53	1092.74	1094.55	1092.92	1091.61	1091.79	1096.18	1099.83	1099.90	1099.79	1098.53
22	1096.03	1094.50	1092.73	1094.54	1092.89	1091.64	1091.83	1096.38	1099.88	1099.81	1099.72	1098.50
23	1095.94	1094.43	1092.67	1094.49	1092.88	1091.65	1091.88	1096.61	1099.90	1099.83	1099.69	1098.40
24	1095.89	1094.34	1092.65	1094.44	1092.86	1091.66	1092.03	1096.87	1099.85	1099.84	1099.66	1098.33
25	1095.80	1094.28	1092.68	1094.37	1092.83	1091.67	1092.16	1097.30	1099.89	1099.89	1099.65	1098.27
26	1095.73	1094.23	1093.15	1094.30	1092.80	1091.71	1092.26	1097.72	1099.95	1099.93	1099.63	1098.17
27	1095.64	1094.18	1093.92	1094.24	1092.76	1091.73	1092.34	1098.04	1099.77	1099.98	1099.61	1098.11
28	1095.56	1094.12	1094.37	1094.22	1092.72	1091.72	1092.44	1098.31	1099.77	1099.90	1099.57	1098.09
29	1095.46	1094.08	1094.62	1094.19	---	1091.72	1092.62	1098.58	1099.84	1099.82	1099.56	1098.05
30	1095.38	1094.02	1094.76	1094.13	---	1091.73	1092.86	1098.91	1099.96	1099.78	1099.54	1098.05
31	1095.31	---	1094.92	1094.04	---	1091.74	---	1099.21	---	1099.77	1099.52	---
MEAN	1096.45	1094.76	1093.42	1094.77	1093.16	1091.93	1091.94	1095.67	1099.83	1099.84	1099.71	1098.82
MAX	1097.43	1095.24	1094.92	1095.21	1093.96	1092.67	1092.86	1099.21	1099.96	1099.98	1099.81	1099.56
MIN	1095.31	1094.02	1092.65	1094.04	1092.72	1091.58	1091.77	1093.18	1099.37	1099.68	1099.52	1098.05
†	524,800	480,100	512,000	481,400	437,900	408,600	448,900	458,000	679,000	670,800	661,600	612,200
‡	-68,700	-44,700	+31,900	-30,600	-43,500	-29,300	+40,300	+9,100	+221,000	-8,200	-9,200	-49,400

CAL YR 1980: MEAN 1,092.76 MAX 1,099.94 MIN 1,081.15 ‡ +162,400
WTR YR 1981: MEAN 1,095.88 MAX 1,099.98 MIN 1,091.58 ‡ +18,700

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

12452500 CHELAN RIVER AT CHELAN, WA

LOCATION.--Lat 47°50'05", long 120°00'43", in S½SE¼ sec.13, T.27 N., R.22 E., Chelan County, Hydrologic Unit 17020009, near right bank in forebay upstream from control dam at outlet of Lake Chelan, 0.4 mi (0.6 km) south of Chelan, and at mile 4.3 (6.9 km).

DRAINAGE AREA.--924 mi^2 (2,393 km^2).

PERIOD OF RECORD.--November 1903 to current year. Published as "below Chelan Lake" 1904-05. Adjusted records for October 1903 to September 1911, published in WSP 482, 492, and 870 are unreliable and should not be used. Chemical analyses, November 1961 to September 1970, October 1971 to September 1972, October 1974 to June 1980.

REVISED RECORDS.--WSP 482: 1904-13. WSP 612: 1924. WSP 1246: 1951. WSP 1286: 1952. WSP 1933: Drainage area. See also PERIOD OF RECORD.

GAGE.--Water-stage recorder and concrete dam. Datum of gage is at mean sea level, datum of 1912. To convert to National Geodetic Vertical Datum of 1929, subtract 1.62 ft (0.494 m). Prior to Jan. 7, 1927, nonrecording gage at site 800 ft (244 m) downstream and Jan. 7 to Sept. 30, 1927, nonrecording gage about 500 to 1,000 ft (152 to 305 m) downstream at same datum. Oct. 1, 1927, to Nov. 10, 1928, nonrecording gage and Nov. 11, 1928, to Mar. 19, 1939, water-stage recorder at sites 2.5 mi (4.0 km) downstream at same datum.

REMARKS.--Records good. Discharge for Oct. 1-May 28, July 9-16, 24-26, and July 3-Sept. 30 completely furnished by Public Utility District No. 1 of Chelan County. Discharge for May 29-July 8, 17-23, and 27-29 partially furnished by Public Utility District No. 1 of Chelan County. Unmeasured water that is diverted for irrigation above station is a small percentage of total runoff. Public Utility District No. 1 of Chelan County diverts water at Chelan to develop about 40,000 KW and to irrigate 900 acres (3.6 km^2) near Chelan. This quantity is included in records of daily discharge. Diversions for irrigation of about 6,280 acres (25 km^2), depletion 11,000 acre-ft (13.6 hm^3) 1964 estimate. Flow regulated by Lake Chelan (see sta 12452000).

COOPERATION.--Records of water used for power and irrigation furnished by the Public Utility District No. 1 of Chelan County.

AVERAGE DISCHARGE.--77 years (water years 1905-81), 2,053 ft^3/s (58.14 m^3/s), 30.17 in/yr (766 mm/yr), 1,487,000 acre-ft (1,833 hm^3/yr), adjusted for storage since October 1911.

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 18,400 ft^3/s (521 m^3/s) June 3, 1968; no flow part of day Jan. 30, 1917, when lake outlet was blocked with ice, and at other times owing to artificial regulation.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 6,840 ft^3/s (194 m^3/s) June 26; minimum daily, 18 ft^3/s (0.510 m^3/s) May 9-10.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1510	1500	1500	2100	2060	2060	936	1800	3080	6810	1880	923
2	1510	1500	1610	2110	2050	2060	936	1910	3100	2430	1880	887
3	1510	1500	1730	2080	2060	2050	936	1250	3700	2570	1880	917
4	1510	1500	1800	2070	2050	2050	936	1710	3710	5610	1870	1170
5	1510	1500	1800	2080	2060	2050	936	1110	3750	4890	1870	1620
6	1510	1500	1800	2080	2050	2040	936	378	5570	4900	1890	1620
7	1510	1500	1810	2080	2040	2050	936	968	5340	4370	1880	1620
8	1510	1500	1800	2080	2030	2050	946	1050	4740	2840	1890	1800
9	1510	1500	1800	2080	1940	2040	966	18	3380	2120	1650	1920
10	1510	1500	1800	2080	2030	2040	976	18	2380	2060	1580	1660
11	1510	1500	1810	2080	2040	2050	966	768	2350	1920	1620	1510
12	1510	1500	1810	2070	2040	2040	966	828	2470	1910	1620	1520
13	1510	1500	1890	2080	2050	2040	996	759	2990	1920	1620	1520
14	1440	1500	1900	2080	2050	2040	986	1040	3100	1920	1620	1450
15	1460	1500	1890	2080	2050	2050	995	789	3090	1920	1630	1470
16	1460	1500	1890	2080	2060	1920	995	1220	3070	2010	1620	1440
17	1510	1500	1880	2080	2060	1990	995	719	3040	4530	1620	1450
18	1510	1500	1890	2080	2050	1490	1020	859	2390	3850	1620	1460
19	1510	1500	1880	2060	2050	926	995	1520	2370	2280	1620	1460
20	1510	1500	1890	2070	2050	946	995	1590	4220	2730	1620	1490
21	1510	1500	1890	2070	2050	936	995	1660	4660	3450	1620	1430
22	1510	1500	1900	2080	2050	936	997	1710	4290	2960	1620	1420
23	1510	1500	1900	2070	2050	936	997	1710	4320	2060	1470	1410
24	1510	1500	1890	2160	2030	936	997	1710	3040	2090	1490	1410
25	1510	1500	1890	2070	2040	936	997	1710	2370	2080	1490	1410
26	1510	1500	2000	2070	2040	936	997	1860	6840	2070	1230	1410
27	1510	1500	2010	2070	2030	936	997	1950	4750	2810	883	1410
28	1510	1500	2080	2060	2060	936	997	1980	2250	6010	923	1120
29	1500	1500	2050	2070	---	946	994	2220	2290	2590	923	485
30	1500	1500	2100	2060	---	936	1340	2380	2740	1650	923	457
31	1500	---	2080	2060	---	936	---	2720	---	1860	923	---
TOTAL	46610	45000	57970	64440	57220	48288	29657	41914	105390	93220	47975	40869
MEAN	1504	1500	1870	2079	2044	1558	989	1352	3513	3007	1548	1362
MAX	1510	1500	2100	2160	2060	2060	1340	2720	6840	6810	1890	1920
MIN	1440	1500	1500	2060	1940	926	936	18	2250	1650	883	457
AC-FT	92450	89260	115000	127800	113500	95780	58820	83140	209000	184900	95160	81060
†	-68,700	-44,700	+31,900	-30,600	-43,500	-29,300	+40,300	+9,100	+221,000	-8,200	-9,200	-49,400
MEAN‡	386	749	2,390	1,580	1,260	1,080	1,670	1,500	7,230	2,870	1,400	532
CFSM‡	0.42	0.81	2.59	1.71	1.36	1.17	1.81	1.62	7.82	3.11	1.52	0.58
IN‡	0.48	0.90	2.98	1.97	1.42	1.35	2.01	1.87	8.73	3.59	1.74	0.64
AC-FT‡	23,800	44,600	146,900	97,200	70,000	66,500	99,100	92,200	430,000	176,700	86,000	31,700

CAL YR 1980: TOTAL 655,265 MEAN 1,790 MAX 10,200 MIN 2.5 AC-FT 1,300,000
DO.....: MEAN‡ 2,014 CFSM‡ 2.18 IN‡ 29.68 AC-FT‡ 162,400
WTR YR 1981: TOTAL 678,553 MEAN 1,859 MAX 6,840 MIN 18 AC-FT 1,346,000
DO.....: MEAN‡ 1,885 CFSM‡ 2.04 IN‡ 27.70 AC-FT‡ 1,365,000

† Change in contents, in acre-feet, in Lake Chelan.
‡ Adjusted for change in contents, in Lake Chelan.

12452800 ENTIAT RIVER NEAR ARDENVOIR, WA

LOCATION.--Lat 47°49'07", long 120°25'19", in NE¼NE¼ sec.27, T.27 N., R.19 E., Chelan County, Hydrologic Unit 17020010, on left bank 0.5 mi (0.8 km) downstream from Stormy Creek, 6.0 mi (9.7 km) northwest of Ardenvoir, and at mile 18.0 (29.0 km).

DRAINAGE AREA.--203 mi^2 (526 km^2).

PERIOD OF RECORD.--September 1957 to current year. Water temperatures July 1968 to September 1970.

REVISED RECORDS.--WSP 1933: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 1,560.97 ft (475.784 m) National Geodetic Vertical Datum of 1929.

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

AVERAGE DISCHARGE.--24 years, 383 ft^3/s (10.85 m^3/s), 25.62 in/yr (651 mm/yr), 277,500 acre-ft/yr (342 hm^3/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 6,430 ft^3/s (182 m^3/s) June 10, 1972, gage height, 8.98 ft (2.737 m); minimum daily, 25 ft^3/s (0.71 m^3/s) Dec. 17, 1964.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 2,040 ft^3/s (57.8 m^3/s) May 26, gage height, 5.55 ft (1.692 m); minimum discharge, 49 ft^3/s (1.39 m^3/s) Dec. 7, 8, gage height, 0.84 ft (0.256 m), result of freezeup.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	95	82	99	604	197	229	236	1270	1580	776	259	132
2	87	105	97	558	196	226	232	1170	1500	744	251	128
3	85	90	98	514	186	225	229	994	1450	749	252	116
4	84	115	96	475	180	227	224	866	1380	825	263	110
5	83	107	86	442	191	220	228	772	1280	885	243	108
6	83	108	73	413	172	212	223	704	1350	805	236	104
7	83	182	50	385	181	215	216	651	1270	663	239	101
8	83	186	58	364	179	207	216	615	1130	554	244	101
9	82	150	75	342	172	204	212	611	976	486	248	103
10	80	126	86	323	149	202	206	616	875	455	244	103
11	79	111	108	307	128	202	204	624	805	427	236	100
12	81	99	114	294	162	203	198	615	767	402	233	97
13	85	90	104	281	196	207	190	624	722	420	218	94
14	81	94	101	268	193	213	193	635	695	420	214	91
15	78	97	128	250	188	222	192	635	713	427	219	89
16	77	98	156	240	225	231	191	622	740	455	211	89
17	75	94	149	248	267	230	192	618	740	476	203	90
18	74	93	142	236	260	230	194	665	735	526	190	92
19	74	94	152	228	294	229	207	838	717	502	184	104
20	75	91	145	222	287	228	228	1020	722	476	189	101
21	74	120	143	226	270	227	233	1220	704	451	173	100
22	73	122	152	256	260	227	253	1330	695	413	162	96
23	71	103	156	259	254	227	325	1370	677	416	152	91
24	71	91	149	246	254	226	469	1410	659	413	148	89
25	71	96	226	233	248	232	481	1760	690	392	147	86
26	71	89	1020	232	244	231	481	1950	785	373	140	84
27	69	102	1250	219	240	229	479	1740	850	370	131	93
28	69	113	982	230	234	233	533	1580	800	361	125	107
29	69	104	785	225	---	240	646	1560	771	340	121	95
30	68	99	695	214	---	236	893	1700	830	300	119	87
31	68	---	664	204	---	239	---	1730	---	272	115	---
TOTAL	2398	3251	8339	9538	6007	6909	9004	32515	27608	15574	6109	2981
MEAN	77.4	108	269	308	215	223	300	1049	920	502	197	99.4
MAX	95	186	1250	604	294	240	893	1950	1580	885	263	132
MIN	68	82	50	204	128	202	190	611	659	272	115	84
CFSM	.38	.53	1.33	1.52	1.06	1.10	1.48	5.17	4.53	2.47	.97	.49
IN.	.44	.60	1.53	1.75	1.10	1.27	1.65	5.96	5.06	2.85	1.12	.55
AC-FT	4760	6450	16540	18920	11910	13700	17860	64490	54760	30890	12120	5910

CAL YR 1980	TOTAL	132733	MEAN 363	MAX 2000	MIN 50	CFSM 1.79	IN 24.32	AC-FT	263300	
WTR YR 1981	TOTAL	130233	MEAN 357	MAX 1950	MIN 50	CFSM 1.76	IN 23.87	AC-FT	258300	

12453700 COLUMBIA RIVER AT ROCKY REACH DAM, WA

LOCATION.--Lat 47°31'28", long 120°18'04", in SW¼NW¼ sec.2, T.23 N., R.20 E., Chelan County, Hydrologic Unit 17020010, on right bank 0.5 mi (0.8 km) downstream from Rocky Reach Dam, 1.5 mi (2.4 km) downstream from Swakane Creek, 7.4 mi (11.9 km) north of Wenatchee, and at mile 473.4 (761.7 km).

DRAINAGE AREA.--87,800 mi^2 (227,400 km^2), approximately.

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

GAGE.--Water-stage recorder. Datum of gage is National Geodetic Vertical Datum of 1929. Auxiliary water-stage recorder 1.9 mi (3.1 km) downstream from base gage at same datum.

REMARKS.--Records good. Discharge for Oct. 1 to Dec. 10, Feb. 22 to Apr. 1, Apr. 19-24, May 9, 10, July 29 and Sept. 5-29 was provided by Corps of Engineers N.P.D. Reservoir Control Center. Flow regulated by nine major reservoirs and numerous smaller reservoirs and powerplants. Diversion by Feeder Canal for Columbia Basin project (see sta 12435500) and for irrigation of about 380,000 acres (1,540 km^2) in the United States and an additional 35,000 acres (142 km^2) in Canada.

AVERAGE DISCHARGE.--21 years, 117,300 ft^3/s (3,322 m^3/s), 84,980,000 acre-ft/yr (104,800 hm^3/yr), unadjusted.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, about 535,000 ft^3/s (15,200 m^3/s) June 10, 1961, elevation, about 635.50 ft (193.700 m); minimum daily, 25,100 ft^3/s (711 m^3/s) Nov. 11, 1973.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 293,000 ft^3/s (8,300 m^3/s) June 1, elevation, 627.26 ft (191.189 m); minimum daily, 35,500 ft^3/s (1,010 m^3/s) Apr. 26.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	74000	61500	106000	152000	133000	81300	110000	118000	227000	169000	186000	104000
2	64200	43400	107000	150000	160000	110000	127000	102000	250000	192000	153000	90100
3	68000	74400	106000	152000	150000	106000	109000	107000	248000	178000	148000	93500
4	50600	69000	120000	148000	157000	115000	92900	125000	241000	185000	189000	87700
5	43700	77100	110000	138000	143000	112000	88000	134000	259000	186000	170000	56600
6	71900	91600	97600	128000	153000	115000	106000	141000	257000	200000	151000	55900
7	74000	81900	101000	140000	150000	108000	99100	143000	244000	234000	159000	66600
8	76200	64400	123000	144000	157000	92800	110000	133000	241000	243000	148000	95200
9	75100	62400	119000	149000	164000	112000	113000	114000	245000	221000	153000	77600
10	71400	89100	114000	145000	161000	109000	110000	104000	234000	203000	148000	89100
11	61600	94000	117000	150000	152000	105000	105000	140000	239000	190000	169000	97400
12	51300	99600	116000	156000	144000	111000	104000	143000	233000	180000	162000	79000
13	73400	102000	105000	153000	136000	107000	101000	134000	242000	177000	156000	68600
14	74600	94300	94700	156000	111000	85300	105000	146000	242000	180000	159000	93400
15	79500	80100	111000	152000	103000	87300	119000	149000	243000	177000	131000	96900
16	77500	75900	103000	162000	99500	109000	106000	118000	221000	189000	117000	98900
17	82600	95300	113000	158000	78500	108000	101000	107000	213000	181000	141000	85100
18	53900	93700	112000	143000	105000	108000	92200	137000	217000	188000	133000	92400
19	47500	88700	116000	155000	121000	103000	68300	146000	217000	185000	132000	77400
20	69100	96800	79400	154000	111000	104000	97000	150000	225000	184000	132000	63000
21	84000	97400	69700	153000	124000	98500	93000	150000	227000	189000	131000	87300
22	90000	85100	84400	139000	104000	79200	86800	147000	233000	192000	108000	86500
23	78500	95400	113000	152000	118000	117000	75300	118000	238000	184000	103000	85500
24	79500	109000	99100	146000	127000	114000	77000	103000	233000	156000	116000	88700
25	61700	101000	76400	129000	123000	108000	52900	120000	234000	150000	122000	81500
26	60000	94200	99500	158000	115000	100000	35500	128000	232000	162000	118000	75200
27	83000	60200	129000	156000	97700	102000	72200	144000	218000	168000	110000	53100
28	78700	65600	140000	152000	84400	81600	85800	167000	213000	171000	119000	78100
29	81400	88600	163000	149000	---	71300	97700	202000	200000	179000	108000	85000
30	78300	82200	157000	146000	---	111000	107000	221000	167000	196000	108000	76900
31	70100	---	157000	139000	---	97900	---	227000	---	177000	129000	---
TOTAL	2185300	2513900	3458800	4604000	3582100	3169200	2846700	4318000	6933000	5766000	4309000	2466200
MEAN	70490	83800	111600	148500	127900	102200	94890	139300	231100	186000	139000	82210
MAX	90000	109000	163000	162000	164000	117000	127000	227000	259000	243000	189000	104000
MIN	43700	43400	69700	128000	78500	71300	35500	102000	167000	150000	103000	53100
AC-FT	4335000	4986000	6861000	9132000	7105000	6286000	5646000	8565000	13750000	11440000	8547000	4892000

CAL YR 1980 TOTAL 36197500 MEAN 98900 MAX 197000 MIN 36100 AC-FT 71800000
WTR YR 1981 TOTAL 46152200 MEAN 126400 MAX 259000 MIN 35500 AC-FT 91540000

12454000 WHITE RIVER NEAR PLAIN, WA

LOCATION.--Lat 47°52'27", long 120°52'09", in NE¼NE¼ sec.5, T.27 N., R.16 E., Chelan County, Hydrologic Unit 17020011, Wenatchee National Forest, on left bank 200 ft (61 m) downstream from Forest Service bridge, 1.2 mi (1.9 km) downstream from Sears Creek, 12.5 mi (20.1 km) northwest of Plain, and at mile 6.4 (10.3 km).

DRAINAGE AREA.--150 mi^2 (388 km^2).

PERIOD OF RECORD.--May 1911 to April 1912, May to September 1912 (monthly discharge only), July to August 1913, October 1913 to March 1914 (monthly discharge only), April to September 1914, August 1954 to current year. Published as "near Chiwaukum" 1911-14. Water temperatures October 1970 to June 1971.

REVISED RECORDS.--WSP 1316: 1914.

GAGE.--Water-stage recorder. Datum of gage is 1,881.92 ft (573.609 m) National Geodetic Vertical Datum of 1929. May 1911 to September 1914, nonrecording gage at same site at different datum.

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

AVERAGE DISCHARGE.--29 years (water years 1912, 1914, 1955-81), 804 ft^3/s (22.77 m^3/s), 72.79 in/yr (1,849 mm/yr), 582,500 acre-ft/yr (718 hm^3/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 19,100 ft^3/s (541 m^3/s) Dec. 26, 1980, gage height, 17.55 ft (5.349 m), from rating curve extended above 6,000 ft^3/s (170 m^3/s) on basis of contracted opening measurement and flow-over-road measurement of peak flow; minimum discharge, 47 ft^3/s (1.33 m^3/s) Nov. 27, 1979, gage height, 2.15 ft (0.655 m), result of freezeup upstream of gage.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 3,500 ft^3/s (99.1 m^3/s) and maximum (*):

Date	Time	Discharge (ft^3/s)	Discharge (m^3/s)	Gage height (ft)	Gage height (m)
Dec. 26	Unknown	*19,100	541	*17.55	5.349

Minimum discharge, 57 ft^3/s (1.61 m^3/s) Oct. 30, gage height, 2.21 ft (0.674 m).

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	250	238	537	1840	413	542	481	2480	1820	1530	672	501
2	197	408	515	1580	401	529	463	1720	1820	1590	702	350
3	205	388	488	1450	389	526	447	1360	1720	1760	687	264
4	214	1250	454	1300	377	520	428	1170	1900	2020	636	253
5	214	597	419	1180	368	497	444	1010	1660	2050	629	230
6	223	595	330	1020	356	481	425	919	2220	1570	661	227
7	241	1270	260	911	347	466	407	835	1610	1130	709	267
8	220	1210	270	835	338	447	413	795	1360	903	759	300
9	158	922	300	775	310	438	407	871	1300	851	771	306
10	140	737	340	721	250	438	392	883	1220	851	717	283
11	130	623	390	672	270	450	383	851	1120	815	698	251
12	132	541	420	636	290	466	371	867	1060	823	679	245
13	180	483	410	600	310	491	356	939	947	1120	643	217
14	127	445	450	573	350	523	353	995	883	1110	643	209
15	112	409	1100	542	419	549	368	975	931	1250	632	230
16	102	376	1450	517	654	570	383	939	1170	1320	583	248
17	95	357	1100	497	1060	539	401	979	1120	1510	542	270
18	92	343	900	481	943	526	416	1080	1040	1660	494	288
19	92	416	800	459	1040	507	478	1490	1470	1380	475	319
20	124	369	720	441	947	497	593	1620	1490	1290	453	215
21	122	825	680	466	859	497	556	1760	1260	1200	398	238
22	95	702	700	576	795	504	679	1620	1300	1130	356	227
23	85	589	760	593	755	501	1080	1720	1340	1120	350	191
24	83	530	710	563	713	481	1380	2020	1240	1100	395	175
25	85	497	1000	523	668	501	1040	2740	1430	1180	359	156
26	80	453	11900	510	625	497	931	2300	1790	1130	297	141
27	76	808	10000	485	587	497	867	1950	1700	1170	278	164
28	73	727	6600	478	559	501	1190	1830	1440	1090	262	327
29	71	641	4000	466	---	513	1590	2060	1480	919	267	241
30	69	586	2400	447	---	497	2150	2450	1690	740	253	199
31	73	---	2240	428	---	504	---	2120	---	675	243	---
TOTAL	4160	18335	52643	22565	15393	15495	19872	45348	42531	37987	16243	7532
MEAN	134	611	1698	728	550	500	662	1463	1418	1225	524	251
MAX	250	1270	11900	1840	1060	570	2150	2740	2220	2050	771	501
MIN	69	238	260	428	250	438	353	795	883	675	243	141
CFSM	.89	4.07	11.3	4.85	3.67	3.33	4.41	9.75	9.45	8.17	3.49	1.67
IN.	1.03	4.55	13.06	5.60	3.82	3.84	4.93	11.25	10.55	9.42	4.03	1.87
AC-FT	8250	36370	104400	44760	30530	30730	39420	89950	84360	75350	32220	14940

CAL YR 1980 TOTAL 298887 MEAN 817 MAX 11900 MIN 69 CFSM 5.45 IN 74.12 AC-FT 592800
WTR YR 1981 TOTAL 298104 MEAN 817 MAX 11900 MIN 69 CFSM 5.45 IN 73.93 AC-FT 591300

12459000 WENATCHEE RIVER AT PESHASTIN, WA

LOCATION.--Lat 47°35'00", long 120°36'46", in SE¼SW¼ sec.8, T.24 N., R.18 E., Chelan County, Hydrologic Unit 17020011, on right bank 1.0 mi (1.6 km) northwest of Peshastin, 3.5 mi (5.6 km) upstream from Peshastin Creek, 4.1 mi (6.6 km) downstream from Icicle Creek, and at mile 21.5 (34.6 km).

DRAINAGE AREA.--1,000 mi^2 (2,600 km^2), approximately.

PERIOD OF RECORD.--October 1928 to February 1929 (monthly discharge only), March 1929 to current year.

REVISED RECORDS.--WSP 1316: 1929-32(M).

GAGE.--Water-stage recorder. Datum of gage is 1,028.04 ft (313.347 m) National Geodetic Vertical Datum of 1929. Prior to Mar. 24, 1932, nonrecording gage at site 1.2 mi (1.9 km) downstream at different datum.

REMARKS.--Records excellent. Numerous diversions upstream for irrigation of an estimated 3,200 acres (13 km^2) upstream from station. Diversion from Icicle Creek 5.7 mi (9.2 km) upstream from mouth is used for irrigation of a substantial part of the 2,000 acres (89 km^2) irrigated downstream from station. Bonneville Power Administration gage-height telemeter at station.

AVERAGE DISCHARGE.--53 years, 3,103 ft^3/s (87.88 m^3/s), 2,248,000 acre-ft/yr (2,770 hm^3/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 32,300 ft^3/s (915 m^3/s) May 28, 1948, gage height, 15.88 ft (4.840 m); minimum, 183 ft^3/s (5.18 m^3/s) Oct. 14, 1939; minimum gage height, 1.24 ft (0.378 m) Nov. 1, 1952; minimum daily discharge, 270 ft^3/s (7.65 m^3/s) Oct. 2, 1929, Nov. 30, 1936, Dec. 1, 1952.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 27,000 ft^3/s (765 m^3/s) Dec. 27, gage height, 14.09 ft (4.295 m); minimum, 447 ft^3/s (12.66 m^3/s) Oct. 31, gage height, 1.74 ft (0.530 m).

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	783	488	2240	8380	1830	2780	2250	10100	7720	5020	1790	692
2	765	747	2110	7240	1780	2660	2150	8850	7260	4820	1710	870
3	727	978	2020	6310	1730	2590	2110	7230	6900	4840	1680	816
4	707	1430	1890	5560	1660	2570	2010	6160	7160	5150	1600	741
5	690	1910	1770	4960	1640	2470	2010	5240	6850	5530	1530	690
6	674	1770	1600	4470	1560	2350	2040	4630	7710	5260	1470	650
7	665	3320	1340	4080	1530	2290	1960	4150	7210	4360	1480	614
8	662	4840	1250	3750	1500	2190	1920	3830	6230	3690	1510	608
9	640	4520	1280	3470	1470	2120	1980	3780	5910	3190	1540	614
10	608	3570	1340	3220	1340	2070	1900	3880	5440	2910	1540	614
11	589	2860	1900	3010	1220	2050	1840	3790	4980	2700	1500	590
12	580	2380	2160	2830	1300	2070	1800	3690	4620	2570	1460	573
13	602	2040	2030	2660	1560	2110	1740	3740	4250	2610	1410	557
14	620	1830	1920	2510	1650	2180	1690	3940	3900	2890	1360	535
15	589	1680	2850	2350	1890	2270	1690	4150	3730	2990	1340	529
16	563	1530	3880	2240	2840	2420	1710	4040	3960	3110	1310	546
17	547	1440	3960	2170	4640	2410	1750	4020	4380	3230	1260	551
18	526	1380	3710	2080	5200	2370	1790	4220	4310	3600	1180	556
19	508	1400	3360	2010	5560	2320	1880	5310	5110	3600	1110	600
20	502	1530	3060	1940	5490	2270	2120	6140	5850	3350	1130	636
21	501	2180	2880	1960	4680	2240	2270	6550	5620	3160	1040	636
22	505	3570	2940	2260	4140	2240	2460	6670	5150	2940	956	691
23	487	2890	3730	2470	3790	2240	3500	6760	5270	2770	882	688
24	487	2460	3530	2520	3630	2200	4860	7200	5050	2650	843	647
25	491	2170	4810	2380	3510	2250	4760	9080	4910	2660	825	607
26	488	1970	17300	2290	3280	2280	4300	9590	5340	2600	785	581
27	479	1940	25700	2200	3080	2240	3950	8640	5690	2580	736	600
28	467	2870	21400	2140	2920	2240	4720	7820	5300	2560	695	669
29	460	2670	14700	2100	---	2250	6640	7740	4980	2430	667	806
30	455	2460	10900	2010	---	2240	8250	8550	5200	2160	662	758
31	453	---	9580	1920	---	2240	---	8560	---	1930	652	---
TOTAL	17820	66823	163140	99490	76420	71220	84050	188050	165990	103860	37653	19265
MEAN	575	2227	5263	3209	2729	2297	2802	6066	5533	3350	1215	642
MAX	783	4840	25700	8380	5560	2780	8250	10100	7720	5530	1790	870
MIN	453	488	1250	1920	1220	2050	1690	3690	3730	1930	652	529
AC-FT	35350	132500	323600	197300	151600	141300	166700	373000	329200	206000	74680	38210

CAL YR 1980 TOTAL 1112950 MEAN 3041 MAX 25700 MIN 453 AC-FT 2208000
WTR YR 1981 TOTAL 1093781 MEAN 2997 MAX 25700 MIN 453 AC-FT 2170000

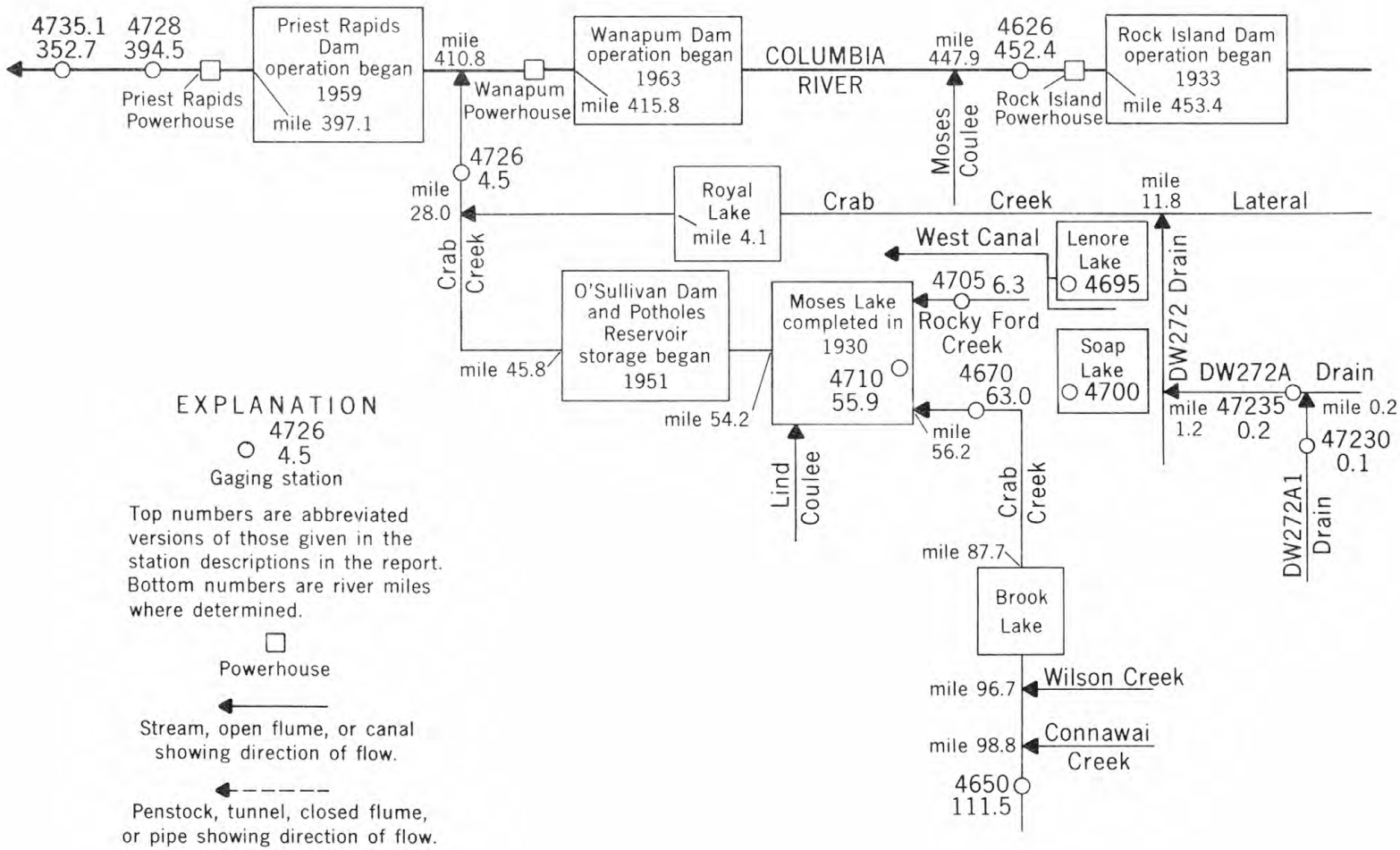

Figure 13. Gaging stations in Columbia River basin from Rock Island Dam to Ringold gage.

12462500 WENATCHEE RIVER AT MONITOR, WA

LOCATION.--Lat 47°29'58", long 120°25'24", in NE¼SW¼ sec.11, T.23 N., R.19 E., Chelan County, Hydrologic Unit 17020011, on right bank 1.0 mi (1.6 km) north of Monitor, 3.5 mi (5.6 km) downstream from Mission Creek, and at mile 7.0 (11.3 km).

DRAINAGE AREA.--1,301 mi^2 (3,370 km^2).

PERIOD OF RECORD.-August to November 1897, October 1962 to current year. Published as "near Wenatchee" 1897.

GAGE.--Water-stage recorder. Altitude of gage is 680 ft (207 m), from topographic map. Aug. 7 to Nov. 7, 1897, nonrecording gage 1 mi (1.6 km) downstream at different datum.

REMARKS.--Records excellent. No regulation. Diversions for irrigation of about 25,000 acres (100 km^2) above station. Chelan County Public Utility District No. 1 gage height telemeter at station.

AVERAGE DISCHARGE.--19 years, 3,345 ft^3/s (94.73 m^3/s), 2,423,000 acre-ft/yr (2,990 hm^3/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 29,600 ft^3/s (838 m^3/s) Dec. 27, 1980, gage height, 27.23 ft (8.300 m); minimum, 357 ft^3/s (10.1 m^3/s) Oct. 12, 1979, gage height, 17.01 ft (5.185 m).

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 29,600 ft^3/s (838 m^3/s) Dec. 27, gage height, 27.23 ft (8.300 m); minimum, 420 ft^3/s (11.9 m^3/s) Sept. 15, gage height, 17.04 ft (5.194 m).

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	730	551	2440	9620	2050	3250	2500	11200	8270	5070	1680	567
2	752	737	2300	8300	1980	3110	2380	9740	7680	4830	1590	750
3	707	1060	2210	7220	1920	3010	2320	7890	7270	4810	1550	750
4	683	1350	2060	6340	1840	2990	2220	6660	7500	5120	1470	660
5	661	2020	1890	5670	1830	2870	2200	5650	7190	5530	1400	617
6	646	1860	1710	5120	1730	2740	2230	4960	8100	5310	1330	575
7	632	3350	1470	4680	1710	2660	2140	4440	7660	4420	1330	543
8	627	5060	1370	4280	1680	2530	2080	4080	6560	3710	1350	527
9	609	4840	1380	3880	1640	2460	2160	3980	6150	3160	1390	527
10	582	3840	1430	3560	1510	2400	2070	4120	5670	2850	1390	535
11	561	3090	2120	3320	1350	2370	1990	4020	5180	2640	1340	519
12	549	2580	2380	3130	1430	2380	1940	3900	4790	2500	1310	503
13	565	2220	2250	2940	1760	2430	1870	3920	4380	2520	1250	487
14	594	1990	2100	2770	1870	2490	1810	4120	4000	2790	1240	465
15	566	1810	3030	2600	2110	2600	1800	4360	3810	2870	1370	450
16	536	1660	4270	2490	3290	2740	1830	4240	3980	2990	1330	480
17	569	1560	4400	2410	5620	2740	1900	4220	4440	3110	1280	487
18	602	1490	4100	2310	6270	2710	1950	4400	4360	3450	1200	495
19	581	1470	3710	2230	7110	2640	2070	5650	5140	3500	1080	535
20	570	1630	3360	2140	6880	2580	2340	6580	5980	3250	1060	583
21	565	2130	3170	2160	5720	2550	2520	7030	5820	3060	962	600
22	572	3870	3180	2490	4980	2530	2710	7190	5270	2840	850	651
23	559	3140	4040	2720	4500	2550	3860	7240	5360	2660	777	687
24	548	2670	3900	2770	4300	2500	5360	7660	5160	2530	741	651
25	561	2370	5840	2640	4140	2560	5250	9800	4960	2530	714	609
26	558	2150	20900	2550	3860	2600	4720	10400	5360	2490	687	575
27	550	2060	28300	2440	3620	2560	4320	9360	5770	2440	626	609
28	537	3020	24000	2400	3410	2560	4960	8410	5400	2430	583	651
29	529	2880	16800	2350	---	2560	7220	8270	5010	2320	559	804
30	524	2670	12500	2250	---	2500	9080	9160	5250	2070	551	795
31	524	---	11000	2140	---	2490	---	9220	---	1830	543	---
TOTAL	18349	71128	183610	111920	90110	81660	91800	201870	171470	101630	34533	17687
MEAN	592	2371	5923	3610	3218	2634	3060	6512	5716	3278	1114	590
MAX	752	5060	28300	9620	7110	3250	9080	11200	8270	5530	1680	804
MIN	524	551	1370	2140	1350	2370	1800	3900	3810	1830	543	450
AC-FT	36400	141100	364200	222000	178700	162000	182100	400400	340100	201600	68500	35080

CAL YR 1980 TOTAL 1205939 MEAN 3295 MAX 28300 MIN 524 AC-FT 2392000
WTR YR 1981 TOTAL 1175767 MEAN 3221 MAX 28300 MIN 450 AC-FT 2332000

12462600 COLUMBIA RIVER BELOW ROCK ISLAND DAM, WA

LOCATION.--Lat 47°19'57", long 120°04'48", in NE¼NW¼ sec.9, T.21 N., R.22 E., Douglas County, Hydrologic Unit 17020010, on left bank 1.0 mi (1.6 km) downstream from Rock Island Dam, 2.0 mi (3.2 km) downstream from Rock Island Creek, 12 mi (19.3 km) southeast of Wenatchee, and at mile 452.4 (727.9 km).

DRAINAGE AREA.--89,400 mi^2 (231,500 km^2), approximately.

PERIOD OF RECORD.--January to December 1910 (gage heights only), May 1913 to December 1916, October 1930 to current year. Published as "at Wenatchee" January 1910 to December 1916, and as "at Trinidad" October 1930 to May 1961.

GAGE.--Water-stage recorder. Datum of gage is National Geodetic Vertical Datum of 1929. Prior to Jan. 1, 1916, nonrecording gage 1.2 mi (1.9 km) upstream from highway bridge at Wenatchee, at mile 466.3 (750.3 km), at datum 583 ft (177.7 m) National Geodetic Vertical Datum of 1929. Jan. 1 to Dec. 31, 1916, nonrecording gage on pier of highway bridge at Wenatchee, at mile 465.1 (748.3 km), at datum 579.30 ft (176.571 m) National Geodetic Vertical Datum of 1929. Oct. 1, 1930, to May 31, 1961, water-stage recorder 0.5 mi (0.8 km) southwest of Trinidad, at mile 441.7 (710.7 km), at datum 499.3 ft (152.19 m) National Geodetic Vertical Datum of 1929 (river-profile survey). Since May 21, 1963, auxiliary water-stage recorder 2.0 mi (3.2 km) downstream at same datum.

REMARKS.--Records fair. Discharge for Oct. 1, 2, Nov. 15, 27, 30, Dec. 1-8, Apr. 18-29, July 1-29, 31, and Aug. 4 to Sept. 30 was provided by Corps of Engineers N.P.D. Reservoir Control Center. Flow regulated by nine major reservoirs and numerous small reservoirs and powerplants. Diversion by Feeder Canal for Columbia Basin project (see sta 12435500) and for irrigation of about 380,000 acres (1,540 km^2) in the United States and an additional 35,000 acres (142 km^2) in Canada.

AVERAGE DISCHARGE.--54 years (water years 1914-16, 1931-81), 121,100 ft^3/s (3,430 m^3/s), 87,740,000 acre-ft/yr (108,200 hm^3/yr), unadjusted.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 692,600 ft^3/s (19,600 m^3/s) June 12, 1948, gage height, 59.35 ft (18.090 m) site and datum then in use; minimum, 4,120 ft^3/s (117 m^3/s) Feb. 10, 1932, gage height, 11.40 ft (3.475 m), site and datum then in use.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of June 7, 1894, reached a discharge of about 740,000 ft^3/s (21,000 m^3/s), from floodmarks at Wenatchee.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 318,000 ft^3/s (9,010 m^3/s) June 1; maximum elevation, 581.30 ft (177.180 m) June 4; minimum daily, 37,700 ft^3/s (1,070 m^3/s) Apr. 26.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	75200	61400	108000	160000	133000	87700	115000	130000	237000	168000	190000	103000
2	64900	46400	111000	157000	163000	115000	127000	116000	261000	190000	154000	92800
3	69100	72900	108000	162000	153000	112000	114000	119000	261000	177000	147000	93500
4	51200	67700	122000	155000	159000	119000	102000	130000	254000	182000	184000	87600
5	44300	76200	113000	147000	146000	117000	97000	139000	273000	183000	168000	55200
6	69000	93000	100000	132000	152000	120000	111000	148000	271000	195000	149000	56600
7	75500	84800	102000	141000	153000	112000	109000	152000	253000	227000	155000	66000
8	77600	70100	123000	150000	160000	99500	115000	143000	252000	238000	147000	94400
9	74700	71600	122000	153000	167000	116000	119000	118000	254000	214000	150000	77400
10	71100	92400	117000	149000	166000	114000	119000	111000	242000	198000	147000	87100
11	62300	101000	120000	152000	156000	110000	114000	148000	247000	187000	165000	95900
12	46000	102000	118000	164000	148000	117000	106000	151000	242000	178000	159000	78200
13	72100	106000	110000	156000	139000	113000	110000	143000	251000	174000	152000	68800
14	73300	96900	99300	160000	114000	93200	108000	153000	250000	178000	160000	91300
15	75900	81600	114000	157000	107000	94300	120000	154000	252000	175000	128000	96000
16	77300	81400	107000	161000	105000	113000	111000	124000	229000	184000	118000	96600
17	83500	98400	117000	163000	94600	114000	104000	114000	220000	179000	138000	85200
18	54000	97800	118000	147000	115000	113000	92800	139000	215000	184000	135000	91200
19	47100	91000	122000	153000	129000	109000	69800	151000	221000	183000	137000	75500
20	66100	99300	92500	161000	118000	109000	98700	156000	233000	181000	128000	62700
21	81200	99600	76700	155000	129000	105000	94400	159000	235000	184000	133000	85600
22	87900	95000	89700	140000	114000	87200	91200	153000	242000	189000	107000	85200
23	78700	97800	120000	155000	124000	120000	78500	126000	245000	180000	105000	83900
24	78600	115000	104000	147000	132000	119000	82500	113000	241000	155000	115000	86900
25	63200	106000	89300	131000	129000	112000	54600	130000	245000	148000	119000	80700
26	62000	99800	117000	161000	121000	104000	37700	139000	241000	159000	115000	74300
27	84600	63200	149000	159000	106000	106000	72200	153000	223000	166000	106000	52900
28	79000	72900	159000	155000	91500	88100	86600	178000	224000	170000	115000	76900
29	80800	89600	171000	152000	---	77800	102000	209000	204000	173000	105000	83900
30	79900	85600	174000	146000	---	116000	115000	233000	173000	199000	106000	76600
31	72000	---	166000	143000	---	101000	---	234000	---	175000	128000	---
TOTAL	2178100	2616400	3659500	4724000	3724100	3333800	2977000	4566000	7191000	5673000	4265000	2441900
MEAN	70260	87210	118000	152400	133000	107500	99230	147300	239700	183000	137600	81400
MAX	87900	115000	174000	164000	167000	120000	127000	234000	273000	238000	190000	103000
MIN	44300	46400	76700	131000	91500	77800	37700	111000	173000	148000	105000	52900
AC-FT	4320000	5190000	7259000	9370000	7387000	6613000	5905000	9057000	14260000	11250000	8460000	4844000

CAL YR 1980 TOTAL 36803200 MEAN 100600 MAX 197000 MIN 36800 AC-FT 73000000
WTR YR 1981 TOTAL 47349800 MEAN 129700 MAX 273000 MIN 37700 AC-FT 93920000

12465000 CRAB CREEK AT IRBY, WA

LOCATION.--Lat 47°21'38", long 118°50'56", in NW¼NW¼ sec.31, T.22 N., R.32 E., Lincoln County, Hydrologic Unit 17020013, on right bank 8 ft (2.4 m) upstream from highway bridge at Irby, 5.4 mi (8.7 km) downstream from Lake Creek, 7.5 mi (12.1 km) west of Odessa, and at mile 111.5 (179.4 km).

DRAINAGE AREA.--1,042 mi^2 (2,699 km^2).

PERIOD OF RECORD.--September 1942 to current year. Chemical analyses October 1961 to September 1962.

REVISED RECORDS.--WSP 1446: 1949-51. WSP 1933: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 1,386.30 ft (422.544 m) National Geodetic Vertical Datum of 1929.

REMARKS.--Records good. Pumpage from ground-water wells for irrigation has been on the increase above the station since 1964. No regulation.

AVERAGE DISCHARGE.--39 years, 73.2 ft^3/s (2.073 m^3/s), 53,030 acre-ft/yr (65.4 hm^3/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 8,370 ft^3/s (237 m^3/s) Feb. 27, 1957, gage height, 11.94 ft (3.639 m); no flow several days during 1969, 1977, 1978, 1979, and 1980.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 62 ft^3/s (1.76 m^3/s) Apr. 7, gage height, 2.40 ft (0.732 m), no peak above base of 300 ft^3/s (8.5 m^3/s); minimum, 2.1 ft^3/s (0.059 m^3/s) Dec. 7; minimum gage height, 1.75 ft (0.533 m) Oct. 22, 23.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	5.8	6.9	2.8	2.8	13	42	54	24	24	21	11	5.0
2	6.4	7.3	2.8	3.2	13	42	54	22	24	20	10	5.6
3	6.4	6.5	3.2	2.8	13	42	54	21	24	20	10	5.6
4	5.8	6.0	3.2	2.8	14	43	54	21	24	20	10	5.6
5	5.8	5.5	2.8	2.8	14	44	56	21	24	20	10	5.6
6	5.8	5.0	2.4	2.8	15	44	56	22	24	19	9.4	5.6
7	5.8	4.5	2.1	3.2	15	44	57	21	24	18	9.4	5.6
8	5.8	3.6	2.4	3.2	16	44	59	22	26	17	8.7	5.6
9	5.5	3.6	2.4	3.2	16	44	57	22	24	16	8.7	5.6
10	5.4	3.6	2.4	3.6	16	44	59	22	24	15	8.7	5.6
11	5.4	3.6	2.4	3.6	16	46	59	23	24	15	8.0	5.6
12	5.8	3.6	2.4	4.1	17	46	57	22	24	15	8.0	5.0
13	5.9	3.2	2.4	4.5	18	46	59	23	24	16	8.0	5.0
14	6.4	3.2	2.4	4.5	18	47	59	23	24	15	7.4	5.0
15	6.0	3.2	2.4	5.0	18	47	57	23	24	15	7.4	5.0
16	5.2	3.2	2.4	5.6	19	47	56	23	26	15	7.4	5.6
17	4.9	3.2	2.4	5.6	19	48	56	23	24	14	6.8	5.0
18	5.0	3.2	2.4	6.2	24	50	54	23	26	14	6.2	5.0
19	4.9	3.2	2.4	6.8	30	51	54	23	24	14	5.6	5.0
20	4.8	2.8	2.4	6.8	32	50	53	23	24	14	5.6	5.0
21	3.8	3.2	2.8	7.4	34	48	51	23	23	13	6.2	5.0
22	3.4	3.6	2.8	8.0	35	47	51	21	23	13	5.6	5.0
23	4.6	3.2	2.4	8.7	38	47	50	21	23	12	5.6	5.0
24	5.0	2.8	2.8	8.7	39	47	48	22	23	13	5.6	4.5
25	4.9	2.8	3.2	9.4	42	47	48	23	23	15	6.8	5.0
26	4.7	2.8	2.8	9.4	40	50	43	23	22	13	6.2	5.0
27	5.0	2.8	2.8	10	42	50	43	24	21	12	6.2	5.6
28	4.8	2.8	2.8	11	42	50	42	24	22	12	6.2	5.6
29	6.7	2.8	2.4	11	---	51	32	24	22	11	6.2	5.0
30	6.7	2.8	2.8	12	---	51	28	24	21	10	5.6	5.0
31	6.2	---	2.8	12	---	53	---	24	---	10	5.0	---
TOTAL	168.6	114.5	80.9	190.7	668	1452	1560	700	709	467	231.5	157.3
MEAN	5.44	3.82	2.61	6.15	23.9	46.8	52.0	22.6	23.6	15.1	7.47	5.24
MAX	6.7	7.3	3.2	12	42	53	59	24	26	21	11	5.6
MIN	3.4	2.8	2.1	2.8	13	42	28	21	21	10	5.0	4.5
AC-FT	334	227	160	378	1320	2880	3090	1390	1410	926	459	312

CAL YR 1980 TOTAL 23158.57 MEAN 63.3 MAX 2540 MIN .02 AC-FT 45940
WTR YR 1981 TOTAL 6499.50 MEAN 17.8 MAX 59 MIN 2.1 AC-FT 12890

12467000 CRAB CREEK NEAR MOSES LAKE, WA

LOCATION.--Lat 47°11'22", long 119°15'53", in NW¼NE¼ sec.35, T.20 N., R.28 E., Grant County, Hydrologic Unit 17020015, on left bank at downstream side of highway bridge, 3 mi (4.8 km) upstream from Parker Horn, 4 mi (6.4 km) north of town of Moses Lake, and at mile 63.0 (101.4 km).

DRAINAGE AREA.--2,228 mi^2 (5,771 km^2), of which 219 mi^2 (567 km^2) in the vicinity of Long Lake Reservoir is noncontributing.

PERIOD OF RECORD.--September 1942 to current year. Chemical analyses October 1961 to September 1962.

REVISED RECORDS.--WSP 1933: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 1,070.39 ft (326.255 m) U.S. Bureau of Reclamation datum. Prior to July 14, 1956, at site 300 ft (91 m) upstream at same datum.

REMARKS.--Records excellent. Numerous small diversions for irrigation and domestic use above station. Most of natural flow from upper basin passes this station underground. No known regulation. Since 1952, return flow from irrigation on Columbia Basin project has increased runoff during summer months.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 10,400 ft^3/s (295 m^3/s), Feb. 28, 1957, gage height, 6.81 ft (2.076 m); no flow for several months each year prior to 1952, and part of each day Jan. 14, 15, 1953.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 90 ft^3/s (2.55 m^3/s) Sept. 27, gage height, 2.94 ft (0.896 m); minimum, 8.0 ft^3/s (0.23 m^3/s) Apr. 4, 21, gage height, 1.64 ft (0.500 m).

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	79	60	30	24	16	15	9.0	13	41	47	68	79
2	78	58	37	23	16	14	8.7	14	41	49	68	76
3	76	56	40	22	16	14	8.7	14	42	51	67	83
4	75	55	43	22	16	16	8.1	15	43	52	68	79
5	75	54	31	21	15	16	8.5	17	44	53	68	78
6	74	55	30	21	15	14	8.3	17	47	58	67	78
7	74	67	27	20	15	13	8.3	18	47	57	66	76
8	74	51	27	19	15	13	8.5	18	52	57	66	75
9	73	47	27	18	14	12	8.7	19	50	61	62	76
10	73	45	27	18	13	12	8.3	20	48	59	62	73
11	73	44	27	18	12	12	8.8	22	48	60	65	73
12	75	42	27	18	13	12	9.2	23	49	61	66	72
13	78	41	27	18	14	11	9.3	25	50	64	62	72
14	76	42	27	18	17	11	9.3	26	49	64	65	73
15	76	40	27	18	17	11	9.7	29	47	64	66	79
16	75	40	27	17	17	11	8.8	30	48	62	68	76
17	75	39	27	17	15	10	8.3	31	47	62	72	76
18	74	38	26	18	16	9.7	8.5	31	49	62	76	73
19	74	37	25	16	24	9.5	8.5	34	51	62	74	78
20	73	37	25	17	17	9.5	8.7	33	48	65	78	74
21	73	38	29	18	16	9.5	8.3	36	48	66	73	74
22	72	36	31	18	15	9.3	9.0	35	50	67	74	80
23	68	35	27	18	15	9.2	8.8	35	51	68	75	76
24	67	33	29	17	15	9.3	8.8	36	51	68	76	78
25	70	33	33	17	24	9.0	8.7	43	50	70	75	78
26	67	32	29	17	18	11	9.3	40	49	70	75	80
27	64	32	26	18	17	11	10	39	49	69	76	88
28	62	31	24	19	16	9.3	11	38	48	68	78	84
29	61	31	24	19	---	9.2	12	38	45	69	86	81
30	61	30	25	17	---	9.0	13	39	45	69	80	83
31	60	---	24	16	---	9.2	---	40	---	68	79	---
TOTAL	2225	1279	885	577	449	350.7	273.1	868	1427	1922	2201	2321
MEAN	71.8	42.6	28.5	18.6	16.0	11.3	9.10	28.0	47.6	62.0	71.0	77.4
MAX	79	67	43	24	24	16	13	43	52	70	86	88
MIN	60	30	24	16	12	9.0	8.1	13	41	47	62	72
AC-FT	4410	2540	1760	1140	891	696	542	1720	2830	3810	4370	4600

CAL YR 1980 TOTAL 37772.0 MEAN 103 MAX 2150 MIN 11 AC-FT 74920
WTR YR 1981 TOTAL 14777.8 MEAN 40.5 MAX 88 MIN 8.1 AC-FT 29310

12469500 LENORE LAKE NEAR SOAP LAKE, WA

LOCATION.--Lat 47°30'52", long 119°30'06", in SE¼SW¼ sec.1, T.23 N., R.26 E., Grant County, Hydrologic Unit 17020014, on east shore 1000 ft (305 km) downlake from outlet gate on Alkali Lake, and 8.8 mi (14.2 km) north of town of Soap Lake.

DRAINAGE AREA.--367 mi^2 (951 km^2), of which 281 mi^2 (728 km^2) in the vicinity of Banks Lake is noncontributing.

PERIOD OF RECORD.--July 1936, March 1938 to December 1956 (fragmentary), January 1957 to current year.

GAGE.--Water-stage recorder. Datum of gage is U.S. Bureau of Reclamation datum. Prior to Dec. 20, 1956, non-recording gages 0.90 mi (1.45 km) uplake at same datum.

REMARKS.--Some diversion from tributaries for irrigation. At extreme high stages, in Soap Lake, water is pumped from Soap Lake into Lenore Lake.

EXTREMES FOR PERIOD OF RECORD.--Maximum elevation observed, 1,087.73 ft (331.540 m) June 12, 1953; minimum, 1,072,72 ft (326.965 m) Jan. 2, 1959 (affected by wind).

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum elevation known, 1,092.2 ft (332.90 m), from well-defined alkali line at gage, date unknown.

EXTREMES FOR CURRENT YEAR.--Maximum elevation, 1,079.76 ft (329.111 m) Mar. 16; minimum, 1,076.45 ft (328.102 m) Oct. 8, 15.

ELEVATION (FEET NGVD)* WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1076.52	1076.58	1076.93	1077.72	1078.48	1079.28	1079.46	1078.70	1078.21	1078.18	1077.67	1077.37
2	1076.52	1076.59	1076.99	1077.75	1078.49	1079.31	1079.45	1078.67	1078.21	1078.15	1077.67	1077.38
3	1076.52	1076.59	1077.04	1077.77	1078.50	1079.34	1079.41	1078.64	1078.22	1078.12	1077.67	1077.37
4	1076.52	1076.61	1077.08	1077.80	1078.52	1079.39	1079.39	1078.60	1078.22	1078.09	1077.66	1077.37
5	1076.52	1076.62	1077.09	1077.82	1078.54	1079.42	1079.36	1078.57	1078.22	1078.07	1077.65	1077.35
6	1076.52	1076.64	1077.07	1077.85	1078.56	1079.45	1079.34	1078.54	1078.24	1078.07	1077.64	1077.35
7	1076.53	1076.71	1077.11	1077.87	1078.58	1079.48	1079.32	1078.51	1078.24	1078.02	1077.64	1077.35
8	1076.52	1076.72	1077.13	1077.90	1078.59	1079.51	1079.30	1078.49	1078.27	1077.98	1077.63	1077.35
9	1076.50	1076.71	1077.14	1077.92	1078.59	1079.54	1079.28	1078.46	1078.28	1077.94	1077.62	1077.34
10	1076.50	1076.72	1077.16	1077.94	1078.61	1079.57	1079.25	1078.40	1078.29	1077.91	1077.62	1077.33
11	1076.50	1076.71	1077.18	1077.97	1078.63	1079.60	1079.24	1078.38	1078.29	1077.86	1077.62	1077.32
12	1076.51	1076.72	1077.20	1077.99	1078.65	1079.63	1079.20	1078.36	1078.30	1077.86	1077.61	1077.32
13	1076.52	1076.73	1077.22	1078.01	1078.68	1079.67	1079.16	1078.33	1078.30	1077.86	1077.60	1077.32
14	1076.51	1076.74	1077.23	1078.02	1078.71	1079.69	1079.14	1078.31	1078.30	1077.85	1077.60	1077.31
15	1076.49	1076.74	1077.25	1078.05	1078.74	1079.72	1079.12	1078.29	1078.31	1077.85	1077.59	1077.31
16	1076.49	1076.75	1077.27	1078.07	1078.78	1079.74	1079.09	1078.26	1078.29	1077.85	1077.59	1077.31
17	1076.50	1076.76	1077.29	1078.09	1078.79	1079.71	1079.07	1078.23	1078.30	1077.85	1077.57	1077.31
18	1076.50	1076.77	1077.32	1078.12	1078.81	1079.69	1079.04	1078.21	1078.31	1077.84	1077.57	1077.31
19	1076.51	1076.78	1077.33	1078.14	1078.88	1079.67	1079.02	1078.20	1078.33	1077.83	1077.55	1077.27
20	1076.52	1076.79	1077.35	1078.16	1078.90	1079.65	1078.99	1078.18	1078.33	1077.82	1077.54	1077.27
21	1076.51	1076.80	1077.39	1078.19	1078.91	1079.63	1078.97	1078.16	1078.33	1077.81	1077.51	1077.26
22	1076.50	1076.80	1077.43	1078.23	1078.93	1079.62	1078.95	1078.14	1078.34	1077.79	1077.51	1077.23
23	1076.50	1076.82	1077.45	1078.26	1078.95	1079.59	1078.93	1078.14	1078.34	1077.79	1077.50	1077.22
24	1076.51	1076.83	1077.49	1078.27	1078.98	1079.58	1078.91	1078.15	1078.34	1077.76	1077.50	1077.22
25	1076.53	1076.84	1077.54	1078.29	1079.13	1079.57	1078.87	1078.19	1078.35	1077.75	1077.48	1077.21
26	1076.54	1076.85	1077.56	1078.31	1079.18	1079.54	1078.84	1078.20	1078.34	1077.76	1077.45	1077.20
27	1076.54	1076.87	1077.60	1078.33	1079.21	1079.53	1078.81	1078.20	1078.32	1077.77	1077.43	1077.22
28	1076.54	1076.88	1077.61	1078.38	1079.24	1079.52	1078.79	1078.20	1078.29	1077.75	1077.42	1077.23
29	1076.55	1076.92	1077.63	1078.43	---	1079.52	1078.76	1078.21	1078.27	1077.72	1077.41	1077.23
30	1076.55	1076.92	1077.67	1078.43	---	1079.51	1078.74	1078.21	1078.22	1077.70	1077.39	1077.23
31	1076.56	---	1077.69	1078.46	---	1079.49	---	1078.20	---	1077.69	1077.39	---
MEAN	1076.52	1076.75	1077.30	1078.08	1078.77	1079.55	1079.11	1078.33	1078.29	1077.88	1077.56	1077.30
MAX	1076.56	1076.92	1077.69	1078.46	1079.24	1079.74	1079.46	1078.70	1078.35	1078.18	1077.67	1077.38
MIN	1076.49	1076.58	1076.93	1077.72	1078.48	1079.28	1078.74	1078.14	1078.21	1077.69	1077.39	1077.20

WTR YR 1981 MEAN 1077.95 MAX 1079.74 MIN 1076.49

12470000 SOAP LAKE NEAR SOAP LAKE, WA

LOCATION.--Lat 47°24'11", long 119°29'11", in NW¼SW¼ sec.18, T.22 N., R.27 E., Grant County, Hydrologic Unit 17020014, on east shore 0.9 mi (1.4 km) north of town of Soap Lake.

DRAINAGE AREA.--413 mi^2 (1,070 km^2), of which 281 mi^2 (728 km^2) in the vicinity of Banks Lake is noncontributing.

PERIOD OF RECORD.--May to August 1936, March 1938 to February 1957 (fragmentary), March 1957 to current year.

GAGE.--Water-stage recorder. Datum of gage is U.S. Bureau of Reclamation datum. Prior to Feb. 4, 1953, nonrecording gage at site 0.2 mi (0.3 km) uplake. Feb. 4, 1953, to June 8, 1954, nonrecording gage at site 1.5 mi (2.4 km) uplake, and June 9, 1954, to June 21, 1957, water-stage recorder at site 0.2 mi (0.3 km) uplake.

REMARKS.--Some diversion from tributaries for irrigation. At extreme high stages, in Soap Lake, water is pumped from Soap Lake into Lenore Lake.

EXTREMES FOR PERIOD OF RECORD.--Maximum elevation observed, 1,079.20 ft (328.940 m) Jan. 28, 1953; minimum observed, 1,070.87 ft (326.401 m) Oct. 21, 1939.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum elevation known, 1,083.1 ft (330.13 m), from well-defined alkali line at gage, date unknown.

EXTREMES FOR CURRENT YEAR.--Maximum elevation observed, 1,074.84 ft (327.611 m) Mar. 16, 26, 27, 29; minimum, 1,073.50 ft (327.203 m) Oct. 1.

ELEVATION (FEET NGVD), WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1073.54	1073.73	1074.00	1074.37	1074.57	1074.78	1074.81	1074.68	1074.56	1074.33	1074.00	1073.68
2	1073.56	1073.75	1074.04	1074.38	1074.57	1074.78	1074.80	1074.67	1074.56	1074.33	1073.99	1073.66
3	1073.57	1073.76	1074.08	1074.38	1074.57	1074.79	1074.80	1074.66	1074.55	1074.33	1073.98	1073.65
4	1073.58	1073.78	1074.12	1074.39	1074.57	1074.80	1074.78	1074.65	1074.53	1074.32	1073.97	1073.65
5	1073.59	1073.78	1074.13	1074.39	1074.57	1074.80	1074.78	1074.65	1074.53	1074.33	1073.97	1073.63
6	1073.60	1073.81	1074.12	1074.39	1074.57	1074.80	1074.77	1074.64	1074.54	1074.35	1073.96	1073.63
7	1073.61	1073.86	1074.11	1074.40	1074.57	1074.80	1074.76	1074.64	1074.53	1074.33	1073.95	1073.63
8	1073.61	1073.86	1074.11	1074.41	1074.57	1074.81	1074.76	1074.63	1074.54	1074.31	1073.96	1073.63
9	1073.60	1073.87	1074.11	1074.41	1074.57	1074.81	1074.76	1074.63	1074.54	1074.31	1073.94	1073.63
10	1073.59	1073.88	1074.13	1074.42	1074.57	1074.81	1074.75	1074.62	1074.53	1074.29	1073.92	1073.61
11	1073.60	1073.88	1074.12	1074.42	1074.57	1074.81	1074.75	1074.60	1074.52	1074.27	1073.92	1073.61
12	1073.61	1073.88	1074.13	1074.42	1074.57	1074.81	1074.74	1074.60	1074.52	1074.27	1073.91	1073.61
13	1073.62	1073.88	1074.14	1074.43	1074.58	1074.81	1074.73	1074.60	1074.50	1074.25	1073.90	1073.61
14	1073.62	1073.89	1074.15	1074.43	1074.61	1074.82	1074.73	1074.60	1074.49	1074.24	1073.88	1073.61
15	1073.62	1073.90	1074.15	1074.43	1074.61	1074.82	1074.73	1074.60	1074.48	1074.24	1073.88	1073.61
16	1073.62	1073.91	1074.16	1074.43	1074.61	1074.82	1074.73	1074.60	1074.47	1074.24	1073.88	1073.61
17	1073.62	1073.91	1074.17	1074.44	1074.62	1074.81	1074.72	1074.60	1074.46	1074.24	1073.87	1073.61
18	1073.63	1073.91	1074.17	1074.45	1074.64	1074.81	1074.73	1074.60	1074.46	1074.22	1073.86	1073.62
19	1073.63	1073.92	1074.17	1074.45	1074.68	1074.81	1074.72	1074.62	1074.46	1074.20	1073.85	1073.60
20	1073.64	1073.92	1074.18	1074.46	1074.68	1074.80	1074.72	1074.62	1074.45	1074.19	1073.82	1073.58
21	1073.65	1073.93	1074.21	1074.47	1074.68	1074.80	1074.71	1074.61	1074.44	1074.16	1073.80	1073.57
22	1073.64	1073.94	1074.23	1074.48	1074.69	1074.80	1074.71	1074.60	1074.43	1074.15	1073.80	1073.56
23	1073.64	1073.94	1074.24	1074.50	1074.69	1074.80	1074.71	1074.60	1074.43	1074.14	1073.79	1073.55
24	1073.65	1073.94	1074.26	1074.50	1074.70	1074.81	1074.71	1074.60	1074.42	1074.14	1073.79	1073.55
25	1073.67	1073.94	1074.30	1074.50	1074.77	1074.81	1074.70	1074.63	1074.42	1074.12	1073.77	1073.55
26	1073.68	1073.95	1074.31	1074.50	1074.77	1074.82	1074.69	1074.62	1074.41	1074.10	1073.74	1073.55
27	1073.68	1073.96	1074.31	1074.51	1074.78	1074.82	1074.68	1074.61	1074.38	1074.11	1073.72	1073.57
28	1073.69	1073.97	1074.32	1074.54	1074.78	1074.81	1074.69	1074.61	1074.37	1074.09	1073.71	1073.57
29	1073.70	1073.98	1074.33	1074.56	---	1074.82	1074.68	1074.61	1074.36	1074.06	1073.70	1073.58
30	1073.70	1073.99	1074.35	1074.56	---	1074.80	1074.69	1074.60	1074.36	1074.02	1073.68	1073.58
31	1073.71	---	1074.36	1074.56	---	1074.80	---	1074.57	---	1074.02	1073.67	---
MEAN	1073.63	1073.89	1074.18	1074.45	1074.63	1074.81	1074.73	1074.62	1074.47	1074.22	1073.86	1073.60
MAX	1073.71	1073.99	1074.36	1074.56	1074.78	1074.82	1074.81	1074.68	1074.56	1074.35	1074.00	1073.68
MIN	1073.54	1073.73	1074.00	1074.37	1074.57	1074.78	1074.68	1074.57	1074.36	1074.02	1073.67	1073.55

WTR YR 1981 MEAN 1074.26 MAX 1074.82 MIN 1073.54

12470500 ROCKY FORD CREEK NEAR EPHRATA, WA

LOCATION.--Lat 47°18'46", long 119°26'40", in SW¼SW¼ sec.16, T.21 N., R.27 E., Grant County, Hydrologic Unit 17020015, on right bank 1.4 mi (2.3 km) downstream from source at Rocky Ford Springs, 5.0 mi (8.0 km) east of Ephrata, and 6.3 mi (10.1 km) upstream from mouth.

DRAINAGE AREA.--458 mi^2 (1,186 km^2), of which 446 mi^2 (1,155 km^2) in vicinity of Banks and Soap Lakes is noncontributing.

PERIOD OF RECORD.--June 1909 to April 1910, July to December 1911, August 1942 to current year. Prior to January 1910, published as Upper Crab Creek near Ephrata.

REVISED RECORDS.--WSP 1933: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 1,068.51 ft (325.682 m) U.S. Bureau of Reclamation datum. Prior to Jan. 1, 1912, nonrecording gages at sites 4.5 mi (7.2 km) to 5.5 mi (8.8 km) downstream at different datums. Aug. 19, 1942, to May 23, 1945, water-stage recorder at site 3.5 mi (5.6 km) downstream at datum 5.37 ft (1.637 m) lower. May 23, 1945 to June 15, 1977, water-stage recorder at site 0.2 mi (0.3 km) downstream at datum 3.53 ft (1.106 m) lower.

REMARKS.--Records good except those for Feb. 10 to Apr. 7, which are fair. No known regulation or diversion.

AVERAGE DISCHARGE.--39 years (water years 1943-81), 77.2 ft^3/s (2.186 m^3/s), 55,930 acre-ft/yr (69.0 hm^3/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 212 ft^3/s (6.00 m^3/s) Apr. 15-18, 1956, gage height, 3.58 ft (1.091 m) datum then in use; minimum observed, 20 ft^3/s (0.57 m^3/s) Aug. 13-18, 1911.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 79 ft^3/s (2.24 m^3/s) Oct. 1, gage height, 5.41 ft (1.649 m); minimum discharge, 42 ft^3/s (1.19 m^3/s) part or all of each day Apr. 12 - May 9; minimum gage height, 5.01 ft (1.527 m) part or all of each day Apr. 12-21.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	78	75	69	61	54	49	45	42	54	60	58	57
2	78	75	69	60	53	48	45	42	55	60	58	57
3	76	74	69	60	52	48	44	42	56	56	57	57
4	74	74	69	60	52	48	44	42	57	51	57	57
5	74	74	67	63	52	48	44	42	58	50	57	58
6	74	74	66	62	52	48	44	42	60	50	58	58
7	74	73	66	63	52	48	44	42	60	50	58	58
8	74	73	66	63	51	48	45	42	61	51	58	58
9	74	72	66	63	51	48	44	42	63	51	58	57
10	74	72	65	63	51	47	44	43	58	52	58	57
11	74	72	65	62	51	47	43	43	54	51	58	57
12	74	72	64	62	51	47	42	43	54	52	58	58
13	74	72	63	62	51	47	42	44	55	52	58	58
14	74	72	63	61	50	47	42	44	55	52	58	58
15	74	72	63	60	50	47	42	44	56	52	58	58
16	74	72	63	60	50	47	42	44	57	53	58	58
17	74	72	62	60	50	47	42	45	58	53	58	58
18	74	71	62	59	50	46	42	45	58	52	58	58
19	74	71	61	59	50	46	42	46	58	52	58	58
20	74	71	61	59	50	46	42	46	59	53	58	58
21	73	71	60	59	50	46	42	46	60	56	58	57
22	73	70	60	58	49	46	42	46	60	56	58	57
23	74	69	60	58	49	46	42	47	60	57	58	57
24	74	69	60	58	49	46	42	48	60	58	59	58
25	75	69	59	57	49	46	42	49	60	57	58	58
26	75	69	59	56	49	45	42	49	60	57	58	58
27	74	69	58	56	49	45	42	50	60	57	58	60
28	74	69	58	56	49	45	42	50	60	57	58	59
29	74	69	60	56	---	45	42	52	60	57	57	58
30	74	69	62	54	---	45	42	53	60	57	57	58
31	74	---	61	54	---	45	---	54	---	57	56	---
TOTAL	2304	2146	1956	1844	1416	1447	1284	1409	1746	1679	1792	1733
MEAN	74.3	71.5	63.1	59.5	50.6	46.7	42.8	45.5	58.2	54.2	57.8	57.8
MAX	78	75	69	63	54	49	45	54	63	60	59	60
MIN	73	69	58	54	49	45	42	42	54	50	56	57
AC-FT	4570	4260	3880	3660	2810	2870	2550	2790	3460	3330	3550	3440

CAL YR 1980 TOTAL 22769 MEAN 62.2 MAX 81 MIN 44 AC-FT 45160
WTR YR 1981 TOTAL 20756 MEAN 56.9 MAX 78 MIN 42 AC-FT 41170

12471000 MOSES LAKE AT MOSES LAKE, WA

LOCATION.--Lat 47°06'11", long 119°19'02", in SW¼SW¼ sec.28, T.19 N., R.28 E., Grant County, Hydrologic Unit 17020015, on east shore 35 ft (11 m) north of Interstate 90, 1.7 mi (2.7 km) upstream from outlet, at town of Moses Lake, and at mile 55.9 (89.9 km).

DRAINAGE AREA.--3,080 mi^2 (7,977 km^2), of which 665 mi^2 (1,722 km^2) is noncontributing.

PERIOD OF RECORD.--June 1909 to September 1914 and November 1936 to September 1945 (fragmentary), October 1945 to current year. Published as "at Neppel" 1912-14.

REVISED RECORDS.--WSP 1933: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is U.S. Bureau of Reclamation datum. Prior to Apr. 3, 1910, nonrecording gage at site 0.6 mi (1.0 km) northeast at different datum. Apr. 3, 1910, to Sept. 30, 1914, and Nov. 19 1936, to Nov. 24, 1944, nonrecording gages at site 2.8 mi (4.5 km) northeast at Parker Horn at various datums. Oct. 30, 1945, to Mar. 12, 1955, water-stage recorder at site near west shore on downstream side of bridge on U.S. Highway 10 at present datum.

REMARKS.--Elevation controlled between 1,046 (318.8 m) and 1,048 ft (319.4 m) by two outlet structures at south end of lake. Many small diversions for irrigation. Elevation for Oct. 4 was provided by U.S. Bureau of Reclamation.

EXTREMES FOR PERIOD OF RECORD.-- Maximum elevation, 1,048.29 ft (319.519 m) Mar. 10, 1950; minimum observed, 1,038.17 ft (316.434 m) Aug. 27, 1910.

EXTREMES FOR CURRENT YEAR.--Maximum elevation, 1,047.01 ft (319.129 m) Aug. 9; minimum, 1,043.50 ft (318.059 m) part or all of each day Dec. 18-20.

ELEVATION (FEET NGVD), WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	1045.17	1043.72	1043.63	1043.96	1044.94	1045.85	1046.57	1046.78	1046.81	1046.94	1046.87
2	---	1045.07	1043.73	1043.63	1043.99	1044.97	1045.89	1046.54	1046.77	1046.82	1046.95	1046.86
3	---	1044.97	1043.75	1043.62	1044.03	1045.01	1045.94	1046.51	1046.77	1046.82	1046.95	1046.87
4	1046.79	1044.89	1043.77	1043.61	1044.05	1045.06	1045.92	1046.48	1046.77	1046.82	1046.96	1046.87
5	---	1044.81	1043.75	1043.61	1044.08	1045.09	1045.96	1046.46	1046.78	1046.85	1046.97	1046.87
6	---	1044.73	1043.72	1043.61	1044.11	1045.12	1045.97	1046.44	1046.79	1046.85	1046.97	1046.88
7	---	1044.70	1043.68	1043.61	1044.14	1045.14	1045.96	1046.42	1046.80	1046.85	1046.98	1046.88
8	1046.84	1044.61	1043.65	1043.61	1044.17	1045.17	1045.96	1046.41	1046.81	1046.85	1046.99	1046.89
9	1046.81	1044.56	1043.63	1043.61	1044.21	1045.19	1045.98	1046.40	1046.82	1046.86	1047.00	1046.90
10	1046.80	1044.50	1043.61	1043.61	1044.22	1045.22	1045.97	1046.39	1046.83	1046.85	1046.98	1046.89
11	1046.80	1044.43	1043.59	1043.61	1044.24	1045.24	1045.95	1046.37	1046.83	1046.87	1046.98	1046.88
12	1046.80	1044.38	1043.58	1043.61	1044.28	1045.27	1045.95	1046.36	1046.84	1046.88	1046.99	1046.87
13	1046.81	1044.32	1043.56	1043.61	1044.32	1045.30	1045.92	1046.35	1046.84	1046.87	1046.99	1046.86
14	1046.81	1044.27	1043.55	1043.62	1044.36	1045.33	1045.89	1046.40	1046.83	1046.89	1046.98	1046.85
15	1046.82	1044.22	1043.54	1043.63	1044.40	1045.36	1045.85	1046.59	1046.83	1046.90	1046.98	1046.85
16	1046.81	1044.18	1043.53	1043.63	1044.45	1045.41	1045.84	1046.63	1046.83	1046.90	1046.97	1046.84
17	1046.81	1044.13	1043.52	1043.63	1044.51	1045.41	1045.90	1046.63	1046.82	1046.91	1046.95	1046.84
18	1046.81	1044.09	1043.51	1043.65	1044.56	1045.40	1045.96	1046.65	1046.83	1046.91	1046.94	1046.84
19	1046.82	1044.06	1043.50	1043.66	1044.64	1045.39	1046.00	1046.72	1046.84	1046.91	1046.94	1046.82
20	1046.82	1044.02	1043.50	1043.67	1044.66	1045.40	1046.04	1046.71	1046.83	1046.92	1046.91	1046.81
21	1046.83	1043.97	1043.54	1043.70	1044.68	1045.42	1046.07	1046.71	1046.83	1046.91	1046.90	1046.79
22	1046.81	1043.95	1043.56	1043.72	1044.71	1045.44	1046.10	1046.71	1046.83	1046.92	1046.89	1046.79
23	1046.80	1043.92	1043.56	1043.73	1044.73	1045.45	1046.19	1046.72	1046.83	1046.92	1046.89	1046.79
24	1046.54	1043.88	1043.59	1043.75	1044.76	1045.46	1046.26	1046.72	1046.84	1046.94	1046.88	1046.79
25	1046.29	1043.86	1043.64	1043.77	1044.86	1045.48	1046.33	1046.76	1046.84	1046.95	1046.87	1046.79
26	1046.05	1043.84	1043.63	1043.80	1044.87	1045.51	1046.38	1046.78	1046.84	1046.94	1046.86	1046.80
27	1045.84	1043.81	1043.63	1043.83	1044.89	1045.53	1046.42	1046.78	1046.83	1046.95	1046.86	1046.83
28	1045.67	1043.80	1043.63	1043.86	1044.92	1045.59	1046.47	1046.79	1046.82	1046.95	1046.86	1046.83
29	1045.53	1043.76	1043.63	1043.88	---	1045.67	1046.52	1046.79	1046.82	1046.94	1046.86	1046.84
30	1045.41	1043.74	1043.64	1043.92	---	1045.74	1046.56	1046.79	1046.83	1046.93	1046.86	1046.84
31	1045.29	---	1043.64	1043.93	---	1045.79	---	1046.78	---	1046.93	1046.86	---
MEAN	---	1044.29	1043.62	1043.69	1044.42	1045.34	1046.07	1046.59	1046.82	1046.89	1046.93	1046.84
MAX	---	1045.17	1043.77	1043.93	1044.92	1045.79	1046.56	1046.79	1046.84	1046.95	1047.00	1046.90
MIN	---	1043.74	1043.50	1043.61	1043.96	1044.94	1045.84	1046.35	1046.77	1046.81	1046.86	1046.79

12472300 DW 272A1 DRAIN NEAR ROYAL CAMP, WA

LOCATION.--Lat 46°54'48", long 119°32'32", in SE¼SW¼ sec.34, T.17 N., R.26 E., Grant County, Hydrologic Unit 17020015, on left bank 200 ft (61 m) upstream from entrance to DW 272A Drain, and 2.7 mi (43.3 km) southwest of Royal Camp.

DRAINAGE AREA.--0.88 mi^2 (2.28 km^2).

PERIOD OF RECORD.--April 1977 to October 1981 (discontinued).

GAGE.--Water-stage recorder and concrete control. Altitude of gage is 990 ft (302 m), from topographic map.

REMARKS.--Records excellent. To obtain comparable records of water flow and water-quality data, all daily values have been computed with the day beginning at 0900 hours. Principal source of flow is waste and ground-water return flows from irrigation. Sediment, chemical, and temperature records for water years 1977 to 1981 in separate basic data report.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 18 ft^3/s (0.51 m^3/s) July 1, 1978, gage height, 5.58 ft (1.701 m) from rating curve extended above 6.0 ft^3/s (0.17 m^3/s) on basis of computation of flow through culvert at gage height 5.58 ft (1.701 m); minimum daily, 0.47 ft^3/s (0.018 m^3/s) Jan. 9, 1979.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, during period October 1980 to October 1981, 8.0 ft^3/s (0.23 m^3/s) Apr. 6, gage height, 5.05 ft (1.539 m); minimum, 0.73 ft^3/s (0.021 m^3/s) Dec. 8.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.9	1.3	1.1	1.3	1.1	1.0	5.3	3.9	2.6	4.3	3.7	6.7
2	2.8	1.2	1.3	1.3	1.1	1.0	5.6	3.9	2.5	4.4	4.1	6.7
3	3.2	1.2	1.3	1.3	1.1	1.0	5.4	3.7	2.4	4.1	4.3	5.7
4	3.2	1.2	1.3	1.3	1.2	1.0	5.4	3.9	2.9	3.9	4.6	4.3
5	2.8	1.3	1.2	1.3	1.2	.93	6.5	3.6	3.2	4.5	4.9	4.0
6	3.3	1.3	1.1	1.3	1.1	.98	6.4	3.0	3.3	5.4	4.9	4.2
7	3.1	1.3	1.1	1.2	1.1	.98	5.3	3.0	3.4	4.6	5.0	4.0
8	3.3	1.2	1.1	1.2	1.2	.88	4.7	3.3	3.7	4.3	4.9	3.6
9	3.8	1.2	1.1	1.2	1.2	.88	4.1	3.9	3.6	4.2	4.9	3.3
10	4.0	1.1	1.1	1.2	1.0	.93	3.9	4.3	2.4	4.4	5.4	3.0
11	4.0	1.1	1.1	1.2	1.1	.93	3.9	4.1	1.8	4.3	5.3	2.7
12	3.4	1.1	1.1	1.2	1.1	.98	3.1	3.7	2.8	4.2	5.5	2.3
13	3.7	1.1	1.1	1.2	1.1	.98	3.2	3.7	2.8	4.2	5.4	2.3
14	4.7	1.1	1.1	1.2	1.1	.98	3.2	4.0	2.7	4.6	5.8	2.1
15	4.0	1.1	1.1	1.2	1.1	.98	2.5	4.0	3.4	4.3	5.4	1.9
16	3.6	1.1	1.2	1.2	1.1	.93	2.5	3.7	3.9	4.1	5.3	1.9
17	3.6	1.1	1.2	1.2	1.1	.88	3.0	3.4	3.8	3.9	5.4	1.9
18	3.1	1.1	1.1	1.2	1.1	.93	3.4	3.5	4.4	3.5	5.4	2.3
19	3.2	1.1	1.1	1.2	1.2	.98	3.2	3.6	5.0	3.1	5.7	2.4
20	2.5	1.2	1.2	1.2	1.0	1.0	3.3	3.4	5.2	3.3	5.8	2.5
21	2.6	1.2	1.3	1.2	1.1	.92	4.2	3.8	4.8	3.8	5.6	2.4
22	2.4	1.1	1.3	1.3	1.2	.86	4.7	3.5	4.2	4.4	5.4	2.3
23	1.6	1.1	1.3	1.3	1.3	.87	4.6	3.0	3.5	4.5	5.6	2.3
24	1.5	1.0	1.4	1.3	1.3	.89	4.9	3.0	3.5	4.7	5.6	2.3
25	1.4	1.1	1.5	1.3	1.1	1.9	4.7	3.3	4.2	4.9	5.3	2.3
26	1.3	1.1	1.5	1.3	1.1	3.4	4.2	3.5	5.4	5.5	5.6	2.3
27	1.2	1.1	1.4	1.3	1.1	3.5	4.0	3.1	5.2	5.5	4.9	2.4
28	1.2	1.2	1.4	1.3	1.3	3.6	3.4	2.8	5.1	5.4	4.3	2.4
29	1.3	1.2	1.4	1.2	---	3.8	3.6	2.9	4.8	5.4	4.6	2.3
30	1.3	1.1	1.3	1.2	---	3.9	3.6	2.7	4.5	5.0	4.6	2.3
31	1.3	---	1.3	1.2	---	5.2	---	2.4	---	4.2	5.5	---
TOTAL	85.3	34.6	38.1	38.5	31.8	47.99	125.8	107.6	111.0	136.9	158.7	91.1
MEAN	2.75	1.15	1.23	1.24	1.14	1.55	4.19	3.47	3.70	4.42	5.12	3.04
MAX	4.7	1.3	1.5	1.3	1.3	5.2	6.5	4.3	5.4	5.5	5.8	6.7
MIN	1.2	1.0	1.1	1.2	1.0	.86	2.5	2.4	1.8	3.1	3.7	1.9
AC-FT	169	69	76	76	63	95	250	213	220	272	315	181

CAL YR 1980 TOTAL 1120.57 MEAN 3.06 MAX 11 MIN .95 AC-FT 2220
WTR YR 1981 TOTAL 1007.39 MEAN 2.76 MAX 6.7 MIN .86 AC-FT 2000

DISCHARGE, IN CUBIC FEET PER SECOND, OCTOBER 1981

DAY	DISCHARGE	DAY	DISCHARGE	DAY	DISCHARGE	DAY	DISCHARGE	DAY	DISCHARGE
1	2.3	7	2.7	13	2.4	19	3.6	25	1.3
2	2.5	8	2.7	14	2.5	20	3.5	26	1.3
3	2.6	9	3.1	15	3.8	21	2.4	27	1.3
4	2.5	10	3.5	16	4.0	22	1.2	28	1.3
5	2.4	11	3.5	17	3.5	23	1.3	29	1.2
6	2.8	12	2.9	18	3.6	24	1.3	30	1.1
								31	1.1

TOTAL.... 75.2
MEAN..... 2.43
MAX..... 4.0
MIN..... 1.1
AC-FT....149

12472350 DW 272A DRAIN NEAR ROYAL CAMP, WA

LOCATION.--Lat 46°54'54", long 119°32'30", in NW¼NW¼ sec.3, T.16 N., R.26 E., Grant County, Hydrologic Unit 17020015, on right bank at upstream end of culvert under a county road, 20 ft (6 m) downstream from entrance of DW 272A1 Drain, 0.2 mi (0.3 km) upstream from entrance to DW 272 Drain, 1.4 mi (2.3 km) upstream from Crab Creek Lateral, and 2.7 mi (4.3 km) southwest of Royal Camp.

DRAINAGE AREA.--3.36 mi^2 (8.70 km^2).

PERIOD OF RECORD.--April 1977 to October 1981 (discontinued).

GAGE.--Water-stage recorder and corrugated metal culvert control. Altitude of gage is 980 ft (299 m), from topographic map.

REMARKS.--Records excellent. Flow includes that of DW 272A1 Drain (station 12472300). To obtain comparable records of water flow and water-quality data, all daily values have been computed with the day beginning at 0900 hours. Principal source of flow is waste and ground-water return flows from irrigation. During the irrigation season most of the flow is reused and during the nonirrigation season wasted to Crab Creek. Sediment, chemical, and temperature records for water years 1977 to 1981 in separate basic data report.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 40 ft^3/s (1.13 m^3/s) July 1, 1978, gage height, 15.18 ft (4.627 m) from rating curve extended above 14 ft^3/s (0.40 m^3/s) on basis of computation of flow through a culvert at gage height 15.18 ft (4.627 m); minimum daily, 1.6 ft^3/s (0.04 m^3/s) Jan. 6-8, 1979.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, during period October 1980 to October 1981, 18 ft^3/s (0.51 m^3/s) Aug. 14, gage height, 11.78 ft (3.591 m); minimum daily, 2.2 ft^3/s (0.062 m^3/s) Mar. 14-19, 21-24.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	7.1	2.9	2.4	3.0	2.7	2.5	7.2	11	7.9	12	11	14
2	6.7	2.7	2.6	2.9	2.7	2.5	7.7	11	8.1	14	11	15
3	7.1	2.7	2.6	2.9	2.7	2.6	9.1	9.5	8.0	13	11	15
4	7.1	2.8	2.6	2.9	2.8	2.5	7.5	11	9.0	12	12	12
5	6.6	3.0	2.6	2.9	2.8	2.4	8.9	9.6	10	13	14	10
6	6.5	3.1	2.5	2.9	2.6	2.4	8.9	8.8	9.8	16	12	10
7	6.0	2.9	2.5	3.0	2.6	2.4	7.3	8.6	12	14	12	11
8	6.2	2.8	2.5	2.9	2.7	2.4	6.6	8.6	14	13	12	11
9	7.0	2.8	2.6	2.8	2.7	2.4	6.3	10	10	14	12	11
10	7.3	2.7	2.6	2.8	2.6	2.4	6.1	10	7.5	14	13	10
11	7.0	2.6	2.5	2.8	2.6	2.3	6.8	9.2	7.4	13	12	9.2
12	5.9	2.5	2.5	2.7	2.6	2.3	6.9	8.2	9.5	11	12	8.7
13	6.9	2.6	2.4	2.7	2.6	2.3	6.0	8.0	9.5	12	12	8.6
14	8.7	2.6	2.4	2.7	2.6	2.2	5.4	9.2	9.8	13	13	8.5
15	7.8	2.6	2.4	2.7	2.6	2.2	4.8	9.5	11	11	12	8.1
16	7.2	2.7	2.4	2.8	2.6	2.2	4.9	8.9	13	12	12	8.1
17	7.5	2.6	2.5	2.7	2.5	2.2	5.3	8.2	12	14	13	8.2
18	6.4	2.6	2.4	2.7	2.6	2.2	7.0	9.2	12	12	11	8.2
19	6.7	2.6	2.4	2.7	2.7	2.2	7.5	9.9	13	11	12	6.7
20	6.0	2.7	2.5	2.7	2.5	2.3	7.6	8.8	14	11	13	6.6
21	5.7	2.7	2.7	2.7	2.6	2.2	8.9	7.7	13	11	13	7.0
22	5.9	2.5	2.7	2.8	2.7	2.2	11	7.2	12	12	12	7.2
23	3.9	2.4	2.6	2.8	2.7	2.2	10	7.2	12	13	13	6.8
24	3.4	2.4	2.8	2.8	2.7	2.2	11	6.8	11	13	14	6.8
25	3.3	2.4	2.9	2.8	2.6	2.8	10	9.0	11	13	13	6.4
26	3.0	2.4	3.0	2.8	2.6	3.9	9.0	9.1	13	13	14	6.6
27	2.9	2.4	2.9	2.9	2.5	4.0	8.5	7.6	13	13	14	7.3
28	2.9	2.6	2.9	2.9	2.5	4.2	7.6	7.3	12	14	12	7.3
29	2.9	2.5	2.9	2.7	---	4.4	7.9	7.9	12	15	12	7.1
30	2.9	2.4	3.0	2.7	---	4.5	8.7	8.1	12	15	13	6.9
31	2.9	---	3.0	2.7	---	6.8	---	8.0	---	14	15	---
TOTAL	177.4	79.2	81.3	86.8	73.7	86.3	230.4	273.1	328.5	401	387	269.3
MEAN	5.72	2.64	2.62	2.80	2.63	2.78	7.68	8.81	11.0	12.9	12.5	8.98
MAX	8.7	3.1	3.0	3.0	2.8	6.8	11	11	14	16	15	15
MIN	2.9	2.4	2.4	2.7	2.5	2.2	4.8	6.8	7.4	11	11	6.4
AC-FT	352	157	161	172	146	171	457	542	652	795	768	534

CAL YR 1980 TOTAL 2636.9 MEAN 7.20 MAX 20 MIN 2.3 AC-FT 5230
WTR YR 1981 TOTAL 2474.0 MEAN 6.78 MAX 16 MIN 2.2 AC-FT 4910

DISCHARGE, IN CUBIC FEET PER SECOND, OCTOBER 1981

DAY	DISCHARGE	DAY	DISCHARGE	DAY	DISCHARGE	DAY	DISCHARGE	DAY	DISCHARGE
1	7.1	7	6.1	13	5.8	19	9.5	25	3.5
2	6.4	8	6.0	14	6.2	20	8.2	26	3.4
3	6.4	9	6.0	15	7.3	21	6.4	27	3.4
4	6.4	10	6.4	16	7.8	22	3.7	28	3.4
5	6.1	11	6.4	17	8.2	23	3.6	29	3.1
6	5.9	12	6.1	18	9.2	24	3.6	30	2.9
								31	3.0

TOTAL....177.5
MEAN..... 5.73
MAX..... 9.5
MIN..... 2.9
AC-FT....352

12472600 CRAB CREEK NEAR BEVERLY, WA

LOCATION.--Lat 46°49'48", long 119°49'48", in NW¼SW¼ sec.33, T.16 N., R.24 E., Grant County, Hydrologic Unit 17020015, on right bank 4.9 mi (7.9 km) east of Beverly, and at mile 4.5 (7.2 km).

DRAINAGE AREA.--4,842 mi^2 (12,541 km^2), of which 665 mi^2 (1,722 km^2) in the vicinity of Soap Lake is noncontributing.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--February 1959 to current year.

REVISED RECORDS.--WSP 1933: Drainage area.

GAGE.--Water-stage recorder. Altitude of gage is 500 ft (152 m), from topographic map.

REMARKS.--Water-discharge records good. Many diversions above station for irrigation. Flow largely regulated by Potholes Reservoir 41.3 mi (66.5 km) upstream. A major portion of flow is return flows, including trans-basin diversions, from parts of the Columbia Basin project.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 936 ft^3/s (26.5 m^3/s) Mar. 3, 1980, gage height, 6.46 ft (1.969 m); minimum discharge, 10 ft^3/s (0.28 m^3/s) Jan. 10, 1963, result of freezeup.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 344 ft^3/s (9.74 m^3/s) Oct. 16, gage height, 4.45 ft (1.356 m); minimum, 137 ft^3/s (3.88 m^3/s) June 30.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	312	246	199	207	182	166	217	220	236	160	211	308
2	301	241	206	204	176	164	213	215	227	160	214	311
3	292	236	232	202	176	164	192	208	215	159	212	306
4	290	231	278	202	177	164	197	211	208	158	213	288
5	291	227	270	198	178	168	191	226	212	163	210	282
6	286	231	237	194	175	164	204	223	212	180	215	286
7	297	245	189	192	175	162	214	223	218	193	220	297
8	291	251	202	190	175	162	208	213	233	218	218	305
9	302	243	191	191	175	159	210	208	247	238	214	306
10	297	235	185	189	165	158	206	211	248	243	206	303
11	294	229	187	187	161	157	201	214	244	245	206	294
12	301	221	188	186	171	157	207	218	233	242	205	277
13	312	216	187	185	170	157	212	210	232	234	209	267
14	326	213	187	181	176	163	208	199	232	227	218	265
15	337	210	190	179	180	166	201	200	229	231	222	268
16	342	211	195	182	175	162	190	208	221	233	229	270
17	341	211	199	182	176	167	192	213	217	232	235	272
18	337	211	199	183	172	163	194	223	209	228	241	272
19	335	210	196	184	165	155	201	242	200	222	248	258
20	332	207	197	183	197	147	199	269	195	211	244	263
21	326	204	207	187	189	157	216	278	194	205	246	266
22	334	208	226	194	179	155	231	289	202	207	254	272
23	335	203	225	192	177	154	226	296	210	209	259	270
24	319	200	219	183	176	154	217	294	212	209	270	268
25	302	199	234	183	176	160	203	294	196	207	284	277
26	303	199	237	179	174	168	193	300	184	206	289	287
27	301	199	226	183	172	177	215	306	168	205	287	304
28	281	200	210	199	168	205	221	305	165	205	289	318
29	255	197	202	210	---	200	219	284	161	205	288	326
30	252	200	204	198	---	201	226	268	151	204	294	334
31	252	---	208	189	---	210	---	245	---	205	303	---
TOTAL	9476	6534	6512	5898	4928	5166	6224	7513	6311	6444	7453	8620
MEAN	306	218	210	190	176	167	207	242	210	208	240	287
MAX	342	251	278	210	197	210	231	306	248	245	303	334
MIN	252	197	185	179	161	147	190	199	151	158	205	258
AC-FT	18800	12960	12920	11700	9770	10250	12350	14900	12520	12780	14780	17100

CAL YR 1980 TOTAL 98941 MEAN 270 MAX 848 MIN 130 AC-FT 196200
WTR YR 1981 TOTAL 81079 MEAN 222 MAX 342 MIN 147 AC-FT 160800

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 (4.2 km) downstream from Priest Rapids Dam, 14.7 mi (23.7 km) south of Beverly, and at mile 394.5 (634.8 km).

DRAINAGE AREA.--96,000 mi² (249,000 km²), approximately.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--January 1917 to current year. January 1917 to September 1930, at site 3.4 mi (5.5 km) downstream, published as "at Vernita." October 1930 to July 27, 1959, at site 46.5 mi (74.8 km) 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 (5.5 km) downstream at datum 388.7 ft (118.48 m) National Geodetic Vertical Datum of 1929. Oct. 1, 1930, to July 27, 1959, water-stage recorder at site 46.5 mi (74.8 km) upstream at datum 499.3 ft (152.19 m) National Geodetic Vertical Datum of 1929 (river-profile survey).

REMARKS.--Water-discharge records excellent. Diversions for irrigation of about 500,000 acres (2,020 km²) above station. Flow regulated by 10 major reservoirs and numerous smaller reservoirs and powerplants.

AVERAGE DISCHARGE.--64 years, 119,800 ft³/s (3,393 m³/s), 86,800,000 acre-ft/yr (107,000 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 692,600 ft³/s (19,600 m³/s) June 12, 1948, gage height, 59.35 ft (18.090 m), site and datum then in use; minimum, 4,120 ft³/s (117 m³/s) Feb. 10, 1932, gage height, 11.40 ft (3.475 m) site and datum then in use.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of June 7, 1894, reached a discharge of about 740,000 ft³/s (21,000 m³/s), based on information obtained at other points.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 316,000 ft³/s (8,950 m³/s) June 5, elevation, 417.97 ft (127.397 m); minimum, 36,100 ft³/s (1,020 m³/s) Oct. 4, elevation, 396.35 ft (120.807 m).

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	84100	56800	110000	166000	126000	81700	112000	127000	232000	165000	189000	123000
2	76200	51600	118000	160000	157000	118000	129000	121000	256000	187000	158000	101000
3	65600	70500	108000	153000	155000	111000	119000	122000	258000	184000	152000	96200
4	51500	74000	128000	156000	164000	120000	100000	129000	235000	191000	186000	85700
5	51800	75000	117000	152000	147000	117000	90800	136000	281000	188000	175000	54800
6	55700	95300	103000	135000	158000	119000	106000	149000	268000	197000	155000	59800
7	75500	81500	98700	139000	149000	113000	107000	155000	253000	234000	157000	65000
8	74300	69900	122000	153000	157000	99700	112000	146000	250000	253000	156000	96400
9	75200	69000	121000	153000	161000	114000	118000	116000	248000	223000	152000	82900
10	82800	90600	118000	156000	166000	112000	112000	109000	245000	214000	148000	85700
11	66500	107000	119000	148000	157000	110000	120000	154000	245000	201000	165000	96600
12	47500	95100	116000	161000	155000	117000	101000	145000	248000	178000	166000	79700
13	71100	101000	110000	162000	139000	113000	104000	148000	256000	181000	155000	70700
14	83200	91900	96700	162000	118000	88400	108000	154000	242000	181000	171000	91400
15	76500	94400	116000	161000	104000	88500	117000	160000	249000	180000	140000	96700
16	89300	86100	109000	157000	108000	113000	108000	123000	238000	193000	131000	96800
17	77100	91900	116000	163000	84500	109000	101000	114000	218000	175000	137000	93400
18	58900	97600	116000	151000	107000	112000	94500	143000	221000	200000	139000	99400
19	48000	79500	124000	145000	130000	111000	74200	152000	223000	182000	138000	75400
20	71600	102000	106000	164000	132000	104000	103000	157000	228000	191000	134000	63500
21	83900	104000	60200	161000	113000	103000	96300	160000	233000	187000	128000	87400
22	87500	98900	85700	141000	114000	90700	94900	154000	240000	194000	135000	88200
23	84700	85500	124000	155000	124000	108000	85400	127000	242000	185000	109000	81100
24	78800	118000	111000	146000	136000	120000	76700	114000	244000	170000	114000	91300
25	56700	114000	84600	132000	126000	111000	63500	130000	243000	146000	126000	89200
26	61700	93300	121000	159000	118000	104000	53400	140000	247000	160000	120000	72300
27	82800	68500	136000	161000	108000	108000	72000	154000	224000	169000	109000	53600
28	80700	74300	152000	153000	88900	90400	80000	172000	216000	178000	120000	75100
29	80400	78300	170000	150000	---	77700	105000	192000	216000	173000	105000	90600
30	79900	80300	184000	144000	---	113000	117000	238000	180000	196000	109000	83600
31	72000	---	169000	145000	---	100000	---	233000	---	183000	113000	---
TOTAL	2231500	2595400	3669900	4748000	3702400	3297100	2980700	4574000	7179000	5839000	4392000	2526500
MEAN	71980	86530	118400	153200	132200	106400	99360	147500	239300	188400	141700	84220
MAX	89300	118000	184000	168000	166000	120000	129000	238000	281000	253000	189000	123000
MIN	47500	51600	60200	132000	84500	77700	53400	109000	180000	146000	105000	53600
AC-FT	4426000	5149000	7279000	9418000	7344000	6540000	5912000	9073000	14240000	11580000	8712000	5011000

CAL YR 1980 TOTAL 37725600 MEAN 103100 MAX 208000 MIN 42900 AC-FT 74830000
WTR YR 1981 TOTAL 47735900 MEAN 130800 MAX 281000 MIN 47500 AC-FT 94680000

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

WATER-QUALITY RECORDS

PERIOD OF DAILY RECORD.--
WATER TEMPERATURE: March 1980 to current year.

INSTRUMENTATION.--Temperature recorder since December 1979.

REMARKS.--Temperature records at site 12472900 Columbia River at Vernita Bridge, near Priest Rapids Dam, published for the period July 1974 to September 1980, are equivalent.

EXTREMES FOR PERIOD OF DAILY RECORD.--
WATER TEMPERATURES: Maximum, 19.7°C Sept. 14, 1980, Aug. 16, 1981; minimum, 2.9°C Mar. 13, 1980.

EXTREMES FOR CURRENT YEAR.--
WATER TEMPERATURES: Maximum, 19.7°C Aug. 16; minimum, 3.2°C Feb. 10, 11, 14.

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		OCTOBER			NOVEMBER			DECEMBER			JANUARY	
1	17.5	16.5	17.0	14.0	13.5	13.5	10.0	9.5	10.0	7.0	7.0	7.0
2	17.5	16.5	17.0	14.0	13.5	13.5	10.0	10.0	10.0	7.0	6.5	7.0
3	18.5	16.5	17.5	14.0	13.5	13.5	10.0	9.5	9.5	6.5	6.5	6.5
4	18.5	16.5	17.5	14.0	13.5	13.5	9.5	9.5	9.5	7.0	6.5	6.5
5	18.5	17.0	17.5	14.0	13.5	14.0	9.5	9.0	9.0	7.0	6.5	6.5
6	18.5	17.0	17.5	14.0	13.5	13.5	9.0	8.5	8.5	6.5	6.5	6.5
7	17.5	17.0	17.5	14.0	13.5	13.5	9.0	8.0	8.5	6.5	6.5	6.5
8	18.0	16.5	17.0	14.0	13.0	13.5	8.0	8.0	8.0	6.5	6.5	6.5
9	17.5	16.5	17.0	14.0	13.0	13.0	8.0	7.5	8.0	6.5	6.0	6.0
10	17.0	16.0	16.5	13.5	12.5	13.0	7.5	7.5	7.5	6.0	6.0	6.0
11	17.5	16.0	16.5	13.0	12.5	13.0	7.5	7.5	7.5	6.0	5.5	6.0
12	16.5	16.0	16.5	13.0	12.0	12.5	7.5	7.5	7.5	5.5	5.5	5.5
13	16.5	15.5	16.0	12.5	11.5	12.0	7.5	7.0	7.5	5.5	5.5	5.5
14	16.0	16.0	16.0	12.0	11.0	11.5	7.5	7.0	7.5	5.5	5.5	5.5
15	16.0	15.5	16.0	12.0	11.5	11.5	7.5	7.0	7.5	5.5	5.0	5.0
16	16.0	15.5	15.5	12.0	11.5	11.5	7.5	7.5	7.5	5.0	5.0	5.0
17	16.0	15.0	15.5	11.5	11.0	11.5	8.0	7.5	7.5	5.0	4.5	5.0
18	16.5	15.0	15.5	11.5	11.0	11.5	8.0	8.0	8.0	5.0	4.5	4.5
19	16.5	15.0	15.5	11.5	11.0	11.5	8.0	8.0	8.0	4.5	4.5	4.5
20	15.5	15.0	15.5	11.5	11.0	11.5	8.0	8.0	8.0	4.5	4.5	4.5
21	15.5	14.5	15.0	11.5	11.0	11.5	8.5	7.5	8.0	4.5	4.5	4.5
22	15.0	14.0	14.5	12.0	11.0	11.5	8.0	7.5	8.0	4.5	4.5	4.5
23	15.0	14.0	14.5	11.5	11.0	11.0	8.0	7.5	8.0	5.0	4.5	5.0
24	14.5	14.0	14.5	11.0	10.0	10.5	8.0	7.5	7.5	5.0	4.5	5.0
25	15.0	14.5	14.5	11.0	10.5	10.5	8.0	7.5	7.5	4.5	4.5	4.5
26	14.5	14.0	14.5	11.0	10.5	10.5	8.0	7.5	8.0	4.5	4.5	4.5
27	14.0	14.0	14.0	10.5	10.0	10.5	8.0	7.5	8.0	4.5	4.5	4.5
28	14.0	13.5	14.0	10.5	10.0	10.0	7.5	7.5	7.5	4.5	4.5	4.5
29	14.0	13.5	13.5	10.5	10.0	10.0	7.5	7.0	7.0	4.5	4.5	4.5
30	14.0	13.5	13.5	10.0	9.5	9.5	6.5	6.5	6.5	4.5	4.5	4.5
31	14.0	13.5	14.0	---	---	---	7.0	6.5	7.0	4.5	4.0	4.5
MONTH	18.5	13.5	15.5	14.0	9.5	12.0	10.0	6.5	8.0	7.0	4.0	5.5

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

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

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

12472900 COLUMBIA RIVER AT VERNITA BRIDGE, NEAR PRIEST RAPIDS DAM, WA
(National Stream Quality Accounting Network Station)

LOCATION.--Lat 46°38'34", long 119°43'54", in NW¼SE¼ sec.6, T.13 N., R.25 E., Grant County, Hydrologic Unit 17020016, at State Highway 24 Vernita Bridge crossing, 9.0 mi (14.5 km) downstream from Priest Rapids Dam, and at mile 388.1 (624.5 km).

DRAINAGE AREA.--96,000 mi^2 (248,600 km^2), approximately.

PERIOD OF RECORD.--Water years 1962-63, 1972, 1974 to current year.

PERIOD OF DAILY RECORD.--
WATER TEMPERATURES: July 1974 to September 1980.

INSTRUMENTATION.--Temperature recorder July 1974 to September 1980.

REMARKS.--October 1971 to September 1972, at site 6.4 mi (10.3 km) upstream, published as 12472800 "below Priest Rapids Dam." Prior to October 1971 published as 12472800 "at Vernita Ferry."

WATER QUALITY DATA, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SPE-CIFIC CON-DUCT-ANCE (UMHOS)	SPE-CIFIC CON-DUCT-ANCE LAB (UMHOS)	PH (UNITS)	PH LAB (UNITS)	TEMPER-ATURE (DEG C)	TUR-BID-ITY (FTU)	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 CACO3)
OCT , 1980												
15...	1115	72300	124	134	7.1	7.8	15.9	.50	9.6	1	3	60
JAN , 1981												
08...	1100	150000	149	172	8.6	7.6	6.3	.70	11.5	<1	<1	74
MAR												
04...	1045	117000	132	147	7.8	7.5	5.2	1.0	11.8	<1	1	68
MAY												
04...	1030	128000	145	152	8.6	8.0	9.8	3.3	12.4	3	3	68
JUL												
06...	1400	176000	123	132	8.0	7.9	15.4	2.0	10.8	<1	<1	62
SEP												
01...	1030	119000	127	133	8.4	8.1	18.5	1.9	9.8	<1	11	60

DATE	HARD-NESS NONCAR-BONATE (MG/L AS CACO3)	ACIDITY (MG/L AS H)	CALCIUM TOTAL RECOV-ERABLE (MG/L AS CA)	CALCIUM SUS-PENDED (MG/L AS CA)	CALCIUM DIS-SOLVED (MG/L AS CA)	MAGNE-SIUM, TOTAL RECOV-ERABLE (MG/L AS MG)	MAGNE-SIUM, SUS-PENDED TOTAL (MG/L AS MG)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG)	SODIUM, TOTAL RECOV-ERABLE (MG/L AS NA)	SODIUM, DIS-SOLVED (MG/L AS NA)	PERCENT SODIUM	SODIUM AD-SORP-TION RATIO
OCT , 1980												
15...	6.0	.0	--	--	18	--	--	3.7	--	2.1	7	.1
JAN , 1981												
08...	4.0	--	21	.00	21	21	16	5.2	2.4	2.7	--	.1
MAR												
04...	14	--	--	.00	20	--	.0	4.3	--	2.4	7	.1
MAY												
04...	12	--	--	--	20	--	--	4.5	--	2.7	8	.1
JUL												
06...	11	--	--	.00	18	4.1	.1	4.0	2.1	2.4	8	.1
SEP												
01...	4.0	--	--	.00	18	3.2	.0	3.6	1.5	1.6	5	.1

DATE	POTAS-SIUM, TOTAL RECOV-ERABLE (MG/L AS K)	POTAS-SIUM, DIS-SOLVED (MG/L AS K)	ALKA-LINITY LAB (MG/L AS CACO3)	SULFATE DIS-SOLVED (MG/L AS SO4)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)	FLUO-RIDE, DIS-SOLVED (MG/L AS F)	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 AC-FT)	SOLIDS, DIS-SOLVED (TONS PER DAY)	SOLIDS, RESIDUE AT 105 DEG. C, SUS-PENDED (MG/L)
OCT , 1980												
15...	--	.9	54	12	2.0	.1	4.6	84	76	.11	16400	--
JAN , 1981												
08...	--	--	70	14	.8	.1	5.2	82	--	.11	33200	8
MAR												
04...	.1	.7	54	15	1.2	.1	5.4	87	82	.12	27500	0
MAY												
04...	--	1.0	56	17	1.0	.1	4.7	89	85	.12	30800	5
JUL												
06...	.8	.9	51	6.0	1.2	--	5.4	74	70	.10	35200	4
SEP												
01...	.8	.7	56	<5.0	1.5	.1	3.5	73	68	.10	23500	33

12472900 COLUMBIA RIVER AT VERNITA BRIDGE, NEAR PRIEST RAPIDS DAM, WA--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	NITROGEN, NITRATE TOTAL (MG/L AS N)	NITROGEN, NITRITE TOTAL (MG/L AS N)	NITROGEN, NO2+NO3 TOTAL (MG/L AS N)	NITROGEN, NO2+NO3 DISSOLVED (MG/L AS N)	NITROGEN, AMMONIA TOTAL (MG/L AS N)	NITROGEN, AMMONIA DISSOLVED (MG/L AS N)	NITROGEN, ORGANIC TOTAL (MG/L AS N)	NITROGEN, ORGANIC DISSOLVED (MG/L AS N)	NITROGEN, AMMONIA + ORGANIC TOTAL (MG/L AS N)	NITROGEN, NH4 + ORG. SUSP. TOTAL (MG/L AS N)	NITROGEN, AMMONIA + ORGANIC DIS. (MG/L AS N)
OCT											
15...	--	--	.00	.08	.010	.050	--	--	--	--	--
JAN											
08...	.16	.010	.17	.17	.020	.020	--	--	--	--	--
MAR											
04...	.12	.000	.12	.12	.010	.030	.39	.35	.40	.02	.38
MAY											
04...	--	--	.05	.03	.080	.020	.47	.22	.55	.31	.24
JUL											
06...	.03	.010	.04	.05	.000	.120	.59	.45	.59	.02	.57
SEP											
01...	.02	.000	.02	.02	.000	.020	.38	.12	.38	.24	.14

DATE	NITROGEN, TOTAL (MG/L AS N)	NITROGEN DISSOLVED (MG/L AS N)	PHOSPHORUS, TOTAL (MG/L AS P)	PHOSPHORUS, DISSOLVED (MG/L AS P)	PHOSPHORUS, ORTHO, TOTAL (MG/L AS P)	PHOSPHORUS, ORTHO, DISSOLVED (MG/L AS P)	CARBON, ORGANIC TOTAL (MG/L AS C)	CARBON, ORGANIC DISSOLVED (MG/L AS C)	CARBON, ORGANIC SUSPENDED TOTAL (MG/L AS C)	SEDIMENT, SUSPENDED (MG/L)	SEDIMENT, DISCHARGE, SUSPENDED (T/DAY)
OCT											
15...	--	.57	.050	.030	.020	--	2.5	--	--	3	586
JAN											
08...	--	.81	.050	.050	--	.030	--	2.8	.0	2	810
MAR											
04...	.52	.50	.050	.030	--	--	--	5.3	--	8	2530
MAY											
04...	.60	.27	.040	.020	--	--	2.9	--	--	4	1380
JUL											
06...	.63	.62	.030	.010	--	.030	--	2.7	--	4	1900
SEP											
01...	.40	.16	.030	.010	--	.030	--	3.1	<.1	6	1930

DATE	TIME	ALUMINUM, TOTAL RECOVERABLE (UG/L AS AL)	ALUMINUM, SUSPENDED RECOV. (UG/L AS AL)	ALUMINUM, DISSOLVED (UG/L AS AL)	ARSENIC TOTAL (UG/L AS AS)	ARSENIC SUSPENDED TOTAL (UG/L AS AS)	ARSENIC DISSOLVED (UG/L AS AS)	BARIUM, TOTAL RECOVERABLE (UG/L AS BA)	BARIUM, SUSPENDED RECOVERABLE (UG/L AS BA)	BARIUM, DISSOLVED (UG/L AS BA)	BORON, TOTAL RECOVERABLE (UG/L AS B)
OCT											
15...	1115	20	10	10	2	0	2	0	0	40	20
JAN											
08...	1100	90	90	0	1	0	2	100	60	40	180
MAR											
04...	1045	130	110	20	--	--	1	100	70	30	220
MAY											
04...	1030	100	90	10	--	--	--	--	--	--	180
JUL											
06...	1400	90	80	10	4	3	1	100	0	100	210
SEP											
01...	1030	80	60	20	2	0	2	100	70	35	340

DATE	BORON, SUSPENDED RECOVERABLE (UG/L AS B)	BORON, DISSOLVED (UG/L AS B)	CADMIUM TOTAL RECOVERABLE (UG/L AS CD)	CADMIUM SUSPENDED RECOVERABLE (UG/L AS CD)	CADMIUM DISSOLVED (UG/L AS CD)	CHROMIUM, TOTAL RECOVERABLE (UG/L AS CR)	CHROMIUM, SUSPENDED RECOV. (UG/L AS CR)	CHROMIUM, DISSOLVED (UG/L AS CR)	COBALT, TOTAL RECOVERABLE (UG/L AS CO)	COBALT, DISSOLVED (UG/L AS CO)
OCT										
15...	0	20	1	--	<1	0	0	0	0	<3
JAN										
08...	180	0	0	0	1	0	0	0	2	<3
MAR										
04...	220	0	1	0	3	0	0	0	2	<3
MAY										
04...	180	3	--	--	--	--	--	--	--	--
JUL										
06...	10	200	0	--	<1	20	10	10	0	<3
SEP										
01...	340	0	1	--	<1	10	10	0	0	<3

12472900 COLUMBIA RIVER AT VERNITA BRIDGE, NEAR PRIEST RAPIDS DAM, WA--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	COPPER, TOTAL RECOV-ERABLE (UG/L AS CU)	COPPER, SUS-PENDED RECOV-ERABLE (UG/L AS CU)	COPPER, DIS-SOLVED (UG/L AS CU)	IRON, TOTAL RECOV-ERABLE (UG/L AS FE)	IRON, SUS-PENDED RECOV-ERABLE (UG/L AS FE)	IRON, DIS-SOLVED (UG/L AS FE)	LEAD, TOTAL RECOV-ERABLE (UG/L AS PB)	LEAD, SUS-PENDED RECOV-ERABLE (UG/L AS PB)	LEAD, DIS-SOLVED (UG/L AS PB)	LITHIUM TOTAL RECOV-ERABLE (UG/L AS LI)
OCT , 1980										
15...	8	7	1	120	--	<10	4	4	0	0
JAN , 1981										
08...	9	6	3	150	110	40	1	1	0	--
MAR										
04...	6	2	4	70	60	10	8	8	0	--
MAY										
04...	13	11	2	110	100	10	6	6	0	--
JUL										
06...	20	15	5	110	--	<10	13	11	2	--
SEP										
01...	180	50	130	100	80	25	61	26	35	--

DATE	LITHIUM DIS-SOLVED (UG/L AS LI)	MANGA-NESE, TOTAL RECOV-ERABLE (UG/L AS MN)	MANGA-NESE, SUS-PENDED RECOV. (UG/L AS MN)	MANGA-NESE, DIS-SOLVED (UG/L AS MN)	MERCURY TOTAL RECOV-ERABLE (UG/L AS HG)	MERCURY SUS-PENDED RECOV-ERABLE (UG/L AS HG)	MERCURY DIS-SOLVED (UG/L AS HG)	MOLYB-DENUM, DIS-SOLVED (UG/L AS MO)	NICKEL, TOTAL RECOV-ERABLE (UG/L AS NI)	NICKEL, SUS-PENDED RECOV-ERABLE (UG/L AS NI)
OCT , 1980										
15...	<4	10	7	3	.2	.1	.1	--	2	2
JAN , 1981										
08...	--	10	3	7	.1	.0	.3	--	1	1
MAR										
04...	--	10	3	7	--	--	.0	--	1	0
MAY										
04...	--	20	20	4	.8	.7	.1	<10	4	4
JUL										
06...	--	20	20	2	.5	.3	.2	--	4	3
SEP										
01...	--	10	6	4	.4	.4	.0	--	5	2

DATE	NICKEL, DIS-SOLVED (UG/L AS NI)	SELE-NIUM, TOTAL (UG/L AS SE)	SELE-NIUM, SUS-PENDED TOTAL (UG/L AS SE)	SELE-NIUM, DIS-SOLVED (UG/L AS SE)	SILVER, TOTAL RECOV-ERABLE (UG/L AS AG)	SILVER, SUS-PENDED RECOV-ERABLE (UG/L AS AG)	SILVER, DIS-SOLVED (UG/L AS AG)	ZINC, TOTAL RECOV-ERABLE (UG/L AS ZN)	ZINC, SUS-PENDED RECOV-ERABLE (UG/L AS ZN)	ZINC, DIS-SOLVED (UG/L AS ZN)
OCT , 1980										
15...	0	0	0	0	0	0	0	20	10	10
JAN , 1981										
08...	0	0	0	0	0	0	0	40	0	50
MAR										
04...	4	--	--	0	1	1	0	40	20	20
MAY										
04...	0	--	--	--	--	--	--	30	30	5
JUL										
06...	1	0	0	0	0	0	0	70	60	6
SEP										
01...	3	0	0	0	0	0	0	50	5	45

DATE	TIME	PERI-PHYTON BIOMASS ASH WEIGHT G/SQ M	PERI-PHYTON BIOMASS TOTAL DRY WEIGHT G/SQ M	CHLOR-A PERI-PHYTON CHROMO-GRAPHIC FLUOROM (MG/M2)	CHLOR-B PERI-PHYTON CHROMO-GRAPHIC FLUOROM (MG/M2)	BIOMASS CHLORO-PHYLL RATIO PERI-PHYTON (UNITS)
OCT , 1980						
15...	1115	22.8	27.1	16.2	2.08	265

12472900 COLUMBIA RIVER AT VERNITA BRIDGE, NEAR PRIEST RAPIDS DAM, WA--Continued

PHYTOPLANKTON ANALYSES, OCTOBER 1980 TO SEPTEMBER 1981

DATE	OCT 15,80	MAR 4,81	MAY 4,81	JUL 6,81	SEP 1,81
TIME	1115	1045	1030	1400	1030
TOTAL CELLS/ML	1900	1100	13000	4200	12000
DIVERSITY: DIVISION	0.9	1.4	0.9	0.8	0.9
.CLASS	0.9	1.4	0.9	0.8	0.9
..ORDER	2.1	2.1	1.5	1.9	1.6
...FAMILY	2.3	2.1	1.5	1.9	1.6
....GENUS	2.7	2.7	1.6	3.1	2.5

ORGANISM	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT
BACILLARIOPHYTA (DIATOMS)										
.BACILLARIOPHYCEAE										
..BACILLARIALES										
...NITZSCHIACEAE										
....NITZSCHIA	190	10	13	1	370	3	67	2	93	1
..EUPODISCALES										
...COSCINODISCACEAE										
....CYCLOTELLA	130	7	280#	25	270	2	1200#	29	3700#	32
....MELOSIRA	620#	32	120	10	170	1	350	8	3400#	29
....STEPHANODISCUS	--	-	--	-	--	-	250	6	--	-
..FRAGILARIALES										
...FRAGILARIACEAE										
....ASTERIONELLA	64	3	90	8	9400#	73	250	6	1600	14
....DIATOMA	--	-	--	-	--	-	370	9	--	-
....FRAGILARIA	570#	29	--	-	--	-	640#	15	610	5
....SYNEDRA	--	-	13	1	100	1	220	5	93	1
....TABELLARIA	--	-	150	14	--	-	--	-	--	-
..NAVICULALES										
...CYMBELLACEAE										
....CYMBELLA	--	-	--	-	°	0	--	-	--	-
...NAVICULACEAE										
....NAVICULA	13	1	--	-	--	-	°	0	--	-
CHLOROPHYTA (GREEN ALGAE)										
.CHLOROPHYCEAE										
..CHLOROCOCCALES										
...DICTYOSPHAERIACEAE										
....DICTYOSPHAERIUM	51	3	--	-	--	-	--	-	--	-
...MICRACTINIACEAE										
....MICRACTINIUM	26	1	--	-	--	-	--	-	190	2
...OOCYSTACEAE										
....ANKISTRODESMUS	26	1	90	8	68	1	50	1	190	2
...SCENEDESMACEAE										
....SCENEDESMUS	51	3	--	-	--	-	67	2	190	2
..VOLVOCALES										
...CHLAMYDOMONADACEAE										
....CHLAMYDOMONAS	13	1	--	-	68	1	°	0	--	-
CHRYSOPHYTA										
.CHRYSOPHYCEAE										
..OCHROMONADALES										
...DINOBRYACEAE										
....DINOBRYON	--	-	--	-	68	1	--	-	--	-
CRYPTOPHYTA (CRYPTOMONADS)										
.CRYPTOPHYCEAE										
..CRYPTOMONADALES										
...CRYPTOCHRYSIDACEAE										
....CHROOMONAS	13	1	--	-	°	0	--	-	--	-
...CRYPTOMONADACEAE										
....CRYPTOMONAS	--	-	--	-	°	0	--	-	--	-
CYANOPHYTA (BLUE-GREEN ALGAE)										
.CYANOPHYCEAE										
..CHROOCOCCALES										
...CHROOCOCCACEAE										
....ANACYSTIS	180	9	13	1	1300	10	67	2	1600	14
..OSCILLATORIALES										
...OSCILLATORIACEAE										
....OSCILLATORIA	--	-	310#	28	1000	8	600	14	--	-
PYRRHOPHYTA (FIRE ALGAE)										
.DINOPHYCEAE										
..DINOKONTAE										
...GLENODINIACEAE										
....GLENODINIUM	--	-	39	3	°	0	--	-	--	-

NOTE: # - DOMINANT ORGANISM; EQUAL TO OR GREATER THAN 15%
° - OBSERVED ORGANISM, MAY NOT HAVE BEEN COUNTED; LESS THAN 1/2%

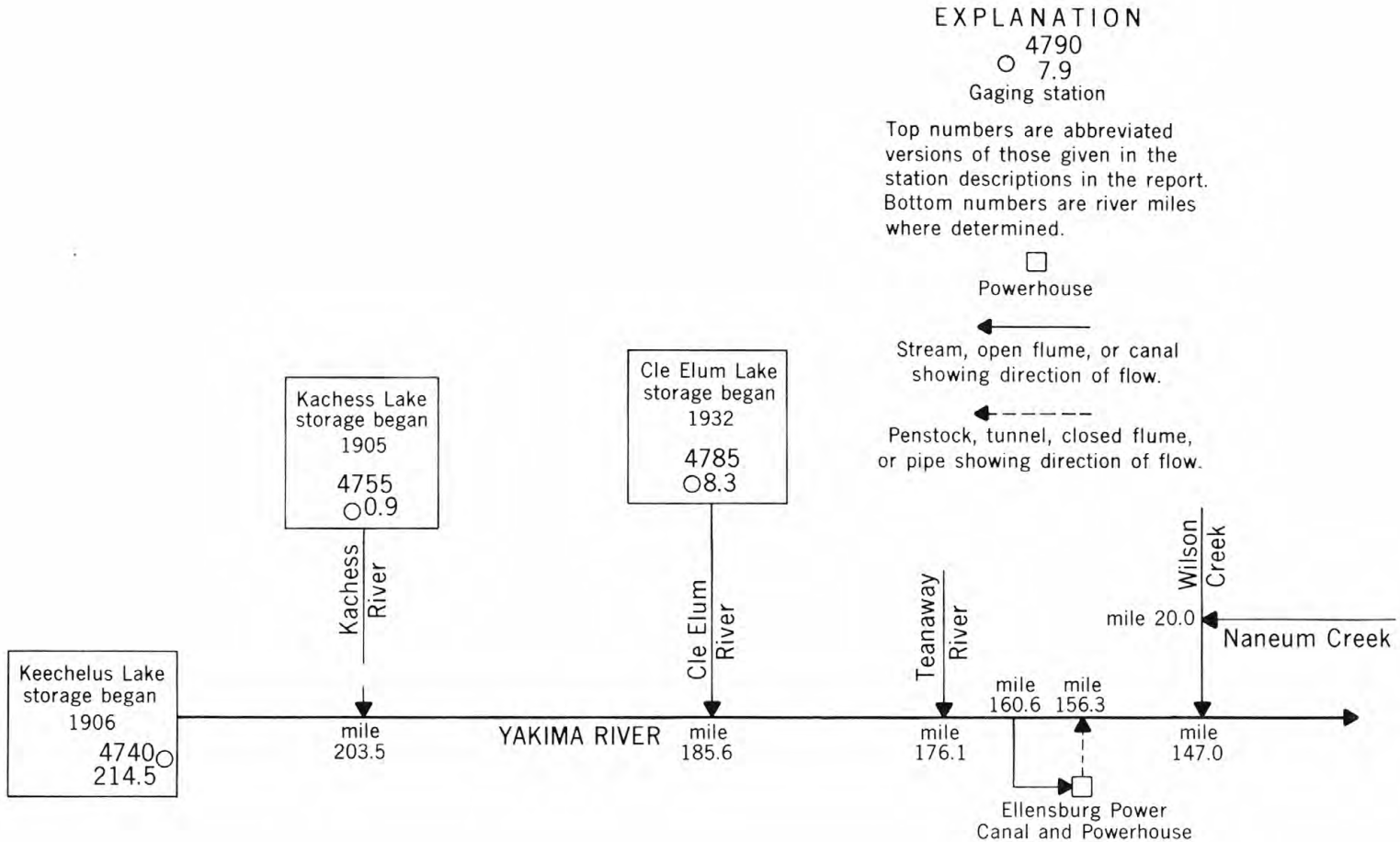

Figure 14. Gaging stations in Yakima River basin between Keechelus Lake and Naneum Creek.

12473510 COLUMBIA RIVER AT RINGOLD, WA

LOCATION.--Lat 46°29'16", long 119°15'15", in SE¼NW¼ sec.36, T.12 N., R.14 E., Franklin County, Hydrologic Unit 17020016, on left bank 0.5 mi (0.8 km) south of Ringold, 1.3 mi (2.1 km) upstream from Ringold wasteway, 14 mi (22.5 km) northeast of Richland, 17.5 mi (28.2 km) above the Yakima River and at mile 352.7 (567.5 km).

DRAINAGE AREA.--96,800 mi^2 (251,000 km^2) approximately.

PERIOD OF RECORD.--October 1979 to September 1981 (elevations only), discontinued. Fragmentary records of gage height for previous years in files of Corps of Engineers.

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

REMARKS.--Records good. No record Jan. 13-20, and May 27 to July 16.

EXTREMES FOR CURRENT YEAR.--Maximum elevation, 358.40 ft (109.240 m) July 16, 1981; minimum elevation, 346.88 ft (105.729 m) Oct. 5, 1980.

ELEVATION (FEET NGVD), WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	349.29	348.53	351.63	355.70	353.24	350.38	352.41	352.89		---	356.43	353.21
2	349.77	348.84	352.96	355.20	354.04	351.89	352.81	353.70		---	355.74	352.16
3	350.38	348.75	352.22	354.79	354.54	352.13	353.26	352.70		---	355.19	351.11
4	347.88	349.67	353.06	355.42	354.52	352.36	351.62	353.43		---	355.83	351.33
5	348.19	349.35	353.10	354.85	354.01	352.88	350.99	353.88		---	356.34	349.10
6	348.20	351.12	351.58	354.06	354.30	352.16	351.71	354.60		---	355.28	348.70
7	349.43	350.70	351.70	353.93	353.97	352.54	352.11	354.85		---	355.01	348.50
8	349.59	349.39	352.76	354.67	354.27	352.13	351.71	354.96		---	355.28	350.44
9	349.97	349.10	352.98	354.61	354.42	351.99	352.73	352.87		---	354.68	351.04
10	350.22	350.91	352.92	355.16	354.74	352.34	352.30	352.70		---	354.68	350.54
11	349.62	351.40	352.90	354.59	354.43	352.70	352.55	353.35		---	355.18	350.97
12	348.52	351.68	352.47	354.95	353.92	352.58	352.11	354.52		---	355.84	351.03
13	348.32	351.57	352.59	---	353.27	352.34	352.08	354.54		---	355.18	349.72
14	350.32	351.98	351.33	---	352.32	351.71	351.76	354.66		---	355.55	350.28
15	349.91	350.04	352.68	---	351.02	350.87	351.65	355.31		---	355.05	351.15
16	350.85	351.23	352.05	---	351.05	352.00	352.50	353.53		---	353.60	351.33
17	349.95	350.90	352.42	---	350.45	352.71	351.51	352.65		356.36	353.88	351.70
18	349.46	351.59	352.56	---	350.76	352.09	351.62	353.64		356.78	354.01	351.29
19	348.52	350.73	352.87	---	352.40	352.44	350.18	354.65		356.69	353.96	350.63
20	348.76	350.82	352.15	---	353.11	351.99	350.45	354.95		356.18	354.15	349.76
21	349.56	352.17	350.06	355.54	352.21	351.99	351.81	355.23		356.56	353.35	349.65
22	350.87	350.94	349.58	354.54	352.18	351.22	351.14	355.04		356.73	353.84	351.05
23	350.87	350.87	352.58	354.91	352.07	351.15	350.82	354.00		356.84	352.49	350.45
24	350.14	352.27	352.32	354.85	353.25	353.22	350.04	352.92		356.34	352.32	350.75
25	349.10	352.64	351.01	354.16	353.33	352.38	349.34	353.00		354.78	353.20	350.89
26	348.60	352.06	351.78	354.68	352.23	352.06	348.31	353.99		355.14	353.36	350.10
27	349.91	350.19	354.24	355.27	352.23	352.10	348.97	---		355.68	352.24	348.85
28	350.39	349.58	354.70	354.93	350.94	351.53	349.70	---		355.69	352.84	349.06
29	350.13	349.39	355.38	354.93	---	350.19	351.22	---		356.06	352.44	350.39
30	350.26	350.19	356.83	354.23	---	351.39	352.68	---		356.72	351.96	351.33
31	349.81	---	355.51	354.32	---	351.46	---	---		356.75	352.29	---
MEAN	349.57	350.62	352.67	---	352.97	351.97	351.40	---	---	---	354.23	350.55
MAX	350.87	352.64	356.83	---	354.74	353.22	353.26	---	---	---	356.43	353.21
MIN	347.88	348.53	349.58	---	350.45	350.19	348.31	---	---	---	351.96	348.50

12473520 COLUMBIA RIVER AT RICHLAND, WA

LOCATION.--Lat 46°18'46", long 119°15'28", in NW¼NW¼ sec.36, T.10 N., R.28 E., Benton County, Hydrologic Unit 17020016, at City of Richland pumping plant, 4.8 mi (7.7 km) upstream from Yakima River, and at mile 340.2 (597.4 km).

DRAINAGE AREA.--96,900 mi^2 (251,000 km^2), approximately.

PERIOD OF DAILY RECORD.--
WATER TEMPERATURE: July 1974 to current year.

INSTRUMENTATION.--Water-temperature recorder with probe located at City of Richland pumping-plant pier near right bank from July 1974 until January 1977. Since January 1977, recorder probe located 200 ft (61 m) streamward from plant.

REMARKS.--Water temperatures as recorded for the period July 1974 to January 1977 did not represent mean stream temperatures (see previous state reports for correlation between thermal load measurements and recorded temperatures). Temperature probe, relocated January 1977, reflects mean river water temperature.

EXTREMES FOR PERIOD OF DAILY RECORD.--
WATER TEMPERATURES: Maximum, 21.5°C Aug. 17-20, 1977; minimum, 0.5°C Feb. 1-4, 1979.

EXTREMES FOR CURRENT YEAR.--
WATER TEMPERATURES: Maximum, 20.4°C Sept. 18; minimum, 3.2°C Feb. 10, 11.

WATER QUALITY DATA, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	TIME	SPECIFIC CONDUCTANCE (UMHOS)	SPECIFIC CONDUCTANCE LAB (UMHOS)	PH (UNITS)	PH LAB (UNITS)	TEMPERATURE (DEG C)	TURBIDITY (FTU)	OXYGEN, DISSOLVED (MG/L)	OXYGEN DEMAND, CHEMICAL (HIGH LEVEL) (MG/L)	COLIFORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)	STREPTOCOCCI FECAL, KF AGAR (COLS. PER 100 ML)	HARDNESS (MG/L AS CACO3)
OCT , 1980												
21...	1045	132	142	8.2	7.7	15.0	.40	9.6	9	4	33	68
JAN , 1981												
06...	1500	--	160	7.5	8.0	6.8	4.0	11.4	230	3	--	66
MAR												
05...	1200	138	148	7.9	7.9	5.0	.90	12.4	17	<1	2	68
JUL												
07...	1015	117	132	7.8	7.5	14.9	2.4	11.1	16	3	7	62
SEP												
02...	0930	128	134	8.7	8.2	18.2	1.7	9.6	39	3	K220	61

DATE	HARDNESS NONCARBONATE (MG/L AS CACO3)	CALCIUM TOTAL RECOVERABLE (MG/L AS CA)	CALCIUM SUSPENDED (MG/L AS CA)	CALCIUM DISSOLVED (MG/L AS CA)	MAGNESIUM, TOTAL RECOVERABLE (MG/L AS MG)	MAGNESIUM, SUSPENDED TOTAL (MG/L AS MG)	MAGNESIUM, DISSOLVED (MG/L AS MG)	SODIUM, TOTAL RECOVERABLE (MG/L AS NA)	SODIUM, DISSOLVED (MG/L AS NA)	PERCENT SODIUM	SODIUM ADSORPTION RATIO	POTASSIUM, TOTAL RECOVERABLE (MG/L AS K)
OCT , 1980												
21...	13	19	--	20	4.1	.0	4.4	2.9	3.1	9	.2	.8
JAN , 1981												
06...	4.0	18	--	19	4.2	.0	4.5	2.3	2.3	7	.1	.6
MAR												
05...	15	17	.00	20	3.8	.0	4.5	2.2	2.4	7	.1	.6
JUL												
07...	6.0	17	.00	18	4.2	.1	4.1	2.0	2.6	8	.1	.7
SEP												
02...	8.0	12	.00	18	3.0	.0	3.9	1.6	2.0	7	.1	.7

DATE	POTASSIUM, DISSOLVED (MG/L AS K)	ALKALINITY LAB (MG/L AS CACO3)	SULFATE DISSOLVED (MG/L AS SO4)	CHLORIDE, DISSOLVED (MG/L AS CL)	FLUORIDE, DISSOLVED (MG/L AS F)	SILICA, DISSOLVED (MG/L AS SIO2)	SOLIDS, RESIDUE AT 180 DEG. C DISSOLVED (MG/L)	SOLIDS, SUM OF CONSTITUENTS, DISSOLVED (MG/L)	SOLIDS, DISSOLVED (TONS PER AC-FT)	SOLIDS, RESIDUE AT 105 DEG. C, SUSPENDED (MG/L)	NITROGEN, NITRATE TOTAL (MG/L AS N)	NITROGEN, NITRATE DISSOLVED (MG/L AS N)
OCT , 1980												
21...	.8	55	14	1.9	.1	5.0	79	82	.11	9	.13	--
JAN , 1981												
06...	.8	62	15	1.0	.2	5.1	83	85	.11	41	.13	--
MAR												
05...	.8	53	14	1.0	.1	5.2	87	80	.12	0	.12	--
JUL												
07...	.9	56	7.6	1.6	.1	5.6	78	74	.11	4	.07	.04
SEP												
02...	.8	53	6.0	1.8	.1	3.5	66	68	.09	27	.02	--

DATE	NITROGEN, NITRITE TOTAL (MG/L AS N)	NITROGEN, NO2+NO3 TOTAL (MG/L AS N)	NITROGEN, NO2+NO3 DISSOLVED (MG/L AS N)	NITROGEN, AMMONIA TOTAL (MG/L AS N)	NITROGEN, AMMONIA DISSOLVED (MG/L AS N)	NITROGEN, ORGANIC TOTAL (MG/L AS N)	NITROGEN, AMMONIA + ORGANIC TOTAL (MG/L AS N)	NITROGEN, TOTAL (MG/L AS N)	PHOSPHORUS, TOTAL (MG/L AS P)	PHOSPHORUS, DISSOLVED (MG/L AS P)	CARBON, ORGANIC TOTAL (MG/L AS C)
OCT , 1980											
21...	.010	.14	--	.050	--	.28	.33	.47	.050	--	4.6
JAN , 1981											
06...	.000	.13	--	.020	--	.31	.33	.46	.040	.160	2.9
MAR											
05...	.010	.13	--	.000	--	.23	.23	.36	.030	--	--
JUL											
07...	.000	.07	.05	.050	.070	.57	.62	.69	.100	--	2.2
SEP											
02...	.000	.02	--	.010	--	.34	.35	.37	.030	--	2.3

K Results based on colony counts outside the acceptable range.

12473520 COLUMBIA RIVER AT RICHLAND, WA--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	TIME	ARSENIC TOTAL (UG/L AS AS)	ARSENIC SUS-PENDED TOTAL (UG/L AS AS)	ARSENIC DIS-SOLVED (UG/L AS AS)	CADMIUM TOTAL RECOV-ERABLE (UG/L AS CD)	CHRO-MIUM, TOTAL RECOV-ERABLE (UG/L AS CR)	COBALT, TOTAL RECOV-ERABLE (UG/L AS CO)	COPPER, TOTAL RECOV-ERABLE (UG/L AS CU)
OCT , 1980								
21...	1045	2	0	2	0	0	0	24
JAN , 1981								
06...	1500	2	0	2	1	0	0	8
MAR								
05...	1200	1	0	3	0	0	2	10
JUL								
07...	1015	1	1	0	2	10	0	110
SEP								
02...	0930	2	0	2	0	10	0	100

DATE	IRON, TOTAL RECOV-ERABLE (UG/L AS FE)	LEAD, TOTAL RECOV-ERABLE (UG/L AS PB)	MANGA-NESE, TOTAL RECOV-ERABLE (UG/L AS MN)	MERCURY TOTAL RECOV-ERABLE (UG/L AS HG)	MERCURY SUS-PENDED RECOV-ERABLE (UG/L AS HG)	MERCURY DIS-SOLVED (UG/L AS HG)	SELE-NIUM, TOTAL (UG/L AS SE)	ZINC, TOTAL RECOV-ERABLE (UG/L AS ZN)
OCT , 1980								
21...	130	6	10	.3	--	--	0	30
JAN , 1981								
06...	340	10	20	.6	--	--	0	50
MAR								
05...	90	10	10	.2	--	--	0	40
JUL								
07...	170	60	10	.7	.6	.1	0	50
SEP								
02...	90	22	10	.1	--	--	0	50

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		OCTOBER			NOVEMBER			DECEMBER			JANUARY	
1	17.5	17.0	17.0	13.5	13.0	13.5	9.5	9.5	9.5	7.0	7.0	7.0
2	17.5	16.5	17.0	13.5	13.0	13.5	9.5	9.5	9.5	7.0	7.0	7.0
3	17.5	16.5	17.0	13.5	13.5	13.5	9.5	9.5	9.5	7.0	6.5	7.0
4	17.5	17.0	17.0	13.5	13.5	13.5	9.5	9.0	9.5	7.0	6.5	6.5
5	17.5	17.0	17.5	13.5	13.5	13.5	9.0	9.0	9.0	7.0	6.5	6.5
6	18.0	17.5	17.5	13.5	13.5	13.5	9.0	7.5	8.0	7.0	6.5	6.5
7	18.0	17.5	17.5	14.0	13.5	13.5	7.5	7.5	7.5	7.0	6.5	6.5
8	17.5	17.0	17.5	13.5	13.0	13.0	7.5	7.5	7.5	6.5	6.5	6.5
9	17.0	16.5	16.5	13.0	12.5	13.0	7.5	7.5	7.5	6.5	6.0	6.5
10	16.5	16.0	16.5	13.0	12.5	12.5	7.5	7.0	7.0	6.0	6.0	6.0
11	16.5	16.0	16.0	12.5	12.5	12.5	7.5	7.0	7.0	6.0	6.0	6.0
12	16.0	16.0	16.0	12.5	12.0	12.5	7.5	7.0	7.5	6.0	5.5	5.5
13	16.0	15.5	16.0	12.0	12.0	12.0	7.5	7.0	7.0	5.5	5.5	5.5
14	16.0	16.0	16.0	12.0	11.5	12.0	7.0	7.0	7.0	5.5	5.5	5.5
15	16.0	15.5	16.0	11.5	11.5	11.5	7.0	7.0	7.0	5.5	5.0	5.5
16	16.0	15.5	15.5	11.5	11.5	11.5	7.5	7.0	7.5	5.0	5.0	5.0
17	15.5	15.0	15.5	11.5	11.0	11.5	7.5	7.5	7.5	5.0	5.0	5.0
18	15.5	15.0	15.5	11.5	11.5	11.5	7.5	7.5	7.5	5.0	4.5	5.0
19	15.5	15.0	15.5	11.5	11.5	11.5	7.5	7.5	7.5	5.0	4.5	4.5
20	15.5	15.0	15.0	11.5	11.5	11.5	7.5	7.5	7.5	4.5	4.5	4.5
21	15.0	14.5	15.0	11.5	11.0	11.0	7.5	7.5	7.5	5.0	4.5	4.5
22	14.5	14.5	14.5	11.0	10.5	11.0	8.0	7.5	7.5	5.0	4.5	5.0
23	14.5	14.0	14.0	11.0	10.5	10.5	7.5	7.5	7.5	5.0	5.0	5.0
24	14.5	14.0	14.0	10.5	10.5	10.5	7.5	7.5	7.5	5.0	4.5	5.0
25	14.5	14.0	14.0	10.5	10.5	10.5	8.0	7.5	8.0	5.0	4.5	5.0
26	14.0	14.0	14.0	10.5	10.5	10.5	8.0	8.0	8.0	5.0	4.5	4.5
27	14.0	13.5	14.0	10.5	10.0	10.0	8.0	8.0	8.0	4.5	4.5	4.5
28	14.0	13.5	13.5	10.0	10.0	10.0	7.5	7.5	7.5	4.5	4.5	4.5
29	13.5	13.0	13.5	10.0	9.5	10.0	7.5	7.0	7.0	4.5	4.5	4.5
30	13.5	13.0	13.0	9.5	9.5	9.5	7.0	7.0	7.0	5.0	4.5	4.5
31	13.5	13.0	13.0	---	---	---	7.0	6.5	7.0	4.5	4.5	4.5
MONTH	18.0	13.0	15.5	14.0	9.5	12.0	9.5	6.5	7.5	7.0	4.5	5.5

12473520 COLUMBIA RIVER AT RICHLAND, WA--Continued

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		FEBRUARY			MARCH			APRIL			MAY	
1	4.5	4.0	4.5	5.5	5.0	5.5	7.0	6.0	6.5	10.5	10.0	10.5
2	4.5	4.0	4.5	5.5	5.0	5.5	6.5	6.0	6.5	10.5	9.5	10.0
3	4.5	4.0	4.5	5.5	5.0	5.0	7.0	6.0	6.5	10.5	9.5	10.0
4	4.5	4.0	4.0	5.5	5.0	5.5	7.0	6.0	6.5	10.5	10.0	10.0
5	4.0	4.0	4.0	5.5	5.0	5.0	6.5	6.5	6.5	10.0	9.5	9.5
6	4.0	4.0	4.0	5.5	4.5	5.0	7.0	6.5	6.5	10.0	9.0	9.5
7	4.0	4.0	4.0	5.0	5.0	5.0	7.0	6.5	6.5	10.0	9.0	9.5
8	4.0	4.0	4.0	5.5	4.5	5.0	6.5	6.5	6.5	10.0	9.0	9.5
9	4.0	3.5	4.0	5.5	5.0	5.5	7.0	6.0	6.5	10.0	9.5	10.0
10	3.5	3.0	3.5	5.5	5.0	5.5	7.0	6.5	6.5	10.5	9.5	10.0
11	3.5	3.0	3.5	5.5	5.0	5.5	7.0	6.5	6.5	10.0	9.5	10.0
12	3.5	3.5	3.5	5.5	5.0	5.5	7.0	6.5	6.5	10.5	9.5	10.0
13	3.5	3.5	3.5	6.0	5.5	5.5	7.0	6.5	6.5	10.5	9.5	10.0
14	4.0	3.5	3.5	6.0	5.5	6.0	7.5	6.5	7.0	10.0	10.0	10.0
15	4.0	4.0	4.0	6.0	5.5	6.0	8.0	7.0	7.5	10.5	9.5	10.0
16	4.5	4.0	4.5	6.5	6.0	6.0	8.0	7.0	7.5	11.0	10.0	10.5
17	4.5	4.5	4.5	6.0	5.5	6.0	8.5	7.5	8.0	11.5	10.0	11.0
18	5.0	4.5	4.5	6.0	5.5	6.0	8.5	7.5	8.0	11.0	10.5	11.0
19	5.0	4.5	4.5	6.5	5.5	6.0	8.5	8.0	8.5	11.0	10.5	11.0
20	4.5	4.0	4.5	6.5	6.0	6.5	9.0	8.5	8.5	11.5	10.5	11.0
21	4.5	4.0	4.5	6.5	6.0	6.5	9.0	8.0	8.5	12.0	11.0	11.5
22	4.5	4.0	4.5	6.5	6.5	6.5	9.0	8.5	8.5	12.5	11.0	11.5
23	5.0	4.5	4.5	6.5	6.0	6.5	9.5	8.0	9.0	13.0	11.5	12.0
24	5.0	4.5	4.5	6.5	6.0	6.0	9.5	9.0	9.5	12.5	12.0	12.0
25	5.0	4.5	5.0	6.5	6.0	6.0	10.0	9.0	9.5	13.0	12.0	12.5
26	5.0	4.5	5.0	6.5	6.0	6.5	10.0	9.5	9.5	13.0	12.0	12.5
27	5.5	5.0	5.0	7.0	6.0	6.5	10.0	9.5	9.5	13.5	12.0	13.0
28	5.5	5.0	5.0	7.0	6.5	7.0	10.5	9.5	10.0	13.5	12.0	13.0
29	---	---	---	7.0	7.0	7.0	10.5	9.5	10.0	13.5	12.5	13.0
30	---	---	---	7.5	6.5	7.0	10.5	9.5	10.0	13.0	12.5	12.5
31	---	---	---	7.0	6.5	6.5	---	---	---	13.0	12.0	12.5
MONTH	5.5	3.0	4.5	7.5	4.5	6.0	10.5	6.0	8.0	13.5	9.0	11.0

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		JUNE			JULY			AUGUST			SEPTEMBER	
1	13.0	12.5	12.5	16.5	15.0	15.5	18.5	17.5	18.0	19.0	18.5	18.5
2	13.0	12.5	12.5	16.5	15.0	16.0	19.0	17.5	18.5	19.0	18.0	18.5
3	13.0	12.5	13.0	16.5	15.5	16.0	19.0	18.0	18.5	19.0	18.0	18.5
4	13.0	12.5	12.5	16.5	15.5	16.0	19.0	18.0	18.5	19.0	18.5	19.0
5	13.0	12.0	12.5	16.0	15.5	16.0	19.0	17.5	18.5	19.5	18.5	19.0
6	12.5	12.0	12.5	15.5	15.5	15.5	19.0	18.0	18.5	19.5	19.0	19.5
7	12.5	12.0	12.0	15.5	15.0	15.0	19.5	18.0	18.5	20.0	19.0	19.5
8	12.5	12.0	12.5	15.5	14.5	15.0	19.5	18.5	19.0	20.0	19.5	20.0
9	13.0	12.0	12.5	16.0	15.0	15.5	19.5	18.5	19.0	20.0	19.0	19.5
10	13.5	12.5	13.0	16.0	15.0	15.5	19.5	18.5	19.0	20.0	19.0	19.5
11	13.5	12.5	13.0	16.0	15.0	15.5	19.5	18.5	19.0	19.5	19.0	19.5
12	13.0	12.5	12.5	16.0	15.0	15.5	20.0	19.0	19.5	20.0	19.0	19.5
13	13.0	12.0	12.5	16.0	15.0	15.5	20.0	19.0	19.5	20.0	19.0	19.5
14	13.5	12.5	13.0	16.0	15.0	15.5	20.0	19.0	19.5	20.0	19.5	19.5
15	14.0	13.0	13.5	16.5	15.0	16.0	20.0	19.0	19.5	20.0	19.0	19.5
16	14.0	13.5	13.5	17.0	16.0	16.5	20.0	19.0	19.5	20.0	19.5	20.0
17	14.0	13.0	13.5	17.5	16.0	16.5	20.0	19.0	19.5	20.5	19.5	20.0
18	13.5	13.5	13.5	17.5	16.5	17.0	20.0	19.0	19.5	20.5	19.5	20.0
19	14.5	13.5	14.0	17.5	16.5	17.0	20.0	19.0	19.5	20.0	19.0	19.5
20	14.5	14.0	14.0	17.5	16.5	17.0	19.5	18.5	19.0	19.0	18.5	18.5
21	14.5	13.5	14.0	17.5	16.5	17.0	19.5	19.0	19.0	18.5	17.5	18.0
22	14.0	13.5	14.0	18.0	16.5	17.5	20.0	18.5	19.5	17.5	17.0	17.5
23	14.5	13.5	14.0	18.0	17.0	17.5	20.0	19.0	19.5	18.0	17.5	17.5
24	15.0	14.0	14.5	18.0	17.0	17.5	19.5	19.0	19.5	17.5	17.0	17.5
25	15.5	14.0	14.5	18.5	17.0	18.0	19.5	18.5	19.0	17.5	17.0	17.5
26	15.5	14.5	15.0	18.5	17.5	18.0	19.5	18.5	19.0	17.5	16.5	17.0
27	15.5	14.0	15.0	18.5	17.5	18.0	19.5	18.5	19.0	17.0	17.0	17.0
28	15.5	14.5	15.0	18.5	17.5	18.0	19.0	18.5	19.0	17.5	17.0	17.0
29	16.0	14.5	15.5	18.0	17.5	17.5	19.0	18.5	18.5	17.0	16.5	17.0
30	16.0	15.0	15.5	18.0	17.0	17.5	19.0	18.5	18.5	17.0	16.5	16.5
31	---	---	---	18.5	17.0	18.0	19.0	18.5	19.0	---	---	---
MONTH	16.0	12.0	13.5	18.5	14.5	16.5	20.0	17.5	19.0	20.5	16.5	18.5
YEAR	20.5	3.0	11.5									

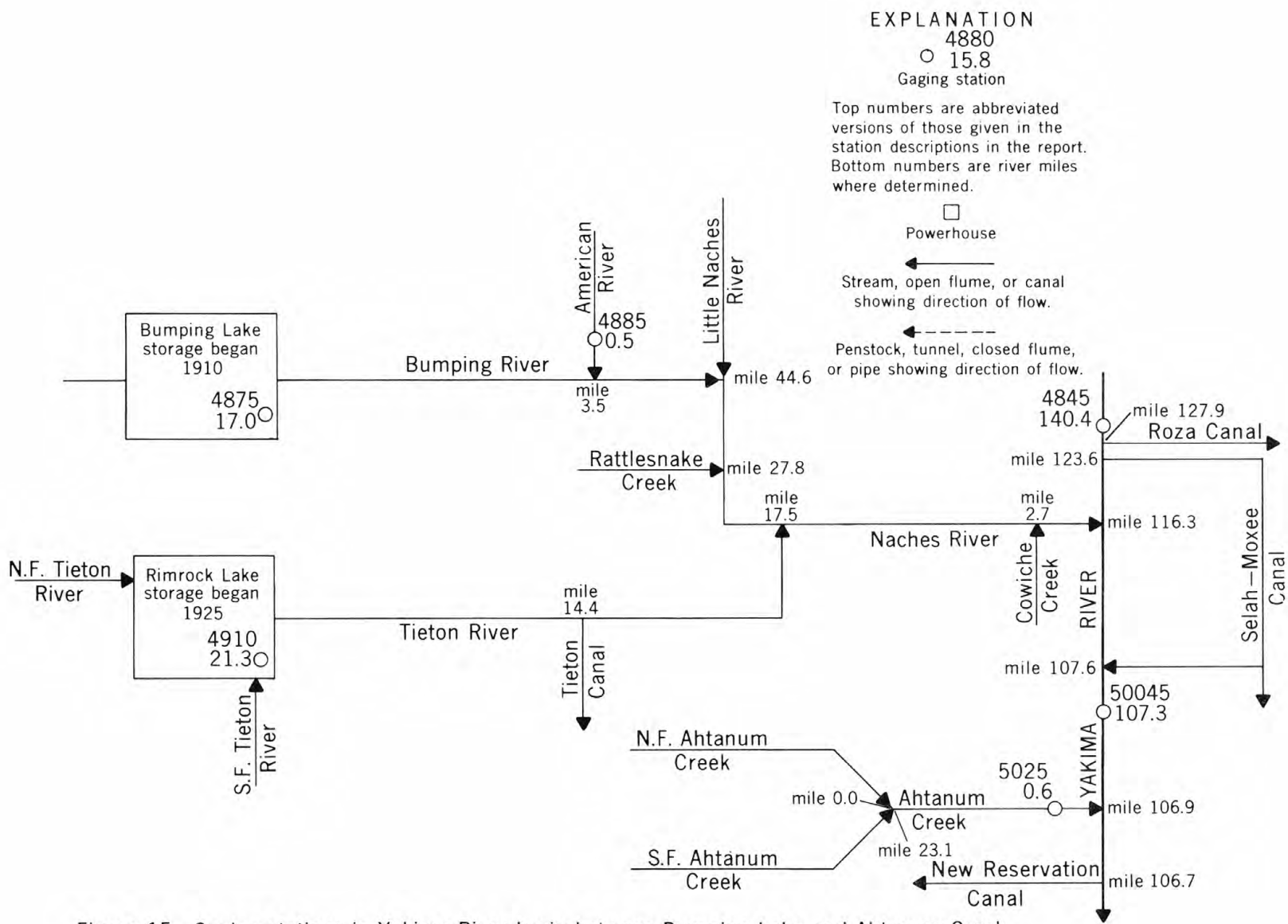

Figure 15. Gaging stations in Yakima River basin between Bumping Lake and Ahtanum Creek.

12474500 YAKIMA RIVER NEAR MARTIN, WA

LOCATION.--Lat 47°19'17", long 121°20'06", in SW¼SW¼ sec.10, T.21 N., R.12 E., Kittitas County, Hydrologic Unit 17030001, Wenatchee National Forest, on left bank 800 ft (244 m) downstream from dam at outlet of Keechelus Lake, 2.9 mi (4.7 km) northwest of Martin, 9.5 mi (15.3 km) northwest of Easton, and at mile 214.4 (345.0 km).

DRAINAGE AREA.--54.7 mi^2 (141.7 km^2).

PERIOD OF RECORD.--Water discharge October 1903 to September 1978. Prior to February 1904 monthly discharge only, published in WSP 1316.

PERIOD OF DAILY RECORD.--
WATER TEMPERATURE: April to September 1981.

INSTRUMENTATION.--Temperature recorder.

REMARKS.--Water-temperature records collected as part of a water-temperature modeling project in the Yakima River basin. Surface-water records available from the U.S. Bureau of Reclamation in Yakima.

EXTEMES FOR CURRENT PERIOD OF DAILY RECORD.--
WATER TEMPERATURES: Maximum, 19.6°C Aug. 26; minimum, 3.0°C Apr. 3.

TEMPERATURE, WATER (DEG. C), PERIOD APRIL 1981 TO SEPTEMBER 1981

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		FEBRUARY			MARCH			APRIL			MAY	
1							---	---	---	5.5	5.0	5.0
2							4.0	3.5	3.5	5.0	5.0	5.0
3							4.0	3.0	3.5	5.0	4.5	5.0
4							4.0	4.0	4.0	6.5	5.0	5.5
5							4.0	4.0	4.0	6.0	5.0	5.5
6							4.0	3.5	3.5	6.0	5.0	5.5
7							4.0	3.5	3.5	6.0	5.5	5.5
8							3.5	3.5	3.5	6.0	5.0	5.5
9							3.5	3.5	3.5	6.0	5.0	5.5
10							3.5	3.5	3.5	6.5	6.0	6.0
11							3.5	3.5	3.5	6.5	6.0	6.0
12							3.5	3.5	3.5	6.0	5.5	6.0
13							3.5	3.5	3.5	6.0	5.5	5.5
14							4.0	3.5	3.5	6.5	5.5	6.0
15							4.0	3.5	4.0	7.0	6.0	6.5
16							4.0	4.0	4.0	7.0	6.5	6.5
17							4.5	4.0	4.0	6.5	6.0	6.0
18							4.5	4.0	4.0	6.5	6.0	6.0
19							4.5	4.0	4.5	6.5	6.0	6.5
20							4.5	4.5	4.5	7.5	6.5	7.0
21							4.5	4.5	4.5	8.0	7.0	7.5
22							4.5	4.5	4.5	8.0	6.0	7.0
23							5.0	4.5	4.5	6.5	6.0	6.5
24							5.0	5.0	5.0	7.0	6.5	6.5
25							5.0	5.0	5.0	8.5	6.5	7.0
26							5.5	5.0	5.0	7.5	5.0	6.5
27							5.0	5.0	5.0	7.0	6.0	6.5
28							5.5	5.0	5.0	7.0	5.5	6.5
29							5.5	5.0	5.0	7.0	6.0	6.5
30							5.5	5.0	5.0	7.5	6.5	7.0
31							---	---	---	6.5	5.5	6.0
MONTH							5.5	3.0	4.0	8.5	4.5	6.0

12474500 YAKIMA RIVER NEAR MARTIN, WA--Continued

TEMPERATURE, WATER (DEG. C), PERIOD APRIL 1981 TO SEPTEMBER 1981

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

12476000 KACHESS RIVER NEAR EASTON, WA

LOCATION.--Lat 47°15'41", long 121°12'08", on north line sec.3, T.20 N., R.13 E., Kittitas County, Hydrologic Unit 17030001, on left bank 0.3 mi (0.5 km) downstream from Kachess Lake, 2.0 mi (3.2 km) northwest of Easton, and at mile 0.6 (1.0 km).

DRAINAGE AREA.--63.6 mi^2 (164.7 km^2)

PERIOD OF RECORD.--Water discharge October 1903 to September 1978.

PERIOD OF DAILY RECORD.--
WATER TEMPERATURE: April to September 1981.

INSTRUMENTATION.--Temperature recorder.

REMARKS.--Water-temperature records collected as part of a water-temperature modeling project in the Yakima River basin. Surface-water records available from the U.S. Bureau of Reclamation in Yakima. Flow completely regulated by Kachess Lake.

EXTREMES FOR CURRENT PERIOD OF DAILY RECORD.--
WATER TEMPERATURES: Maximum, 21.8°C Aug. 16; minimum, 2.3°C Apr. 9, 13.

TEMPERATURE, WATER (DEG. C), PERIOD APRIL 1981 TO SEPTEMBER 1981

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		FEBRUARY			MARCH			APRIL			MAY	
1							---	---	---	8.0	7.5	7.5
2							6.0	4.5	5.0	7.5	7.5	7.5
3							6.0	2.5	4.5	8.0	7.5	7.5
4							6.0	4.0	5.0	8.5	7.5	7.5
5							5.0	3.5	4.5	9.5	7.5	8.0
6							5.5	3.0	4.0	8.0	7.5	7.5
7							6.5	2.5	5.0	8.0	7.5	7.5
8							4.5	3.5	4.0	8.0	7.5	8.0
9							5.5	2.5	3.5	8.5	8.0	8.0
10							6.0	3.5	4.5	8.0	7.5	8.0
11							5.5	3.0	4.5	8.5	8.0	8.0
12							4.5	2.5	3.5	9.0	8.5	8.5
13							6.0	2.5	4.0	9.5	8.5	9.0
14							7.5	3.0	5.0	10.5	8.5	9.0
15							6.5	4.0	5.5	12.0	8.0	9.5
16							9.5	5.0	7.0	12.0	8.5	10.0
17							9.5	5.0	7.0	11.0	8.0	9.5
18							10.5	5.0	7.5	10.0	9.0	9.5
19							9.5	5.5	7.5	10.0	10.0	10.0
20							7.5	6.5	7.0	10.0	9.5	10.0
21							8.5	6.0	7.0	10.5	9.5	10.0
22							8.0	6.5	7.5	11.5	10.0	10.5
23							11.0	6.5	8.5	11.5	10.5	11.0
24							10.0	6.5	7.5	11.5	10.5	11.0
25							11.0	6.0	8.0	11.5	11.0	11.5
26							11.0	7.0	8.5	13.0	11.0	12.0
27							8.5	7.0	7.5	13.0	11.5	12.5
28							10.0	7.0	8.5	13.0	12.0	12.0
29							9.5	7.5	8.5	13.0	11.5	12.0
30							9.0	8.0	8.5	12.5	12.0	12.0
31							---	---	---	13.0	12.0	12.5
MONTH							11.0	2.5	6.0	13.0	7.5	9.5

12476000 KACHESS RIVER NEAR EASTON, WA--Continued

TEMPERATURE, WATER (DEG. C), PERIOD APRIL 1981 TO SEPTEMBER 1981

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		JUNE			JULY			AUGUST			SEPTEMBER	
1	13.0	12.5	12.5	16.0	14.5	15.5	19.5	18.5	19.0	17.5	16.5	17.5
2	12.5	12.5	12.5	16.0	15.0	15.5	19.0	18.5	19.0	17.5	16.5	17.0
3	13.0	12.5	13.0	18.5	15.5	16.5	18.5	18.0	18.0	18.0	17.0	17.5
4	13.0	12.5	13.0	19.0	16.5	17.5	18.5	18.0	18.0	17.5	16.5	17.0
5	13.5	13.0	13.0	18.0	17.5	17.5	19.0	16.0	18.0	17.5	16.5	17.0
6	13.5	13.0	13.5	17.5	16.0	16.5	17.5	17.0	17.0	17.0	16.5	17.0
7	13.0	13.0	13.0	16.0	15.5	16.0	17.5	17.0	17.0	16.5	16.5	16.5
8	13.0	12.5	12.5	16.0	15.5	15.5	18.0	17.5	18.0	17.5	16.0	17.0
9	13.0	12.5	13.0	16.0	15.5	15.5	18.5	17.5	18.0	18.0	17.5	17.5
10	13.0	12.5	13.0	16.0	15.0	15.5	18.0	17.0	17.5	18.0	17.0	17.5
11	14.0	12.5	13.0	16.0	15.0	15.5	20.0	18.0	19.0	18.0	17.0	17.5
12	13.5	13.0	13.0	17.0	15.5	16.0	21.0	20.0	20.5	18.0	17.5	18.0
13	13.0	12.5	12.5	16.0	15.0	15.5	21.0	20.5	21.0	18.0	17.0	17.5
14	13.0	12.5	12.5	16.5	15.0	16.0	21.5	21.0	21.0	18.0	17.0	17.5
15	13.5	12.5	13.0	17.0	15.5	16.5	21.5	21.0	21.0	17.5	16.5	17.0
16	13.5	13.0	13.0	17.5	16.0	17.0	22.0	21.5	21.5	17.5	16.0	16.5
17	13.5	13.0	13.0	18.5	16.5	17.5	21.5	21.0	21.5	17.5	16.5	17.0
18	13.0	13.0	13.0	18.0	17.0	17.5	21.5	20.5	21.0	18.0	17.0	17.5
19	13.5	13.0	13.0	18.5	17.5	18.0	21.5	21.0	21.0	17.5	16.0	17.0
20	13.0	13.0	13.0	18.0	17.5	18.0	21.0	19.5	20.5	16.5	16.0	16.0
21	13.0	13.0	13.0	17.5	17.0	17.5	19.5	19.5	19.5	16.0	15.5	16.0
22	13.0	12.5	13.0	17.5	17.0	17.0	19.5	19.5	19.5	15.5	15.5	15.5
23	13.0	12.5	12.5	17.5	17.0	17.5	19.5	18.5	19.0	15.5	15.0	15.0
24	13.0	12.5	13.0	18.5	17.0	17.5	19.0	18.5	18.5	15.0	15.0	15.0
25	15.5	13.0	14.0	20.0	18.0	18.5	19.0	18.5	18.5	15.0	14.5	14.5
26	14.5	13.5	14.0	20.0	18.0	19.0	19.0	18.5	18.5	14.5	8.5	13.0
27	14.5	13.5	14.0	20.5	19.0	19.5	18.5	18.0	18.5	13.0	8.0	12.0
28	16.0	14.0	14.5	20.0	19.5	19.5	18.5	18.0	18.5	13.5	13.0	13.0
29	16.0	14.5	15.5	19.5	18.5	19.0	18.5	18.0	18.0	13.5	13.0	13.0
30	15.5	15.0	15.0	19.0	18.5	18.5	18.0	17.5	18.0	13.5	13.0	13.0
31	---	---	---	19.5	18.5	19.0	18.0	17.5	17.5	---	---	---
MONTH	16.0	12.5	13.0	20.5	14.5	17.0	22.0	16.0	19.0	18.0	8.0	16.0

12479500 YAKIMA RIVER AT CLE ELUM, WA

LOCATION.--47°11'33", long 120°56'48", in SW¼SE¼ sec.27, T.20 N., R.15 E., Kittitas County, Hydrologic Unit 17030001, on right bank 300 ft (91 m) downstream from highway bridge at Cle Elum, 0.1 mi (0.2 km) downstream from Crystal Creek (formerly Roslyn Creek), 1.3 mi (2.1 km) downstream from Tillman Creek, 7.0 mi (11.3 km) upstream from Teanaway River, and at mile 183.1 (294.6 km).

PERIOD OF RECORD.--Water discharge August 1906 to September 1978. Chemical analysis February 1910 to January 1911, December 1952 to September 1956, July 1969 to September 1970. Water temperature December 1952 to September 1956.

PERIOD OF DAILY RECORD.--
WATER TEMPERATURE: May to November 1981 (discontinued).

INSTRUMENTATION.--Temperature recorder.

REMARKS.--Water-temperature records collected as part of a water-temperature modeling project in the Yakima River basin. Surface-water records available from the U.S. Bureau of Reclamation in Yakima. Flow regulated by upstream storage.

EXTREMES FOR CURRENT PERIOD OF DAILY RECORD.--
WATER TEMPERATURES: Maximum, 20.1°C Aug. 17; minimum 6.1°C Oct. 22, 1981.

TEMPERATURE, WATER (DEG. C), PERIOD MAY 1981 TO NOVEMBER 1981

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

12479500 YAKIMA RIVER AT CLE ELUM, WA--Continued

TEMPERATURE, WATER (DEG. C), PERIOD MAY 1981 TO NOVEMBER 1981

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		SEPTEMBER			OCTOBER			NOVEMBER	
1	17.5	15.5	16.0	14.0	11.0	12.0	9.5	8.0	8.5
2	17.5	14.5	16.0	13.5	11.0	12.0	9.0	7.5	8.0
3	18.0	14.0	16.0	12.0	10.0	11.0	9.0	7.0	8.0
4	17.5	15.0	15.5	12.0	9.5	10.5	8.5	6.5	7.0
5	18.0	13.5	15.5	10.5	9.5	10.0	6.0	6.0	6.0
6	18.5	13.5	15.5	11.0	10.0	10.5	---	---	---
7	18.5	13.5	15.5	11.5	10.0	10.5	---	---	---
8	19.0	14.0	16.0	11.0	9.0	10.0	---	---	---
9	18.5	14.5	16.5	11.5	9.0	10.0	---	---	---
10	18.5	14.5	16.0	11.0	8.5	9.5	---	---	---
11	18.5	14.0	16.0	11.0	8.0	9.5	---	---	---
12	18.5	14.5	16.0	11.0	8.0	9.0	---	---	---
13	18.0	14.0	16.0	10.5	8.0	9.0	---	---	---
14	---	---	---	11.0	8.0	9.0	---	---	---
15	---	---	---	11.0	8.0	9.5	---	---	---
16	---	---	---	12.0	8.5	10.0	---	---	---
17	---	---	---	11.5	8.5	10.0	---	---	---
18	---	---	---	11.5	8.0	9.5	---	---	---
19	---	---	---	11.5	8.0	9.5	---	---	---
20	---	---	---	10.0	7.5	9.0	---	---	---
21	---	---	---	9.0	6.5	7.5	---	---	---
22	---	---	---	9.0	6.0	7.5	---	---	---
23	---	---	---	9.0	6.5	7.5	---	---	---
24	14.5	11.5	12.5	10.5	7.5	9.0	---	---	---
25	14.5	12.0	13.0	10.0	8.0	9.0	---	---	---
26	12.5	11.5	12.0	10.0	8.5	9.0	---	---	---
27	13.0	11.0	12.0	10.0	9.0	9.5	---	---	---
28	13.0	11.5	12.0	9.5	8.5	9.0	---	---	---
29	13.5	11.0	12.0	9.0	7.5	8.5	---	---	---
30	13.5	10.5	12.0	7.5	6.5	7.0	---	---	---
31	---	---	---	9.0	7.0	8.0	---	---	---
MONTH				14.0	6.0	9.5			

RESERVOIRS IN YAKIMA RIVER BASIN, WA

12474000 KEECHELUS LAKE.--Lat 47°19'21", long 121°20'18", in SE¼NE¼ sec.12, T.21 N., R.11 E., Kittitas County, Hydrologic Unit 17030001, Wenatchee National Forest, at headgate tower of outlet at dam on Yakima River 3.0 mi (4.8 km) northwest of Martin, 10 mi (16 km) northwest of Easton, and at mile 214.5 (345.1 km). DRAINAGE AREA, 54.7 mi^2 (141.7 km^2). PERIOD OF RECORD, January 1906 to current year. GAGE, water-stage recorder and low-water staff gages. Datum of gage is National Geodetic Vertical Datum of 1929 (Levels by U.S. Bureau of Reclamation). Prior to Mar. 24, 1967, nonrecording gage at same site and datum.

REMARKS.--Reservoir is formed on natural lake by earthfill dam completed in 1917; storage began behind crib dam Jan. 12, 1906, behind present dam Aug. 19, 1914. Initial filling of present reservoir June 15, 1920. Usable capacity, 157,800 acre-ft (195 hm^3) between elevation, 2,425.00 ft (739.140 m), invert of gate sill, and 2,517.00 ft (767.182 m), spillway crest. Spillway raised 2 ft (0.6 m) Sept. 12, 1952. Figures given herein represent usable contents. Water is used for irrigation.

COOPERATION.--Records furnished by Bureau of Reclamation.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 160,940 acre-ft (198 hm^3) June 5, 1969, elevation, 2,518.23 ft (767.557 m); minimum observed, 448 acre-ft (0.552 hm^3) Sept. 6, 12, 13, 1906 (original crib dam); minimum elevation observed, 2,428.30 ft (740.146 m) Sept. 20, 1926.

EXTREMES FOR CURRENT YEAR.--Maximum contents, 159,750 acre-ft (197 hm^3) May 2, 3, elevation, 2,517.77 ft (767.416 m); minimum, 18,530 acre-ft (22.8 hm^3) Oct. 14, 15, elevation, 2,439.59 ft (743.587 m).

12475500 KACHESS LAKE.--Lat 47°15'53", long 121°12'16", in SW¼SW¼ sec.34, T.21 N., R.13 E., Kittitas County, Hydrologic Unit 17030001, Wenatchee National Forest, on outlet gate tower at dam on Kachess River, 2.4 mi (3.9 km) northwest of Easton. DRAINAGE AREA, 63.6 mi^2 (164.7 km^2). PERIOD OF RECORD, September 1905 to current year. GAGE, water-stage recorder. Datum of gage is National Geodetic Vertical Datum of 1929 (Levels by U.S. Bureau of Reclamation). Prior to Oct. 28, 1966, nonrecording gage at same site and datum.

REMARKS.--Reservoir is formed on natural lake by earthfill dam completed in 1912. Original crib dam capacity of 21,000 acre-ft (25.9 hm^3), used Sept. 20, 1905, to June 30, 1911. Storage behind present dam began June 30, 1911. Usable capacity, 239,000 acre-ft (295 hm^3) between elevation, 2,192.75 ft (668.350 m) invert of gate sill, and 2,262.00 ft (689.458 m), top of spillway gate. Figures given herein represent contents. Water is used for irrigation.

COOPERATION.--Records furnished by Bureau of Reclamation.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 244,800 acre-ft (302 hm^3) May 9, 1957, elevation, 2.263.29 ft (689.851 m); minimum observed, 525 acre-ft (0.647 hm^3) Sept. 14, 15, 1910 (original crib dam); minimum elevation observed, 2,197.73 ft (669.868 m) Sept. 25, 27, 1915.

EXTREMES FOR CURRENT YEAR.--Maximum contents, 240,390 acre-ft (296 hm^3) May 1, elevation, 2,262.31 ft (689.552 m); minimum, 88,800 acre-ft (109 hm^3) Oct. 14, 15, elevation, 2,224.25 ft (677.951 m).

12478500 CLE ELUM LAKE.--Lat 47°14'44", long 121°04'24", in NE¼NE¼ sec.10, T.20 N., R.14 E., Kittitas County, Hydrologic Unit 17030001, at dam on Cle Elum River at outlet of Cle Elum Lake, 4.0 mi (6.4 km) northwest of Roslyn, and at mile 8.3 (13.4 km). DRAINAGE AREA, 203 mi^2 (526 km^2). PERIOD OF RECORD, May 1906 to current year. GAGE, water-stage recorder. Datum of gage is National Geodetic Vertical Datum of 1929 (Levels by U.S. Bureau of Reclamation). Prior to Mar. 6, 1968, nonrecording gage at same site and datum.

REMARKS.--Reservoir is formed on natural lake by earthfill dam completed in 1933; storage began behind present dam Feb. 26, 1932. Usable capacity, 436,900 acre-ft (539 hm^3) between elevation, 2,110.00 ft (643.128 m), invert of gate sill, and 2,240.00 ft (682.752 m), top of spillway gate. Figures given herein represent usable contents. Water is used for irrigation.

COOPERATION.--Records furnished by Bureau of Reclamation.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents observed, 448,520 acre-ft (551 hm^3) May 8, 9, 1957, elevation, 2,241.98 ft (683.356 m); minimum observed, 2,380 acre-ft (2.93 hm^3) Aug. 31, 1906; minimum elevation observed, 2,114.35 ft (644.454 m) Oct. 14, 1932. Storage was uncontrolled Oct. 3, 1931, to Feb. 26, 1932.

EXTREMES FOR CURRENT YEAR.--Maximum contents, 436,610 acre-ft (538 hm^3) June 1, 2, elevation, 2,239.93 ft (682.731 m); minimum, 23,130 acre-ft (28.5 hm^3) Nov. 4, elevation, 2,121.50 ft (646.633 m).

12487500 BUMPING LAKE.--Lat 46°52'25", long 121°17'57", in SW¼ sec.14 (unsurveyed), T.16 N., R.12 E., Yakima County, Hydrologic Unit 17030002, Snoqualmie National Forest, at outlet of dam on Bumping River, 2.2 mi (3.5 km) southwest of Goose Prairie, 10 mi (16 km) southwest of town of American River, 19 mi (31 km) west of Nile, and at mile 17.0 (27.4 km). DRAINAGE AREA, 69.3 mi^2 (179.5 km^2). PERIOD OF RECORD, June to July 1906 April 1909 to current year. GAGE, water-stage recorder. Datum of gage is National Geodetic Vertical Datum of 1929 (Levels by U.S. Bureau of Reclamation). Prior to Nov. 23, 1966, nonrecording gage at same site and datum.

REMARKS.--Reservoir is formed on natural lake by earthfill dam completed in 1910; storage began Nov. 3, 1910. Usable capacity, 33,700 acre-ft (41.6 hm^3) between elevation 3,389.00 ft (1,032.967 m), invert of gate sill and 3,426.00 ft (1,044.245 m), spillway crest. Figures given herein represent usable contents. Water is used for irrigation.

COOPERATION.--Records furnished by Bureau of Reclamation.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents observed, 39,840 acre-ft (49.1 hm^3) June 21, 22, 1925, elevation, 3,430.55 ft (1,045.632 m); minimum observed, 1,130 acre-ft (1.39 hm^3) Feb. 5, 6, 7, 8, 9, 1949, elevation, 3,390.80 ft (1,033.516 m).

EXTREMES FOR CURRENT YEAR.--Maximum contents, 36,520 acre-ft (45.0 hm^3) Dec. 27, elevation, 3,428.12 ft (1,044.891 m); minimum, 4,260 acre-ft (5.25 hm^3) Oct. 27, 28, elevation, 3,395.61 ft (1,034.982 m).

12491000 RIMROCK LAKE.--Lat 46°39'23", long 121°07'43", in NE¼SW¼ sec.31, T.14 N., R.14 E., Yakima County, Hydrologic Unit 17030002, Snoqualmie National Forest, on upstream spillway pier at Tieton dam on Tieton River at Rimrock, 0.6 mi (1.0 km) upstream from Wildcat Creek, 7.1 mi (11.4 km) upstream from headworks on Tieton Canal, 21 mi (34 km) west of Naches and at mile 21.3 (34.3 km). DRAINAGE AREA, 187 mi^2 (484 km^2). PERIOD OF RECORD, April 1925 to current year. Prior to October 1959, published as Tieton Reservoir. GAGE, water-stage recorder and low-water staff gages. Datum of gage is National Geodetic Vertical Datum of 1929 (Levels by U.S. Bureau of Reclamation). Prior to Mar. 14, 1967, nonrecording gage at same site and datum.

REMARKS.--Reservoir is formed by earthfill dam completed in 1925; storage began Apr. 27, 1925. Usable capacity, 198,000 acre-ft (244 hm^3) between elevation 2,766.00 ft (843.077 m), invert of tunnel entrance, and 2,926.00 ft (891.845 m), crest of spillway gates. Figures given herein represent usable contents. Water is used for irrigation.

COOPERATION.--Records furnished by Bureau of Reclamation.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 201,630 acre-ft (249 hm^3) June 18, 1974, elevation, 2,927.43 ft (892.281 m); minimum observed, 30 acre-ft (0.037 hm^3) Oct. 19, 20, 1979, elevation, 2,766.25 ft (843.153 m).

EXTREMES FOR CURRENT YEAR.--Maximum contents, 199,540 acre-ft (246 hm^3) May 2, 3, elevation, 2,926.62 ft (892.034 m); minimum, 39,830 acre-ft (49.1 hm^3) Oct. 16, elevation, 2,837.68 ft (864.925 m).

RESERVOIRS IN YAKIMA RIVER BASIN, WA--Continued

MONTHEND ELEVATION AND CONTENTS AT 2400, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

Date	Elevation (feet)	Contents (acre-feet)	Change in contents (acre-feet)	Elevation (feet)	Contents (acre-feet)	Change in contents (acre-feet)
	12474000 KEECHULUS LAKE			12475500 KACHESS LAKE		
Sept. 30	2,445.38	26,110	---	2,227.07	98,180	---
Oct. 31	2,429.86	18,880	-7,230	2,224.60	89,820	-8,360
Nov. 30	2,459.62	45,450	+26,570	2,231.05	112,310	+22,490
Dec. 31	2,492.45	101,030	+55,580	2,244.21	162,400	+50,090
CAL YR 1980	---	---	+41,760	---	---	+102,080
Jan. 31	2,498.58	113,970	+12,940	2,248.31	179,260	+16,860
Feb. 28	2,511.42	143,760	+29,790	2,254.21	204,410	+25,150
Mar. 31	2,516.83	157,340	+13,580	2,257.29	217,900	+13,490
Apr. 30	2,517.68	159,520	+2,180	2,262.31	240,390	+22,490
May 31	2,512.90	147,420	-12,100	2,261.60	237,170	-3,220
June 30	2,513.80	149,670	+2,250	2,261.47	236,580	-590
July 31	2,497.39	111,400	-38,270	2,257.81	220,200	-16,380
Aug. 31	2,466.11	54,820	-56,580	2,243.53	159,660	-60,540
Sept. 30	2,452.59	35,750	-19,070	2,230.38	109,900	-49,760
WTR YR 1981	---	---	+9,640	---	---	+11,720
	12478500 CLE ELUM LAKE			12487500 BUMPING LAKE		
Sept. 30	2,137.29	57,410	---	3,401.60	8,500	---
Oct. 31	2,122.11	24,390	-33,020	3,396.19	4,650	-3,850
Nov. 30	2,136.15	54,680	+30,290	3,408.93	14,610	+9,960
Dec. 31	2,179.70	185,950	+131,270	3,426.65	34,560	+19,950
CAL YR 1980	---	---	-181,600	---	---	+23,710
Jan. 31	2,189.33	221,030	+35,080	3,411.41	16,960	-17,600
Feb. 28	2,201.53	268,290	+47,260	3,425.23	32,720	+15,760
Mar. 31	2,210.53	305,020	+36,730	3,425.57	33,160	+440
Apr. 30	2,225.67	370,360	+65,340	3,426.57	34,460	+1,300
May 31	2,239.89	436,420	+66,060	3,425.55	33,130	-1,330
June 30	2,230.86	393,920	-42,500	3,422.48	29,260	-3,870
July 31	2,189.07	220,060	-173,860	3,418.43	24,450	-4,810
Aug. 31	2,141.86	68,910	-151,150	3,414.73	20,370	-4,080
Sept. 30	2,127.70	36,060	-32,850	3,400.29	7,520	-12,850
WTR YR 1981	---	---	-21,350	---	---	-980
	12491000 RIMROCK LAKE					
Sept. 30	2,847.51	51,410	---			
Oct. 31	2,841.40	44,010	-7,400			
Nov. 30	2,858.78	66,750	+22,740			
Dec. 31	2,899.78	138,440	+71,690			
CAL YR 1980	---	---	+99,570			
Jan. 31	2,914.72	170,860	+32,420			
Feb. 28	2,925.90	197,750	+26,890			
Mar. 31	2,925.56	196,890	-860			
Apr. 30	2,926.38	198,960	+2,070			
May 31	2,924.06	193,140	-5,820			
June 30	2,925.48	196,690	+3,550			
July 31	2,921.75	187,460	-9,230			
Aug. 31	2,908.30	156,500	-30,960			
Sept. 30	2,846.37	49,980	-106,520			
WTR YR 1981	---	---	-1,430			

12484500 YAKIMA RIVER AT UMTANUM, WA

LOCATION.--Lat 46°51'46", long 120°28'44", in SW¼NW¼ sec.20, T.16 N., R.19 E., Kittitas County, Hydrologic Unit 17030001, on right bank at Umtanum railway siding, 0.5 mi (0.8 km) upstream from Umtanum Creek, 4.2 mi (6.8 km) upstream from McPherson Canyon, 10 mi (16 km) south of Ellensburg, and at mile 140.4 (225.9 km).

DRAINAGE AREA.--1,594 mi^2 (4,128 km^2).

PERIOD OF RECORD.--August 1906 to current year.

REVISED RECORDS.--WSP 412: 1914. WSP 1286: 1910. WSP 1933: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 1,300.00 ft (396.240 m) National Geodetic Vertical Datum of 1929. Prior to Sept. 28, 1911, nonrecording gage at approximately same site at various datums. Sept. 28, 1911, to Nov. 23, 1936, water-stage recorder at site about 300 ft (91 m) upstream at datum 26.70 ft (8.138 m) higher.

REMARKS.--Records good. Flow partly regulated by Keechelus, Kachess, and Cle Elum Lakes. Diversions above station for irrigation of about 105,000 acres (420 km^2).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 41,000 ft^3/s (1,160 m^3/s) Nov. 15 or 16, 1906, gage height, 41.1 ft (12.53 m), from floodmarks, present datum; minimum recorded, 138 ft^3/s (3.91 m^3/s) Oct. 3, 1915, gage height, 2.86 ft (0.872 m), datum then in use.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 16,800 ft^3/s (476 m^3/s) Dec. 26, gage height, 36.54 ft (11.137 m); minimum discharge, 615 ft^3/s (17.4 m^3/s) Oct. 31, gage height, 30.45 ft (9.281 m).

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1840	995	1250	4360	1290	2400	1250	4530	2900	3780	4300	3010
2	1770	1010	1240	3810	1250	2270	1150	4020	2810	3860	4240	2710
3	1740	1010	1130	3330	1240	2200	1010	3360	2680	3790	4320	2240
4	1700	1000	1130	2950	1200	2180	987	3010	2680	3730	4270	1990
5	1660	1000	934	2650	1200	2050	960	2120	2860	4090	4220	1830
6	1610	1010	988	2410	1170	1900	1210	1780	3030	4260	4260	1780
7	1590	1590	914	2210	1150	1810	1290	1600	3040	3970	4350	1770
8	1660	1670	911	2040	1140	1700	1290	1630	3180	4000	4430	1730
9	1660	1610	922	1880	1140	1600	1360	1730	3070	4200	4410	1650
10	1700	1410	943	1740	950	1530	1320	1880	2660	4080	4390	1690
11	1710	1310	1080	1750	890	1500	1270	1890	2490	4110	4330	1750
12	1800	1180	1290	1690	930	1500	1260	1810	2610	4070	4340	1740
13	1870	1100	1280	1540	1100	1530	1230	1900	2660	4190	4360	1710
14	1700	1090	1210	1480	1340	1560	1170	2340	2620	4390	4330	1750
15	1570	1090	1790	1470	1500	1580	1130	2440	2780	4140	4330	1750
16	1390	1150	3000	1340	2450	1660	1160	2360	2850	4280	4330	1740
17	1170	1110	2830	1370	5470	1610	1270	2350	3120	4430	4250	1720
18	1080	1050	2420	1360	6290	1560	1330	2500	2920	4520	4180	1780
19	1030	1030	2040	1320	8180	1510	1400	3040	3190	4520	4280	1800
20	1010	1030	1760	1310	7950	1450	1540	2980	3200	4450	4450	1830
21	985	1030	1610	1360	5690	1400	1530	2690	3190	4300	4380	1880
22	974	1480	1590	1440	4460	1360	1450	2750	3210	4240	4240	1840
23	939	1520	2230	1410	3770	1330	2150	2510	2970	4250	4130	1830
24	952	1420	2510	1390	3540	1310	2660	2460	3080	4400	4150	1830
25	958	1280	4650	1350	3430	1280	2560	2920	3240	4530	4090	1900
26	938	1160	12600	1340	3100	1270	2080	2600	3470	4490	4070	1940
27	916	1190	13600	1340	2810	1240	1810	2230	3390	4450	4030	2200
28	905	1430	9000	1360	2580	1230	1640	1970	3460	4320	3940	2180
29	893	1350	5960	1580	---	1230	2270	2030	3580	4300	3980	2070
30	758	1300	5300	1520	---	1220	3380	2860	3610	4420	3960	2040
31	850	---	5100	1370	---	1230	---	2880	---	4380	3340	---
TOTAL	41328	36605	93212	57470	77210	49200	46117	77170	90550	130940	130680	57680
MEAN	1333	1220	3007	1854	2758	1587	1537	2489	3018	4224	4215	1923
MAX	1870	1670	13600	4360	8180	2400	3380	4530	3610	4530	4450	3010
MIN	758	995	911	1310	890	1220	960	1600	2490	3730	3340	1650
AC-FT	81970	72610	184900	114000	153100	97590	91470	153100	179600	259700	259200	114400

CAL YR 1980 TOTAL 914276 MEAN 2498 MAX 13600 MIN 450 AC-FT 1813000
WTR YR 1981 TOTAL 888162 MEAN 2433 MAX 13600 MIN 758 AC-FT 1762000

12488500 AMERICAN RIVER NEAR NILE, WA

LOCATION.--Lat 46°58'40", long 121°10'03", in SE¼NW¼ sec.12, T.17 N., R.13 E., Yakima County, Hydrologic Unit 17030002, Snoqualmie National Forest, on right bank 300 ft (91 m) upstream from Bumping Lake Road bridge, 4.9 mi (7.9 km) downstream from Hall Creek, 16.0 mi (25.7 km) northwest of Nile, and at mile 0.5 (0.8 km).

DRAINAGE AREA.--78.9 mi^2 (204.4 km^2).

PERIOD OF RECORD.--April 1909 to March 1912, July to September 1913, June to September 1914, June to September 1915, October 1939 to current year. Monthly discharge only for some periods, published in WSP 1316. Chemical analyses October 1962 to September 1964, water temperatures October 1968 to May 1971.

REVISED RECORDS.--WSP 982: 1940-42. WSP 1216: Drainage area. WSP 1286: 1911.

GAGE.--Water-stage recorder. Datum of gage is 2,700 ft (822.96 m) Washington State Highway Department datum. Prior to Sept. 12, 1915, nonrecording gage at site 300 ft (91 m) downstream at different datum. Oct. 12 to Dec. 7, 1939, nonrecording gage at present site and datum.

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

AVERAGE DISCHARGE.--44 years (water years, 1910-11, 1940-81), 242 ft^3/s (6.853 m^3/s), 41.65 in/yr (1,058 mm/yr), 175,300 acre-ft/yr (216 hm^3/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 4,230 ft^3/s (120 m^3/s) Dec. 26, 1980, gage height, 77.99 ft (23.771 m); minimum, 20 ft^3/s (0.57 m^3/s) Nov. 22, 1940.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 4,230 ft^3/s (120 m^3/s) Dec. 26, gage height, 77.99 ft (23.771 m); minimum, 32 ft^3/s (0.91 m^3/s) Sept. 9.

STATION NUMBER 12488500 AMERICAN RIVER NEAR NILE, WASH. STREAM SOURCE AGENCY USGS
LATITUDE 465839 LONGITUDE 1211005 DRAINAGE AREA 78.90 DATUM 2700.00 STATE 53 COUNTY 077

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	41	52	145	734	143	239	152	700	421	190	61	42
2	40	99	129	622	140	225	147	553	399	180	59	42
3	40	84	138	534	137	215	143	444	370	172	58	40
4	39	147	139	465	133	207	138	373	363	168	56	39
5	39	108	126	416	131	194	139	325	363	165	55	39
6	38	118	110	372	127	184	136	292	438	155	54	38
7	37	513	90	335	123	179	132	265	370	141	53	37
8	37	535	85	306	122	172	131	242	339	133	51	36
9	36	361	90	281	119	166	130	235	342	123	50	35
10	36	252	95	258	110	161	126	238	305	115	49	35
11	36	196	105	238	95	159	126	232	286	114	48	35
12	37	162	115	221	95	158	122	221	270	110	47	34
13	39	141	121	207	110	160	118	221	259	109	47	34
14	39	127	130	196	130	164	117	244	236	108	46	34
15	38	117	219	186	190	170	119	271	227	100	45	34
16	37	109	243	176	352	174	119	255	247	96	44	34
17	38	103	273	172	444	170	121	248	264	93	44	33
18	38	98	267	168	456	168	125	257	241	91	43	33
19	37	99	249	163	920	163	137	298	280	86	43	33
20	36	96	232	159	796	160	156	315	308	83	42	33
21	36	158	283	164	620	157	164	334	277	80	42	37
22	35	264	513	175	509	156	185	346	259	77	41	40
23	35	196	576	180	443	152	284	376	260	74	41	38
24	35	169	478	180	394	148	426	429	237	80	40	38
25	38	154	1070	174	348	144	385	536	236	76	40	37
26	38	139	3070	172	310	140	337	504	253	70	39	37
27	37	146	2290	167	282	145	303	466	244	68	39	42
28	37	172	1360	165	258	150	296	452	216	65	39	49
29	37	169	985	159	---	150	391	482	202	64	38	47
30	37	157	912	154	---	155	525	508	210	64	38	47
31	37	---	897	149	---	156	---	467	---	63	38	---
TOTAL	1160	5241	15535	8048	8039	5241	5930	11129	8722	3313	1430	1132
MEAN	37.4	175	501	260	287	169	198	359	291	107	46.1	37.7
MAX	41	535	3070	734	920	239	525	700	438	190	61	49
MIN	35	52	85	149	95	140	117	221	202	63	38	33
CFSM	.47	2.22	6.35	3.30	3.64	2.14	2.51	4.55	3.69	1.36	.58	.48
IN.	.55	2.47	7.32	3.79	3.79	2.47	2.80	5.25	4.11	1.56	.67	.53
AC-FT	2300	10400	30810	15960	15950	10400	11760	22070	17300	6570	2840	2250

CAL YR 1980 TOTAL 95957 MEAN 262 MAX 3070 MIN 35 CFSM 3.32 IN 45.24 AC-FT 190300
WTR YR 1981 TOTAL 74920 MEAN 205 MAX 3070 MIN 33 CFSM 2.60 IN 35.32 AC-FT 148600

12488000 BUMPING RIVER NEAR NILE, WA

LOCATION.--Lat 46°52'48", long 121°16'52", in NE¼ sec.13, T.16 N., R.12 E. (unsurveyed), Yakima County, Hydrologic Unit 17030002, Snoqualmie National Forest, on right bank 1.2 mi (1.9 km) downstream from spillway of Bumping Lake Dam, 1.3 mi (2.1 km) southwest of Gooseprairie post office, 8.6 mi (13.8 km) southwest of town of American River, 15.8 mi (25.4 km) west of Nile, and at mile 15.8 (25.4 km).

PERIOD OF RECORD.--Water discharge June to July 1906, April 1909 to September 1978. Water temperatures October 1970 to May 1971.

PERIOD OF DAILY RECORD.--
WATER TEMPERATURE: April to September 1981.

INSTRUMENTATION.--Temperature recorder.

REMARKS.--Water-temperature records collected as part of a water-temperature modeling project in the Yakima River basin. Surface-water records available from the U.S. Bureau of Reclamation in Yakima. Flow completely regulated by dam at Bumping Lake.

EXTREMES FOR CURRENT PERIOD OF DAILY RECORD.--
WATER TEMPERATURES: Maximum, 22.9°C Aug. 16; minimum, 2.7°C Apr. 13.

TEMPERATURE, WATER (DEG. C), PERIOD APRIL 1981 TO SEPTEMBER 1981

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		FEBRUARY			MARCH			APRIL			MAY	
1							5.0	4.0	4.0	9.5	8.5	9.0
2							4.5	4.0	4.0	8.5	8.0	8.5
3							4.5	3.5	4.0	8.5	8.0	8.0
4							5.0	3.5	4.0	8.0	7.5	7.5
5							4.0	3.5	4.0	7.5	7.0	7.5
6							4.5	3.5	4.0	7.5	7.0	7.0
7							5.0	3.5	4.0	7.5	6.5	7.0
8							4.0	3.5	4.0	8.5	6.5	7.5
9							4.5	3.5	3.5	9.0	8.0	8.5
10							4.5	3.5	4.0	9.5	8.5	8.5
11							5.5	3.0	3.5	9.5	8.5	9.0
12							4.0	3.0	3.5	9.0	7.5	8.5
13							5.0	2.5	3.5	8.5	7.5	8.0
14							6.0	3.5	4.5	9.5	8.5	9.0
15							5.5	4.0	5.0	9.0	8.5	9.0
16							6.5	5.5	5.5	10.0	8.5	9.0
17							7.0	5.5	6.0	9.5	9.0	9.5
18							7.0	5.5	6.0	9.0	8.5	9.0
19							7.0	5.5	6.5	9.5	8.5	9.0
20							7.0	6.5	6.5	10.5	9.0	9.5
21							7.5	6.0	6.5	11.0	10.0	10.0
22							8.0	6.5	7.0	11.5	9.5	10.5
23							14.0	7.0	8.5	10.5	8.5	9.5
24							8.0	7.0	7.5	10.5	8.0	9.0
25							7.5	6.5	7.0	11.0	8.5	10.0
26							7.5	6.0	7.0	11.0	10.0	10.5
27							7.0	6.5	7.0	10.5	10.0	10.5
28							7.5	6.5	7.0	10.5	8.5	10.0
29							8.5	7.5	8.0	10.5	8.5	9.5
30							9.5	8.0	9.0	12.0	10.5	11.5
31							---	---	---	12.0	10.5	11.5
MONTH							14.0	2.5	5.5	12.0	6.5	9.0

12488000 BUMPING RIVER NEAR NILE, WA--Continued

TEMPERATURE, WATER (DEG. C), PERIOD APRIL 1981 TO SEPTEMBER 1981

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		JUNE			JULY			AUGUST			SEPTEMBER	
1	12.5	10.0	10.5	14.5	11.5	13.5	18.5	17.0	17.5	16.5	15.5	16.0
2	13.5	12.0	12.5	13.5	11.5	12.5	19.0	16.5	18.0	17.0	15.0	15.5
3	12.5	11.5	12.0	15.5	12.5	14.0	20.0	17.5	18.5	17.5	15.5	16.5
4	12.5	11.5	12.0	16.5	15.0	16.0	19.5	17.0	18.0	16.5	16.0	16.5
5	12.0	11.0	11.5	16.5	16.0	16.0	19.5	16.5	18.0	17.0	15.5	16.0
6	12.5	11.0	11.5	16.0	15.0	15.5	18.5	16.0	17.0	17.0	15.5	16.0
7	11.5	11.0	11.0	15.5	14.0	14.5	19.5	16.0	17.5	17.5	15.5	16.5
8	11.0	10.0	11.0	15.0	12.5	13.5	20.0	17.0	18.0	18.5	16.0	17.0
9	11.0	10.5	10.5	15.5	12.5	14.0	19.5	17.0	17.5	18.0	17.0	17.5
10	11.5	10.5	11.0	15.5	14.0	14.5	20.0	16.5	18.0	18.0	16.5	17.0
11	11.5	10.5	11.0	15.0	13.5	14.0	21.0	17.5	19.0	18.5	17.0	17.5
12	11.0	10.5	10.5	14.5	12.5	13.5	21.0	18.5	19.5	18.0	17.0	17.5
13	11.0	10.0	10.5	14.0	13.5	14.0	20.5	18.5	19.5	18.0	16.5	17.0
14	11.5	10.5	11.0	15.5	13.0	14.0	21.0	20.0	20.5	18.0	16.5	17.0
15	12.0	10.5	11.5	16.0	13.5	14.5	21.0	20.0	20.5	17.5	16.0	17.0
16	12.0	11.0	11.5	15.0	13.0	14.0	23.0	20.0	21.0	17.0	16.0	16.5
17	11.5	11.0	11.0	17.0	13.0	14.5	21.0	19.5	20.5	17.5	16.0	16.5
18	11.5	11.0	11.0	17.5	15.5	16.0	21.0	19.0	19.5	18.0	16.5	17.0
19	12.0	11.0	11.5	18.0	16.0	16.5	21.0	18.5	19.5	17.0	15.5	16.5
20	12.0	11.0	11.5	18.5	16.0	17.0	21.0	19.0	19.5	15.5	14.5	15.5
21	11.0	11.0	11.0	18.5	16.0	17.0	21.0	18.0	19.0	14.5	13.5	14.0
22	11.0	10.5	11.0	17.5	16.0	16.5	21.0	18.5	19.0	13.5	12.5	13.0
23	11.5	10.0	11.0	17.5	15.5	16.5	20.0	17.5	18.5	13.0	12.0	12.5
24	12.0	10.5	11.0	17.0	15.0	16.0	19.5	18.0	19.0	13.0	12.0	12.5
25	12.0	10.0	11.0	17.5	15.0	16.0	19.0	17.5	18.0	12.5	11.5	12.0
26	14.5	12.0	13.5	18.5	15.0	16.5	19.0	16.5	17.5	12.0	11.5	11.5
27	14.0	13.0	13.5	19.0	16.0	17.5	19.0	16.5	17.5	11.5	11.0	11.5
28	14.5	12.5	13.5	21.0	18.0	19.0	19.5	17.0	18.0	11.5	11.0	11.0
29	15.5	13.5	14.5	18.5	17.5	18.0	18.0	17.0	17.5	11.5	10.5	11.0
30	15.0	14.0	14.5	19.0	17.0	17.5	17.5	16.5	17.0	11.5	10.5	11.0
31	---	---	---	19.0	16.0	17.5	18.0	15.5	16.5	---	---	---
MONTH	15.5	10.0	11.5	21.0	11.5	15.5	23.0	15.5	18.5	18.5	10.5	15.0

12491500 TIETON RIVER AT TIETON DAM, NEAR NACHES, WA

LOCATION.--Lat 46°39'46", long 121°07'25", in NW¼NE¼ sec.31, T.14 N., R.14 E., Yakima County, Hydrologic Unit 17030002, Snoqualmie National Forest, on left bank 900 ft (270 m) upstream from Wildcat Creek, 1,200 ft (370 m) downstream from Tieton Dam, 19.0 mi (30.6 km) upstream from Oak Creek, 22 mi (35 km) southwest of Naches, and at mile 20.9 (33.6 km).

DRAINAGE AREA.--187 mi^2 (484 km^2).

PERIOD OF RECORD.--Water discharge August 1908 to December 1912, June to September 1914, June 1918 to March 1921, April 1925 to September 1978. Monthly discharge only for some periods, published in WSP 1316. Published as "at McAllister Meadows" prior to October 1914 and as "at Rimrock" 1918-19.

PERIOD OF DAILY RECORD.--
WATER TEMPERATURE: April to October 1981 (discontinued).

INSTRUMENTATION.--Temperature recorder.

REMARKS.--Water-temperature records collected as part of a water-temperature modeling project in the Yakima River basin. Surface-water records available from the U.S. Bureau of Reclamation in Yakima. Flow completely regulated by Tieton Dam.

EXTREMES FOR CURRENT PERIOD OF DAILY RECORD.--
WATER TEMPERATURES: Maximum, 27.4°C Aug. 21; minimum, 3.6°C Apr. 1, 3.

TEMPERATURE, WATER (DEG. C), PERIOD APRIL 1981 TO OCTOBER 1981

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		APRIL			MAY			JUNE			JULY	
1	4.0	3.5	3.5	9.0	8.0	8.5	8.5	8.0	8.5	10.5	9.5	10.0
2	4.0	3.5	4.0	8.0	7.5	7.5	9.0	8.0	8.5	10.0	9.5	10.0
3	4.0	3.5	4.0	8.0	7.0	7.5	9.0	8.0	8.5	10.5	10.0	10.0
4	4.0	4.0	4.0	7.5	7.0	7.5	8.5	8.5	8.5	10.5	10.0	10.5
5	4.0	4.0	4.0	7.0	6.5	7.0	9.0	8.5	8.5	10.5	10.0	10.0
6	4.0	3.5	4.0	7.0	7.0	7.0	9.0	8.5	8.5	10.5	10.0	10.0
7	4.0	4.0	4.0	7.0	6.5	6.5	10.0	8.5	9.0	10.5	10.0	10.0
8	4.5	4.0	4.0	7.0	6.5	6.5	11.5	10.0	11.0	10.5	10.0	10.5
9	4.5	4.0	4.0	7.5	6.5	7.0	12.0	11.0	11.5	11.0	10.0	10.5
10	4.5	4.0	4.0	7.5	7.0	7.0	12.0	11.5	11.5	11.0	10.0	10.5
11	4.0	4.0	4.0	7.5	7.0	7.5	12.5	11.0	11.5	11.0	10.0	10.5
12	4.5	4.0	4.0	7.5	7.0	7.0	12.0	10.5	11.5	11.0	10.5	10.5
13	4.5	4.0	4.0	7.5	7.0	7.0	11.0	10.5	10.5	11.0	10.5	10.5
14	4.5	4.0	4.0	7.5	7.0	7.5	11.0	10.0	10.5	11.0	10.5	11.0
15	4.5	4.0	4.0	7.5	7.5	7.5	11.0	10.0	10.5	11.5	10.5	11.0
16	4.5	4.5	4.5	8.0	7.5	7.5	11.0	10.0	10.5	11.5	10.5	11.0
17	4.5	4.5	4.5	7.5	7.5	7.5	11.0	10.5	10.5	11.5	11.0	11.0
18	4.5	4.5	4.5	7.5	7.5	7.5	11.0	10.5	10.5	11.5	11.0	11.0
19	5.0	4.5	4.5	8.0	7.5	7.5	12.0	11.0	11.5	11.5	11.0	11.0
20	5.5	5.0	5.5	8.0	7.5	8.0	12.0	11.5	11.5	11.5	11.0	11.0
21	5.5	5.0	5.0	8.5	7.5	8.0	11.5	11.0	11.5	11.5	11.0	11.0
22	5.5	5.0	5.5	8.5	7.5	8.0	11.5	11.0	11.5	11.5	11.0	11.5
23	6.0	5.0	5.5	8.5	7.5	8.0	12.0	11.0	11.5	11.5	11.0	11.5
24	6.0	5.0	5.5	8.0	8.0	8.0	11.5	10.0	11.0	11.5	11.0	11.5
25	6.0	5.0	5.5	8.5	8.0	8.0	12.0	10.0	10.5	11.5	11.0	11.5
26	6.0	5.5	5.5	8.5	7.5	8.0	11.0	10.0	10.5	11.5	11.5	11.5
27	6.0	5.5	6.0	8.5	8.0	8.0	10.5	9.5	10.0	12.0	11.5	11.5
28	6.5	6.0	6.0	8.5	8.0	8.0	10.0	9.5	9.5	11.5	11.5	11.5
29	6.5	6.0	6.0	8.5	8.0	8.5	10.0	9.5	10.0	---	---	---
30	9.5	6.0	8.0	8.5	8.0	8.5	10.0	9.5	10.0	---	---	---
31	---	---	---	8.5	8.0	8.5	---	---	---	---	---	---
MONTH	9.5	3.5	4.5	9.0	6.5	7.5	12.5	8.0	10.5			

12491500 TIETON RIVER AT TIETON DAM, NEAR NACHES, WA--Continued

TEMPERATURE, WATER (DEG. C), PERIOD APRIL 1981 TO OCTOBER 1981

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		AUGUST			SEPTEMBER			OCTOBER	
1	---	---	---	14.0	13.5	14.0	14.5	14.0	14.0
2	---	---	---	14.0	14.0	14.0	14.5	14.0	14.0
3	---	---	---	14.0	14.0	14.0	14.5	13.5	14.0
4	---	---	---	14.5	14.0	14.5	14.0	13.5	13.5
5	---	---	---	14.5	14.5	14.5	13.0	13.0	13.0
6	---	---	---	15.0	14.5	14.5	13.0	12.0	12.5
7	---	---	---	15.0	14.5	15.0	---	---	---
8	---	---	---	15.5	15.0	15.0	---	---	---
9	---	---	---	15.5	15.5	15.5	---	---	---
10	---	---	---	15.5	15.5	15.5	---	---	---
11	---	---	---	16.0	15.5	16.0	---	---	---
12	12.5	12.0	12.5	16.0	16.0	16.0	---	---	---
13	12.5	12.0	12.0	16.0	16.0	16.0	---	---	---
14	12.5	12.0	12.5	16.0	16.0	16.0	---	---	---
15	12.5	12.0	12.5	16.5	16.0	16.0	---	---	---
16	12.5	12.5	12.5	16.5	16.0	16.5	---	---	---
17	12.5	12.0	12.5	16.5	16.5	16.5	---	---	---
18	12.5	12.0	12.5	17.0	16.5	16.5	---	---	---
19	12.5	12.0	12.5	17.0	16.5	16.5	---	---	---
20	12.5	12.5	12.5	16.5	16.5	16.5	---	---	---
21	27.5	5.0	13.0	16.5	16.5	16.5	---	---	---
22	12.5	12.5	12.5	16.5	16.5	16.5	---	---	---
23	12.5	12.5	12.5	16.0	16.0	16.0	---	---	---
24	13.0	12.5	12.5	16.0	15.5	15.5	---	---	---
25	13.0	12.5	12.5	15.5	15.0	15.5	---	---	---
26	13.0	12.5	12.5	15.0	15.0	15.0	---	---	---
27	13.0	12.5	13.0	15.0	15.0	15.0	---	---	---
28	13.0	13.0	13.0	15.0	14.5	14.5	---	---	---
29	13.0	13.0	13.0	14.5	14.5	14.5	---	---	---
30	13.5	13.0	13.0	14.5	14.0	14.5	---	---	---
31	13.5	13.0	13.5	---	---	---	---	---	---
MONTH				17.0	13.5	15.5			
YEAR									

12500450 YAKIMA RIVER ABOVE AHTANUM CREEK, AT UNION GAP, WA
(National Stream-Quality Accounting Network Station)

LOCATION.--Lat 46°32'04", long 120°27'58", in NW¼NE¼ sec.17, T.12 N., R.19 E., Yakima County, Hydrologic Unit 17030003, on left bank 2,200 ft (670 m) upstream from Ahtanum Creek, 0.8 mi (1.3 km) upstream from Wapato Dam, 1.4 mi (2.3 km) southeast of Union Gap, and at about mile 107.3 (113.8 km).

DRAINAGE AREA.--3,479 mi^2 (9,011 km^2).

WATER-DISCHARGE RECORDS

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

GAGE.--Water-stage recorder. Datum of gage is National Geodetic Vertical Datum of 1929. Prior to Apr. 4, 1967, at site 1,200 ft (370 m) downstream at same datum.

REMARKS.--Water-discharge records good. Diversions above station for irrigation of about 212,000 acres (860 km^2). Flow partly regulated by Keechelus, Kachess, Cle Elum, Bumping, and Rimrock Lakes. Records at this site plus those for Ahtanum Creek at Union Gap (station 12502500) are equivalent to discontinued station 12503000, Yakima River at Union Gap.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 35,300 ft^3/s (1,000 m^3/s) Dec. 3, 1977, elevation, 949.55 ft (289.423 m); minimum daily, 300 ft^3/s (8.50 m^3/s) Jan. 1, 1979.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 31,400 ft^3/s (889 m^3/s) Dec. 27, elevation, 948.620 ft (289.139 m); minimum discharge, 972 ft^3/s (27.5 m^3/s) Oct. 19.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2120	1280	2120	9270	2260	4450	2190	6960	3690	3340	3290	3650
2	1910	1320	2170	8150	2200	4380	2030	7380	3430	3350	3240	3590
3	1780	1420	2070	7200	2170	4270	1870	6130	3170	3270	3290	3100
4	1730	1410	2120	6480	2080	4260	1750	5340	2980	3180	3270	3010
5	1660	1470	1870	5850	1950	4400	1720	3760	3260	3430	3170	3010
6	1610	1470	1830	5310	1910	4070	1780	2780	3320	3880	3190	2990
7	1540	2240	1670	4960	1840	4120	1920	2570	3360	3440	3260	2970
8	1680	3480	1540	4610	1850	3760	1890	2580	3590	3280	3360	2890
9	1710	3140	1560	4250	1840	3560	1900	2810	3940	3450	3340	2800
10	1750	2640	1560	3900	1710	3280	1840	3000	3620	3270	3300	2920
11	1760	2320	1550	3730	1530	3210	1770	3030	3250	3240	3250	3000
12	1820	2050	2010	3630	1820	3270	1690	2880	3130	3210	3190	2980
13	1980	1870	2190	3450	2050	3220	1640	2780	3180	3240	3190	2920
14	1880	1800	2080	3220	2400	3230	1550	3230	3020	3590	3180	2940
15	1820	1770	2600	3160	2610	3270	1530	3460	3020	3170	3200	2960
16	1560	1790	4430	2990	3800	3360	1770	3450	2950	3220	3240	2940
17	1160	1800	4460	2890	8990	3280	1980	3180	3290	3240	3210	2880
18	1060	1730	4040	2890	10300	3210	2030	3320	3090	3400	3110	2890
19	1010	1730	3490	2860	13500	3140	2150	3730	3200	3470	3190	2950
20	1110	1740	3100	2810	14600	3000	2370	3860	3480	3420	3430	2970
21	1400	1740	2940	2520	10300	2940	2470	3350	3480	3260	3410	3050
22	1370	2260	3080	2550	8030	2880	2150	3320	3440	3140	3310	3110
23	1330	2540	4030	2520	6820	2670	2930	3180	3210	3160	3170	2850
24	1320	2340	4350	2440	6310	2460	3680	3100	3030	3260	3190	2660
25	1340	2190	6750	2360	6150	2170	3830	3760	3050	3430	3170	2740
26	1320	2060	22800	2330	6550	2120	3250	3930	3340	3480	3130	2700
27	1290	1920	29100	2340	5680	2200	2800	3350	3230	3410	3130	2970
28	1270	2190	19600	2370	4640	2190	2560	2960	3210	3230	3080	2850
29	1210	2320	12600	2580	---	2200	3210	2730	3280	3190	3110	2610
30	1170	2210	10600	2570	---	2200	4660	3510	3170	3300	3130	2350
31	1260	---	10700	2390	---	2220	---	3870	---	3350	2980	---
TOTAL	46930	60240	175010	118580	135890	98990	68910	113290	98410	103300	99710	88250
MEAN	1514	2008	5645	3825	4853	3193	2297	3655	3280	3332	3216	2942
MAX	2120	3480	29100	9270	14600	4450	4660	7380	3940	3880	3430	3650
MIN	1010	1240	1540	2330	1530	2120	1530	2570	2950	3140	2980	2350
AC-FT	93090	119500	347100	235200	269500	196300	136700	224700	195200	204900	197800	175000

CAL YR 1980 TOTAL 1306400 MEAN 3569 MAX 29100 MIN 800 AC-FT 2591000
WTR YR 1981 TOTAL 1207510 MEAN 3308 MAX 29100 MIN 1010 AC-FT 2395000

12500450 YAKIMA RIVER ABOVE AHTANUM CREEK, AT UNION GAP, WA--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1969, 1971, March 1975 to current year.

WATER QUALITY DATA, WATER YEAR OCTOBER 1979 TO SEPTEMBER 1980

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SPE-CIFIC CON-DUCT-ANCE (UMHOS)	SPE-CIFIC CON-DUCT-ANCE LAB (UMHOS)	PH (UNITS)	PH LAB (UNITS)	TEMPER-ATURE (DEG C)	TUR-BID-ITY (FTU)	OXYGEN, DIS-SOLVED (MG/L)	COLI-FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)
OCT , 1980										
22...	1230	1370	--	190	6.5	8.2	9.7	.60	11.6	K260
NOV										
19...	0930	1720	--	156	7.3	7.7	5.2	.70	11.7	34
DEC										
16...	1330	4700	--	121	8.1	7.4	3.2	41	12.1	36
JAN , 1981										
15...	1000	3180	124	129	7.0	7.8	2.4	1.5	13.2	20
FEB										
10...	1500	1670	145	167	7.8	8.0	1.6	2.5	13.7	12
MAR										
17...	1330	3270	122	131	7.9	7.7	7.0	4.5	12.4	--
APR										
14...	1345	1560	130	136	8.2	8.0	10.0	4.1	--	15
MAY										
11...	1400	3070	103	108	7.7	8.0	12.2	5.5	11.7	9
JUN										
15...	1400	3070	110	114	8.2	7.6	16.0	2.7	10.0	12
JUL										
15...	1340	3160	107	112	7.5	7.6	16.6	5.6	9.6	55
AUG										
11...	0930	3240	98	103	7.3	7.9	19.0	2.4	--	100
SEP										
15...	1530	2950	108	110	8.0	8.4	17.9	5.5	9.9	120

DATE	STREP-TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML)	HARD-NESS (MG/L AS CACO3)	HARD-NESS NONCAR-BONATE (MG/L AS CACO3)	ACIDITY (MG/L AS H)	CALCIUM DIS-SOLVED (MG/L AS CA)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG)	SODIUM, DIS-SOLVED (MG/L AS NA)	PERCENT SODIUM	SODIUM AD-SORP-TION RATIO	POTAS-SIUM, DIS-SOLVED (MG/L AS K)
OCT , 1980										
22...	9	72	.00	.0	17	7.2	10	23	.5	1.9
NOV										
19...	61	59	.00	.0	14	5.8	8.5	23	.5	1.4
DEC										
16...	21	45	1.0	--	12	3.7	5.9	22	.4	.9
JAN , 1981										
15...	17	47	.00	--	12	4.2	6.1	21	.4	1.1
FEB										
10...	7	63	.00	--	15	6.1	9.4	24	.5	1.3
MAR										
17...	2	51	3.0	--	13	4.5	6.5	21	.4	1.2
APR										
14...	49	44	.00	--	10	4.7	4.8	18	.3	1.7
MAY										
11...	43	41	.00	--	11	3.4	5.7	22	.4	1.2
JUN										
15...	22	44	.00	--	11	4.1	5.7	21	.4	1.1
JUL										
15...	63	42	5.0	--	9.7	4.2	5.5	22	.4	1.0
AUG										
11...	84	37	.00	--	9.0	3.6	4.7	21	.4	.9
SEP										
15...	170	43	.00	--	11	3.7	5.7	22	.4	1.3

DATE	ALKA-LINITY LAB (MG/L AS CACO3)	SULFATE DIS-SOLVED (MG/L AS SO4)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)	FLUO-RIDE, DIS-SOLVED (MG/L AS F)	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 AC-FT)	SOLIDS, DIS-SOLVED (TONS PER DAY)	NITRO-GEN, NO2+NO3 TOTAL (MG/L AS N)
OCT , 1980										
22...	78	7.0	6.5	.6	20	117	--	.16	433	.26
NOV										
19...	66	3.9	4.5	.2	19	97	99	.13	450	.30
DEC										
16...	44	19	3.7	.1	15	76	88	.10	964	.00
JAN , 1981										
15...	49	7.6	4.2	.1	18	89	84	.12	764	.34
FEB										
10...	63	8.7	5.2	.1	21	100	107	.14	451	.45
MAR										
17...	48	11	3.9	.1	19	84	89	.11	742	.11
APR										
14...	48	3.7	4.7	.2	--	89	--	.12	375	.10
MAY										
11...	47	3.3	2.7	.1	16	79	72	.11	655	.08
JUN										
15...	48	.5	2.5	.1	14	53	69	.07	439	.17
JUL										
15...	37	1.0	2.6	.0	13	70	66	.10	597	.57
AUG										
11...	43	1.0	2.8	.2	12	67	62	.09	586	.13
SEP										
15...	47	<5.0	3.5	.1	18	83	77	.11	661	<.10

K Results based on colony counts outside the acceptable range.

12500450 YAKIMA RIVER ABOVE AHTANUM CREEK, AT UNION GAP, WA--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N)	NITRO-GEN, AMMONIA TOTAL (MG/L AS N)	NITRO-GEN, AMMONIA DIS-SOLVED (MG/L AS N)	NITRO-GEN, ORGANIC TOTAL (MG/L AS N)	NITRO-GEN, ORGANIC DIS-SOLVED (MG/L AS N)	NITRO-GEN, AM-MONIA + ORGANIC TOTAL (MG/L AS N)	NITRO-GEN, NH4 + ORG. SUSP. TOTAL (MG/L AS N)	NITRO-GEN, AM-MONIA + ORGANIC DIS. (MG/L AS N)	NITRO-GEN, TOTAL (MG/L AS N)	NITRO-GEN DIS-SOLVED (MG/L AS N)
OCT , 1980										
22...	.25	.060	.050	.84	.25	.90	.60	.30	1.2	.55
NOV										
19...	.30	.090	.090	.39	--	.48	--	--	.78	--
DEC										
16...	.17	.000	.000	.63	.17	.63	.46	.17	.63	.34
JAN , 1981										
15...	.34	.080	.080	.39	.34	.47	.05	.42	.81	.76
FEB										
10...	.53	.150	.170	.31	.16	.46	.13	.33	.91	.86
MAR										
17...	.12	.030	.050	.97	.60	1.00	.35	.65	1.1	.77
APR										
14...	.09	.100	.110	.61	.15	.71	.45	.26	.81	.35
MAY										
11...	.09	.130	.080	.81	.37	.94	.49	.45	1.0	.54
JUN										
15...	.16	.040	.070	.42	.33	.46	.06	.40	.63	.56
JUL										
15...	--	.050	.020	1.2	--	1.20	--	--	1.8	--
AUG										
11...	--	.030	<.060	.24	--	.27	.00	.28	.40	.63
SEP										
15...	<.10	.050	.060	.60	.45	.65	.14	.51	.74	.70

DATE	PHOS-PHORUS, TOTAL (MG/L AS P)	PHOS-PHORUS, DIS-SOLVED (MG/L AS P)	PHOS-PHORUS, ORTHO, TOTAL (MG/L AS P)	PHOS-PHORUS, ORTHO, DIS-SOLVED (MG/L AS P)	CARBON, ORGANIC TOTAL (MG/L AS C)	CARBON, ORGANIC DIS-SOLVED (MG/L AS C)	CARBON, ORGANIC SUS-PENDED TOTAL (MG/L AS C)	SEDI-MENT, SUS-PENDED (MG/L)	SEDI-MENT, DIS-CHARGE, SUS-PENDED (T/DAY)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM
OCT , 1980										
22...	.270	.150	.100	.080	--	3.7	--	16	59	87
NOV										
19...	.090	.070	.060	.050	3.6	--	--	9	42	--
DEC										
16...	.160	.080	--	--	8.8	--	--	174	2210	64
JAN , 1981										
15...	.060	.060	--	--	6.1	6.1	--	10	86	--
FEB										
10...	.100	.100	--	--	2.7	--	--	33	149	--
MAR										
17...	.060	.060	--	--	6.6	--	--	29	256	78
APR										
14...	.110	.080	--	--	--	2.9	.1	16	67	--
MAY										
11...	--	--	--	--	3.6	--	--	22	182	86
JUN										
15...	.210	.080	--	--	2.5	--	--	22	182	74
JUL										
15...	.080	.070	--	--	1.9	--	--	40	341	85
AUG										
11...	.110	.060	--	--	1.8	--	--	31	271	87
SEP										
15...	.050	.030	--	--	4.5	--	--	24	191	87

DATE	TIME	ALUM-INUM, TOTAL RECOV-ERABLE (UG/L AS AL)	ALUM-INUM, SUS-PENDED RECOV. (UG/L AS AL)	ALUM-INUM, DIS-SOLVED (UG/L AS AL)	ARSENIC TOTAL (UG/L AS AS)	ARSENIC SUS-PENDED TOTAL (UG/L AS AS)	ARSENIC DIS-SOLVED (UG/L AS AS)	BARIUM, TOTAL RECOV-ERABLE (UG/L AS BA)	BARIUM, SUS-PENDED RECOV-ERABLE (UG/L AS BA)	BARIUM, DIS-SOLVED (UG/L AS BA)	BERYL-LIUM, DIS-SOLVED (UG/L AS BE)	BORON, TOTAL RECOV-ERABLE (UG/L AS B)
OCT , 1980												
22...	1230	170	170	0	1	0	1	0	0	100	--	10
NOV												
19...	0930	190	180	10	1	0	1	0	0	20	<1	30
DEC												
16...	1330	200	200	0	2	1	1	100	90	10	<1	180
JAN , 1981												
15...	1000	70	60	8	1	1	0	100	90	10	--	170
FEB												
10...	1500	190	140	50	--	--	--	--	--	--	--	150
MAR												
17...	1330	290	270	20	--	--	--	--	--	--	--	260
APR												
14...	1345	110	70	40	3	2	1	100	40	60	--	210
MAY												
11...	1400	440	420	20	--	--	--	--	--	--	--	330
JUN												
15...	1400	60	60	0	--	--	--	--	--	--	--	370
JUL												
15...	1340	1000	970	30	--	--	--	--	--	--	--	150
AUG												
11...	0930	600	590	10	--	--	--	--	--	--	--	350
SEP												
15...	1530	510	480	30	--	--	--	--	--	--	--	370

12500450 YAKIMA RIVER ABOVE AHTANUM CREEK, AT UNION GAP, WA--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	BORON, SUS-PENDED RECOV-ERABLE (UG/L AS B)	BORON, DIS-SOLVED (UG/L AS B)	CADMIUM TOTAL RECOV-ERABLE (UG/L AS CD)	CADMIUM SUS-PENDED RECOV-ERABLE (UG/L AS CD)	CADMIUM DIS-SOLVED (UG/L AS CD)	CHRO-MIUM, TOTAL RECOV-ERABLE (UG/L AS CR)	CHRO-MIUM, SUS-PENDED RECOV. (UG/L AS CR)	CHRO-MIUM, DIS-SOLVED (UG/L AS CR)	COBALT, TOTAL RECOV-ERABLE (UG/L AS CO)	COBALT, SUS-PENDED RECOV-ERABLE (UG/L AS CO)	COBALT, DIS-SOLVED (UG/L AS CO)
OCT , 1980											
22...	0	10	0	0	0	0	0	0	0	0	0
NOV											
19...	20	10	0	--	<1	0	0	0	1	0	3
DEC											
16...	180	0	0	0	<1	20	20	0	4	1	<3
JAN , 1981											
15...	170	0	1	0	1	0	0	0	0	--	<3
FEB											
10...	140	10	--	--	--	--	--	--	--	--	--
MAR											
17...	260	0	--	--	--	--	--	--	--	--	--
APR											
14...	200	10	0	--	<1	20	10	10	0	--	<3
MAY											
11...	320	10	--	--	--	--	--	--	--	--	--
JUN											
15...	370	0	--	--	--	--	--	--	--	--	--
JUL											
15...	140	10	--	--	--	--	--	--	--	--	--
AUG											
11...	350	0	--	--	--	--	--	--	--	--	--
SEP											
15...	360	10	--	--	--	--	--	--	--	--	--

DATE	COPPER, TOTAL RECOV-ERABLE (UG/L AS CU)	COPPER, SUS-PENDED RECOV-ERABLE (UG/L AS CU)	COPPER, DIS-SOLVED (UG/L AS CU)	IRON, TOTAL RECOV-ERABLE (UG/L AS FE)	IRON, SUS-PENDED RECOV-ERABLE (UG/L AS FE)	IRON, DIS-SOLVED (UG/L AS FE)	LEAD, TOTAL RECOV-ERABLE (UG/L AS PB)	LEAD, SUS-PENDED RECOV-ERABLE (UG/L AS PB)	LEAD, DIS-SOLVED (UG/L AS PB)	LITHIUM TOTAL RECOV-ERABLE (UG/L AS LI)	LITHIUM SUS-PENDED RECOV-ERABLE (UG/L AS LI)
OCT , 1980											
22...	25	23	2	370	340	30	22	22	0	10	10
NOV											
19...	8	--	<10	370	330	38	5	0	28	0	--
DEC											
16...	12	2	<10	4300	4300	36	2	0	<10	0	--
JAN , 1981											
15...	5	5	0	470	430	40	5	3	2	--	--
FEB											
10...	6	4	2	350	310	40	8	6	2	--	--
MAR											
17...	5	3	2	630	590	40	6	4	2	--	--
APR											
14...	3	1	2	440	--	--	2	2	0	--	--
MAY											
11...	6	5	1	890	860	30	3	1	2	--	--
JUN											
15...	7	5	2	1100	1100	30	6	4	2	--	--
JUL											
15...	26	24	2	--	--	40	12	12	0	--	--
AUG											
11...	4	3	1	950	920	27	4	4	0	--	--
SEP											
15...	8	6	2	1000	980	20	50	49	1	--	--

DATE	LITHIUM DIS-SOLVED (UG/L AS LI)	MANGA-NESE, TOTAL RECOV-ERABLE (UG/L AS MN)	MANGA-NESE, SUS-PENDED RECOV. (UG/L AS MN)	MANGA-NESE, DIS-SOLVED (UG/L AS MN)	MERCURY TOTAL RECOV-ERABLE (UG/L AS HG)	MERCURY SUS-PENDED RECOV-ERABLE (UG/L AS HG)	MERCURY DIS-SOLVED (UG/L AS HG)	MOLYB-DENUM, DIS-SOLVED (UG/L AS MO)	NICKEL, TOTAL RECOV-ERABLE (UG/L AS NI)	NICKEL, SUS-PENDED RECOV-ERABLE (UG/L AS NI)	NICKEL, DIS-SOLVED (UG/L AS NI)
OCT , 1980											
22...	0	40	20	20	.3	.2	.1	--	3	3	0
NOV											
19...	<4	30	8	22	.3	.1	.2	11	6	4	2
DEC											
16...	<4	140	120	19	.0	.0	.1	<10	15	15	0
JAN , 1981											
15...	--	30	20	9	.7	.7	.0	--	1	1	0
FEB											
10...	--	20	0	20	.5	.5	.0	<10	7	7	0
MAR											
17...	--	30	20	8	.1	.1	.0	<10	9	8	1
APR											
14...	--	20	0	20	.4	.3	.1	--	2	0	2
MAY											
11...	--	30	20	7	.1	.0	.1	<10	6	4	2
JUN											
15...	--	30	20	10	.1	.0	.1	<10	16	14	2
JUL											
15...	--	--	--	10	.6	.5	.1	<10	6	4	2
AUG											
11...	--	30	20	9	.4	.4	.0	<10	4	3	1
SEP											
15...	--	40	30	8	.3	.3	.0	<10	5	4	1

12500450 YAKIMA RIVER ABOVE AHTANUM CREEK, AT UNION GAP, WA--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	SELENIUM, TOTAL (UG/L AS SE)	SELENIUM, SUSPENDED TOTAL (UG/L AS SE)	SELENIUM, DISSOLVED (UG/L AS SE)	SILVER, TOTAL RECOVERABLE (UG/L AS AG)	SILVER, SUSPENDED RECOVERABLE (UG/L AS AG)	SILVER, DISSOLVED (UG/L AS AG)	STRONTIUM, DISSOLVED (UG/L AS SR)	VANADIUM, DISSOLVED (UG/L AS V)	ZINC, TOTAL RECOVERABLE (UG/L AS ZN)	ZINC, SUSPENDED RECOVERABLE (UG/L AS ZN)	ZINC, DISSOLVED (UG/L AS ZN)
OCT 1980											
22...	0	0	0	0	0	0	--	--	20	10	10
NOV											
19...	0	0	0	0	0	0	72	10	20	--	<3
DEC											
16...	0	0	0	0	0	0	54	<6.0	30	30	4
JAN 1981											
15...	0	0	0	0	0	0	--	--	50	40	10
FEB											
10...	--	--	--	--	--	--	--	--	10	2	8
MAR											
17...	--	--	--	--	--	--	--	--	20	20	5
APR											
14...	0	0	0	1	1	0	--	--	10	1	9
MAY											
11...	--	--	--	--	--	--	--	--	10	--	<3
JUN											
15...	--	--	--	--	--	--	--	--	10	0	20
JUL											
15...	--	--	--	--	--	--	--	--	--	--	5
AUG											
11...	--	--	--	--	--	--	--	--	0	0	3
SEP											
15...	--	--	--	--	--	--	--	--	20	--	<3

12500450 YAKIMA RIVER ABOVE AHTANUM CREEK, AT UNION GAP, WA--Continued

PHYTOPLANKTON ANALYSES, OCTOBER 1980 TO SEPTEMBER 1981

DATE	NOV 19,80	MAR 17,81	MAY 11,81	JUN 15,81
TIME	0930	1330	1400	1400
TOTAL CELLS/ML	210	1000	850	850
DIVERSITY: DIVISION	1.0	1.3	0.0	1.3
.CLASS	1.0	1.3	0.0	1.3
..ORDER	1.8	1.6	1.9	2.3
...FAMILY	1.8	1.6	2.0	2.5
....GENUS	2.5	1.6	2.3	2.5

ORGANISM	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT
BACILLARIOPHYTA (DIATOMS)								
.BACILLARIOPHYCEAE								
..ACHNANTHALES								
...ACHNANTHACEAE								
....ACHNANTHES	--	-	26	2	--	-	64	8
....COCCONEIS	--	-	--	-	--	-	--	-
....RHOICOSPHENIA	--	-	--	-	--	-	--	-
..BACILLARIALES								
...NITZSCHIACEAE								
....NITZSCHIA	26	13	64	6	190#	23	180#	21
..EUPODISCALES								
...COSCINODISCACEAE								
....CYCLOTELLA	39#	19	--	-	--	-	13	2
....MELOSIRA	--	-	--	-	26	3	--	-
....STEPHANODISCUS	--	-	39	4	340#	39	--	-
..FRAGILARIALES								
...FRAGILARIACEAE								
....ASTERIONELLA	--	-	--	-	--	-	--	-
....DIATOMA	--	-	--	-	130#	15	--	-
....FRAGILARIA	--	-	13	1	--	-	26	3
....SYNEDRA	--	-	--	-	26	3	--	-
..NAVICULALES								
...CYMBELLACEAE								
....CYMBELLA	--	-	--	-	13	2	13	2
...GOMPHONEMACEAE								
....GOMPHONEMA	--	-	--	-	13	2	13	2
...NAVICULACEAE								
....NAVICULA	51#	25	--	-	120	14	150#	18
CHLOROPHYTA (GREEN ALGAE)								
.CHLOROPHYCEAE								
..CHLOROCOCCALES								
...OOCYSTACEAE								
....ANKISTRODESMUS	26	13	--	-	--	-	77	9
....CHODATELLA	--	-	26	2	--	-	--	-
....OOCYSTIS	51#	25	--	-	--	-	--	-
....SELENASTRUM	13	6	--	-	--	-	--	-
...SCENEDESMACEAE								
....SCENEDESMUS	--	-	--	-	--	-	--	-
..VOLVOCALES								
...CHLAMYDOMONADACEAE								
....CHLAMYDOMONAS	--	-	52	5	--	-	--	-
CYANOPHYTA (BLUE-GREEN ALGAE)								
.CYANOPHYCEAE								
..CHROOCOCCALES								
...CHROOCOCCACEAE								
....ANACYSTIS	--	-	--	-	--	-	--	-
..OSCILLATORIALES								
...OSCILLATORIACEAE								
....LYNGBYA	--	-	--	-	--	-	310#	36
....OSCILLATORIA	--	-	--	-	--	-	--	-
....PHORMIDIUM	--	-	760#	73	--	-	--	-
EUGLENOPHYTA (EUGLENOIDS)								
.EUGLENOPHYCEAE								
..EUGLENALES								
...EUGLENACEAE								
....TRACHELOMONAS	--	-	64	6	--	-	--	-

NOTE: # - DOMINANT ORGANISM: EQUAL TO OR GREATER THAN 15%
° - OBSERVED ORGANISM, MAY NOT HAVE BEEN COUNTED: LESS THAN 1/2%

12500450 YAKIMA RIVER ABOVE AHTANUM CREEK, AT UNION GAP, WA--Continued

PHYTOPLANKTON ANALYSES, OCTOBER 1980 TO SEPTEMBER 1981

DATE	JUL 15,81	AUG 11,81	SEP 15,81
TIME	1340	0930	1530
TOTAL CELLS/ML	590	1100	1400
DIVERSITY: DIVISION	1.0	1.0	0.8
.CLASS	1.0	1.0	0.8
..ORDER	1.6	2.6	2.6
...FAMILY	1.7	3.0	3.0
....GENUS	1.7	3.2	3.5

ORGANISM	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT
BACILLARIOPHYTA (DIATOMS)						
.BACILLARIOPHYCEAE						
..ACHNANTHALES						
...ACHNANTHACEAE						
....ACHNANTHES	--	-	56	5	110	8
....COCCONEIS	--	-	70	6	98	7
....RHOICOSPHENIA	26	4	--	-	29	2
..BACILLARIALES						
...NITZSCHIACEAE						
....NITZSCHIA	51	9	140	13	220#	16
..EUPODISCALES						
...COSCINODISCACEAE						
....CYCLOTELLA	39	7	42	4	84	6
....MELOSIRA	--	-	290#	27	98	7
....STEPHANODISCUS	--	-	--	-	--	-
..FRAGILARIALES						
...FRAGILARIACEAE						
....ASTERIONELLA	--	-	--	-	14	1
....DIATOMA	13	2	42	4	28	2
....FRAGILARIA	13	2	--	-	--	-
....SYNEDRA	--	-	--	-	70	5
..NAVICULALES						
...CYMBELLACEAE						
....CYMBELLA	13	2	98	9	130	9
...GOMPHONEMACEAE						
....GOMPHONEMA	--	-	28	3	110	8
...NAVICULACEAE						
....NAVICULA	13	2	98	9	130	9
CHLOROPHYTA (GREEN ALGAE)						
.CHLOROPHYCEAE						
..CHLOROCOCCALES						
...OOCYSTACEAE						
....ANKISTRODESMUS	--	-	14	1	14	1
....CHODATELLA	--	-	--	-	--	-
....OOCYSTIS	--	-	--	-	--	-
....SELENASTRUM	--	-	--	-	--	-
...SCENEDESMACEAE						
....SCENEDESMUS	--	-	56	5	--	-
..VOLVOCALES						
...CHLAMYDOMONADACEAE						
....CHLAMYDOMONAS	13	2	14	1	--	-
CYANOPHYTA (BLUE-GREEN ALGAE)						
.CYANOPHYCEAE						
..CHROOCOCCALES						
...CHROOCOCCACEAE						
....ANACYSTIS	--	-	--	-	14	1
..OSCILLATORIALES						
...OSCILLATORIACEAE						
....LYNGBYA	--	-	--	-	--	-
....OSCILLATORIA	410#	70	150	14	250#	18
....PHORMIDIUM	--	-	--	-	--	-
EUGLENOPHYTA (EUGLENOIDS)						
.EUGLENOPHYCEAE						
..EUGLENALES						
...EUGLENACEAE						
....TRACHELOMONAS	--	-	--	-	--	-

NOTE: # - DOMINANT ORGANISM; EQUAL TO OR GREATER THAN 15%
° - OBSERVED ORGANISM, MAY NOT HAVE BEEN COUNTED; LESS THAN 1/2%

12500450 YAKIMA RIVER ABOVE AHTANUM CREEK, AT UNION GAP, WA--Continued

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

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

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		JUNE			JULY			AUGUST			SEPTEMBER	
1	16.5	14.5	15.5	16.5	14.0	15.5	20.0	16.5	18.5	18.5	16.0	17.5
2	17.5	15.0	16.0	18.0	15.0	16.5	20.5	16.5	18.5	17.5	15.0	16.5
3	16.5	15.5	16.0	18.5	16.0	17.0	20.0	16.5	18.0	18.0	15.0	16.5
4	16.0	14.5	15.0	19.5	17.0	18.0	20.0	16.5	18.0	18.5	15.5	17.0
5	16.0	14.0	15.0	19.5	16.5	18.0	20.5	17.0	18.5	18.5	15.0	16.5
6	16.0	15.0	15.5	16.5	15.5	15.5	21.5	17.5	19.0	18.5	15.0	17.0
7	15.5	14.5	14.5	15.5	13.5	14.5	22.0	18.0	20.0	19.5	15.5	17.5
8	14.5	13.5	14.0	16.0	14.0	15.0	22.5	18.5	20.5	20.0	16.0	18.0
9	15.5	13.5	14.5	17.0	15.0	16.0	22.0	19.0	20.5	19.5	16.5	18.0
10	16.0	14.5	15.5	17.0	15.5	16.0	22.0	18.5	20.0	19.5	15.5	17.5
11	16.0	14.0	15.0	17.0	15.0	16.0	22.0	18.5	20.0	19.5	15.5	17.5
12	16.0	15.0	15.5	18.0	15.5	16.5	22.5	19.0	20.5	19.5	16.0	18.0
13	16.0	13.5	15.0	17.5	16.0	16.5	22.5	19.0	20.5	19.5	15.5	17.5
14	17.0	14.5	16.0	18.0	15.5	16.5	23.0	20.0	21.0	19.0	15.5	17.5
15	17.5	15.5	16.5	19.5	17.5	18.5	23.0	20.0	21.0	19.5	15.5	17.5
16	17.5	16.0	16.5	20.0	17.5	18.5	23.0	19.5	21.0	19.5	16.0	17.5
17	16.5	14.5	15.5	20.0	18.0	19.0	22.0	19.0	20.5	19.5	16.0	18.0
18	16.5	15.0	15.5	19.0	18.0	18.5	22.0	19.0	20.5	20.0	17.0	18.5
19	17.5	14.5	16.0	19.5	17.5	18.5	21.0	19.0	20.0	18.5	16.0	17.5
20	17.0	16.0	16.5	19.5	17.5	18.5	21.0	18.0	19.0	16.0	14.5	15.5
21	16.5	15.0	15.5	19.0	17.5	18.0	20.5	17.5	19.0	15.5	14.0	14.5
22	15.5	15.0	15.0	19.0	17.0	18.0	21.0	17.5	19.0	16.0	12.5	14.5
23	17.5	14.5	15.5	18.5	17.0	18.0	21.5	17.5	19.5	15.5	12.5	14.0
24	18.5	15.5	17.0	19.0	17.5	18.0	21.0	18.5	19.5	15.0	12.5	13.5
25	19.5	16.5	18.0	18.5	17.0	18.0	20.0	18.0	19.0	15.5	13.0	14.0
26	20.0	18.0	19.0	19.5	18.0	18.5	19.5	17.0	18.0	14.0	13.0	13.5
27	18.5	16.5	17.5	20.0	18.5	19.5	19.5	16.5	18.0	14.5	13.0	13.5
28	18.5	16.0	17.0	21.5	18.5	20.5	19.5	16.5	18.0	15.5	12.5	14.0
29	20.0	17.0	18.0	19.0	16.5	17.5	18.5	17.0	17.5	15.0	12.0	13.5
30	18.5	16.0	16.5	19.5	16.0	17.5	19.0	16.0	17.5	14.5	11.5	13.0
31	---	---	---	20.0	16.5	18.0	18.5	16.0	17.5	---	---	---
MONTH	20.0	13.5	16.0	21.5	13.5	17.5	23.0	16.0	19.5	20.0	11.5	16.0

12500450 YAKIMA RIVER ABOVE AHTANUM CREEK, AT UNION GAP, WA--Continued

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1981 TO SEPTEMBER 1982

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		OCTOBER			NOVEMBER			DECEMBER			JANUARY	
1	15.5	12.0	13.5	11.0	8.5	10.0	6.5	4.0	5.0			
2	15.5	13.0	14.0	10.5	8.5	9.5	6.5	5.5	6.0			
3	13.0	11.0	12.5	10.5	8.5	9.5	5.0	4.0	4.5			
4	12.5	10.0	11.5	9.5	7.5	8.5	5.0	4.0	4.5			
5	11.0	10.0	10.5	8.5	6.0	7.5	6.0	4.5	5.5			
6	12.0	10.5	11.0	7.5	5.5	6.5	6.5	5.5	6.0			
7	13.0	11.0	11.5	7.0	5.5	6.5	6.5	5.0	5.5			
8	12.0	10.0	11.0	7.5	5.5	6.5	5.5	5.0	5.5			
9	12.0	10.0	11.0	7.5	6.0	7.0	5.5	5.5	5.5			
10	12.0	10.0	11.0	8.0	6.5	7.0	6.0	5.0	5.5			
11	12.0	9.5	10.5	9.0	7.5	8.0	5.0	4.0	4.5			
12	11.5	9.0	10.0	9.5	8.5	9.0	4.0	3.5	3.5			
13	11.5	9.0	10.0	9.0	8.5	9.0	4.0	2.5	3.5			
14	11.5	8.5	10.0	9.0	8.0	8.5	2.5	1.5	2.0			
15	11.5	9.0	10.0	7.5	7.0	7.5	2.5	1.0	2.0			
16	12.0	9.0	10.5	7.0	6.5	7.0	2.5	2.0	2.0			
17	13.0	10.0	11.5	7.5	7.0	7.5	---	---	---			
18	13.0	10.0	12.0	7.5	6.0	7.0	---	---	---			
19	12.5	10.0	11.5	7.5	6.5	7.0	---	---	---			
20	12.0	10.0	11.0	7.5	6.5	7.0	---	---	---			
21	10.5	8.0	9.5	8.5	7.5	8.0	---	---	---			
22	9.5	7.0	8.5	8.0	7.0	7.5	---	---	---			
23	9.0	7.0	8.0	7.5	7.0	7.0	---	---	---			
24	10.0	7.0	8.5	6.5	5.5	6.5	---	---	---			
25	10.5	8.5	9.5	5.5	4.0	5.0	---	---	---			
26	11.5	10.0	10.5	5.0	4.5	5.0	---	---	---			
27	12.0	10.5	11.5	5.5	4.5	5.0	---	---	---			
28	12.5	11.0	11.5	4.5	3.5	4.0	---	---	---			
29	11.0	9.5	10.5	4.5	3.5	4.0	---	---	---			
30	9.0	8.0	8.5	4.5	3.0	3.5	---	---	---			
31	10.0	8.0	9.0	---	---	---	---	---	---			
MONTH	15.5	7.0	10.5	11.0	3.0	7.0	6.5	1.0	4.5			

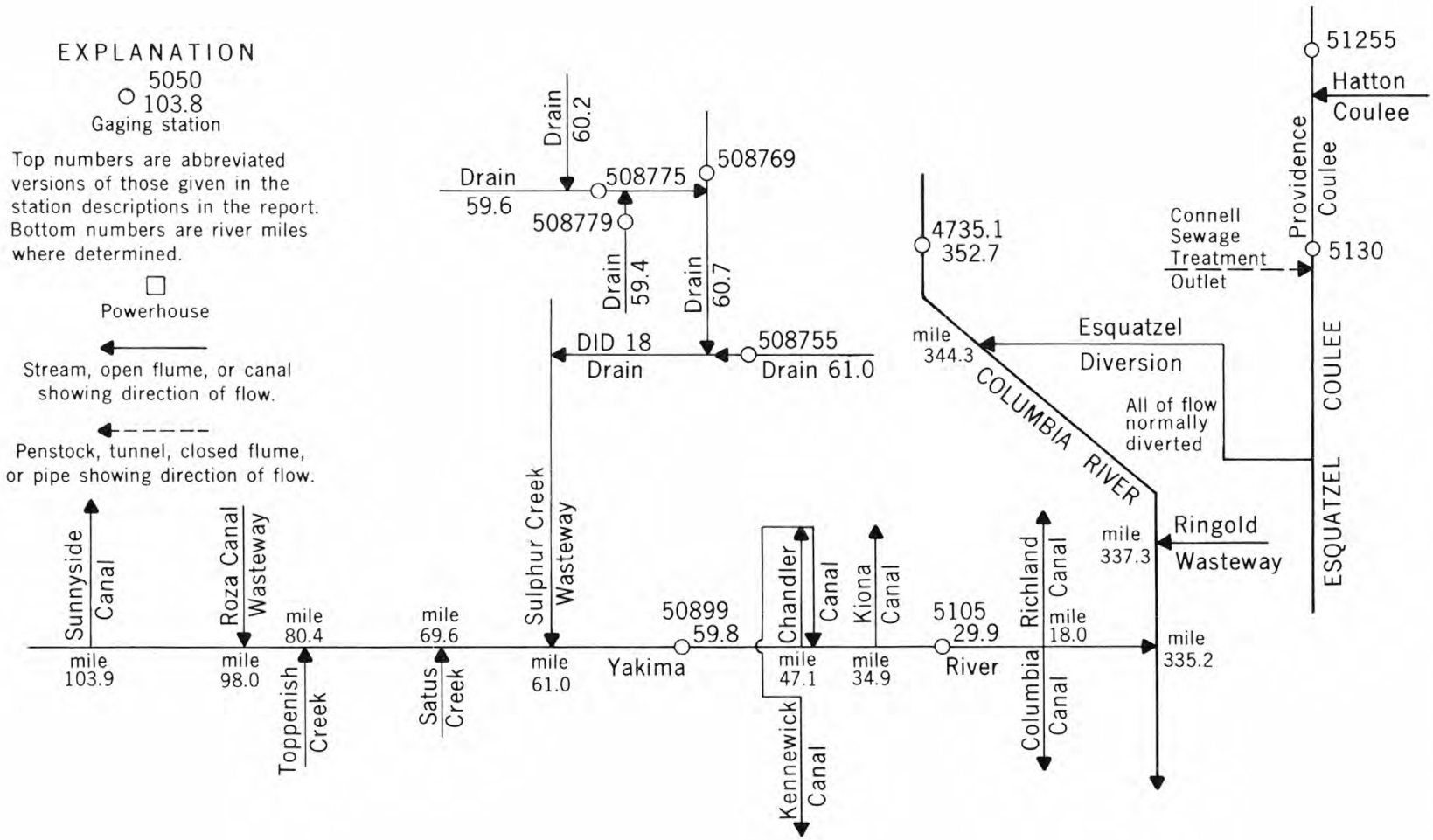

Figure 16. Gaging stations in Yakima River basin downstream from Sunnyside Canal and in Esquatzel Coulee.