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1984



Water Resources Data Washington Water Year 1984



U.S. GEOLOGICAL SURVEY WATER-DATA REPORT WA-84-1
Prepared in cooperation with the State of Washington
and with other agencies

CALENDAR FOR WATER YEAR 1984

1983

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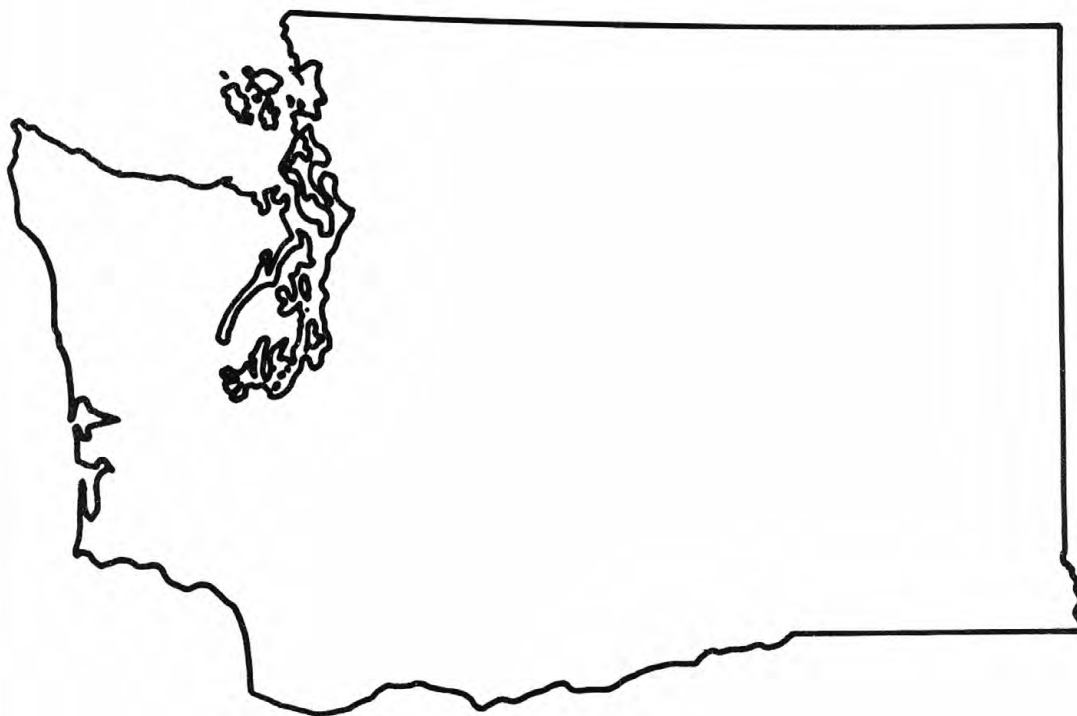
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Water Resources Data Washington Water Year 1984

by E.H. McGavock, P.R. Boucher, W.D. Wiggins, L.L. Reed, R.L. Blasz, and M.L. Smith



U.S. GEOLOGICAL SURVEY WATER-DATA REPORT WA-84-1
Prepared in cooperation with the State of Washington
and with other agencies

UNITED STATES DEPARTMENT OF THE INTERIOR

DONALD PAUL HODEL, Secretary

GEOLOGICAL SURVEY

Dallas L. Peck, Director

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Tacoma, Washington 98402

1986

PREFACE

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

This report was prepared in cooperation with the State of Washington and with other agencies under the general supervision of Phillip J. Carpenter, Washington Office Chief, Leslie B. Laird, Pacific Northwest District Chief, and T. John Conomos, Western Region Regional Hydrologist.

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16. Abstract (Limit: 200 words) Water resources data for the 1984 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 wells and springs. This report contains discharge records for 196 gaging stations; stage only records for 4 gaging stations; stage and contents for 41 lakes and reservoirs; water quality for 42 gaging stations; and water levels for 121 observation wells. Also included are data for 14 crest-stage partial-record stations. Locations of these sites are shown on figures 4, 5, 6, and 34. Additional water data were collected at various sites, not part of the systematic data collection program, and are published as miscellaneous measurements and analyses. These data represent that part of the National Water Data System operated by the U.S. Geological Survey and cooperating State and Federal agencies in Washington.			
17. Document Analysis a. Descriptors *Washington, *Hydrologic Data, *Surface water, *Ground water, *Water quality, Flow rate, Gaging stations, Lakes, Reservoirs, Chemical analyses, Sediment, Water temperatures, Sampling sites, Water levels, Water analyses. b. Identifiers/Open-Ended Terms c. COSATI Field/Group			
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WATER RESOURCES DATA FOR WASHINGTON, 1984

INTRODUCTION

Water resources data for the 1984 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 wells and springs. This report contains discharge records for 196 gaging stations; stage only records for 4 gaging stations; stage and contents for 41 lakes and reservoirs; water quality for 42 gaging stations; and water levels for 121 observation wells. Also included are data for 14 crest-stage partial-record stations. Locations of these sites are shown on figures 4, 5, 6, and 34. Additional water data were collected at various sites, not part of the systematic data collection program, and are published as miscellaneous measurements and analyses. These data represent that part of the National Water Data System operated by the U.S. Geological Survey and cooperating State and Federal agencies in Washington.

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

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

Beginning with the 1975 water year, water data for streamflow, water quality, and ground water are published as an official Survey report on a State-boundary basis. These official Survey reports carry an identification number consisting of the two letter State abbreviation, the last two digits of the water year, and volume number. For example, this report is identified as "U.S. Geological Survey Water-Data Report WA-84-1." For archiving and general distribution, the reports for water years 1971-74 are also identified as water-data reports. These water-data reports are for sale, in paper copy or in microfiche, by the National Technical Information Service, U.S. Department of Commerce, Springfield, VA 22161. Additional information, including current prices, for ordering specific reports may be obtained from the office chief at the address given on the back of the title page or by telephone (206) 593-6510.

COOPERATION

The U.S. Geological Survey and organizations of the State of Washington have had joint-funding 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 joint-funding agreements with the Survey are:

Washington State Department of Ecology, Andrea Beatty Rinicker, director
Washington State Department of Fisheries, William R. Wilkerson, director
Washington State Department of Transportation, Duane Berentson, secretary
City of Seattle, Department of Lighting, R. W. Hardy, superintendent
Municipality of Metropolitan Seattle, Alan Gibbs, executive director
City of Tacoma, Department of Public Utilities, P. J. Nolan, director
City of Tacoma, Department of Public Works, Fred Thompson, director
Chelan County, P.U.D. No. 1, Gerald L. Copp, manager
King County, Department of Public Works, Donald J. LaBelle, director
Lewis County, Department of Public Works, Verne Wagar, director
Quinalt Business Committee, Joseph B. DeLaCruz, tribal chairman
Makah Tribal Council, George Bowechop, chairman
Yakima Tribal Council, Roger Jim, chairman
Hoh Tribal Council, Yvonne Hudson, Jr., chairwoman
Tulalip Tribal Board of Directors, Donald C. Hatch, chairman
Snohomish County Department of Public Works, Gerald E. Weed, director
Island County Board of Commissioners, William Dunlop, chairman
San Juan County Board of Commissioners, Thomas R. Cowan, chairman
Puyallup Indian Nation, Frank Wright, Jr., chairman
City of Bellevue, Department of Public Works, Hugh Warren, director

Assistance in the form of funds or services was given by the Corps of Engineers, U.S. Army, in collecting records for 34 gaging stations; the U.S. Department of Energy, in collecting records for 2 water-quality stations; the Bureau of Reclamation, U.S. Department of Interior, in collecting records for 10 gaging stations; the U.S. Department of State, in collecting records for 15 gaging stations; the Bonneville Power Administration, U.S. Department of Energy, in collecting records for 7 gaging stations; and the Bureau of Indian Affairs, U.S. Department of Interior, in collecting records for 4 gaging stations.

HYDROLOGIC CONDITIONS

Western Washington

The annual mean runoff in western Washington during the 1984 water year ranged from about 95 to 115 percent of normal. Precipitation was above average during November, May, and June, below average during October, December, July, and August, and near average for the other months of the water year.

Peak flows in western Washington generally had recurrence intervals ranging from 2 to 10 years, although the peak for the Nooksack River at Ferndale had a recurrence interval of 25 years. Monthly and annual mean discharges are compared with long-term medians at two gaging stations in figure 3. The Chehalis River, a lowland stream in the southern part of the region, had above normal runoff during November, May, and June, with an annual runoff of 113 percent of normal. The Skykomish River, a stream in the northern Cascade Mountains, had monthly flows above normal during November and January, with annual runoff of 98 percent of normal.

The ground-water level in the key observation well in western Washington was about 5 feet below average in October and rose to about 9 feet above average where it remained through June. It was slightly below average during July and August and rose to about 6 feet above average by the end of September.

Usable storage in Lake Merwin and Ross Reservoir generally was at or above normal for the entire water year. Usable storage in Lake Cushman ranged from 53 percent of normal in January to 104 percent in July.

Eastern Washington

The annual mean runoff in eastern Washington during the 1984 water year ranged from 95 to 110 percent of normal, except in the Kettle and Palouse River basins, where it was 140 and 128 percent of normal, respectively. Peak flows were not unusual anywhere; most had less than 3-year recurrence intervals. Precipitation was generally average or above during all months except October, January, July, and August.

Monthly and annual mean discharges are compared with long-term 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 only during April and May, with an annual runoff of 105 percent of normal. Klickitat River flows were below normal during February, April, and May, with an annual runoff of 109 percent of normal.

The ground-water level in the key observation well in eastern Washington was above average the entire year. It ranged from 1.4 feet above average in August to 4.9 feet in January.

Usable storage in Lake Chelan ranged from 94 percent of normal in June to 150 percent in February, with the exception of May, when it was only 64 percent of normal. The usable storage in Franklin D. Roosevelt Lake rose from near normal at the end of October to 183 percent of normal by the end of March, fell to 61 percent in May, and again rose to 95 percent of normal by September.

DEFINITION OF TERMS

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

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

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

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

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

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

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

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

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

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

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

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

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 ($\text{ft}^3/\text{s-day}$) is the volume of water represented by a flow of 1 cubic foot per second for 24 hours. It is equivalent to 86,400 cubic feet, approximately 1.9835 acre-feet, or about 646,000 gallons, or 2,445 cubic meters. It represents a runoff of approximately 0.0372 inch from 1 square mile or 0.3468 millimeter from 1 square kilometer.

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

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

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.

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

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

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

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

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

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

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

Instantaneous discharge is the discharge at a given time.

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

Dissolved refers to that material in a representative water sample which passes through a 0.45-micrometer membrane filter. This is a convenient operational definition used by Federal agencies that collect water data. Determinations of "dissolved" constituents are made on subsamples of the filtrate. It is recognized that certain kinds of samples cannot be filtered; to provide for this, procedures that are considered equivalent to filtering through a 0.45-micrometer membrane filter will be identified and announced at a later date.

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

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

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

Gaging station is a particular site on a stream, canal, lake, or reservoir where systematic observations of gage height or discharge are obtained. When used in connection with a discharge record, the term is applied only to those gaging stations where a continuous record of discharge is obtained.

Hardness of water is a physical-chemical characteristic that is commonly recognized by the increased quantity of soap required to produce lather. It is attributable to the presence of alkaline earths (principally calcium and magnesium) and is expressed as equivalent calcium carbonate (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 ($\mu\text{g/g}$) is a unit expressing the concentration of a chemical element as the mass (micrograms) of the element sorbed per unit mass (gram) of sediment.

Micrograms per liter ($\mu\text{g/L}$, $\mu\text{g/l}$) is a unit expressing the concentration of chemical constituents in solution as weight (micrograms) of solute per unit volume (liter) of water. One thousand micrograms per liter is equivalent to one milligram per liter.

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

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

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

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

Organism count/area refers to the number of organisms collected and enumerated in a sample and adjusted to the number per area habitat, usually square meters (m), acres, or hectares. Periphyton, benthic organisms, and macrophytes are expressed in these terms.

Organism count/volume refers to the number of organisms collected and enumerated in a sample and adjusted to the number per sample volume, usually milliliters (ml) or liters (l). Number of planktonic organisms can be expressed in these terms.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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 the 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, vegetables, soil, or rocks that dissolves in water.

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

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

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

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.

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

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

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

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

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

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

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

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

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

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

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

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

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

Water year in Geological Survey reports dealing with surface-water supply refers to the 12-month period, October 1 through September 30. The water year is designated by the calendar year in which it ends and which includes 9 of the 12 months. Thus, the year ending September 30, 1984 is called "1984 water year."

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

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

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

DOWNSTREAM ORDER AND STATION NUMBERS

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

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

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.

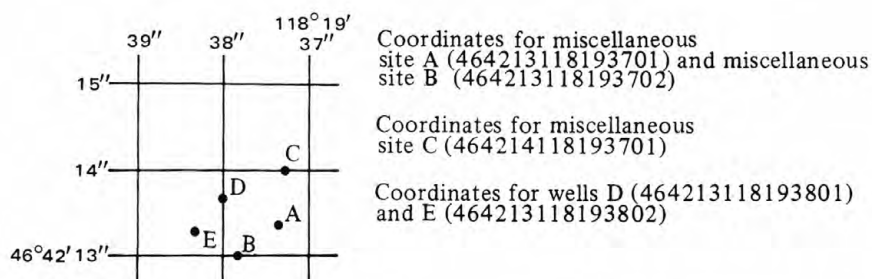


Figure 1. System for numbering wells and miscellaneous sites (latitude and longitude).

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 preceding 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.

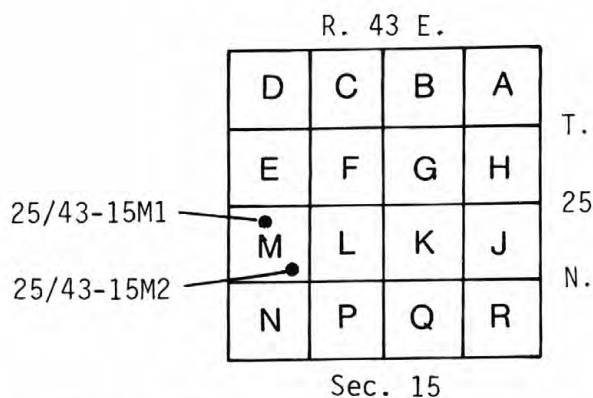


Figure 2. Local identifier well numbering system.

SPECIAL NETWORKS AND PROGRAMS

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

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

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

Pesticide program is a network of regularly sampled water-quality stations where additional 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.

Pesticides are chemical compounds used to control the growth of undesirable plants and animals. Major categories of pesticides include insecticides, miticides, fungicides, herbicides, and rodenticides. Since the first application of DDT as an insecticide in the early 1930's, there have been almost 60,000 pesticide formulations registered, each containing at least one of the approximately 800 different basic pesticide compounds. The United States annually produces about 1 billion pounds. Chlorinated hydrocarbon pesticides are still commonly used in many areas of the country, although efforts are being made to replace many of them with more specific, fast-acting, and easily degradable compounds.

Radiochemical program is a network of regularly sampled water-quality stations where additional samples are collected monthly or twice a year (at high and low flow) to be analyzed for radioisotopes. The streams that are sampled represent major drainage basins in the conterminous United States.

Radioisotopes are isotope forms of an element that exhibit radioactivity. Isotopes are varieties of a chemical element that differ in atomic weight, but are very nearly alike in chemical properties. The difference arises because the atoms of the isotopic forms of an element differ in the number of neutrons in the nucleus. For example: Ordinary chlorine is a mixture of isotopes having atomic weights of 35 and 37, with the natural mixture having atomic weight of about 35.453. Many of the elements similarly exist as mixtures of isotopes, and a great many new isotopes have been produced in the operation of nuclear devices such as the cyclotron (Rose, 1966). There are 275 isotopes of the 81 stable elements in addition to more than 800 radioactive isotopes.

Radioisotopes that are determined in this program are natural uranium in ug/l (micrograms per liter), radium as radium-226 in PC/L (pCi/l, picocuries per liter), gross beta radiation as equivalent strontium/yttrium-90 or cesium-137 in PC/L, and gross alpha radiation as micrograms of uranium equivalent per liter (ug/l). Gross alpha and beta radioactivity associated with the fine-grained (silt- and clay-sized) sediments in the samples are also determined.

A picocurie (PC, pCi) is one trillionth (1×10^{-12}) of the amount of radioactivity represented by a curie (Ci). A curie is the amount of radioactivity that yields 3.7×10^{10} radioactive disintegrations per second. A picocurie yields 2.2 dpm (disintegrations per minute).

EXPLANATION OF STAGE AND WATER-DISCHARGE RECORDS

Collection and computation of data

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

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

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

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

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

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

For some gaging stations, there are periods when no gage-height record is obtained or the recorded gage height is so faulty that it cannot be used to compute daily discharge or contents. This happens when the recorder stops or otherwise fails to operate properly, intakes are plugged, the float is frozen in the well, or for various other reasons. For such periods, the daily discharges are estimated on the basis of recorded range in stage, good record at adjoining stations, discharge measurements, weather records, and comparison with other station records from the same or nearby basins. Likewise, daily contents may be estimated on the basis of operator's log, good record at adjoining stations, inflow-outflow studies, and other information.

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

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

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

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

The average discharge for the number of years indicated is given under "AVERAGE DISCHARGE"; it is not given for stations having fewer than 5 complete years of record or for stations where changes in water development during the period of record cause the figure to have little significance. Under "EXTREMES" 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 the time of occurrence and corresponding gage heights with "EXTREMES FOR THE CURRENT YEAR," if they are all independent peaks (including the maximum for the year) above the selected base. The base discharge, which is given in the table heading, is selected so that an average of about three peaks a year will be presented. Peak discharges are not published for any canals, ditches, drains, or for any stream for which the peaks are subject to substantial control by man. Time of day is expressed in 24-hour local standard time; for example, 12:30 a.m. is 0030, 1:30 p.m. is 1330. The minimums for these stations are published in a separate paragraph following the table of peaks.

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

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

For most gaging stations on lakes and reservoirs, the data presented comprise a description of the station and monthly summary table 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 it is not published for reservoirs for which only monthly data are given.

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

Accuracy of data

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

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

Figures of daily mean discharge are shown to the nearest hundredth of a cubic foot per second for discharges of less than 1 ft³/s, to tenths between 1.0 and 10 ft³/s, to whole numbers between 10 and 1,000 ft³/s, and to three significant figures greater than 1,000 ft³/s. The number of significant figures used is based solely on the magnitude of the figure. The same rounding rules apply to discharge figures listed for partial-record stations and miscellaneous sites.

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

Other data available

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 Washington 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 Washington office.

EXPLANATION OF WATER-QUALITY RECORDS

Collection and examination of data

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

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

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

Water analysis

Most methods for collecting and analyzing water samples are described in the section entitled, "PUBLICATIONS ON TECHNIQUES OF WATER-RESOURCES INVESTIGATIONS."

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

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

For chemical-quality stations equipped with digital monitors, the published records consist of daily maximum, minimum, and mean values. More detailed records may be obtained from the Washington office.

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

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

Water temperature

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

Sediment

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

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

after the periods, and suspended-sediment discharges observed for other periods of similar discharge. A blank in the daily mean concentration column of the suspended-sediment discharge table indicates the value in the sediment discharge column was estimated.

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

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

EXPLANATION OF GROUND-WATER LEVEL RECORDS

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

Water levels are reported to as many significant figures as can be justified by the local conditions. For example, in a measurement of a depth to water of several hundred feet, the error 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.

ACCESS TO WATSTORE DATA

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

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

General inquiries about WATSTORE may be directed to:

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

PUBLICATIONS ON TECHNIQUES OF WATER-RESOURCES INVESTIGATIONS

Forty-three manuals by the U.S. Geological Survey have been published to date in the series on techniques describing procedures for planning and executing specialized work in water-resources investigations. The material is grouped under major subject headings called books and is further divided into sections and chapters. For example, Section A of Book 3 (Applications of Hydraulics) is on surface water. The chapter, the unit of publication, is limited to a narrow field of subject matter. This format permits flexibility in revision and publication as the need arises. The reports listed below are for sale by the U.S. Geological Survey, Branch of Distribution, 604 South Pickett Street, Alexandria, VA 22304 (authorized agent of the Superintendent of Documents, Government Printing Office).

NOTE: When ordering any of these publications, please give the title, book number, chapter number, and "U.S. Geological Survey Techniques of Water-Resources Investigations".

- 1-D1. WATER TEMPERATURE-INFLUENTIAL FACTORS, FIELD MEASUREMENT, AND DATA PRESENTATION, by H. H. Stevens, Jr., J. F. Ficke, and G. F. 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. 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.

PUBLICATIONS ON TECHNIQUES OF WATER-RESOURCES INVESTIGATIONS

- 3-A9. MEASUREMENT OF TIME OF TRAVEL AND DISPERSION IN STREAMS BY DYE TRACING, by E. F. Hubbard, F. A. Kilpatrick, L. A. Martens, and J. F. Wilson, Jr.: USGS--TWRI Book 3, Chapter A9. 1982. 44 pages.
- 3-A11. MEASUREMENT OF DISCHARGE BY MOVING-BOAT METHOD, by G. F. Smoot and C. E. Novak: USGS--TWRI Book 3, Chapter A11. 1969. 22 pages.
- 3-A12. FLUOROMETRIC PROCEDURES FOR DYE TRACING, by J. F. Wilson Jr.: USGS--TWRI Book 3, Chapter A12. 1968. 31 pages. Not currently available.
- 3-A13. COMPUTATION OF CONTINUOUS RECORDS OF STREAMFLOW, by E. J. Kennedy: USGS--TWRI Book 3, Chapter A13. 1983. 53 p.
- 3-A14. USE OF FLUMES IN MEASURING DISCHARGE, by F. A. Kilpatrick and V. R. Schneider: USGS--TWRI Book 3, Chapter A14. 1983. 46 p.
- 3-A15. COMPUTATION OF WATER-SURFACE PROFILES IN OPEN CHANNELS, by Jacob Davidian. 1984. 48 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-B3. TYPE CURVES FOR SELECTED PROBLEMS OF FLOW TO WELLS IN CONFINED AQUIFERS, by J. E. Reed: USGS--TWRI Book 3, Chapter B3. 1980. 106 pages.
- 3-C1. FLUVIAL SEDIMENT CONCEPTS, by H. P. Guy: USGS--TWRI Book 3, Chapter C1. 1970. 55 pages.
- 3-C2. FIELD METHODS FOR MEASUREMENT OF FLUVIAL SEDIMENT, by H. P. Guy and V. W. Norman: USGS--TWRI Book 3, Chapter C2. 1970. 59 pages.
- 3-C3. COMPUTATION OF FLUVIAL-SEDIMENT DISCHARGE, by George Porterfield: USGS--TWRI Book 3, Chapter C3. 1972. 66 pages.
- 4-A1. SOME STATISTICAL TOOLS IN HYDROLOGY, by H. C. Riggs: USGS--TWRI Book 4, Chapter A1. 1968. 39 pages.
- 4-A2. FREQUENCY CURVES, by H. C. Riggs: USGS--TWRI Book 4, Chapter A2. 1968. 15 pages.
- 4-B1. LOW-FLOW INVESTIGATIONS, by H. C. Riggs: USGS--TWRI Book 4, Chapter B1. 1972. 18 pages.
- 4-B2. STORAGE ANALYSES FOR WATER SUPPLY, by H. C. Riggs and C. H. Hardison: USGS--TWRI Book 4, Chapter B2. 1973. 20 pages.
- 4-B3. REGIONAL ANALYSES OF STREAMFLOW CHARACTERISTICS, by H. C. Riggs: USGS--TWRI Book 4, Chapter B3. 1973. 15 pages.
- 4-D1. COMPUTATION OF RATE AND VOLUME OF STREAM DEPLETION BY WELLS, by C. T. Jenkins: USGS--TWRI Book 4, Chapter D1. 1970. 17 pages.
- 5-A1. METHODS FOR 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.

PUBLICATIONS ON TECHNIQUES OF WATER-RESOURCES INVESTIGATIONS

- 5-A4. METHODS FOR COLLECTION AND ANALYSIS OF AQUATIC BIOLOGICAL AND MICROBIOLOGICAL SAMPLES, edited by P. E. Greeson, T. A. Ehike, 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-A6. QUALITY ASSURANCE PRACTICES FOR THE CHEMICAL AND BIOLOGICAL ANALYSES OF WATER AND FLUVIAL SEDIMENTS, by L. C. Friedman and D. E. Erdmann. 1982. 181 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.
- 7-C3. A MODEL FOR SIMULATION OF FLOW IN SINGULAR AND INTERCONNECTED CHANNELS, by R. W. Schaffranek, R. A. Baltzer, and D. E. Goldberg: USGS--TWRI Book 7, Chapter C3. 1981. 110 pages.
- 8-A1. METHODS OF MEASURING WATER LEVELS IN DEEP WELLS, by M. S. Garber and F. C. Koopman: USGS--TWRI Book 8, Chapter A1. 1968. 23 pages.
- 8-A2. INSTALLATION AND SERVICE MANUAL FOR U.S. GEOLOGICAL SURVEY MANOMETERS, by J. D. Craig. 1983. 57 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.

WATER RESOURCES DATA FOR WASHINGTON, 1984

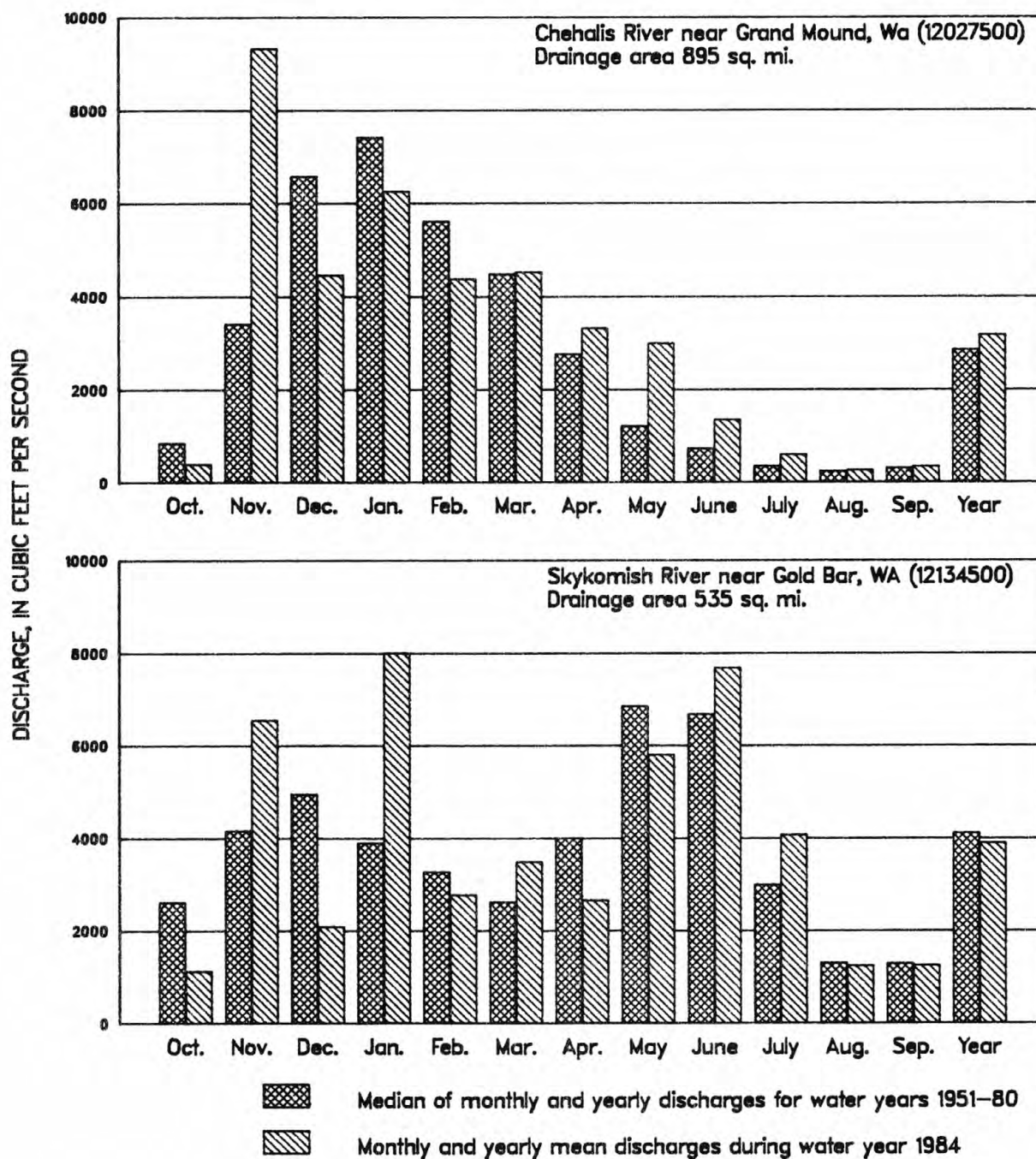


Figure 3a.--Discharge during 1984 water year compared with median discharge for period 1951-80 for two representative gaging stations in Western Washington.

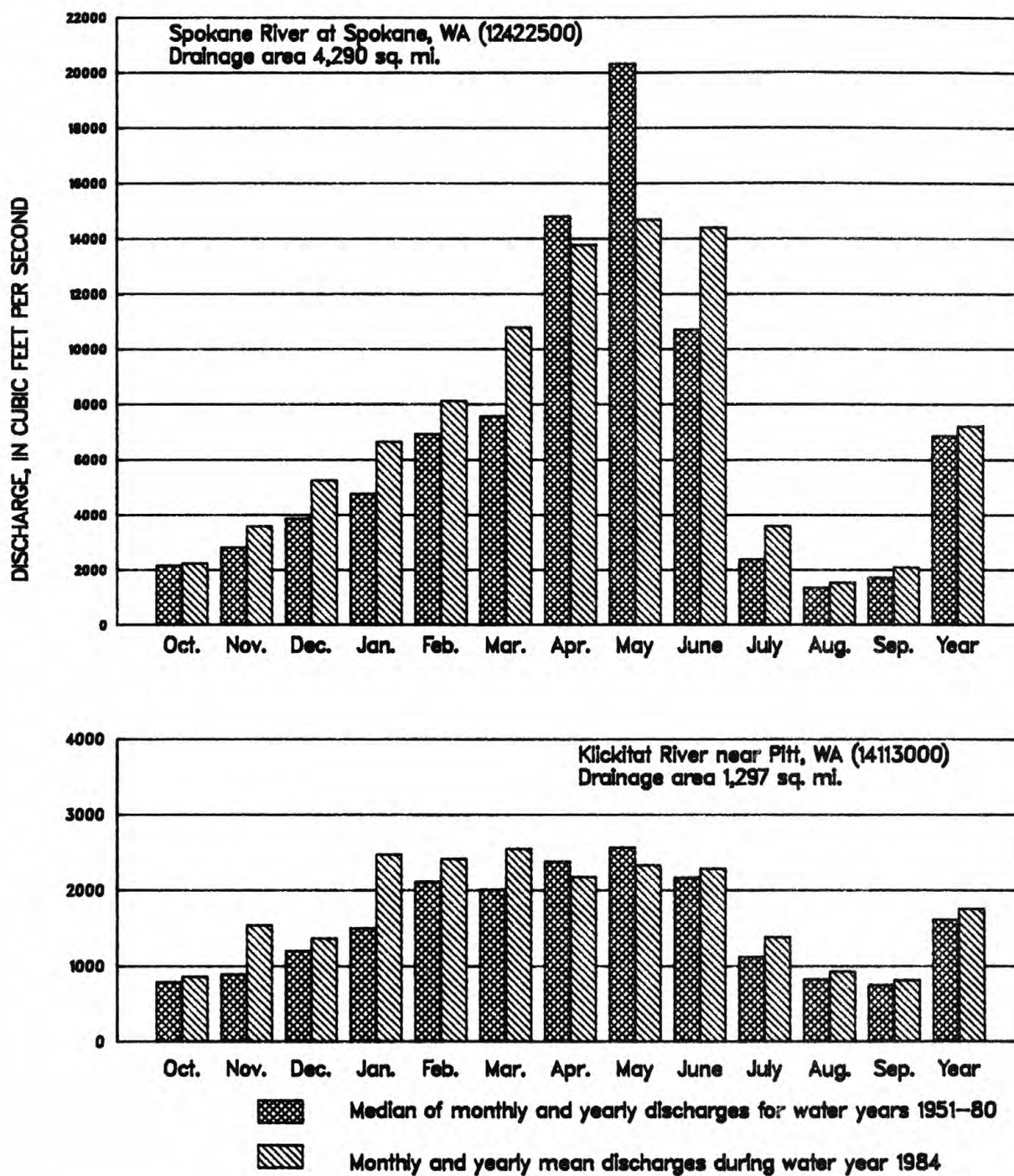


Figure 3b.--Discharge during 1984 water year compared with median discharge for period 1951-80 for two representative gaging stations in Eastern Washington.

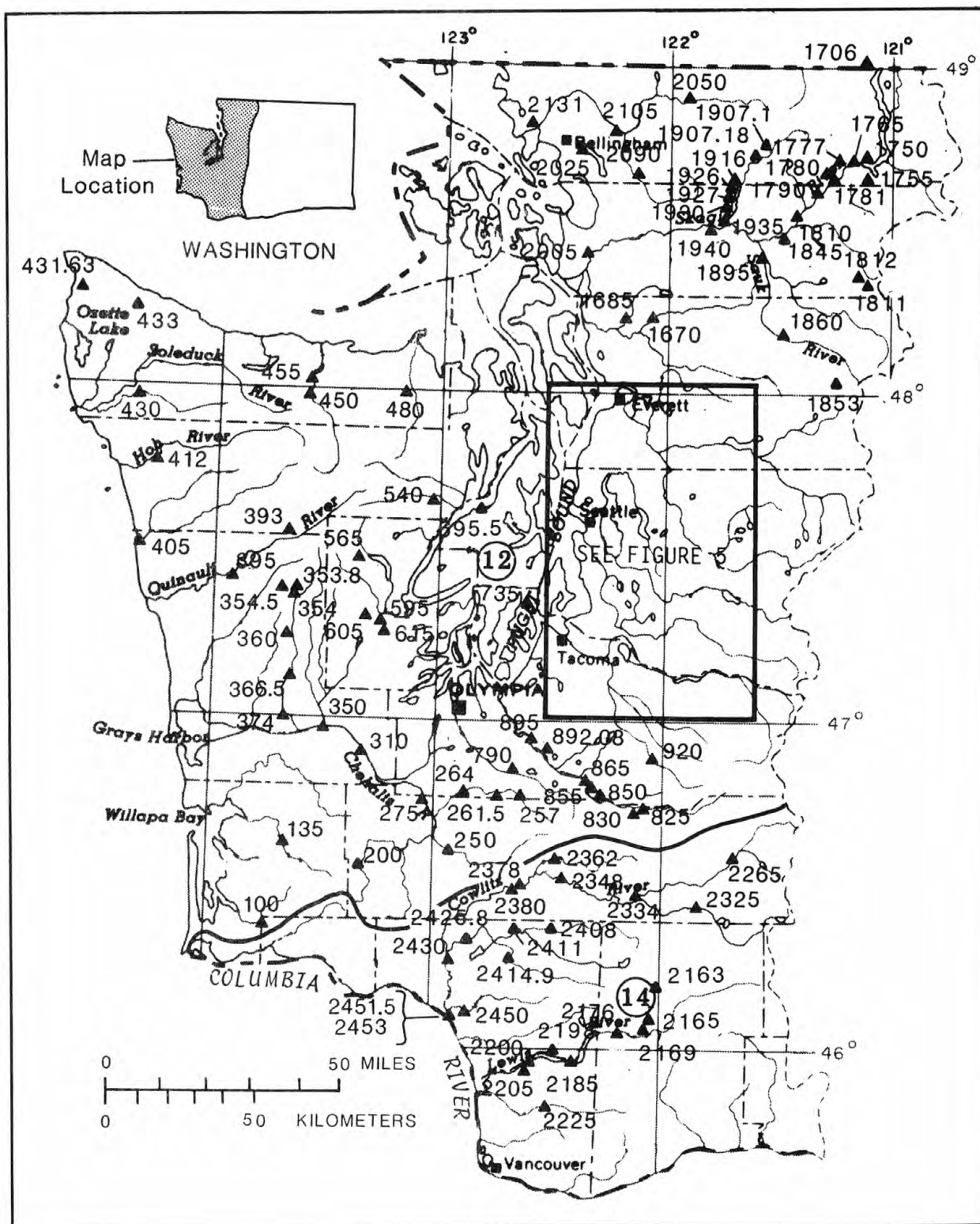


Figure 4a.--Map of Western Washington showing locations of gaging stations. Numbers shown are abbreviated versions of complete station numbers used in text. Part numbers are the large figures.

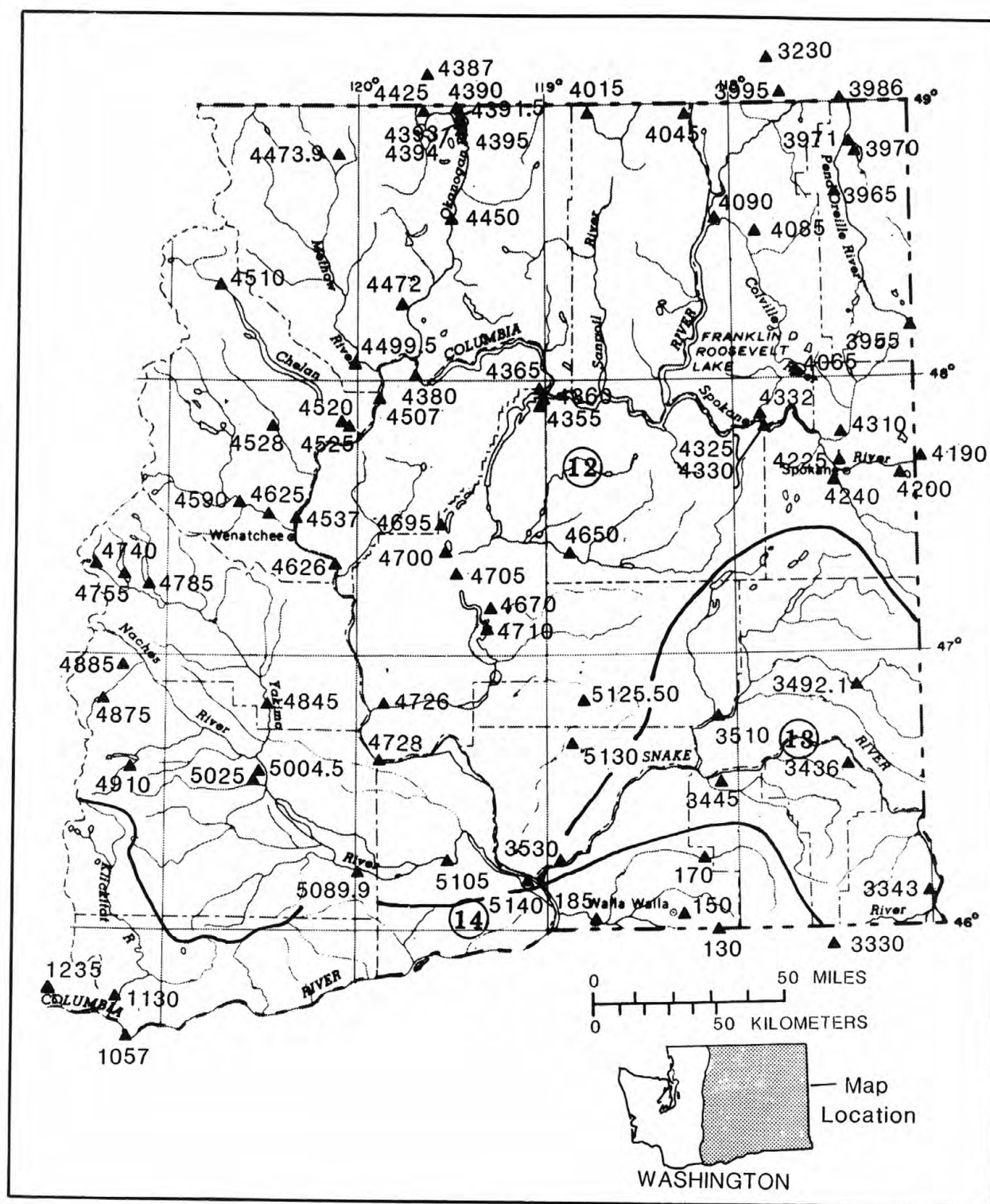


Figure 4b.--Map of Eastern Washington showing locations of gaging stations. Numbers shown are abbreviated versions of complete station numbers used in text. Part numbers are the large figures.

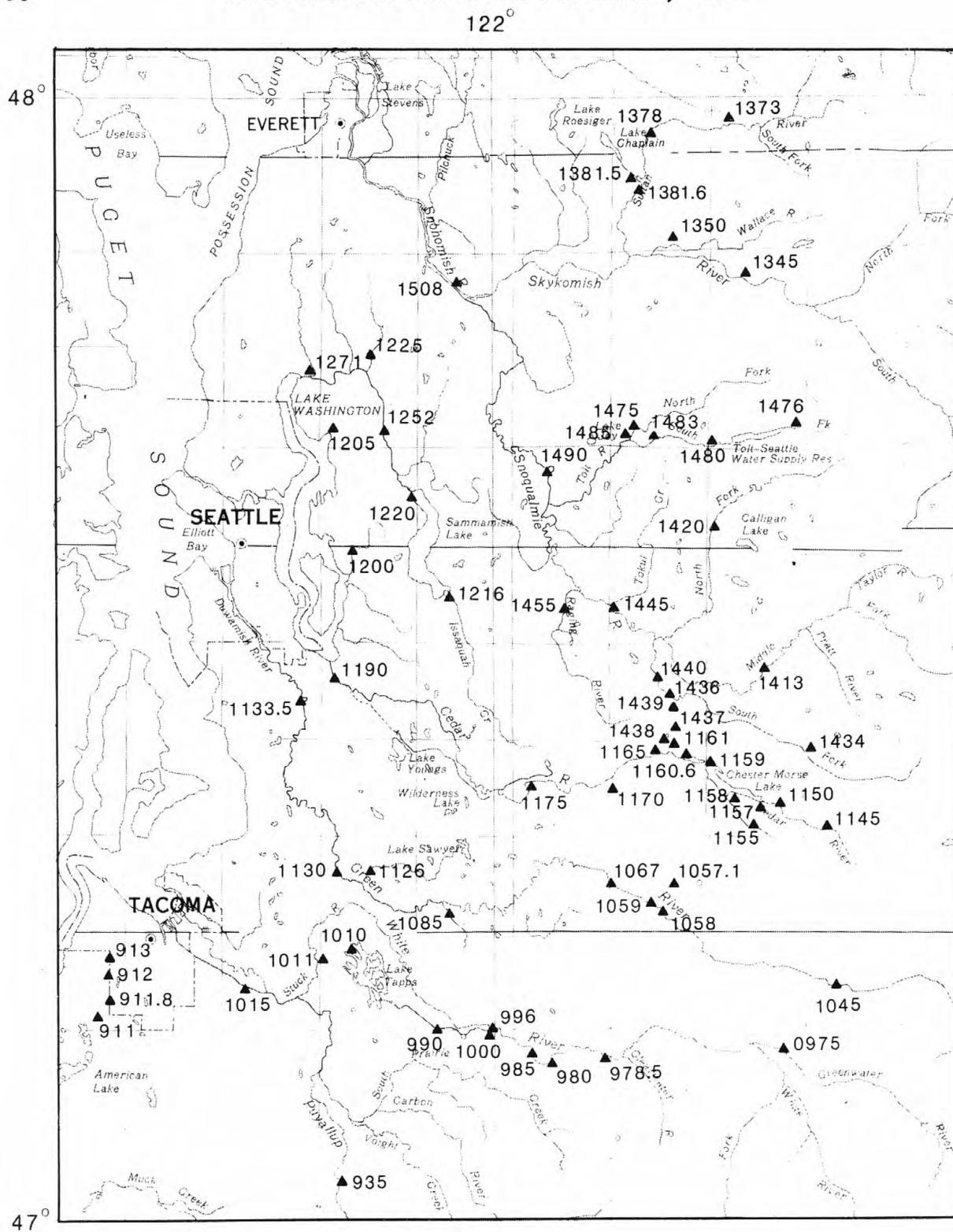


Figure 5.--Map showing locations of gaging stations in the Insert of Figure 4a.

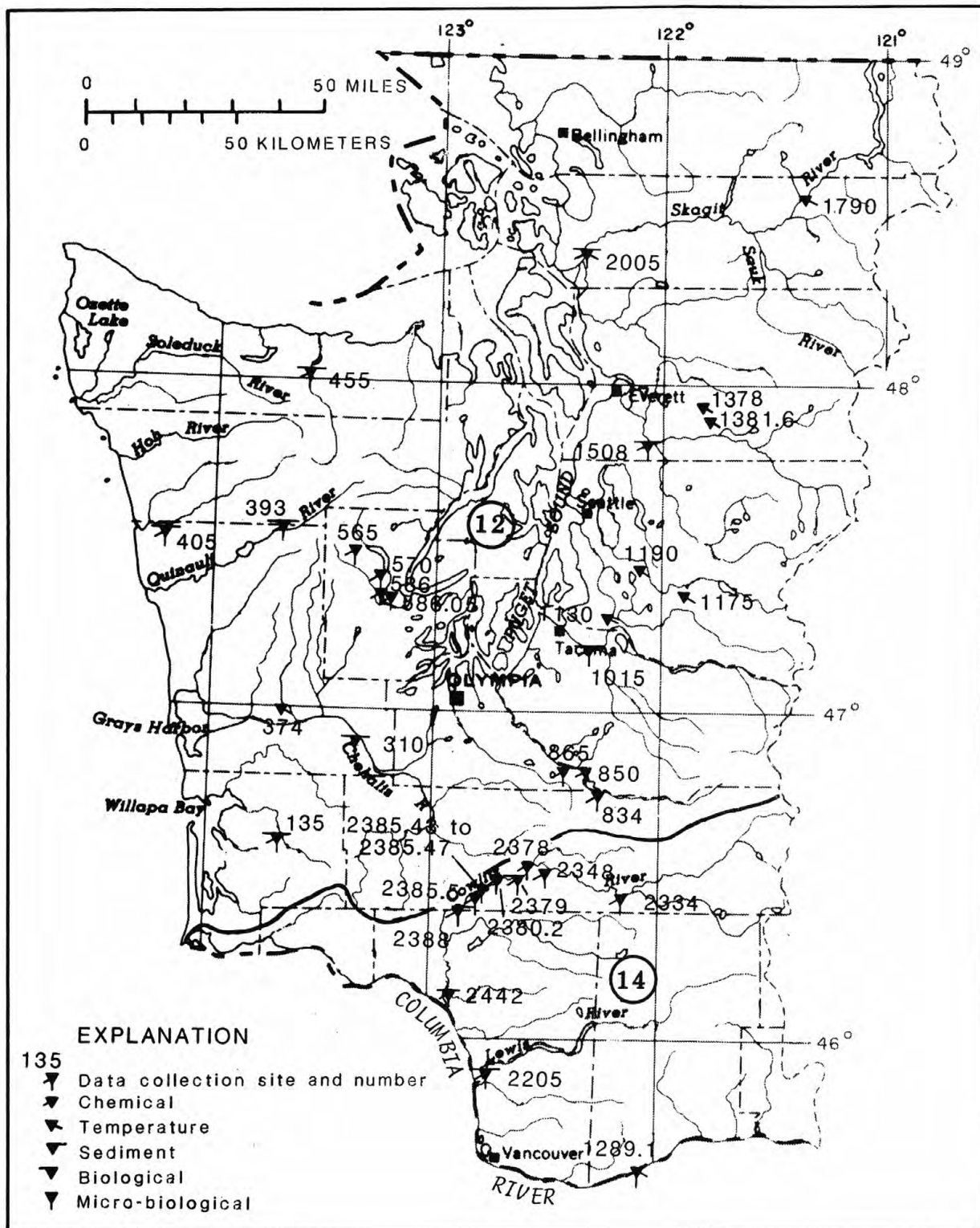


Figure 6a.--Map of Western Washington showing locations of surface-water-quality sampling stations. Numbers shown are abbreviated versions of complete station number used in text. Part numbers are the large figures.

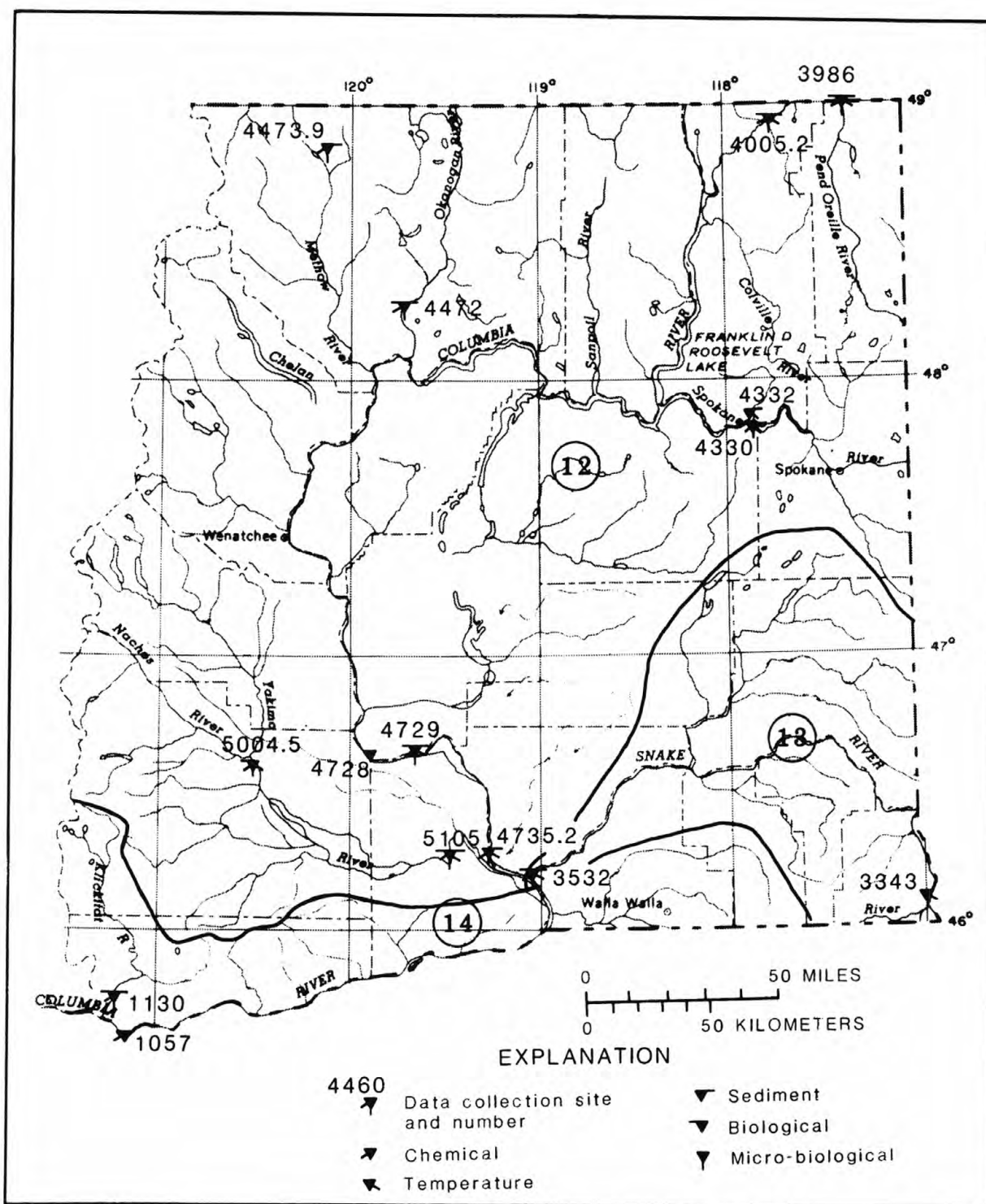


Figure 6b.--Map of Eastern Washington showing locations of surface-water-quality sampling stations. Numbers shown are abbreviated versions of complete station number used in text. Part numbers are the large figures.

NASELLE RIVER BASIN

12010000 NASELLE RIVER NEAR NASELLE, WA

LOCATION.--Lat 46°22'27", long 123°44'32", in SW¼SW¼ sec.1, T.10 N., R.9 W., Pacific County, Hydrologic Unit 17100106, on right bank 0.1 mi upstream from county highway bridge, 2.2 mi upstream from Salmon Creek, 3.4 mi east of Naselle, and at mile 17.4.

DRAINAGE AREA.--54.8 mi².

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

REVISED RECORDS.--WSP 1216: Drainage area. WSP 1316: 1930(M), 1932-40(M), 1945-46(M).

GAGE.--Water-stage recorder. Elevation of gage is 24 ft, by barometer. Prior to Jan. 11, 1957, nonrecording gage and crest-stage gage at site 1,350 ft downstream at present datum. Jan. 11, 1957, to Dec. 31, 1961, nonrecording gage and crest-stage gage at site 1,200 ft downstream at present datum.

REMARKS.--Records excellent. No regulation or diversion upstream from station.

AVERAGE DISCHARGE.--55 years, 432 ft³/s, 107.05 in/yr, 313,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 11,100 ft³/s Jan. 22, 1935, from flood marks at site then in use, from rating curve extended above 4,000 ft³/s on basis of slope-area measurement at gage height 15.2 ft; maximum gage height, 16.20 ft Dec. 2, 1977; minimum discharge, 18 ft³/s Aug. 30, 31, Sept. 1, 1970, Sept. 3, 1982.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 4,000 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Nov. 15	1700	*5,090	*12.49	Jan. 25	0400	4,270	11.39

Minimum discharge, 33 ft³/s Sept. 4, gage height, 3.74 ft.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP		
1	55	157	494	747	432	580	336	458	225	147	50	39		
2	55	440	436	813	380	566	313	710	207	134	49	36		
3	57	2140	380	2270	336	512	296	552	198	122	48	34		
4	74	1600	340	2110	303	453	261	458	232	113	47	33		
5	62	972	404	1400	271	400	238	467	226	108	49	113		
6	55	1150	360	956	247	352	226	440	229	103	54	150		
7	53	1070	388	758	232	313	392	388	216	98	47	93		
8	52	863	539	610	241	278	356	376	219	94	45	150		
9	50	715	552	512	320	254	396	355	231	91	44	106		
10	49	813	710	489	630	254	640	359	212	89	42	77		
11	48	863	705	458	835	241	901	474	198	86	42	66		
12	47	879	846	412	2220	424	1340	495	184	86	43	67		
13	48	1310	967	372	1770	428	1030	436	172	83	45	61		
14	50	2630	829	332	1110	412	758	407	160	79	42	53		
15	48	4660	660	299	879	476	595	377	151	76	40	49		
16	47	3640	534	271	695	481	490	340	144	72	39	48		
17	59	3070	445	247	570	650	404	302	137	70	41	46		
18	54	2160	380	226	508	797	372	274	129	69	41	44		
19	50	2010	332	210	458	808	320	306	123	67	38	43		
20	54	2660	292	198	747	890	285	324	132	66	37	41		
21	55	1660	250	203	824	956	271	286	159	65	36	40		
22	133	1100	210	328	835	912	244	311	131	62	36	52		
23	87	841	170	1440	1040	780	238	346	117	60	35	54		
24	72	1980	170	3020	1160	650	215	323	111	58	35	44		
25	66	1810	180	3420	945	650	205	319	106	57	34	41		
26	61	1310	190	1870	753	685	190	494	127	57	34	40		
27	59	1280	190	1220	610	600	178	428	125	56	36	38		
28	57	989	173	901	570	562	170	361	113	56	41	37		
29	55	775	428	720	534	494	170	311	183	54	35	36		
30	152	610	1040	595	---	432	232	277	174	53	34	36		
31	175	---	962	508	---	380	---	252	---	51	34	---		
TOTAL	2039	46157	14556	27915	20455	16670	12062	12006	5071	2482	1273	1767		
MEAN	65.8	1539	470	900	705	538	402	387	169	80.1	41.1	58.9		
MAX	175	4660	1040	3420	2220	956	1340	710	232	147	54	150		
MIN	47	157	170	198	232	241	170	252	106	51	34	33		
CFSM	1.20	28.1	8.58	16.4	12.9	9.82	7.34	7.06	3.08	1.46	.75	1.07		
IN.	1.38	31.33	9.88	18.95	13.89	11.32	8.19	8.15	3.44	1.68	.86	1.20		
AC-FT	4040	91550	28870	55370	40570	33060	23920	23810	10060	4920	2520	3500		
CAL YR 1983	TOTAL	182149	MEAN	499	MAX	4660	MIN	47	CFSM	9.11	IN.	123.65	AC-FT	361300
WTR YR 1984	TOTAL	162453	MEAN	444	MAX	4660	MIN	33	CFSM	8.10	IN.	110.28	AC-FT	322200

WILLAPA RIVER BASIN

41

12013500 WILLAPA RIVER NEAR WILLAPA, WA
(National stream quality accounting network station)

LOCATION.--Lat 46°39'04", long 123°39'05", in SW¼SW¼ sec.35, T.14 N., R.8 W., Pacific County, Hydrologic Unit 17100106, on right bank 2,150 ft downstream from Mill Creek, 1.8 mi southeast of Willapa, and at mile 17.8.

DRAINAGE AREA.--130 mi².

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--August to October 1947, July 1948 to December 1954, water years 1955-56, 1958-59 (annual maximum), April 1961 to current year.

GAGE.--Water-stage recorder. Datum of gage is 3.57 ft above National Geodetic Vertical Datum of 1929. Aug. 26 to Oct. 16, 1947, water-stage recorder at site 2,060 ft upstream at different datum. July 28, 1948, to Dec. 2, 1954, water-stage recorder, water years 1955-56, 1958-59, nonrecording gage, and Apr. 1, 1961, to Apr. 14, 1974, water-stage recorder at site 2,000 ft upstream at datum 2.12 ft higher.

REMARKS.--Water-discharge records good. Some diversion for domestic use and irrigation upstream from station. No regulation.

AVERAGE DISCHARGE.--29 years (water years 1949-1954, 1962-1984), 654 ft³/s, 68.32 in/yr, 473,800 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 11,400 ft³/s Feb. 22, 1949, Dec. 13, 1966, from rating curve extended above 7,300 ft³/s; maximum gage height, 24.22 ft Feb. 22, 1949, site and datum then in use; minimum discharge, 13 ft³/s Aug. 20, 1967; minimum gage height, 2.87 ft Aug. 18-21, 23-25, 31, Sept. 1, 1970, site and datum then in use.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 5,000 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Nov. 15	1800	*7,230	*18.18	Jan. 25	0800	5,330	15.47
Nov. 20	0400	5,610	15.87				

Minimum discharge, 30 ft³/s Aug. 27, gage height, 3.17 ft.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP		
1	50	130	784	1120	614	973	567	500	354	241	50	34		
2	49	359	682	1240	543	969	518	962	325	221	48	37		
3	50	2180	620	2660	485	882	491	812	309	197	47	34		
4	56	2150	571	2540	442	791	455	672	355	181	46	32		
5	58	1150	638	1800	411	699	416	780	333	167	47	94		
6	52	1230	586	1350	382	623	392	808	325	160	55	225		
7	48	1250	595	1100	353	555	580	693	305	146	50	128		
8	47	1040	1050	920	364	497	574	641	301	137	45	140		
9	46	889	1130	791	450	452	574	638	319	130	43	122		
10	44	1110	1550	724	931	434	1020	623	290	127	40	88		
11	43	1450	1450	672	1120	405	1350	679	267	119	39	73		
12	42	1410	1440	604	2240	752	2150	681	248	119	40	69		
13	42	1900	1790	549	2660	798	1790	622	230	115	43	65		
14	43	4110	1550	497	1780	724	1340	594	217	107	43	59		
15	43	6300	1250	452	1460	738	1030	558	204	101	40	53		
16	42	5190	1030	424	1200	727	843	531	193	96	38	50		
17	49	4420	861	395	969	1110	710	471	184	87	37	48		
18	61	3560	738	372	840	1170	654	431	175	82	37	47		
19	52	2890	644	348	728	1150	564	461	166	79	37	46		
20	50	4920	568	330	878	1210	503	568	191	77	36	45		
21	49	3040	490	335	1070	1440	455	501	297	76	35	43		
22	104	1910	450	497	1070	1410	424	509	239	74	32	58		
23	104	1400	380	1190	1300	1210	411	595	198	69	32	78		
24	72	3410	380	3870	1520	1050	374	561	181	66	32	58		
25	63	3380	400	4350	1330	1000	364	541	170	63	32	50		
26	57	2160	434	2600	1110	1030	343	714	175	63	32	48		
27	53	1780	457	1700	955	916	316	625	189	63	33	45		
28	52	1370	398	1260	959	878	300	537	170	62	44	42		
29	49	1100	714	1000	903	791	291	465	298	60	39	40		
30	79	920	1580	833	---	703	343	423	294	56	34	38		
31	189	---	1420	710	---	629	---	392	---	53	32	---		
TOTAL	1838	68108	26630	37233	29067	26716	20142	18588	7502	3394	1238	1989		
MEAN	59.3	2270	859	1201	1002	862	671	600	250	109	39.9	66.3		
MAX	189	6300	1790	4350	2660	1440	2150	962	355	241	55	225		
MIN	42	130	380	330	353	405	291	392	166	53	32	32		
CFSM	.46	17.5	6.61	9.24	7.71	6.63	5.16	4.62	1.92	.84	.31	.51		
IN.	.53	19.49	7.62	10.65	8.32	7.64	5.76	5.32	2.15	.97	.35	.57		
AC-FT	3650	135100	52820	73850	57650	52990	39950	36870	14880	6730	2460	3950		
CAL YR 1983	TOTAL	268044	MEAN	734	MAX	6300	MIN	42	CFSM	5.65	IN.	76.70	AC-FT	531700
WTR YR 1984	TOTAL	242445	MEAN	662	MAX	6300	MIN	32	CFSM	5.09	IN.	69.38	AC-FT	480900

WILLAPA RIVER BASIN

12013500 WILLAPA RIVER NEAR WILLAPA, WA--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1966-1973, 1976 to current year.

WATER QUALITY DATA, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984

DATE	TIME	STREAM- FLOW, INSTAN- TANEOUS (CFS)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH (STAND- ARD UNITS)	TEMPER- ATURE (DEG C)	TUR- BID- ITY (NTU)	OXYGEN, DIS- SOLVED (MG/L)	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)
NOV , 1983												
15...	1015	6770	48	7.8	10.0	38	10.6	--	K1200	K700	12	2
MAR , 1984												
01...	1000	955	53	7.5	7.5	2.1	11.9	99	K330	250	14	0
MAY												
24...	0900	552	60	7.6	9.0	1.3	11.4	97	100	47	16	6
JUL												
18...	1000	82	70	7.5	17.5	1.4	8.6	89	210	120	19	0
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)
NOV , 1983												
15...		3.1	1.1	3.9	39	.5	.90	10	5.0	4.3	<.10	9.7
MAR , 1984												
01...		3.8	1.2	4.6	40	.5	.60	16	4.2	4.5	<.10	13
MAY												
24...		4.1	1.3	4.8	39	.5	.50	10	4.4	7.1	<.10	14
JUL												
18...		5.0	1.6	5.8	39	.6	.70	21	5.3	4.4	<.10	13
DATE		SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L)	SOLIDS, SUM OF CONSTITUENTS, DIS- SOLVED (MG/L)	SOLIDS, DIS- SOLVED (TONS PER AC-FT)	SOLIDS, DIS- SOLVED (TONS PER DAY)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N)	NITRO- GEN,AM- MONIA + ORGANIC TOTAL (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)	ALUM- INUM, DIS- SOLVED (UG/L AS AL)
NOV , 1983												
15...		36	35	.05	658	1.1	.140	1.7	.210	.010	<.010	40
MAR , 1984												
01...		40	42	.05	103	.83	.030	<.20	.020	.010	<.010	30
MAY												
24...		44	42	.06	66	.56	.050	.20	.020	.010	.020	20
JUL												
18...		49	49	.07	11	.27	.020	.30	.010	<.010	<.010	20

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

WILLAPA RIVER BASIN

43

12013500 WILLAPA RIVER NEAR WILLAPA, WA--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984

DATE	ARSENIC DIS- SOLVED (UG/L AS AS)	BARIUM, DIS- SOLVED (UG/L AS BA)	BERYL- LIUM, DIS- SOLVED (UG/L AS BE)	CADMIUM DIS- SOLVED (UG/L AS CD)	CHRO- MIUM, DIS- SOLVED (UG/L AS CR)	COBALT, DIS- SOLVED (UG/L AS CO)	COPPER, DIS- SOLVED (UG/L AS CU)	IRON, DIS- SOLVED (UG/L AS FE)	LEAD, DIS- SOLVED (UG/L AS PB)	LITHIUM DIS- SOLVED (UG/L AS LI)	MANGA- NESE, DIS- SOLVED (UG/L AS MN)
NOV , 1983											
15...	<1	9	<.5	<1	<1	<3	2	260	<1	6	29
MAR , 1984											
01...	1	9	<.5	<1	<1	<3	3	69	<1	<4	5
MAY											
24...	<1	8	<.5	<1	<1	<3	1	95	<1	6	5
JUL											
18...	<1	9	<.5	<1	<1	<3	2	220	<1	<4	9
DATE	MERCURY DIS- SOLVED (UG/L AS HG)	MOLYB- DENUM, DIS- SOLVED (UG/L AS MO)	NICKEL, DIS- SOLVED (UG/L AS NI)	SELE- NIUM, DIS- SOLVED (UG/L AS SE)	SILVER, DIS- SOLVED (UG/L AS AG)	STRON- TIUM, DIS- SOLVED (UG/L AS SR)	VANA- DIUM, DIS- SOLVED (UG/L AS V)	ZINC, DIS- SOLVED (UG/L AS ZN)	SEDI- MENT, SUS- PENDE (MG/L)	SEDI- MENT, DIS- CHARGE, SUS- PENDE (T/DAY)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM
NOV , 1983											
15...	<.1	<10	<1	<1	<1	22	<6	48	411	7510	46
MAR , 1984											
01...	<.1	<10	3	<1	<1	25	<6	17	9	23	--
MAY											
24...	<.1	<10	<1	<1	<1	28	<6	9	9	13	--
JUL											
18...	<.1	<10	2	<1	<1	33	<6	5	4	0.89	--

WATER RESOURCES DATA FOR WASHINGTON, 1984

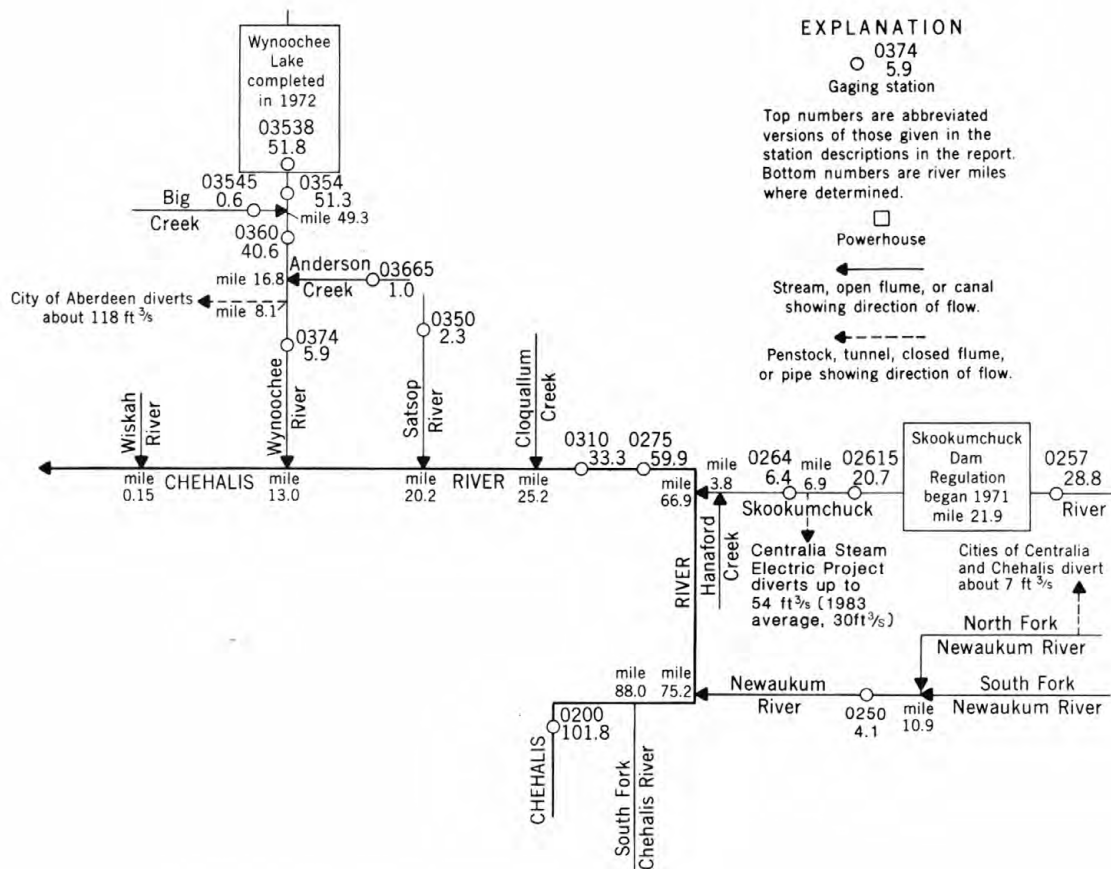


Figure 7.--Gaging stations in Chehalis River basin.

CHEHALIS RIVER BASIN

45

12020000 CHEHALIS RIVER NEAR DOTY, WA

LOCATION.--Lat 46°37'03", long 123°16'35", in NE¼NW¼ sec.14, T.13 N., R.5 W., Lewis County, Hydrologic Unit 17100103, on right bank 1.3 mi south of Doty, 1.6 mi upstream from Elk Creek, 3.4 mi north of Pe Ell, and at mile 101.8.

DRAINAGE AREA.--113 mi².

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

REVISED RECORDS.--WSP 1316: 1943(M). WSP 1446: 1946(M). WDR-WA-72-1: 1945(M).

GAGE.--Water-stage recorder. Datum of gage is 302.1 ft above National Geodetic Vertical Datum of 1929 (river-profile survey). Prior to Oct. 1, 1961, nonrecording gage and crest-stage gage at site 100 ft downstream at same datum.

REMARKS.--Records good. No regulation or diversion upstream from station.

AVERAGE DISCHARGE.--45 years, 578 ft³/s, 69.46 in/yr, 418,800 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 22,800 ft³/s Jan. 20, 1972, gage height, 18.36 ft, from rating curve extended above 7,400 ft³/s on basis of slope-area measurement of peak flow; minimum, 18 ft³/s Oct. 14, 1952, Aug. 25-28, 1958, Sept. 4, 5, 1972; minimum gage height, 0.69 ft Aug. 18, 19, 1977, Aug. 24-27, Sept. 3, 1982.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 6,800 ft³/s and maximum, 4,790 ft³/s Nov. 15, 20, gage height, 7.82 ft; minimum, 35 ft³/s Sept. 30, gage height, 0.88 ft.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP		
1	52	107	605	1040	470	684	485	552	338	259	57	43		
2	50	333	535	1070	414	670	435	1160	303	219	56	42		
3	52	2720	480	2040	374	614	407	912	281	194	54	39		
4	57	2770	423	2070	342	565	373	703	315	177	54	37		
5	56	1420	455	1490	315	520	339	687	298	163	54	46		
6	52	1660	418	1070	291	468	317	678	278	150	56	121		
7	50	1460	446	846	275	417	447	594	263	139	53	98		
8	49	1100	806	715	275	375	501	551	265	130	52	101		
9	47	1010	1010	620	360	342	527	538	281	124	49	90		
10	46	1010	1550	580	630	322	1160	517	263	117	48	66		
11	45	1270	1320	560	992	308	1670	592	243	113	47	57		
12	45	1240	1260	510	2430	623	2500	634	227	112	48	56		
13	45	1890	1690	465	2200	726	1920	576	209	108	50	53		
14	47	3650	1390	418	1410	693	1290	553	196	100	49	48		
15	46	4400	1040	378	1230	742	944	530	183	95	46	45		
16	45	4180	813	346	1100	748	739	494	173	90	45	44		
17	54	4240	685	320	806	1250	623	441	166	84	45	42		
18	56	3630	580	295	715	1340	584	398	155	82	45	41		
19	50	2730	505	279	625	1160	510	421	148	80	44	40		
20	52	4180	430	263	695	1100	449	531	176	79	41	40		
21	50	2520	360	259	720	1500	408	486	243	78	41	39		
22	115	1590	300	360	830	1450	374	451	190	74	40	47		
23	100	1140	240	988	1000	1110	362	644	165	71	40	53		
24	76	3190	240	2760	1160	889	325	700	149	69	40	46		
25	66	3060	250	3180	902	837	309	604	142	67	40	42		
26	60	1780	280	2000	830	868	289	755	145	68	39	40		
27	57	1430	279	1310	720	773	267	735	155	66	40	39		
28	56	1090	251	946	696	739	250	598	140	65	48	38		
29	54	860	450	755	629	667	242	505	382	64	42	36		
30	70	720	1340	630	---	598	292	432	315	61	40	35		
31	122	---	1430	540	---	540	---	385	---	59	39	---		
TOTAL	1822	62380	21861	29103	23436	23638	19338	18357	6787	3357	1442	1564		
MEAN	58.8	2079	705	939	808	763	645	592	226	108	46.5	52.1		
MAX	122	4400	1690	3180	2430	1500	2500	1160	382	259	57	121		
MIN	45	107	240	259	275	308	242	385	140	59	39	35		
CFSM	.52	18.4	6.24	8.31	7.15	6.75	5.71	5.24	2.00	.96	.41	.46		
IN.	.60	20.54	7.20	9.58	7.72	7.78	6.37	6.04	2.23	1.11	.47	.51		
AC-FT	3610	123700	43360	57730	46490	46890	38360	36410	13460	6660	2860	3100		
CAL YR 1983	TOTAL	231103	MEAN	633	MAX	5010	MIN	45	CFSM	5.60	IN.	76.08	AC-FT	458400
WTR YR 1984	TOTAL	213085	MEAN	582	MAX	4400	MIN	35	CFSM	5.15	IN.	70.15	AC-FT	422700

CHEHALIS RIVER BASIN

12025000 NEWAUKUM RIVER NEAR CHEHALIS, WA

LOCATION.--Lat 46°37'13", long 122°56'38", in SW¼SW¼ sec.9, T.13 N., R.2 W., Lewis County, Hydrologic Unit 17100103, on left bank at highway bridge 3.0 mi southeast of Chehalis, and at mile 4.1.

DRAINAGE AREA.--155 mi².

PERIOD OF RECORD.--March 1929 to September 1931, July 1942 to September 1981, October 1982 to current year.

REVISED RECORDS.--WSP 1012: 1943. WSP 1316: 1929-30(M), 1960(M). WSP 1716: Drainage area. WSP 1932: 1931(M), 1945-49, 1954(M), 1956(P), 1958(M), 1959-60.

GAGE.--Water-stage recorder. Elevation of gage is 190 ft, from topographic map. Prior to Oct. 1, 1929, nonrecording gage at same site at datum 1.0 ft higher. Oct. 1, 1929, to July 5, 1962, nonrecording gage and crest-stage gage at same site and datum.

REMARKS.--Records good. Cities of Chehalis and Centralia divert about 7 ft³/s from North Fork Newaukum River for municipal use. No regulation upstream from station.

AVERAGE DISCHARGE.--43 years (water years, 1930-31, 1943-81, 1983, 1984), 504 ft³/s, 365,100 acre-ft/yr, unadjusted.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 10,300 ft³/s Dec. 2, 1977, gage height, 12.49 ft; maximum gage height, 13.62 ft Dec. 9, 1953; minimum discharge, 12 ft³/s Sept. 13, 14, 1949, Aug. 29, 1967.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 4,000 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Nov. 18	0700	4,690	7.99	Jan. 25	1100	*6,760	*9.80

Minimum discharge, 40 ft³/s Sept. 29, 30, gage height, 1.10 ft.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	73	147	655	800	592	710	574	471	337	297	71	65
2	72	260	597	1100	534	650	525	906	306	261	71	69
3	73	1290	579	2180	484	579	475	816	287	234	68	53
4	83	2060	507	2490	447	520	451	665	398	215	65	46
5	81	1390	561	1440	415	471	455	610	405	198	64	49
6	73	1270	565	1060	392	435	423	601	456	186	66	109
7	70	1640	547	858	367	399	592	507	388	171	63	97
8	68	1150	972	715	356	374	800	525	379	160	60	101
9	67	888	1120	620	392	353	725	471	465	152	58	112
10	65	810	2040	630	388	356	1020	439	436	150	55	78
11	63	858	1540	700	489	356	990	599	382	144	54	67
12	63	800	1180	606	1050	556	1080	550	343	142	57	84
13	64	1050	1460	547	1350	695	1020	553	307	141	65	77
14	67	2400	1330	489	1020	695	828	643	281	131	62	63
15	68	1850	1040	435	864	1050	700	613	262	123	57	55
16	64	1960	852	388	858	840	606	707	247	113	55	51
17	69	3110	710	353	695	852	534	585	233	106	54	48
18	80	4010	625	322	625	765	502	486	218	103	54	47
19	72	2200	561	301	556	775	467	493	202	99	52	45
20	93	2680	498	284	670	1040	447	638	261	96	52	48
21	83	2070	430	290	1290	1770	411	551	833	96	48	46
22	172	1380	380	395	1090	1870	407	597	618	90	48	52
23	236	1090	350	1060	1030	1380	378	1070	412	87	49	84
24	147	2240	350	5450	1400	1130	349	827	323	83	50	59
25	117	2120	380	5580	1140	1020	329	684	278	81	48	53
26	99	1340	450	2540	882	1010	304	805	255	84	46	47
27	91	1280	450	1490	750	840	281	726	275	80	52	44
28	86	1080	385	1130	665	906	266	576	235	80	63	43
29	83	900	610	924	606	918	281	476	440	78	54	41
30	84	765	1160	775	---	775	325	413	391	75	53	40
31	163	---	996	675	---	665	---	378	---	72	53	---
TOTAL	2789	46088	23880	36627	21397	24755	16545	18981	10653	4128	1767	1873
MEAN	90.0	1536	770	1182	738	799	552	612	355	133	57.0	62.4
MAX	236	4010	2040	5580	1400	1870	1080	1070	833	297	71	112
MIN	63	147	350	284	356	353	266	378	202	72	46	40
AC-FT	5530	91420	47370	72650	42440	49100	32820	37650	21130	8190	3500	3720
CAL YR 1983	TOTAL	203845	MEAN	558	MAX	4010	MIN	60	AC-FT	404300		
WTR YR 1984	TOTAL	209483	MEAN	572	MAX	5580	MIN	40	AC-FT	415500		

CHEHALIS RIVER BASIN

47

12025700 SKOOKUMCHUCK RIVER NEAR VAIL, WA

LOCATION.--Lat 46°46'22", long 122°35'34", in SW¼NW¼ sec.20, T.15 N., R.2 E., Thurston County, Hydrologic Unit 17100103, on right bank about 150 ft downstream from logging bridge, 0.4 mi downstream from Hospital Creek, 5.8 mi southeast of Vail, and at mile 28.8.

DRAINAGE AREA.--40.0 mi².

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

REVISED RECORDS.--WDR WA-75-1: 1974.

GAGE.--Water-stage recorder. Elevation of gage is 710 ft, from topographic map.

REMARKS.--Records excellent except those above 1,000 ft³/s, which are good.

AVERAGE DISCHARGE.--17 years, 205 ft³/s, 69.60 in/yr, 148,500 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 6,900 ft³/s Jan. 20, 1972, gage height, 10.93 ft; minimum, 18 ft³/s part or all of each day Aug. 22-24, 26-31, 1970.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 1,250 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Nov. 14	0300	1,620	7.00	Jan. 25	0400	*1,670	*7.06
Nov. 18	0300	1,660	7.05				

Minimum discharge, 22 ft³/s part or all of each day Sept. 28-30, gage height, 3.20 ft.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP		
1	34	74	227	261	183	238	203	208	153	112	38	30		
2	33	140	205	317	164	224	183	552	138	104	37	26		
3	33	816	183	713	151	203	176	421	130	96	36	25		
4	36	839	164	755	138	183	160	317	157	89	35	24		
5	33	512	162	538	128	169	160	270	178	83	35	36		
6	32	570	149	398	122	155	147	235	170	80	35	46		
7	31	525	157	317	113	147	243	208	164	75	34	35		
8	31	406	288	258	111	140	279	208	158	71	33	53		
9	30	330	348	218	126	132	264	193	174	69	32	38		
10	29	282	718	238	136	138	351	185	162	66	32	32		
11	29	348	570	232	188	130	429	229	149	64	31	32		
12	28	380	457	211	499	270	525	227	136	63	32	39		
13	28	584	525	193	547	282	503	227	124	60	33	31		
14	29	1230	494	173	380	301	402	229	115	58	31	29		
15	28	946	391	155	320	358	365	227	107	55	30	27		
16	28	1100	314	142	288	298	307	216	102	53	29	26		
17	32	1290	258	132	246	288	249	190	96	51	29	26		
18	28	1370	221	124	216	288	221	171	90	50	28	25		
19	30	874	195	117	193	304	193	213	86	49	28	25		
20	31	1050	160	111	232	394	173	235	109	48	28	24		
21	30	728	130	111	301	904	164	205	190	47	28	24		
22	86	507	110	171	276	661	155	255	146	46	28	31		
23	51	391	90	252	279	574	147	387	125	45	28	27		
24	41	697	90	788	380	469	138	327	112	43	28	25		
25	37	777	95	1290	327	406	134	276	102	43	27	24		
26	34	516	110	713	276	362	124	445	108	43	26	24		
27	33	445	109	469	235	320	115	358	100	42	27	23		
28	32	369	99	351	227	314	113	282	92	41	29	23		
29	31	310	153	285	216	285	111	229	142	40	27	22		
30	45	264	310	240	---	258	124	198	125	38	26	22		
31	64	---	314	208	---	229	---	173	---	38	26	---		
TOTAL	1097	18670	7796	10481	6998	9424	6858	8096	3940	1862	946	874		
MEAN	35.4	622	251	338	241	304	229	261	131	60.1	30.5	29.1		
MAX	86	1370	718	1290	547	904	525	552	190	112	38	53		
MIN	28	74	90	111	111	130	111	171	86	38	26	22		
CFSM	.88	15.5	6.27	8.45	6.02	7.60	5.72	6.52	3.27	1.50	.76	.73		
IN.	1.02	17.36	7.25	9.75	6.51	8.76	6.38	7.53	3.66	1.73	.88	.81		
AC-FT	2180	37030	15460	20790	13880	18690	13600	16060	7810	3690	1880	1730		
CAL YR 1983	TOTAL	80560	MEAN	221	MAX	1980	MIN	28	CFSM	5.52	IN.	74.92	AC-FT	159800
WTR YR 1984	TOTAL	77042	MEAN	210	MAX	1370	MIN	22	CFSM	5.25	IN.	71.65	AC-FT	152800

CHEHALIS RIVER BASIN

12026150 SKOOKUMCHUCK RIVER BELOW BLOODY RUN CREEK, NEAR CENTRALIA, WA

LOCATION.--Lat 46°47'25", long 122°44'03", in NW¼NW¼ sec.18, T.15 N., R.1 E., Thurston County, Hydrologic Unit 17100103, on right bank 0.7 mi downstream from Bloody Run Creek, 1.2 mi downstream from Skookumchuck Dam, 12 mi northeast of Centralia, and at mile 20.7.

DRAINAGE AREA.--65.9 mi². Prior to August 1969, 61.7 mi².

PERIOD OF RECORD.--April 1929 to November 1933, October 1939 to current year. Monthly discharge only for some periods, published in WSP 1316 and 1736. Published as "near Centralia" (12026000) prior to August 1969.

GAGE.--Water-stage recorder. Datum of gage is 317.34 ft above National Geodetic Vertical Datum of 1929. Apr. 1, 1929, to Sept. 30, 1931, and Feb. 1, 1932, to Dec. 6, 1933, nonrecording gage at site 1.1 mi upstream at different datum. Oct. 9, 1939, to July 31, 1969 at site 1.3 mi upstream at datum 301.04 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--Records good. Flow regulated by Skookumchuck Dam since January 1971. No diversions upstream from station.

AVERAGE DISCHARGE.--49 years (water years 1930-33, 1940-84), 254 ft³/s, 52.34 in/yr, 184,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 6,710 ft³/s Dec. 9, 1953, gage height, 48.59 ft, site and datum in use; minimum, 12 ft³/s May 28, 1970, caused by pumping during dam construction.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 2,000 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Nov. 18	0815	*2,220	*9.89	No other peak greater than base discharge.			
Minimum discharge, 85 ft ³ /s Aug. 9, gage height, 4.95 ft.							

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	166	105	327	307	442	290	290	186	299	161	99	144
2	160	108	293	327	423	307	259	494	285	147	99	145
3	156	150	277	407	394	299	238	564	277	135	98	146
4	154	162	269	382	373	274	223	455	228	125	98	146
5	150	130	269	304	361	228	214	382	150	116	98	144
6	148	140	269	344	344	211	197	332	113	114	98	146
7	148	138	299	413	313	204	254	285	113	111	98	144
8	146	160	382	376	259	162	356	274	117	108	98	146
9	146	228	426	376	231	160	335	259	121	108	99	143
10	148	251	619	394	228	171	448	282	121	108	99	144
11	148	254	831	391	231	173	532	315	138	108	100	146
12	146	254	696	385	277	285	619	321	150	108	100	144
13	148	261	692	401	313	448	668	315	143	107	104	142
14	146	299	692	404	293	426	553	361	138	106	105	142
15	144	288	589	388	285	491	474	401	137	106	105	144
16	144	532	536	367	285	448	435	407	131	105	105	144
17	144	1580	522	347	280	413	347	347	126	103	105	144
18	144	2020	484	335	280	398	304	304	119	103	105	144
19	144	1330	461	321	280	401	269	301	117	103	105	141
20	144	1390	423	310	269	505	243	329	132	103	104	142
21	142	1100	404	299	391	818	223	332	269	103	105	142
22	148	739	388	293	435	936	211	332	285	102	101	144
23	144	550	364	307	423	801	197	465	216	101	105	146
24	142	672	341	407	474	676	188	494	175	100	104	145
25	132	1080	321	634	481	568	186	455	153	99	96	143
26	110	768	301	990	423	518	173	455	144	99	94	142
27	101	589	290	752	364	451	162	474	142	99	95	141
28	101	491	282	568	329	438	152	401	132	99	95	140
29	101	426	282	491	299	429	152	350	168	99	94	140
30	103	367	313	471	---	385	158	335	179	99	115	140
31	106	---	313	455	---	335	---	321	---	99	137	---
TOTAL	4304	16562	12955	12946	9780	12649	9060	11328	5018	3384	3163	4304
MEAN	139	552	418	418	337	408	302	365	167	109	102	143
MAX	166	2020	831	990	481	936	668	564	299	161	137	146
MIN	101	105	269	293	228	160	152	186	113	99	94	140
AC-FT	8540	32850	25700	25680	19400	25090	17970	22470	9950	6710	6270	8540
CAL YR 1983	TOTAL	105547	MEAN	289	MAX	2040	MIN	88	AC-FT	209400		
WTR YR 1984	TOTAL	105453	MEAN	288	MAX	2020	MIN	94	AC-FT	209200		

CHEHALIS RIVER BASIN

49

12026400 SKOOKUMCHUCK RIVER NEAR BUCODA, WA

LOCATION.--Lat 46°46'20", long 122°55'23", in SW¼NW¼ sec.22, T.15 N., R.2 W., Thurston County, Hydrologic Unit 17100103, on left bank 100 ft downstream from bridge on State Highway 507, 3.3 mi southwest of Bucoda, and at mile 6.4.

DRAINAGE AREA.--112 mi².

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

GAGE.--Water-stage recorder. Datum of gage is 194.60 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--Records good except those above 2,000 ft³/s, which are fair. Flow regulated by Skookumchuck Dam since January 1971. An average of 30 ft³/s is diverted at point 0.5 mi upstream for consumptive use at Centralia Steam Electric Project. During peak demand, months up to 54 ft³/s may be diverted for periods of one day or less. Other minor diversions for domestic use and irrigation upstream from station.

AVERAGE DISCHARGE.--13 years (water years 1972-84), 369 ft³/s, 267,300 acre-ft/yr, unadjusted.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 8,190 ft³/s Jan. 21, 1972, gage height, 16.82 ft; minimum, 21 ft³/s Aug. 15, 16, 18, 19, 20, 1970, gage height, 3.85 ft.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 2,750 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Nov. 18	1700	*3,260	*12.02	No other peak greater than base discharge.			
Minimum discharge, 75 ft ³ /s Aug. 23, gage height, 4.51 ft.							

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	164	104	485	584	624	435	488	272	350	214	85	146
2	169	116	440	649	594	452	442	509	335	187	93	147
3	160	337	413	1080	555	444	399	710	324	169	100	141
4	162	528	396	1320	519	412	360	569	316	154	92	135
5	160	373	392	796	500	367	364	488	232	141	84	136
6	159	347	393	658	486	324	345	461	185	132	84	139
7	157	343	401	694	453	312	387	381	161	129	85	139
8	156	318	578	631	409	274	516	359	163	121	84	141
9	156	348	718	572	351	241	513	351	170	119	83	142
10	156	372	1180	605	343	255	643	357	164	118	86	140
11	155	380	1380	607	349	261	783	402	169	116	85	141
12	154	366	1050	589	459	372	853	426	191	114	86	139
13	154	396	1040	590	659	658	915	407	180	113	87	140
14	154	714	1060	598	531	642	783	476	166	110	86	139
15	154	613	909	573	467	761	646	490	166	109	92	137
16	154	647	779	542	468	686	557	514	158	110	86	133
17	152	1810	726	483	433	641	478	444	151	108	87	133
18	146	2890	672	460	417	620	426	383	143	100	87	132
19	141	2110	616	444	405	613	392	388	137	95	87	128
20	143	1850	572	432	425	820	381	461	155	95	87	127
21	146	1600	533	425	626	1290	355	432	369	95	87	128
22	166	1090	505	439	688	1430	342	438	425	93	85	131
23	169	825	477	497	642	1240	325	610	317	92	76	133
24	152	1080	441	1130	688	1070	311	634	250	95	80	135
25	144	1690	420	2140	689	894	307	571	207	99	86	132
26	117	1230	404	1680	593	822	289	532	186	90	86	129
27	94	921	399	1220	524	698	260	558	185	89	83	126
28	91	765	381	910	471	655	243	481	163	88	88	123
29	93	646	422	752	438	671	245	419	220	87	88	123
30	100	558	669	697	---	605	248	391	249	87	95	122
31	108	---	680	664	---	542	---	373	---	86	130	---
TOTAL	4486	25367	19531	23461	14806	19507	13596	14287	6587	3555	2730	4037
MEAN	145	846	630	757	511	629	453	461	220	115	88.1	135
MAX	169	2890	1380	2140	689	1430	915	710	425	214	130	147
MIN	91	104	381	425	343	241	243	272	137	86	76	122
AC-FT	8900	50320	38740	46530	29370	38690	26970	28340	13070	7050	5410	8010
CAL YR 1983	TOTAL	148471	MEAN	407	MAX	3500	MIN	82	AC-FT	294500		
WTR YR 1984	TOTAL	151950	MEAN	415	MAX	2890	MIN	76	AC-FT	301400		

CHEHALIS RIVER BASIN

12027500 CHEHALIS RIVER NEAR GRAND MOUND, WA

LOCATION.--Lat 46°46'34", long 123°02'04", in NE¼NE¼ sec.22, T.15 N., R.3 W., Thurston County, Hydrologic Unit 17100103, on left bank at downstream side of highway bridge at Meadows, 1.5 mi southwest of Grand Mound, 7.0 mi downstream from Skookumchuck River, and at mile 59.9.

DRAINAGE AREA.--895 mi².

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

REVISED RECORDS.--WSP 1216: Drainage area. WSP 1286: 1929-30(M), 1931, 1932-34(M).

GAGE.--Water-stage recorder. Datum of gage is 123.65 ft above National Geodetic Vertical Datum of 1929. Prior to Oct. 3, 1934, nonrecording gage at present site at datum 3.0 ft higher.

REMARKS.--Records excellent. Minor effect from regulation on Skookumchuck River by Skookumchuck Dam since January 1971. Up to 54 ft³/s of Skookumchuck River is consumptively used at Centralia steam generating plant. Many small diversions for irrigation and domestic use upstream from station, including about 7 ft³/s for municipal water supply for Centralia and Chehalis.

AVERAGE DISCHARGE.--56 years, 2,839 ft³/s, 43.08 in/yr, 2,057,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 49,200 ft³/s Jan. 21, 1972, gage height, 18.21 ft; minimum, 82 ft³/s Aug. 30, 1967; minimum gage height, 0.83 ft Aug. 27, 1958.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 16,000 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Nov. 19	0100	19,100	13.68	Jan. 26	0400	*19,200	*13.71
Nov. 25	1800	16,900	13.00				

Minimum discharge, 226 ft³/s Aug. 24, minimum gage height, 2.14 ft.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP		
1	382	557	4110	6590	3530	3750	3150	1800	1790	1470	318	300		
2	381	642	3490	5900	3090	3760	2760	4020	1610	1220	312	323		
3	377	3110	3210	8830	2740	3590	2490	4760	1490	1070	316	323		
4	382	9240	2830	13900	2490	3250	2340	4000	1680	960	311	299		
5	397	7910	2720	11700	2290	2920	2160	3400	1810	877	298	292		
6	394	5840	2850	8190	2130	2600	2010	3410	1720	812	299	339		
7	378	6300	2610	6110	1970	2360	2140	2950	1560	768	302	543		
8	370	5690	4110	5020	1860	2140	3370	2630	1460	723	292	514		
9	365	4730	5490	4220	1920	1920	3150	2540	1480	685	279	510		
10	365	4500	8920	3750	2390	1830	4850	2420	1520	661	270	470		
11	354	4950	10800	3890	3220	1820	6660	2510	1360	637	264	408		
12	346	5070	8380	3480	5170	2170	8240	2980	1280	618	266	381		
13	345	5430	8790	3160	10700	4380	9340	2680	1180	607	273	387		
14	350	10100	9160	2900	8710	4630	7180	2960	1100	583	278	364		
15	351	13200	7420	2610	6640	4840	5380	2890	1030	554	274	343		
16	350	14000	5740	2380	5790	4770	4450	2860	968	526	269	324		
17	365	15600	4870	2170	4960	5080	3650	2590	917	500	261	312		
18	380	18200	4190	2000	4330	6080	3220	2220	872	469	256	308		
19	385	18200	3590	1850	3780	5680	2950	2050	827	442	252	300		
20	384	16600	3180	1740	3600	6270	2680	2730	869	427	248	292		
21	399	17400	2750	1690	5090	8090	2380	2670	1740	427	246	289		
22	432	13400	2210	1870	5310	9850	2220	2500	2370	420	238	295		
23	701	8950	1940	2840	5110	8490	2050	4010	1630	400	232	331		
24	633	10100	1770	11900	6010	6870	1900	4240	1240	385	227	363		
25	517	16000	1880	17900	6310	5600	1750	3600	1060	377	231	332		
26	450	14700	2030	18800	5310	5490	1620	3650	956	367	237	311		
27	393	10600	2000	14100	4710	5000	1480	3860	992	364	238	299		
28	364	7890	2010	9040	4130	4670	1370	3180	937	358	245	286		
29	352	5970	2140	6280	3800	4710	1350	2620	1340	352	270	279		
30	363	4910	5640	4980	---	4170	1400	2230	1940	346	262	273		
31	425	---	7540	4140	---	3630	---	1990	---	335	273	---		
TOTAL	12430	279789	138370	193930	127090	140410	99690	92950	40728	18740	8337	10390		
MEAN	401	9326	4464	6256	4382	4529	3323	2998	1358	605	269	346		
MAX	701	18200	10800	18800	10700	9850	9340	4760	2370	1470	318	543		
MIN	345	557	1770	1690	1860	1820	1350	1800	827	335	227	273		
CFSM	.45	10.4	4.99	6.99	4.90	5.06	3.71	3.35	1.52	.68	.30	.39		
IN.	.52	11.63	5.75	8.06	5.28	5.84	4.14	3.86	1.69	.78	.35	.43		
AC-FT	24650	555000	274500	384700	252100	278500	197700	184400	80780	37170	16540	20610		
CAL YR 1983	TOTAL	1220292	MEAN	3343	MAX	19800	MIN	272	CFSM	3.74	IN.	50.72	AC-FT	2420000
WTR YR 1984	TOTAL	1162854	MEAN	3177	MAX	18800	MIN	227	CFSM	3.55	IN.	48.33	AC-FT	2307000

12031000 CHEHALIS RIVER AT PORTER, WA
(National stream quality accounting network station)

LOCATION.--Lat 46°56'17", long 123°18'45", on north line of NE¼ sec.28, T.17 N., R.5 W., Grays Harbor County, Hydrologic Unit 17100103, at downstream end of left bank bridge pier, 30 ft downstream from Porter Creek, 0.1 mi west of Porter, and at mile 33.3.

DRAINAGE AREA.--1,294 mi².

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--January 1952 to September 1972, water years 1973-75 (annual maximum), May 1975 to current year.

REVISED RECORDS.--WSP 1716: Drainage area. WSP 1932: 1954, 1956, 1960(M).

GAGE.--Water-stage recorder. Datum of gage is 23.64 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--Water-discharge records excellent except those above 20,000 ft³/s, which are good. Minor effect from regulation on Skookumchuck River by Skookumchuck Dam since January 1971. Up to 54 ft³/s of Skookumchuck River is consumptively used at Centralia steam generating plant. Many small diversions for irrigation and domestic use upstream from station, including about 7 ft³/s for municipal water supply for Centralia and Chehalis.

AVERAGE DISCHARGE.--29 years (water years 1935-72, 1976-84), 4,207 ft³/s, 44.15 in/yr, 3,048,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 55,600 ft³/s Jan. 22, 1972, gage height, 23.88 ft; minimum, 164 ft³/s Oct. 17, 1952, gage height, 2.25 ft.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of Dec. 28, 1937, reached a stage of 24.7 ft, from levels by Grays Harbor County. Flood of December 1933 reached a stage of 23.13 ft, from river profile by Corps of Engineers.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 20,000 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Nov. 20	0100	23,000	20.27	Jan. 26	1700	*23,200	*20.30
Nov. 26	1600	20,000	19.51				

Minimum discharge, 450 ft³/s Sept. 30, gage height, 3.38 ft.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP		
1	559	672	6560	9630	6070	5720	4990	2910	2900	2390	594	537		
2	555	847	5640	8900	5330	5740	4470	4480	2650	2030	579	552		
3	559	2320	5070	13000	4780	5500	4090	6210	2490	1800	575	559		
4	587	7620	4610	18900	4350	5090	3820	5750	2580	1620	577	546		
5	578	9200	4380	19000	4010	4670	3580	5040	2890	1490	573	668		
6	578	7070	4360	15500	3730	4270	3370	4760	2790	1370	580	692		
7	564	7080	4170	11300	3490	3910	3390	4420	2650	1290	578	734		
8	546	7210	5020	8810	3300	3610	4240	3980	2440	1220	578	865		
9	541	6040	7270	7240	3270	3330	4520	3830	2400	1150	572	803		
10	533	5540	10700	6340	3660	3160	5200	3680	2430	1110	564	762		
11	528	5910	13900	6050	4470	3090	7750	3700	2280	1070	564	687		
12	515	6380	12900	5620	6390	3400	9290	4070	2140	1040	569	650		
13	515	6380	11600	5110	11000	5180	11000	4000	2020	1020	589	622		
14	515	9040	12500	4720	12900	6120	10200	3990	1890	988	591	601		
15	515	15100	11300	4320	10400	6320	8060	4010	1770	945	586	567		
16	515	16700	9100	3960	8900	6550	6470	3860	1670	904	583	548		
17	533	17700	7480	3660	7710	6670	5430	3730	1590	866	576	527		
18	537	19900	6360	3390	6630	8090	4770	3350	1510	825	562	514		
19	550	21300	5570	3160	5940	8190	4430	3180	1440	785	550	506		
20	569	22400	4980	2980	5600	8630	4070	3560	1510	758	547	492		
21	569	21100	4420	2890	6570	10200	3760	3850	1920	745	540	480		
22	648	20100	3700	3070	7640	12400	3500	3680	2990	735	533	492		
23	755	16000	3100	4110	7540	12500	3290	4450	2590	717	520	507		
24	910	13800	2800	10100	8140	10400	3090	5370	2070	688	510	539		
25	775	17700	3100	21600	9000	8920	2880	5000	1770	669	503	537		
26	681	19600	3220	22800	8200	8290	2720	4920	1620	667	506	509		
27	615	17900	3180	22300	7170	7660	2550	5140	1600	650	516	489		
28	564	13300	3180	18100	6410	6950	2380	4650	1580	646	525	472		
29	537	9900	3490	12000	5960	6780	2300	4010	1870	638	517	460		
30	550	7900	6960	8780	---	6240	2430	3510	2590	631	524	454		
31	564	---	9650	7110	---	5600	---	3160	---	614	510	---		
TOTAL	18060	351709	200270	294450	188560	203180	142040	130250	64640	32071	17191	17371		
MEAN	583	11720	6460	9498	6502	6554	4735	4202	2155	1035	555	579		
MAX	910	22400	13900	22800	12900	12500	11000	6210	2990	2390	594	865		
MIN	515	672	2800	2890	3270	3090	2300	2910	1440	614	503	454		
CFSM	.45	9.06	4.99	7.34	5.02	5.06	3.66	3.25	1.67	.80	.43	.45		
IN.	.52	10.11	5.76	8.46	5.42	5.84	4.08	3.74	1.86	.92	.49	.50		
AC-FT	35820	697600	397200	584000	374000	403000	281700	258400	128200	63610	34100	34460		
CAL YR 1983	TOTAL	1691137	MEAN	4633	MAX	24900	MIN	509	CFSM	3.58	IN.	48.62	AC-FT	3354000
WTR YR 1984	TOTAL	1659792	MEAN	4535	MAX	22800	MIN	454	CFSM	3.50	IN.	47.72	AC-FT	3292000

CHEHALIS RIVER BASIN

12031000 CHEHALIS RIVER AT PORTER, WA--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1959-73, 1975 to current year.

PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: JULY 1959 to September 1960.

pH: July 1959 to September 1960.

WATER TEMPERATURES: July 1959 to September 1960, October 1961 to July 1972.

SUSPENDED SEDIMENT: October 1961 to September 1971.

WATER QUALITY DATA, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984

DATE	TIME	STREAM- FLOW, INSTAN- TANEOUS (CFS)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH (STAND- ARD UNITS)	TEMPER- ATURE (DEG C)	TUR- BID- ITY (NTU)	OXYGEN, DIS- SOLVED (MG/L)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION)	COLI- FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)	STREP- TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML)	HARD- NESS (MG/L AS CAC03)	HARD- NESS NONCAR- BONATE (MG/L AS CAC03)
NOV , 1983												
18...	0945	19900	57	7.6	8.5	19	10.5	89	280	450	18	2
JAN , 1984												
10...	1030	6370	69	7.2	7.5	5.1	11.2	93	K73	630	22	0
MAR												
01...	1430	5630	68	7.4	8.0	4.4	11.1	93	93	270	23	0
MAY												
24...	1330	5430	68	7.4	9.5	1.3	9.8	85	240	150	22	8
JUL												
18...	1330	821	98	7.5	20.5	.70	10.8	119	K10	23	31	0
SEP												
20...	1120	506	102	7.5	15.0	1.8	8.7	86	K200	54	35	0

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 CAC03)	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)
NOV , 1983												
18...	4.6	1.5	3.8	31	.4	.90	16	9.4	4.3	<.10	13	50
JAN , 1984												
10...	5.5	1.9	4.3	29	.4	.90	22	5.9	4.1	<.10	15	39
MAR												
01...	5.8	2.0	4.6	30	.4	.70	24	5.9	3.9	<.10	16	51
MAY												
24...	5.8	1.9	4.5	30	.4	.50	14	7.2	7.4	<.10	15	54
JUL												
18...	8.0	2.7	5.9	29	.5	.60	31	4.5	5.1	<.10	17	66
SEP												
20...	9.1	3.0	6.3	28	.5	.80	35	5.2	5.9	<.10	18	69

DATE	SOLIDS, SUM OF CONSTITU- ENTS, 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)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N)	NITRO- GEN,AM- MONIA + ORGANIC TOTAL (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)	ALUM- INUM, DIS- SOLVED (UG/L AS AL)
NOV , 1983											
18...	48	.07	2690	63	.90	.070	.90	.100	.050	.020	140
JAN , 1984											
10...	51	.05	671	9	.78	.050	.30	.050	.010	.030	20
MAR											
01...	54	.07	775	32	.80	.030	.30	.030	.020	.010	30
MAY											
24...	53	.07	792	12	<.10	.050	.30	.050	.020	.500	50
JUL											
18...	63	.09	146	4	.37	.020	.40	.020	.010	.010	20
SEP											
20...	75	.09	94	10	.41	.010	.40	.070	.040	<.010	--

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

CHEHALIS RIVER BASIN

12035000 SATSOP RIVER NEAR SATSOP, WA

LOCATION.--Lat 47°00'03", long 123°29'37", in NE¼SE¼ sec.36, T.18 N., R.7 W., Grays Harbor County, Hydrologic Unit 17100104, in west pier of bridge on old U.S. Highway 410, 0.6 mi west of Satsop, and 2.3 mi upstream from mouth.

DRAINAGE AREA.--299 mi².

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

REVISED RECORDS.--WSP 1286: 1930-35(M), 1937(M). WSP 1716: Drainage area. WSP 1932: 1945, 1949(M), 1951(M), 1956-57(M), 1959(M).

GAGE.--Water-stage recorder. Datum of gage is National Geodetic Vertical Datum of 1929. Prior to Mar. 19, 1938, nonrecording gage at site 60 ft upstream at datum 20.9 ft higher.

REMARKS.--Records excellent. No regulation or diversion upstream from station.

AVERAGE DISCHARGE.--55 years, 2,038 ft³/s, 92.56 in/yr, 1,477,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 46,600 ft³/s Jan. 22, 1935, elevation, 38.9 ft, from floodmarks, present datum; minimum, 166 ft³/s Sept. 21, 1938; minimum elevation, 21.66 ft, present datum, Sept. 3-6, 1934.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in November 1909 reached a stage of 37.1 ft, from high-water mark, at railroad bridge 300 ft downstream.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 13,500 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Elevation (ft)	Date	Time	Discharge (ft ³ /s)	Elevation (ft)
Nov. 15	2200	*32,800	*34.66	Jan. 25	0700	17,400	31.12
Jan. 3	2100	16,400	30.83				

Minimum discharge, 244 ft³/s Oct. 16, 17, minimum elevation, 21.99 ft Sept. 28-30.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	304	860	2700	3790	2400	3810	1920	2170	1480	711	359	274
2	298	2020	2420	4870	2200	3740	1780	4020	1370	674	355	273
3	304	6180	2220	12200	2010	3250	1720	3190	1300	643	350	266
4	388	5790	2000	13200	1870	2810	1690	2560	1340	619	345	268
5	338	3720	2060	8010	1740	2520	1560	2350	1250	596	348	457
6	304	4220	1880	5270	1630	2280	1460	2080	1290	573	356	592
7	292	4180	1790	4120	1540	2100	1700	1850	1200	557	345	440
8	286	3580	2640	3860	1630	1950	1740	1780	1110	545	336	467
9	274	3180	3280	3650	1760	1810	1690	1700	1090	531	329	481
10	274	3450	5080	3410	2530	1760	2430	1690	1020	522	324	394
11	262	4800	4480	3110	2980	1690	3110	2060	980	512	324	382
12	262	4850	3860	2750	5590	2360	5170	2390	930	504	328	459
13	256	5030	4940	2480	6160	2920	4800	2140	890	495	345	405
14	256	6190	4610	2230	4310	2740	3570	1970	850	484	331	356
15	250	21900	3660	2010	3900	2760	3160	1850	820	475	319	330
16	244	22400	3040	1840	3400	2920	2710	1670	783	466	310	317
17	262	14600	2600	1690	2920	3560	2350	1520	756	452	310	314
18	268	12000	2300	1570	2700	4310	2150	1420	738	441	304	303
19	262	8550	2070	1450	2650	4250	2040	1610	720	433	298	296
20	338	11300	1870	1360	4260	4350	1910	2220	801	426	297	290
21	436	7050	1680	1350	4750	5690	1870	1910	920	419	292	281
22	1200	4970	1510	1790	3980	5250	1870	1930	783	412	290	296
23	1020	4080	1370	2580	3930	4160	1790	2640	711	405	285	293
24	747	7270	1220	5740	4350	3480	1640	2600	675	401	282	282
25	630	7900	1370	13900	3780	3250	1540	2370	648	397	279	278
26	540	5370	1420	6880	3260	3160	1430	2800	693	399	276	273
27	492	5960	1430	5360	3160	2830	1340	2580	747	391	287	267
28	452	4540	1280	4290	3260	2690	1290	2260	693	385	294	261
29	420	3670	1540	3600	3770	2490	1240	1990	776	379	278	256
30	540	3120	4600	3100	---	2250	1520	1780	781	372	274	256
31	1030	---	5180	2800	---	2080	---	1630	---	366	273	---
TOTAL	13229	202730	82100	134260	92420	95220	64190	66730	28145	14985	9723	10107
MEAN	427	6758	2648	4331	3187	3072	2140	2153	938	483	314	337
MAX	1200	22400	5180	13900	6160	5690	5170	4020	1480	711	359	592
MIN	244	860	1220	1350	1540	1690	1240	1420	648	366	273	256
CFSM	1.43	22.6	8.86	14.5	10.7	10.3	7.16	7.20	3.14	1.62	1.05	1.13
IN.	1.65	25.22	10.21	16.70	11.50	11.85	7.99	8.30	3.50	1.86	1.21	1.26
AC-FT	26240	402100	162800	266300	183300	188900	127300	132400	55830	29720	19290	20050
CAL YR 1983	TOTAL	882831	MEAN	2419	MAX	22400	MIN	244	CFSM	8.09	IN.	109.84
WTR YR 1984	TOTAL	813839	MEAN	2224	MAX	22400	MIN	244	CFSM	7.44	IN.	101.25
											AC-FT	1751000
											AC-FT	1614000

CHEHALIS RIVER BASIN

55

12035380 WYNOCHEE LAKE NEAR GRIDALE, WA

LOCATION.--Lat 47°23'08", long 123°36'16", in NE¼NW¼ sec.20, T.22 N., R.7 W., Grays Harbor County, Hydrologic Unit 17100104, Olympic National Forest, in monolith No. 6, near center line axis of Wynoochee Dam on Wynoochee River, 2.0 mi north of Gridale, at river mile 51.8.

DRAINAGE AREA.--41.0 mi².

PERIOD OF RECORD.--October 1972 to current year.

GAGE.--Water-stage recorder. Datum of gage is National Geodetic Vertical Datum of 1929 (levels by Corps of Engineers). Prior to May 22, 1973, staff gage on upstream face of dam.

REMARKS.--Reservoir is formed by concrete gravity-type dam with gate-type spillway; construction began in 1969; completed in 1972. Usable capacity, 67,288 acre-ft below elevation 690 ft, sluice invert level, and 800 ft, full pool elevation. Dead storage, 2,117 acre-ft below elevation 690 ft. Figures given herein represent total contents. Water is used for flood control, water supply, and recreation.

COOPERATION.--Daily elevations at 0800 hours, monthend elevations at 2400 hours, and capacity table furnished by Corps of Engineers.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents observed, 70,078 acre-ft July 13, 1983, elevation, 800.60 ft; minimum observed, 12,210 acre-ft Oct. 31, 1972, elevation, 725.7 ft.

EXTREMES FOR CURRENT YEAR.--Maximum contents observed, 69,427 acre-ft June 8, elevation, 800.02 ft; minimum observed, 32,439 acre-ft Nov. 7, elevation, 759.98 ft.

MONTHEND ELEVATION AND CONTENTS AT 2400, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984

Date	Elevation (feet)	Contents (acre-feet)	Change in contents (acre-feet)
Sept. 30.....	775.25	44,700	--
Oct. 31.....	764.35	35,761	-8,939
Nov. 30.....	762.35	34,224	-1,538
Dec. 31.....	764.79	36,103	+1,879
CAL YR 1983.....	--	--	+2,539
Jan. 31.....	762.54	34,369	-1,734
Feb. 29.....	762.47	34,316	-53
Mar. 31.....	784.93	53,611	+19,295
Apr. 30.....	797.06	66,141	+12,530
May 31.....	798.04	67,220	+1,079
June 30.....	799.14	68,442	+1,222
July 31.....	794.40	63,263	-5,179
Aug. 31.....	785.02	53,699	-9,564
Sept. 30.....	774.53	44,077	-9,622
WTR YR 1984.....	--	--	-623

12035400 WYNOCHEE RIVER NEAR GRIDDALE, WA

LOCATION.--Lat 47°22'50", long 123°36'31", in NW¼SW¼ sec.20, T.22 N., R.7 W., Grays Harbor County, Hydrologic Unit 17100104, Olympic National Forest, on right bank 0.5 mi downstream from Wynoochee Dam, 1.7 mi north of Grisdale, 1.7 mi downstream from Scatter Creek, and at mile 51.3.

DRAINAGE AREA.--41.3 mi².

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

GAGE.--Water-stage recorder. Elevation of gage is 630 ft, from topographic map. Prior to Nov. 3, 1967, at site 1,500 ft upstream at different datum.

REMARKS.--Records excellent. Since August 1972, flow regulated by Wynoochee Lake (see sta 12035380) for flood control, during summer months to augment the natural river flow, and for the water supply for the city of Aberdeen. Some regulation from 1969 to August 1972 due to dam construction. No diversion upstream from station.

AVERAGE DISCHARGE.--19 years, 542 ft³/s, 178.22 in/yr, 392,700 acre-ft/yr, adjusted for storage in Wynoochee Lake since October 1972.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 11,800 ft³/s Dec. 12, 1966, gage height, about 18.0 ft, from graph based on gage readings, site and datum then in use; minimum, 0.9 ft³/s Sept. 10, 12, 1974, gage height, 0.06 ft.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 10,400 ft³/s Nov. 16, gage height 7.74 ft; minimum, 171 ft³/s Mar. 1, gage height, 1.17 ft; minimum daily, 194 ft³/s Mar. 30, 31, Apr. 1.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	205	750	540	804	410	401	194	552	202	271	222	271
2	202	1440	488	804	338	231	197	1080	202	236	222	271
3	202	2040	430	2690	338	242	197	884	202	215	222	270
4	202	2190	378	4370	338	242	197	596	202	215	222	269
5	202	2030	351	1480	338	222	197	516	202	215	222	261
6	202	1480	347	985	338	208	197	516	205	217	249	286
7	202	868	347	713	333	215	197	435	205	221	280	294
8	202	577	510	684	570	218	197	378	226	222	320	264
9	202	577	705	924	698	218	197	383	351	222	266	264
10	202	642	705	900	698	218	200	383	410	253	222	264
11	202	590	705	616	698	218	200	499	410	271	222	264
12	202	596	932	471	1060	225	202	629	410	271	222	264
13	202	1010	1160	405	1600	215	200	629	410	271	222	264
14	202	1870	1010	351	1010	208	200	401	410	271	222	263
15	202	1670	772	351	622	212	202	324	410	271	221	263
16	202	7850	450	356	558	215	202	483	410	271	221	260
17	200	7850	342	351	430	218	200	483	410	238	220	260
18	200	5850	342	351	369	218	200	483	410	219	220	260
19	200	2210	342	351	378	218	200	483	346	221	219	260
20	200	1490	342	347	1150	720	200	772	249	221	218	260
21	253	1710	307	347	1700	1800	200	780	205	222	218	258
22	315	1230	279	347	1350	1700	200	635	205	222	218	257
23	315	892	264	900	924	1150	200	780	205	222	218	256
24	494	900	242	1450	828	908	287	772	205	222	218	256
25	635	1550	242	1730	720	684	342	642	205	222	218	256
26	629	1620	242	1270	713	347	338	642	205	222	218	256
27	629	1620	242	684	684	202	291	642	208	222	218	255
28	516	1220	242	528	663	202	256	635	211	222	239	254
29	405	772	245	540	663	200	256	635	240	222	275	253
30	405	603	546	534	---	194	260	494	271	222	273	251
31	528	---	804	528	---	194	---	275	---	222	271	---
TOTAL	9159	55697	14853	27162	20519	12663	6606	17841	8442	7254	7238	7884
MEAN	295	1857	479	876	708	408	220	576	281	234	233	263
MAX	635	7850	1160	4370	1700	1800	342	1080	410	271	320	294
MIN	200	577	242	347	333	194	194	275	202	215	218	251
AC-FT	18170	110500	29460	53880	40700	25120	13100	35390	16740	14390	14360	15640
MEAN†	150	1832	510	848	706	722	431	593	302	150	78	101
CFSM†	3.63	44.4	12.3	20.5	17.1	17.5	10.4	14.4	7.31	3.63	1.89	2.45
IN.†	4.19	49.49	14.23	23.68	18.46	20.17	11.64	16.56	8.15	4.18	2.18	2.73
AC-FT†	9230	109000	31340	52150	40650	44420	25630	36470	17960	9210	4800	6020

CAL YR 1983 TOTAL 231136 MEAN 633 MAX 7850 MIN 200 AC-FT 458500 MEAN† 637 CFSM† 15.4 IN.† 209.32 AC-FT† 461000
WTR YR 1984 TOTAL 195318 MEAN 534 MAX 7850 MIN 194 AC-FT 387400 MEAN† 533 CFSM† 12.9 IN.† 175.66 AC-FT† 386800

† Adjusted for change in contents in Wynoochee Lake.

CHEHALIS RIVER BASIN

57

12035450 BIG CREEK NEAR GRIDDALE, WA

LOCATION.--Lat 47°22'28", long 123°38'08", in SE¼SE¼ sec.24, T.22 N., R.8 W., Grays Harbor County, Hydrologic Unit 17100104, Olympic National Forest, on left bank 280 ft upstream from road bridge, 1.5 mi northwest of Grisdale, and 0.6 mi upstream from mouth.

DRAINAGE AREA.--9.57 mi².

PERIOD OF RECORD.--August 1972 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 600 ft, from topographic map.

REMARKS.--Records fair. No regulation or diversion upstream from station.

AVERAGE DISCHARGE.--12 years, 120 ft³/s, 170.28 in/yr, 86,940 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 2,760 ft³/s Dec. 26, 1975, gage height, 8.89 ft, from rating curve extended above 1,500 ft³/s; minimum, 9.4 ft³/s part or all of each day Aug. 25, 28, 29, 31, Sept. 1, 2, 3, 7, 8, 1982, gage height, 2.51 ft.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 1,100 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Nov. 15	1400	*2,530	*8.13	No other peak greater than base discharge.			
Minimum daily discharge, 11 ft ³ /s Aug. 25, 30, 31.							

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP		
1	19	84	135	177	119	298	82	228	74	36	17	12		
2	19	358	120	362	110	225	74	258	68	32	16	11		
3	21	574	109	731	102	161	78	156	64	31	16	11		
4	22	282	101	545	94	124	74	121	66	29	16	12		
5	19	184	96	284	89	102	67	108	62	29	15	41		
6	18	206	88	191	84	89	64	96	64	28	16	41		
7	18	211	94	162	80	74	78	86	61	28	15	24		
8	17	156	191	189	102	65	87	84	58	27	15	41		
9	17	161	235	173	171	59	104	94	54	26	15	28		
10	16	187	297	154	261	59	142	106	52	26	14	22		
11	16	344	224	133	305	60	237	174	50	25	14	22		
12	16	301	214	120	502	267	441	144	47	24	14	22		
13	16	324	460	104	328	228	237	113	45	24	15	20		
14	16	433	270	91	258	169	182	104	43	23	14	18		
15	16	1970	186	84	225	217	160	98	40	23	13	17		
16	15	1090	149	78	184	198	130	86	39	22	13	18		
17	16	840	127	71	156	331	110	78	37	21	12	16		
18	15	632	112	67	147	355	98	72	35	21	12	16		
19	16	577	101	62	220	243	90	90	34	20	12	16		
20	34	558	91	59	490	348	86	120	40	20	12	16		
21	43	309	84	59	295	386	90	96	46	20	12	15		
22	156	223	76	121	184	295	86	100	38	19	12	16		
23	59	188	68	246	147	220	82	145	34	19	12	15		
24	46	570	64	433	198	182	75	140	28	19	12	14		
25	39	397	58	550	142	169	72	130	31	19	11	14		
26	34	380	68	318	126	159	65	160	34	21	11	13		
27	31	363	63	264	174	137	62	140	38	20	15	13		
28	29	237	58	209	246	126	59	115	28	19	13	12		
29	28	186	152	174	264	110	55	100	42	18	12	12		
30	91	157	369	152	---	98	91	90	41	17	11	12		
31	80	---	289	133	---	87	---	80	---	17	11	---		
TOTAL	998	12482	4749	6496	5803	5641	3358	3712	1393	723	418	560		
MEAN	32.2	416	153	210	200	182	112	120	46.4	23.3	13.5	18.7		
MAX	156	1970	460	731	502	386	441	258	74	36	17	41		
MIN	15	84	58	59	80	59	55	72	28	17	11	11		
CFSM	3.36	43.5	16.0	21.9	20.9	19.0	11.7	12.5	4.85	2.43	1.41	1.95		
IN.	3.88	48.52	18.46	25.25	22.56	21.93	13.05	14.43	5.41	2.81	1.62	2.18		
AC-FT	1980	24760	9420	12880	11510	11190	6660	7360	2760	1430	829	1110		
CAL YR 1983	TOTAL	51618	MEAN	141	MAX	1970	MIN	15	CFSM	14.7	IN.	200.65	AC-FT	102400
WTR YR 1984	TOTAL	46333	MEAN	127	MAX	1970	MIN	11	CFSM	13.3	IN.	180.10	AC-FT	91900

NOTE.--No gage-height record May 18 to Aug. 29.

CHEHALIS RIVER BASIN

12036000 WYNOOCHEE RIVER ABOVE SAVE CREEK, NEAR ABERDEEN, WA

LOCATION.--Lat 47°17'57", long 123°39'07", in NE¼NE¼ sec.23, T.21 N., R.8 W., Grays Harbor County, Hydrologic Unit 17100104, on right bank 0.8 mi upstream from Save Creek, 2.5 mi downstream from Oxbow Dam Site, 11.0 mi downstream from Wynoochee Dam, 23.5 mi northeast of city hall in Aberdeen, and at mile 40.6.

DRAINAGE AREA.--74.1 mi².

PERIOD OF RECORD.--May 1925 to current year. Published as "at Oxbow, near Aberdeen" 1925-52, where drainage area was 70.7 mi². Records published for both sites October 1951 to October 1952.

REVISED RECORDS.--WSP 1346: 1952. WSP 1736: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 401 ft above National Geodetic Vertical Datum of 1929 (stadia traverse). Prior to Nov. 7, 1925, nonrecording gage at site 2.3 mi upstream at different datum. Nov. 7, 1925, to Sept. 3, 1947, water-stage recorder at site 1.5 mi upstream at datum 444.0 ft above National Geodetic Vertical Datum of 1929 (levels by city of Aberdeen). Sept. 4, 1947, to Oct. 13, 1952, water-stage recorder at site 2.5 mi upstream at datum about 91 ft higher. Oct. 5, 1951, to Sept. 30, 1976, water-stage recorder on left bank at same site and datum.

REMARKS.--Records good. Since August 1972, flow regulated by Wynoochee Lake (station 12035380) for flood control, during summer months to augment the natural river flow, and for the water supply for the city of Aberdeen. Some regulation from August 1969 to September 1972 due to dam construction. No diversions upstream from station.

AVERAGE DISCHARGE.--59 years, 832 ft³/s, 152.48 in/yr, 602,800 acre-ft/yr, adjusted for storage in Wynoochee Lake since October 1972.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 23,600 ft³/s Dec. 9, 1956, gage height, 16.95 ft, from rating curve extended above 9,000 ft³/s, minimum, 57 ft³/s Sept. 3, 4, 5, 1972, gage height, 4.43 ft.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 12,000 ft³/s Nov. 17, gage height, 12.50 ft; minimum discharge, 259 ft³/s Aug. 24-26, 28, minimum gage height, 5.14 ft Oct. 13; minimum daily, 268 ft³/s Aug. 26.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	291	849	966	1430	746	1190	464	1040	419	388	287	320
2	290	1990	894	1960	620	830	452	1740	408	357	286	317
3	300	3370	788	4930	602	725	464	1400	404	326	286	316
4	299	2840	725	6750	584	655	440	955	406	325	286	319
5	290	2560	683	2940	566	590	425	832	407	320	287	367
6	286	2070	655	1790	554	542	415	797	413	317	301	370
7	286	1530	669	1320	548	518	470	706	417	318	331	377
8	285	1010	974	1310	753	494	458	639	518	316	372	367
9	281	1030	1320	1480	1030	482	506	645	584	316	339	338
10	280	1130	1500	1500	1300	488	602	660	575	335	281	328
11	277	1350	1340	1080	1410	482	816	881	569	360	281	330
12	277	1320	1590	966	2330	760	1280	984	563	358	284	331
13	277	1740	2400	774	2670	739	902	931	557	355	282	322
14	276	2820	1860	676	1830	648	732	737	552	353	280	317
15	273	6990	1430	648	1250	690	676	572	546	351	277	316
16	273	10600	990	627	1040	683	596	724	542	350	277	319
17	279	10900	774	608	846	934	542	707	539	327	277	313
18	272	8850	739	590	753	1010	536	693	480	299	277	311
19	282	4540	711	578	878	854	518	865	391	299	276	309
20	325	3710	683	560	2240	1560	500	1110	358	299	272	308
21	366	3020	634	566	2780	2990	518	1100	345	298	273	306
22	655	2160	584	725	2160	2650	506	978	335	295	273	310
23	472	1570	560	1530	1540	1830	494	1210	330	295	273	306
24	561	2620	524	3020	1610	1440	530	1150	327	293	271	304
25	701	2840	524	3710	1280	1190	578	969	325	295	270	302
26	689	2920	548	2340	1210	809	562	1030	340	293	268	301
27	680	2890	524	1480	1250	608	520	960	330	292	275	299
28	602	2120	512	1080	1310	590	468	918	333	291	279	298
29	477	1370	718	990	1370	542	464	776	368	291	321	296
30	588	1100	1490	918	---	506	552	548	397	289	319	295
31	656	---	1710	870	---	488	---	435	---	289	317	---
TOTAL	12146	93809	30019	49746	37060	28517	16986	27692	13078	9890	8978	9612
MEAN	392	3127	968	1605	1278	920	566	893	436	319	290	320
MAX	701	10900	2400	6750	2780	2990	1280	1740	584	388	372	377
MIN	272	849	512	560	548	482	415	435	325	289	268	295
AC-FT	24090	186100	59540	98670	73510	56560	33690	54930	25940	19620	17810	19070
MEAN†	246	3103	999	1576	1277	1233	777	911	457	235	134	159
CFSM†	3.32	41.9	13.5	21.3	17.2	16.6	10.5	12.3	6.17	3.17	1.81	2.15
IN.†	3.83	46.70	15.54	24.53	18.59	19.19	11.69	14.17	6.87	3.65	2.09	2.39
AC-FT†	15150	184600	61420	96940	73460	75860	46220	56010	27160	14440	8250	9450

CAL YR 1983 TOTAL 383630 MEAN 1051 MAX 10900 MIN 272 AC-FT 760900 MEAN† 1054 CFSM† 14.2 IN.† 193.16 AC-FT† 763400
WTR YR 1984 TOTAL 337533 MEAN 922 MAX 10900 MIN 268 AC-FT 669500 MEAN† 922 CFSM† 12.4 IN.† 169.24 AC-FT† 668900

† Adjusted for change in contents in Wynoochee Lake.

CHEHALIS RIVER BASIN

59

12036650 ANDERSON CREEK NEAR MONTESANO, WA

LOCATION.--Lat 47°07'02", long 123°39'17", in SE¼NE¼ sec.22, T.19 N., R.8 W., Grays Harbor County, Hydrologic Unit 17100104, on right bank 70 ft upstream from Wynoochee Valley road bridge, 9.6 mi northwest of Montesano, and 1.0 mi upstream from mouth.

DRAINAGE AREA.--2.72 mi².

PERIOD OF RECORD.--August 1972 to current year.

REVISED RECORDS.--WDR WA-78-1: 1976, 1977.

GAGE.--Water-stage recorder and concrete control. Elevation of gage is 150 ft, from topographic map.

REMARKS.--Records fair. Natural regulation by upstream beaver dams. No diversions upstream from station.

AVERAGE DISCHARGE.--12 years, 14.8 ft³/s, 73.89 in/yr, 10,720 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 452 ft³/s Feb. 13, 1982, gage height, 8.53 ft; no flow at times most years.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 100 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Nov. 15	0545	285	6.56	Jan. 24	2400	*384	*7.96
Jan. 3	1100	325	7.19				

Minimum discharge, no flow Aug. 26, 27.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP		
1	.81	5.5	9.1	30	12	21	9.2	22	9.1	3.7	.69	.07		
2	.80	23	6.8	47	9.7	21	8.0	37	8.0	3.5	.69	.07		
3	1.1	85	5.5	247	8.4	20	7.6	31	7.2	3.1	.77	.07		
4	2.3	54	4.0	117	7.6	17	6.8	25	7.5	2.8	.78	.07		
5	1.2	37	4.2	60	6.4	13	6.0	21	6.8	2.5	.88	2.6		
6	.99	46	3.9	35	6.0	11	5.3	18	6.4	2.4	1.1	2.4		
7	.95	43	3.4	22	5.7	8.8	9.7	16	6.1	2.0	.56	1.1		
8	.95	39	7.2	17	5.7	7.6	8.4	14	5.9	1.9	.52	2.0		
9	.82	33	12	14	6.4	6.8	10	13	5.8	1.9	.45	1.0		
10	.80	39	26	15	9.7	6.4	19	12	5.0	1.9	.40	.70		
11	.80	62	27	16	12	5.7	28	18	4.8	1.6	.45	.87		
12	.80	53	22	14	55	11	49	17	4.5	1.6	.59	2.2		
13	.89	50	25	14	48	11	39	16	4.1	1.4	.65	1.7		
14	1.1	83	23	11	30	13	28	15	3.8	1.3	.56	.92		
15	.97	261	22	9.7	28	17	21	13	3.5	1.1	.45	.68		
16	.95	130	20	8.0	24	18	17	11	3.2	1.0	.29	.80		
17	1.6	97	17	6.8	18	24	14	9.6	3.0	.94	.33	1.2		
18	1.7	69	14	6.0	16	28	13	8.7	2.8	.88	.38	1.1		
19	1.6	67	12	5.3	14	28	11	13	2.5	.84	.24	1.0		
20	4.1	91	9.7	4.6	22	32	9.7	12	4.7	.81	.13	.80		
21	4.1	53	8.4	5.0	34	40	10	12	5.4	.84	.08	.65		
22	13	32	7.2	9.7	34	37	9.2	16	3.5	.86	.04	1.3		
23	6.9	22	6.4	27	40	28	9.2	23	2.8	.81	.04	1.3		
24	5.1	78	5.6	136	47	21	8.4	23	2.5	.84	.06	.80		
25	4.3	64	6.0	195	32	21	8.0	22	2.3	.90	.05	.52		
26	3.8	39	6.8	66	24	18	7.6	27	3.9	.95	.02	.36		
27	3.4	33	6.4	45	20	17	6.8	24	3.8	.74	.09	.58		
28	3.1	25	5.6	32	19	16	6.5	20	3.4	.95	.29	.70		
29	2.8	18	17	24	19	13	6.2	16	4.8	.95	.15	.65		
30	4.8	13	40	19	---	12	9.3	13	4.1	.89	.09	.58		
31	4.5	---	39	15	---	11	---	11	---	.76	.07	---		
TOTAL	81.03	1744.5	422.2	1273.1	613.6	554.3	400.9	549.3	141.2	46.66	11.89	28.79		
MEAN	2.61	58.1	13.6	41.1	21.2	17.9	13.4	17.7	4.71	1.51	.38	.96		
MAX	13	261	40	247	55	40	49	37	9.1	3.7	1.1	2.6		
MIN	.80	5.5	3.4	4.6	5.7	5.7	5.3	8.7	2.3	.74	.02	.07		
CFSM	.96	21.4	5.00	15.1	7.79	6.58	4.93	6.51	1.73	.56	.14	.35		
IN.	1.11	23.86	5.77	17.41	8.39	7.58	5.48	7.51	1.93	.64	.16	.39		
AC-FT	161	3460	837	2530	1220	1100	795	1090	280	93	24	57		
CAL YR 1983	TOTAL	5888.19	MEAN	16.1	MAX	261	MIN	.35	CFSM	5.92	IN.	80.53	AC-FT	11680
WTR YR 1984	TOTAL	5867.47	MEAN	16.0	MAX	261	MIN	.02	CFSM	5.88	IN.	80.25	AC-FT	11640

CHEHALIS RIVER BASIN

12037400 WYNOOCHEE RIVER ABOVE BLACK CREEK, NEAR MONTESANO, WA

LOCATION.--Lat 47°00'42", long 123°39'15", in SE¼SE¼ sec.27. T.18 N., R.8 W., Grays Harbor County, Hydrologic Unit 17100104, on left bank 2,000 ft upstream from Black Creek, 3.5 mi northwest of Montesano, and at mile 5.9.

DRAINAGE AREA.--155 mi².

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1956 to current year.

REVISED RECORDS.--WSP 1932: Drainage area.

GAGE.--Water-stage recorder. Elevation of gage is 40 ft, from topographic map.

REMARKS.--Water-discharge records excellent. City of Aberdeen diverted about 114 ft³/s for municipal supply at intake 2.2 mi upstream. Other small diversions for irrigation and domestic use. Since August 1972, flow regulated by Wynoochee Dam, 45.7 mi upstream, for flood control, during summer months to augment the natural river flow, and for the water supply for the city of Aberdeen. Some regulation from 1969 to August 1972 due to dam construction.

AVERAGE DISCHARGE.--28 years, 1,355 ft³/s, 945,500 acre-ft/yr, unadjusted.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 25,500 ft³/s Jan. 19, 1968; maximum gage height, 20.54 ft Dec. 10, 1956; minimum discharge, 3.0 ft³/s part or all of each day Aug. 26-30, 1967, gage height, 2.86 ft.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 15,900 ft³/s Nov. 17, gage height, 15.20 ft; minimum, 185 ft³/s Aug. 24-27, 29, gage height, 2.50 ft.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	211	809	1530	2120	1360	2130	832	1200	680	437	219	242
2	209	1880	1400	2890	1130	1680	771	2410	630	425	248	237
3	217	5050	1230	7350	1040	1410	751	2320	600	439	221	233
4	264	4340	1130	10300	965	1250	738	1600	630	412	214	239
5	230	3730	1120	5810	916	1130	680	1380	594	363	217	340
6	214	3390	1020	3410	867	965	642	1250	618	342	224	379
7	207	2930	990	2440	804	916	797	1150	582	307	244	344
8	203	2080	1320	2160	853	832	797	1020	594	305	269	378
9	200	1880	1820	2080	1200	777	790	972	738	300	303	330
10	198	2070	2610	2370	1710	771	1130	986	712	296	244	286
11	193	2750	2330	1910	1950	745	1410	1200	699	328	214	286
12	191	2590	2250	1580	3360	1080	2450	1420	680	338	215	324
13	191	2760	3260	1350	4090	1260	2130	1340	667	332	222	290
14	190	4190	2910	1180	3130	1180	1560	1260	648	326	211	267
15	186	11300	2340	1060	2260	1170	1300	916	636	321	205	255
16	184	12800	1750	986	1890	1230	1130	979	618	314	201	257
17	204	14100	1320	930	1560	1520	986	972	600	309	201	252
18	194	11500	1180	881	1360	1810	930	937	582	270	197	244
19	195	6830	1080	832	1330	1770	867	1090	496	253	194	240
20	271	6460	986	790	2380	1970	825	1340	474	248	193	235
21	288	4440	916	811	3760	3700	818	1490	474	244	190	231
22	683	3610	804	1060	3400	3840	811	1360	408	242	189	242
23	647	2500	738	1710	2780	2910	777	1670	375	238	189	236
24	516	4140	811	4910	3000	2200	719	1720	353	269	186	232
25	709	4430	706	8770	2380	2080	790	1480	342	282	185	226
26	718	4060	738	4720	2030	1670	771	1650	381	295	185	224
27	703	4000	745	3300	2010	1270	732	1490	392	281	201	222
28	683	3380	660	2360	1940	1180	654	1360	364	233	196	217
29	516	2310	902	1950	2080	1080	636	1250	430	230	208	215
30	574	1840	2260	1680	---	972	790	1000	447	226	234	213
31	695	---	2600	1500	---	902	---	771	---	222	236	---
TOTAL	10884	138149	45456	85200	57535	47400	29014	40983	16444	9427	6655	7916
MEAN	351	4605	1466	2748	1984	1529	967	1322	548	304	215	264
MAX	718	14100	3260	10300	4090	3840	2450	2410	738	439	303	379
MIN	184	809	660	790	804	745	636	771	342	222	185	213
AC-FT	21590	274000	90160	169000	114100	94020	57550	81290	32620	18700	13200	15700
CAL YR 1983	TOTAL	552887	MEAN	1515	MAX	14100	MIN	184	AC-FT	1097000		
WTR YR 1984	TOTAL	495063	MEAN	1353	MAX	14100	MIN	184	AC-FT	982000		

CHEHALIS RIVER BASIN

61

12037400 WYNOCHEE RIVER ABOVE BLACK CREEK, NEAR MONTESANO, WA--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Sediment records October 1961 to June 1965.

PERIOD OF DAILY RECORD.--

WATER TEMPERATURES: October 1969 to current year.

INSTRUMENTATION.--Temperature recorder since October 1969.

REMARKS.--Interruptions in record were due to malfunctions of the instrument.

EXTREMES FOR PERIOD OF DAILY RECORD.--

WATER TEMPERATURES: Maximum, 24.0°C Aug. 10, 1971; minimum, 1.0°C Jan. 9, 10, 1973, Jan. 7-9, 1974, Jan. 29, 1980.

EXTREMES FOR CURRENT YEAR.--

WATER TEMPERATURES: Maximum recorded, 21.5°C Aug. 8; minimum recorded, 1.5°C Dec. 21.

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984

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

CHEHALIS RIVER BASIN

12037400 WYNOOCHEE RIVER ABOVE BLACK CREEK, NEAR MONTESANO, WA--Continued

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984

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

QUINULT RIVER BASIN

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12039300 NORTH FORK QUINULT RIVER NEAR AMANDA PARK, WA
(Hydrologic bench-mark station)

LOCATION.--Lat 47°35'46", long 123°37'23", in SW¼ sec.6, T.24 N., R.7 W., Jefferson County, Hydrologic Unit 17100102, Olympic National Park, on right bank 15.5 mi northeast of Amanda Park, and at mile 5.2.

DRAINAGE AREA.--74.1 mi².

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--November 1964 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 620 ft, from topographic map.

REMARKS.--Water-discharge records poor. No regulation or diversion upstream from station.

AVERAGE DISCHARGE.--19 years, 889 ft³/s, 162.92 in/yr, 644,100 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 30,000 ft³/s Dec. 3, 1982, gage height, 15 ft, from floodmarks, from rating curve extended above 4,000 ft³/s; minimum, 103 ft³/s Oct. 3, 1965.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 6,000 ft³/s and maximum (*) from rating curve extended above 4,000 ft³/s:

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Nov. 3	0200	14,500	11.56	Nov. 24	1400	6,200	10.27
Nov. 11	0800	7,170	9.50	Jan. 4	0700	10,600	12.15
Nov. 15	1000	*20,500	*13.51	Jan. 24	2400	6,570	10.97

Minimum recorded discharge, 104 ft³/s Oct. 16, 19.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP		
1	145	995	788	776	627	760	561	698	819	1060	624	259		
2	142	3800	741	2510	592	714	528	927	789	1100	571	208		
3	195	5540	691	5270	560	616	500	682	816	1140	512	193		
4	232	2650	658	6950	540	561	480	568	954	1160	487	326		
5	162	1340	622	2260	520	550	475	500	1180	1150	490	1300		
6	148	1660	586	1800	510	540	470	490	1020	970	470	539		
7	137	1150	665	1600	540	535	470	490	973	874	450	335		
8	131	871	978	1400	1230	530	470	806	913	907	500	564		
9	125	803	953	1130	1090	540	480	739	885	944	510	331		
10	121	2820	970	1050	857	560	545	645	878	927	490	276		
11	117	4790	850	901	833	725	589	1030	901	921	460	265		
12	115	3130	789	789	2120	929	842	978	1040	858	440	268		
13	112	2360	1160	698	1230	834	670	1040	1210	839	430	229		
14	110	3190	967	635	923	817	742	1050	1450	867	390	209		
15	108	15200	775	590	806	814	1160	794	1370	968	370	201		
16	105	5490	682	554	723	773	879	696	1140	1090	350	214		
17	115	4160	618	525	685	953	671	647	1000	1050	356	208		
18	106	3520	575	505	672	961	662	662	1010	920	322	206		
19	116	2450	530	475	1050	910	624	1940	1020	819	295	193		
20	257	2160	478	459	3970	2830	574	1230	1090	745	285	183		
21	435	1530	442	459	1370	2070	631	882	1130	682	308	174		
22	1120	1270	418	623	1000	1320	615	1100	1120	682	277	190		
23	325	1150	403	900	900	1200	556	1310	1230	760	262	169		
24	237	3630	398	2890	800	974	510	964	1350	823	249	160		
25	232	1710	426	2890	760	878	500	851	1290	836	239	155		
26	191	1470	433	1220	730	808	470	1160	1370	687	242	150		
27	194	1520	384	1070	800	715	450	1050	1190	625	380	146		
28	164	1120	363	981	880	679	440	1230	1340	609	257	142		
29	153	952	845	849	940	616	435	1580	1810	623	223	139		
30	1160	857	1800	726	---	583	400	1350	1190	653	214	138		
31	547	---	1140	681	---	580	---	955	---	655	213	---		
TOTAL	7557	83288	22128	44166	28258	26875	17399	29044	33478	26944	11666	8070		
MEAN	244	2776	714	1425	974	867	580	937	1116	869	376	269		
MAX	1160	15200	1800	6950	3970	2830	1160	1940	1810	1160	624	1300		
MIN	105	803	363	459	510	530	400	490	789	609	213	138		
CFSM	3.29	37.5	9.64	19.2	13.1	11.7	7.83	12.6	15.1	11.7	5.07	3.63		
IN.	3.79	41.81	11.11	22.17	14.19	13.49	8.73	14.58	16.81	13.53	5.86	4.05		
AC-FT	14990	165200	43890	87600	56050	53310	34510	57610	66400	53440	23140	16010		
CAL YR 1983	TOTAL	414154	MEAN	1135	MAX	15200	MIN	105	CFSM	15.3	IN.	207.92	AC-FT	821500
WTR YR 1984	TOTAL	338873	MEAN	926	MAX	15200	MIN	105	CFSM	12.5	IN.	170.12	AC-FT	672200

QUINULT RIVER BASIN

12039300 NORTH FORK QUINULT RIVER NEAR AMANDA PARK, WA--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1965 to current year.

PERIOD OF DAILY RECORD.--

WATER TEMPERATURES: March 1965 to September 1979.

WATER QUALITY DATA, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984

		STREAM- FLOW, INSTAN- TANEOUS (CFS)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH (STAND- ARD UNITS)	TEMPER- ATURE (DEG C)	TUR- BID- ITY (NTU)	OXYGEN, DIS- SOLVED (MG/L)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION)	COLI- FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)	STREP- TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML)	HARD- NESS (MG/L AS CAC03)	
JAN 1984												
11...	11:15	900	73	8.0	5.5	1.5	12.9	103	K2	K3	33	
MAR												
21...	12:30	1680	50	7.2	4.0	5.0	12.5	98	<1	K10	22	
MAY												
23...	11:00	1290	58	7.3	4.5	3.0	11.4	89	K1	K4	24	
AUG												
15...	12:00	322	84	7.6	10.0	0.6	10.7	97	<1	K8	38	
DATE	TIME	HARD- NESS NONCAR- BONATE (MG/L AS CAC03)	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)	SULFATE DIS- SOLVED (MG/L AS S04)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	FLUO- RIDE, DIS- SOLVED (MG/L AS F)	SILICA, DIS- SOLVED (MG/L AS SiO2)
JAN 1984												
11...	33	12	0.6	1.4	9	0.1	0.2	9.4	1.1	<0.1	4.6	
MAR												
21...	22	8.3	0.4	1.0	9	0.1	0.2	6.8	0.9	<0.1	3.4	
MAY												
23...	24	9.0	0.41	1.2	10	0.1	0.1	7.9	1.0	<0.1	3.6	
AUG												
15...	38	14	0.7	1.5	8	0.1	0.2	10	0.7	<0.1	4.6	
DATE	TIME	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 DIS- SOLVED (MG/L AS N)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N)	NITRO- GEN,AM- MONIA + ORGANIC TOTAL (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)	ALUM- INUM, DIS- SOLVED (UG/L AS AL)
JAN 1984												
11...	44	46	0.06	107	<0.10	0.04	<0.2	0.01	0.01	0.01	20	
MAR												
21...	28	33	0.04	127	<0.10	0.05	<0.2	0.01	0.01	<0.01	--	
MAY												
23...	32	35	0.04	111	<0.10	0.04	0.4	0.02	0.01	0.02	--	
AUG												
15...	47	49	0.06	41	<0.10	0.03	0.6	<0.01	0.01	<0.01	20	

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

QUINULT RIVER BASIN

65

12039300 NORTH FORK QUINULT RIVER NEAR AMANDA PARK, WA--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984

DATE	ARSENIC DIS- SOLVED (UG/L AS AS)	BARIUM, DIS- SOLVED (UG/L AS BA)	BERYL- LIUM, DIS- SOLVED (UG/L AS BE)	CADMIUM DIS- SOLVED (UG/L AS CD)	CHRO- MIUM, DIS- SOLVED (UG/L AS CR)	COBALT, DIS- SOLVED (UG/L AS CO)	COPPER, DIS- SOLVED (UG/L AS CU)	IRON, DIS- SOLVED (UG/L AS FE)	LEAD, DIS- SOLVED (UG/L AS PB)	LITHIUM DIS- SOLVED (UG/L AS LI)	MANGA- NESE, DIS- SOLVED (UG/L AS MN)
JAN 1984 11...	<1	6	<0.5	<1	<1	<3	7	6	1	4	3
MAR 21...	--	--	--	--	--	--	--	--	--	--	--
MAY 23...	--	--	--	--	--	--	--	--	--	--	--
AUG 15...	<1	10	<0.5	<1	<1	<3	2	<3	2	5	1
DATE	MERCURY DIS- SOLVED (UG/L AS HG)	MOLYB- DENUM, DIS- SOLVED (UG/L AS MO)	NICKEL, DIS- SOLVED (UG/L AS NI)	SELE- NIUM, DIS- SOLVED (UG/L AS SE)	SILVER, DIS- SOLVED (UG/L AS AG)	STRON- TIUM, DIS- SOLVED (UG/L AS SR)	VANA- DIUM, DIS- SOLVED (UG/L AS V)	ZINC, DIS- SOLVED (UG/L AS ZN)	SEDI- MENT, DIS- SUS- PENDE (MG/L)	SEDI- MENT, DIS- CHARGE, SUS- PENDE (T/DAY)	
JAN 1984 11...	0.1	<10	<1	<1	<1	89	<6	25	7	17	
MAR 21...	--	--	--	--	--	--	--	--	18	82	
MAY 23...	--	--	--	--	--	--	--	--	3	10	
AUG 15...	<0.1	<10	<1	<1	<1	92	<6	11	4	3.5	
DATE	TIME	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 DIS- SOLVED, EXTRAC- TION (UG/L)		
AUG , 1984 15...	1200	<.8	<.4	<.6	<.4	<.5	<.4	.08	.03		

QUINALT RIVER BASIN

12039500 QUINALT RIVER AT QUINALT LAKE, WA

LOCATION.--Lat 47°27'28", long 123°53'17", in SW¼NE¼ sec.25, T.23 N., R.10 W., Grays Harbor County, Hydrologic Unit 17100102, Quinalt Indian Reservation, on left bank at outlet of Quinalt Lake, 50 ft downstream from Olympic Highway bridge on U. S. Highway 101, 2.0 mi southwest of Quinalt, and at mile 33.4.

DRAINAGE AREA.--264 mi².

PERIOD OF RECORD.--October 1911 to current year. Monthly discharge only for some periods, published in WSP 1316.

REVISED RECORDS.--WSP 442: Drainage area. WSP 1286: 1915-16(M), 1934, 1936-39(M). WSP 1316: 1923, 1925, 1933. WSP 1635: 1917.

GAGE.--Water-stage recorder. Datum of gage is 184.60 ft above National Geodetic Vertical Datum of 1929 (State Highway Department bench mark). Prior to Sept. 30, 1916, nonrecording gages at sites within 4 mi northeast of present site, at different datum. Oct. 1, 1916, to May 2, 1935, water-stage recorder at site 300 ft downstream from present site at datum 0.36 ft higher than present datum.

REMARKS.--Records excellent. Flow affected by natural storage in Quinalt Lake. No diversions upstream from station.

AVERAGE DISCHARGE.--73 years, 2,858 ft³/s, 147.01 in/yr, 2,071,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 50,200 ft³/s Nov. 4, 1955, gage height, 20.51 ft; minimum, 276 ft³/s Sept. 12, 1944, gage height, 1.96 ft.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in November 1909 reached a stage of approximately 22 ft, present datum, discharge, 52,600 ft³/s.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 12,000 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Nov. 15	2400	*33,100	*15.97	Jan. 4	1400	16,600	10.67

Minimum discharge, 423 ft³/s Sept. 30, minimum gage height, 2.20 ft Oct. 18, 19.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP		
1	604	1620	3330	3700	2780	3970	2160	1870	3230	3080	1350	572		
2	584	3680	2920	4760	2480	3830	2020	2770	2830	2810	1320	565		
3	584	8690	2620	9660	2240	3390	1930	3180	2590	2670	1270	545		
4	619	9820	2380	15300	2060	2940	1880	2960	2540	2630	1200	538		
5	619	7300	2240	13400	1950	2590	1790	2710	2630	2610	1150	776		
6	600	6010	2050	9040	1890	2390	1710	2450	2820	2560	1110	1390		
7	576	5550	1930	6660	1800	2310	1710	2210	2790	2370	1060	1350		
8	558	4720	2220	5580	2030	2260	1720	2200	2700	2210	1030	1360		
9	540	3980	2600	4900	2650	2290	1740	2360	2640	2130	1020	1320		
10	523	3950	3260	4400	3380	2360	1970	2470	2520	2090	1020	1180		
11	508	8210	3470	3940	3600	2440	2410	2650	2430	2060	1010	1080		
12	495	9820	3410	3450	4660	2790	3460	3220	2420	2020	978	1020		
13	485	9710	4270	3040	6090	3450	4000	3250	2500	1950	948	930		
14	475	9250	4860	2700	5210	3420	3540	3350	2720	1900	900	843		
15	464	21600	4270	2420	4420	3400	3450	3260	3010	1890	848	769		
16	454	29400	3570	2190	3800	3440	3540	2950	3060	1960	810	751		
17	459	22700	3000	2010	3240	4030	3180	2660	2880	2070	787	714		
18	453	18800	2590	1850	2840	4560	2870	2420	2690	2090	768	676		
19	459	13400	2290	1730	2670	4500	2720	2750	2570	2010	741	645		
20	501	11300	2050	1640	5670	4900	2530	4190	2570	1890	713	611		
21	555	8420	1820	1640	7280	7750	2390	4050	2640	1760	685	583		
22	1090	6230	1660	1880	5790	7420	2350	3610	2640	1650	663	572		
23	1280	4930	1540	2510	4780	6050	2300	3920	2630	1580	645	560		
24	1180	6290	1440	4940	4300	5080	2150	4030	2740	1590	624	542		
25	1060	8960	1380	10800	3830	4340	1980	3640	2860	1640	604	518		
26	964	7230	1420	8860	3370	3870	1830	3550	2930	1640	585	496		
27	886	7240	1420	6550	3220	3410	1710	3550	2990	1570	607	476		
28	819	5900	1330	5080	3370	3100	1610	3390	2880	1480	642	459		
29	763	4710	1430	4270	3810	2800	1550	3500	3240	1400	627	441		
30	980	3900	2860	3610	---	2530	1580	3820	3440	1360	596	428		
31	1570	---	3970	3120	---	2310	---	3690	---	1360	573	---		
TOTAL	21707	273320	79600	155630	105210	113920	69780	96630	83130	62030	26884	22710		
MEAN	700	9111	2568	5020	3628	3675	2326	3117	2771	2001	867	757		
MAX	1570	29400	4860	15300	7280	7750	4000	4190	3440	3080	1350	1390		
MIN	453	1620	1330	1640	1800	2260	1550	1870	2420	1360	573	428		
CFSM	2.65	34.5	9.73	19.0	13.7	13.9	8.81	11.8	10.5	7.58	3.28	2.87		
IN.	3.06	38.51	11.22	21.93	14.83	16.05	9.83	13.62	11.71	8.74	3.79	3.20		
AC-FT	43060	542100	157900	308700	208700	226000	138400	191700	164900	123000	53320	45050		
CAL YR 1983	TOTAL	1298779	MEAN	3558	MAX	29400	MIN	453	CFSM	13.5	IN.	183.01	AC-FT	2576000
WTR YR 1984	TOTAL	1110551	MEAN	3034	MAX	29400	MIN	428	CFSM	11.5	IN.	156.49	AC-FT	2203000

QUEETS RIVER BASIN

12040500 QUEETS RIVER NEAR CLEARWATER, WA--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--October 1977 to current year.

WATER QUALITY DATA, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984

DATE	TIME	STREAM- FLOW, INSTAN- TANEOUS (CFS)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH (STAND- ARD UNITS)	TEMPER- ATURE (DEG C)	TUR- BID- ITY (NTU)	OXYGEN, DIS- SOLVED (MG/L)	OXYGEN, DIS- SOLVED (MG/L)	ATION)	COLI- FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)	STREP- TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML)	HARD- NESS (MG/L AS CACO3)	HARD- NESS BONATE (MG/L AS CACO3)
NOV , 1983													
16...	1130	45000	34	7.4	9.0	320	10.7	94		140	K11	11	0
FEB , 1984													
29...	1300	6090	47	7.5	6.5	3.7	12.1	98		K5	K3	18	4
MAY													
22...	1130	4540	55	7.0	8.0	4.6	11.6	98		K11	K2	20	4
AUG													
14...	1200	890	74	7.3	14.5	1.2	9.9	97		K8	K1	29	5
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)	
NOV , 1983													
16...		3.6	.57	2.1	28	.3	.40	12		5.6	2.4	<.10	4.2
FEB , 1984													
29...		5.8	.80	2.4	22	.3	.30	14		6.4	2.4	<.10	5.3
MAY													
22...		6.7	.80	2.4	20	.2	.30	16		6.4	2.3	<.10	5.7
AUG													
14...		10	.90	2.5	16	.2	.30	24		7.9	1.7	.10	5.0
DATE		SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L)	SOLIDS, SUM OF CONSTITUENTS, DIS- SOLVED (MG/L)	SOLIDS, DIS- SOLVED (TONS PER AC-FT)	SOLIDS, DIS- SOLVED (TONS PER DAY)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N)	NITRO- GEN,AM- MONIA + ORGANIC TOTAL (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)	ALUM- INUM, DIS- SOLVED (UG/L AS AL)	
NOV , 1983													
16...		30	27	.04	3650	.13	.060	.40	.500	.010	<.010	190	
FEB , 1984													
29...		30	32	.04	493	<.10	.010	.20	.020	.010	<.010	50	
MAY													
22...		35	34	.05	429	<.10	.040	.30	.010	.010	.030	30	
AUG													
14...		39	43	.05	94	<.10	<.010	.40	.010	.010	<.010	20	

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

QUEETS RIVER BASIN

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12040500 QUEETS RIVER NEAR CLEARWATER, WA--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984

DATE	ARSENIC DIS- SOLVED (UG/L AS AS)	BARIUM, DIS- SOLVED (UG/L AS BA)	BERYL- LIUM, DIS- SOLVED (UG/L AS BE)	CADMIUM DIS- SOLVED (UG/L AS CD)	CHRO- MIUM, DIS- SOLVED (UG/L AS CR)	COBALT, DIS- SOLVED (UG/L AS CO)	COPPER, DIS- SOLVED (UG/L AS CU)	IRON, DIS- SOLVED (UG/L AS FE)	LEAD, DIS- SOLVED (UG/L AS PB)	LITHIUM DIS- SOLVED (UG/L AS LI)	MANGA- NESE, DIS- SOLVED (UG/L AS MN)
NOV , 1983											
16...	<1	12	<.5	<1	<1	<3	3	170	1	5	28
FEB , 1984											
29...	<1	12	<.5	<1	<1	<3	<1	47	2	<4	4
MAY											
22...	<1	13	2.0	1	<1	<3	2	40	<1	6	4
AUG											
14...	<1	17	1.0	<1	<1	<3	3	25	2	7	6
DATE	MERCURY DIS- SOLVED (UG/L AS HG)	MOLYB- DENUM, DIS- SOLVED (UG/L AS MO)	NICKEL, DIS- SOLVED (UG/L AS NI)	SELE- NIUM, DIS- SOLVED (UG/L AS SE)	SILVER, DIS- SOLVED (UG/L AS AG)	STRON- TIUM, DIS- SOLVED (UG/L AS SR)	VANA- DIUM, DIS- SOLVED (UG/L AS V)	ZINC, DIS- SOLVED (UG/L AS ZN)	SEDI- MENT, SUS- PENDE (MG/L)	SED- MENT, DIS- CHARGE, SUS- PENDE (T/DAY)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM
NOV , 1983											
16...	<.1	<10	<1	<1	1	31	<6	31	1000	122000	72
FEB , 1984											
29...	<.1	<10	6	<1	<1	49	<6	34	12	197	--
MAY											
22...	<.1	<10	<1	<1	<1	56	<6	10	16	196	--
AUG											
14...	<.1	<10	<1	<1	<1	71	<6	13	4	9.6	--

12041200 HOH RIVER AT U.S. HIGHWAY 101, NEAR FORKS, WA

LOCATION.--Lat 47°48'25", long 124°14'59", in NE¼NE¼ sec.33, T.27 N., R.12 W., Jefferson County, Hydrologic Unit 17100101, on left bank 250 ft downstream from U.S. Highway 101, 1.0 mi downstream from Hell Roaring Creek, 11.5 mi southeast of Forks, and at mile 15.4.

DRAINAGE AREA.--253 mi².

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

GAGE.--Water-stage recorder. Datum of gage is 163.64 ft above National Geodetic Vertical Datum of 1929.

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

AVERAGE DISCHARGE.--24 years, 2,625 ft³/s, 137.95 in/yr, 1,862,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 51,600 ft³/s Dec. 17, 1979, gage height, 19.08 ft from rating curve extended above 30,100 ft³/s on basis of slope-area measurement at gage height 17.74 ft; minimum, 335 ft³/s Oct. 19, 1983; minimum gage height, 2.40 ft Sept. 27, 1961.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 16,000 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height [†] (ft)	Date	Time	Discharge (ft ³ /s)	Gage height [†] (ft)
Nov. 15	1900	*42,000	*17.13	Jan. 24	2400	17,700	11.09
Jan. 4	1300	23,700	12.82				

Minimum discharge, 335 ft³/s Oct. 19, gage height, 2.71 ft.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP		
1	494	1880	2330	2520	2240	3310	1740	1540	2080	2230	1620	1020		
2	476	6240	2140	6810	2030	3250	1640	2210	1830	2170	1540	916		
3	518	9660	1980	12800	1880	2640	1600	2160	1760	2060	1400	811		
4	778	7900	1870	18700	1760	2250	1570	1760	1880	2130	1280	822		
5	650	4590	1750	10100	1710	2030	1490	1930	2170	2200	1240	2670		
6	567	4550	1610	6390	1630	1950	1490	1760	2160	2040	1290	2910		
7	518	4680	1610	5090	1590	1890	1800	1570	2090	1790	1210	1670		
8	476	3660	3010	4680	2340	1820	1750	2170	2130	1690	1430	1950		
9	446	3030	2830	3700	2880	1810	1850	2340	2120	1700	1550	1560		
10	425	3820	3350	3550	3350	1890	2400	2400	1970	1690	1550	1320		
11	410	9740	2940	3150	3120	1840	3000	2430	1870	1670	1430	1240		
12	400	7520	2950	2710	5270	2940	4070	2620	1890	1630	1290	1500		
13	375	5920	4840	2390	4320	2730	3110	2390	2000	1570	1230	1270		
14	370	5790	4160	2140	3480	2370	2520	2620	2290	1570	1100	1070		
15	355	32600	3080	1950	2920	2320	3010	2340	2410	1640	1030	1000		
16	345	20600	2500	1820	2450	2140	2820	2070	2160	1820	1050	1070		
17	350	13900	2140	1700	2140	3870	2260	1870	1930	2050	1210	1180		
18	355	12300	1900	1600	1980	3770	2080	1770	1820	1850	1180	1220		
19	345	7800	1740	1510	2210	3110	1990	3820	1790	1650	1040	1120		
20	494	6770	1560	1440	8920	4620	1820	4270	1930	1490	955	997		
21	635	4800	1430	1470	5480	6790	1760	3150	2020	1370	935	893		
22	2280	3800	1310	2450	4210	4970	1790	2670	2030	1330	959	848		
23	1220	3230	1220	3820	3660	4200	1810	3300	2000	1440	921	763		
24	860	6700	1160	8770	3350	3630	1550	2890	2280	1660	866	692		
25	894	5830	1150	12300	2760	3250	1440	2480	2320	1910	822	646		
26	886	5050	1390	6130	2480	2880	1330	2740	2400	1840	832	602		
27	938	5400	1240	4640	3200	2480	1240	2520	2560	1580	1750	576		
28	794	3790	1100	3790	3350	2410	1200	2330	2460	1460	1460	552		
29	685	3080	1690	3350	3230	2160	1150	2670	3660	1420	1090	539		
30	2130	2640	4420	2800	---	1940	1230	2920	2980	1470	938	548		
31	2580	---	3700	2470	---	1840	---	2500	---	1560	863	---		
TOTAL	23049	217270	70100	146740	89940	89100	58510	76210	64990	53680	37061	33975		
MEAN	744	7242	2261	4734	3101	2874	1950	2458	2166	1732	1196	1133		
MAX	2580	32600	4840	18700	8920	6790	4070	4270	3660	2230	1750	2910		
MIN	345	1880	1100	1440	1590	1810	1150	1540	1760	1330	822	539		
CFSM	2.94	28.6	8.94	18.7	12.3	11.4	7.71	9.72	8.56	6.85	4.73	4.48		
IN.	3.39	31.95	10.31	21.58	13.22	13.10	8.60	11.21	9.56	7.89	5.45	5.00		
AC-FT	45720	431000	139000	291100	178400	176700	116100	151200	128900	106500	73510	67390		
CAL YR 1983	TOTAL	1065192	MEAN	2918	MAX	32600	MIN	345	CFSM	11.5	IN.	156.62	AC-FT	2113000
WTR YR 1984	TOTAL	960625	MEAN	2625	MAX	32600	MIN	345	CFSM	10.4	IN.	141.25	AC-FT	1905000

QUILLAYUTE RIVER BASIN

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12043000 CALAWAH RIVER NEAR FORKS, WA

LOCATION.--Lat 47°57'37", long 124°23'30", in NW¼SW¼ sec.4, T.28 N., R.13 W., Clallam County, Hydrologic Unit 17100101, on left bank 30 ft downstream from U.S. Highway 101 bridge, 0.8 mi northwest of Forks, and at mile 6.6.

DRAINAGE AREA.--129 mi².

PERIOD OF RECORD.--November 1897 to December 1901, October to December 1975 (discharge measurements and peak discharges), January 1976 to September 1980, March to September 1984. Monthly and peak discharge only, November 1897 and August 1898, published in WSP 1316. Published as Calowa River at Forks, November 1897 to December 1899; as Calowa River near Forks, 1900; and as Kalawa River near Forks, 1901.

REVISED RECORDS.--WSP 1316: 1898-1902. WSP 1736: Drainage area.

GAGE.--Water-stage recorder and crest-stage gage. Datum of gage is 201.58 ft above National Geodetic Vertical Datum of 1929. November 1897 to December 1901, nonrecording gage at same site but at different datum; October to December 1975, nonrecording gage and crest-stage gage at same site and datum.

REMARKS.--Records good, except those for period of no gage-height record, March 17 to April 24 and May 19 to 23, which are fair. No regulation or diversion upstream from station.

AVERAGE DISCHARGE.--7 years (water years 1899-1901, 1977-80), 1,032 ft³/s, 108.64 in/yr, 747,700 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 28,900 ft³/s Dec. 17, 1979, gage height, 18.98 ft, from rating curve extended above 10,000 ft³/s on basis of step-backwater analysis; minimum, 15 ft³/s Sept. 28, 1899.

EXTREMES FOR CURRENT YEAR.--Maximum discharge during period March to September, unknown, March 21, gage height, unknown, no peak above base of 10,000 ft³/s; minimum discharge for period, 72 ft³/s Aug. 26, gage height, 2.72 ft.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1						1940	700	686	686	314	116	142
2						2070	660	1060	609	291	113	109
3						1660	680	1190	574	270	111	88
4						1300	660	1000	599	257	107	81
5						1080	590	949	604	253	110	338
6						968	590	865	594	240	124	491
7						859	800	768	579	229	114	246
8						756	770	986	599	219	106	350
9						681	820	1040	670	212	101	282
10						660	1050	1430	609	205	99	245
11						599	1700	1330	560	199	97	221
12						1500	2600	1260	508	198	94	210
13						1530	1800	1110	468	192	100	183
14						1330	1300	1080	438	184	100	165
15						1220	1300	999	413	175	92	152
16						1110	1100	895	393	173	89	164
17						2400	900	784	374	168	92	145
18						2600	860	713	354	163	89	134
19						2000	860	2000	343	159	86	126
20						2500	810	1900	339	156	82	122
21						3500	790	1500	332	154	80	117
22						2600	830	1300	317	149	79	129
23						2000	880	1700	300	144	77	127
24						1600	790	1530	286	142	76	111
25						1500	687	1310	278	138	74	108
26						1300	609	1710	290	140	73	103
27						1100	560	1360	287	134	200	101
28						1100	517	1080	297	131	135	97
29						980	485	889	438	125	95	96
30						850	526	773	375	123	84	93
31						750	---	796	---	120	82	---
TOTAL						46043	27224	35993	13513	5757	3077	5076
MEAN						1485	907	1161	450	186	99.3	169
MAX						3500	2600	2000	686	314	200	491
MIN						599	485	686	278	120	73	81
CFSM						11.5	7.03	9.00	3.49	1.44	.77	1.31
IN.						13.28	7.85	10.38	3.90	1.66	.89	1.46
AC-FT						91330	54000	71390	26800	11420	6100	10070

12043163 SOOES RIVER BELOW MILLER CREEK, NEAR OZETTE, WA

LOCATION.--Lat 48°15'58", long 124°37'30", in NE¼NE¼ sec. 21, T.32 N., R.15 W., Clallam County, Hydrologic Unit 17100101, on right bank at downstream side on Crown Zellerback logging road, 0.6 mi downstream from Miller Creek, and 8 mi north of Ozette.

DRAINAGE AREA.--32.0 mi².

PERIOD OF RECORD.--March 1976 to current year.

REVISED RECORDS.--WDR WA-77-1: 1976(M). WDR WA-83-1: 1982(M,P).

GAGE.--Water-stage recorder and crest-stage gage. Elevation of gage is 70 ft, from topographic map.

REMARKS.--Records fair. No regulation or diversion upstream from station.

AVERAGE DISCHARGE.--8 years, 208 ft³/s, 88.27 in/yr, 150,700 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 5,610 ft³/s, Jan. 23, 1982, gage height, 15.08 ft; minimum, 8.4 ft³/s Aug. 8-11, Sept. 3-4, 1982.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 2,500 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Nov. 15	0600	3,580	12.67	Jan. 3	1500	3,570	12.66
Nov. 19	2200	2,530	11.24	Jan. 24	2100	*4,830	*14.16
Nov. 26	2000	2,610	11.35	Feb. 20	0800	2,550	11.27

Minimum discharge, 9.8 ft³/s Aug. 22-26, gage height, 4.92 ft.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP		
1	46	149	179	263	223	360	103	166	99	48	16	18		
2	47	662	161	1180	197	402	96	261	90	42	16	15		
3	62	1060	149	2580	174	258	146	176	90	38	15	13		
4	87	509	134	2400	160	195	113	139	115	36	15	11		
5	60	279	129	966	145	162	108	137	105	34	16	28		
6	53	289	115	489	134	137	105	120	98	33	17	43		
7	50	693	120	356	132	120	125	105	84	31	16	28		
8	48	386	696	438	225	109	120	266	80	30	15	124		
9	47	252	301	305	303	101	214	281	85	29	14	59		
10	46	415	239	443	605	118	418	289	74	28	14	46		
11	44	785	309	374	402	110	714	325	69	27	14	42		
12	44	1220	383	266	934	328	763	246	66	27	13	46		
13	43	960	515	210	539	203	306	205	61	26	14	31		
14	43	882	558	178	369	180	190	186	59	25	14	27		
15	43	3140	288	152	263	166	190	154	56	24	13	23		
16	42	1830	210	137	205	166	170	137	53	24	13	38		
17	45	1600	172	125	172	311	132	123	51	23	13	42		
18	44	934	150	113	174	390	128	178	47	22	12	34		
19	48	1270	137	107	387	234	125	1050	47	22	12	30		
20	62	1110	119	101	1710	718	128	434	46	22	12	26		
21	82	426	102	125	586	714	120	266	45	21	11	24		
22	307	311	93	508	579	447	122	261	45	20	11	24		
23	106	259	85	943	508	303	126	223	41	20	10	22		
24	87	1460	80	2410	470	244	105	186	40	20	10	20		
25	154	628	80	1630	276	437	94	174	39	19	10	20		
26	102	969	127	678	268	268	74	351	46	19	11	20		
27	236	799	119	889	698	184	70	197	54	19	25	18		
28	118	379	95	893	397	210	63	150	71	18	17	18		
29	92	265	131	514	345	150	60	129	86	17	13	18		
30	345	212	475	339	---	128	102	117	60	17	11	17		
31	233	---	516	261	---	113	---	110	---	17	12	---		
TOTAL	2866	24133	6967	20373	11580	7966	5330	7142	2002	798	425	925		
MEAN	92.5	804	225	657	399	257	178	230	66.7	25.7	13.7	30.8		
MAX	345	3140	696	2580	1710	718	763	1050	115	48	25	124		
MIN	42	149	80	101	132	101	60	105	39	17	10	11		
CFSM	2.89	25.1	7.03	20.5	12.5	8.03	5.56	7.19	2.08	.80	.43	.96		
IN.	3.33	28.05	8.10	23.68	13.46	9.26	6.20	8.30	2.33	.93	.49	1.08		
AC-FT	5680	47870	13820	40410	22970	15800	10570	14170	3970	1580	843	1830		
CAL YR 1983	TOTAL	92012	MEAN	252	MAX	3140	MIN	17	CFSM	7.87	IN.	106.96	AC-FT	182500
WTR YR 1984	TOTAL	90507	MEAN	247	MAX	3140	MIN	10	CFSM	7.72	IN.	105.21	AC-FT	179500

NOTE.--No gage-height record Apr. 14-26, July 1 to Aug. 22.

HOKO RIVER BASIN

73

12043300 HOKO RIVER NEAR SEKIU, WA

LOCATION.--Lat 48°14'30", long 124°22'57", in NE1SW1/4 sec.28, T.32 N., R.13 W., Clallam County, Hydrologic Unit 17110021, on right bank 2.2 mi upstream from Little Hoko River, and 4.0 mi southwest of Sekiu.

DRAINAGE AREA.--51.2 mi².

PERIOD OF RECORD.--July 1962 to September 1974, water years 1976-78 (annual maximum), water years 1983 to current year (June to October seasonal records).

GAGE.--Water-stage recorder. Elevation of gage is 50 ft, from topographic map.

REMARKS.--Records good. No regulation or diversion upstream from station.

AVERAGE DISCHARGE.--12 years (water years 1963-74), 408 ft³/s, 108.22 in/yr, 295,600 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 14,100 ft³/s Dec. 25, 1972, gage height, 14.17 ft, from rating curve extended above 2,100 ft³/s, on basis of slope-area measurement at gage height, 12.49 ft; minimum, 12 ft³/s Aug. 30, 1967; minimum gage height, 0.97 ft Sept. 15-17, 1973.

EXTREMES FOR CURRENT YEAR.--Maximum discharge during period June to October 1984, 2,030 ft³/s Oct. 8, gage height, 5.53 ft; minimum, 20 ft³/s Aug. 25, 26, gage height, 1.07 ft.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR JUNE TO OCTOBER 1984
MEAN VALUES

DAY	JUN	JUL	AUG	SEP	OCT
1	193	86	29	28	23
2	170	88	28	26	23
3	168	75	27	22	23
4	193	70	27	21	30
5	180	70	27	44	34
6	183	66	28	85	30
7	165	61	29	54	458
8	156	59	29	120	1550
9	183	56	26	81	1130
10	156	55	25	62	1050
11	140	52	25	56	708
12	129	52	24	52	582
13	120	52	24	47	555
14	113	48	24	42	551
15	106	46	23	38	426
16	101	44	23	43	317
17	94	42	23	43	244
18	88	41	25	40	197
19	83	40	24	37	168
20	82	39	23	34	145
21	79	39	21	32	129
22	76	37	21	33	117
23	72	35	21	32	109
24	68	34	21	30	109
25	65	33	21	28	637
26	69	34	21	27	441
27	76	33	35	26	358
28	88	32	31	24	405
29	99	31	25	23	313
30	96	31	22	23	374
31	---	30	22	---	306
TOTAL	3591	1511	774	1253	11542
MEAN	120	48.7	25.0	41.8	372
MAX	193	88	35	120	1550
MIN	65	30	21	21	23
CFSM	2.34	.95	.49	.82	7.27
IN.	2.61	1.10	.56	.91	8.39
AC-FT	7120	3000	1540	2490	22890

WATER RESOURCES DATA FOR WASHINGTON, 1984

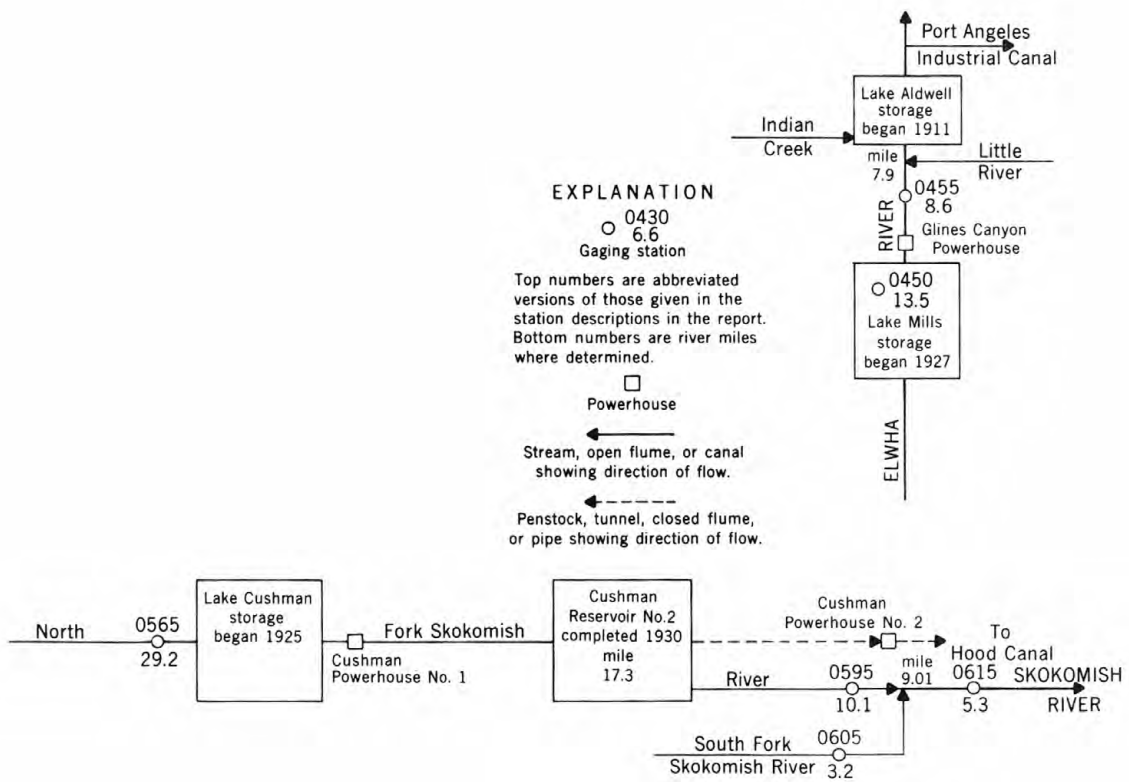


Figure 8.--Gaging stations in Elwha and Skokomish River basins.

ELWHA RIVER BASIN

75

12045000 LAKE MILLS AT GLINES CANYON, NEAR PORT ANGELES, WA

LOCATION.--Lat 48°00'08", long 123°35'55", in SW¼SE¼ sec.17, T.29 N., R.7 W., Clallam County, Hydrologic Unit 17110020, Olympic National Park, at Glines Canyon Dam on Elwha River, 2 mi upstream from Griff Creek, 4.1 mi south of Elwha, and 11 mi southwest of Port Angeles.

DRAINAGE AREA.--245 mi².

PERIOD OF RECORD.--April 1927 to current year. Prior to October 1950, monthly change in contents only, published in WSP 1316.

GAGE.--Nonrecording gage. Datum of gage is 19.67 ft below National Geodetic Vertical Datum of 1929.

REMARKS.--Reservoir is formed by concrete dam, completed in 1927; storage began Apr. 1, 1927. Usable capacity, 7,460 acre-ft between gage heights 592.0 ft, normal minimum operation level, and 610.0 ft, top of spillway gates. Storage below gage height 592.0 ft, 31,190 acre-ft. Figures given herein represent total contents. Water is used for power production by Crown Zellerbach Corp.

COOPERATION.--Gage-height record furnished by Crown Zellerbach Corp.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents observed, 39,940 acre-ft Dec. 22, 1936, gage height, 613.0 ft; minimum observed since reservoir first filled in May 1927, 24,290 acre-ft Nov. 14, 1929, gage height, 574.4 ft.

EXTREMES FOR CURRENT YEAR.--Maximum contents observed, 38,951 acre-ft July 25, 26, gage height, 610.7 ft; minimum observed, 33,712 acre-ft Oct. 26, gage height, 598.2 ft.

MONTHEND GAGE HEIGHT AND CONTENTS AT 2400, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984

Date	Gage height (feet)	Contents (acre-feet)	Change in contents (acre-feet)
Sept. 30.....	606.0	36,950	--
Oct. 31.....	604.4	36,278	-672
Nov. 30.....	609.2	38,306	+2,028
Dec. 31.....	608.0	37,790	-516
CAL YR 1983.....	--	--	-516
Jan. 31.....	608.8	38,134	+344
Feb. 29.....	607.9	37,748	-386
Mar. 31.....	608.9	38,177	+429
Apr. 30.....	609.8	38,564	+387
May 31.....	609.5	38,435	-129
June 30.....	609.9	38,607	+172
July 31.....	610.4	38,822	+215
Aug. 31.....	609.7	38,521	-301
Sept. 30.....	607.0	37,370	-1,151
WTR YR 1984.....	--	--	+420

12045500 ELWHA RIVER AT McDONALD BRIDGE, NEAR PORT ANGELES, WA
(National stream quality accounting network station)

LOCATION.--Lat 48°03'18", long 123°34'55", in NE¼NW¼ sec.33, T.30 N., R.7 W., Clallam County, Hydrologic Unit 17110020, Olympic National Forest, on right bank 300 ft upstream from site of McDonald Bridge (now removed), 0.7 mi upstream from Little River, 4.9 mi below Glines Canyon Dam, 8 mi southwest of Port Angeles, and at mile 8.6.

DRAINAGE AREA.--269 mi².

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1897 to December 1901, October 1918 to current year. Published as "at McDonald" October 1897 to December 1901.

REVISED RECORDS.--WSP 1246: Drainage area. WSP 1286: 1898, 1899(M), 1900-1902, 1919, 1920-31(M), 1932, 1933(M). WSP 1566: 1957(M).

GAGE.--Water-stage recorder. Datum of gage is 200.00 ft above National Geodetic Vertical Datum of 1929. Oct. 1, 1897, to Dec. 31, 1901, nonrecording gage at McDonald Bridge at different datum. Dec. 9, 1918, to May 1, 1936, water-stage recorder under McDonald Bridge at datum 7.4 ft higher.

REMARKS.--Water-discharge records good. Water is diverted through Glines Canyon powerhouse and returned to river upstream from gage. Flow partly regulated by Lake Mills 4.9 mi upstream (see sta 12045000).

AVERAGE DISCHARGE.--70 years (water years 1898-1901, 1919-1984), 1,516 ft³/s, 76.53 in/yr, 1,098,000 acre-ft/yr, adjusted for storage since April 1927.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 41,600 ft³/s Nov. 18, 1897, gage height, 14.5 ft, from graph based on gage readings, site and datum then in use, from rating curve extended above 3,300 ft³/s on basis of two determinations of flow over dam at discharge 26,700 ft³/s and 30,100 ft³/s, referred to 1897 datum; minimum daily discharge, 10 ft³/s Oct. 3, 1938.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 21,700 ft³/s Nov. 15, gage height, 21.02 ft; minimum, 204 ft³/s Apr. 9, gage height, 9.19 ft; minimum daily, 264 ft³/s Sept. 29.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	332	551	1630	1160	1270	1410	1120	914	1950	2160	1300	600
2	332	1870	1560	3160	1260	1270	1130	984	1740	2320	1250	594
3	355	3990	1510	6360	1290	1270	1180	945	1420	2200	1160	575
4	420	3000	1260	11500	1250	1190	1100	953	1490	2330	1130	625
5	438	1910	1410	6300	1140	1200	1100	876	1810	2400	1020	1300
6	438	1650	1340	4580	1170	1090	1030	730	1860	2180	1060	1680
7	420	1450	1300	4130	1210	1150	899	846	1740	1930	930	938
8	343	1000	1380	3280	1450	1350	839	839	1900	1630	899	723
9	289	1120	1370	2930	1850	1300	984	1060	1830	1860	1030	660
10	284	1790	1310	2550	1710	1370	976	1060	1110	1830	1070	565
11	289	4510	1010	2290	1510	1160	809	1110	1670	1730	969	619
12	305	3340	1270	2140	2570	1490	884	1210	1560	1770	914	612
13	299	2750	1670	1900	2440	1510	1110	1270	1800	1750	876	592
14	278	2770	1620	1850	2000	1420	1030	1490	2350	1760	708	520
15	278	14500	1310	1440	1840	1340	1330	1340	2760	1600	794	513
16	278	10000	1310	1460	1560	1270	1590	1230	2450	1810	702	421
17	289	7020	1160	1450	1420	1410	1270	1230	2090	2020	824	421
18	310	6160	945	1320	1260	1500	1240	1220	1990	1820	794	433
19	343	4540	1140	1270	1260	1530	1210	1570	1980	1610	639	439
20	451	3530	930	1260	3440	2250	1070	2020	2230	1530	632	439
21	598	2680	907	1260	2670	3280	1040	1720	2350	1360	667	439
22	1040	2400	758	1270	2050	2310	1020	1570	2360	1290	714	439
23	884	2230	744	1330	1870	2100	961	1850	2270	1400	632	421
24	884	3630	625	2530	1970	1950	953	1660	2630	1450	609	369
25	666	3590	611	4180	1740	1670	984	1480	2700	1680	688	375
26	414	2590	773	2490	1490	1460	831	1370	2750	1540	400	404
27	310	2900	722	2140	1620	1560	816	1480	2880	1490	769	375
28	338	2230	618	1860	1490	1510	794	1620	2740	1280	789	386
29	310	2060	687	1630	1540	1320	730	2110	3260	1190	646	264
30	294	2020	1770	1610	---	1270	702	2900	2420	1250	549	274
31	396	---	1540	1590	---	1250	---	2250	---	1370	544	---
TOTAL	12905	103781	36190	84220	49340	47160	30732	42907	64090	53540	25708	17015
MEAN	416	3459	1167	2717	1701	1521	1024	1384	2136	1727	829	567
MAX	1040	14500	1770	11500	3440	3280	1590	2900	3260	2400	1300	1680
MIN	278	551	611	1160	1140	1090	702	730	1110	1190	400	264
AC-FT	25600	205800	71780	167100	97870	93540	60960	85110	127100	106200	50990	33750
MEAN†	405	3493	1159	2722	1694	1528	1031	1382	2140	1730	824	548
CFSM†	1.51	12.99	4.31	10.12	6.30	5.68	3.83	5.14	7.96	6.43	3.06	2.04
IN.†	1.74	14.48	4.97	11.67	6.79	6.55	4.28	5.92	8.87	7.42	3.53	2.27
AC-FT†	24930	207800	71260	167400	97480	93970	61350	84980	127300	106400	50690	32600

CAL YR 1983 TOTAL 644931 MEAN 1767 MAX 14500 MIN 278 AC-FT 1279000 MEAN† 1765 CFSM† 6.56 IN.† 89.08 AC-FT† 1278000
WTR YR 1984 TOTAL 567588 MEAN 1551 MAX 14500 MIN 264 AC-FT 1126000 MEAN† 1552 CFSM† 5.77 IN.† 78.49 AC-FT† 1126000

† Adjusted for change in contents in Lake Mills.

ELWHA RIVER BASIN

77

12045500 ELWHA RIVER AT MCDONALD BRIDGE, NEAR PORT ANGELES, WA--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1959-60, 1962-70, 1972 to current year.

PERIOD OF DAILY RECORD.--

WATER TEMPERATURE: April 1976 to August 1977.

REMARKS.--Prior to 1962 published as Elwha River near Port Angeles. October 1971 to September 1974 published as Elwha River below Little River, near Port Angeles.

WATER QUALITY DATA, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984

DATE	TIME	STREAM- FLOW, INSTAN- TANEOUS (CFS)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH (STAND- ARD UNITS)	TEMPER- ATURE (DEG C)	TUR- BID- ITY (NTU)	OXYGEN, DIS- SOLVED (MG/L)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION)	COLI- FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)	STREP- TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML)	HARD- NESS (MG/L AS CAC03)
NOV , 1983											
09...	1230	1120	80	--	8.0	6.2	11.4	97	K2	K10	37
JAN , 1984											
25...	1245	4370	85	8.2	4.5	16	13.3	103	K1	K1	38
FEB											
28...	1715	1340	81	7.9	4.5	2.1	12.6	98	K2	K20	38
MAY											
10...	0930	1060	95	7.9	8.0	.70	11.5	97	<2	K1	41
JUL											
12...	0900	1790	71	7.9	10.0	2.1	11.6	102	--	<2	31
SEP											
19...	1330	438	93	8.0	13.0	1.6	10.1	97	K4	K14	42
DATE	HARD- NESS NONCAR- BONATE (MG/L AS CAC03)	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 CAC03)	SULFATE DIS- SOLVED (MG/L AS S04)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	FLUO- RIDE, DIS- SOLVED (MG/L AS F)
NOV , 1983											
09...	3	13	1.1	1.8	10	.1	.20	34	7.5	.90	<.10
JAN , 1984											
25...	3	13	1.3	2.0	10	.1	.20	35	8.0	.70	<.10
FEB											
28...	0	13	1.3	1.9	10	.1	.20	37	8.0	.70	<.10
MAY											
10...	2	14	1.4	2.1	10	.1	.20	39	8.8	.90	<.10
JUL											
12...	5	11	.80	1.4	--	.1	<.10	26	6.2	.60	<.10
SEP											
19...	0	15	1.2	2.0	9	.1	.20	35	8.8	.70	<.10
DATE	SILICA, DIS- SOLVED (MG/L AS SiO2)	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L)	SOLIDS, SUM OF CONSTITUENTS, DIS- SOLVED (MG/L)	SOLIDS, DIS- SOLVED (TONS PER AC-FT)	SOLIDS, DIS- SOLVED (TONS PER DAY)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N)	NITRO- GEN,AM- MONIA + ORGANIC TOTAL (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)
NOV , 1983											
09...	4.9	42	50	.06	127	<.10	.080	.50	.010	<.010	<.010
JAN , 1984											
25...	6.1	48	53	.06	566	<.10	.040	<.20	.010	<.010	.020
FEB											
28...	6.3	47	54	.06	170	<.10	.010	<.20	.020	.010	<.010
MAY											
10...	5.8	62	57	.08	177	<.10	<.010	<.20	<.010	<.010	.020
JUL											
12...	4.6	39	--	--	--	<.10	<.010	<.20	.010	.010	<.010
SEP											
19...	2.2	54	57	.07	64	<.10	<.010	<.20	.010	<.010	.030

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

WATER QUALITY DATA, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984

[illegible]

DUNGENESS RIVER BASIN

79

12048000 DUNGENESS RIVER NEAR SEQUIM, WA

LOCATION.--Lat 48°00'52", long 123°07'53", in NW¼NE¼ sec.13, T.29 N., R.4 W., Clallam County, Hydrologic Unit 17110020, on right bank 1.0 mi upstream from Canyon Creek, 4.8 mi southwest of Sequim, and at mile 11.8.

DRAINAGE AREA.--156 mi².

PERIOD OF RECORD.--June 1923 to September 1930, June 1937 to current year. July 1897 to July 1898 at site downstream from Canyon Creek, published as "near Sequim," records not equivalent.

REVISED RECORDS.--WSP 1316: 1924-25(M), 1927(M). WSP 1932: 1957, 1958-59(M), 1960.

GAGE.--Water-stage recorder. Datum of gage is 569.3 ft above National Geodetic Vertical Datum of 1929 (river-profile survey). June 8, 1923, to Sept. 30, 1930, nonrecording gage just above fish-hatchery diversion 0.5 mi downstream at different datum. June 19 to Aug. 12, 1937, nonrecording gage at present site and datum.

REMARKS.--Records good. No regulation or diversion upstream from station.

AVERAGE DISCHARGE.--54 years (water years 1924-30, 1938-84), 393 ft³/s, 34.21 in/yr, 284,700 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 6,820 ft³/s Nov. 27, 1949, gage height, 8.58 ft, from floodmarks, from rating curve extended above 2,000 ft³/s on basis of slope-area measurement of peak flow; minimum, 65 ft³/s Jan. 31 to Feb. 3, 1979, during period of ice effect.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 1,700 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Nov. 11	0600	1,800	5.31	Nov. 24	1500	2,000	5.49
Nov. 15	1700	*5,510	*7.71	Jan. 4	1900	2,900	6.18

Minimum discharge, 108 ft³/s Sept. 30.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP		
1	143	247	398	235	398	318	277	208	495	683	450	172		
2	138	506	380	508	375	309	269	215	443	740	421	167		
3	138	1010	357	1210	357	289	258	212	413	686	384	158		
4	143	786	330	2580	348	273	247	209	428	717	348	162		
5	138	500	318	2000	343	266	247	205	474	750	338	314		
6	132	442	297	1340	339	269	240	199	490	663	323	316		
7	125	361	289	1120	330	269	236	195	453	562	314	222		
8	125	318	297	938	394	273	236	229	438	543	348	194		
9	125	305	297	796	448	285	240	251	448	541	364	190		
10	122	714	313	706	403	297	243	240	423	536	355	179		
11	120	1420	309	635	380	289	240	266	408	537	332	169		
12	122	1100	309	562	458	309	251	297	458	521	313	159		
13	118	963	327	506	468	305	243	326	511	510	299	150		
14	115	872	322	463	408	301	266	370	653	505	272	143		
15	115	3570	314	432	375	293	322	335	772	517	258	140		
16	115	2370	305	423	348	293	326	313	744	545	256	141		
17	113	1530	288	403	330	313	305	301	640	599	279	152		
18	113	1200	267	389	327	297	297	297	591	571	279	168		
19	111	932	251	370	390	285	281	370	591	508	255	165		
20	120	850	237	352	920	453	269	438	751	475	233	154		
21	120	678	220	335	660	724	254	366	925	428	222	143		
22	189	579	205	343	550	533	254	352	865	407	219	141		
23	151	506	190	330	480	458	236	394	814	419	218	134		
24	135	1220	190	550	400	398	229	352	879	469	209	126		
25	138	1060	210	1030	400	370	226	330	909	510	194	122		
26	140	737	210	704	345	352	212	326	979	509	185	119		
27	148	615	198	585	315	326	205	352	940	445	238	115		
28	140	539	181	522	321	318	205	408	967	405	232	114		
29	138	474	191	474	322	309	199	622	1080	394	196	111		
30	171	432	314	443	---	297	199	807	760	399	180	111		
31	199	---	264	418	---	289	---	615	---	422	173	---		
TOTAL	4160	26836	8578	21702	11932	10360	7512	10400	19742	16516	8687	4851		
MEAN	134	895	277	700	411	334	250	335	658	533	280	162		
MAX	199	3570	398	2580	920	724	326	807	1080	750	450	316		
MIN	111	247	181	235	315	266	199	195	408	394	173	111		
CFSM	.86	5.74	1.78	4.49	2.63	2.14	1.60	2.15	4.22	3.42	1.79	1.04		
IN.	.99	6.40	2.05	5.18	2.85	2.47	1.79	2.48	4.71	3.94	2.07	1.16		
AC-FT	8250	53230	17010	43050	23670	20550	14900	20630	39160	32760	17230	9620		
CAL YR 1983	TOTAL	191023	MEAN	523	MAX	3570	MIN	111	CFSM	3.35	IN.	45.55	AC-FT	378900
WTR YR 1984	TOTAL	151276	MEAN	413	MAX	3570	MIN	111	CFSM	2.65	IN.	36.07	AC-FT	300100

DUCKABUSH RIVER BASIN

12054000 DUCKABUSH RIVER NEAR BRINNON, WA

LOCATION.--Lat 47°41'03", long 123°00'37", in NW¼SW¼ sec.1, T.25 N., R.3 W., Jefferson County, Hydrologic Unit 17110018, Olympic National Forest, on left bank 5.2 mi west of Brinnon, and at mile 4.5.

DRAINAGE AREA.--66.5 mi².

PERIOD OF RECORD.--August to December 1910 (gage height only), December 1910 to December 1911, June 1938 to current year. Published as "near Duckabush" water years 1910-11.

REVISED RECORDS.--WSP 1216: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 241.49 ft above National Geodetic Vertical Datum of 1929. Aug. 19, 1910, to Dec. 31, 1911, nonrecording gage at same site at different datum.

REMARKS.--Records good except those for period of no gage-height record Jan. 26 to Feb. 29, which are fair. No regulation or diversion upstream from station.

AVERAGE DISCHARGE.--46 years (water years 1939-84), 423 ft³/s, 86.38 in/yr, 306,500 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 8,960 ft³/s Nov. 26, 1949, gage height, 10.06 ft, from rating curve extended above 4,800 ft³/s on basis of slope-area measurement of peak flow; minimum, 45 ft³/s Oct. 26, 28, 29, 1942; minimum gage height, 1.26 ft Sept. 30, 1984.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 2,500 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Nov. 3	0500	2,860	5.76	Nov. 24	1400	3,500	6.26
Nov. 11	0500	3,790	6.49	Jan. 4	1000	2,620	5.53
Nov. 15	1800	*6,880	*8.86				

Minimum discharge, 72 ft³/s Sept. 30, gage height, 1.26 ft.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP		
1	96	302	394	291	300	447	265	324	479	580	339	127		
2	95	1750	364	715	270	383	258	412	434	620	314	119		
3	93	2030	331	1600	260	339	258	320	416	599	287	112		
4	98	1340	307	2430	260	306	246	281	442	660	262	115		
5	96	719	288	1500	270	288	239	261	493	672	249	266		
6	91	651	267	1060	265	306	227	246	479	584	241	239		
7	90	526	266	930	265	339	227	233	456	490	228	161		
8	88	412	370	792	580	366	218	387	447	472	245	177		
9	85	395	399	645	620	408	233	387	412	481	255	151		
10	84	1490	478	563	540	416	252	332	408	494	252	133		
11	82	2700	447	495	470	391	265	403	412	491	234	123		
12	81	2080	392	442	1000	465	442	434	470	482	210	115		
13	78	1910	459	391	800	451	391	470	546	462	196	109		
14	78	1650	436	359	580	412	412	502	724	456	181	105		
15	76	5100	366	324	450	461	607	438	803	493	173	101		
16	75	3760	317	309	390	507	521	387	713	554	169	99		
17	75	2880	280	288	350	690	412	355	587	592	174	101		
18	75	2030	256	275	320	561	416	339	531	546	169	105		
19	74	1520	237	261	450	484	383	597	551	485	161	103		
20	78	1330	215	249	1300	923	335	640	690	439	153	100		
21	79	906	190	233	850	1190	320	470	748	391	150	96		
22	146	700	174	252	580	736	309	451	753	362	149	94		
23	117	579	169	242	480	597	285	498	730	379	145	91		
24	100	2020	168	412	420	488	265	429	791	416	141	87		
25	95	1410	175	771	380	442	249	395	783	446	134	83		
26	90	876	174	550	340	399	233	438	827	415	131	81		
27	88	751	162	470	350	362	221	465	780	363	151	79		
28	85	612	154	410	450	335	213	541	750	339	146	77		
29	82	508	171	370	465	309	207	791	883	333	130	75		
30	190	444	432	340	---	288	213	859	652	338	124	74		
31	193	---	357	320	---	275	---	607	---	343	119	---		
TOTAL	2953	43381	9195	18289	14055	14364	9122	13692	18190	14777	6012	3498		
MEAN	95.3	1446	297	590	485	463	304	442	606	477	194	117		
MAX	193	5100	478	2430	1300	1190	607	859	883	672	339	266		
MIN	74	302	154	233	260	275	207	233	408	333	119	74		
CFSM	1.43	21.7	4.47	8.87	7.29	6.96	4.57	6.65	9.11	7.17	2.92	1.76		
IN.	1.65	24.27	5.14	10.23	7.86	8.04	5.10	7.66	10.18	8.27	3.36	1.96		
AC-FT	5860	86050	18240	36280	27880	28490	18090	27160	36080	29310	11920	6940		
CAL YR 1983	TOTAL	218939	MEAN	600	MAX	5100	MIN	74	CFSM	9.02	IN.	122.47	AC-FT	434300
WTR YR 1984	TOTAL	167528	MEAN	458	MAX	5100	MIN	74	CFSM	6.89	IN.	93.71	AC-FT	332300

12056500 NORTH FORK SKOKOMISH RIVER BELOW STAIRCASE RAPIDS, NEAR HOODSPORT, WA

LOCATION.--Lat 47°30'52", long 123°19'43", in NW¼ sec.4, T.23 N., R.5 W., Mason County, Hydrologic Unit 17110017, Olympic National Park, on left bank 1.2 mi upstream from Lake Cushman, 2.8 mi upstream from Dry Creek, 11.3 mi northwest of Hoodsport, and at mile 29.2.

DRAINAGE AREA.--57.2 mi².

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--July 1924 to current year.

REVISED RECORDS.--WSP 1286: 1932, 1935, 1937(M), 1942(M), 1947(P), 1948(M). WSP 1636: 1940(M). WSP 1736: 1927. WSP 1932: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 762.26 ft above National Geodetic Vertical Datum of 1929. Prior to Nov. 1, 1934, water-stage recorder, and Nov. 1, 1934, to Nov. 10, 1941, nonrecording gages, on right bank at same datum.

REMARKS.--Estimated daily discharges: June 8, July 1. Water-discharge records good except those above 5,000 ft³/s, which are poor. No regulation or diversion upstream from station. U.S. Geological Survey satellite telemeter at station.

AVERAGE DISCHARGE.--60 years, 510 ft³/s, 121.08 in/yr, 369,500 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 27,000 ft³/s Nov. 5, 1934, gage height, 14.4 ft, from high-water mark, from rating curve extended above 9,800 ft³/s on basis of slope-area measurement at gage height 12.2 ft; minimum recorded, 16 ft³/s Sept. 23, 1930, gage height, 1.12 ft.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 3,200 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Nov. 3	0245	3,580	5.96	Nov. 15	1315	*8,850	*8.33
Nov. 11	0330	3,550	5.94	Nov. 24	1230	3,380	5.63

Minimum discharge, 67 ft³/s Oct. 18, 19, Sept. 30; minimum gage height, 1.52 ft Sept. 30.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP		
1	94	535	525	428	392	540	365	482	543	590	298	119		
2	91	2130	487	988	361	500	357	620	503	585	275	110		
3	92	2320	455	2190	345	446	361	482	496	586	257	105		
4	102	1430	419	2370	341	405	337	415	537	622	240	130		
5	92	847	401	1450	353	387	317	365	580	617	235	326		
6	88	854	369	1120	349	415	301	337	577	538	224	228		
7	85	746	392	1020	349	446	313	325	545	485	213	147		
8	82	595	550	917	791	478	301	455	510	478	226	165		
9	80	565	595	764	875	515	305	469	483	483	232	137		
10	78	1710	746	698	716	560	321	433	479	488	225	122		
11	76	2560	625	605	595	530	369	595	493	485	209	114		
12	74	2190	520	530	1360	650	496	590	536	466	196	109		
13	72	1900	650	482	1070	625	446	585	632	446	188	103		
14	71	1820	630	442	728	575	451	600	812	451	173	98		
15	69	6820	510	410	605	674	625	510	857	481	166	95		
16	68	4720	451	383	515	722	565	464	724	516	165	96		
17	73	3630	401	361	460	917	478	433	608	524	168	97		
18	68	2710	365	337	428	840	496	424	572	486	161	97		
19	68	1910	341	317	560	722	469	932	588	445	152	94		
20	96	1710	309	305	2060	1490	428	854	664	409	146	89		
21	102	1200	282	297	1130	1550	419	581	711	371	141	86		
22	301	931	271	357	764	945	410	586	706	355	140	86		
23	142	791	254	392	620	791	374	727	713	368	136	84		
24	110	2320	247	840	570	650	349	594	778	391	132	81		
25	102	1610	247	1420	510	585	321	541	769	402	127	76		
26	92	1130	243	746	464	525	305	665	794	353	126	74		
27	90	1070	229	595	473	487	289	645	708	326	145	71		
28	84	826	215	530	550	455	285	722	678	308	130	69		
29	79	686	305	491	560	419	278	968	793	301	118	68		
30	473	595	698	446	---	401	317	965	610	307	113	68		
31	321	---	540	419	---	383	---	664	---	307	110	---		
TOTAL	3515	52861	13272	22650	18894	19628	11448	18028	18999	13970	5567	3344		
MEAN	113	1762	428	731	652	633	382	582	633	451	180	111		
MAX	473	6820	746	2370	2060	1550	625	968	857	622	298	326		
MIN	68	535	215	297	341	383	278	325	479	301	110	68		
CFSM	1.98	30.8	7.48	12.8	11.4	11.1	6.68	10.2	11.1	7.88	3.15	1.94		
IN.	2.29	34.38	8.63	14.73	12.29	12.77	7.45	11.72	12.36	9.09	3.62	2.17		
AC-FT	6970	104800	26330	44930	37480	38930	22710	35760	37680	27710	11040	6630		
CAL YR 1983	TOTAL	248608	MEAN	681	MAX	6820	MIN	68	CFSM	11.9	IN.	161.68	AC-FT	493100
WTR YR 1984	TOTAL	202176	MEAN	552	MAX	6820	MIN	68	CFSM	9.65	IN.	131.49	AC-FT	401000

12056500 NORTH FORK SKOKOMISH RIVER BELOW STAIRCASE RAPIDS, NEAR HOODSPORT, WA---Continued

WATER-QUALITY RECORDS

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

PERIOD OF DAILY RECORD.--

WATER TEMPERATURES: April 1965 to September 1982.

WATER QUALITY DATA, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984

DATE	DATE OF SAMPLE	TIME	TEMPER- ATURE (DEG C)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	OXYGEN, DIS- SOLVED (MG/L)	PH (STAND- ARD UNITS)	NITRO- GEN,AM- MONIA + ORGANIC TOTAL (MG/L AS N)	NITRO- GEN, NO2+NO3 TOTAL (MG/L AS N)	PHOS- PHORUS, TOTAL (MG/L AS P)	COLI- FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)
OCT , 1983										
20...		0930	7.5	100	11.6	7.6	.40	<.10	.010	K10
NOV										
23...		1300	5.5	76	12.6	7.9	.70	<.10	.020	<10
DEC										
16...		1045	3.5	81	13.2	8.1	<.20	<.10	<.010	K2
JAN , 1984										
19...		1130	2.5	85	13.8	7.7	<.20	<.10	<.010	<1
FEB										
17...		1100	4.5	77	13.5	7.8	<.20	<.10	<.010	<1
MAR										
21...		1300	5.0	56	13.4	8.2	<.20	<.10	.020	<1
APR										
20...		1200	5.5	78	11.8	8.0	.30	<.10	<.010	<1
MAY										
18...		1100	6.0	74	11.7	7.2	.30	<.10	<.010	<1
JUN										
12...		1130	6.5	68	11.6	7.5	.20	<.10	<.010	K1
JUL										
26...		1030	9.0	70	10.2	7.8	<.20	<.10	.010	K4
AUG										
21...		1200	11.5	88	9.8	7.8	.20	<.10	<.010	<1
SEP										
13...		1000	8.5	93	9.3	8.0	.50	<.10	<.010	--

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

SKOKOMISH RIVER BASIN

83

12058600 LOWER LAKE CUSHMAN NEAR HOODSPORT, WA

LOCATION.--Lat 47°23'52", long 123°11'57", in SE¼NW¼ sec.16. T.22 N., R.4 W., Mason County, Hydrologic Unit 17110018, at Cushman Dam No. 2, 2.9 mi west of Hoodsport.

DRAINAGE AREA.--99.2 mi².

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

REMARKS.--Descriptive location given is for lake outlet. Samples are taken from wooden raft, approximately 20 ft upstream from dam.

WATER QUALITY DATA, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984

DATE	DATE OF SAMPLE	TIME	TEMPER- ATURE (DEG C)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	OXYGEN, DIS- SOLVED (MG/L)	PH (STAND- ARD UNITS)	NITRO- GEN,AM- MONIA + ORGANIC TOTAL (MG/L AS N)	NITRO- GEN, NO2+NO3 TOTAL (MG/L AS N)	PHOS- PHORUS, TOTAL (MG/L AS P)	COLI- FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)
OCT , 1983										
20...		1045	11.0	63	9.9	7.5	.40	<.10	.010	<1
NOV										
23...		0830	8.5	56	9.7	7.8	.60	<.10	.010	K1
DEC										
16...		0830	7.0	56	11.1	7.9	<.20	<.10	.010	<1
JAN. , 1984										
19...		0730	5.0	55	11.7	7.6	.20	<.10	.010	<1
FEB										
17...		0930	6.5	58	12.3	7.9	<.20	<.10	<.010	<1
MAR										
21...		0845	7.5	57	12.0	8.0	<.20	<.10	<.010	<1
APR										
20...		1400	11.0	61	9.8	7.8	.30	<.10	.050	<1
MAY										
18...		0930	11.5	60	11.4	7.6	.20	<.10	<.010	<1
JUN										
12...		0900	13.0	58	10.9	7.9	.20	<.10	<.010	<1
JUL										
26...		1230	9.0	63	10.0	7.7	.40	<.10	<.010	<1
AUG										
21...		1400	10.0	61	9.0	7.5	<.20	<.10	<.010	<1
SEP										
13...		1200	10.0	66	11.5	7.8	.20	<.10	<.010	--

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

SKOKOMISH RIVER BASIN

12059500 NORTH FORK SKOKOMISH RIVER NEAR POTLATCH, WA

LOCATION.--Lat 47°19'42", long 123°14'33", in NE¼NW¼ sec.7, T.21 N., R.4 W., Mason County, Hydrologic Unit 17110017, on left bank 1.1 mi upstream from South Fork Skokomish River, 5.4 mi southwest of Potlatch, 7.2 mi downstream from city of Tacoma's Cushman Dam No. 2, and at mile 10.1.

DRAINAGE AREA.--117 mi², Includes 99 mi² above Cushman Dam No. 2 which is noncontributing except during spillage.

PERIOD OF RECORD.--March 1944 to November 1949 (destroyed by flood of Nov. 27, 1949), March 1950 to current year.

GAGE.--Water-stage recorder. Datum of gage is 63.49 ft above National Geodetic Vertical Datum of 1929 (levels by city of Tacoma). Prior to Nov. 27, 1949, and Mar. 18 to May 9, 1950, water-stage recorder at site 200 ft downstream at present datum.

REMARKS.--Records good. Entire flow of river normally diverted at Cushman Dam No. 2 to supply powerplant which discharges directly into sea (Hood Canal). Main portion of McTaggart Creek is diverted through Deer Meadow Creek into Cushman Reservoir No. 2 and may bypass this station. Flow regulated by Lake Cushman (station 12057500) and by pondage in Cushman Reservoir No. 2, from which spill and releases are infrequent.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 7,740 ft³/s Nov. 4, 1955, gage height, 10.45 ft; minimum recorded, 1.3 ft³/s Sept. 5, 14, 16, 1951.

EXTREMES FOR CURRENT YEAR.--Maximum observed discharge, 1,720 ft³/s Nov. 15, gage height, 5.52 ft; minimum, 11 ft³/s Aug. 26 to Sept. 1, Sept. 3.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	12	25	136	151	70	196	76	103	63	24	13	12
2	12	87	122	218	65	188	76	143	61	24	13	12
3	12	297	109	372	63	158	81	110	56	23	13	12
4	12	218	100	292	61	135	70	93	58	22	13	13
5	12	165	103	218	58	121	65	81	54	21	13	24
6	12	205	92	177	54	107	61	76	52	21	13	18
7	12	188	98	158	54	97	76	70	48	21	13	15
8	12	147	145	148	63	87	68	68	44	20	13	16
9	12	154	193	138	70	79	87	70	43	20	13	14
10	12	201	288	128	84	79	139	65	41	20	12	13
11	12	301	232	118	124	73	177	100	41	18	12	13
12	12	287	227	110	248	124	344	84	39	18	12	14
13	12	321	280	103	235	114	256	76	38	18	12	13
14	12	386	230	93	177	114	196	70	36	18	12	13
15	12	1380	182	84	173	132	158	65	35	18	12	13
16	12	1050	153	79	151	139	132	63	35	17	12	14
17	13	928	131	73	132	184	114	58	33	17	12	14
18	14	680	115	70	121	209	107	56	32	17	12	14
19	13	487	102	65	128	192	93	97	32	16	12	14
20	17	543	90	61	162	213	84	87	39	16	12	15
21	17	334	87	63	154	227	81	76	39	16	12	15
22	38	248	76	81	147	196	76	93	30	15	12	16
23	23	211	73	84	158	169	70	103	28	15	12	16
24	18	418	65	100	192	143	65	93	26	15	12	16
25	17	347	68	151	169	147	61	97	25	15	12	16
26	16	283	70	124	151	135	58	114	28	15	11	16
27	15	278	68	107	162	117	54	97	26	15	11	16
28	14	223	61	93	180	107	52	87	25	15	11	16
29	14	182	114	84	184	97	50	79	30	14	11	16
30	26	156	188	79	---	90	61	73	26	14	11	16
31	26	---	177	76	---	84	---	68	---	13	11	---
TOTAL	473	10730	4175	3898	3790	4253	3088	2615	1163	551	375	445
MEAN	15.3	358	135	126	131	137	103	84.4	38.8	17.8	12.1	14.8
MAX	38	1380	288	372	248	227	344	143	63	24	13	24
MIN	12	25	61	61	54	73	50	56	25	13	11	12
AC-FT	938	21280	8280	7730	7520	8440	6130	5190	2310	1090	744	883
CAL YR 1983	TOTAL	40130	MEAN	110	MAX	1380	MIN	11	AC-FT	79600		
WTR YR 1984	TOTAL	35556	MEAN	97.1	MAX	1380	MIN	11	AC-FT	70530		

SKOKOMISH RIVER BASIN

85

12060500 SOUTH FORK SKOKOMISH RIVER NEAR UNION, WA

LOCATION.--Lat 47°20'26", long 123°16'44", in SW¼NE¼ sec.2, T.21 N., R.5 W., Mason County, Hydrologic Unit 17110017, on right bank 3.0 mi upstream from Vance Creek, 2.3 mi upstream from confluence with North Fork, and 8.5 mi west of Union.

DRAINAGE AREA.--76.3 mi².

PERIOD OF RECORD.--August 1931 to September 1984 (discontinued).

REVISED RECORDS.--WSP 1216: 1950. WSP 1316: 1934(M), 1938(M). WSP 1932: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 103.35 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--Water-discharge records good except those for periods of no gage-height record Jan. 3 to 18, Mar. 31 to Apr. 19, which are fair. No regulation or diversion upstream from station.

AVERAGE DISCHARGE.--53 years, 742 ft³/s, 132.06 in/yr, 537,600 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 21,600 ft³/s Jan. 22, 1935, Nov. 26, 1949, gage height, 11.0 ft, from rating curve extended above 11,000 ft³/s; minimum, 62 ft³/s Sept. 18, 1938; minimum gage height, 1.06 ft Oct. 3, 1965.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 6,000 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Nov. 3	0500	6,160	5.23	Nov. 15	1300	*13,000	*6.92

Minimum discharge, 88 ft³/s Sept. 27 to 30, gage height, 1.50 ft.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP		
1	149	459	893	1110	553	1360	580	934	596	313	154	105		
2	145	2570	796	1720	501	1250	560	1470	544	305	154	105		
3	145	4090	720	3300	459	1020	570	990	519	296	153	97		
4	149	2490	654	3500	418	880	540	796	527	296	149	103		
5	145	1500	616	2300	403	776	500	688	510	293	145	172		
6	140	1630	550	1700	380	746	480	623	519	283	145	231		
7	136	1510	560	1530	365	736	500	561	484	265	144	156		
8	132	1130	1220	1350	679	736	470	596	451	258	140	168		
9	132	1140	1480	1190	945	736	490	641	442	252	140	155		
10	128	1820	2020	1060	1180	756	520	660	418	251	139	136		
11	128	3160	1510	960	1140	746	600	901	411	249	136	127		
12	124	2970	1240	870	2450	1220	830	901	411	245	136	123		
13	124	3030	1870	800	2010	1290	780	786	418	236	136	118		
14	120	3380	1670	710	1400	1090	780	746	451	223	134	113		
15	120	10500	1220	640	1150	1250	1050	679	467	222	132	110		
16	120	7940	979	580	990	1310	970	623	426	223	124	109		
17	124	7030	828	520	858	1780	850	570	395	225	124	108		
18	120	5120	731	493	786	1800	860	527	365	221	124	105		
19	124	3620	649	459	923	1540	827	934	356	212	122	105		
20	163	3670	574	426	2770	1990	756	1050	409	206	120	98		
21	168	2240	512	418	1830	2340	717	786	430	195	119	98		
22	467	1660	464	596	1280	1680	708	776	398	185	116	97		
23	290	1380	424	727	1090	1320	651	1010	378	182	116	98		
24	224	3820	392	1180	1130	1090	623	901	380	177	116	97		
25	197	2890	389	2130	1010	1000	570	806	371	177	113	96		
26	177	1970	414	1310	912	934	519	1000	386	177	113	92		
27	168	2090	361	1040	945	848	484	890	373	172	110	92		
28	158	1510	323	880	1220	786	467	817	339	171	109	88		
29	149	1210	459	766	1350	717	459	806	383	167	109	88		
30	403	1020	1540	688	---	660	519	776	352	163	105	88		
31	501	---	1660	596	---	614	---	669	---	161	105	---		
TOTAL	5570	88549	27718	35549	31127	35001	19230	24913	12909	7001	3982	3478		
MEAN	180	2952	894	1147	1073	1129	641	804	430	226	128	116		
MAX	501	10500	2020	3500	2770	2340	1050	1470	596	313	154	231		
MIN	120	459	323	418	365	614	459	527	339	161	105	88		
CFSM	2.36	38.7	11.7	15.0	14.1	14.8	8.40	10.5	5.64	2.96	1.68	1.52		
IN.	2.72	43.17	13.51	17.33	15.18	17.06	9.38	12.15	6.29	3.41	1.94	1.70		
AC-FT	11050	175600	54980	70510	61740	69420	38140	49410	25600	13890	7900	6900		
CAL YR 1983	TOTAL	353965	MEAN	970	MAX	10500	MIN	120	CFSM	12.7	IN.	172.58	AC-FT	702100
WTR YR 1984	TOTAL	295027	MEAN	806	MAX	10500	MIN	88	CFSM	10.6	IN.	143.84	AC-FT	585200

SKOKOMISH RIVER BASIN

12061500 SKOKOMISH RIVER NEAR POTLATCH, WA

LOCATION.--Lat 47°18'36", long 123°10'33", in SE¼NW¼ sec.15, T.21 N., R.4 W., Mason County, Hydrologic Unit 17110017, on upstream side of right pier of bridge on U.S. Highway 101, 3.7 mi downstream from confluence of North and South Forks, 4.7 mi southwest of Potlatch, and at mile 5.3.

DRAINAGE AREA.--227 mi², includes 99 mi² above Cushman Dam No. 2 which is normally noncontributing.

PERIOD OF RECORD.--July 1943 to current year.

REVISED RECORDS.--WSP 1716: 1950(M), 1956. WSP 1932: Drainage area. WDR WA-72: 1968(M), 1971(M). WDR WA-75: 1974.

GAGE.--Water-stage recorder. Datum of gage is 10.67 ft above National Geodetic Vertical Datum of 1929. Prior to May 27, 1964, water-stage recorders or nonrecording gage at several sites about 0.6 mi upstream at different datums. Supplementary water-stage recorder on right bank at site 0.6 mi upstream at datum 16.47 ft above National Geodetic Vertical Datum of 1929 used Nov. 16 to Dec. 10, 1964, June 11 to July 7, and Nov. 2-24, 1965.

REMARKS.--Records good. Flow partly regulated by Lake Cushman and Cushman Reservoir No. 2. In normal years, practically entire flow of North Fork is diverted at Cushman Dam No. 2 and is discharged into Puget Sound through Cushman powerplant No. 2.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 27,000 ft³/s Nov. 3, 1955, gage height, 12.6 ft, site and datum then in use; minimum, 125 ft³/s Sept. 14-17, 1944.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of December 1933 reached an elevation of 30.8 ft above National Geodetic Vertical Datum of 1929 at site on left bank 150 ft upstream from old highway bridge, discharge, 18,600 ft³/s.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 16,700 ft³/s Nov. 15, gage height, 16.11 ft from high-water mark in well; minimum, 170 ft³/s Sept. 29, 30, gage height, 8.96 ft.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	294	940	1460	1840	922	2160	899	1200	838	483	260	196
2	293	4100	1300	2610	860	2090	868	2240	772	463	260	194
3	291	6100	1180	5440	801	1720	868	1550	743	447	259	191
4	294	4300	1090	5820	757	1440	853	1240	743	437	244	192
5	291	2400	1070	3540	729	1270	793	1070	715	429	241	257
6	288	2500	975	2380	695	1180	757	938	715	420	239	323
7	285	2300	962	1960	667	1130	770	860	681	403	238	267
8	270	1800	1690	2070	898	1090	740	860	648	385	235	263
9	265	1750	2150	1980	1190	1080	770	906	621	373	232	258
10	260	2800	3270	1760	1620	1080	810	930	602	370	227	236
11	255	4900	2530	1560	1730	1060	930	1210	589	366	227	224
12	252	4600	2120	1380	3420	1660	1240	1320	577	358	227	221
13	252	4700	3000	1240	3350	1920	1150	1120	577	351	227	213
14	250	5300	2680	1120	2240	1660	1160	1050	596	339	225	206
15	245	15500	1970	1030	1890	1780	1550	961	615	333	222	200
16	242	13400	1590	970	1590	1920	1450	883	583	328	220	197
17	255	12300	1350	883	1380	2620	1250	808	546	329	217	197
18	249	9440	1200	830	1260	2880	1260	765	522	324	212	194
19	250	6230	1090	786	1350	2500	1190	1140	516	317	212	193
20	320	7130	989	743	3530	2810	1110	1490	575	307	211	191
21	350	3910	902	722	2790	3710	1060	1120	628	302	208	187
22	880	2740	840	922	1980	2790	1030	1090	573	295	208	186
23	640	2220	789	1080	1730	2130	977	1430	544	288	203	186
24	450	5710	747	1630	1810	1740	914	1320	537	285	201	186
25	400	5100	738	3200	1630	1590	853	1190	528	285	201	184
26	350	3230	794	2130	1440	1480	793	1450	539	283	199	182
27	335	3590	731	1660	1470	1320	750	1340	537	280	198	180
28	320	2550	674	1410	1780	1210	722	1180	505	275	199	178
29	310	2010	868	1240	2140	1100	701	1110	545	271	197	177
30	700	1680	2380	1100	---	1030	765	1060	523	268	197	170
31	1000	---	2670	1000	---	953	---	930	---	266	195	---
TOTAL	11136	145230	45799	56036	47649	54103	28983	35761	18233	10660	6841	6229
MEAN	359	4841	1477	1808	1643	1745	966	1154	608	344	221	208
MAX	1000	15500	3270	5820	3530	3710	1550	2240	838	483	260	323
MIN	242	940	674	722	667	953	701	765	505	266	195	170
AC-FT	22090	288100	90840	111100	94510	107300	57490	70930	36170	21140	13570	12360
CAL YR 1983	TOTAL	570885	MEAN	1564	MAX	15500	MIN	242	AC-FT	1132000		
WTR YR 1984	TOTAL	466660	MEAN	1275	MAX	15500	MIN	170	AC-FT	925600		

NOTE.--No gage-height record Oct. 7 to Nov. 16, Apr. 7-19.

BIG BEEF CREEK BASIN

97

12069550 BIG BEEF CREEK NEAR SEABECK, WA

LOCATION.--Lat 47°38'27", long 122°47'02", in NW¼SE¼ sec. 22, T.25 N., R.1 W., Kitsap County, Hydrologic Unit 17110018, on left bank 1.1 mi upstream from county road bridge across Big Beef Harbor, and 1.9 mi east of Seabeck.

DRAINAGE AREA.--13.8 mi².

PERIOD OF RECORD.--August 1969 to October 1981, water years 1983-84, June to October months only.

REVISED RECORDS.--WDR WA-76-1: 1975(M).

GAGE.--Water-stage recorder. Elevation of gage is 40 ft above National Geodetic Vertical Datum of 1929, from topographic map. Prior to July 7, 1978, at site 110 ft downstream at datum 2.03 ft lower.

REMARKS.--Records good except those for period of no gage-height record, Sept. 8 to Oct. 31, which are poor. Flow regulated by Lake Symington, 4.6 mi upstream. No diversions upstream from station.

AVERAGE DISCHARGE.--12 years (water years 1970-81), 37.9 ft³/s, 37.30 in/yr, 27,460 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 757 ft³/s Dec. 7, 1970, gage height, 4.92 ft; maximum gage height, 5.74 ft Jan. 16, 1974, site and datum then in use; minimum, 2.3 ft³/s Aug. 30, 31, 1970, Sept. 2, 1974, but may have been less during period of no gage-height record Sept. 3-30, 1974.

EXTREMES FOR CURRENT PERIOD.--Maximum discharge recorded during period, 27 ft³/s Sept. 5, gage height, 2.22 ft, but may have been greater on Oct. 10 during period of no gage-height record; minimum discharge recorded, 3.5 ft³/s Aug. 29 to Sept. 4, but may have been less during period of no gage-height record.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR JUNE TO OCTOBER 1984
MEAN VALUES

DAY	JUN	JUL	AUG	SEP	OCT
1	24	12	4.7	3.7	4.5
2	22	11	4.6	3.5	4.5
3	21	9.9	4.5	3.5	4.5
4	22	9.6	4.5	3.8	5.0
5	20	9.3	4.6	13	5.5
6	19	8.8	4.6	15	7.0
7	19	8.4	4.4	9.8	8.0
8	18	8.3	4.2	11	7.5
9	17	8.0	4.2	7.0	10
10	16	8.0	4.1	5.5	22
11	14	8.0	4.0	5.8	16
12	13	8.0	4.0	6.2	25
13	12	8.0	4.0	5.5	23
14	10	7.7	4.0	5.0	12
15	11	7.0	4.0	4.5	9.5
16	11	6.6	3.9	4.3	7.5
17	11	6.6	4.0	4.0	6.5
18	11	6.2	3.7	4.0	5.5
19	9.8	5.8	3.9	3.8	4.7
20	14	5.6	3.7	4.2	4.3
21	21	5.5	3.9	4.2	4.0
22	19	5.3	3.9	4.5	4.0
23	15	5.2	3.7	4.5	4.0
24	12	4.7	3.7	4.5	4.0
25	11	4.7	3.7	4.5	4.7
26	11	4.8	3.7	4.5	4.5
27	11	4.5	4.1	4.5	4.5
28	11	4.7	3.9	4.5	5.0
29	15	4.9	3.7	4.5	4.5
30	13	4.7	3.5	4.5	5.8
31	---	4.7	3.5	---	5.6
TOTAL	453.8	216.5	124.9	167.8	243.1
MEAN	15.1	6.98	4.03	5.59	7.84
MAX	24	12	4.7	15	25
MIN	9.8	4.5	3.5	3.5	4.0
CFSM	1.09	.51	.29	.41	.57
IN.	1.22	.58	.34	.45	.66
AC-FT	900	429	248	333	482

MINTER RIVER BASIN

12073500 HUGE CREEK NEAR WAUNA, WA

LOCATION.--Lat 47°23'22", long 122°41'52", at north line sec.20, T.22 N., R.1 E., Pierce County, Hydrologic Unit 17110019, on right bank 25 ft upstream from bridge, 0.1 mi upstream from mouth, and 2.5 mi west of Wauna.

DRAINAGE AREA.--6.47 mi².

PERIOD OF RECORD.--July 1947 to September 1969, October 1977 to current year.

REVISED RECORDS.--WSP 1636: 1953-54, 1956, 1957(M). WSP 1932: Drainage area.

GAGE.--Water-stage recorder. Elevation of gage is 100 ft, from topographic map. Prior to Sept. 27, 1978, at site 50 ft downstream and prior to June 26, 1951, at datum 0.86 ft higher.

REMARKS.--Records good except for those during periods of no gage-height record Nov. 9 to Dec. 6, Dec. 22-28, Jan. 16 to Mar. 1, Apr. 7-9, and May 5 to Aug. 27, which are poor. No regulation or diversion upstream from station.

AVERAGE DISCHARGE.--29 years (water years 1948-69, 1978-84), 11.5 ft³/s, 24.14 in/yr, 8,330 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 391 ft³/s, Feb. 9, 1951, gage height, 4.50 ft present datum; minimum, 2.6 ft³/s Aug. 26, 1980.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 70 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Nov. 15	unknown	*53	*2.30				

Minimum discharge, 4.8 ft³/s Sept. 27-30, gage height, 1.06 ft.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP		
1	5.3	6.3	12	14	8.8	22	11	15	9.6	7.4	6.1	5.5		
2	5.5	7.7	11	22	8.4	20	10	14	9.2	7.4	6.1	5.5		
3	5.5	21	10	41	7.8	17	11	11	9.0	7.3	6.0	5.5		
4	5.5	15	9.6	42	7.6	14	10	9.8	11	7.3	6.0	5.5		
5	5.5	9.3	10	33	7.4	13	10	9.6	10	7.2	6.0	9.2		
6	5.5	11	9.0	24	6.8	12	9.8	9.4	9.6	7.2	6.0	6.6		
7	5.5	9.8	13	20	6.8	11	13	9.0	9.2	7.2	5.9	5.8		
8	5.5	7.7	23	18	7.8	11	12	8.8	8.8	7.1	5.9	6.6		
9	5.5	7.9	32	16	8.8	10	16	8.7	8.5	7.1	5.9	5.8		
10	5.3	10	49	16	10	10	23	8.6	8.3	7.1	5.9	5.7		
11	5.3	12	39	14	14	10	20	13	8.1	7.0	5.8	5.6		
12	5.5	11	34	13	25	15	25	12	8.0	7.0	5.8	5.5		
13	5.5	14	46	12	24	17	20	11	7.9	7.0	5.8	5.3		
14	5.5	22	34	11	18	17	18	10	7.8	6.9	5.8	5.2		
15	5.5	50	24	10	17	17	15	9.6	7.8	6.9	5.7	5.1		
16	5.5	40	19	9.6	16	15	13	9.2	7.7	6.8	5.7	5.2		
17	5.9	33	16	9.0	14	17	12	8.8	7.6	6.7	5.7	5.1		
18	5.7	27	14	8.4	13	22	12	8.4	7.6	6.7	5.7	5.1		
19	6.1	22	12	8.0	14	21	12	12	9.0	6.6	5.7	5.1		
20	6.3	23	11	7.6	18	29	11	11	11	6.6	5.7	5.2		
21	6.1	19	10	7.8	17	32	11	10	11	6.5	5.6	5.3		
22	6.9	17	9.5	9.8	16	22	11	12	9.0	6.5	5.6	5.3		
23	6.3	14	8.6	10	18	21	11	13	8.2	6.4	5.6	5.3		
24	5.9	23	7.8	12	20	17	10	12	7.7	6.4	5.6	5.1		
25	5.9	20	8.0	18	19	21	9.8	13	7.5	6.3	5.6	5.1		
26	5.7	18	8.5	16	18	20	9.3	14	8.0	6.3	5.5	5.1		
27	5.7	16	8.3	13	19	16	9.1	12	7.7	6.3	5.5	5.0		
28	5.7	14	7.6	11	20	15	9.1	11	7.5	6.2	5.5	4.9		
29	5.7	13	15	10	21	14	9.1	11	8.0	6.2	5.5	4.9		
30	6.5	12	22	9.8	---	13	11	10	7.6	6.2	5.5	5.0		
31	6.7	---	18	9.2	---	11	---	9.8	---	6.1	5.5	---		
TOTAL	178.5	525.7	550.9	475.2	421.2	522	384.2	336.7	257.9	209.9	178.2	165.1		
MEAN	5.76	17.5	17.8	15.3	14.5	16.8	12.8	10.9	8.60	6.77	5.75	5.50		
MAX	6.9	50	49	42	25	32	25	15	11	7.4	6.1	9.2		
MIN	5.3	6.3	7.6	7.6	6.8	10	9.1	8.4	7.5	6.1	5.5	4.9		
CFSM	.89	2.70	2.75	2.36	2.24	2.60	1.98	1.68	1.33	1.05	.89	.85		
IN.	1.03	3.02	3.17	2.73	2.42	3.00	2.21	1.94	1.48	1.21	1.02	.95		
AC-FT	354	1040	1090	943	835	1040	762	668	512	416	353	327		
CAL YR 1983	TOTAL	5508.7	MEAN	15.1	MAX	122	MIN	5.0	CFSM	2.33	IN.	31.67	AC-FT	10930
WTR YR 1984	TOTAL	4205.5	MEAN	11.5	MAX	50	MIN	4.9	CFSM	1.78	IN.	24.18	AC-FT	8340

DESCHUTES RIVER BASIN

89

12079000 DESCHUTES RIVER NEAR RAINIER, WA

LOCATION.--Lat 46°51'08", long 122°40'03", in SE¼SW¼ sec.22, T.16 N., R.1 E., Thurston County, Hydrologic Unit 17110016, on right bank 75 ft upstream from county road crossing, 0.4 mi downstream from outlet of Reichel Lake, 2.7 mi southeast of Rainier, and at mile 25.9.

DRAINAGE AREA.--89.8 mi².

PERIOD OF RECORD.--June 1949 to September 1975, water years 1976-79 (annual maximum), June 1980 to July 1982, water years 1983-1984 (June to October seasonal records).

REVISED RECORDS.--WSP 1246: Drainage area. WDR WA-83-1: 1978(P).

GAGE.--Water-stage recorder. Datum of gage is 348.77 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--Records good. Probably some small diversions for irrigation and domestic use above station. No regulation.

AVERAGE DISCHARGE.--27 years (water years 1950-75, 1981), 269 ft³/s, 40.68 in/yr, 194,900 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 7,780 ft³/s Jan. 15, 1974, gage height, 15.68 ft, from high-water mark in well, from rating curve extended above 3,900 ft³/s; minimum, 16 ft³/s Sept. 7, 1963, gage height, 2.60 ft.

EXTREMES FOR CURRENT PERIOD.--Maximum discharge during period June to October 1984, 476 ft³/s June 21, gage height, 4.76 ft; minimum discharge, 33 ft³/s Sept. 27 to Oct. 4, Oct. 8, gage height, 3.16 ft.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR JUNE TO OCTOBER 1984
MEAN VALUES

DAY	JUN	JUL	AUG	SEP	OCT
1	178	125	51	38	33
2	162	118	50	39	33
3	150	109	49	36	33
4	165	103	47	34	34
5	162	96	47	36	38
6	157	92	48	58	36
7	148	88	46	52	35
8	143	84	45	46	34
9	150	80	44	47	44
10	150	80	43	42	102
11	143	76	43	41	142
12	136	76	44	48	101
13	138	74	46	46	134
14	127	71	44	40	168
15	120	69	42	38	133
16	114	66	41	37	107
17	107	64	40	36	90
18	103	62	39	36	77
19	98	61	39	36	69
20	120	59	39	35	64
21	310	59	38	34	59
22	277	58	38	37	58
23	183	58	38	41	56
24	147	55	38	37	54
25	131	54	37	35	59
26	122	55	37	34	98
27	125	55	37	34	134
28	116	56	39	33	174
29	140	56	38	33	161
30	143	53	37	33	133
31	---	52	36	---	129
TOTAL	4465	2264	1300	1172	2622
MEAN	149	73.0	41.9	39.1	84.6
MAX	310	125	51	58	174
MIN	98	52	36	33	33
CFSM	1.66	.81	.47	.44	.94
IN.	1.85	.94	.54	.49	1.09
AC-FT	8860	4490	2580	2320	5200

NOTE.--Maximum discharge for the 1984 water year, 2,550 ft³/s, Nov. 18, gage height, 8.92 ft.

WATER RESOURCES DATA FOR WASHINGTON, 1984

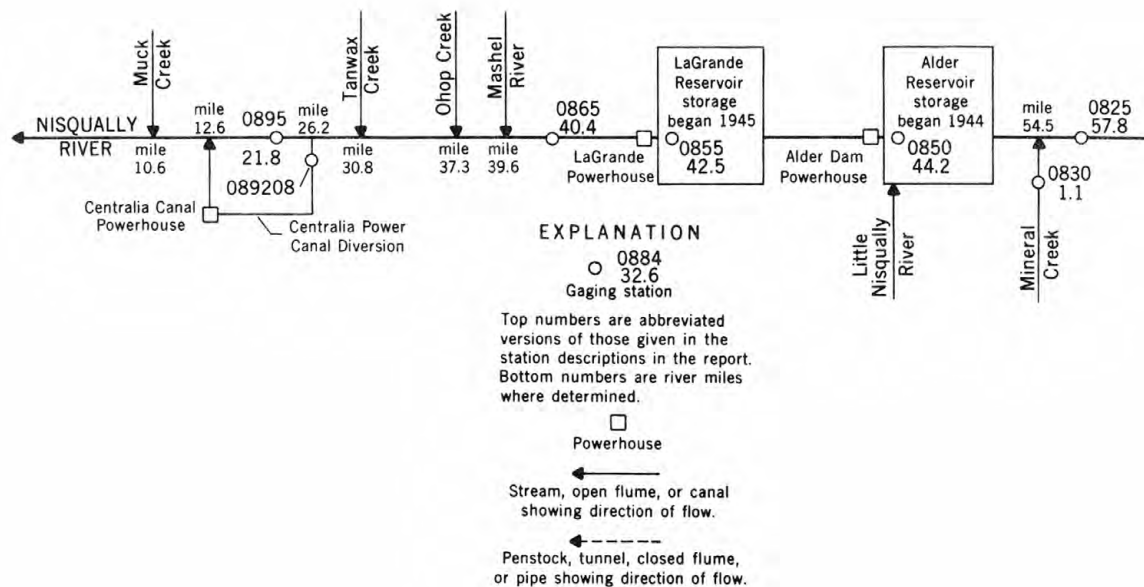


Figure 9.--Gaging stations in Nisqually River basin.

NISQUALLY RIVER BASIN

91

12082500 NISQUALLY RIVER NEAR NATIONAL, WA

LOCATION.--Lat 46°45'10", long 122°04'57", in SW¼SW¼ sec.29, T.15 N., R.6 E., Pierce County, Hydrologic Unit 17110015, on right bank 100 ft downstream from old railroad bridge, 1.2 mi west of National, 3.3 mi upstream from Mineral Creek, and at mile 57.8.

DRAINAGE AREA.--133 mi².

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

REVISED RECORDS.--WSP 1716: 1943(M), 1947(P), 1950-51, 1956(M). WDR WA-74-1: 1968(M), 1969(M), 1972(P).

GAGE.--Water-stage recorder. Elevation of gage is 1,450 ft, from river-profile map.

REMARKS.--Records good. Small diversions for domestic use. Slight regulation at low flow by powerplant of Mount Rainier National Park on Paradise River. U.S. Geological Survey satellite telemeter at station.

AVERAGE DISCHARGE.--42 years, 782 ft³/s, 79.85 in/yr, 566,600 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 17,100 ft³/s Dec. 2, 1977, gage height, 11.96 ft, from rating curve extended above 8,000 ft³/s on basis of slope-area measurement at gage height 11.25 ft; minimum, 108 ft³/s Dec. 1, 3, 1952.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 2,600 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Nov. 3	2245	2,610	6.52	Jan. 3	2330	7,650	9.18
Nov. 17	0530	2,970	6.78	Jan. 25	0515	*8,020	*9.33

Minimum discharge, 171 ft³/s Oct. 21, gage height, 3.47 ft.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	288	326	738	650	833	490	604	544	1060	982	847	445
2	263	440	670	970	756	490	574	918	918	1030	847	370
3	271	1650	620	4640	688	465	544	840	826	1020	777	406
4	393	1880	568	5800	646	445	520	735	854	1060	700	425
5	395	1210	539	3800	640	430	530	694	1140	1250	735	440
6	318	1300	502	2330	646	435	510	670	1050	1200	622	500
7	261	1170	505	1790	622	450	604	622	1080	934	574	379
8	249	950	588	1470	628	470	616	728	1120	882	676	538
9	227	821	617	1180	628	520	592	805	1190	861	784	460
10	219	876	939	1050	610	604	646	714	1100	854	784	375
11	222	1030	885	998	646	646	604	847	1040	847	670	343
12	234	940	819	854	966	777	682	1130	1020	812	580	339
13	226	974	990	756	1180	763	658	1170	1110	791	510	282
14	217	1240	1100	670	1020	735	688	1210	1170	819	490	278
15	207	1800	940	604	903	735	1010	1090	1300	903	510	294
16	202	2520	794	562	784	688	974	990	1170	1030	568	330
17	209	2770	692	515	682	670	847	854	974	1050	622	397
18	187	2500	629	465	616	622	777	791	982	958	550	480
19	184	1790	572	445	586	664	714	966	990	861	480	532
20	184	1700	506	430	670	1090	658	1260	1100	819	485	460
21	177	1290	430	445	735	1440	628	1070	1380	756	526	326
22	354	1050	390	520	658	1200	610	1020	1240	721	562	302
23	266	923	370	798	616	1200	586	1290	1260	770	490	262
24	218	1610	350	4180	610	1120	544	1180	1390	882	445	250
25	211	1510	370	5780	574	1030	515	1050	1410	1090	445	218
26	222	1240	400	2860	526	974	480	1140	1420	1090	495	202
27	212	1190	397	1810	500	861	455	1140	1380	854	544	194
28	207	1070	351	1420	495	833	450	1210	1360	770	435	192
29	218	937	382	1200	480	756	435	1590	1510	784	425	200
30	321	826	799	1050	---	688	440	1820	1170	826	460	219
31	393	---	749	926	---	646	---	1380	---	833	425	---
TOTAL	7755	39533	19201	50968	19944	22937	18495	31468	34714	28339	18063	10438
MEAN	250	1318	619	1644	688	740	617	1015	1157	914	583	348
MAX	395	2770	1100	5800	1180	1440	1010	1820	1510	1250	847	538
MIN	177	326	350	430	480	430	435	544	826	721	425	192
CFSM	1.88	9.91	4.65	12.4	5.17	5.56	4.64	7.63	8.70	6.87	4.38	2.62
IN.	2.17	11.06	5.37	14.26	5.58	6.42	5.17	8.80	9.71	7.93	5.05	2.92
AC-FT	15380	78410	38090	101100	39560	45500	36680	62420	68860	56210	35830	20700
CAL YR 1983	TOTAL	281249	MEAN	771	MAX	4070	MIN	177	CFSM	5.80	IN.	78.67
WTR YR 1984	TOTAL	301855	MEAN	825	MAX	5800	MIN	177	CFSM	6.20	IN.	84.43
											AC-FT	557900
											AC-FT	598700

NISQUALLY RIVER BASIN

12083000 MINERAL CREEK NEAR MINERAL, WA

LOCATION.--Lat 46°44'15", long 122°08'33", in NE¼SW¼ sec.35, T.15 N., R.5 E., Lewis County, Hydrologic Unit 17110015, on right bank 0.5 mi downstream from railroad bridge, 2.3 mi northeast of Mineral, and at mile 1.1.

DRAINAGE AREA.--75.2 mi².

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

REVISED RECORDS.--WSP 1932: Drainage area. WRD WA-74: 1971(P).

GAGE.--Water-stage recorder. Elevation of gage is 1,340 ft, from topographic map.

REMARKS.--Records good except for no gage-height record Feb. 16 to Mar. 16, and July 20 to Sept. 30, which are fair. No regulation or diversion upstream from station. U.S. Geological Survey satellite telemeter at station.

AVERAGE DISCHARGE.--42 years, 378 ft³/s, 68.26 in/yr, 273,900 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 9,740 ft³/s Jan. 20, 1972, gage height, 10.87 ft; minimum, 16 ft³/s Aug. 30, 31, 1970; minimum gage height, 1.40 ft Sept. 22, 23, 1950.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 2,700 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Nov. 18	0515	3,260	*8.43	Jan. 25	0400	*3,460	8.32

Minimum daily discharge, 41 ft³/s Sept. 29, 30.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP		
1	55	94	431	585	371	380	371	350	283	146	72	56		
2	54	175	383	772	340	410	344	788	246	134	69	49		
3	52	1250	344	2070	316	390	326	700	222	121	68	47		
4	55	1580	305	2430	293	360	309	545	240	113	66	45		
5	54	768	293	1990	281	320	316	473	257	109	66	70		
6	51	1160	272	1370	275	320	299	415	245	106	66	84		
7	50	988	290	978	263	310	447	368	229	104	64	66		
8	49	660	473	766	278	310	509	375	231	102	62	98		
9	48	515	532	620	290	310	468	391	296	101	60	66		
10	48	480	1250	580	296	350	550	368	275	101	60	60		
11	47	550	1010	565	419	350	580	473	251	100	58	60		
12	46	520	816	490	1350	470	711	545	221	100	60	71		
13	46	650	1150	439	1310	510	684	504	213	99	61	58		
14	47	1840	1170	387	882	570	662	491	207	97	58	54		
15	46	2200	906	344	678	630	816	431	192	96	56	50		
16	46	2500	711	312	510	486	695	375	171	95	54	49		
17	48	2650	570	284	450	486	565	330	151	94	54	48		
18	48	2830	478	260	390	518	491	296	139	93	53	47		
19	47	2160	411	240	360	545	435	368	129	92	53	47		
20	49	2070	351	225	430	772	391	455	182	90	53	45		
21	47	1390	287	223	550	1180	368	391	341	88	53	45		
22	116	912	248	354	500	990	354	419	266	87	53	56		
23	99	700	218	514	450	997	330	615	217	85	53	50		
24	73	1610	200	1990	470	888	305	560	191	81	52	47		
25	62	1510	260	2860	440	766	287	486	171	81	50	45		
26	58	1050	240	1720	400	727	260	590	172	80	49	45		
27	55	906	205	990	360	635	235	518	160	79	52	43		
28	52	761	179	700	360	580	228	455	137	77	53	43		
29	51	610	365	565	355	509	218	423	195	75	50	41		
30	63	500	744	473	---	455	222	391	181	72	49	41		
31	114	---	750	415	---	411	---	332	---	72	48	---		
TOTAL	1776	35589	15842	26511	13667	16935	12776	14221	6411	2970	1775	1626		
MEAN	57.3	1186	511	855	471	546	426	459	214	95.8	57.3	54.2		
MAX	116	2830	1250	2860	1350	1180	816	788	341	146	72	98		
MIN	46	94	179	223	263	310	218	296	129	72	48	41		
CFSM	.76	15.8	6.80	11.4	6.26	7.26	5.66	6.10	2.85	1.27	.76	.72		
IN.	.88	17.61	7.84	13.11	6.76	8.38	6.32	7.03	3.17	1.47	.88	.80		
AC-FT	3520	70590	31420	52580	27110	33590	25340	28210	12720	5890	3520	3230		
CAL YR 1983	TOTAL	147768	MEAN	405	MAX	3570	MIN	46	CFSM	5.39	IN.	73.10	AC-FT	293100
WTR YR 1984	TOTAL	150099	MEAN	410	MAX	2860	MIN	41	CFSM	5.45	IN.	74.25	AC-FT	297700

NISQUALLY RIVER BASIN

93

12083400 NISQUALLY RIVER AT ELBE, WA

LOCATION.--Lat 46°45'47", long 122°11'27", in NW¼NW¼ sec.28, T.15 N., R.5 E., Pierce County, Hydrologic Unit 17110015, at State Highway 7 crossing at Elbe, and at mile 51.7.

DRAINAGE AREA.--226 mi².

PERIOD OF RECORD.--Water years 1973 to current year.

REMARKS.--Water discharge obtained by routing flow from upstream gaging stations; discharge values are fair.

WATER QUALITY DATA, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984

DATE	DATE OF SAMPLE	TIME	TEMPER- ATURE (DEG C)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	OXYGEN, DIS- SOLVED (MG/L)	PH (STAND- ARD UNITS)	NITRO- GEN,AM- MONIA + ORGANIC TOTAL (MG/L AS N)	NITRO- GEN, NO2+NO3 TOTAL (MG/L AS N)	PHOS- PHORUS, TOTAL (MG/L AS P)	COLI- FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)
OCT , 1983										
21...		0810	8.0	81	11.2	7.2	.50	<.10	.010	K2
NOV										
21...		0900	5.5	50	12.2	7.8	.50	.30	.020	K22
DEC										
13...		1100	5.0	48	12.6	8.4	<.20	.20	.010	K5
JAN , 1984										
17...		1400	3.0	55	12.7	8.1	<.20	.20	.010	<1
FEB										
14...		1230	5.0	48	12.5	7.9	.20	.20	.290	K2
MAR										
23...		1330	7.0	44	11.4	8.0	.20	<.10	.020	--
APR										
17...		1330	8.5	52	11.0	8.1	.20	.10	.010	K1
MAY										
17...		1530	10.0	50	10.3	7.4	.20	<.10	.010	K1
JUN										
13...		1230	10.5	50	10.8	7.6	.20	<.10	<.010	K1
JUL										
25...		1000	11.0	35	9.9	7.5	.30	<.10	.250	K10
AUG										
23...		0930	10.0	44	10.6	7.4	<.20	<.10	.100	K27
SEP										
11...		1400	12.0	59	10.0	8.1	<.20	<.10	.050	K4

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

NISQUALLY RIVER BASIN

12085000 ALDER RESERVOIR AT ALDER, WA

LOCATION.--Lat 46°48'09", long 122°18'37", in SE¼NW¼ sec.9, T.15 N., R.4 E., Thurston County, Hydrologic Unit 17110015, near left end of Alder Dam on Nisqually River, 1.0 mi west of Alder, 1.7 mi upstream from La Grande Dam, 4.6 mi upstream from Mashel River, and at mile 44.2.

DRAINAGE AREA.--286 mi².

PERIOD OF RECORD.--November 1944 to current year.

GAGE.--Water-stage recorder. Datum of gage is 7.61 ft above National Geodetic Vertical Datum of 1929 (levels by city of Tacoma). Prior to July 8, 1946, nonrecording gage at same site and datum.

REMARKS.--Reservoir is formed by concrete-arch dam; storage began Nov. 7, 1944; dam completed in 1945. Usable capacity, 179,600 acre-ft between gage heights 1,114 ft, lower limit of operating range, and 1,207 ft, top of spillway gates. Unused storage below gage height 1,114 ft, 52,110 acre-ft. Crest of spillway is at gage height 1,177 ft. Figures given herein represent total contents. Water is used by city of Tacoma for power production.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 233,848 acre-ft Dec. 4, 1975, gage height, 1,207.68 ft; minimum since reservoir first filled, 86,710 acre-ft Mar. 26, 1969, gage height, 1,142.77 ft.

EXTREMES FOR CURRENT YEAR.--Maximum contents, 226,090 acre-ft June 30, gage height, 1,205.15 ft; minimum, 154,079 acre-ft Dec. 28, gage height, 1,178.21 ft.

Capacity table (gage height, in feet, and total contents, in acre-feet)
(Based on project surveys and maps by city of Tacoma in 1944)

1,144	88,510	1,170	135,800	1,200	210,840
1,150	97,910	1,180	158,260	1,207.7	233,910
1,160	115,960	1,190	183,270		

RESERVOIR STORAGE (AC-FT), WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984
INSTANTANEOUS OBSERVATIONS AT 2400

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	195714	162794	199433	160140	211014	187394	208375	201840	217960	225070	220270	207213
2	194615	162794	197461	162674	208317	187239	207242	205030	215480	224350	220270	207213
3	193280	169713	195446	174740	205408	186981	207067	207271	213740	223840	220000	207213
4	192436	178058	193254	187471	202275	186465	206892	208810	210289	223810	219580	204595
5	191406	181612	191010	195365	198911	186259	207329	210202	209129	224440	219310	204160
6	190358	186284	188557	199665	196649	186284	207707	211217	209477	225340	218920	204015
7	189157	190070	186517	202014	195446	186310	208694	211797	210231	225730	218380	203464
8	188039	192383	186078	203058	194293	186439	209390	212783	211159	225880	217600	203261
9	186981	193838	186542	203116	193571	186646	209564	213479	212493	226000	217450	203261
10	185641	195070	189731	202797	192462	187265	210086	213595	213479	225940	217240	201840
11	184647	195982	191168	202362	192198	188039	210376	214378	214117	225880	216670	200912
12	183550	196794	191512	204189	195365	189966	211101	215973	214755	225640	216089	200448
13	182505	198563	192568	200158	200651	191881	211101	217540	215451	225430	215480	199346
14	181306	203870	193043	199549	203638	193624	210637	218680	216234	225190	214755	198360
15	180234	208636	192198	198563	203928	195472	211159	219250	217120	225070	214668	197432
16	179158	209390	190514	196736	203435	197026	211304	219340	217540	225100	214349	197432
17	177905	208839	188271	194695	202362	198505	210550	218950	217570	225220	213769	195580
18	176681	207591	185692	192647	200912	199955	209506	218320	217540	225280	213769	195258
19	175584	201202	182785	191644	199143	201550	208114	218260	217900	225070	213769	194990
20	174330	195312	179568	190618	198244	204305	206427	219310	219040	224650	212116	194615
21	173101	192172	175865	189627	197664	208288	206456	219580	221200	224140	211449	193945
22	172565	192779	171698	189261	196591	209941	206456	220000	222160	223690	211014	193945
23	171698	192673	167560	189992	195446	211623	206747	221290	222730	223330	210579	193945
24	170678	196475	164064	198215	194454	212754	206310	221920	223450	223330	210057	191749
25	169509	200071	161426	211652	193228	213334	205030	222010	224290	223330	209506	190592
26	168519	201550	158942	216611	191617	213740	203725	222430	225100	223000	209071	189653
27	167285	202304	155990	217510	189783	213566	202536	221710	225610	222970	208752	188323
28	166035	202536	154079	217570	188478	213247	202130	220750	225610	222970	208201	187600
29	164896	202072	154196	216700	187420	212464	201608	221080	226060	222970	207794	187600
30	164039	200941	156833	215190	---	211391	201144	221440	225910	220900	207300	187600
31	163353	---	158942	213218	---	209999	---	220270	---	220360	207213	---
MEAN	179200	194100	180000	198000	197700	198600	207500	216400	217800	224300	214000	197500
MAX	195714	209390	199433	217570	211014	213740	211304	222430	226060	226000	220270	207213
MIN	163353	162794	154079	160140	187420	186259	201144	201840	209129	220360	207213	187600
†	1182.14	1196.59	1180.29	1200.82	1191.62	1199.71	1196.66	1203.21	1205.09	1203.24	1198.75	1191.69
‡	-33557	+37588	-41999	+54276	-25798	+22579	-8855	+19126	+5640	-5550	-13147	-19613

CAL YR 1983 MEAN 201200 MAX 230314 MIN 154079 ‡ -27420
WTR YR 1984 MEAN 202100 MAX 226060 MIN 154079 ‡ -9310

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

12085500 LA GRANDE RESERVOIR AT LA GRANDE, WA

LOCATION.--Lat 46°49'23", long 122°18'13", in SW¼SE¼ sec.33, T.16 N., R.4 E., Thurston County, Hydrologic Unit 17110015, at left end of gate control structure, 1.1 mi southeast of La Grande, 1.7 mi downstream from Alder Dam, and at mile 42.5.

DRAINAGE AREA.--289 mi².

PERIOD OF RECORD.--January 1945 to current year. January 1945 to September 1951 included in combined adjustment to monthly flow of Nisqually River at La Grande. Monthend contents January 1945 to September 1950, published in WSP 1316.

GAGE.--Water-stage recorder. Datum of gage is 7.61 ft below National Geodetic Vertical Datum of 1929 (levels by city of Tacoma). Prior to June 12, 1947, monthend gage heights furnished by city of Tacoma from temporary gages in pool upstream from dam.

REMARKS.--Reservoir is formed by concrete gravity dam completed in 1944; storage began in February 1945. Usable storage, 1,053 acre-ft between gage heights 910 ft, minimum practical head, and 935 ft, normal reservoir level. Dead storage below gage height 910 ft, 1,629 acre-ft. Figures given herein represent total contents. Water used by city of Tacoma for power production.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 2,760 acre-ft May 14, 1950, gage height, 936.4 ft; minimum observed since reservoir first filled, 1,370 acre-ft Aug. 24, 1956, gage height, 900.0 ft.

EXTREMES FOR CURRENT YEAR.--Maximum contents, 2,556 acre-ft June 27, gage height, 932.67 ft; minimum, 2,175 acre-ft Mar. 23, gage height, 924.93 ft.

MONTHEND GAGE HEIGHT AND CONTENTS AT 2400, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984

Date	Gage height (feet)	Contents (acre-feet)	Change in contents (acre-feet)
Sept. 30.....	930.17	2,426	--
Oct. 31.....	929.84	2,409	-17
Nov. 30.....	930.20	2,427	+18
Dec. 31.....	929.74	2,404	-23
CAL YR 1983.....	--	--	-48
Jan. 31.....	930.60	2,448	+44
Feb. 29.....	930.65	2,450	+2
Mar. 31.....	929.75	2,404	-46
Apr. 30.....	930.07	2,421	+17
May 31.....	929.20	2,377	-44
June 30.....	930.33	2,434	+57
July 31.....	930.29	2,382	-52
Aug. 31.....	929.78	2,406	+24
Sept. 30.....	930.02	2,418	+12
WTR YR 1984.....	--	--	-8

NISQUALLY RIVER BASIN

12086500 NISQUALLY RIVER AT LA GRANDE, WA

LOCATION.--Lat 46°50'25", long 122°19'38", in NW¼ sec.29, T.16 N., R.4 E., Pierce County, Hydrologic Unit 17110015, on right bank 0.4 mi downstream from city of Tacoma powerplant, 0.6 mi northwest of La Grande, 0.8 mi upstream from Mashel River, and at mile 40.4.

DRAINAGE AREA.--292 mi².

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--September 1906 to October 1911, November to December 1911 (gage heights only), October 1919 to September 1931, October 1943 to current year. Monthly discharge only for some periods, published in WSP 1316. Published as "below Little Nisqually River, near La Grande" September 1906 to October 1911, and as "near La Grande" November to December 1911 and October 1919 to September 1931.

REVISED RECORDS.--WSP 1216: Drainage area. WSP 1316: 1927-28(M), 1949-50. WRD WA-74: 1956(M), 1959-61(M), 1965.

GAGE.--Water-stage recorder. Elevation of gage is 490 ft, from river-profile map. See WSP 1932 for history of changes prior to Feb. 8, 1945.

REMARKS.--Water-discharge records good. Flow regulated by city of Tacoma powerplant at La Grande since December 1943, by Alder Reservoir (see sta. 12085000) since November 1944, and by La Grande Reservoir (see sta 12085500) since February 1945. All diversions returned to river upstream from gage. U.S. Geological Survey satellite telemeter at station.

AVERAGE DISCHARGE.--58 years (water years 1907-11, 1920-31, 1944-84), 1,443 ft³/s, 67.11 in/yr, 1,045,000 acre-ft/yr, adjusted for storage.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 27,100 ft³/s Dec. 4, 1975, gage height, 11.90 ft; practically no flow on many occasions at site "near La Grande" (which excluded diversion) as a result of regulation.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 9,640 ft³/s Nov. 16, gage height, 7.81 ft; minimum, 376 ft³/s Sept. 18, gage height, 2.88 ft; minimum daily, 713 ft³/s Sept. 19.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1040	924	2250	1160	2760	1340	2240	1170	2690	1750	1060	758
2	1040	926	2240	1170	2700	1340	1890	1300	2690	1660	1030	759
3	1040	942	2240	1450	2750	1340	1380	1280	2690	1610	1040	759
4	1040	1100	2230	2200	2770	1340	1310	1160	2690	1270	1050	760
5	1040	1190	2230	2270	2760	1160	1020	1020	2220	1080	1050	763
6	1000	1190	2230	2260	2320	1020	1020	1020	1390	1010	1050	756
7	978	1190	2110	2270	1730	1020	1130	1120	1170	1010	1010	815
8	979	1180	1740	2260	1730	1020	1350	1020	1170	1010	992	869
9	977	1180	1470	2250	1730	1020	1620	1280	1170	1040	993	868
10	960	1410	1630	2260	1730	1020	1690	1430	1170	1130	1020	867
11	920	1800	1900	2250	1740	1020	1790	1430	1170	1130	1050	867
12	922	1800	2120	2250	1730	1020	1920	1420	1170	1130	1050	867
13	919	1800	2250	2100	1100	1020	2180	1420	1170	1130	1020	865
14	921	2040	2580	1730	1220	1020	2250	1590	1160	1130	921	865
15	921	3870	2820	1730	2120	1020	2230	1720	1270	1130	859	865
16	920	8100	2770	2020	2110	1020	2270	1720	1340	1140	848	868
17	922	9570	2770	2100	2110	1020	2270	1720	1340	1130	850	806
18	920	9570	2760	2000	2120	1020	2270	1720	1290	1140	851	732
19	922	9250	2780	1460	2110	1170	2280	1720	1070	1170	851	713
20	919	8870	2730	1450	2120	1410	2250	1720	1010	1170	873	727
21	920	5420	2770	1440	2120	1750	1380	1720	1140	1170	871	751
22	920	2290	2700	1440	2120	2240	1330	1720	1390	1180	797	751
23	925	2250	2580	1440	2110	2240	1130	1930	1400	1200	763	748
24	921	2260	2240	2260	2120	2240	1450	2010	1380	1200	760	820
25	920	2270	2230	2870	2120	2240	1740	2020	1390	1200	760	867
26	923	2270	2230	2790	2120	2240	1640	2150	1390	1200	762	864
27	927	2260	1990	3430	2120	2240	1560	2630	1460	1200	760	842
28	922	2260	1590	2760	1880	2240	1180	2600	1740	1200	758	777
29	923	2250	1260	2770	1710	2240	1170	2240	1750	1200	760	775
30	924	2280	1170	2770	---	2240	1170	2320	1750	1200	758	775
31	924	---	1160	2770	---	2240	---	2670	---	1280	762	---
TOTAL	29449	93712	67770	65380	59880	46510	50110	51990	45830	37200	27979	24119
MEAN	950	3124	2186	2109	2065	1500	1670	1677	1528	1200	903	804
MAX	1040	9570	2820	3430	2770	2240	2280	2670	2690	1750	1060	869
MIN	919	924	1160	1160	1100	1020	1020	1020	1010	1010	758	713
AC-FT	58410	185900	134400	129700	118800	92250	99390	103100	90900	73790	55500	47840
MEAN†	404	3757	1502	2992	1616	1867	1522	1987	1624	1109	689	475
CFSM†	1.38	12.87	5.14	10.25	5.74	6.39	5.21	6.80	5.56	3.80	2.36	1.63
IN.†	1.59	14.35	5.93	11.81	5.97	7.37	5.81	7.85	6.20	4.38	2.72	1.81
AC-FT†	24840	223500	92380	184000	93000	114800	90550	122200	96600	68190	42380	28240

CAL YR 1983 TOTAL 605556 MEAN 1659 MAX 9570 MIN 778 AC-FT 1201000 MEAN† 1621 CFSM† 5.55 IN.† 75.38 AC-FT† 1174000
WTR YR 1984 TOTAL 599929 MEAN 1639 MAX 9570 MIN 713 AC-FT 1190000 MEAN† 1627 CFSM† 5.57 IN.† 75.83 AC-FT† 1181000

† Adjusted for change in contents of Alder and LaGrande Reservoirs.

NISQUALLY RIVER BASIN

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12086500 NISQUALLY RIVER AT LA GRANDE, WA--Continued

WATER-QUALITY RECORDS

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

PERIOD OF DAILY RECORD.--

WATER TEMPERATURES: October 1965 to September 1982.

WATER QUALITY DATA, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984

DATE	DATE OF SAMPLE	TIME	TEMPER- ATURE (DEG C)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	OXYGEN, DIS- SOLVED (MG/L)	PH (STAND- ARD UNITS)	NITRO- GEN, AM- MONIA + ORGANIC TOTAL (MG/L AS N)	NITRO- GEN, NO2+NO3 TOTAL (MG/L AS N)	PHOS- PHORUS, TOTAL (MG/L AS P)	COLI- FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)
OCT , 1983										
21...		1015	12.5	56	9.9	7.1	.40	<.10	<.010	<1
NOV										
21...		1330	8.5	49	11.9	8.3	.70	.20	.050	K9
DEC										
13...		0905	6.0	50	12.0	8.3	<.20	.20	.010	K4
JAN , 1984										
17...		1200	4.5	49	12.8	8.1	<.20	.10	<.010	K3
FEB										
14...		1030	5.0	47	13.0	8.2	.20	.20	.010	<2
MAR										
23...		1015	5.5	47	12.2	7.9	<.20	.20	.020	--
APR										
17...		1030	6.5	52	12.6	8.2	.30	.10	.010	K5
MAY										
17...		1630	8.0	50	11.6	7.7	.20	.10	.010	<1
JUN										
13...		0930	9.0	52	11.0	7.7	.20	<.10	<.010	<1
JUL										
25...		1345	11.0	54	11.8	7.2	.20	<.10	<.010	<1
AUG										
23...		1230	12.5	50	9.7	7.3	.40	<.10	.020	K1
SEP										
11...		1000	13.5	44	8.5	7.7	<.20	<.10	<.010	<1

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

NISQUALLY RIVER BASIN

12089208 CENTRALIA POWER CANAL NEAR MCKENNA, WA

LOCATION.--Lat 46°54'01", long 122°29'50", in NE¼SW¼ sec.1, T.16 N., R.2 E., Thurston County, Hydrologic Unit 17110015, on right bank 500 ft downstream from headworks at dam, and 3.7 mi southeast of McKenna.

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

GAGE.--Water-stage recorder. Elevation of gage is 330 ft, from topographic map.

REMARKS.--Records excellent except those below 200 ft³/s, which are fair. Flow regulated by headworks 500 ft upstream from station. U.S. Geological Survey satellite telemeter at station.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 887 ft³/s Dec. 15, 1979, gage height, 7.39 ft; minimum observed, 31 ft³/s Sept. 10-15, 1984, gage height, -0.55 ft.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 832 ft³/s Jan. 3, gage height, 7.15 ft; minimum observed 31 ft³/s, Sept. 10-15, gage height, -0.55 ft.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	477	443	752	637	750	648	690	612	708	668	623	335
2	460	439	742	656	749	642	675	697	710	654	599	340
3	460	532	744	736	761	638	637	703	710	641	598	340
4	462	645	738	736	755	634	644	657	710	605	601	329
5	469	739	736	758	755	614	612	612	687	525	603	333
6	439	783	733	769	733	578	605	614	633	520	604	355
7	407	786	724	764	686	574	622	612	620	548	584	381
8	411	781	695	758	683	371	689	619	639	546	553	402
9	410	780	687	767	674	361	692	637	654	541	539	401
10	404	797	725	771	687	434	713	666	646	592	547	344
11	361	728	761	777	692	431	712	666	631	612	592	31
12	355	788	763	772	715	455	724	669	619	615	605	31
13	356	789	777	757	689	478	727	659	611	617	585	31
14	348	772	763	709	677	477	719	683	605	609	512	31
15	351	766	757	704	753	513	715	695	611	614	431	47
16	350	764	755	725	746	544	707	705	620	605	406	400
17	345	638	763	736	739	557	704	695	616	602	411	359
18	359	555	771	728	738	554	704	693	614	597	408	278
19	370	753	777	660	736	579	701	694	579	603	405	297
20	370	786	771	650	744	648	704	706	572	604	406	297
21	359	719	763	653	764	684	645	702	653	600	416	315
22	410	625	761	666	753	683	632	698	683	601	377	326
23	493	771	760	680	752	697	589	705	657	618	328	325
24	438	775	760	757	752	694	628	700	639	628	326	348
25	418	757	739	761	750	686	672	701	629	628	333	411
26	407	750	722	758	746	692	674	695	616	627	332	430
27	394	760	709	766	739	695	650	695	626	624	326	423
28	390	764	665	739	721	709	608	699	658	629	336	351
29	380	763	635	761	695	710	602	682	672	630	334	352
30	381	757	675	749	---	700	605	686	681	631	331	279
31	425	---	654	752	---	694	---	696	---	644	335	---
TOTAL	12459	21505	22777	22612	21134	18374	20001	20953	19309	18778	14386	8922
MEAN	402	717	735	729	729	593	667	676	644	606	464	297
MAX	493	797	777	777	764	710	727	706	710	668	623	430
MIN	345	439	635	637	674	361	589	612	572	520	326	31
AC-FT	24710	42660	45180	44850	41920	36440	39670	41560	38300	37250	28530	17700
CAL YR 1983	TOTAL	228278	MEAN	625	MAX	825	MIN	59	AC-FT	452800		
WTR YR 1984	TOTAL	221210	MEAN	604	MAX	797	MIN	31	AC-FT	438800		

NISQUALLY RIVER BASIN

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12089500 NISQUALLY RIVER AT MCKENNA, WA

LOCATION.--Lat 46°56'01", long 122°33'35", in SE¼NW¼ sec.28, T.17 N., R.2 E., Thurston County, Hydrologic Unit 17110015, on left bank at downstream side of State Highway 507 bridge at McKenna, and at mile 21.8.

DRAINAGE AREA.--517 mi².

PERIOD OF RECORD.--October 1947 to September 1968, May 1977 to current year.

GAGE.--Water-stage recorder. Datum of gage is 285.47 ft above National Geodetic Vertical Datum of 1929. Prior to Sept. 30, 1968, water-stage recorder at site 100 ft downstream at present datum.

REMARKS.--Records good. Flow regulated by Alder Reservoir (see sta 12085000) at mile 44.2 and La Grande Reservoir (see sta 12085500) at mile 42.5. Centralia Power Canal (see sta 12089208) diverts water 4.4 mi upstream from station, which is returned to river at powerplant 9.2 mi downstream from station. Minor diversions for irrigation upstream from station. U.S. Geological Survey satellite telemeter at station.

AVERAGE DISCHARGE.--27 years (water years 1948-67, 1978-84), 1,372 ft³/s, 994,000 acre-ft/yr, unadjusted.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 25,700 ft³/s Jan. 29, 1965, gage height, 13.00 ft at site then in use; minimum, 20 ft³/s Sept. 10, 11, 1965, Aug. 31, 1966.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 9,590 ft³/s Nov. 18, gage height, 8.33 ft; minimum, 380 ft³/s Aug. 13, gage height, 1.87 ft.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	558	576	1990	1010	2480	1100	1900	840	2180	1320	487	427
2	576	594	1930	1190	2360	1050	1690	1570	2140	1210	413	424
3	570	1120	1890	2820	2370	1020	1070	1660	2130	1100	433	417
4	582	2310	1850	4040	2320	996	1010	1290	2190	864	430	427
5	576	1860	1830	3320	2310	880	816	1050	2080	702	427	430
6	582	1470	1830	2820	2050	702	816	1030	1170	594	425	440
7	576	1450	1750	2520	1340	688	888	996	904	552	423	437
8	570	1230	1510	2320	1320	864	1390	880	969	546	413	469
9	564	987	1390	2170	1360	872	1430	996	1060	552	423	466
10	564	996	1980	2100	1340	808	1850	1220	1060	576	434	503
11	570	1690	2310	2160	1360	888	1780	1210	920	564	434	835
12	576	1610	2180	2110	1610	928	1950	1280	840	558	424	852
13	570	1630	2400	1980	1560	1100	2320	1200	793	552	421	854
14	582	2500	2780	1480	1220	1050	2340	1360	758	552	417	836
15	576	3390	2900	1410	1960	1010	2320	1610	786	540	419	825
16	576	6820	2680	1570	1930	896	2170	1660	856	542	425	455
17	594	9040	2560	1660	1840	840	2040	1560	832	540	417	458
18	588	9520	2440	1610	1780	816	1960	1440	800	540	421	474
19	582	8460	2420	1100	1740	848	1920	1400	624	552	423	428
20	582	8180	2340	1010	1830	1240	1890	1530	594	555	435	430
21	588	5900	2240	1010	2290	2220	1180	1480	1260	556	426	437
22	606	2650	2220	1110	2130	2500	952	1460	1580	556	426	430
23	582	2240	2150	1200	1990	2360	786	2020	1240	565	429	445
24	570	2710	1950	4400	1990	2420	996	2180	1080	554	429	450
25	576	2890	1850	6700	1950	2290	1250	2020	996	552	421	442
26	570	2490	1760	4410	1870	2280	1280	1960	969	550	421	420
27	582	2320	1590	3950	1830	2190	1080	2400	936	552	432	418
28	576	2260	1180	3070	1660	2160	832	2300	1210	549	418	426
29	576	2190	987	2830	1450	2160	772	2010	1330	549	420	432
30	582	2100	1300	2680	---	2060	800	1810	1430	546	422	493
31	588	---	1140	2580	---	1960	---	2220	---	585	417	---
TOTAL	17910	93183	61327	74340	53240	43196	43478	47642	35717	19625	13205	15280
MEAN	578	3106	1978	2398	1836	1393	1449	1537	1191	633	426	509
MAX	606	9520	2900	6700	2480	2500	2340	2400	2190	1320	487	854
MIN	558	576	987	1010	1220	688	772	840	594	540	413	417
AC-FT	35520	184800	121600	147500	105600	85680	86240	94500	70840	38930	26190	30310
CAL YR 1983	TOTAL	497123	MEAN	1362	MAX	9610	MIN	375	AC-FT	986000		
WTR YR 1984	TOTAL	518143	MEAN	1416	MAX	9520	MIN	413	AC-FT	1028000		

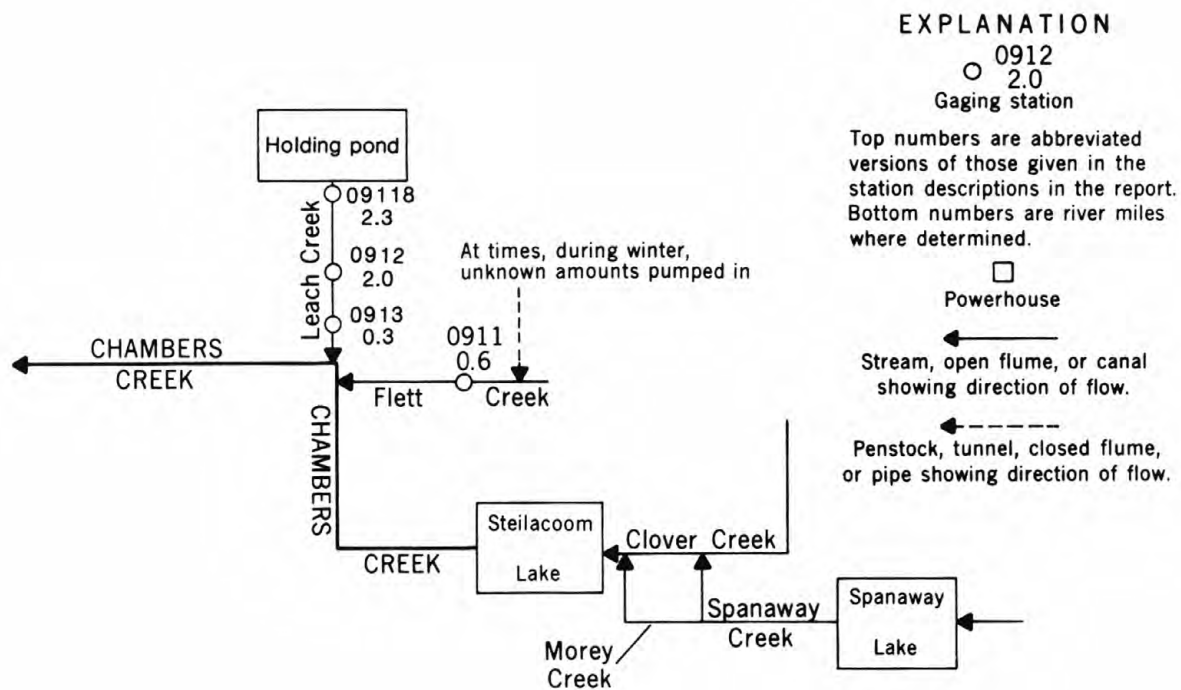


Figure 10.--Gaging stations in Chambers Creek basin.

CHAMBERS CREEK BASIN

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12091100 FLETT CREEK AT TACOMA, WA

LOCATION.--Lat 47°11'23", long 122°31'08", in NE¼SW¼ sec.26, T.20 N., R.2 E., Pierce County, Hydrologic Unit 17110019, on right bank at 75th Street, 0.6 mi upstream from mouth and 0.7 mi west of city limits of Tacoma.

DRAINAGE AREA.--7.33 mi², excludes 0.68 mi² storm drainage diverted to Leach Creek basin but does not include some urban storm drainage diverted into the basin.

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

REVISED RECORDS.--WSP 1932: Drainage area.

GAGE.--Water-stage recorder and concrete control. Elevation of gage is 200 ft, from topographic map.

REMARKS.--Records poor. Storm sewer drainage upstream from station. Several diversions for irrigation and industrial use. At times during winter months 1,000 gpm are pumped into creek for short intervals from Mountain View Memorial Park. Since October 1979, Flett Creek flood control retention ponds store and release flood water upstream from station.

AVERAGE DISCHARGE.--25 years, 9.94 ft³/s, 7,200 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 132 ft³/s Mar. 5, 1972, gage height, 2.97 ft, from rating curve extended above 45 ft³/s on basis of computation of peak flow over weir at gage height 2.82 ft; minimum, 0.29 ft³/s Aug. 27, 1967.

EXTREMES FOR CURRENT YEAR.--Maximum observed discharge, 42 ft³/s Jan. 27, 28, gage height, 2.53 ft; minimum daily, 1.6 ft³/s Aug. 22, 23.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	8.9	7.4	17	22	27	24	24	21	13	17	2.3	2.0
2	8.8	8.7	17	27	27	24	24	25	12	16	2.9	2.0
3	9.2	15	16	34	26	24	24	25	12	15	2.5	2.2
4	9.4	16	16	36	26	24	24	24	16	14	2.5	2.0
5	9.0	16	17	36	25	23	24	23	16	12	2.5	2.3
6	8.5	17	17	33	24	21	24	22	16	11	2.7	3.2
7	8.2	17	17	28	24	22	25	21	15	11	2.6	2.5
8	8.4	16	18	16	25	22	24	21	14	11	2.3	3.0
9	8.1	16	18	20	25	22	24	21	13	9.4	2.3	2.9
10	7.2	17	26	32	24	22	25	20	13	9.3	2.0	2.9
11	7.0	16	33	25	26	22	25	21	13	8.8	2.0	2.4
12	7.2	16	32	24	26	24	25	20	13	8.6	2.1	3.1
13	7.1	16	34	23	27	24	24	21	13	8.2	2.1	2.5
14	7.5	19	30	23	26	26	24	21	13	7.7	2.1	3.0
15	7.3	17	27	22	26	28	23	20	12	7.0	2.1	2.9
16	7.0	18	24	22	26	27	22	20	12	6.7	1.9	2.7
17	9.5	23	23	22	25	26	22	19	13	6.4	2.0	2.5
18	7.5	28	22	22	25	26	22	18	13	5.7	2.0	2.8
19	7.6	21	22	22	25	26	22	19	13	5.2	1.9	2.5
20	9.5	23	21	21	27	28	21	19	14	5.2	1.9	2.9
21	8.2	18	21	21	27	28	21	19	18	4.6	1.8	2.6
22	9.0	18	21	21	25	33	21	21	16	4.9	1.6	3.6
23	7.4	18	21	21	26	32	21	20	16	4.6	1.6	3.2
24	6.8	25	21	25	33	27	20	19	16	4.2	1.8	2.8
25	7.9	25	21	35	26	26	20	19	16	3.7	1.9	2.7
26	7.7	22	20	40	25	25	20	19	17	3.6	1.9	3.0
27	6.9	18	20	42	25	24	19	19	16	3.4	1.9	2.8
28	6.8	18	19	39	24	24	18	18	16	3.2	2.3	2.9
29	6.8	18	22	38	24	24	18	16	18	3.3	2.0	2.9
30	7.1	18	23	35	---	24	20	14	17	2.9	1.9	2.6
31	7.9	---	22	28	---	24	---	13	---	2.5	1.7	---
TOTAL	245.4	541.1	678	855	747	776	670	618	435	236.1	65.1	81.4
MEAN	7.92	18.0	21.9	27.6	25.8	25.0	22.3	19.9	14.5	7.62	2.10	2.71
MAX	9.5	28	34	42	33	33	25	25	18	17	2.9	3.6
MIN	6.8	7.4	16	16	24	21	18	13	12	2.5	1.6	2.0
AC-FT	487	1070	1340	1700	1480	1540	1330	1230	863	468	129	161
CAL YR 1983	TOTAL	6194.7	MEAN	17.0	MAX	50	MIN	3.7	AC-FT	12290		
WTR YR 1984	TOTAL	5948.1	MEAN	16.3	MAX	42	MIN	1.6	AC-FT	11800		

CHAMBERS CREEK BASIN

12091180 LEACH CREEK AT HOLDING POND, AT FIRCREST, WA

LOCATION.--Lat 47°13'29", long 122°30'32", in NE¼NE¼ sec.14, T.20 N., R.2 E., Pierce County, Hydrologic Unit 17110019, on right bank at holding pond dam, 0.2 mi north of southern city limits of Fircrest, and 2.3 mi upstream from mouth.

DRAINAGE AREA.--4.59 mi², includes 0.68 mi² of storm drainage from Flett Creek basin.

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

REVISED RECORDS.--WDR WA-77-1: 1975(M).

GAGE.--Water-stage recorder and crest-stage gage. Datum of gage is 200 ft above National Geodetic Vertical Datum of 1929 (levels by city of Tacoma).

REMARKS.--Records poor. Drainage into basin influenced by urbanization of area. Flow can be regulated by manually operated gate in flood-control dam. Storage is not retained and observed annual runoff closely represents natural runoff of basin. No known diversion upstream from station.

AVERAGE DISCHARGE.--17 years, 4.13 ft³/s, 2,990 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge recorded, 118 ft³/s Dec. 15, 1979, gage height, 12.06 ft, from rating curve extended above 45 ft³/s; minimum, little or no flow Aug. 8, 9, 1983.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 97 ft³/s Jan. 25, gage height, 11.41 ft from crest-stage gage; minimum, 1.0 ft³/s July 15.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.6	4.6	2.2	1.6	2.5	4.0	2.1	12	2.1	1.2	1.7	1.4
2	2.5	10	8.0	16	2.3	4.4	2.4	9.2	2.1	1.2	1.8	1.3
3	2.6	44	3.0	28	2.1	2.3	3.0	5.0	3.6	1.2	1.8	1.3
4	3.1	13	3.7	9.7	2.1	2.1	2.7	3.3	12	1.2	1.7	1.4
5	2.1	7.8	12	4.7	2.1	2.0	3.5	2.4	3.7	1.2	2.6	8.3
6	2.1	8.3	3.0	3.3	2.1	2.1	2.2	2.4	2.7	1.2	1.5	1.6
7	2.2	7.0	12	3.0	2.4	2.1	15	2.1	3.6	1.2	1.3	1.4
8	2.0	2.5	20	2.5	8.4	2.0	3.4	3.7	2.2	1.2	1.4	2.5
9	1.8	6.5	23	2.6	8.9	2.0	9.8	11	2.1	1.2	1.4	1.5
10	1.8	10	35	6.1	3.2	4.0	13	3.5	2.1	1.2	1.5	1.6
11	1.8	7.0	4.7	2.9	12	3.7	5.0	10	2.2	1.2	1.6	2.3
12	1.9	5.0	10	2.6	20	15	10	2.5	2.2	1.4	1.9	1.9
13	2.8	6.7	7.9	2.6	8.4	6.0	3.5	6.5	2.2	1.7	1.8	1.9
14	2.4	29	4.1	2.3	3.6	19	2.5	8.0	2.2	1.2	1.8	2.1
15	1.9	13	2.7	2.0	5.1	15	2.5	3.5	2.2	1.1	1.8	2.3
16	1.8	14	2.5	2.0	4.8	3.9	2.5	2.5	2.1	1.2	1.9	2.3
17	5.0	16	2.2	2.0	2.5	6.5	2.5	2.5	1.8	1.2	1.8	2.4
18	2.0	5.2	2.2	2.0	2.6	7.0	3.9	2.0	1.8	1.4	1.8	2.5
19	8.8	11	2.9	2.0	3.9	8.1	2.5	15	1.9	1.8	1.8	2.5
20	6.0	12	1.7	2.0	20	10	2.2	30	30	2.0	1.7	2.8
21	5.3	2.8	1.5	2.5	7.5	7.0	3.0	2.0	15	1.9	1.7	1.6
22	3.7	3.5	1.5	5.4	3.3	3.4	2.8	20	2.0	1.2	1.7	10
23	1.8	8.2	1.5	4.0	9.8	5.2	2.5	3.5	1.6	1.2	1.7	1.7
24	1.9	34	1.5	24	6.2	2.5	2.5	2.5	1.2	1.3	1.7	1.6
25	1.9	3.8	2.5	47	2.5	11	2.5	5.2	1.3	1.5	1.7	1.9
26	1.9	5.2	3.4	4.2	4.1	1.8	2.5	3.0	11	1.7	1.3	2.0
27	2.1	3.0	2.1	4.1	2.7	2.3	2.5	2.1	1.5	1.7	2.4	1.9
28	2.0	2.9	1.7	2.8	5.4	5.4	3.5	2.0	1.9	1.8	1.4	2.0
29	2.0	2.3	24	2.7	7.7	2.4	3.5	2.0	12	1.6	1.4	2.1
30	6.4	2.2	21	2.6	---	2.2	9.0	2.0	1.3	1.7	1.4	2.1
31	2.8	---	3.6	2.5	---	2.2	---	2.1	---	1.6	1.4	---
TOTAL	89.0	300.5	227.1	201.7	168.2	166.6	128.5	183.5	133.6	43.4	52.4	72.2
MEAN	2.87	10.0	7.33	6.51	5.80	5.37	4.28	5.92	4.45	1.40	1.69	2.41
MAX	8.8	44	35	47	20	19	15	30	30	2.0	2.6	10
MIN	1.8	2.2	1.5	1.6	2.1	1.8	2.1	2.0	1.2	1.1	1.3	1.3
AC-FT	177	596	450	400	334	330	255	364	265	86	104	143
CAL YR 1983	TOTAL	1794.49	MEAN	4.92	MAX	61	MIN	.08	AC-FT	3560		
WTR YR 1984	TOTAL	1766.7	MEAN	4.83	MAX	47	MIN	1.1	AC-FT	3500		

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LOCATION.--Lat 47°13'18", long 122°30'29", in lot 24, block 14, SE¼NE¼ sec.14, T.20 N., R.2 E., Pierce County, Hydrologic Unit 17110019, on left bank 1.0 mi south of Fircrest, and 2 mi upstream from mouth.

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

REVISED RECORDS.--WSP 1932: Drainage area.

GAGE.--Water-stage recorder and concrete control. Prior to Oct. 19, 1979, at site 20 ft downstream at same datum. Elevation of gage is 190 ft. from topographic map.

REMARKS.--Records fair. Since Oct. 1, 1961, flow may be regulated at dam upstream from station for flood control. Storage is not retained and observed annual runoff closely represents natural runoff of basin. Drainage into upper end of basin influenced by urbanizing of area. No known diversion upstream from station.

AVERAGE DISCHARGE.--27 years, 4.38 ft³/s, 12.58 in/yr, 3,170 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 198 ft³/s Feb. 28, 1972, gage height, 3.51 ft, from rating curve extended above 60 ft³/s; minimum, 0.1 ft³/s Sept. 22, 1965, gage height, 1.02 ft at site in use; minimum gage height, 0.15 ft June 24, 1980, due to regulation.

EXTREMES FOR CURRENT YEAR.--Maximum observed discharge, 126 ft³/s Jan. 25, gage height, 2.93 ft; minimum, 2.0 ft³/s Sept. 3, 27-29; minimum gage height, 0.29 Sept. 27-29.

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.6	4.8	2.6	2.8	2.6	3.6	2.7	12	2.4	2.5	2.4	2.3
2	2.6	10	8.4	18	2.6	4.9	3.1	9.0	2.4	2.5	2.5	2.3
3	2.6	49	3.1	35	2.6	2.7	3.5	4.9	3.8	2.4	2.4	2.2
4	3.5	14	3.6	10	2.5	2.8	3.2	3.4	11	2.4	2.3	2.3
5	2.7	8.3	12	4.8	2.5	2.9	4.0	2.6	4.0	2.5	3.4	10
6	2.6	8.8	3.2	3.4	2.4	2.9	2.7	2.6	3.0	2.4	2.5	2.8
7	2.8	7.4	12	3.1	2.8	2.7	19	2.3	3.8	2.4	2.4	2.5
8	2.7	2.9	22	2.8	7.2	2.7	2.9	3.7	2.8	2.3	2.5	3.6
9	2.6	6.6	24	2.7	8.6	2.7	9.8	11	2.3	2.5	2.5	2.4
10	2.6	12	40	6.4	3.2	4.2	13	3.6	2.3	2.6	2.4	2.4
11	2.7	7.6	5.5	2.8	13	6.0	5.1	13	2.3	2.5	2.4	3.0
12	2.8	5.1	12	2.6	24	14	11	2.6	2.3	2.5	2.7	2.7
13	3.4	7.0	9.0	2.6	8.4	7.5	3.6	6.6	2.3	2.5	2.7	2.4
14	3.2	33	4.5	2.4	3.5	29	2.8	8.3	2.3	2.4	2.5	2.4
15	2.7	15	3.1	2.4	6.3	11	2.6	3.7	2.3	2.3	2.5	2.4
16	2.7	14	2.7	2.4	4.4	4.2	2.5	2.6	2.3	2.4	2.5	2.3
17	6.1	17	2.6	2.4	2.7	5.7	2.5	2.5	2.2	2.4	2.6	2.4
18	2.7	6.1	2.7	2.4	2.8	6.7	4.0	2.4	2.2	2.4	2.5	2.5
19	9.4	11	3.0	2.4	3.9	12	2.6	18	2.3	2.5	2.5	2.5
20	6.8	13	2.5	2.4	27	22	2.4	3.1	34	2.5	2.4	3.0
21	6.0	3.2	2.3	2.9	7.4	4.5	3.0	2.5	16	2.5	2.4	2.3
22	4.4	3.7	2.3	7.4	4.0	5.1	2.8	23	2.8	2.5	2.3	8.0
23	2.6	8.2	2.3	4.3	14	4.9	2.6	3.8	2.5	2.4	2.4	2.3
24	2.7	40	2.3	31	4.8	3.1	2.5	2.7	2.4	2.4	2.4	2.2
25	2.6	4.1	3.6	56	2.9	14	2.4	5.5	2.5	2.4	2.7	2.3
26	2.6	5.3	4.4	3.9	4.9	3.6	2.4	3.5	12	2.4	2.3	2.3
27	2.7	3.3	3.0	4.0	3.2	7.2	2.6	2.5	2.9	2.5	3.5	2.2
28	2.6	3.1	2.7	3.0	6.1	6.2	3.8	2.5	3.2	2.6	2.4	2.2
29	2.6	2.7	28	2.8	10	3.2	3.7	2.5	16	2.4	2.3	2.2
30	6.5	2.6	24	2.7	---	2.9	9.3	2.4	2.8	2.4	2.4	2.2
31	3.1	---	3.5	2.6	---	2.8	---	2.4	---	2.4	2.3	---
TOTAL	108.2	328.8	256.9	234.4	190.3	207.7	138.1	171.2	155.0	75.8	78.0	86.6
MEAN	3.49	11.0	8.29	7.56	6.56	6.70	4.60	5.52	5.17	2.45	2.52	2.89
MAX	9.4	49	40	56	27	29	19	23	34	2.6	3.5	10
MIN	2.6	2.6	2.3	2.4	2.4	2.7	2.4	2.3	2.2	2.3	2.3	2.2
CFSM	.74	2.33	1.75	1.60	1.39	1.42	.97	1.17	1.09	.52	.53	.61
IN.	.85	2.59	2.02	1.84	1.50	1.63	1.09	1.35	1.22	.60	.61	.68
AC-FT	215	652	510	465	377	412	274	340	307	150	155	1

CHAMBERS CREEK BASIN

12091300 LEACH CREEK NEAR STEILACOOM, WA

LOCATION.--Lat 47°11'54", long 122°31'17", in NW¼NW¼ sec. 26, T.20 N., R.2 E., Pierce County, Hydrologic Unit 17110019, on left bank 0.3 mi upstream from mouth, and 4.1 mi northeast of Steilacoom.

DRAINAGE AREA.--6.56 mi², includes 0.68 mi² storm drainage from Flett Creek basin. Area used prior to July 1967, 5.88 mi².

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

REVISED RECORDS.--WSP 1932: Drainage area.

GAGE.--Water-stage recorder. Elevation of gage is 140 ft, from topographic map. Prior to June 27, 1973, water-stage recorder at site 150 ft upstream at different datum. Supplementary water-stage recorder at site 50 ft downstream at different datum used Feb. 4, 1963, to Feb. 27, 1964. June 27, 1973, to Mar. 14, 1975, nonrecording gage at site 350 ft upstream at different datum.

REMARKS.--Records poor. Drainage basin influenced by urbanizing of area. Some pumping for community use upstream from gage. Flow can be regulated by manually operated gate in flood control dam. Storage is not retained and observed annual runoff closely represents natural runoff of basin.

AVERAGE DISCHARGE.--27 years, 10.4 ft³/s, 7,530 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 238 ft³/s Mar. 5, 1972, gage height, 6.88 ft, from high-water mark in well, from rating curve extended above 60 ft³/s, site and datum then in use; maximum gage height, 10.92 ft Feb. 28, 1972, backwater from partially plugged culvert, site and datum then in use; minimum discharge, 2.0 ft³/s July 3, 1961.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 132 ft³/s Jan. 25, gage height, 3.85 ft; minimum daily, 6.1 ft³/s Nov. 30, Dec. 1.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	7.8	14	6.1	10	8.3	14	10	24	11	11	8.8	8.8
2	9.6	18	12	33	8.6	16	11	25	9.8	11	8.8	8.8
3	9.5	72	8.9	55	9.5	14	13	21	10	10	8.8	8.8
4	11	31	7.4	24	8.4	13	12	16	25	10	8.8	8.8
5	10	15	17	16	8.4	13	14	14	15	10	9.6	16
6	10	17	7.9	11	9.2	13	11	14	13	10	10	11
7	10	17	14	11	10	12	31	15	13	9.8	9.8	9.8
8	11	7.3	34	11	17	12	16	17	11	9.8	9.8	11
9	12	16	34	11	28	12	20	23	11	10	9.8	10
10	12	18	67	15	16	16	28	18	11	11	9.8	9.8
11	12	12	20	11	25	18	20	27	11	9.9	9.8	10
12	12	6.6	23	10	39	31	25	15	10	9.8	9.7	9.6
13	13	8.9	27	9.8	22	20	19	20	11	9.8	9.0	9.8
14	14	44	17	9.2	11	37	17	22	12	9.8	8.8	8.9
15	12	29	14	8.8	14	35	16	19	12	9.8	8.8	8.7
16	11	24	14	8.8	13	17	16	14	12	9.8	9.1	8.2
17	18	24	12	8.8	12	18	16	14	12	9.8	9.3	8.8
18	12	18	12	8.8	12	18	17	14	12	9.8	9.3	8.2
19	18	17	13	8.8	24	28	15	30	11	9.8	9.3	7.9
20	20	22	11	8.8	45	37	15	16	44	9.8	9.6	9.1
21	15	8.9	10	9.6	28	25	15	14	40	9.8	9.1	8.6
22	17	9.1	11	16	15	13	14	40	9.9	9.8	8.5	15
23	12	13	11	12	22	18	15	20	8.9	9.8	8.8	9.0
24	11	62	9.4	38	17	12	15	15	8.4	9.8	9.3	8.8
25	11	11	11	85	12	25	15	17	8.5	9.8	10	8.8
26	11	8.9	14	17	21	19	14	15	21	9.8	8.9	8.4
27	12	8.5	13	15	15	12	13	15	11	9.8	10	7.4
28	10	7.0	11	16	30	23	15	14	9.8	9.8	8.9	7.4
29	10	6.3	49	17	11	16	16	14	30	9.8	8.8	7.4
30	14	6.1	42	9.3	---	11	23	13	12	9.8	8.8	7.4
31	13	---	13	7.9	---	10	---	12	---	9.5	8.8	---
TOTAL	380.9	571.6	565.7	532.6	511.4	578	497	567	436.3	308.2	286.6	280.2
MEAN	12.3	19.1	18.2	17.2	17.6	18.6	16.6	18.3	14.5	9.94	9.25	9.34
MAX	20	72	67	85	45	37	31	40	44	11	10	16
MIN	7.8	6.1	6.1	7.9	8.3	10	10	12	8.4	9.5	8.5	7.4
AC-FT	756	1130	1120	1060	1010	1150	986	1120	865	611	568	556
CAL YR 1983	TOTAL	5540.5	MEAN	15.2	MAX	98	MIN	5.2	AC-FT	10990		
WTR YR 1984	TOTAL	5515.5	MEAN	15.1	MAX	85	MIN	6.1	AC-FT	10940		

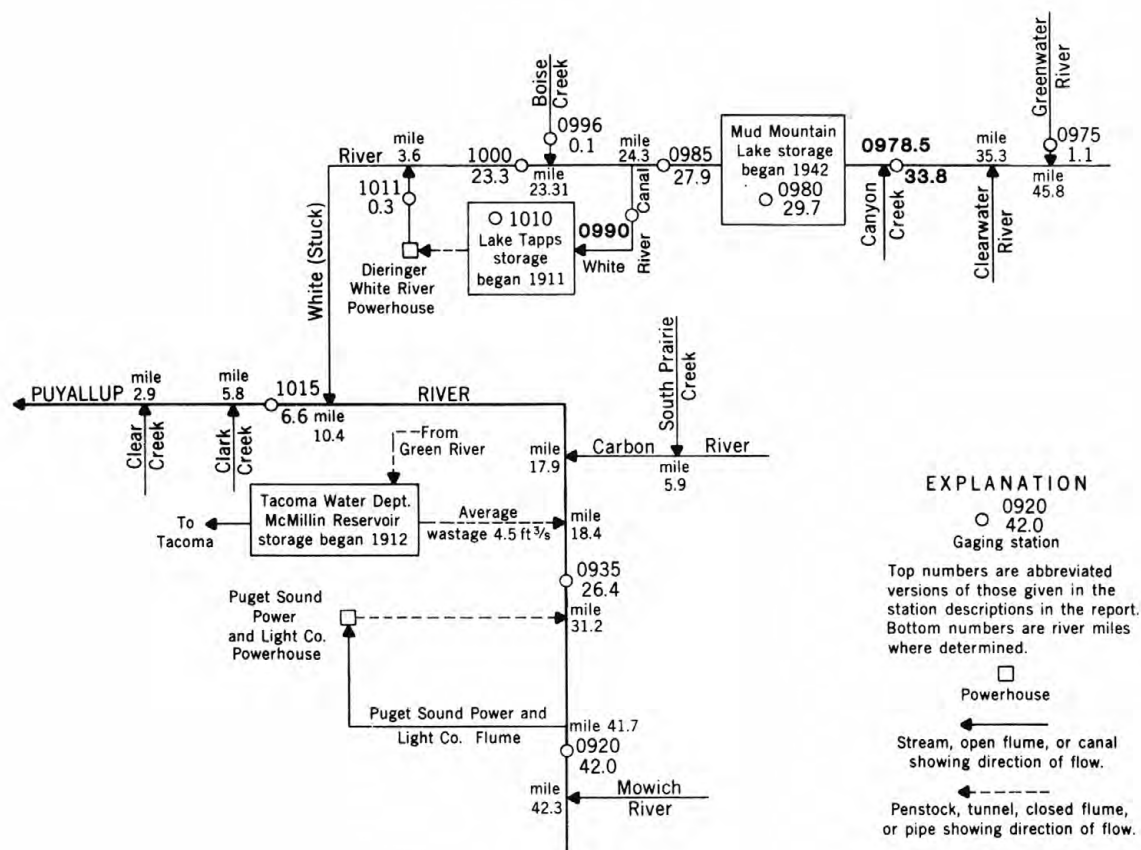


Figure 11.--Gaging stations in Puyallup River basin.

12092000 PUYALLUP RIVER NEAR ELECTRON, WA

LOCATION.--Lat 46°54'14", long 122°02'02", in SE¼NW¼ sec.3, T.16 N., R.6 E., Pierce County, Hydrologic Unit 17110014, on left bank 1,000 ft upstream from Puget Sound Power & Light Co.'s flume headworks, 0.3 mi downstream from Mowich River, 9.8 mi southeast of Electron, and at mile 42.0.

DRAINAGE AREA.--92.8 mi².

PERIOD OF RECORD.--October 1908 to September 1926, October 1944 to September 1949, October 1957 to current year. October 1926 to September 1933 (monthly discharge only) published in State of Washington Water-Supply Bulletin No. 6.

REVISED RECORDS.--WSP 1092: 1946(M). WSP 1346: 1913, 1916-17(M), 1918-23, drainage area. WSP 1566: 1945(M), 1947(P).

GAGE.--Water-stage recorder and crest-stage gage. Datum of gage is 1,632.7 ft (revised) above National Geodetic Vertical Datum of 1929. Prior to Jan. 1, 1913, nonrecording gage, and Jan. 1, 1913, to Sept. 30, 1926, Oct. 1, 1944, to Sept. 30 1949, and Oct. 1, 1957, to Nov. 22, 1959 (gage destroyed by flood), water-stage recorder, at sites near present gage at different datums. Aug. 19, 1960, to Dec. 23, 1980, at site 100 ft downstream at same datum.

REMARKS.--Records good except those for periods of no gage-height record Jan. 3, 4, July 27 to Sept. 11, ice effect Dec. 22-28, and those above 3,000 ft³/s, which are poor. No regulation or diversion upstream from station.

AVERAGE DISCHARGE.--57 years (water years 1909-33, 1945-49, 1958-84), 528 ft³/s, 77.27 in/yr, 382,500 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 10,800 ft³/s Nov. 22, 1959, gage height, 11.9 ft, from floodmarks, site and datum then in use, result of slope-area measurement; minimum daily, 100 ft³/s Dec. 13, 14, 1972, Oct. 28-30, 1980.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 2,300 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Jan. 3	unknown	6,260	6.93	Jan. 25	0145	*6,930	*7.12

Minimum discharge, 151 ft³/s Sept. 27, 28, gage height, 2.05 ft.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP		
1	222	287	360	396	483	272	333	324	600	770	740	410		
2	208	320	340	827	431	272	315	624	520	759	700	400		
3	221	1440	317	3200	394	252	288	515	492	753	630	390		
4	325	1440	296	3000	378	239	275	427	524	790	590	400		
5	289	769	285	1930	386	236	301	398	747	927	630	420		
6	247	882	271	1400	402	245	285	390	637	843	550	520		
7	221	679	282	1140	378	255	340	378	854	685	500	400		
8	209	530	317	907	390	265	347	533	907	658	610	450		
9	195	473	350	759	386	288	329	562	858	632	680	440		
10	193	778	555	707	359	333	340	488	728	637	700	355		
11	190	789	436	691	362	347	322	571	645	647	610	310		
12	190	587	381	596	591	386	340	730	607	637	550	313		
13	185	535	444	533	606	378	329	782	665	626	485	256		
14	182	669	484	470	519	382	477	843	756	621	430	238		
15	173	1090	409	427	453	366	747	741	822	707	425	272		
16	169	1240	353	406	390	333	637	674	745	806	480	336		
17	185	1150	320	370	347	311	506	601	631	837	540	382		
18	173	1070	299	351	322	301	427	533	603	770	540	448		
19	171	740	280	336	322	344	406	730	605	696	470	470		
20	174	741	254	322	435	702	378	856	702	653	430	359		
21	165	552	215	347	470	812	358	669	1060	686	430	269		
22	327	465	190	398	394	632	362	724	875	576	480	244		
23	240	437	170	718	362	632	344	981	837	632	480	207		
24	204	1130	160	2880	351	571	315	812	917	770	435	196		
25	208	790	200	3270	329	524	294	669	901	868	410	170		
26	218	585	220	1330	298	528	268	753	995	837	420	163		
27	211	588	210	947	291	462	255	718	973	710	460	156		
28	205	515	190	776	295	453	248	710	960	630	450	156		
29	208	444	467	663	281	410	258	930	1260	650	410	165		
30	305	395	708	576	---	374	258	980	955	670	405	185		
31	347	---	476	533	---	351	---	680	---	710	405	---		
TOTAL	6760	22110	10239	31206	11405	12256	10682	20326	23381	22193	16075	9480		
MEAN	218	737	330	1007	393	395	356	656	779	716	519	316		
MAX	347	1440	708	3270	606	812	747	981	1260	927	740	520		
MIN	165	287	160	322	281	236	248	324	492	576	405	156		
CFSM	2.35	7.94	3.56	10.9	4.23	4.26	3.84	7.07	8.39	7.72	5.59	3.41		
IN.	2.71	8.86	4.10	12.51	4.57	4.91	4.28	8.15	9.37	8.90	6.44	3.80		
AC-FT	13410	43860	20310	61900	22620	24310	21190	40320	46380	44020	31880	18800		
CAL YR 1983	TOTAL	176791	MEAN	484	MAX	2400	MIN	160	CFSM	5.22	IN.	70.87	AC-FT	350700
WTR YR 1984	TOTAL	196113	MEAN	536	MAX	3270	MIN	156	CFSM	5.78	IN.	78.61	AC-FT	389000

12093500 PUYALLUP RIVER NEAR ORTING, WA

LOCATION.--Lat 47°02'22", long 122°12'24", in SW¼SW¼ sec.17, T.18 N., R.5 E., Pierce County, Hydrologic Unit 17110014, on right bank 600 ft downstream from highway bridge, 4.0 mi south of Orting, 8.5 mi upstream from Carbon River, and at mile 26.4.

DRAINAGE AREA.--172 mi².

PERIOD OF RECORD.--September 1931 to current year.

REVISED RECORDS.--WSP 932: 1937-39. WSP 962: 1934. WSP 1246: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 352.5 ft above National Geodetic Vertical Datum of 1929. Prior to Feb. 6, 1946, at site 600 ft upstream at datum 8.93 ft higher. Supplementary water-stage recorder 200 ft upstream at datum 7.1 ft higher than present gage datum, used at times during period in 1942-46. Feb. 6, 1946, to Mar. 12, 1965, at present site at datum 5.0 ft higher.

REMARKS.--Records good except those for flows above 5,000 ft³/s, which are poor. Up to 400 ft³/s diverted for Electron powerplant of Puget Sound Power and Light Co. which is returned to river 4.8 mi upstream from gage. Minor regulation by Electron powerplant.

AVERAGE DISCHARGE.--53 years, 714 ft³/s, 56.37 in/yr, 517,300 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 15,300 ft³/s Nov. 20, 1962, gage height, 11.82 ft, present datum, from rating curve extended above 8,600 ft³/s on basis of slope-area measurement at gage height 12.25 ft, present datum; minimum, 25 ft³/s Nov. 28, 1952; minimum daily, 59 ft³/s Nov. 29, 1952.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 4,500 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Nov. 4	0030	4,770	8.07	Jan. 25	0330	*10,200	*10.38
Jan. 3	1000	8,610	9.75				

Minimum discharge, 146 ft³/s Oct. 21; minimum daily discharge, 186 ft³/s Oct. 16.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP		
1	254	413	519	574	747	486	553	514	793	1020	891	468		
2	236	472	472	1500	674	472	538	1040	685	944	855	459		
3	236	2770	429	5810	622	455	500	951	628	921	800	450		
4	401	3860	385	4380	584	433	481	767	685	959	716	455		
5	359	1840	363	3590	579	421	523	716	1020	1120	773	481		
6	302	1910	342	2770	579	421	500	710	862	1020	674	611		
7	246	1390	331	2220	548	417	590	650	1110	800	600	463		
8	236	944	429	1820	558	417	662	773	1280	760	685	528		
9	215	722	468	1510	558	437	595	827	1220	722	793	514		
10	208	1050	1150	1400	538	477	645	747	1020	728	813	421		
11	208	1280	928	1420	548	509	633	841	899	735	716	363		
12	206	855	685	1250	886	600	645	1040	807	722	650	363		
13	201	728	780	1110	1060	633	662	1060	848	710	569	317		
14	199	1250	1020	998	877	617	754	1190	944	697	504	291		
15	188	1900	800	913	735	595	1070	1140	1010	767	490	314		
16	186	2230	639	862	645	538	906	1060	921	877	548	355		
17	204	2230	533	786	574	509	728	891	773	928	633	404		
18	194	2550	468	741	533	486	639	786	728	834	639	484		
19	190	1530	417	716	523	509	600	991	716	767	548	524		
20	201	1830	367	685	674	921	574	1230	855	697	500	429		
21	190	1190	299	735	855	1440	543	967	1580	633	504	327		
22	514	841	270	862	722	1100	533	1030	1300	611	553	309		
23	356	704	245	1180	645	1070	519	1570	1130	650	558	265		
24	277	2190	230	5790	617	998	490	1310	1180	793	504	258		
25	257	1810	280	6340	595	891	477	1060	1120	944	472	228		
26	268	1060	302	2580	538	906	450	1150	1210	936	486	215		
27	257	1010	283	1780	519	793	429	1060	1210	800	538	211		
28	244	877	252	1370	514	780	425	1040	1170	728	523	206		
29	249	728	558	1120	486	710	472	1270	1660	754	468	213		
30	356	611	1240	951	---	639	468	1370	1330	793	468	233		
31	611	---	773	834	---	595	---	1010	---	855	463	---		
TOTAL	8249	42775	16257	58597	18533	20275	17604	30761	30694	25225	18934	11159		
MEAN	266	1426	524	1890	639	654	587	992	1023	814	611	372		
MAX	611	3860	1240	6340	1060	1440	1070	1570	1660	1120	891	611		
MIN	186	413	230	574	486	417	425	514	628	611	463	206		
CFSM	1.55	8.29	3.05	11.0	3.72	3.80	3.41	5.77	5.95	4.73	3.55	2.16		
IN.	1.78	9.25	3.52	12.67	4.01	4.39	3.81	6.65	6.64	5.46	4.10	2.41		
AC-FT	16360	84840	32250	116200	36760	40220	34920	61010	60880	50030	37560	22130		
CAL YR 1983	TOTAL	274069	MEAN	751	MAX	4410	MIN	186	CFSM	4.37	IN.	59.28	AC-FT	543600
WTR YR 1984	TOTAL	299063	MEAN	817	MAX	6340	MIN	186	CFSM	4.75	IN.	64.68	AC-FT	593200

PUYALLUP RIVER BASIN

12097500 GREENWATER RIVER AT GREENWATER, WA

LOCATION.--Lat 47°09'13", long 121°38'10", in NE¼NE¼ sec.10, T.19 N., R.9 E., Pierce County, Hydrologic Unit 17110014, on left bank at bridge crossing, 0.7 mi east of Greenwater, and at mile 1.1.

DRAINAGE AREA.--73.5 mi².

PERIOD OF RECORD.--September 1911 to August 1912 (fragmentary), May 1929 to September 1977, water years 1980-84 (June to October seasonal records). Published as "near Enumclaw" 1911-12.

REVISED RECORDS.--WSP 1716: 1947(M). WSP 1932: Drainage area.

GAGE.--Water-stage recorder. Elevation of gage is 1,720 ft, from river-profile survey. Prior to Aug. 10, 1912, nonrecording gages at sites approximately 500 ft upstream at different datums. May 1, 1929, to Aug. 14, 1934, water-stage recorder at site 1,400 ft upstream at different datum. Aug. 17, 1934, to Sept. 30, 1977, water-stage recorder at site 500 ft upstream at different datum.

REMARKS.--Records excellent. No regulation upstream from station.

AVERAGE DISCHARGE.--48 years (water years 1930-77), 211 ft³/s, 38.98 in/yr, 152,900 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 5,360 ft³/s Nov. 22, 1959, gage height, 7.67 ft site and datum then in use, from rating curve extended above 1,200 ft³/s on basis of slope-area measurement of peak flow; minimum, 23 ft³/s Oct. 7, 1934.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of Dec. 2, 1977, reached a stage of 9.8 ft former site and datum, from floodmarks, discharge, about 10,500 ft³/s.

EXTREMES FOR JUNE TO OCTOBER.--Maximum discharge, 576 ft³/s June 21, gage height, 4.65 ft; minimum, 40 ft³/s Oct. 20-24, gage height, 2.70 ft.

DISCHARGE, IN CUBIC FEET PER SECOND, JUNE TO OCTOBER 1984
MEAN VALUES

DAY	JUN	JUL	AUG	SEP	OCT
1	448	369	105	56	43
2	410	337	99	56	42
3	394	317	94	54	42
4	395	301	90	53	42
5	435	288	87	52	42
6	446	273	85	63	42
7	434	260	83	65	41
8	414	247	81	59	41
9	404	237	79	55	43
10	394	229	77	53	43
11	389	217	75	52	47
12	388	200	76	53	47
13	399	193	75	52	57
14	421	184	72	50	66
15	454	176	71	49	58
16	449	169	70	47	50
17	423	164	69	47	45
18	408	156	67	47	43
19	399	149	66	46	42
20	399	144	65	45	41
21	513	139	63	45	40
22	534	133	62	48	40
23	515	127	61	52	40
24	504	123	61	52	41
25	495	119	59	50	119
26	479	116	58	47	118
27	455	112	58	46	91
28	430	108	59	45	88
29	434	106	58	43	75
30	409	103	57	43	68
31	---	100	56	---	65
TOTAL	13071	5896	2238	1525	1702
MEAN	436	190	72.2	50.8	54.9
MAX	534	369	105	65	119
MIN	388	100	56	43	40
CFSM	5.93	2.59	.98	.69	.75
IN.	6.62	2.98	1.13	.77	.86
AC-FT	25930	11690	4440	3020	3380

PUYALLUP RIVER BASIN

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12097850 WHITE RIVER BELOW CLEARWATER RIVER, NEAR BUCKLEY, WA

LOCATION.--Lat 47°08'49", long 121°51'32", in NE¼SW¼ sec.12, T.19 N., R.7 E., King County, Hydrologic Unit 17110014, on right bank 300 ft upstream from Canyon Creek, 1.5 mi downstream from Clearwater River, 6.4 mi east of Buckley, and at mile 33.8.

DRAINAGE AREA.--375 mi².

PERIOD OF RECORD.--June 1974 to September 1976, March 1982 to current year.

REVISED RECORDS.--WDR WA-76-1: 1975(M).

GAGE.--Water-stage recorder. Datum of gage is 1,100.00 ft above National Geodetic Vertical Datum of 1929 (Corps of Engineers bench mark). Prior to March 1982, at datum 47.16 ft higher.

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

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 22,800 ft³/s Dec. 2, 1975, gage height, 55.16 ft, present datum, from high-water mark in well; minimum, 265 ft³/s Nov. 4-6, 1974.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 13,300 ft³/s Jan. 25, gage height, 53.43 ft; minimum, 350 ft³/s Oct. 16, 19, gage height, 47.49 ft; minimum gage height, 46.94 ft Sept. 29.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP		
1	422	542	999	835	1780	843	1260	876	2330	2260	1310	673		
2	416	630	927	1620	1580	865	1170	1480	2070	2270	1270	607		
3	416	2150	854	6810	1440	800	1110	1540	1890	2270	1200	596		
4	512	3540	778	8140	1310	750	1030	1400	2010	2270	1110	617		
5	477	2210	732	6770	1250	720	1070	1300	2340	2390	1090	640		
6	458	2280	687	4710	1210	760	1000	1240	2310	2210	997	794		
7	434	1900	638	3700	1130	821	1240	1160	2290	2010	934	643		
8	425	1510	677	3060	1090	887	1330	1270	2250	1880	964	631		
9	406	1300	708	2550	1070	992	1260	1400	2170	1820	1050	626		
10	392	1340	1120	2320	1020	1090	1270	1330	2020	1770	1100	585		
11	382	1540	1060	2380	1030	1160	1200	1500	1940	1720	1070	560		
12	376	1330	908	2270	1550	1290	1200	2140	2000	1680	1070	550		
13	371	1190	1190	2060	1960	1260	1160	2120	2190	1650	924	498		
14	373	1480	1850	1780	1650	1220	1250	2340	2360	1620	853	476		
15	368	2240	1610	1550	1470	1200	1820	2300	2630	1630	818	469		
16	357	2340	1270	1440	1290	1130	1820	2170	2550	1740	834	476		
17	380	2310	1020	1280	1130	1040	1580	1940	2270	1780	885	499		
18	368	2430	884	1160	1030	1030	1410	1780	2120	1690	842	537		
19	362	2090	795	1100	968	1130	1330	1980	2090	1550	767	581		
20	377	1930	683	1010	1090	1960	1220	2560	2170	1460	726	577		
21	359	1600	509	1030	1220	2790	1170	2330	2720	1320	727	518		
22	653	1360	450	1120	1080	2410	1160	2230	2860	1250	763	520		
23	557	1220	410	1630	1040	2310	1110	2680	2740	1250	756	489		
24	468	1560	390	7820	1000	2170	1020	2650	2860	1330	704	471		
25	434	1540	500	10600	1000	2070	968	2400	2960	1430	673	430		
26	417	1300	603	5690	898	2280	887	2260	3030	1490	678	410		
27	407	1440	529	4060	854	2040	821	2150	2920	1370	748	401		
28	393	1460	463	3150	876	1880	800	2200	2850	1280	749	381		
29	384	1290	606	2590	843	1650	800	2630	2980	1240	681	368		
30	439	1140	1300	2260	---	1480	790	3280	2570	1250	678	371		
31	611	---	1020	1990	---	1370	---	2820	---	1300	660	---		
TOTAL	13194	50192	26170	98485	34859	43398	35256	61456	72490	52180	27631	15994		
MEAN	426	1673	844	3177	1202	1400	1175	1982	2416	1683	891	533		
MAX	653	3540	1850	10600	1960	2790	1820	3280	3030	2390	1310	794		
MIN	357	542	390	835	843	720	790	876	1890	1240	660	368		
CFSM	1.14	4.46	2.25	8.47	3.21	3.73	3.13	5.29	6.44	4.49	2.38	1.42		
IN.	1.31	4.98	2.60	9.77	3.46	4.31	3.50	6.10	7.19	5.18	2.74	1.59		
AC-FT	26170	99560	51910	195300	69140	86080	69930	121900	143800	103500	54810	31720		
CAL YR 1983	TOTAL	477922	MEAN	1309	MAX	5750	MIN	357	CFSM	3.49	IN.	47.41	AC-FT	948000
WTR YR 1984	TOTAL	531305	MEAN	1452	MAX	10600	MIN	357	CFSM	3.87	IN.	52.71	AC-FT	1054000

PUYALLUP RIVER BASIN

12098000 MUD MOUNTAIN LAKE NEAR BUCKLEY, WA

LOCATION.-- Lat 47°08'27", long 121°55'48", in NE¼NE¼ sec.17, T.19 N., R.7 E., Pierce County, Hydrologic Unit 17110014, on left bank of reservoir just upstream from Mud Mountain Dam on White River, 5 mi southeast of Buckley, 5.6 mi downstream from Clearwater River, and at mile 29.7.

DRAINAGE AREA.--400 mi².

PERIOD OF RECORD.--October 1943 to current year. Monthend contents only October 1943 to September 1944, published in WSP 1316. Prior to October 1970, published as Mud Mountain Reservoir near Buckley.

GAGE.--Nonrecording gage. Datum of gage is National Geodetic Vertical Datum of 1929 (levels by Corps of Engineers).

REMARKS.--Lake, for flood control, is formed by earthfill dam. Embankment completed and storage began on small scale in 1942. Capacity, 106,000 acre-ft between elevations 895 ft, invert of outlet tunnel, and 1,215 ft, spillway crest. Storage is dissipated as soon after a flood as is possible, without creating damaging flows downstream, in order to have the maximum capacity available for any following flood which might develop.

COOPERATION.--Records of lake elevations and capacity table furnished by Corps of Engineers.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents observed since dam was completed, 55,880 acre-ft Aug. 23, 1974, elevation, 1,150.0 ft; no pool at times in some years.

EXTREMES FOR CURRENT YEAR.--Maximum contents observed, 18,033 acre-ft June 14, elevation, 1,072.0 ft; minimum observed, 20 acre-ft Oct. 27-30, Nov. 1, Dec. 7, elevation, 902.0 ft.

Capacity table (elevation, in feet, and total contents, acre-feet)
(Based on area maps by Corps of Engineers in 1939)

907	39	930	191	970	1,520	1,070	17,380
910	52	935	266	985	2,510	1,100	29,050
915	77	940	366	1,000	3,830	1,150	55,880
920	107	945	491	1,020	6,260		
925	141	955	817	1,040	9,680		

RESERVOIR STORAGE (AC-FT), WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984
INSTANTANEOUS OBSERVATIONS AT 0800

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	37	20	31	38	2090	264	249	2100	1430	2470	2120	2010
2	50	23	43	51	2570	266	249	2150	315	2470	2180	1970
3	81	45	31	1940	4660	277	233	2340	125	2470	2120	1970
4	247	2120	31	4480	6070	249	218	2290	1930	2460	2130	1970
5	1380	1720	31	3060	5460	244	179	2120	2400	2510	2130	1980
6	1380	1150	31	2510	4090	247	179	1560	2500	2470	2110	2050
7	1620	1250	20	2220	2670	258	1210	138	4810	2390	2060	2000
8	2290	164	31	1950	757	249	2120	138	8100	2360	2080	1980
9	2930	63	31	1760	1760	256	1990	261	10900	2340	2120	1980
10	3440	311	39	1400	355	251	191	139	13000	2320	2120	1960
11	3910	1620	50	3910	252	264	191	139	14600	2290	2130	1960
12	4520	138	31	4310	254	249	189	1460	15800	2290	2130	1950
13	5270	58	39	2380	534	275	929	2720	17400	2270	2080	1920
14	5770	79	266	204	303	270	988	2480	18000	2270	2050	1920
15	6000	779	154	508	297	271	423	1620	17900	2260	2040	1920
16	6200	1250	58	491	1400	280	218	779	15500	2310	2040	1920
17	6460	2550	48	1940	2040	266	210	168	12400	2340	2060	1930
18	2960	3410	45	2670	1450	264	200	147	8490	3020	2060	1940
19	1720	2480	39	3300	1260	263	186	143	4150	4130	2020	1960
20	1760	904	39	2050	1470	319	184	817	2420	2510	2020	1940
21	1740	85	39	1870	1890	1340	144	844	2530	2230	2010	1940
22	1800	389	39	1870	1890	1670	135	243	2610	2190	2020	1940
23	1840	1920	39	1880	962	929	138	896	2570	2150	2020	1940
24	1800	75	39	3350	277	783	136	1530	2600	2880	2010	1940
25	1790	72	39	8510	279	340	135	1320	2640	3410	1990	1900
26	55	61	39	3410	275	677	1440	743	2650	2610	1990	1920
27	20	66	39	2510	266	606	2020	378	2670	2160	2010	1870
28	20	67	39	3920	266	344	2080	280	2630	2170	2040	1870
29	20	87	149	4930	261	1890	2100	609	2670	2150	2010	1850
30	20	52	60	4170	---	284	2100	1760	2610	2120	2000	1860
31	31	---	50	2410	---	258	---	2720	---	2110	1990	---
MEAN	2166	767	53.5	2581	1590	465	699	1130	6612	2456	2061	1942
MAX	6460	3410	266	8510	6070	1890	2120	2720	18000	4130	2180	2050
MIN	20	20	20	38	252	244	135	138	125	2110	1990	1850
(††)	903.0	906.7	907.7	978.4	934.8	934.2	979.3	974.0	984.7	979.5	977.8	975.7
(†)	23	38	42	2036	263	252	2097	1755	2488	2110	1996	1860
(+)	-10	+15	+4	+1994	-1773	-11	+1845	-342	+733	-378	-114	-136

CAL YR 1983 MEAN 624 MAX 8490 MIN 20 AC-FT+ -71
WTR YR 1984 MEAN 1871 MAX 18000 MIN 20 AC-FT+ -1869

†† Monthend estimated elevation, in feet, at 2400 hours.

† Monthend estimated contents, in acre-feet.

+ Change in contents, in acre-feet.

12098500 WHITE RIVER NEAR BUCKLEY, WA

LOCATION.--Lat 47°09'05", long 121°56'55", in SW¼NW¼ sec.8, T.19 N., R.7 E., King County, Hydrologic Unit 17110014, on right bank 0.4 mi upstream from Red Creek, 1.7 mi downstream from Mud Mountain Dam, 3.8 mi east of Buckley, 7.4 mi downstream from Clearwater River and at mile 27.9.

DRAINAGE AREA.--401 mi².

PERIOD OF RECORD.--October 1928 to November 1933, October 1938 to current year.

REVISED RECORDS.--WSP 1247: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is National Geodetic Vertical Datum of 1929 (Corps of Engineers bench mark). Oct. 26 to Dec. 9, 1928, nonrecording gage, and Dec. 9 1928, to Nov. 30, 1933, water-stage recorder at site 3.0 mi upstream at different datum. Nov. 26, 1938, to Feb. 14, 1939, nonrecording gage at present site and datum.

REMARKS.--Records good except those for October through January, which are poor. Flow regulated by Mud Mountain Lake (station 12098000) for flood control. Storage is not retained and observed annual runoff closely represents natural runoff of basin. No diversion above station.

COOPERATION.--Water-stage recorder inspected by employees of Corps of Engineers.

AVERAGE DISCHARGE.--51 years (water years 1929-33, 1939-84), 1,452 ft³/s, 49.17 in/yr, 1,051,000 acre-ft/yr, adjusted for storage since December 1943.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 17,000 ft³/s Feb. 26, 1932, gage height, 17.5 ft, site and datum then in use, from rating curve extended above 3,500 ft³/s; probably no flow for part of each day Oct. 1, 2, 7, 8, Nov. 14, Dec. 1, 5, 15, 1958; Jan. 3, Mar. 24, June 8, Aug. 19, 1959; minimum daily, 59 ft³/s June 25, 1957, Mar. 26, 1958.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in December 1933 reached a stage of 23.4 ft, from floodmarks, at former site, discharge, 28,000 ft³/s, from rating curve extended above 3,500 ft³/s.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 13,400 ft³/s Jan. 25, elevation, 807.59 ft; minimum, 46 ft³/s Jan. 18, but may have been less Feb. 3, 16, July 18, 24; minimum daily, 160 ft³/s Oct. 12.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	485	648	1190	976	2110	1160	1440	1050	2660	2350	1370	705
2	470	790	1130	1550	675	1170	1350	1580	2120	2290	1350	628
3	460	2210	1050	5720	1200	1120	1280	1700	1560	2300	1280	612
4	400	4870	976	8750	1630	1060	1220	1640	1700	2270	1180	632
5	385	3290	922	6490	1860	1030	1240	1630	2270	2420	1150	660
6	460	2740	880	4160	1900	1050	1030	1750	1770	2280	1060	850
7	400	2460	830	3800	1980	1100	1110	1350	1330	2080	988	690
8	220	1740	855	2820	1300	1150	1430	1420	1290	1940	1010	652
9	235	1450	842	2290	1490	1250	1840	1540	1340	1870	1100	652
10	245	1220	1410	1600	1370	1330	1470	1490	1370	1840	1140	612
11	215	2000	1350	1710	1330	1410	1380	1510	1410	1780	1110	588
12	160	1500	1210	2230	1630	1520	1270	1770	1420	1760	1110	592
13	194	1380	1450	2190	2250	1530	1230	2150	1790	1720	970	509
14	263	1620	2050	1610	1880	1470	1560	2650	2400	1690	890	488
15	427	2370	1840	1340	1690	1460	1850	2700	3290	1680	855	474
16	340	2300	1500	1060	946	1400	1880	2430	3900	1760	865	479
17	1020	1990	1300	926	1630	1330	1670	2060	3760	1830	916	507
18	1090	2710	1180	570	1410	1320	1520	1850	3710	1010	880	537
19	433	3100	1100	1560	1240	1370	1460	1950	3240	2090	805	589
20	439	2650	855	1230	1220	2080	1360	2480	2270	1820	755	588
21	409	1900	700	1080	1520	2720	1300	2440	2940	1380	755	542
22	648	1230	616	1170	1600	2740	1290	2190	3030	1300	790	537
23	800	1930	570	1290	1570	2540	1250	2580	2890	1300	795	510
24	624	1840	540	6410	1330	2410	1170	2730	3010	900	735	494
25	835	1760	680	12100	1330	2170	916	2650	3100	1720	690	443
26	464	1520	760	7320	1220	2410	770	2440	3120	1740	695	423
27	427	1610	720	3820	1170	2270	976	2210	3040	1450	780	415
28	409	1600	660	2890	1180	1800	982	2150	2960	1350	800	389
29	394	1440	780	2930	1160	2060	1040	2440	3180	1290	710	372
30	409	1320	1530	2910	---	1670	1010	2830	2790	1300	700	370
31	795	---	1300	2550	---	1530	---	3120	---	1350	680	---
TOTAL	14555	59188	32776	97052	42821	50630	39294	64480	74660	53860	28914	16539
MEAN	470	1973	1057	3131	1477	1633	1310	2080	2489	1737	933	551
MAX	1090	4870	2050	12100	2250	2740	1880	3120	3900	2420	1370	850
MIN	160	648	540	570	675	1030	770	1050	1290	900	680	370
AC-FT	28870	117400	65010	192500	84940	100400	77940	127900	148100	106800	57350	32810
MEAN†	469	1973	1057	3163	1445	1633	1341	2075	2501	1730	931	549
CFSM†	1.17	4.92	2.64	7.89	3.60	4.07	3.34	5.17	6.24	4.31	2.32	1.37
IN.†	1.35	5.49	3.04	9.09	3.89	4.69	3.73	5.97	6.96	4.98	2.68	1.53
AC-FT†	28860	117400	65010	194500	83170	100400	79780	127600	148800	106400	57240	32670

CAL YR 1983 TOTAL 488713 MEAN 1339 MAX 6690 MIN 160 AC-FT 969400 MEAN† 1339 CFSM† 3.34 IN.† 45.32 AC-FT† 969300
WTR YR 1984 TOTAL 574769 MEAN 1570 MAX 12100 MIN 160 AC-FT 1140000 MEAN† 1568 CFSM† 3.91 IN.† 53.21 AC-FT† 1138000

† Adjusted for change in contents of Mud Mountain Lake.

PUYALLUP RIVER BASIN

12099000 WHITE RIVER CANAL AT BUCKLEY, WA

LOCATION.--Lat 47°10'21", long 122°03'48", in SW¼SE¼ sec.32, T.20 N., R.6 E., Pierce County, Hydrologic Unit 17110014, on right bank 0.3 mi downstream from Dingle Basin, and 1.7 mi northwest of Buckley.

PERIOD OF RECORD.--February 1913 to September 1938 (monthly runoff only, published in WSP 1316), October 1981 to current year. Records for September 1958 to September 1981 available in files of the Geological Survey. Records prior to October 1961, published as White River flume near Buckley, at site 3.5 mi upstream; several stilling basins between the two sites affect runoff.

GAGE.--Water-stage recorder. Elevation of gage is 655 ft, from topographic map.

REMARKS.--Records excellent except those below 100 ft³/s, which are fair, and those below 5.0 ft³/s, which are poor. Flow completely regulated at White River Diversion Dam about 4.0 mi upstream from gage.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 1,760 ft³/s May 30; gage height, 8.98 ft; no flow on all or part of many days during year.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	464	615	152	246	0	1060	1380	1010	1700	0	1140	599
2	454	657	829	320	24	1070	1310	1410	1690	0	1180	545
3	446	1230	1030	771	549	1040	1230	1290	1530	0	1160	521
4	386	1660	953	952	1080	977	1190	759	1500	0	1070	540
5	366	1610	901	578	1300	943	1200	1520	1700	0	1030	559
6	436	1640	864	315	1370	958	1040	1560	1580	0	966	701
7	357	1550	809	241	1440	1010	1030	1310	1330	0	899	619
8	209	1330	870	123	1140	1040	1320	1310	1240	0	891	561
9	216	975	902	84	812	1120	1490	1470	1300	0	962	567
10	213	778	1340	57	23	1180	1460	1420	1300	0	1020	535
11	196	1100	1370	66	0	1260	1370	1430	56	0	991	506
12	141	1230	1170	103	6.6	1290	1270	1640	0	0	992	507
13	153	1360	1300	108	8.5	1380	1130	1680	0	0	906	452
14	236	1550	1590	58	3.4	1350	1240	1690	0	0	803	373
15	332	1640	1600	34	71	1330	1260	1710	0	0	761	409
16	279	1630	1510	29	443	1280	1270	1710	0	0	743	410
17	805	679	1270	11	1380	1210	881	1700	0	13	796	432
18	1430	1410	1110	104	1280	1200	1480	1700	0	239	786	459
19	414	1120	1010	1300	1120	1210	1390	1710	0	885	723	509
20	413	1120	895	1130	1090	1530	1320	1720	0	881	675	516
21	387	1010	528	957	1360	1570	1250	1730	0	880	649	476
22	588	252	345	1030	1390	1610	1240	1710	0	825	680	460
23	665	1030	328	1170	1380	1630	1210	1730	0	818	687	445
24	534	1560	307	1520	1220	1620	1130	1710	0	569	654	431
25	722	1620	263	647	1210	1610	942	1720	0	1240	611	382
26	647	1480	203	280	1130	1630	727	1730	0	1370	609	353
27	452	1540	147	93	1090	1610	901	1720	0	1230	657	342
28	432	1620	89	44	1080	1530	935	1730	0	1110	710	323
29	417	1150	97	37	1070	1440	992	1750	0	1060	619	304
30	456	527	293	2.0	---	1540	991	1740	0	1060	596	303
31	662	---	313	0	---	1480	---	1730	-	1090	586	---
TOTAL	13908	36673	24388	12410.0	24070.5	40708	35579	48749	14926	13270	25552	14139
MEAN	449	1222	787	400	830	1313	1186	1573	498	428	824	471
MAX	1430	1660	1600	1520	1440	1630	1490	1750	1700	1370	1180	701
MIN	141	252	89	0	0	943	727	759	0	0	586	303
AC-FT	27590	72740	48370	24620	47740	80740	70570	96690	29610	26320	50680	28040
CAL YR 1983	TOTAL 353140.0		MEAN	968	MAX	1770	MIN	0	AC-FT	700500		
WTR YR 1984	TOTAL 304372.5		MEAN	832	MAX	1750	MIN	0	AC-FT	603700		

PUYALLUP RIVER BASIN

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12099600 BOISE CREEK AT BUCKLEY, WA

LOCATION.--Lat 47°10'34", long 122°01'02", in NE¼SE¼ sec.34, T.20 N., R.6 E., King County, Hydrologic Unit 17110014, on left bank at downstream side of county road bridge, 1.0 mi northeast of Buckley, and at mile 0.1.

DRAINAGE AREA.--15.4 mi².

PERIOD OF RECORD.--March 1977 to September 1981, December 1981 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 640 ft, from topographic map. Prior to January 25, 1984, at site 25 ft upstream at datum 1.91 ft higher.

REMARKS.--Records good. Flow partly regulated by millpond at mile 5.6. Diversions above station for domestic and industrial use. Interbasin diversion from Scatter Creek of about 2 ft³/s during low-flow periods enters Boise Creek above millpond.

AVERAGE DISCHARGE.--6 years (1978-81, 1983, 1984), 34.2 ft³/s, 24,780 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 972 ft³/s Jan. 25, 1984, gage height, 5.18 ft from floodmarks; minimum, 1.7 ft³/s Sept. 19, 1979.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 972 ft³/s Jan. 25, gage height, 5.18 ft from floodmarks; minimum, 4.9 ft³/s Sept. 18.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	9.9	22	40	38	54	48	45	62	33	36	9.0	7.0
2	9.5	21	35	89	50	47	42	101	32	33	9.0	6.8
3	8.5	206	34	348	47	44	39	79	30	29	8.8	6.4
4	10	148	28	348	44	40	36	63	36	26	8.5	6.0
5	9.5	96	30	359	40	37	41	58	41	25	9.0	7.0
6	8.5	114	34	221	41	35	40	54	35	22	9.3	9.9
7	9.0	87	35	171	39	35	65	47	35	20	8.5	7.6
8	9.0	66	45	136	36	34	58	46	35	19	8.3	7.6
9	8.5	60	66	108	38	33	52	49	41	17	8.1	7.0
10	8.0	48	139	118	37	37	69	49	35	18	7.8	6.4
11	7.3	45	84	192	46	36	64	62	32	17	7.8	9.3
12	7.6	36	64	151	85	55	70	62	31	17	7.6	9.6
13	7.6	34	70	123	82	49	64	61	29	16	7.4	6.9
14	8.5	80	80	100	66	47	56	59	27	16	6.8	6.3
15	8.3	79	79	85	58	48	51	73	25	15	6.6	6.0
16	8.0	79	63	75	50	42	48	64	24	14	6.6	6.1
17	9.9	70	49	66	45	39	45	54	23	13	6.6	5.6
18	8.5	80	42	59	41	47	42	47	20	12	7.0	5.3
19	9.9	74	37	53	39	53	40	55	20	12	7.2	5.7
20	12	68	31	49	72	96	35	54	29	12	6.6	5.9
21	9.9	53	25	70	92	111	35	47	92	12	6.0	5.8
22	21	43	21	100	61	70	34	62	50	12	6.4	9.0
23	13	39	19	176	57	69	33	72	40	11	6.6	7.2
24	9.5	43	18	488	57	59	31	57	34	10	6.6	7.5
25	8.5	38	21	620	66	62	33	54	29	10	6.8	6.2
26	8.5	36	26	205	53	67	31	69	29	10	6.8	6.0
27	11	57	24	140	48	57	28	55	27	9.9	8.8	5.8
28	9.9	62	21	105	49	71	33	49	24	10	8.1	5.5
29	9.0	50	33	85	47	64	46	43	47	10	6.6	5.5
30	18	45	52	72	---	55	44	40	47	9.9	6.6	5.6
31	31	---	48	61	---	49	---	36	---	9.6	6.6	---
TOTAL	327.3	1979	1393	5011	1540	1636	1350	1783	1032	503.4	232.4	202.5
MEAN	10.6	66.0	44.9	162	53.1	52.8	45.0	57.5	34.4	16.2	7.50	6.75
MAX	31	206	139	620	92	111	70	101	92	36	9.3	9.9
MIN	7.3	21	18	38	36	33	28	36	20	9.6	6.0	5.3
AC-FT	649	3930	2760	9940	3050	3250	2680	3540	2050	998	461	402
CAL YR 1983	TOTAL	12036.5	MEAN	33.0	MAX	318	MIN	7.3	AC-FT	23870		
WTR YR 1984	TOTAL	16989.6	MEAN	46.4	MAX	620	MIN	5.3	AC-FT	33700		

NOTE.--No gage-height record Jan. 25 to 31.

PUYALLUP RIVER BASIN

12100000 WHITE RIVER AT BUCKLEY, WA .

LOCATION.--Lat 47°10'28", long 122°01'09", in NE¼SE¼ sec.34, T.20 N., R.6 E., Pierce County, Hydrologic Unit 17110014, on left bank 150 ft downstream from railway bridge, 200 ft downstream from Boise Creek, 1.0 mi northeast of Buckley, and at mile 23.3

DRAINAGE AREA.--427 mi².

PERIOD OF RECORD.--July 1910 to November 1911, April 1977 to current year. February 1913 to September 1938 (records not equivalent as they include flow of White River flume, see REMARKS).

REVISED RECORDS.--WSP 1316: Drainage area.

GAGE.--Water-stage recorder and concrete control. Elevation of gage is 620 ft, from topographic map. June 8, 1910, to Nov. 30, 1911, nonrecording gage at site 150 ft upstream at different datum, and Jan. 18, 1913, to Sept. 30, 1938, water-stage recorder at site 100 ft upstream at National Geodetic Vertical Datum of 1929 (levels by Puget Sound Power and Light Co.).

REMARKS.--Records good. Since November 1911, White River Canal (station 12099000) has diverted from left bank 1.0 mi upstream for storage in Lake Tapps (station 12101000). Water is returned to White River 19.7 mi downstream via the Lake Tapps Diversion (station 12101100) after power development at White River powerplant at Dieringer. Since 1942, flow regulated by Mud Mountain Lake (station 12098000) for flood control.

EXTREMES FOR PERIOD OF RECORD.--During water years 1911-12, 1914-19, 1921-23, 1935-38, maximum discharge, 23,100 ft³/s Dec. 18, 1917, during period of combined flows; minimum, not determined. River, excluding canal, since April 1977, maximum discharge, 14,300 ft³/s Dec. 2, 1977, gage height, 9.11 ft; minimum, 25 ft³/s Nov. 19, 1979, gage height, 2.41 ft; minimum daily, 31 ft³/s July 30, 1978.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 12,700 ft³/s Jan. 25, gage height, 8.75 ft; minimum, 45 ft³/s Nov. 26, gage height, 2.49 ft; minimum daily 59 ft³/s Oct. 8, 26.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	71	71	1010	935	2030	149	109	133	1080	2270	208	124
2	67	89	354	1520	670	146	104	267	536	2210	153	121
3	65	837	98	5450	648	143	100	746	202	2190	131	119
4	65	2510	87	8220	469	135	95	872	206	2180	126	115
5	69	1550	89	6350	492	133	102	181	725	2270	125	117
6	72	1270	98	4260	481	130	95	287	368	2170	119	146
7	91	1170	95	3810	522	128	141	104	96	1980	112	117
8	59	890	106	2840	275	128	169	104	93	1860	117	123
9	69	795	120	2380	633	128	436	118	104	1800	123	119
10	81	592	275	1810	1300	133	160	109	226	1770	124	115
11	64	1200	146	1910	1020	152	130	128	1460	1720	124	120
12	65	528	120	2330	1280	175	135	207	1460	1690	123	124
13	67	160	188	2290	2130	191	197	579	1780	1600	102	118
14	72	304	707	1700	1850	135	394	1100	1750	1520	110	157
15	67	991	510	1450	1550	135	655	1170	3050	1500	117	105
16	65	1010	146	1200	522	130	700	863	3630	1570	133	109
17	87	1470	104	1000	247	125	855	458	3510	1630	129	108
18	89	1480	95	404	160	133	100	260	3420	653	119	108
19	62	1740	91	304	143	141	95	380	2980	1150	112	109
20	71	1450	83	240	166	452	89	872	2180	931	114	108
21	71	982	394	214	240	1100	89	872	2810	506	126	106
22	85	872	370	232	207	1220	89	649	2860	474	132	113
23	67	890	340	308	247	1000	89	1050	2680	468	127	108
24	64	374	310	5000	188	872	89	1170	2780	287	118	111
25	67	291	520	11800	181	633	95	1080	2870	391	119	104
26	59	120	750	6980	172	804	100	908	2900	340	119	108
27	64	149	700	3770	160	771	111	655	2840	241	130	103
28	65	146	650	2820	154	516	95	553	2730	228	129	102
29	65	469	863	2800	152	612	118	812	2970	227	125	102
30	72	837	1470	2760	---	243	102	1200	2640	228	127	102
31	106	---	1120	2430	---	120	---	1490	---	231	120	---
TOTAL	2203	25237	12009	89517	18289	11013	5838	19377	56936	38285	3893	3441
MEAN	71.1	841	387	2888	631	355	195	625	1898	1235	126	115
MAX	106	2510	1470	11800	2130	1220	855	1490	3630	2270	208	157
MIN	59	71	83	214	143	120	89	104	93	227	102	102
AC-FT	4370	50060	23820	177600	36280	21840	11580	38430	112900	75940	7720	6830
CAL YR 1983	TOTAL	155084	MEAN	425	MAX	5590	MIN	49	AC-FT	307600		
WTR YR 1984	TOTAL	286038	MEAN	782	MAX	11800	MIN	59	AC-FT	567400		

PUYALLUP RIVER BASIN

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12101000 LAKE TAPPS NEAR SUMNER, WA

LOCATION.--Lat 47°14'28", long 122°11'26", in NE¼NE¼ sec.8, T.20 N., R.5 E., Pierce County, Hydrologic Unit 17110014, 1.7 mi east of Dieringer, and 3.5 mi northeast of Sumner.

PERIOD OF RECORD.--November 1911 to current year. October 1934 to October 1950, change in contents published with records for Puyallup River at Puyallup. Monthend contents only November 1911 to September 1950, published in WSP 1316.

GAGE.--Nonrecording gage. Datum of gage is 0.7 ft above National Geodetic Vertical Datum of 1929 (levels by Puget Sound Power & Light Co.).

REMARKS.--Reservoir is formed by a diked natural lake into which a large part of the low-water flow of White River is diverted. Construction of dike began June 1910; storage began in 1911. Usable capacity (based on 1959 resurvey; capacity table dated July 28, 1959, put into use Oct. 1, 1958), 46,600 acre-ft between gage heights of 515 ft, normal minimum pool, and 543 ft, normal maximum pool. Dead storage unknown. Figures given herein represent usable contents. Reservoir is used for power development at the White River powerplant at Dieringer.

COOPERATION.--Gage-height record and contents curve furnished by Puget Sound Power & Light Co.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents observed, 51,710 acre-ft June 30, 1958, gage height, 541.57 ft, capacity table dated Jan. 19, 1920; maximum gage height observed, 543.04 ft June 19, 1967; minimum contents observed, not determined (below normal minimum pool) Apr. 3, 1978, gage height, 514.90 ft; minimum gage height, 505.70 ft June 24, 1912.

EXTREMES FOR CURRENT YEAR.--Maximum contents observed, 46,655 acre-ft June 10, July 31, gage height, 543.00 ft; minimum observed, 7,812 acre-ft Feb. 15, gage height, 522.61 ft.

MONTHEND GAGE HEIGHT AND CONTENTS AT 2400, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984

	Gage height (feet)	Contents (acre-feet)	Change in contents (acre-feet)
Sept. 30.....	542.31	44,917	--
Oct. 31.....	541.34	42,525	-2,392
Nov. 30.....	541.40	42,671	+146
Dec. 31.....	535.51	29,169	-13,502
CAL YR 1983.....	--	--	-1,684
Jan. 31.....	531.27	20,793	-8,376
Feb. 29.....	526.22	12,667	-8,126
Mar. 31.....	532.81	23,663	+10,996
Apr. 30.....	526.45	13,004	-10,659
May 31.....	542.36	45,043	+32,039
June 30.....	542.62	45,698	+655
July 31.....	543.00	46,655	+957
Aug. 31.....	542.38	45,093	-1,562
Sept. 30.....	542.27	44,817	-276
WTR YR 1984.....	--	--	-100

PUYALLUP RIVER BASIN

12101100 LAKE TAPPS DIVERSION AT DIERINGER, WA

LOCATION.--Lat 47°14'18", long 122°13'37", in SW¼NW¼ sec.7, T.20 N., R.5 E., Pierce County, Hydrologic Unit 17110014, on right bank 850 ft downstream from White River powerplant at Dieringer, and 1,400 ft upstream from mouth.

PERIOD OF RECORD.--April 1958 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 60 ft, from topographic map.

REMARKS.--Records excellent. Flow regulated by White River powerplant.

AVERAGE DISCHARGE.--26 years, 968 ft³/s, 701,300 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 2,530 ft³/s Jan. 29, 1965, gage height, 6.23 ft; maximum gage height, 7.28 ft Jan. 25, 1984 (backwater from White River); minimum discharge, 7.2 ft³/s Sept. 29, 1967, gage height, 0.20 ft; minimum daily discharge, 10 ft³/s Aug. 21, 22, 1974.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 2,030 ft³/s Feb. 10, maximum gage height, 7.28 ft Jan. 25 (backwater from White River); minimum, 11 ft³/s Mar. 1, gage height 0.42 ft.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	441	697	333	720	127	845	1290	765	1750	15	1210	549
2	441	722	716	516	139	1180	1160	1180	1720	15	1160	526
3	448	1460	724	718	600	1120	1280	1190	1570	16	1100	481
4	434	1820	680	134	765	1340	1280	385	1540	16	1190	488
5	344	1700	850	19	580	1310	1420	588	1640	16	1190	566
6	492	1730	532	19	895	885	1630	905	1550	17	1170	638
7	365	1660	1020	568	1290	1160	1630	835	1340	16	1080	618
8	255	1480	1020	1090	1450	1160	1630	712	1060	17	850	537
9	246	840	1100	564	1410	1020	1630	950	704	17	862	498
10	187	604	1320	504	1330	910	1640	805	1090	17	906	469
11	193	860	1600	496	1640	975	1640	990	85	17	949	520
12	187	544	1520	246	1650	1150	1640	1000	14	17	934	490
13	83	1260	1590	470	1280	1110	1640	463	14	17	914	420
14	30	1570	1580	406	1120	1110	1610	825	14	16	812	386
15	325	1720	1580	207	159	960	190	945	14	16	750	352
16	323	1580	1580	552	243	1410	1230	935	14	16	689	357
17	680	748	1460	732	231	1630	1640	795	14	16	763	379
18	1660	1480	1360	775	980	1580	1650	676	14	27	729	390
19	621	1140	1360	584	1080	1400	1540	716	14	388	669	401
20	454	1140	1360	1170	985	1200	1490	1020	15	763	609	478
21	407	805	870	656	1130	1190	1320	770	15	810	590	461
22	564	860	1330	552	1170	1190	1490	895	15	810	592	455
23	719	1040	1260	975	1520	1180	1640	1160	15	810	593	448
24	606	1100	644	1590	1540	1210	1640	1150	15	633	592	407
25	1030	1720	945	924	965	1170	1650	1450	15	1180	567	377
26	1540	1540	333	1080	1110	980	1650	1620	15	1370	548	340
27	542	1510	249	1630	1390	1300	1660	1700	15	1320	591	328
28	475	1640	564	477	1260	970	1230	1720	15	1310	688	330
29	421	1590	178	403	1180	1280	940	1730	15	948	612	312
30	451	1540	950	358	---	1280	608	1720	15	533	550	275
31	643	---	372	231	---	1280	---	1750	---	345	559	---
TOTAL	15607	38100	30980	19366	29219	36485	42688	32345	14326	11524	25018	13276
MEAN	503	1270	999	625	1008	1177	1423	1043	478	372	807	443
MAX	1660	1820	1600	1630	1650	1630	1660	1750	1750	1370	1210	638
MIN	30	544	178	19	127	845	190	385	14	15	548	275
AC-FT	30960	75570	61450	38410	57960	72370	84670	64160	28420	22860	49620	26330
CAL YR 1983	TOTAL	365053	MEAN	1000	MAX	1980	MIN	12	AC-FT	724100		
WTR YR 1984	TOTAL	308934	MEAN	844	MAX	1820	MIN	14	AC-FT	612800		

12101500 PUYALLUP RIVER AT PUYALLUP, WA
(National stream quality accounting network station)

LOCATION.--Lat 47°12'31", long 122°19'33", in SE¼NW¼ sec.20, T.20 N., R.4 E., Pierce County, Hydrologic Unit 17110014, on left bank 0.8 mi upstream from bridge at Clark Creek, 2.0 mi northwest of Puyallup City Hall, and at mile 6.6.

DRAINAGE AREA.--948 mi².

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--May 1914 to current year.

REVISED RECORDS.--WSP 832: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is National Geodetic Vertical Datum of 1929. Prior to Dec. 3, 1919, at sites 1.2 mi upstream and 900 ft upstream at different datums. Dec. 3, 1919, to Nov. 9, 1935, at site 500 ft upstream at datum 9.61 ft higher.

REMARKS.--Water-discharge records excellent. All diverted water returned to river above gage. Large part of flow of White River (a tributary) diverted through Lake Tapps (station 12101000). Flood flow regulated by Mud Mountain Lake (station 12098000) on White River. Some pondage on tributaries and upper Puyallup River. Diurnal fluctuations caused by powerplants and glacial melt above station.

Since 1912 the city of Tacoma pipeline diversion from Green River has released as much as 123 ft³/s daily, and since 1957 an average of about 20 ft³/s per month into Puyallup River 0.5 mi east of McMillin. Monthly mean discharge, in cubic feet per second, for the year is as follows:

October	3.97	January	1.90	April	1.68	July	5.15
November	2.19	February	1.87	May	16.89	August	3.59
December	3.08	March	1.69	June	8.54	September	2.76

AVERAGE DISCHARGE.--70 years, 3,372 ft³/s, 2,443,000 acre-ft/yr, adjusted for storage in Lake Tapps since October 1934, and Mud Mountain Lake October 1944 to September 1947.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 57,000 ft³/s Dec. 10, 1933, elevation, 31.0 ft, present datum; minimum, 306 ft³/s Sept. 25, 1955, elevation, 8.23 ft; minimum daily, 400 ft³/s Nov. 30, 1952.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 37,100 ft³/s Jan. 25, elevation, 26.01 ft; minimum, 568 ft³/s Oct. 14, elevation, 8.56 ft; minimum daily, 587 ft³/s Oct. 14.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1130	1800	3390	3660	4560	2730	3130	2280	5150	5040	3220	1660
2	1100	1910	2800	5020	3440	2820	2940	4160	4290	4740	3110	1570
3	1080	5490	2310	16800	3250	2890	2970	4530	3620	4600	2890	1480
4	1300	11500	2280	23200	3200	2840	2880	3810	3470	4500	2800	1500
5	1150	8140	2320	18000	3090	2950	3090	2880	4930	4820	2880	1640
6	1330	6870	2010	12300	3290	2400	3280	3200	4660	4700	2690	2140
7	1120	6060	2410	9960	3730	2610	3530	2900	4100	4110	2470	1770
8	923	4790	2690	8160	3840	2690	3950	2830	4470	3790	2360	1830
9	865	3610	2840	6290	3770	2690	3730	3280	3890	3630	2570	1730
10	808	3240	4610	5210	4750	2550	4040	3170	3840	3630	2700	1490
11	780	4170	4780	5080	5050	2840	3830	3330	3620	3540	2540	1460
12	773	3470	3950	5180	5780	3140	3720	4270	3560	3510	2430	1530
13	678	3390	3990	5280	6870	3550	3810	3720	3850	3430	2240	1330
14	587	4280	4840	4450	5850	3310	3920	5100	4650	3380	1980	1220
15	850	5460	4700	3590	4340	3010	3490	5420	5520	3410	1920	1120
16	865	5860	3880	3740	2930	3340	4300	4920	6430	3660	1960	1150
17	1130	5210	3360	3100	2240	3440	4630	3950	5970	3850	2180	1240
18	2450	6210	3040	2970	2620	3330	3560	3180	5670	2910	2100	1340
19	1300	5780	2890	2230	2710	3200	3250	3350	5390	3050	1820	1470
20	1110	5730	2760	2640	3080	4420	3130	5430	4540	3570	1690	1460
21	1010	4630	2230	2350	4100	6580	2830	4580	6580	2870	1720	1300
22	1700	4100	2620	2460	3640	5640	3030	4150	6640	2720	1810	1290
23	1950	3810	2440	2790	3770	5290	3140	6710	5740	2720	1790	1230
24	1520	5000	2110	13200	3840	5080	3040	6250	5760	2580	1660	1150
25	1720	5450	2790	32200	3140	4470	3000	5690	5820	3400	1590	1040
26	2320	4440	2300	19400	2930	4410	2950	5700	5910	3740	1620	963
27	1380	4240	2030	11300	3310	4480	2890	5450	6100	3390	1810	922
28	1200	4300	2180	6790	3090	3910	2440	5010	5690	3150	1900	911
29	1110	4040	2180	5700	3130	3840	2480	5530	6790	2790	1670	876
30	1240	4370	5880	5290	---	3740	2140	6320	6560	2420	1640	864
31	2020	---	4110	5080	---	3290	---	5910	---	2210	1600	---
TOTAL	38499	147350	96720	253420	109340	111480	99120	137010	153210	109860	67360	40676
MEAN	1242	4912	3120	8175	3770	3596	3304	4420	5107	3544	2173	1356
MAX	2450	11500	5880	32200	6870	6580	4630	6710	6790	5040	3220	2140
MIN	587	1800	2010	2230	2240	2400	2140	2280	3470	2210	1590	864
AC-FT	76360	292300	191800	502700	216900	221100	196600	271800	303900	217900	133600	80680
MEAN†	1203	4916	2899	8038	3628	3774	3126	4940	5120	3559	2147	1352
AC-FT†	73970	292400	178300	494300	208800	232100	185900	303800	304600	218900	132000	80400

† Adjusted for change in contents of Lake Tapps.

PUYALLUP RIVER BASIN

12101500 PUYALLUP RIVER AT PUYALLUP, WA--Continued

WATER-QUALITY RECORDS

LOCATION.--Water-quality data obtained at Clark Creek bridge 0.8 mi downstream from gage.

PERIOD OF RECORD.--Water years 1959-68, 1971-72, 1975 to current year.

PERIOD OF DAILY RECORD.--

WATER TEMPERATURES: July 1959 to September 1961, August 1965 to September 1966.

WATER QUALITY DATA, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984

DATE	TIME	STREAM- FLOW, INSTAN- TANEOUS (CFS)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH (STAND- ARD UNITS)	TEMPER- ATURE (DEG C)	TUR- BID- ITY (NTU)	OXYGEN, DIS- SOLVED (MG/L)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION)	COLI- FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)	STREP- TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML)	HARD- NESS (MG/L AS CAC03)	HARD- NESS NONCAR- BONATE (MG/L AS CAC03)
NOV , 1983												
07...	1230	6080	62	8.0	9.0	15	10.7	92	370	480	23	0
FEB , 1984												
22...	1400	4160	70	7.0	5.5	8.0	12.2	96	490	890	25	0
MAY												
07...	1215	3130	71	7.9	9.5	3.4	11.3	98	100	270	24	0
JUL												
09...	1015	3690	60	7.7	13.0	24	10.5	99	--	K26	21	0
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- LITY LAB (MG/L AS CAC03)	SULFATE DIS- SOLVED (MG/L AS SO4)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	FLUO- RIDE, DIS- SOLVED (MG/L AS F)	SILICA, DIS- SOLVED (MG/L AS SiO2)	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L)
NOV , 1983												
07...	6.4	1.6	3.1	22	.3	1.1	22	9.3	2.2	<.10	14	53
FEB , 1984												
22...	6.9	1.8	3.5	23	.3	1.1	26	8.6	1.9	<.10	16	63
MAY												
07...	6.6	1.7	3.2	22	.3	.70	25	6.4	1.7	<.10	15	57
JUL												
09...	6.1	1.5	3.0	23	.3	.80	25	5.4	1.2	<.10	13	41
DATE	SOLIDS, SUM OF CONSTITUENTS, 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)	NITRO- GEN, NO2+N03 DIS- SOLVED (MG/L AS N)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N)	NITRO- GEN,AM- MONIA + ORGANIC TOTAL (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)	ALUM- INUM, DIS- SOLVED (UG/L AS AL)	
NOV , 1983												
07...	51	.07	870	25	.41	.060	.70	.050	.040	<.010	120	
FEB , 1984												
22...	56	.09	708	19	.42	.010	.70	.070	.010	.020	20	
MAY												
07...	51	.08	482	5	.21	.080	.30	.040	.020	.030	30	
JUL												
09...	46	.06	408	35	.10	.010	<.20	.060	.010	.020	170	

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

PUYALLUP RIVER BASIN

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12101500 PUYALLUP RIVER AT PUYALLUP, WA--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984

DATE	ARSENIC DIS- SOLVED (UG/L AS AS)	BARIUM, DIS- SOLVED (UG/L AS BA)	BERYL- LIUM, DIS- SOLVED (UG/L AS BE)	CADMIUM DIS- SOLVED (UG/L AS CD)	CHRO- MIUM, DIS- SOLVED (UG/L AS CR)	COBALT, DIS- SOLVED (UG/L AS CO)	COPPER, DIS- SOLVED (UG/L AS CU)	IRON, DIS- SOLVED (UG/L AS FE)	LEAD, DIS- SOLVED (UG/L AS PB)	LITHIUM DIS- SOLVED (UG/L AS LI)	MANGA- NESE, DIS- SOLVED (UG/L AS MN)
NOV , 1983											
07...	<1	9	<.5	<1	<1	<3	3	99	<1	5	9
FEB , 1984											
22...	<1	9	<.5	<1	<1	<3	3	92	<1	<4	22
MAY											
07...	<1	14	<.5	<1	1	<3	6	110	7	<4	13
JUL											
09...	<1	12	1.0	<1	<1	<3	4	72	<1	4	11
DATE	MERCURY DIS- SOLVED (UG/L AS HG)	MOLYB- DENUM, DIS- SOLVED (UG/L AS MO)	NICKEL, DIS- SOLVED (UG/L AS NI)	SELE- NIUM, DIS- SOLVED (UG/L AS SE)	SILVER, DIS- SOLVED (UG/L AS AG)	STRON- TIUM, DIS- SOLVED (UG/L AS SR)	VANA- DIUM, DIS- SOLVED (UG/L AS V)	ZINC, DIS- SOLVED (UG/L AS ZN)	SEDI- MENT, SUS- PENDED (MG/L)	SEDI- MENT, DIS- CHARGE, SUS- PENDED (T/DAY)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM
NOV , 1983											
07...	<.1	<10	3	<1	<1	35	<6	4	283	4650	16
FEB , 1984											
22...	<.1	<10	<1	<1	<1	39	<6	9	226	2540	10
MAY											
07...	<.1	<10	<1	<1	<1	38	<6	6	--	--	--
JUL											
09...	<.1	<10	9	<1	1	29	<6	11	226	2250	14

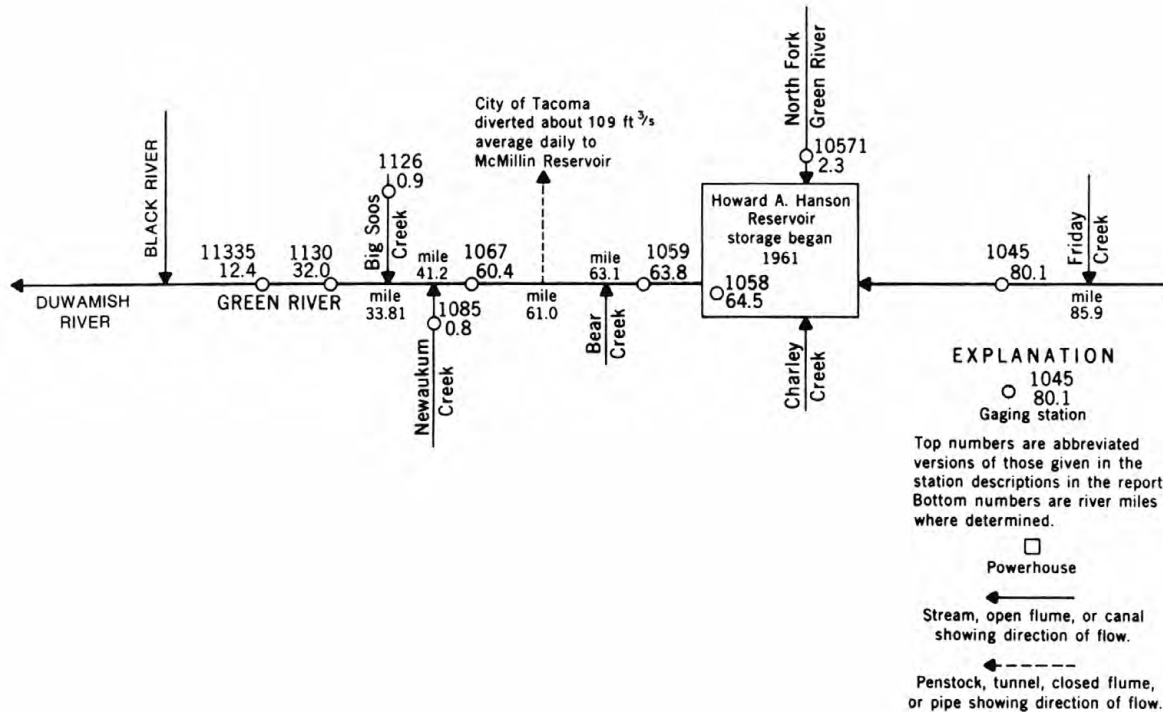


Figure 12.--Gaging stations in Duwamish River basin.

12104500 GREEN RIVER NEAR LESTER, WA

LOCATION.--Lat 47°12'28", long 121°33'07", in NE¼SE¼ sec.20, T.20 N., R.10 E., King County, Hydrologic Unit 17110013, on left bank 0.4 mi upstream from Champion Creek, 1.2 mi downstream from McCain Creek, 2.9 mi west of Lester, and at mile 80.1.

DRAINAGE AREA.--96.2 mi².

PERIOD OF RECORD.--October 1945 to current year.

REVISED RECORDS.--WSP 1286: 1947(M). WSP 1316: 1948(M). WSP 1932: 1960, drainage area.

GAGE.--Water-stage recorder. Elevation of gage is 1,480 ft, from river-profile map. Prior to Nov. 22, 1959, water-stage recorder at site 300 ft upstream at different datum (gage destroyed by flood of Nov. 22, 1959), Dec. 28, 1959, to Sept. 21, 1960, nonrecording gage at site 400 ft downstream at different datum.

REMARKS.--Records good except those above 1,000 ft³/s, which are poor. No regulation or diversion upstream from station.

AVERAGE DISCHARGE.--39 years, 391 ft³/s, 55.20 in/yr, 283,300 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 22,000 ft³/s Nov. 22, 1959, gage height, 12.41 ft, from floodmarks, present site and datum, on basis of slope-area measurement of peak flow; minimum, 22 ft³/s Nov. 20, 1952, Sept. 27, 1967, part or all of each day Oct. 18-20, 23-27, 1974.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 2,000 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Jan. 3	2400	3,680	5.08	Jan. 24	2400	*16,600	*8.21

Minimum discharge, 36 ft³/s Sept. 29, 30, gage height, 1.08 ft.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP		
1	69	77	335	144	572	192	442	277	620	320	90	44		
2	67	94	301	220	477	201	409	399	531	295	84	43		
3	67	301	277	1780	415	201	373	442	482	276	79	41		
4	82	690	251	3400	369	192	354	420	488	261	74	40		
5	73	607	230	2840	345	192	364	404	607	246	73	40		
6	69	601	217	1790	331	208	364	394	648	230	73	56		
7	67	549	198	1410	318	240	383	388	607	214	68	53		
8	65	465	192	1140	301	292	409	442	601	200	65	53		
9	63	388	186	879	296	354	425	518	568	189	61	49		
10	63	349	198	720	292	394	409	494	537	180	59	46		
11	62	340	198	690	284	465	388	531	518	171	56	47		
12	60	326	189	627	482	459	388	821	488	166	61	55		
13	59	318	269	549	676	448	394	922	543	156	59	48		
14	60	436	555	471	537	409	436	922	588	149	55	44		
15	59	683	500	409	459	410	758	805	620	142	51	41		
16	58	705	388	369	394	388	813	669	555	137	49	41		
17	63	728	314	326	340	373	641	588	465	133	48	40		
18	64	845	269	296	301	364	543	531	409	127	50	39		
19	60	773	240	273	273	378	494	601	377	120	47	40		
20	62	648	211	254	258	735	471	789	387	115	47	39		
21	59	531	170	244	254	1200	448	720	553	113	44	38		
22	103	442	150	262	240	1080	453	634	615	109	43	43		
23	95	378	128	465	230	939	425	758	585	105	42	49		
24	82	359	115	4770	220	854	378	829	549	103	44	47		
25	77	331	135	8980	217	789	335	750	500	100	43	43		
26	73	309	169	2380	201	797	301	713	459	97	43	42		
27	71	442	151	1520	192	757	277	728	402	94	43	41		
28	69	494	136	1250	189	676	269	781	363	91	48	38		
29	67	436	136	1050	186	600	262	939	366	88	42	37		
30	69	378	134	845	---	531	258	1100	370	86	41	36		
31	81	---	146	683	---	482	---	845	---	84	42	---		
TOTAL	2138	14023	7088	41036	9649	15600	12664	20154	15401	4897	1724	1313		
MEAN	69.0	467	229	1324	333	503	422	650	513	158	55.6	43.8		
MAX	103	845	555	8980	676	1200	813	1100	648	320	90	56		
MIN	58	77	115	144	186	192	258	277	363	84	41	36		
CFSM	.72	4.85	2.38	13.8	3.46	5.23	4.39	6.76	5.33	1.64	.58	.46		
IN.	.83	5.42	2.74	15.87	3.73	6.03	4.90	7.79	5.96	1.89	.67	.51		
AC-FT	4240	27810	14060	81390	19140	30940	25120	39980	30550	9710	3420	2600		
CAL YR 1983	TOTAL	106346	MEAN	291	MAX	2700	MIN	58	CFSM	3.02	IN.	41.12	AC-FT	210900
WTR YR 1984	TOTAL	145687	MEAN	398	MAX	8980	MIN	36	CFSM	4.14	IN.	56.34	AC-FT	289000

DUWAMISH RIVER BASIN

12105710 NORTH FORK GREEN RIVER NEAR LEMOLO, WA

LOCATION.--Lat 47°18'21", long 121°46'20", near line between SW¼ and SE¼ sec.15, T.21 N., R.8 E., King County, Hydrologic Unit 17110013, on left bank 1.8 mi northeast of Lemolo siding, 5.5 mi east of Palmer, and at mile 2.3.

DRAINAGE AREA.--16.7 mi².

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

GAGE.--Water-stage recorder and crest-stage gage. Elevation of gage is 1,250 ft, from topographic map.

REMARKS.--Records good except those above 400 ft³/s, which are poor. An undetermined amount of water goes underground a short distance above the gage and, at times during dry summers, the streambed at the gage may become completely dry. Streamflow diverted by withdrawal from nearby wells, by the city of Tacoma Water Department, affects low flows.

AVERAGE DISCHARGE.--19 years, 87.0 ft³/s, 70.75 in/yr, 63,030 acre-ft/yr, unadjusted.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 2,010 ft³/s Dec. 2, 1975, gage height, 8.29 ft; no flow Aug. 8, 9, 18, Sept. 5-13, 1965.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of Jan. 28, 1965, reached a stage of 9.50 ft from floodmarks, discharge, 2,370 ft³/s on basis of slope-area measurement.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 500 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Jan. 3	2100	760	5.06	Jan. 24	1800	*1,710	*6.88

Minimum discharge, 4.3 ft³/s Sept. 30.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP		
1	21	28	101	81	123	60	98	75	96	56	11	8.9		
2	20	37	79	140	105	64	98	165	88	51	11	7.2		
3	20	236	82	567	92	59	91	144	81	45	11	6.0		
4	33	283	74	642	81	55	87	132	95	41	9.9	5.3		
5	24	169	70	444	75	53	88	134	131	38	9.5	6.0		
6	22	202	63	364	71	57	88	136	106	35	9.6	10		
7	20	178	59	242	67	62	111	136	115	33	9.2	8.6		
8	19	148	59	158	65	67	113	148	120	31	8.6	14		
9	19	129	68	132	63	71	111	146	118	29	8.2	9.8		
10	18	129	91	125	62	81	120	136	104	28	7.9	7.7		
11	18	123	85	140	72	87	115	183	95	26	7.6	10		
12	17	111	81	123	174	98	123	296	88	25	8.1	12		
13	16	108	136	106	220	98	116	242	82	25	9.3	8.8		
14	18	144	202	88	148	93	148	220	79	23	8.2	6.7		
15	18	265	174	82	127	98	248	188	74	22	7.5	5.8		
16	16	360	136	72	106	93	169	152	68	20	7.0	5.4		
17	20	340	113	64	91	85	134	136	60	19	6.7	5.2		
18	19	321	98	56	81	87	116	123	56	18	6.6	4.9		
19	18	248	85	52	77	93	110	148	53	18	6.4	4.8		
20	22	253	74	49	84	160	101	146	55	17	6.1	5.0		
21	19	178	60	55	87	289	99	129	114	17	5.8	5.3		
22	54	146	50	75	78	259	96	131	83	16	5.6	9.8		
23	35	123	43	163	74	253	87	188	69	15	5.6	9.1		
24	28	152	38	985	70	220	77	150	62	14	5.6	10		
25	25	140	42	860	69	174	70	136	55	14	5.4	8.1		
26	23	123	48	441	62	188	64	242	55	13	5.3	6.2		
27	23	152	44	385	57	152	59	197	51	13	8.3	5.6		
28	22	150	39	308	59	142	60	178	45	13	10	4.9		
29	20	134	55	242	56	132	55	158	72	13	6.9	4.6		
30	22	116	98	178	---	118	57	138	72	12	6.0	4.3		
31	34	---	88	142	---	108	---	111	---	11	5.9	---		
TOTAL	703	5226	2535	7561	2596	3656	3109	4944	2442	751	239.8	220.0		
MEAN	22.7	174	81.8	244	89.5	118	104	159	81.4	24.2	7.74	7.33		
MAX	54	360	202	985	220	289	248	296	131	56	11	14		
MIN	16	28	38	49	56	53	55	75	45	11	5.3	4.3		
CFSM	1.36	10.4	4.90	14.6	5.36	7.07	6.23	9.52	4.87	1.45	.46	.44		
IN.	1.57	11.64	5.65	16.84	5.78	8.14	6.93	11.01	5.44	1.67	.53	.49		
AC-FT	1390	10370	5030	15000	5150	7250	6170	9810	4840	1490	476	436		
CAL YR 1983	TOTAL	29556	MEAN	81.0	MAX	773	MIN	14	CFSM	4.85	IN.	65.84	AC-FT	58620
WTR YR 1984	TOTAL	33982.8	MEAN	92.8	MAX	985	MIN	4.3	CFSM	5.56	IN.	75.70	AC-FT	67400

12105800 HOWARD A. HANSON RESERVOIR NEAR PALMER, WA

LOCATION.--Lat 47°16'38", long 121°47'03", in NE¼SE¼ sec.28, T.21 N., R.8 E., King County, Hydrologic Unit 17110013, near left bank on outlet gate structure, just upstream from Howard A. Hanson Dam on Green River, 1.4 mi upstream from Bear Creek, 5.1 mi southeast of Palmer, and at mile 64.5.

DRAINAGE AREA.--220 mi², approximately.

PERIOD OF RECORD.--December 1961 to current year.

GAGE.--Nonrecording gage. Datum of gage is National Geodetic Vertical Datum of 1929.

REMARKS.--Reservoir is formed by earth-fill dam; completed Mar. 31, 1962; storage began Dec. 5, 1961. Capacity, 105,650 acre-ft between elevations 1,035 ft, invert of outlet tunnel, and 1,206 ft, top of spillway gates. Storage is not retained but is dissipated as soon after a flood as possible without creating damaging flows downstream in order to have the maximum capacity available for any following flood which might develop.

COOPERATION.--Daily elevations at 0830, monthend elevations at 2400, and capacity table furnished by Corps of Engineers.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents observed, 61,325 acre-ft Dec. 5, 1975, elevation, 1,175.8 ft; minimum observed, 34 acre-ft Nov. 2, 1962, elevation, 1,037.6 ft.

EXTREMES FOR CURRENT YEAR.--Maximum contents observed, 26,595 acre-ft June 22, elevation, 1,142.2 ft; minimum observed, 79 acre-ft Feb. 28, elevation, 1,040.6 ft.

Capacity table (elevation, in feet, and total contents, in acre-feet)
(Based on photogrammetric maps by Fairchild Aerial Surveys in 1961)

1,045	153	1,080	2,800	1,140	24,887
1,050	289	1,090	4,554	1,150	33,301
1,055	493	1,100	6,893	1,160	43,092
1,060	770	1,110	9,715	1,170	54,326
1,065	1,132	1,120	13,386	1,180	66,591
1,070	1,588	1,130	18,362		

RESERVOIR STORAGE (AC-FT), WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984
INSTANTANEOUS OBSERVATIONS AT 0900

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	16009	8007	1460	1251	1260	1277	1568	1132	1043	26120	25573	22208
2	15959	7979	1251	1166	855	1394	1199	1629	1013	26120	25573	22074
3	15959	7951	1303	3354	1358	1978	1051	1529	883	26042	25573	21877
4	15808	9591	1588	7123	1277	1723	1021	1157	903	25884	25497	21681
5	15070	9530	1539	4368	1303	2130	1051	1067	2366	25497	25497	21484
6	14549	8544	1233	883	1225	1745	1174	975	4267	25497	25497	21355
7	14001	7869	876	953	1132	1312	1233	983	6029	25497	25497	21291
8	13777	6692	925	2404	975	1021	1670	990	7733	25497	25420	21163
9	13560	5908	733	2277	1233	1067	1766	1199	9591	25573	25420	21034
10	13302	5053	975	1225	1067	990	1367	1191	11331	25497	25344	20906
11	12964	5347	1233	1479	1149	1191	1191	896	12923	25497	25268	20778
12	12841	5555	1432	1083	835	1367	2277	1650	14271	25497	25192	20653
13	12596	5601	1083	910	493	1157	1358	2340	15559	25573	25116	20527
14	12357	5884	1529	1578	493	876	2744	2059	17098	25573	25039	20402
15	12158	6419	1432	1451	493	1108	4247	1432	18768	25649	24963	20214
16	11851	4898	605	1242	1787	1100	3114	1157	20402	25573	24887	20029
17	11551	3437	1251	1075	1140	1166	1385	1225	21747	25573	24740	19845
18	11331	1809	1286	990	1233	1191	1116	1208	22815	25573	24592	19661
19	11080	1712	1083	975	1166	1199	1067	1251	24079	25573	24519	19420
20	10870	2166	917	998	1051	1578	932	1887	25268	25573	24224	19241
21	10662	2179	745	1124	1013	1955	1199	1989	26277	25573	24007	19002
22	10561	1809	917	1394	1021	1619	1166	1157	26595	25573	23865	18826
23	10731	1578	953	1798	1233	932	1124	1558	26515	25649	23651	18652
24	10696	2166	998	3732	1067	1233	1051	1539	26277	25649	23508	18594
25	10359	2564	889	15858	1166	1013	1013	1294	25963	25649	23368	18193
26	10000	2605	1339	18250	1260	917	1629	1558	26198	25573	23161	17800
27	9591	2715	1442	9874	855	968	1157	2107	25963	25573	22953	17420
28	9194	3420	961	5671	79	1067	1609	2315	25649	25573	22884	16993
29	8777	2715	983	2632	1208	2523	1558	2470	25649	25573	22679	16625
30	8344	1820	1051	2059	---	2328	1413	2095	26042	25573	22544	16263
31	8035	---	1286	1216	---	2107	---	1157	---	25573	22343	---
MEAN	12080	4784	1139	3238	1049	1395	1515	1490	16640	25630	24460	19810
MAX	16009	9591	1588	18250	1787	2523	4247	2470	26595	26120	25573	22208
MIN	8035	1578	605	883	79	876	932	896	883	25497	22343	16263
††	1104.2	1069.8	1066.9	1066.4	1066.4	1071.5	1066.3	1064.4	1141.6	1140.9	1136.3	1125.6
†	8007	1568	1294	1251	1251	1744	1242	1083	26120	25573	22276	16009
‡	-8002	-6439	-274	-43	0	+493	-502	-159	+25037	-547	-3297	-6267

CAL YR 1983 MEAN 10740 MAX 26120 MIN 153 ‡ +95
WTR YR 1984 MEAN 9468 MAX 26595 MIN 79 ‡ 0

†† Monthend estimated elevation, in feet, at 2400 hours.

† Monthend estimated contents, in acre-feet.

‡ Change in contents, in acre-feet.

NOTE.--Daily contents, in acre-feet, usually at 0900 hours.

DUWAMISH RIVER BASIN

12105900 GREEN RIVER BELOW HOWARD A. HANSON RESERVOIR, WA

LOCATION.--Lat 47°17'02", long 121°47'48", In NE¼NW¼ sec.28, T.21 N., R.8 E., King County, Hydrologic Unit 17110013, on right bank 0.7 mi upstream from Bear Creek, 0.7 mi downstream from Howard A. Hanson Dam, 5.0 mi southeast of Palmer, and at mile 63.8.

DRAINAGE AREA.--221 mi².

PERIOD OF RECORD.--October 1960 (monthly discharge only), November 1960 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 990 ft, from topographic map.

REMARKS.--Records excellent. Flow regulated by Howard A. Hanson Reservoir (station 12105800) for flood control and during summer months to augment the natural river flow. Minor diversions on upstream tributaries for domestic use.

AVERAGE DISCHARGE.--24 years, 1,032 ft³/s, 63.41 in/yr, 747,700 acre-ft/yr, adjusted for storage in Howard A. Hanson Reservoir since December 1961.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 12,200 ft³/s Feb. 21, 1961, gage height, 14.40 ft; minimum, 87 ft³/s Dec. 29, 1961, gage height, 3.49 ft.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 11,100 ft³/s Jan. 5, gage height, 14.22 ft; minimum, 216 ft³/s Feb. 28, gage height, 4.18 ft.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	239	304	1190	717	1620	643	1310	835	1360	785	243	253
2	239	461	963	741	1130	595	1120	1220	1250	784	234	253
3	308	1030	796	3840	1130	583	1020	1620	1160	783	234	253
4	538	2080	805	9340	1040	607	970	1480	738	781	234	253
5	563	2610	850	8850	1050	765	960	1360	520	681	234	253
6	503	2550	851	4750	1030	895	980	1290	510	578	234	253
7	408	2500	720	2800	1010	885	1010	1240	527	508	234	253
8	348	2150	647	2420	870	865	1150	1260	496	508	234	252
9	345	1820	667	2470	840	960	1430	1400	432	508	234	251
10	345	1370	718	2050	890	1010	1500	1490	444	488	234	251
11	326	1030	769	2010	975	1060	1120	1480	454	437	234	251
12	316	1030	938	1910	1920	1270	1360	1880	461	411	234	251
13	331	1030	1300	1470	2320	1330	1230	2230	396	400	234	251
14	340	1480	2020	1240	1770	1130	680	2370	362	387	234	250
15	340	2770	2170	1240	1130	1120	1830	2130	368	387	234	249
16	337	3710	1350	1150	1110	1100	2920	1730	373	374	233	248
17	337	3430	1050	995	1160	1050	1910	1520	376	360	247	248
18	334	2950	1050	885	1010	1060	1470	1390	285	361	256	248
19	334	2380	969	792	990	1110	1360	1380	230	339	256	248
20	332	2100	831	711	970	1760	1180	1700	362	311	256	248
21	331	2000	581	667	950	2770	1140	1920	926	293	256	247
22	331	1660	487	707	860	2810	1180	1690	1220	293	256	247
23	331	1260	459	1110	890	2340	1130	1930	1210	292	256	246
24	408	1140	436	6760	870	2190	1040	2150	1210	292	256	305
25	458	1190	433	8350	801	2070	788	1860	996	293	255	348
26	454	1190	457	9300	910	2030	840	1740	965	278	254	341
27	449	1210	640	7450	955	1860	788	1840	1040	256	255	339
28	446	1640	570	4760	506	1280	675	1870	850	257	255	337
29	441	1880	495	3020	475	1220	830	2180	785	257	254	335
30	437	1550	524	2440	---	1380	870	2430	785	257	254	334
31	368	---	639	1870	---	1460	---	1830	---	256	254	---
TOTAL	11617	53505	26375	96815	31182	41208	35791	52445	21091	13195	7572	8096
MEAN	375	1784	851	3123	1075	1329	1193	1692	703	426	244	270
MAX	563	3710	2170	9340	2320	2810	2920	2430	1360	785	256	348
MIN	239	304	433	667	475	583	675	835	230	256	233	246
AC-FT	23040	106100	52310	192000	61850	81740	70990	104000	41830	26170	15020	16060
MEAN†	245	1675	846	3122	1075	1337	1185	1688	1124	417	191	165
CFSM†	1.11	7.58	3.83	14.1	5.04	6.05	5.36	7.64	5.09	1.89	0.86	0.75
IN.†	1.28	8.46	4.42	16.29	5.25	6.98	5.98	8.81	5.67	2.17	0.99	0.83
AC-FT†	15040	99660	52040	192000	61850	82230	70490	103800	66870	25620	11720	9790

CAL YR 1983 TOTAL 313106 MEAN 858 MAX 7120 MIN 232 AC-FT 621000 MEAN† 858 CFSM† 3.88 IN.† 52.70 AC-FT† 621100
WTR YR 1984 TOTAL 398892 MEAN 1090 MAX 9340 MIN 230 AC-FT 791200 MEAN† 1090 CFSM† 4.93 IN.† 67.13 AC-FT† 791200

† Adjusted for change in contents in Howard A. Hanson Reservoir.

DUWAMISH RIVER BASIN

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12106700 GREEN RIVER AT PURIFICATION PLANT, NEAR PALMER, WA

LOCATION.--Lat 47°18'19", long 121°50'58", in NE¼SE¼ sec.13, T.21 N., R.7 E., King County, Hydrologic Unit 17110013, on left bank at city of Tacoma purification plant, 0.6 mi downstream from diversion dam, 2 mi southeast of Palmer, and at mile 60.4.

DRAINAGE AREA.--231 mi².

PERIOD OF RECORD.--July 1963 to current year.

GAGE.--Water-stage recorder. Datum of gage is 859.53 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--Records excellent except those for period of no gage-height record Dec. 21 to Jan. 20, which are fair. Since Dec. 5, 1961, flow regulated by Howard A. Hanson Reservoir (station 12105800), 4.1 mi upstream for flood control and during summer months to augment the natural river flow. City of Tacoma diverted an average daily discharge of about 109 ft³/s upstream from station for municipal supply. Minor diversions on upstream tributaries for domestic use.

AVERAGE DISCHARGE.--21 years, 1,002 ft³/s, 725,900 acre-ft/yr, unadjusted.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 12,500 ft³/s Feb. 12, 1981, gage height, 12.05 ft; minimum, 20 ft³/s part or all of each day Oct. 26, 27, Nov. 3, 6, 1974, gage height, 3.90 ft.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of Nov. 23, 1959, had a discharge of 27,800 ft³/s, on basis of slope-area measurement at site 0.6 mi downstream from gage.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 11,100 ft³/s Jan. 4, gage height, 12.48 ft; minimum, 118 ft³/s Aug. 15, minimum gage height, 5.18 ft, Oct. 1-3.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	135	231	1160	675	1670	592	1330	751	1360	689	136	142
2	135	379	947	695	1140	564	1110	1250	1210	682	129	141
3	202	1220	751	3900	1100	530	967	1670	1110	680	129	141
4	438	2250	759	9400	976	544	906	1510	659	674	128	141
5	486	2730	802	9100	985	713	881	1370	429	576	127	144
6	418	2720	815	4800	959	881	906	1300	412	461	127	146
7	324	2630	688	2900	923	847	976	1230	429	383	127	144
8	257	2190	590	2500	790	822	1120	1220	406	383	127	144
9	257	1790	628	2500	743	906	1420	1370	335	383	127	144
10	252	1360	719	2100	814	967	1520	1480	346	367	127	144
11	238	1000	778	2050	898	1020	1130	1490	400	316	127	144
12	223	1000	920	1900	2160	1280	1320	1950	356	287	127	144
13	231	1000	1330	1540	2660	1350	1250	2350	296	277	127	144
14	243	1460	2100	1240	1960	1140	607	2540	252	260	127	141
15	243	2900	2200	1240	1260	1130	1860	2250	252	260	125	138
16	243	4140	1400	1120	1190	1050	3160	1760	252	251	132	138
17	245	3790	1030	950	1150	994	1960	1510	256	234	142	138
18	248	3210	1030	835	967	1000	1430	1370	187	228	141	138
19	248	2520	946	745	941	1060	1300	1360	135	214	141	138
20	248	2170	802	666	915	1790	1110	1710	244	193	141	138
21	245	2040	545	614	906	3020	1060	1980	831	175	141	138
22	260	1640	460	666	822	3120	1110	1710	1150	173	141	143
23	253	1240	435	1150	822	2550	1070	1990	1140	173	141	141
24	319	1160	415	7480	831	2340	959	2220	1130	173	141	197
25	380	1180	410	9100	743	2210	697	1890	917	164	141	235
26	380	1180	435	9390	855	2160	713	1810	858	161	141	224
27	374	1200	600	7680	950	1960	689	1920	951	143	148	222
28	368	1600	535	5140	510	1370	557	1920	747	141	146	212
29	363	1850	470	3310	423	1190	735	2220	692	141	144	212
30	363	1520	495	2620	---	1410	782	2580	708	141	146	212
31	302	---	600	1980	---	1490	---	1930	---	142	144	---
TOTAL	8921	55300	25795	99986	31063	42000	34635	53611	18450	9525	4188	4768
MEAN	288	1843	832	3225	1071	1355	1155	1729	615	307	135	159
MAX	486	4140	2200	9400	2660	3120	3160	2580	1360	689	148	235
MIN	135	231	410	614	423	530	557	751	135	141	125	138
AC-FT	17690	109700	51160	198300	61610	83310	68700	106300	36600	18890	8310	9460
CAL YR 1983	TOTAL	300945	MEAN	825	MAX	7820	MIN	135	AC-FT	596900		
WTR YR 1984	TOTAL	388242	MEAN	1061	MAX	9400	MIN	125	AC-FT	770100		

DUWAMISH RIVER BASIN

12108500 NEWAUKUM CREEK NEAR BLACK DIAMOND, WA

LOCATION.--Lat 47°16'33", long 122°03'30", in NW¼SW¼ sec.28, T.21 N., R.6 E., King County, Hydrologic Unit 17110013, on right bank 0.1 mi downstream from West Whitney Hill bridge, 0.8 mi upstream from mouth, and 3.5 mi southwest of Black Diamond.

DRAINAGE AREA.--27.4 mi².

PERIOD OF RECORD.--July 1944 to November 1950, water years 1951-52 (annual maximum), September 1952 to current year.

REVISED RECORDS.--WSP 1396: 1946(M), 1949(P). WSP 1932: Drainage area. WDR WA-74-1: 1973(M). WDR WA-76-1: 1975.

GAGE.--Water-stage recorder. Elevation of gage is 310 ft, from topographic map. November 1950 to September 1952 stilling well with nonrecording gage only.

REMARKS.--Records fair. Many small diversions upstream from station for irrigation and domestic use. No regulation.

AVERAGE DISCHARGE.--38 years (water years 1945-50, 1953-84), 61.7 ft³/s, 30.58 in/yr, 44,700 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,820 ft³/s probably Feb. 17, 1949, gage height, 3.54 ft from recorded range in stage, from rating curve extended above 600 ft³/s; minimum, 8.0 ft³/s Oct. 13, 14, 1952; minimum gage height, 0.62 ft Aug. 26, 1958.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 450 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Nov. 3	1500	553	2.77	Jan. 25	0330	*1,060	*3.31
Jan. 3	0600	654	2.92				

Minimum discharge, 16 ft³/s Oct. 11.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP		
1	19	39	55	102	84	86	76	98	62	51	23	19		
2	19	45	58	273	78	81	73	171	59	45	23	19		
3	18	355	69	540	75	78	69	120	58	41	23	19		
4	19	335	59	354	72	70	67	93	66	38	22	18		
5	18	135	62	360	70	67	73	94	70	36	23	19		
6	18	157	75	188	70	65	83	83	66	36	23	21		
7	17	110	72	147	67	62	86	70	62	34	22	20		
8	18	79	94	108	67	61	114	69	61	33	22	19		
9	17	75	110	89	70	59	84	73	59	32	21	19		
10	18	73	349	96	73	57	116	86	57	32	21	19		
11	17	75	183	135	86	62	126	96	54	32	21	20		
12	17	65	112	98	152	72	110	89	53	32	21	21		
13	17	63	122	83	161	88	114	76	51	30	22	19		
14	18	110	124	75	114	78	88	94	50	29	21	18		
15	17	138	112	67	88	83	78	152	48	28	21	19		
16	17	110	93	63	79	78	72	114	47	27	20	18		
17	19	108	81	58	73	66	69	83	46	27	20	18		
18	19	98	76	54	69	67	67	73	44	27	20	18		
19	19	79	72	52	69	72	66	89	43	26	20	18		
20	24	110	69	51	142	131	62	112	51	26	19	18		
21	20	86	62	57	207	280	59	89	155	26	19	18		
22	31	70	59	81	110	116	59	116	97	25	19	21		
23	23	69	56	102	98	126	63	159	55	25	20	19		
24	21	161	52	399	102	106	59	100	46	24	19	19		
25	19	94	52	706	138	88	59	96	42	24	19	18		
26	19	75	58	306	100	120	57	133	42	25	19	18		
27	22	70	56	183	88	94	53	93	41	24	20	18		
28	23	75	54	138	84	133	51	81	38	24	20	18		
29	19	70	157	110	86	118	93	73	66	24	20	18		
30	27	62	218	91	---	93	75	67	72	24	19	18		
31	51	---	126	86	---	83	---	65	---	23	19	---		
TOTAL	640	3191	2997	5252	2772	2840	2321	3007	1761	930	641	564		
MEAN	20.6	106	96.7	169	95.6	91.6	77.4	97.0	58.7	30.0	20.7	18.8		
MAX	51	355	349	706	207	280	126	171	155	51	23	21		
MIN	17	39	52	51	67	57	51	65	38	23	19	18		
CFSM	.75	3.87	3.53	6.17	3.49	3.34	2.82	3.54	2.14	1.09	.76	.69		
IN.	.87	4.33	4.07	7.13	3.76	3.86	3.15	4.08	2.39	1.26	.87	.77		
AC-FT	1270	6330	5940	10420	5500	5630	4600	5960	3490	1840	1270	1120		
CAL YR 1983	TOTAL	21449	MEAN	58.8	MAX	420	MIN	17	CFSM	2.15	IN.	29.12	AC-FT	42540
WTR YR 1984	TOTAL	26916	MEAN	73.5	MAX	706	MIN	17	CFSM	2.68	IN.	36.54	AC-FT	53390

DUWAMISH RIVER BASIN

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12112600 BIG SOOS CREEK ABOVE HATCHERY, NEAR AUBURN, WA

LOCATION.--Lat 47°18'45", long 122°09'51", on west line NW¼ sec.15, T.21 N., R.5 E., King County, Hydrologic Unit 17110013, on left bank 0.2 mi upstream from fish hatchery, 2.7 mi east of Auburn, and at mile 0.9.

DRAINAGE AREA.--66.7 mi², excludes 3.67 mi² in vicinity of Youngs Lake (flow from which has been diverted to Cedar River since about 1935).

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

GAGE.--Water-stage recorder. Datum of gage is 77.2 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--Records good. City of Seattle diverts probably less than 2 ft³/s from Youngs Lake into Little Soos Creek, a tributary, during low flows. Prior to October 1966, fish hatchery 0.5 mi upstream from station diverted up to 19 ft³/s which was returned downstream from the station.

AVERAGE DISCHARGE.--18 years (water years 1967-84), 130 ft³/s, 26.47 in/yr, 94,180 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,090 ft³/s Feb. 28, 1972, gage height, 6.17 ft; minimum, 11 ft³/s Sept. 5, 1963, gage height, 1.07 ft.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 440 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Jan. 4	2400	482	4.29	Jan. 25	0800	*704	*5.08

Minimum discharge, 28 ft³/s part or all of each day Sept. 14-20, 28, 30, gage height, 1.73 ft.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP		
1	43	58	155	195	251	255	182	151	135	101	46	33		
2	41	66	155	246	230	235	175	204	132	95	46	33		
3	40	138	164	405	216	215	167	229	129	91	45	32		
4	41	159	152	459	205	200	161	210	155	89	44	32		
5	40	140	149	459	195	189	161	184	153	87	47	33		
6	41	140	151	407	185	182	158	169	140	84	49	34		
7	42	136	147	360	178	175	181	157	130	80	45	32		
8	40	119	164	321	173	168	195	152	124	76	42	32		
9	39	114	190	293	175	160	181	161	122	74	41	31		
10	41	115	359	282	171	157	241	166	118	73	40	31		
11	40	117	358	297	181	157	260	179	113	74	40	32		
12	39	108	301	294	248	172	246	172	110	71	40	33		
13	39	106	287	269	275	182	238	159	107	68	40	32		
14	39	141	275	250	245	175	212	163	104	66	39	29		
15	39	189	255	234	226	188	192	176	102	63	38	28		
16	38	212	232	222	211	179	180	159	100	60	38	29		
17	43	235	214	209	193	167	170	148	98	58	37	28		
18	42	219	199	200	182	164	164	138	94	57	37	28		
19	42	196	187	193	176	168	158	161	90	57	36	28		
20	44	251	177	187	208	230	151	176	111	57	36	30		
21	45	248	161	186	298	332	146	151	233	56	35	30		
22	47	214	142	214	285	283	144	166	188	55	35	38		
23	45	192	130	223	263	269	140	253	141	53	33	37		
24	42	264	120	318	292	248	133	213	117	52	32	33		
25	42	256	120	665	317	239	127	188	106	52	31	32		
26	41	217	131	555	300	258	124	194	104	51	31	30		
27	43	197	130	459	269	230	118	183	105	50	32	29		
28	43	192	127	385	263	227	114	172	98	50	34	29		
29	42	179	161	339	251	234	128	159	115	49	33	28		
30	49	165	254	303	---	213	135	149	113	48	33	28		
31	63	---	223	274	---	196	---	140	---	47	33	---		
TOTAL	1315	5083	5970	9703	6662	6447	5082	5382	3687	2044	1188	934		
MEAN	42.4	169	193	313	230	208	169	174	123	65.9	38.3	31.1		
MAX	63	264	359	665	317	332	260	253	233	101	49	38		
MIN	38	58	120	186	171	157	114	138	90	47	31	28		
CFSM	.64	2.53	2.89	4.69	3.45	3.12	2.53	2.61	1.84	.99	.57	.47		
IN.	.73	2.83	3.33	5.41	3.72	3.60	2.83	3.00	2.06	1.14	.66	.52		
AC-FT	2610	10080	11840	19250	13210	12790	10080	10680	7310	4050	2360	1850		
CAL YR 1983	TOTAL	46322	MEAN	127	MAX	788	MIN	28	CFSM	1.90	IN.	25.83	AC-FT	91880
WTR YR 1984	TOTAL	53497	MEAN	146	MAX	665	MIN	28	CFSM	2.19	IN.	29.84	AC-FT	106100

DUWAMISH RIVER BASIN

12113000 GREEN RIVER NEAR AUBURN, WA

LOCATION.--Lat 47°18'45", long 122°12'10", in NW¼NW¼ sec.17, T.21 N., R.5 E., King County, Hydrologic Unit 17110013, on left bank 1.2 mi east of Auburn, 1.8 mi downstream from Big Soos Creek, and at mile 32.0.

DRAINAGE AREA.--399 mi², excludes 3.67 mi² in the vicinity of Youngs Lake, flow from which has been diverted to Cedar River basin since about 1935.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--August 1936 to current year.

REVISED RECORDS.--WSP 1932: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is National Geodetic Vertical Datum of 1929. Prior to Oct. 19, 1936, nonrecording gage at same site and datum.

REMARKS.--Water-discharge records good. Since Dec. 5, 1961, flow regulated by Howard A. Hanson Reservoir (station 12105800), 32.5 mi upstream from station, for flood control and during summer months, to augment the natural river flow. City of Tacoma diverted an average daily discharge of about 113 ft³/s from river at headworks near Palmer, 29 mi upstream from station, for municipal use. Minor diversions on upstream tributaries for domestic use.

AVERAGE DISCHARGE.--48 years, 1,359 ft³/s, 984,600 acre-ft/yr, unadjusted.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 28,100 ft³/s Nov. 23, 1959, elevation, 69.75 ft; minimum, 81 ft³/s Sept. 23, 1952; minimum elevation, 53.15 ft Aug. 23-29, Sept. 1-3, 6-9, 1982.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 10,900 ft³/s Jan. 25, elevation, 63.17 ft; minimum, 268 ft³/s Oct. 3, elevation, 53.27 ft.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	279	405	1750	1210	2600	1390	2070	1380	1970	1120	345	420
2	273	424	1580	1460	2170	1330	1860	1690	1700	1100	350	412
3	269	1380	1300	3120	1940	1240	1630	2280	1630	1080	349	410
4	394	2520	1270	8630	1760	1210	1560	2220	1480	1060	345	413
5	654	3170	1270	10300	1720	1260	1510	1990	1010	1010	350	425
6	542	3100	1320	6660	1680	1490	1520	1930	949	884	351	442
7	526	2990	1290	4100	1640	1440	1650	1790	894	754	347	433
8	386	2670	1130	3240	1570	1430	1800	1760	920	731	358	433
9	371	2200	1240	3190	1350	1430	1950	1860	818	723	354	434
10	368	1950	1740	3020	1530	1530	2300	2020	799	717	353	432
11	363	1390	1730	2730	1440	1590	2220	2070	819	672	349	442
12	358	1330	1640	2760	2370	1830	1660	2320	799	613	349	450
13	332	1320	2010	2360	3430	2080	2490	2670	766	602	353	430
14	352	1640	2640	1900	2800	1870	1230	2900	659	569	349	424
15	353	2730	2890	1870	2350	1720	1720	2920	650	554	345	419
16	350	4300	2390	1790	1650	1730	3560	2430	646	545	356	417
17	360	4010	1680	1610	2020	1600	2740	2090	638	513	411	418
18	353	3760	1650	1470	1640	1600	2120	1930	619	505	398	415
19	353	3180	1570	1320	1590	1650	1900	1900	481	495	400	416
20	362	2840	1410	1240	1670	2200	1800	2160	506	456	398	420
21	354	2770	1200	1150	1910	3600	1570	2390	1250	431	397	420
22	373	2380	943	1270	1780	3680	1660	2420	1710	418	397	448
23	372	2000	888	1550	1580	3320	1640	2470	1610	408	400	441
24	365	1980	777	5750	1740	2980	1520	2750	1560	400	403	418
25	475	1920	841	10500	1670	2920	1390	2580	1450	395	406	527
26	480	1820	847	10100	1650	2880	1060	2360	1210	395	410	494
27	485	1790	921	9370	1820	2720	1400	2440	1400	369	423	411
28	483	1990	1070	6300	1530	2410	926	2390	1230	354	438	393
29	473	2430	926	4510	1150	1670	1260	2480	1160	348	422	402
30	488	2210	1250	3510	---	2200	1280	2840	1200	347	415	394
31	557	---	1150	3070	---	2220	---	2670	---	345	421	---
TOTAL	12483	68599	44313	121060	53750	62220	52996	70100	32533	18913	11742	12853
MEAN	403	2287	1429	3905	1853	2007	1767	2261	1084	610	379	428
MAX	654	4300	2890	10500	3430	3680	3560	2920	1970	1120	438	527
MIN	269	405	777	1150	1150	1210	926	1380	481	345	345	393
AC-FT	24760	136100	87890	240100	106600	123400	105100	139000	64530	37510	23290	25490
CAL YR 1983	TOTAL	437744	MEAN	1199	MAX	8790	MIN	269	AC-FT	868300		
WTR YR 1984	TOTAL	561562	MEAN	1534	MAX	10500	MIN	269	AC-FT	1114000		

DUWAMISH RIVER BASIN

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12113000 GREEN RIVER NEAR AUBURN, WA--Continued

WATER-QUALITY RECORDS

PERIOD OF DAILY RECORD.--

WATER TEMPERATURES: March 1952 to current year.

INSTRUMENTATION.--Temperature recorder since March 1952.

EXTREMES FOR PERIOD OF DAILY RECORD.--

WATER TEMPERATURES: Maximum, 24.0°C July 28, 1958; minimum, 0.0°C on Jan. 29, 30, 1980.

EXTREMES FOR CURRENT YEAR.--

WATER TEMPERATURES: Maximum, 21.0°C Aug. 9; minimum, 0.5°C Dec. 21-25.

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	OCTOBER			NOVEMBER			DECEMBER			JANUARY		
1	12.0	9.5	11.0	11.0	10.0	10.5	4.0	3.5	4.0	4.0	3.0	3.5
2	12.5	11.0	11.5	11.5	10.0	10.5	4.5	4.0	4.5	4.5	4.0	4.5
3	12.5	12.0	12.5	11.0	10.5	11.0	5.0	4.5	5.0	5.0	3.5	4.5
4	14.0	12.0	13.0	10.5	10.0	10.5	5.5	5.0	5.0	5.0	3.5	4.5
5	12.5	11.0	12.0	10.0	9.0	9.0	5.5	5.0	5.5	5.5	5.0	5.5
6	13.0	11.0	12.0	9.0	8.5	9.0	5.0	4.5	5.0	6.5	5.5	6.0
7	12.0	10.0	11.0	8.5	8.0	8.0	4.5	4.0	4.0	6.5	5.5	6.0
8	12.5	9.5	11.0	8.0	7.5	8.0	5.5	4.0	5.0	6.0	5.5	6.0
9	13.0	10.5	11.5	8.5	8.0	8.0	6.0	4.5	5.5	6.0	5.5	5.5
10	12.5	10.0	11.5	8.5	7.5	8.0	6.0	6.0	6.0	6.0	5.5	5.5
11	11.5	8.5	10.0	9.0	8.5	8.5	6.0	5.5	6.0	6.0	6.0	6.0
12	10.5	8.5	9.5	8.5	8.0	8.5	6.0	5.5	5.5	6.0	5.5	6.0
13	11.5	9.0	10.0	8.5	8.0	8.5	6.5	6.0	6.0	5.5	4.5	5.0
14	12.0	11.0	11.5	8.5	8.0	8.0	6.0	6.0	6.0	4.5	3.5	4.0
15	12.0	10.0	11.0	8.5	7.5	8.0	6.0	5.5	5.5	3.5	3.0	3.0
16	11.0	9.0	10.0	8.0	7.5	8.0	5.5	4.5	5.0	3.0	2.5	3.0
17	12.0	10.0	11.0	8.5	8.0	8.0	4.5	3.5	4.0	3.0	2.5	2.5
18	11.5	9.5	10.5	8.0	7.5	8.0	3.5	3.0	3.0	2.5	2.0	2.0
19	11.0	10.0	10.5	7.5	7.5	7.5	3.5	3.0	3.0	2.5	2.0	2.5
20	12.0	10.5	11.0	7.5	7.0	7.0	3.0	1.5	2.5	3.0	2.0	2.5
21	12.0	10.5	11.5	7.0	6.5	7.0	1.5	.5	1.0	4.0	3.0	3.5
22	12.5	11.5	12.0	7.0	6.5	6.5	.5	.5	.5	5.0	4.0	4.5
23	11.5	9.5	10.5	7.0	6.5	6.5	.5	.5	.5	5.5	5.0	5.0
24	10.0	8.5	9.0	7.5	7.0	7.0	.5	.5	.5	5.5	5.0	5.0
25	11.0	9.0	10.0	7.5	6.5	7.0	2.0	.5	1.0	6.0	5.5	5.5
26	11.0	9.0	10.0	7.5	7.0	7.0	3.0	2.0	2.5	6.0	5.5	5.5
27	11.5	9.5	10.5	8.0	7.5	7.5	3.0	2.0	2.5	6.0	5.5	6.0
28	10.5	10.0	10.5	7.5	7.0	7.5	2.5	1.0	2.0	6.5	6.0	6.5
29	10.5	10.0	10.0	7.0	5.5	6.0	3.0	2.5	3.0	7.0	6.5	6.5
30	11.5	10.0	10.5	5.5	4.5	5.0	4.0	2.5	3.0	6.5	5.5	6.0
31	12.0	10.5	11.0	---	---	---	4.5	3.5	4.0	5.5	5.5	5.5
MONTH	14.0	8.5	11.0	11.5	4.5	8.0	6.5	.5	4.0	7.0	2.0	5.0

12113000 GREEN RIVER NEAR AUBURN, WA--Continued

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984

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

DUWAMISH RIVER BASIN

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12113350 GREEN RIVER AT TUKWILA, WA

LOCATION.--Lat 47°27'55", long 122°14'48", in NW¼SW¼ sec.24, T.23 N., R.4 E., King County, Hydrologic Unit 17110013, on right bank under highway bridge 0.6 mi southeast of Tukwila, 1.4 mi upstream from Black River, and at mile 12.4.

DRAINAGE AREA.--440 mi².

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

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

REMARKS.--Records fair. Flow regulated by Howard A. Hanson Reservoir (station 12105800) for flood control and during summer months to augment the natural river flow. City of Tacoma diverted an average daily discharge of about 109 ft³/s from river at headworks near Palmer, 49 mi upstream from station, for municipal use. Municipality of Metropolitan Seattle (METRO) released an average daily sewage discharge of 69 ft³/s at the outfall structure about 0.3 mi downstream from station. This discharge is included in the discharge measurements made during the year but not in the published record that was computed by the CONROUT model (WRI Report 83-4160). Minor diversions and regulation on upstream tributaries. River stages are affected daily by backwater during high tide. Chemical analyses October 1967 to September 1970.

AVERAGE DISCHARGE.--24 years, 1,516 ft³/s, 1,098,000 acre-ft/yr, unadjusted.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 12,100 ft³/s Jan. 31, 1965, elevation, 21.70 ft; minimum recorded, 195 ft³/s Sept. 14, 15, 1961; minimum observed elevation, 2.26 ft Oct. 24, 1974, but may have been less during period of no gage-height record Oct. 14-27, 1974.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of Nov. 24, 1959, reached a stage of 22.63 ft, present datum from gage-height record of stages above 14.2 ft, discharge, 13,200 ft³/s.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 10,700 ft³/s Jan. 25, elevation, 20.70 ft; minimum daily, 314 ft³/s Oct. 3.

REVISIONS.--The minimum daily discharge for water year 1983 has been revised to 322 ft³/s Aug. 23; revised daily discharges, in cubic feet per second for March through September 1983, are given below. These figures supersede those published in the report for 1983.

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

DAY	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1840	2950	994	407	640	617	494
2	1770	2520	990	405	643	606	521
3	1720	2300	895	526	620	550	501
4	1620	2040	847	573	596	521	483
5	1520	1950	829	578	584	510	469
6	1520	1880	858	577	647	498	457
7	1560	1780	823	578	660	490	454
8	1820	1630	821	573	637	479	450
9	2610	1500	873	568	600	441	448
10	3390	1460	875	622	577	420	482
11	3490	1440	871	666	563	429	527
12	2990	1430	863	662	568	439	528
13	2730	1350	826	643	860	413	590
14	2440	1220	804	598	1540	392	612
15	2200	1130	839	551	1760	383	612
16	2000	1040	845	529	2000	355	644
17	1840	995	836	512	2090	340	841
18	1630	983	829	589	1950	336	951
19	1390	1020	823	602	1180	332	991
20	1300	1300	812	671	797	330	791
21	1300	1550	779	813	730	334	675
22	1390	1530	762	856	727	330	641
23	1400	1490	750	873	681	328	626
24	1360	1450	683	832	653	327	616
25	1330	1400	595	750	654	324	608
26	1280	1290	506	712	713	322	602
27	1250	1160	456	699	725	333	529
28	1240	1120	429	682	725	356	483
29	1460	1080	412	650	708	383	406
30	2320	1010	398	633	661	428	369
31	2960	---	398	---	631	445	---
TOTAL	58670	44998	23321	18930	27120	12791	17401
MEAN	1893	1500	752	631	875	413	580
MAX	3490	2950	994	873	2090	617	991
MIN	1240	983	398	405	563	322	369
AC-FT	116400	89250	46260	37550	53790	25370	34510

WTR YR 1983 TOTAL 472160 MEAN 1294 MAX 9800 MIN 322 AC-FT 936500

DUWAMISH RIVER BASIN

12113350 GREEN RIVER AT TUKWILA, WA--Continued

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	340	502	2150	1310	3390	1520	2390	1500	2480	1290	388	468
2	324	478	1900	1500	2880	1520	2200	1740	2100	1250	390	463
3	314	1140	1630	2730	2530	1440	1980	2240	1950	1230	390	459
4	396	2190	1510	7020	2270	1390	1850	2380	1790	1210	387	460
5	608	3010	1470	9790	2140	1410	1770	2240	1400	1160	389	469
6	607	3220	1490	8080	2060	1570	1740	2160	1210	1060	391	484
7	582	3210	1470	5580	1980	1600	1820	2050	1110	926	389	483
8	482	3000	1350	4250	1880	1590	1950	1990	1090	864	395	482
9	434	2610	1380	3850	1670	1590	2090	2040	1010	839	395	483
10	421	2310	1740	3620	1710	1660	2380	2180	953	824	394	482
11	413	1840	1870	3320	1670	1730	2440	2260	946	785	391	488
12	393	1620	1830	3220	2280	1920	2050	2460	926	728	390	497
13	381	1560	2070	2910	3260	2160	2480	2780	890	698	392	486
14	391	1760	2610	2460	3160	2100	1810	3050	799	665	390	477
15	395	2590	2980	2280	2750	1960	1840	3160	757	641	387	471
16	393	3980	2750	2170	2150	1930	3200	2850	742	626	393	468
17	400	4270	2160	1990	2200	1840	3140	2500	729	597	434	467
18	397	4130	1940	1810	2000	1800	2580	2280	709	579	441	465
19	395	3710	1840	1620	1860	1830	2260	2190	605	566	442	465
20	400	3330	1690	1500	1880	2220	2110	2340	581	533	442	467
21	397	3170	1480	1390	2050	3340	1900	2560	1090	503	441	468
22	408	2850	1230	1430	2020	3810	1880	2650	1610	483	441	488
23	413	2470	1100	1630	1860	3680	1870	2710	1710	469	444	491
24	408	2320	984	4610	1910	3400	1780	2930	1690	458	447	474
25	483	2240	979	9070	1900	3270	1640	2890	1620	450	450	544
26	517	2140	982	10300	1860	3220	1370	2710	1430	446	454	550
27	528	2080	1030	10100	1970	3100	1500	2710	1500	427	465	489
28	531	2190	1140	7950	1810	2840	1240	2680	1420	408	479	455
29	526	2540	1080	5940	1470	2230	1340	2730	1340	397	473	452
30	535	2500	1270	4660	---	2380	1420	3000	1340	393	465	446
31	587	---	1280	3950	---	2490	---	2990	---	390	468	---
TOTAL	13799	74960	50385	132040	62570	68540	60020	76950	37527	21895	13037	14341
MEAN	445	2499	1625	4259	2158	2211	2001	2482	1251	706	421	478
MAX	608	4270	2980	10300	3390	3810	3200	3160	2480	1290	479	550
MIN	314	478	979	1310	1470	1390	1240	1500	581	390	387	446
AC-FT	27370	148700	99940	261900	124100	135900	119000	152600	74430	43430	25860	28450
CAL YR 1983	TOTAL	499096		MEAN	1367	MAX	9800	MIN	314	AC-FT	990000	
WTR YR 1984	TOTAL	626064		MEAN	1711	MAX	10300	MIN	314	AC-FT	1242000	

NOTE.--Entire record was developed using the CONROUT model.

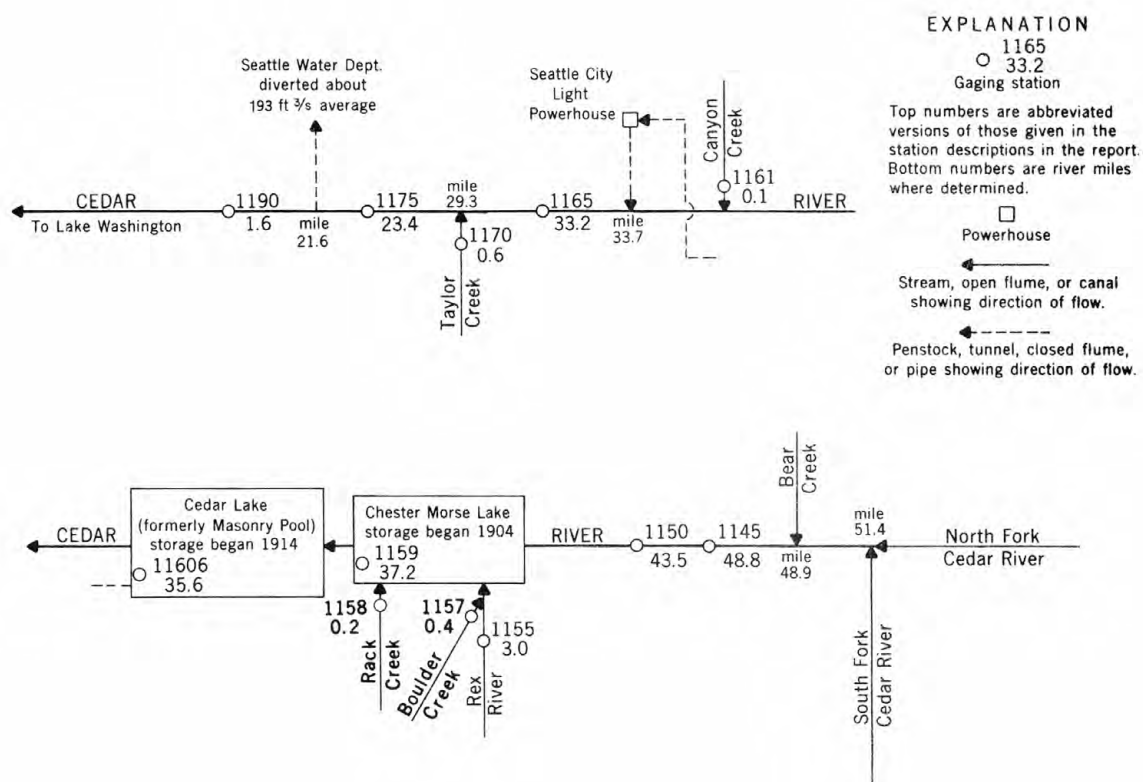


Figure 13.--Gaging stations in Lake Washington basin (Cedar River).

LAKE WASHINGTON BASIN

12114500 CEDAR RIVER BELOW BEAR CREEK, NEAR CEDAR FALLS, WA

LOCATION.--Lat 47°20'32", long 121°32'52", in SE¼SE¼ sec.32, T.22 N., R.10 E., King County, Hydrologic Unit 17110012, on right bank 500 ft downstream from Bear Creek, and 12.2 mi southeast of town of Cedar Falls.

DRAINAGE AREA.--25.4 mi².

PERIOD OF RECORD.--October 1945 to December 1963, October 1975 to current year.

REVISED RECORDS.--WSP 1716: 1956-57(M), 1959(M).

GAGE.--Water-stage recorder. Elevation of gage is 1,880 ft, from topographic map. Prior to Sept. 16, 1960, at site 90 ft upstream at datum 2.35 ft higher.

REMARKS.--Records good except those above 1,100 ft³/s and those during ice effect Dec. 21 to Jan. 1, which are fair. No regulation or diversion upstream from station. U.S. Geological Survey satellite telemeter at station.

AVERAGE DISCHARGE.--27 years (water years 1946-63, 1976-84), 171 ft³/s, 91.42 in/yr, 123,900 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 7,620 ft³/s Nov. 22, 1959, gage height, 6.98 ft site and datum then in use, from rating curve extended above 890 ft³/s on basis of slope-area measurement of peak flow; minimum, 12 ft³/s Nov. 27, 1952.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 700 ft³/s and maximum (*), from rating curve extended above 910 ft³/s on basis of slope-area measurement at gage height 9.37 ft:

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Jan. 4	2100	1,380	4.92	Jan. 25	0200	*2,620	*6.18

Minimum discharge, 21 ft³/s Sept. 28-30, gage height, 1.71 ft.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP		
1	41	40	142	60	230	77	144	133	287	231	45	28		
2	40	48	129	98	199	80	138	233	252	222	44	25		
3	41	306	116	574	178	76	129	227	236	216	42	24		
4	47	422	105	1240	163	72	123	207	249	216	41	23		
5	41	313	96	946	153	72	129	204	338	212	40	26		
6	40	347	88	647	153	77	127	193	316	185	39	31		
7	38	315	84	532	147	84	129	180	320	160	38	26		
8	37	257	83	422	140	98	129	197	366	149	36	34		
9	36	215	83	328	135	117	127	220	341	146	35	28		
10	36	191	84	277	133	147	129	211	307	139	34	26		
11	35	183	80	257	131	170	125	263	284	133	34	29		
12	34	173	74	218	218	191	140	414	279	123	34	29		
13	34	173	135	185	233	188	133	408	327	114	34	27		
14	34	274	183	163	210	173	158	400	379	112	33	25		
15	34	413	165	144	188	170	242	334	388	114	32	24		
16	33	537	138	129	165	160	248	279	311	114	30	24		
17	35	522	117	116	147	158	215	242	257	107	30	23		
18	33	548	103	103	131	156	196	227	244	96	30	23		
19	34	396	83	95	121	165	185	293	245	86	29	23		
20	34	328	75	88	117	274	175	398	257	79	28	22		
21	33	242	65	88	117	409	173	324	363	75	28	23		
22	60	199	55	103	107	392	173	289	324	71	27	28		
23	47	178	48	215	100	367	163	363	363	68	27	25		
24	43	178	42	1240	95	320	147	346	371	66	27	24		
25	41	165	43	1610	90	277	135	302	347	62	26	23		
26	40	153	45	731	84	264	123	364	332	60	26	22		
27	39	191	47	569	80	230	116	385	295	56	29	22		
28	38	191	44	473	78	212	114	414	286	54	28	22		
29	36	175	43	396	76	188	108	549	306	52	26	21		
30	38	160	80	320	---	168	110	557	272	49	24	21		
31	42	---	67	264	---	156	---	376	---	47	25	---		
TOTAL	1194	7833	2742	12631	4119	5688	4483	9532	9242	3614	1001	751		
MEAN	38.5	261	88.5	407	142	183	149	307	308	117	32.3	25.0		
MAX	60	548	183	1610	233	409	248	557	388	231	45	34		
MIN	33	40	42	60	76	72	108	133	236	47	24	21		
CFSM	1.52	10.3	3.48	16.0	5.59	7.20	5.87	12.1	12.1	4.61	1.27	.98		
IN.	1.75	11.47	4.02	18.50	6.03	8.33	6.57	13.96	13.54	5.29	1.47	1.10		
AC-FT	2370	15540	5440	25050	8170	11280	8890	18910	18330	7170	1990	1490		
CAL YR 1983	TOTAL	54000	MEAN	148	MAX	1210	MIN	33	CFSM	5.83	IN.	79.09	AC-FT	107100
WTR YR 1984	TOTAL	62830	MEAN	172	MAX	1610	MIN	21	CFSM	6.77	IN.	92.02	AC-FT	124600

LOCATION.--Lat 47°22'13", long 121°37'26", in SE¼SW¼ sec.23, T.22 N., R.9 E., King County, Hydrologic Unit 17110012, Snoqualmie National Forest, on left bank 1.4 mi upstream from Chester Morse Lake, 8.3 mi southeast of town of Cedar Falls, and at mile 43.5.

REVISED RECORDS.--WSP 1286: 1946-48, 1950(P), 1951. WSP 1516: 1946(M), 1947-48(P), 1950-51(M), 1953-54(P), 1955(M). WSP 1932: Drainage area.

REMARKS.--Records fair except those for periods of no gage-height record Oct. 4 to Nov. 7, and ice effect Dec. 18 to Jan. 1, which are poor. No regulation or diversion upstream from station.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 9,490 ft³/s Nov. 22, 1959, gage height, 11.34 ft, from high-water mark in well, from rating curve extended above 4,300 ft³/s, on basis of slope-area measurements at gage heights 10.16 ft and 11.34 ft; maximum gage height, 11.4 ft Feb. 11, 1951, backwater from Chester Morse Lake; minimum discharge, 20 ft³/s Nov. 30 to Dec. 1, 1952.

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Jan. 4	1100	2,060	7.12	Jan. 24	2000	*3,300	*8.42

Minimum discharge, 29 ft³/s Sept. 29, 30, gage height, 2.16 ft.

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	65	63	231	115	350	142	239	208	425	322	69	43
2	61	75	210	179	301	148	229	390	369	304	67	39
3	61	500	192	948	271	142	216	393	343	294	64	36
4	79	685	172	1960	244	136	208	356	359	288	61	34
5	64	510	159	1530	229	132	216	353	467	284	60	38
6	62	565	148	958	227	139	216	335	465	254	58	49
7	59	513	138	783	217	147	231	309	454	224	56	43
8	57	440	138	631	212	167	235	330	524	208	54	56
9	56	362	144	494	208	195	231	365	499	201	53	49
10	55	321	158	423	208	233	250	354	455	194	51	43
11	54	301	153	406	210	273	248	423	419	185	50	48
12	53	280	144	356	356	318	271	646	399	176	53	51
13	52	280	219	312	416	318	259	629	448	162	52	44
14	53	454	341	273	356	288	271	611	502	157	49	39
15	51	716	307	239	315	288	406	534	521	157	46	37
16	50	860	250	217	275	271	416	453	433	157	45	36
17	53	811	208	197	241	266	353	394	362	150	44	35
18	51	845	170	178	217	261	315	362	337	140	43	34
19	50	635	140	166	202	268	299	444	333	127	42	34
20	52	560	130	153	197	420	283	599	353	118	41	34
21	50	420	105	155	199	635	273	511	484	111	40	34
22	95	332	90	190	190	611	278	457	448	105	39	45
23	74	278	75	326	183	580	266	561	468	101	39	42
24	67	296	68	1670	176	520	239	546	487	97	39	39
25	64	268	72	2400	169	458	219	477	452	94	38	36
26	63	244	76	1090	156	447	204	560	440	91	37	34
27	61	304	80	826	148	384	192	587	397	85	45	33
28	60	324	73	698	144	350	190	594	377	81	46	31
29	59	293	70	592	139	312	183	698	408	78	39	30
30	62	259	135	490	---	280	183	735	379	74	38	29
31	66	---	120	410	---	259	---	544	---	70	38	---
TOTAL	1859	12794	4716	19365	6756	9388	7619	14758	12807	5089	1496	1175
MEAN	60.0	426	152	625	233	303	254	476	427	164	48.3	39.2
MAX	95	860	341	2400	416	635	416	735	524	322	69	56
MIN	50	63	68	115	139	132	183	208	333	70	37	29
CFSM	1.47	10.5	3.73	15.4	5.72	7.44	6.24	11.7	10.5	4.03	1.19	.96
IN.	1.70	11.69	4.31	17.70	6.18	8.58	6.96	13.49	11.71	4.65	1.37	1.07
AC-FT	3690	25380	9350	38410	13400	18620	15110	29270	25400	10090	2970	2330
CAL YR 1983	TOTAL											

LAKE WASHINGTON BASIN

12115500 REX RIVER NEAR CEDAR FALLS, WA

LOCATION.--Lat 47°21'03", long 121°39'43", in NE¼NW¼ sec.33, T.22 N., R.9 E., King County, Hydrologic Unit 17110012, Snoqualmie National Forest, on right bank 3.0 mi upstream from mouth and Chester Morse Lake, and 7.5 mi southeast of town of Cedar Falls.

DRAINAGE AREA.--13.4 mi².

PERIOD OF RECORD.--October 1945 to current year.

REVISED RECORDS.--WSP 1286: 1946, 1948(P), 1949(M), 1950(P), 1952(M). WSP 1446: 1946(M), 1951, 1953-55(M). WSP 1932: Drainage area. WDR WA-74-1: 1973.

GAGE.--Water-stage recorder. Elevation of gage is 1,600 ft, from topographic map.

REMARKS.--Records fair. No regulation or diversion upstream from station.

AVERAGE DISCHARGE.--39 years, 104 ft³/s, 105.40 in/yr, 75,350 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 4,200 ft³/s Nov. 22, 1959, gage height, 8.20 ft, from rating curve extended above 1,600 ft³/s on basis of contracted-opening measurement at gage height 7.19 ft and slope-area measurement at gage height 8.20 ft; maximum gage height, Nov. 19, 1962, backwater from debris; minimum discharge, 4.3 ft³/s Nov. 29, 1952, gage height, 2.43 ft.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 700 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Jan. 4	2000	1,320	6.15	Jan. 24	1800	*3,300	*7.66

Minimum discharge, 6.5 ft³/s Aug. 26, 27, gage height, 3.21 ft.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP		
1	22	31	77	56	92	48	77	122	129	75	13	15		
2	20	52	66	166	80	51	73	264	115	69	13	9.3		
3	22	373	58	919	69	47	71	181	105	63	13	8.1		
4	42	413	52	1100	65	45	67	141	124	58	12	7.3		
5	26	241	47	548	63	44	76	132	198	53	12	15		
6	23	299	44	339	70	49	71	125	151	48	12	22		
7	22	226	42	269	64	55	77	131	201	44	11	16		
8	20	172	42	195	65	65	78	151	222	41	11	41		
9	19	143	54	148	63	72	78	157	191	37	10	19		
10	19	148	68	140	63	98	81	140	154	35	10	17		
11	18	151	63	167	66	100	81	249	137	33	9.9	28		
12	17	132	58	127	241	117	91	378	127	31	12	25		
13	17	129	163	106	222	112	87	286	127	29	13	18		
14	19	273	191	86	140	105	148	265	124	27	10	15		
15	17	439	137	73	115	113	273	215	115	26	9.6	14		
16	16	445	99	64	94	98	175	163	99	24	9.1	13		
17	20	378	75	55	80	92	128	137	88	23	8.9	12		
18	17	413	55	48	69	91	115	129	80	21	8.8	12		
19	19	230	45	43	64	106	111	198	75	20	8.4	11		
20	23	198	40	42	75	241	105	222	77	19	8.4	12		
21	19	146	35	47	71	312	112	163	134	19	8.2	12		
22	73	112	28	82	64	265	128	163	97	19	8.0	26		
23	40	92	25	198	60	277	109	290	92	17	8.1	18		
24	35	110	24	1580	57	195	90	219	88	17	7.8	16		
25	31	97	25	1120	55	154	78	163	80	16	7.6	14		
26	29	92	27	360	49	161	70	326	80	16	7.1	12		
27	28	160	28	300	47	128	66	269	69	15	18	12		
28	26	129	26	222	47	117	69	257	64	14	12	11		
29	25	105	25	166	43	100	63	257	105	14	8.7	9.9		
30	27	86	70	129	---	91	70	215	90	13	8.2	9.9		
31	38	---	62	108	---	83	---	154	---	13	8.7	---		
TOTAL	789	6015	1851	9003	2353	3632	2918	6262	3538	949	317.5	470.5		
MEAN	25.5	201	59.7	290	81.1	117	97.3	202	118	30.6	10.2	15.7		
MAX	73	445	191	1580	241	312	273	378	222	75	18	41		
MIN	16	31	24	42	43	44	63	122	64	13	7.1	7.3		
CFSM	1.90	15.0	4.46	21.6	6.05	8.73	7.26	15.1	8.81	2.28	.76	1.17		
IN.	2.19	16.70	5.14	24.99	6.53	10.08	8.10	17.38	9.82	2.63	.88	1.31		
AC-FT	1560	11930	3670	17860	4670	7200	5790	12420	7020	1880	630	933		
CAL YR 1983	TOTAL	32769	MEAN	89.8	MAX	1030	MIN	12	CFSM	6.70	IN.	90.97	AC-FT	65000
WTR YR 1984	TOTAL	38098	MEAN	104	MAX	1580	MIN	7.1	CFSM	7.76	IN.	105.76	AC-FT	75570

LAKE WASHINGTON BASIN

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12115700 BOULDER CREEK NEAR CEDAR FALLS, WA

LOCATION.--Lat 47°21'59", long 121°41'30", in NW¼NW¼ sec.29, T.22 N., R.9 E., King County, Hydrologic Unit 17110012, Snoqualmie National Forest, on right bank 5.8 mi southeast of Cedar Falls, and at mile 0.4.

DRAINAGE AREA.--4.64 mi².

PERIOD OF RECORD.--March 1983 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 1,610 ft, from topographic map.

REMARKS.--Records good except those for October 1983 to February 1984, which are fair. No regulation or diversion upstream from station.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 637 ft³/s Jan. 24, 1984, gage height, 4.25 ft; minimum, no flow for many days during August and September 1984.

EXTREMES FOR CURRENT YEAR.--

MARCH TO SEPTEMBER 1983.--Maximum discharge, 256 ft³/s July 15, gage height, 3.39 ft; minimum, 2.1 ft³/s Aug. 26, gage height, 1.39 ft.

OCTOBER TO SEPTEMBER 1984.--Maximum discharge, 637 ft³/s Jan. 24, gage height, 4.25 ft; minimum, no flow for many days during August and September.

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

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1						15	38	11	5.6	14	10	7.3
2						16	35	12	5.5	18	9.4	13
3						15	30	12	4.9	15	8.6	7.8
4						14	27	11	4.4	13	7.8	6.4
5						14	25	16	4.0	12	7.1	5.8
6						15	22	28	3.6	11	6.6	5.6
7						18	20	26	3.2	10	6.1	6.8
8						46	18	27	2.9	9.7	5.7	5.5
9						107	17	28	2.8	9.3	5.4	10
10						84	15	26	9.1	8.0	5.2	38
11						54	14	22	7.5	7.1	7.4	43
12						42	13	19	6.2	21	7.5	29
13						36	12	17	5.0	7.9	5.5	20
14						30	11	16	4.3	80	4.7	16
15						26	10	19	7.5	163	4.2	13
16						22	10	17	5.6	76	3.9	12
17						19	10	15	7.6	49	3.6	11
18						17	12	16	15	35	3.3	11
19						16	14	15	17	26	3.2	12
20						13	16	14	32	29	3.0	12
21						12	17	14	24	22	2.8	11
22						14	14	12	19	18	2.6	9.9
23						13	13	11	18	17	2.5	9.2
24						12	16	10	15	14	2.6	8.2
25						11	12	9.2	13	19	2.5	7.6
26						10	12	8.4	14	18	2.2	7.0
27						10	11	7.5	12	16	2.2	7.8
28						12	10	6.7	10	16	2.6	7.1
29						54	10	5.9	9.7	13	3.2	6.4
30						68	11	5.6	10	12	4.1	5.8
31						50	---	5.7	---	11	2.9	---
TOTAL						885	495	463.0	298.4	861.1	148.4	365.2
MEAN						28.5	16.5	14.9	9.95	27.8	4.79	12.2
MAX						107	38	28	32	163	10	43
MIN						10	10	5.6	2.8	7.1	2.2	5.5
CFSM						10.8	6.23	5.62	3.75	10.5	1.81	4.60
IN.						12.42	6.95	6.50	4.19	12.09	2.08	5.13
AC-FT						1760	982	918	592	1710	294	724

LAKE WASHINGTON BASIN

12115700 BOULDER CREEK NEAR CEDAR FALLS, WA--Continued

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP		
1	5.4	8.5	30	25	38	10	20	22	23	8.9	.38	.00		
2	5.2	11	24	38	37	11	19	59	20	8.1	.33	.00		
3	4.9	110	21	156	28	9.8	18	49	18	7.3	.24	.00		
4	7.9	104	18	232	25	8.9	16	42	20	6.5	.16	.00		
5	6.3	75	16	145	23	8.7	18	39	35	6.1	.15	.00		
6	5.2	84	15	93	22	10	17	38	27	5.4	.10	.00		
7	4.7	68	14	67	21	12	18	38	28	4.9	.04	.00		
8	4.5	54	14	51	20	15	19	44	32	4.5	.00	.78		
9	4.3	43	15	42	20	17	19	43	31	4.0	.00	.00		
10	4.1	59	19	45	20	24	20	40	26	3.6	.00	.00		
11	4.0	54	19	51	26	25	20	60	23	3.4	.00	.51		
12	4.0	51	18	42	55	34	23	84	20	3.2	.00	.42		
13	3.8	51	39	37	61	33	24	67	18	2.9	.00	.00		
14	4.3	79	61	30	40	30	41	66	17	2.5	.00	.00		
15	3.4	108	51	26	32	31	84	55	15	2.3	.00	.00		
16	2.6	121	37	21	25	27	55	45	13	2.0	.00	.00		
17	4.3	103	28	18	21	25	39	38	11	1.7	.00	.00		
18	2.9	91	22	14	16	24	31	33	10	1.6	.00	.00		
19	4.3	78	18	12	14	29	28	45	8.8	1.5	.00	.00		
20	5.4	85	15	12	16	66	25	47	9.3	1.4	.00	.00		
21	4.7	47	12	13	18	87	27	36	20	1.2	.00	.00		
22	14	43	10	15	15	73	27	37	14	1.1	.00	.63		
23	12	36	8.7	36	13	74	23	58	11	.92	.00	.27		
24	9.5	50	7.5	365	12	58	19	48	10	.84	.00	.42		
25	8.5	48	7.8	265	12	50	16	39	8.9	.77	.00	.00		
26	7.7	40	8.0	119	11	52	14	76	9.5	.77	.00	.00		
27	7.7	55	8.2	82	10	42	12	61	8.3	.69	.06	.00		
28	7.1	64	7.7	68	9.2	37	13	54	7.2	.63	.00	.00		
29	6.3	41	11	59	8.9	30	12	49	13	.55	.00	.00		
30	6.8	33	25	49	---	26	13	39	11	.43	.00	.00		
31	12	---	28	42	---	23	---	28	---	.38	.00	---		
TOTAL	187.8	1894.5	627.9	2270	669.1	1002.4	730	1479	518.0	90.08	1.46	3.03		
MEAN	6.06	63.1	20.3	73.2	23.1	32.3	24.3	47.7	17.3	2.91	.05	.10		
MAX	14	121	61	365	61	87	84	84	35	8.9	.38	.78		
MIN	2.6	8.5	7.5	12	8.9	8.7	12	22	7.2	.38	.00	.00		
CFSM	2.29	23.8	7.66	27.6	8.72	12.2	9.17	18.0	6.53	1.10	.02	.04		
IN.	2.64	26.59	8.81	31.87	9.39	14.07	10.25	20.76	7.27	1.26	.02	.04		
AC-FT	373	3760	1250	4500	1330	1990	1450	2930	1030	179	2.9	6.0		
WTR YR 1984	TOTAL	9473.27	MEAN	25.9	MAX	365	MIN	.00	CFSM	9.77	IN.	132.98	AC-FT	18790

LAKE WASHINGTON BASIN

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12115800 RACK CREEK NEAR CEDAR FALLS, WA

LOCATION.--Lat 47°23'29", long 121°43'17", in NW¼SE¼ sec.13, T.22 N., R.8 E., King County, Hydrologic Unit 17110012, Snoqualmie National Forest, on left bank 3.7 mi southeast of Cedar Falls, and at mile 0.2.

DRAINAGE AREA.--2.14 mi².

PERIOD OF RECORD.--March 1983 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 1,590 ft, from topographic map.

REMARKS.--Records good except those for March 1 to July 15, 1983, which are fair. No regulation or diversion upstream from station.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 192 ft³/s Jan. 24, 1984, gage height, 2.85 ft; minimum, no flow for many days during August and September 1984.

EXTREMES FOR CURRENT YEAR.--

MARCH TO SEPTEMBER 1983.--Maximum discharge, 181 ft³/s July 15, gage height, 2.80 ft; minimum, 0.16 ft³/s Aug. 31, Sept. 1, gage height, 0.93 ft.

OCTOBER TO SEPTEMBER 1984.--Maximum discharge, 192 ft³/s Jan. 24, gage height, 2.85 ft; minimum, no flow for many days during August and September.

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

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1						7.5	22	2.2	1.3	3.7	3.5	2.2
2						7.1	18	2.6	1.3	4.8	3.0	5.0
3						6.5	16	2.6	1.1	3.7	2.7	2.4
4						5.3	15	2.1	.94	3.1	2.4	1.9
5						5.3	12	4.1	.80	2.7	2.2	1.5
6						5.6	10	9.2	.64	2.6	2.0	1.5
7						7.1	9.0	10	.57	2.3	1.8	1.4
8						28	7.8	11	.48	2.0	1.6	1.1
9						46	6.7	12	.40	1.9	1.4	2.3
10						26	5.6	11	2.0	1.7	1.3	12
11						18	5.0	9.2	1.8	1.6	2.5	21
12						16	4.4	7.8	1.6	3.9	1.9	12
13						14	3.7	6.8	1.4	37	1.3	7.6
14						12	3.3	5.9	1.3	40	1.1	5.4
15						10	2.9	6.2	1.7	108	1.0	4.2
16						8.7	2.7	5.8	1.6	45	.88	3.6
17						7.5	2.6	5.6	4.1	24	.77	2.9
18						6.4	2.5	5.1	5.6	15	.69	4.9
19						5.4	2.6	4.8	8.4	12	.61	4.1
20						4.7	2.7	4.3	12	12	.53	3.5
21						4.0	3.3	3.8	8.4	9.3	.47	3.2
22						4.8	2.7	3.4	6.5	7.7	.42	2.9
23						4.6	2.5	3.0	5.6	6.4	.38	2.5
24						3.7	2.9	2.6	4.8	5.3	.34	2.2
25						3.7	2.2	2.3	3.9	6.1	.29	2.0
26						3.5	2.1	2.0	4.3	5.1	.23	2.4
27						3.3	2.0	1.8	3.7	5.2	.21	2.8
28						3.3	2.0	1.6	2.9	5.4	.27	2.0
29						12	2.0	1.4	2.7	4.7	.31	1.7
30						31	2.1	1.3	2.9	4.3	.51	1.5
31						27	---	1.4	---	3.9	.21	---
TOTAL						348.0	178.3	152.9	94.73	390.4	36.82	123.7
MEAN						11.2	5.94	4.93	3.16	12.6	1.19	4.12
MAX						46	22	12	12	108	3.5	21
MIN						3.3	2.0	1.3	.40	1.6	.21	1.1
CFSM						5.23	2.78	2.30	1.48	5.89	.56	1.93
IN.						6.05	3.10	2.66	1.65	6.79	.64	2.15
AC-FT						690	354	303	188	774	73	245

LAKE WASHINGTON BASIN

12115800 RACK CREEK NEAR CEDAR FALLS, WA--Continued

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP		
1	1.4	2.7	12	7.7	12	5.8	8.2	8.2	9.3	5.0	.16	.00		
2	1.1	5.3	9.9	29	9.5	6.2	7.6	21	8.1	4.7	.14	.00		
3	1.2	48	8.5	125	8.5	5.8	7.3	23	7.2	4.3	.10	.00		
4	2.4	41	6.8	145	7.6	5.3	6.7	20	7.3	3.8	.06	.00		
5	1.5	29	5.8	91	6.9	5.1	7.0	20	9.8	3.5	.06	.00		
6	1.2	33	4.9	47	6.8	5.6	7.4	19	9.0	3.2	.05	.00		
7	1.1	31	4.5	35	6.3	6.1	9.2	17	10	2.9	.01	.00		
8	1.1	25	4.5	28	6.0	6.8	10	18	15	2.6	.00	.00		
9	.88	18	5.5	22	6.1	7.5	10	19	16	2.5	.00	.00		
10	.80	17	8.9	22	6.1	8.8	11	19	14	2.3	.00	.00		
11	.73	15	9.5	30	6.7	9.2	9.5	19	11	2.1	.00	.00		
12	.67	14	7.7	25	20	15	10	24	9.4	2.0	.00	.00		
13	.61	14	16	20	24	18	10	24	8.2	1.8	.02	.00		
14	.80	30	33	14	19	15	17	25	7.1	1.7	.00	.00		
15	.55	41	27	10	14	15	24	25	6.4	1.5	.00	.00		
16	.44	48	16	8.0	11	12	20	23	6.0	1.4	.00	.00		
17	.80	41	11	6.1	8.5	11	15	19	5.3	1.3	.00	.00		
18	.49	35	9.2	4.6	7.3	10	12	16	4.8	1.1	.00	.00		
19	.67	29	7.4	3.6	6.7	12	10	16	4.3	1.0	.00	.00		
20	.96	31	5.6	3.0	7.0	24	9.1	19	4.4	1.0	.00	.00		
21	.73	23	4.1	5.1	7.5	32	8.8	17	7.7	.89	.00	.00		
22	5.1	15	3.4	10	6.8	28	8.6	16	6.5	.79	.00	.07		
23	3.5	12	2.8	27	6.4	26	8.4	19	5.9	.67	.00	.01		
24	2.6	16	2.3	126	6.2	24	7.5	19	5.5	.61	.00	.00		
25	2.0	15	2.4	90	6.1	22	6.8	16	5.0	.54	.00	.00		
26	1.7	13	2.5	50	5.6	23	6.2	26	5.2	.51	.00	.00		
27	1.7	25	2.6	34	5.1	20	5.6	26	4.5	.44	.00	.00		
28	1.4	27	2.4	29	5.1	17	5.6	21	4.0	.39	.05	.00		
29	1.1	21	3.7	24	4.9	14	5.8	17	6.0	.32	.00	.00		
30	1.5	15	8.0	20	---	11	6.1	15	5.7	.25	.00	.00		
31	3.3	---	9.1	15	---	9.3	---	12	---	.21	.00	---		
TOTAL	44.03	730.0	257.0	1106.1	253.7	430.5	290.4	598.2	228.6	55.32	1.13	.08		
MEAN	1.42	24.3	8.29	35.7	8.75	13.9	9.68	19.3	7.62	1.78	.04	.00		
MAX	5.1	48	33	145	24	32	24	26	16	5.0	.48	.07		
MIN	.44	2.7	2.3	3.0	4.9	5.1	5.6	8.2	4.0	.21	.00	.00		
CFSM	.66	11.4	3.87	16.7	4.09	6.50	4.52	9.02	3.56	.83	.02	.00		
IN.	.77	12.69	4.47	19.23	4.41	7.48	5.05	10.40	3.97	.96	.02	.00		
AC-FT	87	1450	510	2190	503	854	576	1190	453	110	2.2	.2		
WTR YR 1984	TOTAL	3995.06	MEAN	10.9	MAX	145	MIN	.00	CFSM	5.09	IN.	69.45	AC-FT	7920

LAKE WASHINGTON BASIN

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12115900 CHESTER MORSE LAKE AT CEDAR FALLS, WA

LOCATION.--Lat 47°24'34", long 121°43'22", in SW¼ sec.12, T.22 N., R.8 E., King County, Hydrologic Unit 17110012, 100 ft upstream of Crib Dam, 3.1 mi southeast of town of Cedar Falls, and at mile 37.2.

DRAINAGE AREA.--78.4 mi².

PERIOD OF RECORD.--October 1977 to current year.

GAGE.--Nonrecording gage. Datum of gage is 7.39 ft above National Geodetic Vertical Datum of 1929 (levels by city of Seattle).

REMARKS.--Reservoir is formed by wood crib dam. Usable capacity, 37,186 acre-ft between gage heights 1,532 ft, minimum operation level, and 1,555 ft, spillway crest. Unused storage below gage height 1,532 ft is 38,137 acre-ft. Occasionally, elevation of downstream Cedar Lake exceeds 1,555 ft and wood crib dam is submerged. Chester Morse Lake is then controlled by masonry gravity dam at Cedar Lake. Water is used by city of Seattle for municipal water supply and power production.

COOPERATION.--Gage-height record furnished by city of Seattle.

EXTREMES FOR PERIOD OF RECORD.--Maximum gage height observed, 1,566.82 ft Dec. 3, 1977; minimum observed, 1,535.60 ft Oct. 16, 1979.

EXTREMES FOR CURRENT YEAR.--Maximum gage height observed, 1,559.25 ft May 15, 16; minimum observed, 1,538.60 ft Nov. 1.

GAGE HEIGHT (FEET ABOVE DATUM), WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984
INSTANTANEOUS OBSERVATIONS AT 0800

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1544.34	1538.60	1551.77	1546.00	1555.45	1549.85	1552.16	1555.21	1558.98	1558.57	1555.07	1548.31
2	1544.15	1538.61	1551.30	1546.00	1555.14	1549.91	1552.34	1555.68	1558.66	1558.44	1554.84	1548.18
3	1543.96	1538.98	1550.93	1545.65	1554.58	1549.92	1552.44	1556.23	1558.26	1558.37	1554.52	1547.95
4	1543.81	1541.39	1550.24	1550.80	1554.10	1549.90	1552.55	1556.64	1557.92	1558.40	1554.30	1547.78
5	1543.70	1543.00	1549.61	1554.51	1553.58	1549.89	1552.57	1557.20	1557.80	1558.40	1554.09	1547.60
6	1543.49	1544.45	1549.02	1555.75	1553.13	1549.88	1552.72	1557.53	1557.94	1558.33	1553.96	1547.44
7	1543.30	1545.40	1548.32	1556.14	1552.54	1549.89	1552.89	1558.13	1557.90	1558.28	1553.80	1547.29
8	1543.18	1546.22	1547.82	1556.33	1552.06	1549.92	1553.12	1558.34	1558.04	1558.22	1553.52	1547.18
9	1542.94	1546.41	1547.06	1556.30	1551.42	1549.99	1553.34	1558.53	1558.20	1558.18	1553.30	1547.05
10	1542.74	1546.45	1546.69	1555.94	1550.97	1550.12	1553.36	1558.47	1558.04	1558.13	1553.06	1546.94
11	1542.60	1546.78	1546.44	1555.83	1550.39	1550.43	1553.25	1558.35	1557.96	1558.09	1552.86	1546.88
12	1542.19	1546.78	1546.44	1555.51	1550.00	1550.62	1553.45	1558.66	1557.82	1558.02	1552.64	1546.80
13	1542.00	1546.63	1546.55	1555.33	1550.20	1550.75	1553.70	1558.99	1557.75	1558.00	1552.48	1546.56
14	1541.90	1547.18	1547.21	1554.78	1550.38	1550.68	1553.90	1559.19	1557.77	1558.90	1552.30	1546.34
15	1541.70	1548.00	1547.21	1554.39	1550.20	1550.73	1554.18	1559.25	1557.85	1557.81	1552.04	1546.03
16	1541.37	1549.44	1547.78	1553.85	1549.87	1550.66	1554.56	1559.25	1557.92	1557.71	1551.89	1546.02
17	1541.22	1550.90	1546.96	1553.20	1549.87	1550.60	1554.58	1558.96	1558.01	1557.57	1551.58	1545.96
18	1541.08	1552.27	1546.90	1552.57	1549.82	1550.62	1554.12	1558.68	1558.02	1557.48	1551.30	1545.84
19	1540.85	1553.46	1547.22	1551.95	1549.92	1550.51	1554.24	1558.44	1558.10	1557.26	1551.14	1545.65
20	1540.65	1553.99	1546.54	1551.30	1549.98	1550.72	1554.46	1558.43	1558.10	1557.11	1550.82	1545.51
21	1540.42	1554.36	1546.50	1550.62	1550.03	1551.22	1554.51	1558.45	1558.40	1556.94	1550.52	1545.32
22	1540.30	1554.39	1546.00	1550.10	1549.95	1551.71	1554.47	1558.27	1558.42	1556.78	1550.28	1545.22
23	1540.32	1554.35	1545.60	1549.65	1549.87	1552.01	1554.38	1558.33	1558.46	1556.61	1550.12	1545.07
24	1540.22	1554.03	1544.61	1550.65	1549.97	1552.41	1554.52	1558.44	1558.56	1556.48	1549.94	1544.95
25	1540.02	1553.70	1543.93	1557.17	1549.99	1552.44	1554.69	1558.41	1558.62	1556.28	1549.77	1544.75
26	1539.81	1553.37	1545.00	1558.43	1550.00	1552.50	1554.78	1558.42	1558.40	1556.13	1549.50	1544.60
27	1539.63	1552.99	1545.46	1558.01	1550.02	1552.49	1554.86	1558.69	1558.40	1555.95	1549.28	1544.42
28	1539.42	1552.90	1545.65	1557.37	1549.94	1552.43	1554.88	1558.71	1558.27	1555.83	1549.12	1544.23
29	1539.26	1552.67	1545.35	1556.71	1549.87	1552.26	1555.00	1558.95	1558.24	1555.67	1548.94	1543.98
30	1539.01	1552.26	1545.20	1555.95	---	1551.93	1555.04	1559.16	1558.50	1555.51	1548.83	1543.80
31	1538.97	---	1545.61	1555.65	---	1552.02	---	1559.21	---	1555.29	1548.60	---
MEAN	1541.57	1548.67	1547.13	1553.63	1551.15	1550.94	1553.84	1558.23	1558.18	1557.38	1551.76	1546.12
MAX	1544.34	1554.39	1551.77	1558.43	1555.45	1552.50	1555.04	1559.25	1558.98	1558.90	1555.07	1548.31
MIN	1538.97	1538.60	1543.93	1545.65	1549.82	1549.85	1552.16	1555.21	1557.75	1555.29	1548.60	1543.80
CAL YR 1983	MEAN	1548.80	MAX	1559.13	MIN	1538.60						
WTR YR 1984	MEAN	1551.55	MAX	1559.25	MIN	1538.60						

LAKE WASHINGTON BASIN

12116060 CEDAR LAKE (MASONRY POOL) NEAR CEDAR FALLS, WA

LOCATION.--Lat 47°24'43", long 121°45'04", in NE¼NW¼ sec.11, T.22 N., R.8 E., King County, Hydrologic Unit 17110012, at Masonry Dam, 1.6 mi southeast of town of Cedar Falls, and at mile 35.6.

DRAINAGE AREA.--78.4 mi².

PERIOD OF RECORD.--October 1977 to current year.

GAGE.--Water-stage recorder. Datum of gage is 7.39 ft above National Geodetic Vertical Datum of 1929 (levels by city of Seattle).

REMARKS.--Reservoir is formed by masonry gravity dam. Usable capacity, 40,285 acre-ft between gage heights 1,530.0 ft, normal minimum regulating pool, and 1,554.6 ft, normal maximum regulating pool. Unused storage below gage height 1,530.0 ft, 36,000 acre-ft. Water is used by city of Seattle for municipal water supply and power production.

COOPERATION.--Gage-height record furnished by city of Seattle.

EXTREMES FOR PERIOD OF RECORD.--Maximum gage height observed, 1,566.82 ft Dec. 3, 1977; minimum not determined (during period Aug. 2 to Sept. 19, 1978, while the pool was drained for maintenance).

EXTREMES FOR CURRENT YEAR.--Maximum gage height observed, 1,559.25 ft May 15, 16; minimum observed, 1,529.48 ft Nov. 2.

GAGE HEIGHT (FEET ABOVE DATUM), WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984
INSTANTANEOUS OBSERVATIONS AT 0800

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1540.46	1529.69	1551.77	1543.32	1555.45	1549.85	1552.16	1555.21	1558.98	1558.57	1555.07	1548.31
2	1540.25	1529.48	1551.30	1543.68	1555.14	1549.91	1552.34	1555.68	1558.66	1558.44	1554.84	1548.18
3	1539.95	1529.59	1550.93	1545.65	1554.58	1549.92	1552.44	1556.23	1558.26	1558.37	1554.52	1547.95
4	1539.67	1532.30	1550.24	1550.80	1554.10	1549.90	1552.55	1556.64	1557.92	1558.40	1554.30	1547.78
5	1539.49	1534.69	1549.61	1554.51	1553.58	1549.89	1552.57	1557.20	1557.80	1558.40	1554.09	1547.60
6	1539.24	1536.30	1549.02	1555.75	1553.13	1549.88	1552.72	1557.53	1557.94	1558.33	1553.96	1547.44
7	1538.90	1538.09	1548.32	1556.14	1552.54	1549.89	1552.89	1558.13	1557.90	1558.28	1553.80	1547.29
8	1538.46	1540.51	1547.54	1556.33	1552.06	1549.92	1553.12	1558.34	1558.04	1558.22	1553.52	1547.18
9	1538.24	1543.13	1546.56	1556.30	1551.42	1549.99	1553.34	1558.53	1558.20	1558.18	1553.30	1547.05
10	1537.74	1545.01	1545.33	1555.94	1550.97	1550.12	1553.36	1558.47	1558.04	1558.13	1553.06	1546.94
11	1537.24	1545.93	1545.92	1555.83	1550.39	1550.43	1553.25	1558.35	1557.96	1558.09	1552.86	1546.88
12	1536.65	1546.36	1546.14	1555.51	1550.00	1550.62	1553.45	1558.66	1557.82	1558.02	1552.64	1546.80
13	1536.36	1546.55	1546.33	1555.33	1550.20	1550.75	1553.70	1558.99	1557.75	1558.00	1552.48	1546.56
14	1536.24	1547.02	1546.79	1554.78	1550.38	1550.68	1553.90	1559.19	1557.77	1558.90	1552.30	1546.34
15	1536.00	1548.00	1547.21	1554.39	1550.20	1550.73	1554.18	1559.25	1557.85	1557.81	1552.04	1546.03
16	1535.58	1549.44	1547.22	1553.85	1549.87	1550.66	1554.56	1559.25	1557.92	1557.71	1551.89	1545.90
17	1535.26	1550.90	1546.96	1553.20	1549.87	1550.60	1554.58	1558.96	1558.01	1557.57	1551.58	1545.63
18	1534.36	1552.27	1546.90	1552.57	1549.82	1550.62	1554.12	1558.68	1558.02	1557.48	1551.30	1545.22
19	1533.58	1553.46	1546.89	1551.95	1549.92	1550.51	1554.24	1558.44	1558.10	1557.26	1551.14	1544.86
20	1533.14	1553.99	1546.42	1551.30	1549.98	1550.72	1554.46	1558.43	1558.10	1557.11	1550.82	1544.54
21	1532.68	1554.36	1545.97	1550.62	1550.03	1551.22	1554.51	1558.45	1558.40	1556.94	1550.52	1544.09
22	1532.42	1554.39	1544.65	1550.10	1549.95	1551.71	1554.47	1558.27	1558.42	1556.78	1550.28	1543.64
23	1532.17	1554.35	1542.98	1549.65	1549.87	1552.01	1554.38	1558.33	1558.46	1556.61	1550.12	1542.21
24	1531.80	1554.03	1541.74	1550.65	1549.97	1552.41	1554.52	1558.44	1558.56	1556.48	1549.94	1541.58
25	1531.60	1553.70	1540.84	1557.17	1549.99	1552.44	1554.69	1558.41	1558.62	1556.28	1549.77	1541.46
26	1531.36	1553.37	1541.67	1558.43	1550.00	1552.50	1554.78	1558.42	1558.40	1556.13	1549.50	1541.42
27	1531.08	1552.99	1542.80	1558.01	1550.02	1552.49	1554.86	1558.69	1558.40	1555.95	1549.28	1539.54
28	1530.74	1552.90	1543.01	1557.37	1549.94	1552.43	1554.88	1558.71	1558.27	1555.83	1549.12	1537.41
29	1530.44	1552.67	1542.73	1556.71	1549.87	1552.26	1555.00	1558.95	1558.24	1555.67	1548.94	1536.71
30	1530.28	1552.26	1542.60	1555.95	---	1551.93	1555.04	1559.16	1558.50	1555.51	1548.83	1535.53
31	1530.01	---	1543.02	1555.65	---	1552.02	---	1559.21	---	1555.29	1548.60	---
MEAN	1535.21	1546.26	1546.11	1553.47	1551.15	1550.94	1553.84	1558.23	1558.18	1557.38	1551.76	1544.60
MAX	1540.46	1554.39	1551.77	1558.43	1555.45	1552.50	1555.04	1559.25	1558.98	1558.90	1555.07	1548.31
MIN	1530.01	1529.48	1540.84	1543.32	1549.82	1549.85	1552.16	1555.21	1557.75	1555.29	1548.60	1535.53
WTR YR 1984	MEAN	1550.59	MAX	1559.25	MIN	1529.48						

LAKE WASHINGTON BASIN

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12116100 CANYON CREEK NEAR CEDAR FALLS, WA

LOCATION.--Lat 47°25'11", long 121°45'55", in NW¼SE¼ sec.3, T.22 N., R.8 E., King County, Hydrologic Unit 17110012, Snoqualmie National Forest, on right bank 400 ft upstream from mouth, and 0.8 mi east of town of Cedar Falls.

DRAINAGE AREA.--0.19 mi².

PERIOD OF RECORD.--May 1945 to current year. Prior to October 1960 published in WSP 1932.

GAGE.--Water-stage recorder and wooden control. Elevation of gage is 1,040 ft, from topographic map.

REMARKS.--Records good. No regulation or diversion upstream from station. Flow is mostly seepage from Chester Morse Lake.

AVERAGE DISCHARGE.--39 years, 15.5 ft³/s, 11,230 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 131 ft³/s Dec. 7, 1975, gage height, 2.22 ft; minimum, 0.3 ft³/s for many days during 1953-55, 1958 and 1961 water years, Oct. 28, 29, 1966, Nov. 27, 1970.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 31 ft³/s May 19 to June 5, maximum gage height, 1.36 ft May 19-26; minimum, 2.1 ft³/s Nov. 10-12, gage height, 0.80 ft.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	6.4	2.6	14	6.4	20	8.7	9.2	13	31	27	22	11
2	6.1	2.6	14	6.4	20	8.7	9.2	14	31	27	22	11
3	6.1	3.2	14	6.7	20	8.7	9.7	14	31	27	22	10
4	5.8	2.8	14	6.7	20	8.7	9.7	14	31	27	21	9.9
5	5.8	2.6	13	6.4	19	8.3	9.7	15	30	27	21	9.7
6	5.5	2.5	13	6.1	18	8.3	10	15	29	28	20	9.7
7	5.5	2.5	13	6.1	17	8.3	10	16	28	28	20	9.2
8	5.2	2.3	13	7.1	16	8.3	10	18	28	28	20	9.2
9	5.2	2.3	13	9.2	15	8.3	10	20	27	28	19	8.7
10	4.9	2.1	13	11	15	8.3	11	21	27	28	19	8.7
11	4.9	2.1	12	13	14	8.3	11	22	27	28	18	8.6
12	4.6	2.1	12	14	14	8.3	11	23	27	28	18	8.3
13	4.6	2.3	12	15	13	8.3	11	24	27	28	18	8.1
14	4.3	2.5	12	15	13	8.3	11	24	27	28	17	7.9
15	4.3	2.6	11	16	12	8.3	11	26	27	27	17	7.9
16	4.1	2.8	11	17	12	8.3	12	27	26	27	16	7.5
17	4.1	3.0	11	17	12	8.3	12	28	26	27	16	7.5
18	3.9	3.0	10	17	11	8.3	12	30	26	27	15	7.3
19	3.9	3.2	10	16	11	8.3	12	31	26	27	15	7.1
20	3.6	3.9	10	16	11	8.3	12	31	26	27	14	7.1
21	3.6	4.3	9.7	16	10	8.3	12	31	26	27	14	7.0
22	3.4	4.9	9.7	15	10	8.3	13	31	26	27	14	6.7
23	3.4	5.8	9.2	14	10	8.3	13	31	26	27	14	6.7
24	3.4	7.1	9.2	16	10	8.3	13	31	26	26	13	6.6
25	3.2	8.3	8.7	16	9.7	8.7	13	31	27	26	13	6.4
26	3.2	9.7	8.3	14	9.2	8.7	13	31	27	25	13	6.4
27	3.0	11	7.9	15	9.2	8.7	13	31	27	24	13	6.1
28	3.0	12	7.5	16	9.2	8.7	13	31	27	24	12	6.1
29	3.0	13	7.1	17	9.2	9.2	13	31	27	24	12	6.0
30	2.8	13	6.7	18	---	9.2	13	31	27	24	11	5.8
31	2.8	---	6.4	20	---	9.2	---	31	---	23	11	---
TOTAL	133.6	142.1	335.4	405.1	389.5	263.2	342.5	767	824	826	510	238.2
MEAN	4.31	4.74	10.8	13.1	13.4	8.49	11.4	24.7	27.5	26.6	16.5	7.94
MAX	6.4	13	14	20	20	9.2	13	31	31	28	22	11
MIN	2.8	2.1	6.4	6.1	9.2	8.3	9.2	13	26	23	11	5.8
AC-FT	265	282	665	804	773	522	679	1520	1630	1640	1010	472
CAL YR 1983	TOTAL	4075.8	MEAN	11.2	MAX	32	MIN	2.1	AC-FT	8080		
WTR YR 1984	TOTAL	5176.6	MEAN	14.1	MAX	31	MIN	2.1	AC-FT	10270		

LAKE WASHINGTON BASIN

12116500 CEDAR RIVER AT CEDAR FALLS, WA

LOCATION.--Lat 47°25'02", long 121°47'27", in SW¼SE¼ sec.4, T.22 N., R.8 E., King County, Hydrologic Unit 17110012, Snoqualmie National Forest, on right bank 0.5 mi downstream from Seattle municipal powerplant at town of Cedar Falls, 4.0 mi downstream from Chester Morse Lake, and at mile 33.2.

DRAINAGE AREA.--84.2 mi².

PERIOD OF RECORD.--April 1914 to current year.

REVISED RECORDS.--WSP 722: 1930. WSP 1286: 1934(M), drainage area.

GAGE.--Water-stage recorder. Datum of gage is 902.1 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--Records good except those for period of no gage-height record Dec. 23-31, which are poor. All artificially diverted water returned to river upstream from station. Flow regulated by Chester Morse Lake (station 12115900) and Cedar Lake (station 12116060).

AVERAGE DISCHARGE.--70 years, 322 ft³/s, 233,300 acre-ft/yr, unadjusted.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 6,860 ft³/s Dec. 3, 1975, gage height, 11.68 ft; no flow for part of Nov. 25, 1917, Aug. 18, 1923; minimum daily, 0.5 ft³/s Oct. 6, 1958.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 2,190 ft³/s Jan. 25, gage height, 8.58 ft; minimum, 35 ft³/s Dec. 31, gage height, 4.84 ft; minimum daily, 51 ft³/s Sept. 16.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	159	220	710	100	704	122	118	65	738	303	82	59
2	156	224	710	135	740	122	113	76	731	273	80	59
3	156	320	704	251	734	120	104	86	729	142	82	57
4	159	280	704	794	728	113	146	82	688	123	83	57
5	159	245	704	806	728	105	94	80	497	190	85	58
6	159	260	704	845	728	98	94	80	491	127	83	60
7	159	250	704	904	728	96	108	81	565	117	81	60
8	162	240	698	917	722	91	106	203	552	103	76	58
9	165	262	704	884	722	79	340	580	587	76	75	58
10	168	234	619	839	722	96	576	542	712	61	77	58
11	171	273	214	813	728	138	291	549	567	63	77	60
12	183	269	303	770	734	383	151	653	506	62	78	60
13	168	269	265	758	740	515	156	732	434	62	79	58
14	168	356	344	752	734	398	206	752	454	64	77	53
15	168	413	455	746	728	465	302	758	387	62	79	52
16	168	422	608	746	570	358	538	751	295	61	79	51
17	220	418	608	746	352	391	718	738	276	61	79	58
18	220	408	130	746	211	399	586	705	203	65	79	62
19	220	400	431	740	207	403	126	737	235	64	79	60
20	220	413	427	740	204	441	239	739	112	63	78	60
21	217	400	422	740	295	709	319	736	383	65	77	58
22	224	468	431	740	340	732	448	737	413	68	78	59
23	220	619	320	752	204	729	198	742	300	66	77	60
24	220	716	240	972	177	725	78	738	300	65	76	59
25	220	710	150	1970	186	722	77	736	537	61	73	120
26	220	710	87	2130	183	720	77	752	425	59	71	120
27	220	716	116	1890	144	716	73	747	379	59	75	117
28	220	716	116	1720	186	716	63	739	337	62	74	111
29	220	716	168	1570	156	713	62	739	240	60	71	128
30	217	710	149	1190	---	411	63	755	196	57	65	140
31	220	---	108	794	---	121	---	751	---	83	60	---
TOTAL	5926	12657	13053	28500	14335	11947	6570	17161	13269	2847	2385	2130
MEAN	191	422	421	919	494	385	219	554	442	91.8	76.9	71.0
MAX	224	716	710	2130	740	732	718	758	738	303	85	140
MIN	156	220	87	100	144	79	62	65	112	57	60	51
AC-FT	11750	25110	25890	56530	28430	23700	13030	34040	26320	5650	4730	4220
CAL YR 1983	TOTAL	106824	MEAN	293	MAX	1580	MIN	44	AC-FT	211900		
WTR YR 1984	TOTAL	130780	MEAN	357	MAX	2130	MIN	51	AC-FT	259400		

LAKE WASHINGTON BASIN

145

12117000 TAYLOR CREEK NEAR SELLECK, WA

LOCATION.--Lat 47°23'12", long 121°50'42", in NW¼NW¼ sec.19, T.22 N., R.8 E., King County, Hydrologic Unit 17110012, Snoqualmie National Forest, on left bank 0.6 mi upstream from mouth, and 1.3 mi northeast of Selleck.

DRAINAGE AREA.--17.2 mi².

PERIOD OF RECORD.--June to October 1945, August 1956 to current year.

REVISED RECORDS.--WSP 1932: Drainage area.

GAGE.--Water-stage recorder. Elevation of gage is 940 ft, from topographic map. June to October 1945 on right bank 350 ft downstream at different datum.

REMARKS.--Records good except those for Jan.3-31, which are fair. No regulation or diversion upstream from station.

AVERAGE DISCHARGE.--28 years, 100 ft³/s, 78.95 in/yr, 72,450 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 2,730 ft³/s Jan. 29, 1965, gage height, 5.78 ft from rating curve extended above 1,100 ft³/s on basis of slope-area measurement of peak flow; minimum, 15 ft³/s Oct. 3, 4, 7-14, 1979.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 450 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Jan. 4	0600	704	4.13	Jan. 24	2100	*1,690	*5.09

Minimum discharge, 21 ft³/s Sept. 29, 30.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP		
1	34	41	106	83	152	102	102	94	98	70	35	28		
2	33	55	100	166	136	100	106	140	93	67	35	26		
3	33	298	91	453	129	94	102	142	89	64	35	25		
4	40	221	84	622	117	89	96	127	95	61	34	25		
5	34	147	81	513	113	86	100	130	109	60	34	28		
6	33	187	77	319	111	86	106	137	98	57	34	29		
7	32	154	75	233	109	84	131	127	96	56	33	26		
8	31	115	84	192	102	84	127	125	101	54	32	31		
9	30	104	96	168	102	84	127	128	97	53	32	26		
10	30	106	140	171	102	86	140	127	92	52	31	26		
11	29	102	129	201	115	84	134	137	87	50	31	28		
12	29	89	123	168	187	121	138	145	84	50	32	27		
13	28	93	181	145	171	107	127	136	80	49	32	25		
14	32	206	209	125	142	100	129	143	77	47	31	24		
15	30	252	184	117	131	100	140	148	74	46	30	24		
16	28	295	149	106	119	91	127	135	74	45	29	24		
17	33	258	123	98	111	89	115	123	70	44	29	23		
18	30	224	109	93	106	93	107	113	68	44	29	23		
19	31	181	100	87	102	98	104	129	66	43	28	23		
20	34	242	87	83	107	142	98	125	69	43	28	23		
21	31	181	75	91	113	184	98	114	121	42	28	23		
22	61	147	68	129	106	166	93	122	91	41	27	30		
23	41	129	61	187	104	168	91	144	80	40	27	25		
24	35	187	60	841	104	147	86	126	75	40	27	26		
25	33	149	60	873	104	142	83	118	71	39	27	23		
26	32	134	60	397	96	149	80	192	73	39	26	22		
27	33	154	64	291	94	131	77	163	69	38	34	22		
28	31	149	64	233	102	134	77	139	66	38	30	22		
29	30	131	73	201	98	125	77	124	86	38	27	21		
30	34	117	111	176	---	115	80	113	77	37	26	21		
31	49	---	96	161	---	107	---	105	---	36	27	---		
TOTAL	1044	4848	3120	7723	3385	3488	3198	4071	2526	1483	940	749		
MEAN	33.7	162	101	249	117	113	107	131	84.2	47.8	30.3	25.0		
MAX	61	298	209	873	187	184	140	192	121	70	35	31		
MIN	28	41	60	83	94	84	77	94	66	36	26	21		
CFSM	1.96	9.42	5.87	14.5	6.80	6.57	6.22	7.62	4.90	2.78	1.76	1.45		
IN.	2.26	10.49	6.75	16.70	7.32	7.54	6.92	8.80	5.46	3.21	2.03	1.62		
AC-FT	2070	9620	6190	15320	6710	6920	6340	8070	5010	2940	1860	1490		
CAL YR 1983	TOTAL	31981	MEAN	87.6	MAX	652	MIN	28	CFSM	5.09	IN.	69.17	AC-FT	63430
WTR YR 1984	TOTAL	36575	MEAN	99.9	MAX	873	MIN	21	CFSM	5.81	IN.	79.10	AC-FT	72550

LAKE WASHINGTON BASIN

12117500 CEDAR RIVER NEAR LANDSBURG, WA

LOCATION.--Lat 47°23'38", long 121°57'12", on west line NW¼SW¼ sec.17, T.22 N., R.7 E., King County, Hydrologic Unit 17110012, on left bank 1.8 mi upstream from intake of Seattle water-supply system near Landsburg, 4.0 mi east of Maple Valley, 5.9 mi downstream from Taylor Creek, and at mile 23.4.

DRAINAGE AREA.--121 mi², excludes Walsh Lake diversion which enters Cedar River at mile 19.5, and excludes 1.9 mi² of Walsh Lake drainage in Cedar River basin which is normally diverted into Issaquah Creek.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--July 1895 to current year (prior to October 1948, flow of Rock Creek Included). Monthly discharge only for some periods, published in WSP 1316. Published as "near Seattle" 1895-98, "near Maple Valley" 1902, and as "near Ravensdale" 1898-1901, 1903-12.

REVISED RECORDS.--WSP 313: 1895-98, 1902-09. WSP 1286: 1912. WSP 1316: 1896-98(M), 1902-11(M). WSP 1736: 1960. WSP 1932: 1947, drainage area.

GAGE.--Water-stage recorder. Datum of gage is 565.9 ft above National Geodetic Vertical Datum of 1929. Prior to Oct. 1, 1898, nonrecording gage at site 2.2 mi downstream at different datum. Mar. 24, 1901, to May 15, 1913, nonrecording gage at site 2 mi downstream at datum 535.84 ft above National Geodetic Vertical Datum of 1929 (levels by city of Seattle). Apr. 30, 1914, to Oct. 22, 1928, water-stage recorder 0.2 mi downstream at different datum.

REMARKS.--Water-discharge records good. All diversions except Rock Creek returned to river upstream from station. Rock Creek, a tributary which entered naturally just upstream from station prior to 1932, is diverted during summer months to enter river at a point about 3.9 mi downstream from station. Some regulation by Chester Morse Lake (station 12115900) and Cedar Lake (station 12116060), 12.2 mi upstream.

AVERAGE DISCHARGE.--89 years, 696 ft³/s, 504,300 acre-ft/yr, unadjusted.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 14,200 ft³/s Nov. 19, 1911, gage height, 10.0 ft, from graph based on gage readings, site and datum then in use, by computation of peak flow over dam, peak caused by failure of flashboards at Chester Morse Lake; minimum observed, 83 ft³/s Sept. 19, 1898.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 3,990 ft³/s Jan. 25, gage height, 5.38 ft; minimum, 279 ft³/s Sept. 16, 17, gage height, 1.09 ft.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	443	507	1140	501	1290	560	554	457	1150	596	352	312
2	434	538	1130	664	1300	548	554	548	1140	631	348	310
3	434	920	1120	1120	1270	538	533	577	1130	507	349	305
4	447	831	1100	1770	1250	517	554	538	1120	453	350	304
5	438	689	1090	1730	1230	512	523	543	934	511	351	307
6	434	714	1090	1530	1230	496	533	548	920	447	352	312
7	429	670	1090	1500	1210	491	593	533	927	437	347	309
8	429	622	1100	1460	1200	482	582	610	990	417	342	312
9	429	683	1130	1400	1200	467	733	976	962	397	340	305
10	434	646	1210	1350	1190	482	1120	990	1120	374	339	305
11	434	677	746	1360	1220	507	844	1010	990	372	339	307
12	443	652	753	1290	1330	759	670	1070	892	371	340	308
13	429	652	804	1260	1320	927	646	1180	811	365	342	304
14	434	844	920	1230	1260	811	677	1210	817	366	338	296
15	434	1020	990	1210	1250	864	778	1230	740	360	338	290
16	429	1120	1090	1190	1100	765	955	1220	664	356	338	289
17	477	1070	1120	1180	851	778	1170	1190	640	354	337	290
18	482	1000	622	1170	677	798	1070	1130	548	353	337	298
19	482	927	844	1160	658	811	616	1190	560	353	335	295
20	486	1050	871	1150	670	920	628	1190	496	348	334	294
21	477	962	811	1170	772	1240	702	1170	804	349	333	295
22	533	927	824	1230	811	1260	871	1190	851	351	333	308
23	496	1090	702	1280	695	1260	652	1240	664	347	331	300
24	491	1260	620	2210	640	1230	482	1200	658	346	333	298
25	482	1210	530	3510	652	1230	467	1190	857	338	331	331
26	482	1190	467	3000	628	1230	457	1300	798	339	331	343
27	482	1220	501	2660	582	1200	447	1260	727	335	343	341
28	477	1210	501	2420	616	1220	438	1220	683	338	333	334
29	477	1190	560	2230	593	1200	438	1190	635	336	323	341
30	486	1160	577	1870	---	955	443	1190	554	331	318	355
31	538	---	523	1400	---	577	---	1180	---	346	312	---
TOTAL	14302	27251	26576	48205	28695	25635	19730	31270	24782	12124	10469	9298
MEAN	461	908	857	1555	989	827	658	1009	826	391	338	310
MAX	538	1260	1210	3510	1330	1260	1170	1300	1150	631	352	355
MIN	429	507	467	501	582	467	438	457	496	331	312	289
AC-FT	28370	54050	52710	95610	56920	50850	39130	62020	49160	24050	20770	18440
CAL YR 1983	TOTAL	238410	MEAN	653	MAX	2220	MIN	339	AC-FT	472900		
WTR YR 1984	TOTAL	278337	MEAN	760	MAX	3510	MIN	289	AC-FT	552100		

12117500 CEDAR RIVER NEAR LANDSBURG, WA--Continued

WATER-QUALITY RECORDS

PERIOD OF DAILY RECORD.--

WATER TEMPERATURES: August 1953 to current year.

INSTRUMENTATION.--Temperature recorder since August 1953.

REMARKS.--Interruptions in the record were due to malfunctions of the instrument.

EXTREMES FOR PERIOD OF DAILY RECORD.--

WATER TEMPERATURES: Maximum, 19.5°C July 27, 28, 1960, July 13, 1961; minimum, 1.0°C Dec. 31, 1978.

EXTREMES FOR CURRENT YEAR.--

WATER TEMPERATURES: Maximum recorded for period Feb. 28 to July 4, 14.0°C June 23, 25, 27, July 2, 4; minimum recorded, 5.5°C Mar. 30.

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
FEBRUARY			MARCH			APRIL			MAY			
1	---	---	---	7.5	7.0	7.0	8.0	7.0	7.5	9.0	8.5	8.5
2	---	---	---	7.5	6.5	7.0	8.5	7.5	8.0	9.0	8.0	8.5
3	---	---	---	7.5	6.0	6.5	8.0	7.0	7.5	8.5	7.5	8.0
4	---	---	---	7.5	6.0	6.5	8.5	7.0	8.0	8.5	7.0	8.0
5	---	---	---	8.0	6.0	7.0	8.5	7.5	8.0	8.5	7.5	8.0
6	---	---	---	8.0	6.5	7.5	8.5	6.5	7.5	9.0	7.5	8.0
7	---	---	---	8.5	7.0	7.5	7.5	7.0	7.5	10.5	7.5	9.0
8	---	---	---	8.5	7.5	8.0	8.5	7.0	7.5	9.5	8.5	9.0
9	---	---	---	8.5	7.5	8.0	7.5	6.5	7.0	9.0	8.0	8.5
10	---	---	---	8.5	7.5	8.0	7.0	6.5	6.5	9.0	8.0	8.5
11	---	---	---	8.0	7.5	7.5	7.5	6.5	7.0	9.0	8.0	8.5
12	---	---	---	7.5	6.0	7.0	7.5	7.0	7.5	10.0	8.0	9.0
13	---	---	---	6.5	6.0	6.0	9.0	7.0	7.5	9.0	8.5	9.0
14	---	---	---	7.0	6.0	6.5	10.5	7.5	9.0	9.0	8.5	8.5
15	---	---	---	7.0	6.0	6.5	9.0	8.0	8.5	9.0	8.0	8.5
16	---	---	---	7.0	6.0	6.5	8.0	7.5	8.0	9.5	8.0	8.5
17	---	---	---	7.0	6.5	6.5	8.5	7.0	7.5	9.5	8.0	8.5
18	---	---	---	7.0	6.5	6.5	8.5	7.0	7.5	9.5	8.5	9.0
19	---	---	---	7.0	6.5	7.0	9.0	7.5	8.5	9.0	9.0	9.0
20	---	---	---	7.5	6.5	7.0	9.0	8.0	8.5	9.5	8.5	9.0
21	---	---	---	6.5	6.0	6.5	8.5	8.0	8.0	10.0	8.5	9.0
22	---	---	---	7.0	6.0	6.5	8.5	7.5	8.0	9.0	8.5	9.0
23	---	---	---	7.0	6.0	6.5	8.5	7.5	8.0	10.0	9.0	9.0
24	---	---	---	6.5	6.0	6.5	9.0	7.5	8.0	9.5	8.5	9.0
25	---	---	---	6.0	6.0	6.0	8.5	7.0	8.0	9.0	8.5	9.0
26	---	---	---	6.5	6.0	6.5	10.0	7.0	8.5	9.0	9.0	9.0
27	---	---	---	7.0	6.0	6.5	10.5	7.5	9.0	11.0	8.5	9.5
28	7.0	6.5	6.5	6.5	6.0	6.5	9.0	7.5	8.5	11.5	9.0	10.0
29	7.5	6.0	6.5	6.5	6.0	6.0	9.5	8.0	8.5	11.5	9.5	10.0
30	---	---	---	8.5	5.5	7.0	9.0	8.0	8.5	10.0	9.0	9.5
31	---	---	---	9.5	7.0	8.0	---	---	---	10.0	9.0	9.5
MONTH	---	---	---	9.5	5.5	7.0	10.5	6.5	8.0	11.5	7.0	9.0
DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
JUNE			JULY			AUGUST			SEPTEMBER			
1	10.5	8.5	9.5	12.5	11.0	11.5						
2	10.0	9.0	9.5	14.0	11.0	12.5						
3	10.0	9.5	9.5	13.5	11.0	12.0						
4	10.0	9.5	9.5	14.0	11.0	12.0						
5	10.5	9.5	9.5	---	---	11.5						
6	11.0	9.0	10.0	---	---	---						
7	10.0	9.5	9.5	---	---	---						
8	10.0	9.0	9.5	---	---	---						
9	10.0	9.5	9.5	---	---	---						
10	10.5	9.5	10.0	---	---	---						
11	10.5	9.0	10.0	---	---	---						
12	11.5	9.5	10.5	---	---	---						
13	11.5	10.0	10.5	---	---	---						
14	12.0	10.0	11.0	---	---	---						
15	10.5	10.0	10.5	---	---	---						
16	10.5	10.0	10.0	---	---	---						
17	12.5	9.5	11.0	---	---	---						
18	13.0	9.5	11.0	---	---	---						
19	13.0	9.5	11.0	---	---	---						
20	10.5	10.0	10.0	---	---	---						
21	11.0	9.5	10.0	---	---	---						
22	13.0	10.5	11.5	---	---	---						
23	14.0	10.5	12.0	---	---	---						
24	13.5	11.0	12.0	---	---	---						
25	14.0	11.0	12.5	---	---	---						
26	12.0	11.5	12.0	---	---	---						
27	14.0	11.5	12.5	---	---	---						
28	12.5	12.0	12.0	---	---	---						
29	12.0	11.0	11.5	---	---	---						
30	13.0	10.5	11.5	---	---	---						
31	---	---	---	---	---	---						
MONTH	14.0	8.5	10.5	---	---	---						

LAKE WASHINGTON BASIN

12119000 CEDAR RIVER AT RENTON, WA

LOCATION.--Lat 47°28'58", long 122°12'08", in SW¼NW¼ sec.17, T.23 N., R.5 E., King County, Hydrologic Unit 17110012, on left bank 125 ft downstream from bridge on Mill Avenue at Renton, and at mile 1.6.

DRAINAGE AREA.--184 mi², includes 3.67 mi² in vicinity of Youngs Lake in Big Soos Creek basin, excludes 1.9 mi² from upper Rock Creek, Cedar River basin, normally diverted into Issaquah Creek.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--March 1901 to July 1903 (fragmentary), September 1906 to December 1907 (monthly discharge only), August 1945 to current year.

REVISED RECORD.--WSP 1316: 1901-02. WSP 1932: Drainage area. WDR WA-75-1: 1972-74.

GAGE.--Water-stage recorder. Datum of gage is 15.20 ft above National Geodetic Vertical Datum of 1929. Prior to Jan. 1, 1908, nonrecording gages within 1 mi of present site, at datum 10.67 ft above National Vertical Datum of 1929. Aug. 7, 1945, to Aug. 15, 1947, water-stage recorder at site 700 ft upstream at datum 20.13 ft above National Geodetic Vertical Datum of 1929, and Aug. 16, 1947, to Dec. 7, 1950, at datum 19.13 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--Records good. Flow partly regulated by Chester Morse Lake and Masonry Dam for operation of powerplant at Cedar Falls 32.1 mi upstream from gage. An average daily discharge of about 167 ft³/s was diverted during the year at Landsburg by the city of Seattle for municipal use.

AVERAGE DISCHARGE.--39 years (water years 1946-84), 689 ft³/s, 499,200 acre-ft/yr, unadjusted.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 8,800 ft³/s Dec. 4, 1975, gage height, 14.14 ft from outside high-water mark; minimum daily, 30 ft³/s July 1, 1962.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 5,540 ft³/s Jan. 25, gage height, 12.63 ft; minimum, 121 ft³/s Aug. 17, gage height, 7.26 ft.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	385	366	882	395	1380	586	580	410	1140	415	132	145
2	390	395	868	592	1280	580	556	622	1120	510	127	145
3	390	812	868	1200	1210	568	515	670	1100	430	129	147
4	395	959	847	2080	1110	544	445	544	1140	338	131	205
5	362	777	847	2330	1090	526	450	465	917	350	135	190
6	379	763	826	1880	1100	510	400	470	798	314	142	196
7	380	728	819	1760	1070	495	465	450	777	290	135	178
8	375	652	868	1690	1080	490	475	465	903	276	129	193
9	366	694	959	1540	1160	480	470	742	882	255	127	190
10	362	646	1310	1370	1170	480	1110	938	1070	214	127	190
11	358	598	910	1400	1230	495	847	1040	938	199	127	187
12	362	574	700	1250	1420	682	586	1040	861	193	129	188
13	354	580	798	1180	1490	988	574	1200	784	190	133	195
14	358	756	861	1040	1330	917	670	1240	676	184	131	191
15	354	980	931	1000	1290	931	728	1280	592	184	125	184
16	350	1130	945	980	1200	854	812	1250	544	175	125	185
17	358	1120	1010	959	868	840	1110	1190	495	152	123	180
18	334	1000	694	945	670	847	1200	1090	435	147	147	187
19	350	924	610	924	628	988	682	1270	400	147	147	185
20	362	1130	756	917	670	910	520	1280	415	138	147	191
21	350	1000	664	959	791	1420	592	1200	688	140	142	191
22	385	889	670	1060	854	1460	742	1180	903	202	133	210
23	370	973	604	1100	784	1960	634	1250	580	157	133	203
24	358	1130	505	2320	714	1740	415	1160	538	155	133	192
25	354	1070	435	5060	721	1890	395	1160	664	149	129	194
26	350	973	380	3980	676	1380	390	1350	634	149	129	196
27	350	1000	395	3500	622	1340	370	1320	556	145	129	195
28	350	1020	390	3010	640	1370	338	1250	526	144	140	193
29	346	938	480	2830	634	1350	334	1210	520	147	131	193
30	358	910	616	2410	---	1210	362	1190	445	144	152	192
31	415	---	480	1530	---	646	---	1170	---	138	147	---
TOTAL	11310	25487	22928	53191	28882	29477	17767	31096	22041	6771	4146	5611
MEAN	365	850	740	1716	996	951	592	1003	735	218	134	187
MAX	415	1130	1310	5060	1490	1960	1200	1350	1140	510	152	210
MIN	334	366	380	395	622	480	334	410	400	138	123	145
AC-FT	22430	50550	45480	105500	57290	58470	35240	61680	43720	13430	8220	11130
CAL YR 1983	TOTAL	216843	MEAN	594	MAX	2900	MIN	155	AC-FT	430100		
WTR YR 1984	TOTAL	258707	MEAN	707	MAX	5060	MIN	123	AC-FT	513100		

LAKE WASHINGTON BASIN

12119000 CEDAR RIVER AT RENTON, WA--Continued

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984

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

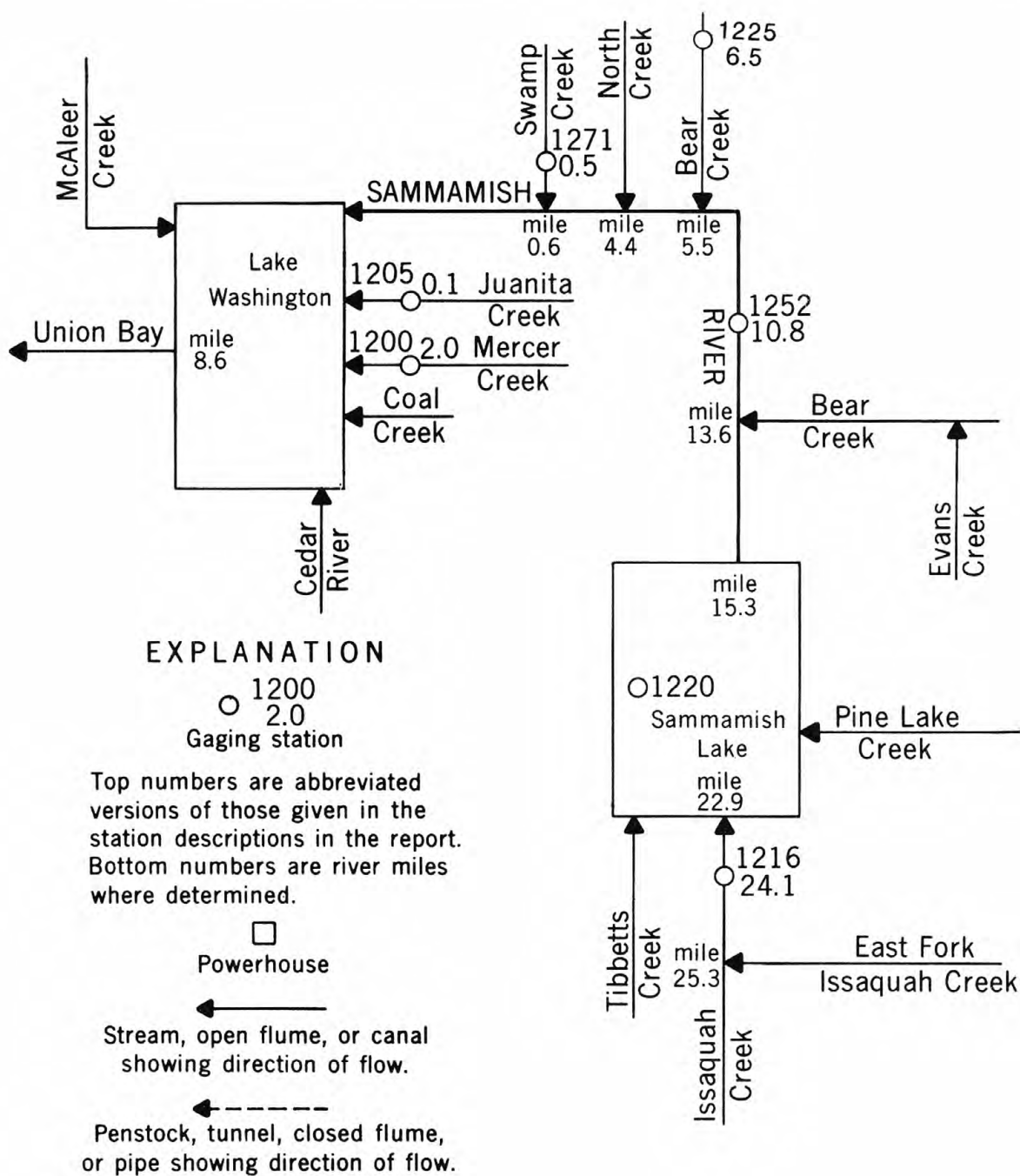


Figure 14.--Gaging stations in Lake Washington basin (below Cedar River).

LAKE WASHINGTON BASIN

12120000 MERCER CREEK NEAR BELLEVUE, WA

LOCATION.--Lat 47°36'11", long 122°10'47", in NW¼NW¼ sec.4, T.24 N., R.5 E., King County, Hydrologic Unit 17110012, on left bank 40 ft upstream from Burlington Northern Railroad trestle, 1.2 mi southeast of Bellevue, and 2.0 mi upstream from mouth.

DRAINAGE AREA.--12.0 mi².

PERIOD OF RECORD.--June to October 1945, June 1955 to current year.

REVISED RECORDS.--WSP 1446: Drainage area. WDR WA-83-1: 1977-79(P).

GAGE.--Water-stage recorder. Datum of gage is 17.11 ft above National Geodetic Vertical Datum of 1929 (levels by Municipality of Metropolitan Seattle engineers). Prior to June 5, 1959, at site 600 ft downstream at different datums.

REMARKS.--Records good. Natural flow affected by urbanization and construction of flood-control catchments.

AVERAGE DISCHARGE.--29 years, 22.7 ft³/s, 25.69 in/yr, 16,450 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 670 ft³/s Oct. 6, 1981, gage height, 5.58 ft; maximum gage height, 8.68 ft Mar. 6, 1972 caused by backwater from plugged culvert; minimum discharge, 1.9 ft³/s Aug. 6, 1958.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 250 ft³/s (revised) and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Nov. 20	0545	*404	*4.34	Dec. 10	0645	300	3.69
Nov. 24	0830	278	3.54				

Minimum discharge, 6.6 ft³/s Sept. 4, gage height, 0.18 ft.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP		
1	9.7	36	17	23	15	26	16	44	11	9.5	7.7	7.6		
2	9.4	55	26	115	15	27	16	33	11	9.7	8.0	7.0		
3	9.7	163	22	104	15	19	18	22	11	9.2	7.9	7.2		
4	11	69	17	58	15	17	16	15	36	9.0	7.8	7.1		
5	9.7	33	50	46	15	17	30	22	33	9.0	11	22		
6	9.4	50	26	33	15	16	29	18	17	8.8	9.3	14		
7	9.4	33	35	27	16	16	55	14	36	8.5	8.3	8.6		
8	9.4	18	110	25	30	15	26	20	63	8.4	7.9	8.3		
9	9.2	28	119	22	42	15	47	17	18	8.5	7.9	8.4		
10	9.0	38	186	25	20	19	48	14	14	8.3	7.6	8.1		
11	9.2	34	58	29	53	21	25	39	12	8.4	7.9	7.9		
12	9.2	23	60	21	58	45	33	16	12	8.8	7.9	7.7		
13	9.4	27	60	19	36	25	21	19	11	8.6	7.8	7.6		
14	9.4	60	34	18	24	26	19	16	10	8.1	7.6	7.5		
15	11	128	27	16	36	35	17	15	10	7.9	7.6	7.4		
16	9.2	105	24	15	21	22	17	14	10	7.9	7.6	7.4		
17	17	86	20	15	19	21	15	12	9.6	8.2	7.5	7.4		
18	10	41	19	15	18	19	17	12	9.2	8.0	7.5	7.4		
19	21	57	19	14	17	28	15	38	9.0	7.9	8.2	7.6		
20	16	289	17	14	70	83	14	17	33	8.0	7.4	12		
21	13	70	16	17	44	59	14	13	80	8.0	7.4	9.1		
22	20	31	15	38	37	26	14	41	17	7.6	7.4	30		
23	10	30	15	23	38	40	17	29	13	7.5	7.4	11		
24	10	153	15	65	54	26	14	16	11	7.8	7.5	8.4		
25	9.9	40	19	77	33	52	14	16	10	8.0	7.3	8.0		
26	9.7	28	24	27	24	29	13	24	14	7.9	7.2	7.7		
27	13	28	17	22	21	22	13	15	11	7.7	10	7.7		
28	10	23	15	19	28	34	13	13	10	7.7	8.4	7.6		
29	9.7	20	70	19	23	24	13	12	17	7.6	7.6	7.5		
30	24	19	68	17	---	19	26	12	10	7.5	7.5	7.5		
31	16	---	28	16	---	17	---	12	---	7.5	7.6	---		
TOTAL	362.6	1815	1248	994	852	860	645	620	568.8	255.5	245.7	282.7		
MEAN	11.7	60.5	40.3	32.1	29.4	27.7	21.5	20.0	19.0	8.24	7.93	9.42		
MAX	24	289	186	115	70	83	55	44	80	9.7	11	30		
MIN	9.0	18	15	14	15	15	13	12	9.0	7.5	7.2	7.0		
CFSM	.97	5.04	3.36	2.67	2.45	2.31	1.79	1.67	1.58	.69	.66	.78		
IN.	1.12	5.63	3.87	3.08	2.64	2.67	2.00	1.92	1.76	.79	.76	.88		
AC-FT	719	3600	2480	1970	1690	1710	1280	1230	1130	507	487	561		
CAL YR 1983	TOTAL	9667.2	MEAN	26.5	MAX	289	MIN	8.0	CFSM	2.21	IN.	29.97	AC-FT	19170
WTR YR 1984	TOTAL	8749.3	MEAN	23.9	MAX	289	MIN	7.0	CFSM	1.99	IN.	27.12	AC-FT	17350

LAKE WASHINGTON BASIN

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12120500 JUANITA CREEK NEAR KIRKLAND, WA

LOCATION.--Lat 47°42'20", long 122°12'56", in SW¼SE¼ sec.30, T.26 N., R.5 E., King County, Hydrologic Unit 17110012, on right bank 0.1 mi upstream from mouth and Lake Washington, and 1.7 mi north of Kirkland.

DRAINAGE AREA.--6.69 mi². Prior to May 3, 1972, 6.43 mi².

PERIOD OF RECORD.--June to October 1945, September 1963 to June 1973, October 1973 to April 1974, October 1974 to current year.

REVISED RECORDS.--WSP 1932: Drainage area.

GAGE.--Water-stage recorder. Elevation of gage is 20 ft, from topographic map. Prior to Oct. 2, 1945, water-stage recorder at site 1,500 ft upstream at different datum. Sept. 1, 1963, to May 2, 1972, water-stage recorder and concrete control at site 1,000 ft upstream at different datum. May 3, 1972, to Oct. 27, 1972, nonrecording gage at present site and different datum.

REMARKS.--Records poor due to debris and backwater conditions at the control. Retention ponds in basin may cause minor regulation. Probably several small diversions upstream from station for domestic use.

AVERAGE DISCHARGE.--19 years (water years 1964-72, 1975-84), 11.3 ft³/s, 22.94 in/yr, 8,190 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 326 ft³/s Oct. 6, 1981; maximum gage height, 6.75 ft Dec. 3, 1982, backwater from debris; minimum discharge, 0.58 ft³/s Sept. 13, 1967.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 243 ft³/s Nov. 20, gage height, 4.54 ft; minimum daily discharge, 3.2 ft³/s Sept. 30.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP		
1	3.7	17	13	12	7.2	12	9.2	29	5.2	4.5	4.0	3.4		
2	3.4	26	17	47	6.8	11	8.5	15	5.2	4.7	3.9	3.3		
3	3.4	70	16	51	7.1	9.2	10	12	5.4	4.5	3.8	3.3		
4	6.5	31	14	32	6.7	8.5	8.8	8.1	15	4.4	3.7	3.4		
5	3.9	20	35	21	7.1	8.1	13	7.4	14	4.3	5.8	17		
6	3.9	23	22	17	6.8	7.8	13	7.8	7.8	4.2	4.8	9.0		
7	3.7	14	29	14	7.1	7.4	33	6.8	23	4.1	4.0	5.0		
8	3.7	9.9	45	13	17	7.4	24	8.5	19	4.0	3.8	4.0		
9	3.4	12	69	11	21	7.1	35	8.8	11	4.0	3.6	3.8		
10	3.4	26	88	14	10	14	27	8.1	7.7	4.0	3.6	4.2		
11	3.7	24	42	17	25	13	15	20	6.8	3.9	3.6	12		
12	3.7	15	46	13	32	20	20	8.8	6.4	4.1	3.7	7.0		
13	4.2	19	40	11	22	14	11	8.5	6.0	4.1	3.6	4.5		
14	4.2	26	25	10	13	15	9.9	11	6.4	3.9	3.5	3.8		
15	4.2	62	14	9.0	19	15	8.8	9.9	5.8	3.8	3.5	3.5		
16	3.9	56	12	8.5	12	12	8.5	8.5	5.6	3.8	3.4	3.4		
17	5.9	45	11	8.2	9.9	10	7.8	6.8	5.4	4.0	3.4	3.4		
18	4.2	22	11	7.8	9.2	8.8	8.8	7.4	5.2	3.9	3.4	3.4		
19	6.8	44	9.9	7.6	9.2	15	7.8	17	5.4	3.8	3.4	3.6		
20	5.6	129	9.2	7.4	31	41	7.1	10	38	3.8	3.4	6.0		
21	5.0	41	8.8	9.0	27	25	6.8	8.0	37	3.8	3.4	4.6		
22	11	25	7.8	19	25	15	7.1	21	10	3.7	3.4	15		
23	5.6	25	7.4	12	22	20	7.1	15	6.0	3.5	3.4	5.1		
24	5.3	99	7.4	35	26	19	6.8	8.8	4.8	3.6	3.4	4.2		
25	5.6	34	7.8	40	17	39	6.5	9.3	4.6	3.8	3.4	3.8		
26	5.0	23	9.9	13	12	19	6.2	12	6.5	3.7	3.3	3.7		
27	5.9	28	8.8	10	11	13	6.2	7.3	4.8	3.6	5.0	3.6		
28	4.7	19	8.5	9.0	14	22	5.9	6.4	4.6	3.7	3.7	3.4		
29	4.7	16	32	8.6	12	18	7.1	5.9	9.0	3.6	3.4	3.3		
30	9.9	14	32	9.0	---	12	13	5.5	5.4	3.6	3.4	3.2		
31	9.2	---	17	8.0	---	11	---	5.4	---	3.6	3.4	---		
TOTAL	157.3	1014.9	715.5	504.1	445.1	469.3	358.9	324.0	297.0	122.0	115.1	156.9		
MEAN	5.07	33.8	23.1	16.3	15.3	15.1	12.0	10.5	9.90	3.94	3.71	5.23		
MAX	11	129	88	51	32	41	35	29	38	4.7	5.8	17		
MIN	3.4	9.9	7.4	7.4	6.7	7.1	5.9	5.4	4.6	3.5	3.3	3.2		
CFSM	.76	5.05	3.45	2.44	2.29	2.26	1.79	1.57	1.48	.59	.55	.78		
IN.	.87	5.64	3.98	2.80	2.47	2.61	2.00	1.80	1.65	.68	.64	.87		
AC-FT	312	2010	1420	1000	883	931	712	643	589	242	228	311		
CAL YR 1983	TOTAL	5528.6	MEAN	15.1	MAX	181	MIN	3.4	CFSM	2.26	IN.	30.74	AC-FT	10970
WTR YR 1984	TOTAL	4680.1	MEAN	12.8	MAX	129	MIN	3.2	CFSM	1.91	IN.	26.02	AC-FT	9280

NOTE.--Backwater from debris and (or) high stages on Lake Washington Jan. 4 to Feb. 1; June 22 to Aug. 7; and Sept. 5-22.

LAKE WASHINGTON BASIN

12121600 ISSAQUAH CREEK NEAR MOUTH, NEAR ISSAQUAH, WA

LOCATION.--Lat 47°33'09", long 122°02'48", in SE¼NW¼ sec.21, T.24 N., R.6 E., King County, Hydrologic Unit 17110012, on right bank 30 ft downstream from S.E. 56th Street bridge, 0.7 mi downstream from North Fork, 1.2 mi upstream from mouth, and 1.6 mi northwest of Issaquah.

DRAINAGE AREA.--56.6 mi², includes 1.9 mi² of Cedar River drainage from upper Rock Creek which normally is diverted into Issaquah Creek.

PERIOD OF RECORD.--September 1963 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 40 ft, from topographic map.

REMARKS.--Records fair except those for periods of no gage-height record May 22-30 and Aug. 18 to Sept. 30, which are poor. Many minor diversions for irrigation and domestic use upstream from station.

AVERAGE DISCHARGE.--21 years, 142 ft³/s, 34.07 in/yr, 102,900 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 2,870 ft³/s Dec. 3, 1975, gage height, 11.46 ft; maximum gage height, 11.79 ft Jan. 25, 1984; minimum, 10 ft³/s Aug. 12, 1984.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 800 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Nov. 20	1315	836	7.22	Jan. 25	0400	*2,330	*11.79
Jan. 5	0015	854	7.28				

Minimum recorded discharge, 10 ft³/s Aug. 12.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP		
1	42	82	117	125	172	160	177	113	96	76	35	36		
2	40	108	115	264	157	145	168	196	91	71	37	35		
3	38	367	121	488	145	134	156	190	90	66	37	34		
4	42	357	104	560	135	125	141	166	119	62	37	34		
5	39	210	101	668	128	120	159	143	114	59	37	35		
6	37	196	95	427	120	117	200	137	101	57	38	38		
7	37	171	97	294	113	110	260	121	97	54	33	36		
8	37	132	156	224	113	102	246	114	134	52	32	36		
9	37	124	188	180	129	98	238	113	116	51	29	35		
10	36	113	553	184	115	102	337	128	104	51	26	35		
11	35	110	468	194	156	101	310	131	98	49	40	36		
12	36	98	343	172	250	147	298	137	93	49	36	37		
13	36	108	353	153	240	151	272	120	89	47	44	36		
14	36	242	343	128	186	137	228	134	85	45	43	35		
15	37	425	288	114	177	159	198	143	79	44	42	35		
16	35	547	232	106	156	143	170	141	79	42	42	35		
17	41	488	186	97	141	139	156	127	76	41	42	34		
18	39	335	157	85	129	137	149	113	72	40	41	33		
19	40	278	141	84	125	138	138	122	68	39	40	33		
20	45	765	125	81	165	220	125	168	84	39	39	33		
21	43	530	104	86	240	360	118	131	275	39	38	34		
22	53	315	88	131	220	256	115	118	168	38	37	35		
23	48	230	75	139	218	278	117	116	123	37	37	38		
24	44	363	70	703	258	310	110	115	102	35	37	34		
25	41	254	81	1670	232	305	104	128	93	34	35	34		
26	40	194	80	703	204	296	103	143	94	34	35	34		
27	43	188	74	468	186	248	98	138	90	33	36	34		
28	42	172	67	350	170	262	95	127	80	33	37	34		
29	40	153	122	280	159	260	98	121	98	33	37	34		
30	49	132	202	232	---	230	106	109	89	34	36	34		
31	106	---	147	196	---	200	---	102	---	35	36	---		
TOTAL	1314	7787	5393	9586	4939	5690	5190	4105	3097	1419	1151	1046		
MEAN	42.4	260	174	309	170	184	173	132	103	45.8	37.1	34.9		
MAX	106	765	553	1670	258	360	337	196	275	76	44	38		
MIN	35	82	67	81	113	98	95	102	68	33	26	33		
CFSM	.75	4.59	3.07	5.46	3.00	3.25	3.06	2.33	1.82	.81	.66	.62		
IN.	.86	5.12	3.54	6.30	3.25	3.74	3.41	2.70	2.04	.93	.76	.69		
AC-FT	2610	15450	10700	19010	9800	11290	10290	8140	6140	2810	2280	2070		
CAL YR 1983	TOTAL	49891	MEAN	137	MAX	1740	MIN	30	CFSM	2.42	IN.	32.79	AC-FT	98960
WTR YR 1984	TOTAL	50717	MEAN	139	MAX	1670	MIN	26	CFSM	2.46	IN.	33.33	AC-FT	100600

LAKE WASHINGTON BASIN

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12122000 SAMMAMISH LAKE NEAR REDMOND, WA

LOCATION.--Lat 47°34'47", long 122°06'38", in NE¼SW¼ sec.12, T.24 N., R.5 E., King County, Hydrologic Unit 17110012, on west shore 5.6 mi above lake outlet, and 6.5 mi south of Redmond.

DRAINAGE AREA.--99.6 mi², Includes 1.9 mi² of Cedar River drainage from upper Rock Creek, which normally is diverted into Issaquah Creek.

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

REVISED RECORDS.--WSP 1446: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 24.04 ft above National Geodetic Vertical Datum of 1929. Prior to June 22, 1942, nonrecording gage at different site at datum 1.00 ft higher. June 22, 1942, to Aug. 22, 1951, nonrecording gage at different site at datum 1.00 ft higher and Aug. 23, 1951, to Apr. 29, 1965, at present datum.

REMARKS.--Minor regulation on tributaries. Many small diversions from tributaries for irrigation and domestic use.

EXTREMES FOR PERIOD OF RECORD.--Maximum gage height observed, 9.40 ft Feb. 12, 1951 (present datum); minimum observed, 1.09 ft Aug. 25-27, 1951.

EXTREMES OUTSIDE PERIOD OF RECORD.--A stage of 10.83 ft, present datum, was observed on Dec. 22, 1933, from information by Corps of Engineers.

EXTREMES FOR CURRENT YEAR.--Maximum gage height, 3.98 ft (from peak-stage indicator) occurred during period of no gage-height record Jan. 2-29; minimum, 1.37 ft Sept. 5.

GAGE HEIGHT (FEET ABOVE DATUM), WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.89	1.90	3.26	3.49	3.28	2.85	2.94	2.42	2.48	2.27	1.73	1.45
2	1.88	1.97	3.19	---	3.19	2.83	2.90	2.48	2.45	2.25	1.72	1.45
3	1.87	2.19	3.14	---	3.11	2.78	2.85	2.48	2.42	2.24	1.71	1.44
4	1.86	2.38	3.07	---	3.03	2.74	2.82	2.48	2.44	2.22	1.70	1.44
5	1.86	2.45	3.03	---	2.96	2.70	2.79	2.47	2.45	2.20	1.70	1.43
6	1.84	2.53	2.99	---	2.90	2.66	2.80	2.47	2.44	2.18	1.69	1.43
7	1.83	2.61	2.94	---	2.84	2.62	2.83	2.47	2.42	2.15	1.69	1.44
8	1.82	2.61	3.01	---	2.81	2.59	2.87	2.46	2.49	2.13	1.68	1.44
9	1.81	2.58	3.07	---	2.76	2.55	2.83	2.45	2.48	2.11	1.68	1.44
10	1.80	2.56	3.30	---	2.73	2.53	2.81	2.44	2.47	2.09	1.66	1.45
11	1.79	2.56	3.46	---	2.73	2.51	2.81	2.45	2.45	2.07	1.65	1.44
12	1.78	2.56	3.50	---	2.74	2.56	2.81	2.46	2.42	2.05	1.63	1.44
13	1.77	2.54	3.56	---	2.73	2.56	2.81	2.45	2.39	2.04	1.62	1.43
14	1.77	2.56	3.56	---	2.73	2.57	2.81	2.45	2.36	2.02	1.61	1.43
15	1.77	2.56	3.54	---	2.73	2.60	2.81	2.46	2.34	2.01	1.60	1.41
16	1.76	2.56	3.52	---	2.74	2.59	2.81	2.45	2.31	2.00	1.59	1.41
17	1.77	3.00	3.38	---	2.74	2.56	2.81	2.45	2.29	1.98	1.58	1.41
18	1.77	3.25	3.31	---	2.74	2.57	2.80	2.42	2.26	1.96	1.57	1.42
19	1.78	3.27	3.05	---	2.73	2.58	2.77	2.45	2.24	1.94	1.57	1.42
20	1.80	3.25	2.77	---	2.72	2.66	2.72	2.46	2.24	1.92	1.56	1.43
21	1.80	3.81	2.72	---	2.73	2.78	2.68	2.45	2.36	1.90	1.55	1.43
22	1.81	3.82	2.69	---	2.73	2.76	2.63	2.47	2.41	1.88	1.53	1.47
23	1.81	3.75	2.62	---	2.75	2.82	2.60	2.55	2.41	1.87	1.52	1.49
24	1.80	3.74	2.71	---	2.91	2.93	2.56	2.58	2.40	1.86	1.52	1.49
25	1.80	3.70	2.75	---	2.93	2.98	2.52	2.57	2.39	1.84	1.50	1.49
26	1.79	3.68	2.77	---	2.92	3.03	2.48	2.59	2.36	1.82	1.49	1.49
27	1.80	3.60	2.81	---	2.90	3.03	2.45	2.60	2.35	1.81	1.48	1.48
28	1.80	3.54	2.99	---	2.89	3.03	2.42	2.59	2.33	1.79	1.48	1.48
29	1.80	3.53	3.15	---	2.87	3.03	2.39	2.57	2.31	1.78	1.47	1.47
30	1.81	3.34	3.32	3.44	---	3.01	2.39	2.55	2.29	1.76	1.47	1.47
31	1.85	---	3.47	3.36	---	2.98	---	2.51	---	1.75	1.46	---
MEAN	1.81	2.95	3.12	---	2.85	2.74	2.72	2.49	2.38	2.00	1.59	1.45
MAX	1.89	3.82	3.56	---	3.28	3.03	2.94	2.60	2.49	2.27	1.73	1.49
MIN	1.76	1.90	2.62	---	2.72	2.51	2.39	2.42	2.24	1.75	1.46	1.41

CAL YR 1983 MEAN 2.46 MAX 4.77 MIN 1.71

LAKE WASHINGTON BASIN

12122500 BEAR CREEK NEAR REDMOND, WA

LOCATION.--Lat 47°43'04", long 122°04'34", in NW¼NW¼ sec.29, T.26 N., R.6 E., King County, Hydrologic Unit 17110012, on right bank, 1.0 mi upstream from Cottage Lake Creek and 3.5 mi northeast of Redmond, and at mile 6.5.

DRAINAGE AREA.--13.9 mi².

PERIOD OF RECORD.--June 1945 to October 1949, May 1979 to September 1981; October 1981 to current year (seasonal records only).

REVISED RECORD.--WRD WA-79-1: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 111.0 ft (revised) above National Geodetic Vertical Datum of 1929. June 1945 to October 1949 at different datum.

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

AVERAGE DISCHARGE.--6 years (water years 1946-49, 1980-81), 27.8 ft³/s, 17,100 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 223 ft³/s Dec. 17, 1979, gage height, 3.63 ft, maximum gage height, 3.89 ft Feb. 22, 1949 at datum then in use; minimum discharge, 3.1 ft³/s Aug. 22, 1946, gage height, 1.34 ft at datum then in use; minimum gage height, 1.00 ft Aug. 19, 1983.

EXTREMES FOR JUNE TO OCTOBER.--Maximum discharge, 63 ft³/s June 7, gage height, 1.99 ft; minimum, 5.6 ft³/s Sept. 15.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR JUNE TO OCTOBER 1984
MEAN VALUES

DAY	JUN	JUL	AUG	SEP	OCT
1	17		8.8	8.4	8.9
2	16		8.2	8.3	9.4
3	16		8.4	8.7	9.4
4	20		8.5	8.9	9.4
5	23		8.5	11	9.0
6	20		8.6	13	9.6
7	35		8.5	10	9.8
8	48		8.2	9.2	9.8
9	45		7.8	9.2	11
10	34		7.4	8.6	19
11	29		7.1	10	19
12	---		7.3	8.1	15
13	---		7.5	7.0	14
14	---		7.8	6.7	13
15	---		7.6	6.4	13
16	---		7.2	6.9	12
17	---		7.0	7.8	12
18	---		6.9	7.1	11
19	---		6.6	6.6	11
20	---		6.8	7.5	11
21	---		6.8	7.7	11
22	---		6.6	12	11
23	---		7.0	10	10
24	---		7.2	9.9	10
25	---		7.0	8.7	14
26	---		7.1	8.5	17
27	---		7.6	8.5	16
28	---		8.6	8.6	15
29	---		8.1	8.8	18
30	---		8.3	8.8	15
31	---		8.3	---	15
TOTAL	---		237.3	260.9	388.3
MEAN	---		7.65	8.70	12.5
MAX	---		8.8	13	19
MIN	---		6.6	6.4	8.9
AC-FT	---		471	517	770

NOTE.--No gage-height record June 12 to August 8.

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LOCATION.--Lat 47°42'15", long 122°08'29", in SW¼SW¼ sec.26, T.26 N., R.5 E., King County, Hydrologic Unit 17110012, on right bank 3.9 mi upstream from Bear Creek, 3.6 mi southeast of Woodinville, and at mile 10.8.

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

REMARKS.--Records fair. Natural regulation from Sammamish Lake and some minor regulation. Many small diversions for irrigation and domestic use.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 2,390 ft³/s Mar. 6, 1972, elevation, 25.83 ft; minimum daily, 25 ft³/s Aug. 2, 1977.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 1,590 ft³/s Nov. 20, elevation, 22.76 ft; minimum discharge, 55 ft³/s Aug. 25-27.

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	87	142	610	456	590	460	492	294	262	246	85	65
2	89	202	582	586	554	448	470	343	255	235	75	67
3	87	388	570	720	516	424	454	308	249	229	81	66
4	101	462	536	781	484	398	436	295	289	220	79	63
5	94	406	550	874	452	377	438	287	324	209	81	77
6	100	416	536	871	422	359	462	286	305	201	81	88
7	95	406	508	832	396	338	516	271	334	193	74	78
8	100	366	630	770	412	318	536	266	454	185	73	70
9	95	359	726	714	448	306	532	262	430	181	74	62
10	95	390	1040	676	406	308	604	257	386	177	71	72
11	93	414	1020	690	438	318	564	289	349	174	69	81
12	94	381	955	676	516	359	568	274	323	171	69	75
13	94	379	979	620	552	345	544	263	304	164	68	73
14	94	458	907	576	510	352	514	266	289	157	66	72
15	96	620	834	536	512	370	476	266	276	149	64	68
16	95	788	768	502	470	361	452	265	266	146	64	62
17	101	825	708	468	436	343	428	254	251	141	63	67
18	103	777	662	436	410	327	408	246	238	137	65	67
19	90	762	618	406	388	338	390	276	229	137	62	66
20	98	1450	576	384	440	460	365	282	252	136	59	68
21	100	1380	526	375	516	588	345	266	402	133	62	70
22	119	1150	478	412	544	538	329	284	355	133	73	83
23	108	989	440	412	556	544	329	330	319	132	61	81
24	108	1210	406	508	604	598	313	310	296	128	56	75
25	109	1080	402	786	572	634	297	298	284	122	57	75
26	112	936	400	876	544	642	286	308	277	113	55	72
27	119	860	379	849	512	584	273	305	272	112	56	70
28	116	783	361	792	494	596	260	294	261	109	59	68
29	107	720	400	728	470	604	258	284	275	105	60	67
30	113	660	546	678	---	558	270	271	257	101	63	67
31	125	---	494	636	---	522	---	270	---	92	65	---
TOTAL	3137	20159	19147	19626	14164	13717	12609	8770	9063	4868	2090	2135
MEAN	101	672	618	633	488	442	420	283	302	157	67.4	71.2
MAX	125	1450	1040	876	604	642	604	343	454	246	85	88
MIN	87	142	361	375	388	306	258	246	229	92	55	62
CFSM	.64	4.23	3.89	3.98	3.07	2.78	2.64	1.78	1.90	.99	.42	.45
IN.	.73	4.72	4.48	4.59	3.31	3.21	2.95	2.05	2.12	1.14	.49	.50
AC-FT	6220	39990	37980	38930	28090	27210	25010	17400	17980	9660	4150	4230

LAKE WASHINGTON BASIN

12127100 SWAMP CREEK AT KENMORE, WA

LOCATION.--Lat 47°45'22", long 122°13'57", in NE¼ sec.12, T.26 N., R.4 E., King County, Hydrologic Unit 17110012, on right bank on upstream side of Bothell Way bridge (State Highway 522) at Kenmore, and at mile 0.5.

DRAINAGE AREA.--23.1 mi².

PERIOD OF RECORD.--October 1963 to June 1973, October 1973 to April 1974, October 1974 to current year.

GAGE.--Water-stage recorder and concrete control. Datum of gage is 14.46 ft above National Geodetic Vertical Datum of 1929 (Washington State Highway Department). Apr. 27 to Sept. 7, 1967, nonrecording gage at same site and datum.

REMARKS.--Records good except for periods of no gage-height record Nov. 5 to Jan. 31, and Apr. 15 to June 4, which are fair. Some minor diversion for domestic use upstream from station. Peak flows are affected by flood control storage and urbanization.

AVERAGE DISCHARGE.--19 years (water years 1964-72, 1975-84), 34.9 ft³/s, 20.52 in/yr, 25,280 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 651 ft³/s, revised, Jan. 5, 1983, gage height, 6.12 ft; minimum, 2.3 ft³/s Aug. 12, 1977; minimum gage height, 1.71 ft July 31, Aug. 1, 2, 1965, Aug. 12, 1977.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 250 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Nov. 20	unknown	*615	*5.98	Dec. 10	unknown	unknown	unknown
Nov. 24	unknown	unknown	unknown	Mar. 24	0630	254	4.25

Minimum discharge, 5.2 ft³/s Aug. 22, gage height, 1.92 ft.

REVISIONS.--The maximum discharge for the water year 1983 has been revised to 651 ft³/s, Jan. 5, 1983, gage height, 6.12 ft.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP		
1	7.7	21	34	32	31	53	53	72	16	14	12	7.2		
2	7.7	52	42	140	28	47	46	56	15	12	8.3	6.7		
3	8.9	106	35	125	27	38	43	34	24	11	7.6	6.7		
4	11	117	30	85	25	34	39	25	40	11	7.1	6.5		
5	8.6	68	80	70	24	31	43	29	24	10	7.7	42		
6	8.4	76	54	64	23	30	43	24	19	10	8.9	35		
7	8.4	54	90	47	22	27	65	21	20	9.4	7.8	14		
8	8.1	32	140	36	44	25	57	27	25	9.1	7.1	9.8		
9	8.1	38	170	30	91	24	68	24	20	8.8	6.9	9.1		
10	7.9	57	240	37	56	39	87	22	17	9.0	6.7	9.9		
11	7.9	49	100	48	90	77	53	55	15	8.6	6.5	29		
12	7.9	40	110	39	107	89	68	25	14	8.6	6.5	15		
13	7.9	47	85	33	104	64	47	30	13	8.5	7.3	10		
14	7.9	115	60	28	77	65	39	26	12	7.8	6.6	8.8		
15	8.1	185	42	26	82	65	34	23	12	7.9	6.3	8.4		
16	7.9	170	34	24	65	51	31	21	12	7.7	6.3	8.1		
17	9.1	150	26	22	50	47	27	19	11	7.4	6.1	7.9		
18	8.4	88	24	21	44	39	30	18	11	7.4	6.1	7.7		
19	10	110	26	20	39	46	26	52	10	7.4	6.1	7.7		
20	11	400	23	21	78	96	24	24	30	7.2	5.9	8.5		
21	9.7	150	22	24	96	109	23	20	73	8.7	5.9	8.9		
22	22	80	20	46	129	67	24	60	23	8.0	5.5	38		
23	20	65	19	28	110	86	26	45	18	7.4	5.9	19		
24	12	230	21	97	133	190	23	25	14	7.1	6.0	12		
25	11	90	25	105	98	165	22	30	13	6.7	6.0	10		
26	10	58	35	34	76	135	21	35	12	6.7	6.0	9.2		
27	9.7	47	25	30	63	89	20	24	13	6.5	14	8.6		
28	9.4	37	21	28	66	116	19	20	11	6.4	14	8.4		
29	9.4	31	76	29	55	129	19	17	25	6.5	9.0	8.1		
30	13	28	90	42	---	85	47	15	18	6.5	7.6	8.1		
31	21	---	37	35	---	68	---	17	---	6.5	7.4	---		
TOTAL	318.1	2791	1836	1446	1933	2226	1167	935	580	259.8	231.1	388.3		
MEAN	10.3	93.0	59.2	46.6	66.7	71.8	38.9	30.2	19.3	8.38	7.45	12.9		
MAX	22	400	240	140	133	190	87	72	73	14	14	42		
MIN	7.7	21	19	20	22	24	19	15	10	6.4	5.5	6.5		
CFSM	.45	4.03	2.56	2.02	2.89	3.11	1.68	1.31	.84	.36	.32	.56		
IN.	.51	4.49	2.96	2.33	3.11	3.58	1.88	1.51	.93	.42	.37	.63		
AC-FT	631	5540	3640	2870	3830	4420	2310	1850	1150	515	458	770		
CAL YR 1983	TOTAL	14960.4	MEAN	41.0	MAX	400	MIN	6.1	CFSM	1.77	IN.	24.09	AC-FT	29670
WTR YR 1984	TOTAL	14111.3	MEAN	38.6	MAX	400	MIN	5.5	CFSM	1.67	IN.	22.72	AC-FT	27990

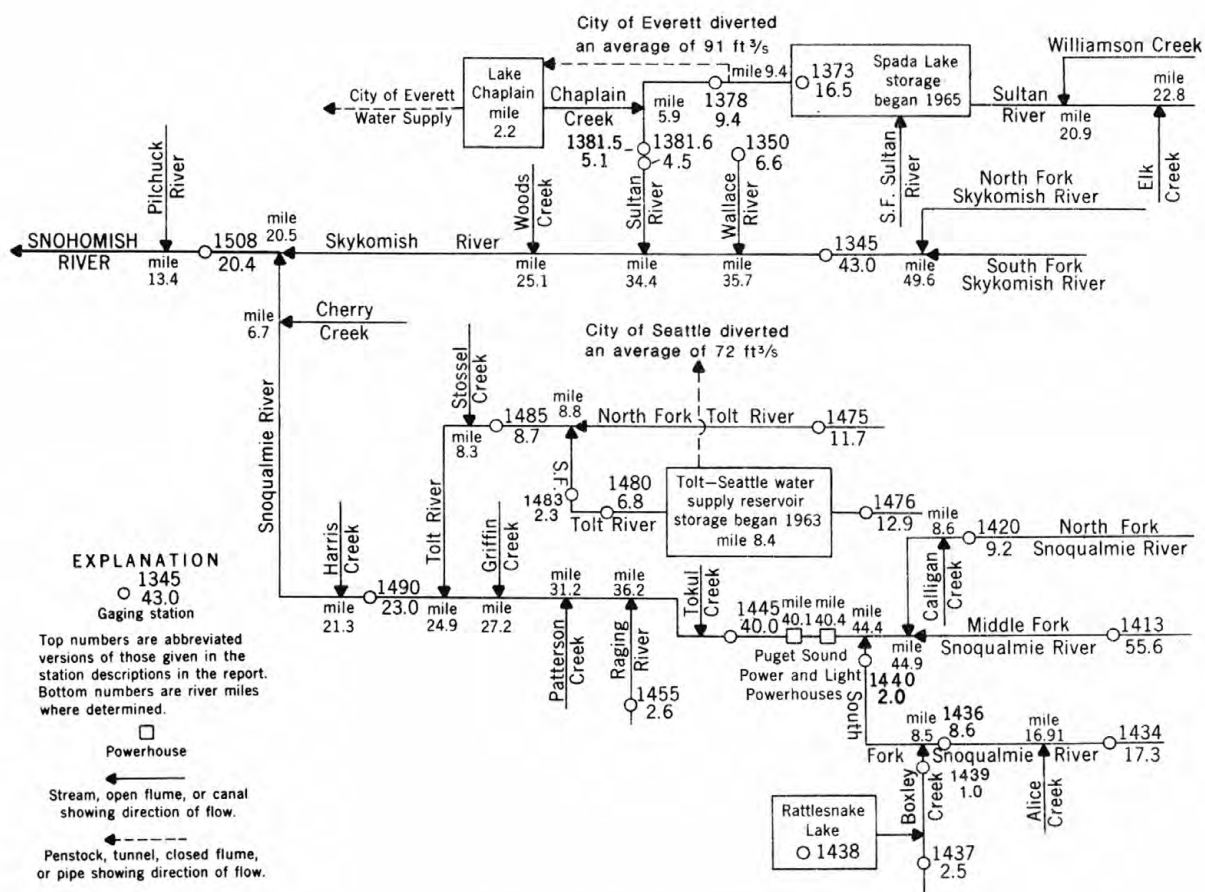


Figure 15.--Gaging stations in Snohomish River basin.

SNOHOMISH RIVER BASIN

12134500 SKYKOMISH RIVER NEAR GOLD BAR, WA

LOCATION.--Lat 47°50'15", long 121°39'56", in SW¼SW¼ sec.9, T.27 N., R.9 E., Snohomish County, Hydrologic Unit 17110009, on right bank 2.0 mi southeast of Gold Bar, 7.3 mi upstream from Wallace River, and at mile 43.0.

DRAINAGE AREA.--535 mi².

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

REVISED RECORDS.--WSP 1316: 1932-35(M), 1944(M).

GAGE.--Water-stage recorder. Datum of gage is 209.26 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--Records good. No regulation. Several small diversions upstream from station. Chemical analyses July 1959 to September 1970, October 1977 to June 1980.

AVERAGE DISCHARGE.--56 years, 3,966 ft³/s, 100.67 in/yr, 2,873,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 90,400 ft³/s Dec. 26, 1980, gage height, 21.38 ft, from rating curve extended above 53,000 ft³/s; minimum, 315 ft³/s Nov. 29, 1952; minimum gage height, 2.73 ft Dec. 1, 1936.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 19,000 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Nov. 3	1130	19,600	11.27	Jan. 25	0400	38,000	14.72
Jan. 4	1830	*40,800	*15.18				

Minimum discharge, 641 ft³/s Oct. 16, 17, gage height, 3.62 ft.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP		
1	842	1760	2750	2220	3700	1880	2600	2230	6500	6380	2210	975		
2	818	3000	2500	5100	3300	2000	2420	3870	5510	5830	2040	975		
3	802	13500	2300	14900	2950	1920	2290	3540	5100	6130	1860	850		
4	1190	12000	2090	34200	2740	1800	2210	3080	5230	6380	1720	794		
5	1070	7250	1940	23300	2700	1720	2210	2840	6700	6850	1630	810		
6	939	7700	1820	14600	2790	1780	2180	2680	6980	6080	1540	2130		
7	874	7050	1690	11200	2780	1970	2250	2560	6850	4850	1420	1860		
8	826	5900	1880	8950	2700	2220	2280	3100	7930	4400	1370	2840		
9	786	4590	2050	6700	2720	2670	2280	3590	6850	4310	1420	2170		
10	754	4200	2370	5470	2780	2950	2490	3340	6250	4500	1420	1700		
11	730	5250	2350	5160	2790	3340	2630	3950	6000	4420	1360	1560		
12	706	4850	2130	4400	4770	3660	2770	7330	6030	4290	1300	1770		
13	690	4520	3300	3740	5140	3910	2700	6700	7950	3760	1340	1600		
14	676	6030	4790	3260	3870	3400	2540	7400	9690	3890	1240	1300		
15	662	13900	3740	2840	3340	3300	3830	6000	10600	4230	1150	1130		
16	648	14700	2890	2610	2880	3050	4270	5010	8280	4740	1090	1030		
17	706	11400	2370	2360	2560	2980	3460	4350	6350	4770	1070	966		
18	906	11400	2090	2100	2320	3190	3110	4080	6080	4330	1050	914		
19	778	8730	1890	2000	2160	3420	3060	6900	6280	3660	1000	890		
20	906	7280	1700	1860	2280	5600	2950	9930	7400	3240	948	866		
21	984	5540	1460	1840	2490	8180	2820	6980	10800	2850	914	948		
22	2860	4350	1350	2260	2390	7080	3020	5780	8730	2720	898	1300		
23	2970	3640	1250	3290	2350	6100	3260	7500	9100	2780	882	1420		
24	1990	3910	1200	14700	2290	5490	2820	6550	10100	2890	858	1270		
25	1600	4210	1250	27200	2180	4700	2510	5380	9630	3020	826	1110		
26	1410	3640	1400	11100	2010	4160	2290	8480	9480	3060	802	1000		
27	1260	4630	1290	8130	1900	3640	2210	8430	8750	2640	975	939		
28	1160	4550	1150	7130	1850	3450	2170	7730	8600	2420	1400	874		
29	1070	3760	1150	6230	1830	3160	2120	10100	8950	2290	1040	818		
30	1140	3180	1890	5050	---	2880	2090	11800	7780	2260	898	786		
31	2170	---	2720	4250	---	2720	---	8730	---	2250	850	---		
TOTAL	34923	196420	64750	248150	80560	108320	79840	179940	230480	126220	38521	37595		
MEAN	1127	6547	2089	8005	2778	3494	2661	5805	7683	4072	1243	1253		
MAX	2970	14700	4790	34200	5140	8180	4270	11800	10800	6850	2210	2840		
MIN	648	1760	1150	1840	1830	1720	2090	2230	5100	2250	802	786		
CFSM	2.11	12.2	3.90	15.0	5.19	6.53	4.97	10.9	14.4	7.61	2.32	2.34		
IN.	2.43	13.66	4.50	17.25	5.60	7.53	5.55	12.51	16.03	8.78	2.68	2.61		
AC-FT	69270	389600	128400	492200	159800	214900	158400	356900	457200	250400	76410	74570		
CAL YR 1983	TOTAL	1327518	MEAN	3637	MAX	28100	MIN	648	CFSM	6.80	IN.	92.31	AC-FT	2633000
WTR YR 1984	TOTAL	1425719	MEAN	3895	MAX	34200	MIN	648	CFSM	7.28	IN.	99.13	AC-FT	2828000

SNOHOMISH RIVER BASIN

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12135000 WALLACE RIVER AT GOLD BAR, WA

LOCATION.--Lat 47°51'51", long 122°40'53", in NE¼NW¼ sec.5, T.27 N., R.9 E., Snohomish County, Hydrologic Unit 17110009, on left bank at downstream side of highway bridge, 1.0 mi north of Gold Bar, 2.1 mi upstream from Olney Creek, and at mile 6.6.

DRAINAGE AREA.--18.6 mi².

PERIOD OF RECORD.--October 1928 to September 1933, July 1946 to November 1976, August 1977 to June 1978, July 1980 to current year (seasonal records only). Monthly discharge only for some periods, published in WSP 1316.

REVISED RECORDS.--WSP 1316: 1930(M), 1932-33(M). WSP 1932: Drainage area. WDR WA-74-1: 1971-73(P). WDR WA-80-1: Drainage area. WDR WA-83-1: 1980.

GAGE.--Water-stage recorder. Datum of gage is 203.00 ft above National Geodetic Vertical Datum of 1929. December 1928 to Sept. 20, 1933, nonrecording gage 0.8 mi downstream at different datum. July 25, 1946, to June 30, 1978, water-stage recorder 0.8 mi downstream at different datum.

REMARKS.--Records good. Flow affected by natural storage in Wallace Lake. No diversions upstream from station. Water temperatures July 1955 to September 1972.

AVERAGE DISCHARGE.--35 years (water years 1929-33, 1947-76), 165 ft³/s, 117.93 in/yr, 119,500 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 3,400 ft³/s Jan. 5, 1969, gage height, 8.37 ft, site and datum then in use; minimum, 5.8 ft³/s Aug. 25, 29, 30, 1961.

EXTREMES FOR JUNE TO OCTOBER.--Maximum discharge, 1,340 ft³/s Oct. 25, gage height, 4.79 ft; minimum, 15 ft³/s Aug. 26, gage height, 0.95 ft.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR JUNE TO OCTOBER 1984
MEAN VALUES

DAY	JUN	JUL	AUG	SEP	OCT
1	214	163	36	35	21
2	191	145	32	27	21
3	185	144	29	21	20
4	201	149	27	19	28
5	417	149	27	19	35
6	287	120	26	161	26
7	381	100	25	46	24
8	412	92	24	158	23
9	423	91	24	79	103
10	309	97	23	64	100
11	255	97	22	85	103
12	249	87	22	68	152
13	283	76	35	48	177
14	288	80	27	37	133
15	261	94	23	31	88
16	203	102	21	29	68
17	166	94	20	27	58
18	165	80	19	25	49
19	172	67	18	24	44
20	222	60	18	26	40
21	317	51	17	28	36
22	250	53	17	61	35
23	259	57	17	53	33
24	247	58	16	45	34
25	223	58	16	35	449
26	230	51	15	30	198
27	208	43	65	27	134
28	197	39	44	25	136
29	253	38	25	23	104
30	204	39	21	22	97
31	---	39	20	---	86
TOTAL	7672	2613	771	1378	2655
MEAN	256	84.3	24.9	45.9	85.6
MAX	423	163	65	161	449
MIN	165	38	15	19	20
CFSM	13.5	4.44	1.31	2.42	4.51
IN.	15.02	5.12	1.51	2.70	5.20
AC-FT	15220	5180	1530	2730	5270

12137300 SPADA LAKE NEAR STARTUP, WA

LOCATION.--Lat 47°58'28", long 121°41'10", in NW¼ sec.29, T.29 N., R.9 E., Snohomish County, Hydrologic Unit 17110009, Snoqualmie National Forest, on right bank at Culmbach Dam on Sultan River, 1.7 mi downstream from South Fork, 7.8 mi north of Startup, and at mile 16.5.

DRAINAGE AREA.--68.3 mi².

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

REVISED RECORDS.--WDR WA-79-1: 1975-76(M).

GAGE.--Nonrecording gage. Datum of gage is National Geodetic Vertical Datum of 1929 (levels by Snohomish County P.U.D. No. 1).

REMARKS.--Reservoir is formed by earthfill dam originally completed to elevation 1,408 ft in 1965. Storage began April 5, 1965 for water supply for the city of Everett. During 1983 the dam was raised to elevation 1,470 ft with storage beginning November 1983. Capacity was increased to 153,260 acre-feet at elevation 1,450 ft, crest of spillway. Normal operating pool is between elevations 1,420 ft and 1,460 ft. Figures given herein represent total contents. Spada Lake is used to provide water for the city of Everett, and since June 1, 1984, power generation for Snohomish County Public Utility District No. 1. Midnight elevations for last day of each month are interpolated by using the change between observed 0900 hours daily elevation on the last day of the month and the first day of the next month through March 31, 1984; subsequently, midnight elevations are shown.

COOPERATION.--Elevations furnished by Snohomish County Public Utility District No. 1.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents observed, 158,734 acre-ft Jan. 25, 1984, elevation, 1,452.8 ft; minimum observed since reservoir was first filled, 4,250 acre-ft Sept. 30, 1967, elevation, 1,301.28 ft.

EXTREMES FOR CURRENT YEAR.--Maximum contents observed, 158,734 acre-ft Jan. 25, elevation, 1,452.8 ft; minimum observed, 8,062 acre-ft Oct. 17, elevation, 1,314.1 ft.

MONTHEND ELEVATION AND CONTENTS AT 2400, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984

Date	Elevation (feet)	Contents (acre-feet)	Change in contents (acre-feet)
Sept. 30.....	1,315.8	8,820	--
Oct. 31.....	1,326.1	13,132	+4,312
Nov. 30.....	1,394.7	68,188	+55,056
Dec. 31.....	1,407.3	84,183	+15,995
CAL YEAR 1983.....	--	--	+69,633
Jan. 31.....	1,449.5	152,360	+68,177
Feb. 29.....	1,446.5	146,880	-5,480
Mar. 31.....	1,449.7	152,737	+5,857
Apr. 30.....	1,450.1	153,456	+719
May 31.....	1,450.0	153,260	-196
June 30.....	1,443.9	142,140	-11,120
July 31.....	1,431.0	119,717	-22,423
Aug. 31.....	1,425.6	111,067	-8,650
Sept. 30.....	1,428.6	115,804	+4,737
WTR YR 1984.....	--	--	+106,984

SNOHOMISH RIVER BASIN

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12137800 SULTAN RIVER BELOW DIVERSION DAM, NEAR SULTAN, WA

LOCATION.--Lat 47°57'34", long 121°47'46", in SE¼NE¼ sec.32, T.29 N., R.8 E., Snohomish County, Hydrologic Unit 17110009, on right bank 300 ft downstream from city of Everett diversion dam on Sultan River, 6.8 mi north of Sultan, and at mile 9.4.

DRAINAGE AREA.--77.1 mi².

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--May 1983 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 660 ft from topographic map.

REMARKS.--Records good except those during period of no gage-height record March 30 to July 11, 1984, which are fair. During water years 1983 to 1984, the city of Everett diverted about 91 ft³/s daily into Lake Chaplain for municipal use. Flow regulated at Spada Lake (station 12137300) since Apr. 5, 1965, unadjusted for storage. Since May 1984, water is diverted at Spada Lake through a 10-ft diameter pipeline for power generation at the Jackson Project. Since July 1984, undetermined flows are returned to river at diversion dam by pipeline from Lake Chaplain for maintenance of instream flow requirements.

EXTREMES FOR CURRENT PERIOD.--

MAY TO SEPTEMBER 1983: Maximum discharge, 2,520 ft³/s July 13, gage height 7.52 ft; minimum daily, 35 ft³/s Aug. 23-25.

WATER YEAR 1984: Maximum discharge, 8,320 ft³/s Jan. 25, gage height, 10.15 ft; minimum daily, 101 ft³/s Aug. 25, 26.

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

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1								1140	1090	344	120	242
2								800	709	495	119	1160
3								540	472	601	98	1630
4								440	509	601	58	1140
5								350	370	590	45	668
6								450	275	820	40	480
7								600	275	860	38	230
8								850	267	480	37	190
9								1100	240	280	57	170
10								840	628	220	36	240
11								410	1100	210	39	764
12								370	559	960	56	1130
13								380	432	2120	78	1120
14								490	410	1740	77	733
15								600	500	1670	76	406
16								660	539	1640	73	390
17								640	549	1630	73	334
18								660	585	1620	67	319
19								640	1560	1600	56	247
20								640	1500	1580	56	159
21								560	1400	1540	51	157
22								460	1300	1500	40	169
23								460	950	1470	35	250
24								760	585	1400	35	225
25								1050	574	1330	35	217
26								978	559	1240	46	185
27								601	539	829	52	120
28								423	454	476	53	122
29								436	313	316	89	117
30								440	307	181	90	135
31								816	---	133	55	---
TOTAL								19584	19550	30476	1880	13449
MEAN								632	652	983	60.6	448
MAX								1140	1560	2120	120	1630
MIN								350	240	133	35	117
AC-FT								38840	38780	60450	3730	26680

SNOHOMISH RIVER BASIN

12137800 SULTAN RIVER BELOW DIVERSION DAM, NEAR SULTAN, WA--Continued

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	193	796	187	129	1450	359	330	425	275	120	118	107
2	187	1270	161	295	850	820	350	1030	220	165	106	106
3	193	1640	149	580	285	320	270	1100	210	170	107	102
4	207	1710	145	509	204	280	235	875	215	165	109	102
5	191	1600	143	310	202	255	225	795	245	160	109	107
6	191	1600	145	275	276	205	235	740	234	150	107	163
7	185	1560	149	225	415	164	265	635	315	147	101	115
8	185	1410	185	205	1060	140	345	665	335	143	112	122
9	181	1120	199	247	850	140	415	935	410	195	116	118
10	179	1300	275	242	276	159	515	485	315	225	116	112
11	179	1260	295	262	305	177	700	405	265	210	118	133
12	175	670	217	181	445	623	735	715	235	129	118	121
13	175	720	195	171	899	964	475	705	220	127	125	112
14	175	770	267	181	1520	964	545	880	210	125	118	124
15	175	710	150	173	1410	575	800	765	205	125	118	149
16	175	900	145	169	1010	231	980	360	200	125	114	149
17	171	800	140	169	964	223	775	265	190	131	119	145
18	171	920	135	167	228	169	790	375	175	138	123	144
19	171	750	145	167	207	189	555	790	130	159	121	144
20	175	860	139	173	472	591	445	1130	140	168	121	145
21	173	600	155	189	1280	1670	485	1280	180	168	121	150
22	247	277	153	215	1280	1580	590	545	185	168	123	214
23	351	215	151	534	871	1430	635	610	145	170	114	183
24	440	257	155	2510	1170	1320	550	555	130	170	109	171
25	319	230	161	6870	1280	1030	435	345	125	166	101	165
26	245	189	163	4180	850	913	365	720	150	155	101	163
27	201	215	163	2270	226	674	360	960	140	151	119	172
28	195	210	161	1580	223	662	345	485	145	149	110	160
29	185	179	173	1470	220	580	375	365	160	149	104	158
30	200	195	173	1720	---	740	380	490	175	151	102	159
31	420	---	191	1470	---	760	---	480	---	134	102	---
TOTAL	6610	24933	5365	27838	20728	18907	14505	20910	6279	4808	3502	4215
MEAN	213	831	173	898	715	610	484	675	209	155	113	141
MAX	440	1710	295	6870	1520	1670	980	1280	410	225	125	214
MIN	171	179	135	129	202	140	225	265	125	120	101	102
WTR YR 1984	TOTAL	158600	MEAN	433	MAX	6870	MIN	101				

12137800 SULTAN RIVER BELOW DIVERSION DAM, NEAR SULTAN, WA--Continued

WATER-QUALITY RECORDS

PERIOD OF DAILY RECORD.--

WATER TEMPERATURES: July to September 1984.

INSTRUMENTATION.--Temperature recorder since July 1984.

EXTREMES FOR CURRENT YEAR.--

WATER TEMPERATURES: Maximum for period July to September, 15.0°C Aug. 1; minimum, 8.5°C July 13.

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984												
DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	JUNE			JULY			AUGUST			SEPTEMBER		
1				---	---	---	15.0	11.5	13.0	12.5	11.0	11.5
2				---	---	---	14.0	12.5	13.0	12.0	10.5	11.0
3				---	---	---	13.5	12.5	13.0	13.0	11.0	11.5
4				---	---	---	13.5	12.5	13.0	12.5	11.0	11.5
5				---	---	---	14.0	12.5	13.0	12.0	11.0	11.5
6				---	---	---	14.0	12.5	13.0	12.5	10.5	11.5
7				---	---	---	13.5	13.0	13.5	11.0	10.0	11.0
8				---	---	---	14.0	13.0	13.5	12.0	10.5	11.5
9				---	---	---	14.0	11.5	13.0	12.0	11.0	11.5
10				---	---	---	12.0	11.0	11.5	11.5	11.0	11.5
11				---	---	---	11.5	11.0	11.0	12.0	11.0	11.5
12				10.0	8.5	9.0	12.0	10.5	11.0	11.5	11.0	11.0
13				11.0	8.5	9.5	11.5	11.0	11.5	11.5	10.5	11.0
14				12.0	11.0	11.5	11.0	10.0	10.5	13.0	10.5	11.5
15				12.5	11.5	12.0	11.0	10.0	11.0	11.5	10.5	11.0
16				13.0	12.0	12.0	11.5	11.0	11.0	11.5	11.0	11.5
17				13.0	12.0	12.5	12.0	11.0	11.5	11.5	11.0	11.5
18				13.5	11.5	12.5	11.5	10.5	11.5	11.5	11.0	11.5
19				13.0	10.0	12.0	11.5	10.5	11.0	12.0	10.5	11.5
20				12.5	10.5	11.5	12.0	10.5	11.0	12.0	10.5	11.5
21				12.0	10.5	11.5	11.5	10.5	11.0	11.5	11.0	11.5
22				12.5	10.5	11.5	12.0	10.5	11.0	11.5	10.0	11.0
23				12.5	11.0	12.0	12.0	11.0	11.5	11.0	10.0	10.5
24				12.5	11.5	12.0	12.0	11.0	11.0	11.0	10.0	10.5
25				13.5	11.0	12.0	14.0	10.5	11.5	11.0	10.0	10.5
26				13.5	11.5	12.0	14.5	11.5	12.0	11.5	10.5	11.0
27				12.5	11.5	12.0	12.5	11.5	12.0	11.5	10.5	11.0
28				13.0	11.5	12.0	11.5	10.5	11.0	11.5	10.5	11.0
29				12.5	11.5	12.0	12.0	10.5	11.0	12.0	10.5	11.5
30				13.0	12.0	12.0	12.5	10.5	11.5	11.0	10.5	11.0
31				14.5	12.5	13.0	12.0	10.5	11.0	---	---	---
MONTH				---	---	---	15.0	10.0	12.0	13.0	10.0	11.0

SNOHOMISH RIVER BASIN

12138150 SULTAN RIVER BELOW CHAPLAIN CREEK, NEAR SULTAN, WA

LOCATION.--Lat 47°54'52", long 121°48'36", In NE¼SW¼ sec.17, T.28 N., R.8 E., Snohomish County, Hydrologic Unit 17110009, on right bank 0.8 mi downstream from Chaplain Creek, 3.5 mi north of Sultan, and at mile 5.1.

DRAINAGE AREA.--92.6 mi².

PERIOD OF RECORD.--November 1974 to September 1984 (discontinued).

GAGE.--Water-stage recorder and crest-stage gage. Elevation of gage is 320 ft, from topographic map.

REMARKS.--Records good. City of Everett diverted about 91 ft³/s daily into Lake Chaplain for municipal use. Flow regulated at Spada Lake (sta 12137300) since Apr. 5, 1965. Since May 1984, water is diverted at Spada Lake through a 10-ft diameter, 4-mi long pipeline for power production. Since July 1984, undetermined flows are returned to the river at the upstream diversion dam by pipeline from Lake Chaplain for maintenance of instream flow requirement.

AVERAGE DISCHARGE.--9 years, 727 ft³/s, 526,700 acre-ft/yr, unadjusted.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 24,600 ft³/s Dec. 2, 1975, gage height, 13.19 ft, from rating curve extended above 8,000 ft³/s; minimum, 35 ft³/s Aug. 23, 1983, gage height, 2.36 ft.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 7,730 ft³/s Jan. 25, gage height, 8.76 ft; minimum, 90 ft³/s Aug. 24-27, Sept. 4, 5, gage height, 2.68 ft.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	198	597	249	213	1470	375	350	438	298	181	125	99
2	194	1320	213	454	991	838	370	1050	245	177	110	94
3	194	1810	198	852	370	336	288	1130	237	183	110	93
4	229	1820	186	858	274	316	253	887	241	176	115	91
5	198	1630	186	628	258	307	245	817	270	177	115	94
6	198	1600	180	481	307	284	249	776	258	173	115	196
7	194	1580	180	380	498	253	288	653	340	170	110	109
8	190	1450	237	336	1090	221	365	678	360	168	120	113
9	183	1180	270	350	991	217	432	953	432	221	125	113
10	183	1430	406	336	345	233	532	509	340	250	125	105
11	183	1340	422	401	380	284	716	427	288	224	125	134
12	183	723	336	279	555	858	763	736	262	150	125	120
13	180	743	274	245	1080	1300	697	723	245	140	130	106
14	180	838	397	245	1590	1300	567	894	233	140	125	113
15	180	756	258	229	1520	866	817	783	225	140	125	142
16	176	991	194	217	1120	350	1010	380	221	140	120	142
17	176	845	194	209	1110	316	796	284	213	150	125	142
18	180	1010	183	202	284	241	810	401	198	160	130	142
19	180	770	186	202	262	302	573	810	146	170	125	142
20	183	887	180	202	526	824	459	1120	152	180	125	142
21	180	615	186	225	1470	1990	498	1330	201	180	120	145
22	279	411	183	340	1460	1880	609	555	210	180	120	245
23	380	312	176	743	1020	1670	653	634	165	180	110	201
24	470	396	176	3170	1330	1480	567	585	152	180	100	181
25	350	355	183	6750	1380	1220	448	370	146	180	90	173
26	257	274	194	3940	1090	1130	380	743	162	170	90	168
27	213	360	186	2400	292	968	380	976	162	160	120	168
28	209	340	183	1700	288	887	365	498	157	155	105	160
29	198	274	198	1630	288	775	390	390	182	155	94	159
30	217	266	284	1880	---	991	397	515	195	155	93	159
31	416	---	298	1520	---	983	---	515	---	140	93	---
TOTAL	6931	26923	7176	31617	23639	23995	15267	21560	6936	5305	3560	4191
MEAN	224	897	231	1020	815	774	509	695	231	171	115	140
MAX	470	1820	422	6750	1590	1990	1010	1330	432	250	130	245
MIN	176	266	176	202	258	217	245	284	146	140	90	91
AC-FT	13750	53400	14230	62710	46890	47590	30280	42760	13760	10520	7060	8310
CAL YR 1983	TOTAL	245795	MEAN	673	MAX	8250	MIN	42	AC-FT	487500		
WTR YR 1984	TOTAL	177100	MEAN	484	MAX	6750	MIN	90	AC-FT	351300		

SNOHOMISH RIVER BASIN

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12138160 SULTAN RIVER BELOW POWERPLANT NEAR SULTAN, WA

LOCATION.--Lat 47°54'27", long 121°48'51", In SW¼SW¼ sec.17, T.28 N., R.8 E., Snohomish County, Hydrologic Unit 17110009, on right bank, 100 ft downstream from Henry M. Jackson powerplant, 3.2 mi north of Sultan, and at mile 4.5.

DRAINAGE AREA.--94.2 mi².

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1983 to September 1984.

GAGE.--Water-stage recorder and crest-stage gage. Datum of gage is 267.0 ft above National Geodetic Vertical Datum of 1929 (levels by Snohomish County Public Utility District).

REMARKS.--Records good except for December, January, February, which are fair. City of Everett diverted about 91 ft³/s daily into Lake Chaplain for municipal use. Flow regulated at Spada Lake (station 12137300) since April 5, 1965; unadjusted for storage. Since May 1984, water is diverted from Spada Lake through a 10-ft diameter, 4-mi long pipeline for power production and returned to the river upstream from the station. Since July 1984, an undetermined flow was returned to river at upstream diversion dam by pipeline from Lake Chaplain for instream flow requirement.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 7,720 ft³/s Jan. 25, gage height, 10.76 ft from crest-stage gage; minimum, 166 ft³/s July 30, gage height, 4.61 ft.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	189	580	304	275	1500	440	372	443	1430	1330	199	188
2	192	1330	265	450	1000	800	387	962	1380	1310	190	184
3	190	1780	246	835	418	400	309	1080	1380	1170	194	183
4	240	1830	234	840	327	340	274	871	1370	1080	194	182
5	195	1640	231	660	319	295	271	798	1320	1080	193	190
6	195	1600	229	488	368	280	271	768	1230	1060	188	261
7	195	1590	227	389	500	276	313	664	1330	1050	184	196
8	195	1460	290	346	1080	242	388	674	1520	941	190	199
9	191	1170	302	361	934	237	451	1250	1570	1070	194	197
10	190	1420	460	347	407	259	538	1340	1500	1110	196	192
11	187	1350	480	399	446	314	698	598	1460	1120	196	233
12	185	776	390	291	614	836	737	1010	987	981	196	207
13	185	803	335	258	1080	1220	683	1230	1140	958	210	192
14	185	874	460	259	1700	1220	568	1280	1100	935	201	199
15	184	816	310	240	1600	821	781	1490	1200	588	198	230
16	182	992	215	228	1120	370	962	1300	1390	794	196	229
17	175	853	210	221	1050	342	783	865	1390	957	198	227
18	180	929	200	212	360	264	824	858	949	921	200	227
19	182	826	205	216	250	329	779	1190	731	215	200	224
20	182	953	190	228	500	797	473	2340	752	192	200	226
21	180	677	200	275	1450	1800	508	2100	776	197	198	228
22	290	484	205	401	1500	1720	553	1660	985	197	198	331
23	410	385	195	750	1050	1530	642	1660	1370	197	199	284
24	485	466	190	3300	1350	1360	574	1640	1330	197	193	252
25	350	423	205	6900	1400	1140	466	1490	878	192	180	235
26	265	340	215	4300	1150	1070	399	1740	397	176	178	230
27	220	430	205	2500	310	856	401	1930	966	173	207	247
28	215	411	210	1800	295	850	383	1600	1280	169	190	223
29	200	334	230	1700	290	756	407	1500	990	170	182	227
30	220	321	310	2000	---	936	412	1290	1340	170	181	222
31	400	---	350	1600	---	926	---	1350	---	499	181	---
TOTAL	7034	27843	8298	33069	24368	23026	15607	38971	35441	21199	6004	6645
MEAN	227	928	268	1067	840	743	520	1257	1181	684	194	222
MAX	485	1830	480	6900	1700	1800	962	2340	1570	1330	210	331
MIN	175	321	190	212	250	237	271	443	397	169	178	182
AC-FT	13950	55230	16460	65590	48330	45670	30960	77300	70300	42050	11910	13180
WTR YR 1984	TOTAL	247505	MEAN	676	MAX	6900	MIN	169	AC-FT	490900		

12138160 SULTAN RIVER BELOW POWERPLANT, NEAR SULTAN, WA---Continued

WATER-QUALITY RECORDS

PERIOD OF DAILY RECORD.--

WATER TEMPERATURES: June to September 1984.

INSTRUMENTATION.--Temperature recorder since June 1984.

REMARKS.--Daily record of water temperatures for July 19 to August 23 were not published due to clock stoppage.

EXTREMES FOR CURRENT YEAR.--

WATER TEMPERATURES: Maximum for period June to September, 15.5°C June 25; minimum, 8.5°C June 16.

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984												
DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	JUNE			JULY			AUGUST			SEPTEMBER		
1	---	---	---	14.0	13.0	13.5	---	---	---	12.5	11.0	11.5
2	---	---	---	14.5	12.5	13.5	---	---	---	12.5	11.0	11.5
3	---	---	---	15.5	13.0	14.0	---	---	---	12.5	11.0	12.0
4	---	---	---	15.5	13.5	14.5	---	---	---	12.0	11.5	12.0
5	---	---	---	15.5	13.5	14.5	---	---	---	12.0	11.5	11.5
6	---	---	---	14.0	12.0	13.5	---	---	---	13.0	11.5	12.0
7	---	---	---	13.0	11.5	12.5	---	---	---	12.0	11.0	11.5
8	---	---	---	12.5	11.5	12.0	---	---	---	12.0	11.5	11.5
9	---	---	---	12.5	11.0	12.0	---	---	---	12.5	11.5	12.0
10	---	---	---	13.0	11.5	12.0	---	---	---	12.0	11.5	12.0
11	---	---	---	13.0	11.0	12.0	---	---	---	12.0	11.5	12.0
12	---	---	---	13.5	11.0	12.0	---	---	---	12.5	11.5	11.5
13	9.5	8.5	9.0	13.5	11.5	12.5	---	---	---	12.0	11.0	11.5
14	9.0	8.5	8.5	13.5	11.5	12.0	---	---	---	12.5	10.5	11.5
15	9.5	8.0	8.5	13.0	11.5	12.0	---	---	---	12.5	11.5	12.0
16	9.0	8.0	8.5	13.0	10.5	12.0	---	---	---	13.0	11.5	12.0
17	8.5	8.0	8.5	13.0	11.0	12.0	---	---	---	12.5	11.5	12.0
18	10.0	7.5	8.5	13.0	11.0	12.0	---	---	---	12.5	11.5	12.0
19	10.0	7.5	9.0	---	---	---	---	---	---	12.0	11.5	12.0
20	15.0	8.0	11.5	---	---	---	---	---	---	12.0	11.0	12.0
21	15.0	12.0	13.5	---	---	---	---	---	---	11.5	11.0	11.5
22	14.5	12.0	13.5	---	---	---	---	---	---	11.5	11.0	11.0
23	14.5	12.0	13.0	---	---	---	---	---	---	11.5	10.0	10.5
24	15.5	12.5	13.5	---	---	---	12.5	11.0	11.5	11.0	10.0	10.5
25	15.5	12.5	14.0	---	---	---	13.0	11.0	11.5	11.0	10.0	10.5
26	15.0	11.0	13.0	---	---	---	13.0	11.5	12.0	11.5	10.5	11.0
27	15.0	13.0	14.0	---	---	---	12.5	11.5	12.0	11.5	10.5	11.0
28	14.5	13.0	13.5	---	---	---	12.5	11.5	12.0	11.5	10.0	11.0
29	15.0	13.0	14.0	---	---	---	12.5	11.0	11.5	12.0	10.0	11.0
30	14.5	13.0	13.5	---	---	---	12.0	11.0	11.5	11.5	10.5	11.0
31	---	---	---	---	---	---	11.5	11.0	11.5	---	---	---
MONTH	---	---	---	---	---	---	---	---	---	13.0	10.0	11.5

12141300 MIDDLE FORK SNOQUALMIE RIVER NEAR TANNER, WA

LOCATION.--Lat 47°29'10", long 121°38'48", in SW¼ sec.10, T.23 N., R.9 E., King County, Hydrologic Unit 17110010, on left bank 0.7 mi downstream from Granite Creek, 6.4 mi east of North Bend, and at mile 55.6.

DRAINAGE AREA.--154 mi².

PERIOD OF RECORD.--February 1961 to current year.

GAGE.--Water-stage recorder and crest-stage gage. Elevation of gage is 780 ft, from topographic map.

REMARKS.--Records good except those for period of no gage-height record Dec. 17 to Jan. 3, Jan. 7-17, which are fair. No regulation or diversion upstream from station. Water temperatures June 1979 to September 1980.

AVERAGE DISCHARGE.--23 years, 1,264 ft³/s, 111.46 in/yr, 915,800 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 30,200 ft³/s Dec. 2, 1977, gage height, 14.93 ft; minimum, 111 ft³/s Oct. 13, 14, 1979, gage height, 1.00 ft.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of Nov. 23, 1959, reached a stage of 18.7 ft from floodmarks, discharge, 49,000 ft³/s by slope-area measurement at site 6 mi downstream.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 8,000 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Nov. 3	1115	8,330	8.44	Jan. 24	2115	*20,000	*12.35
Jan. 3	2230	15,000	10.81				

Minimum discharge, 206 ft³/s Aug. 27, gage height, 1.39 ft.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	295	512	826	900	1090	659	805	718	1530	1620	635	272
2	281	1050	749	4000	941	695	758	1710	1330	1530	572	287
3	276	5980	691	10700	826	627	731	1400	1260	1610	525	243
4	504	4620	627	12800	767	567	704	1130	1420	1660	486	223
5	431	2360	587	7210	800	539	727	1180	2330	1820	456	230
6	360	3070	547	4470	883	599	740	1150	2110	1590	432	524
7	321	2620	512	2800	872	709	810	1040	2360	1270	395	573
8	295	2150	555	1900	821	800	821	1210	3290	1170	386	993
9	279	1510	740	1260	826	920	805	1320	2730	1160	430	723
10	265	1650	1050	1160	851	1040	914	1260	2060	1200	427	525
11	251	2020	920	1500	877	1130	930	1560	1760	1140	402	456
12	243	1600	781	1320	2150	1280	1050	2740	1710	1120	382	626
13	233	1540	1600	1110	1870	1210	984	2300	2210	1010	388	547
14	236	2450	2230	900	1390	1040	1050	2600	2710	1070	348	410
15	231	4400	1380	770	1150	1070	1630	2050	2910	1120	320	338
16	220	4810	978	690	957	952	1600	1660	2120	1250	305	304
17	276	3830	800	620	810	914	1180	1360	1600	1250	306	284
18	321	4040	620	570	722	946	1030	1230	1540	1190	300	269
19	279	2400	510	547	659	1080	1040	2030	1640	1010	279	261
20	369	2280	445	485	767	2210	1010	3080	1900	877	264	257
21	369	1610	400	519	973	2940	920	2030	3170	772	251	320
22	1380	1250	365	888	883	2190	1010	1690	2490	753	249	448
23	968	1040	330	2060	841	2030	925	2620	2600	767	246	482
24	655	1300	310	11500	795	1850	805	1990	2840	817	237	439
25	523	1230	405	11000	740	1540	713	1550	2580	866	225	365
26	448	1050	385	3530	655	1490	639	3610	2520	869	213	319
27	407	1630	365	2950	607	1200	619	2980	2340	717	287	288
28	379	1560	350	2370	595	1180	627	2470	2190	649	432	264
29	348	1190	500	1920	583	1070	619	3340	2490	629	300	243
30	351	968	2100	1480	---	941	615	3560	2040	629	248	228
31	587	---	1350	1230	---	877	---	2160	---	636	234	---
TOTAL	12381	67720	24008	95159	26701	36295	26811	60728	65780	33771	10960	11741
MEAN	399	2257	774	3070	921	1171	894	1959	2193	1089	354	391
MAX	1380	5980	2230	12800	2150	2940	1630	3610	3290	1820	635	993
MIN	220	512	310	485	583	539	615	718	1260	629	213	223
CFSM	2.59	14.7	5.03	19.9	5.98	7.60	5.81	12.7	14.2	7.07	2.30	2.54
IN.	2.99	16.36	5.80	22.99	6.45	8.77	6.48	14.67	15.89	8.16	2.65	2.84
AC-FT	24560	134300	47620	188700	52960	71990	53180	120500	130500	66980	21740	23290
CAL YR 1983	TOTAL	426805	MEAN	1169	MAX	9940	MIN	220	CFSM	7.59	IN.	103.10
WTR YR 1984	TOTAL	472055	MEAN	1290	MAX	12800	MIN	213	CFSM	8.38	IN.	114.03
											AC-FT	846600
											AC-FT	936300

SNOHOMISH RIVER BASIN

12142000 NORTH FORK SNOQUALMIE RIVER NEAR SNOQUALMIE FALLS, WA

LOCATION.--Lat 47°36'54", long 121°42'44", in NW¼NW¼ sec.31, T.25 N., R.9 E., King County, Hydrologic Unit 17110010, on left bank 0.6 mi upstream from Calligan Creek, 7.0 mi northeast of town of Snoqualmie Falls, and at mile 9.2.

DRAINAGE AREA.--64.0 mi².

PERIOD OF RECORD.--August 1929 to October 1949, water years 1950-60 (annual maximum), February 1961 to current year.

REVISED RECORDS.--WSP 1346: 1930-31(M), 1932, 1935, 1936-37(M), 1938, 1939-42(M), 1944, 1945-46(P), 1947, 1948(P), 1949(M). WSP 1736: 1932-34(M), 1935, 1938(M), 1943-45(M), 1947(M), drainage area. WSP 1932: 1950-54(M), 1956-57(M), 1959(M).

GAGE.--Water-stage recorder. Elevation of gage is 1,130 ft, from topographic map. Prior to Oct. 19, 1949, water-stage recorder, and October 1949 to February 1961, crest-stage gage, at site 1,500 ft downstream at different datum.

REMARKS.--Records good. No regulation or diversion upstream from station. Daily water temperatures June 1979 to August 1980.

AVERAGE DISCHARGE.--43 years (water years 1930-49, 1962-84), 502 ft³/s, 106.52 in/yr, 363,700 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 15,800 ft³/s Feb. 26, 1932, gage height, 17.5 ft, site and datum then in use, from rating curve extended above 2,200 ft³/s on basis of slope-area measurement at gage height 16.47 ft; minimum observed, 30 ft³/s Sept. 17-19, 1929.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 4,000 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Jan. 4	0015	5,560	8.85	Jan. 24	2300	*8,020	*10.21

Minimum discharge, 69 ft³/s Aug. 27, gage height, 1.90 ft.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP		
1	130	309	362	500	464	327	362	334	538	521	159	101		
2	125	625	324	1810	397	334	337	730	480	481	148	105		
3	123	2450	297	3640	351	303	324	561	464	494	139	90		
4	218	1620	268	4760	327	265	324	460	520	511	131	84		
5	186	832	253	2600	351	253	334	444	898	532	125	84		
6	159	1210	237	2010	375	268	337	444	766	445	125	219		
7	145	1020	225	1380	362	327	397	420	947	366	117	238		
8	135	892	306	1020	344	337	408	538	1350	342	112	446		
9	126	620	355	695	382	404	379	556	1050	338	111	300		
10	120	928	547	625	365	428	416	500	784	353	108	228		
11	116	1090	464	790	362	508	397	675	655	354	105	203		
12	113	730	368	579	1070	570	452	1380	616	333	103	231		
13	110	720	784	464	928	570	420	947	778	288	109	195		
14	108	1220	1050	386	570	556	456	1170	853	305	101	156		
15	106	1980	665	334	460	552	844	892	870	342	94	133		
16	105	1930	464	303	386	464	640	715	652	382	90	119		
17	126	1590	365	270	337	416	464	579	502	371	87	110		
18	163	1630	315	245	303	428	408	516	491	331	84	104		
19	130	1030	282	237	282	472	432	1010	512	279	81	99		
20	184	1040	248	222	390	1330	400	1230	599	247	78	99		
21	176	710	205	248	508	1330	382	700	1170	223	77	138		
22	680	543	188	424	400	916	460	635	847	220	75	193		
23	382	456	168	802	372	874	408	1250	803	226	74	202		
24	255	705	154	4620	355	720	348	796	821	230	73	209		
25	209	615	201	4500	337	601	303	606	753	232	72	168		
26	182	468	193	1410	300	620	276	1920	785	219	70	146		
27	168	961	178	1220	282	512	265	1290	776	195	105	132		
28	159	796	165	982	291	534	265	1020	690	180	168	116		
29	149	556	199	796	297	492	273	1210	773	172	104	106		
30	157	432	1070	588	---	424	282	1130	615	170	95	100		
31	404	---	778	534	---	393	---	710	---	167	90	---		
TOTAL	5649	29708	11678	38994	11948	16528	11793	25368	22358	9849	3210	4854		
MEAN	182	990	377	1258	412	533	393	818	745	318	104	162		
MAX	680	2450	1070	4760	1070	1330	844	1920	1350	532	168	446		
MIN	105	309	154	222	282	253	265	334	464	167	70	84		
CFSM	2.84	15.5	5.89	19.7	6.44	8.33	6.14	12.8	11.6	4.97	1.62	2.53		
IN.	3.28	17.27	6.79	22.67	6.94	9.61	6.85	14.75	13.00	5.72	1.87	2.82		
AC-FT	11200	58930	23160	77340	23700	32780	23390	50320	44350	19540	6370	9630		
CAL YR 1983	TOTAL	175621	MEAN	481	MAX	4130	MIN	103	CFSM	7.52	IN.	102.08	AC-FT	348300
WTR YR 1984	TOTAL	191937	MEAN	524	MAX	4760	MIN	70	CFSM	8.19	IN.	111.56	AC-FT	380700

12143400 SOUTH FORK SNOQUALMIE RIVER ABOVE ALICE CREEK, NEAR GARCIA, WA

LOCATION.--Lat 47°24'55", long 121°35'10", in SW¼SW¼ sec.6, T.22 N., R.10 E., King County, Hydrologic Unit 17110010, Snoqualmie National Forest, on left bank 0.4 mi upstream from Alice Creek, 1.5 mi southeast of Garcia, 11 mi southeast of North Bend, and at mile 17.3.

DRAINAGE AREA.--41.6 mi².

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

REVISED RECORDS.--WDR WA-80-1: 1978.

GAGE.--Water-stage recorder. Datum of gage is 1,447.67 ft above Washington Highway Department datum.

REMARKS.--Records good. No regulation or diversion upstream from station.

AVERAGE DISCHARGE.--24 years, 304 ft³/s, 99.24 in/yr, 220,200 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 7,090 ft³/s Nov. 19, 1962, gage height, 11.96 ft; minimum, 25 ft³/s Oct. 25, 26, 27, 1974, gage height, 0.99 ft; minimum gage height, 0.06 ft all or part of each day Oct. 10-14, 1979.

EXTREMES OUTSIDE PERIOD OF RECORD.--Floods in November and December 1959 reached stages of 14.7 ft and 13.4 ft respectively, from flood marks, discharges not determined.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 1,500 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Nov. 3	0930	1,620	3.17	Jan. 24	2015	*5,640	*6.59
Jan. 4	0600	3,340	4.86				

Minimum discharge, 38 ft³/s Sept. 4, 5, gage height, 0.13 ft.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP		
1	67	84	206	116	317	135	237	263	475	416	101	51		
2	65	164	189	278	283	143	219	514	451	415	94	46		
3	65	1120	173	1820	250	132	216	388	444	421	87	40		
4	110	922	158	3190	210	124	206	321	503	422	82	39		
5	84	509	146	1910	212	121	226	314	684	428	80	47		
6	74	582	137	1220	228	135	223	296	605	361	75	93		
7	67	489	126	928	222	152	230	290	630	305	69	78		
8	63	395	132	681	209	183	223	362	741	290	67	152		
9	63	313	152	474	199	223	216	393	655	292	68	96		
10	61	317	164	399	209	270	240	360	562	283	67	73		
11	57	351	158	404	212	289	237	513	531	273	64	79		
12	56	317	143	330	399	330	278	812	555	255	65	100		
13	54	326	259	278	395	305	251	703	673	237	67	81		
14	54	571	368	237	330	266	270	712	795	238	59	62		
15	54	752	278	202	282	286	460	555	752	250	55	54		
16	52	1010	216	183	244	263	413	460	568	257	53	50		
17	59	968	176	161	216	263	334	406	463	247	53	47		
18	56	962	158	137	196	266	309	397	467	221	51	44		
19	56	592	143	132	183	286	305	649	489	191	48	43		
20	67	555	121	124	186	545	286	821	536	170	47	43		
21	63	386	100	126	192	710	289	535	724	156	45	54		
22	202	309	94	158	183	550	305	481	588	150	44	81		
23	137	263	84	364	176	545	274	706	671	148	43	79		
24	103	313	76	2860	173	489	237	562	693	151	43	68		
25	87	270	110	2640	164	427	212	465	633	152	41	57		
26	80	248	115	922	149	408	196	749	620	143	40	51		
27	74	351	94	776	140	342	192	714	549	127	54	47		
28	69	342	84	642	135	322	199	743	556	120	63	43		
29	65	282	84	545	129	282	196	994	598	115	46	40		
30	67	237	106	436	---	259	202	960	498	109	42	40		
31	89	---	143	364	---	251	---	612	---	106	41	---		
TOTAL	2320	14300	4693	23037	6423	9302	7681	17050	17709	7449	1854	1878		
MEAN	74.8	477	151	743	221	300	256	550	590	240	59.8	62.6		
MAX	202	1120	368	3190	399	710	460	994	795	428	101	152		
MIN	52	84	76	116	129	121	192	263	444	106	40	39		
CFSM	1.80	11.5	3.63	17.9	5.31	7.21	6.15	13.2	14.2	5.77	1.44	1.50		
IN.	2.07	12.79	4.20	20.60	5.74	8.32	6.87	15.25	15.84	6.66	1.66	1.68		
AC-FT	4600	28360	9310	45690	12740	18450	15240	33820	35130	14780	3680	3730		
CAL YR 1983	TOTAL	101968	MEAN	279	MAX	2730	MIN	52	CFSM	6.71	IN.	91.18	AC-FT	202300
WTR YR 1984	TOTAL	113696	MEAN	311	MAX	3190	MIN	39	CFSM	7.48	IN.	101.67	AC-FT	225500

SNOHOMISH RIVER BASIN

12143600 SOUTH FORK SNOQUALMIE RIVER AT EDGEWICK, WA

LOCATION.--Lat 47°27'10", long 121°43'00", in NE¼NE¼ sec.25, T.23 N., R.8 E., King County, Hydrologic Unit 17110010, on left bank at upstream side of highway bridge in Edgewick, 3 mi downstream from Change Creek, and at mile 8.6.

DRAINAGE AREA.--65.9 mi².

PERIOD OF RECORD.--July to October 1962, March 1963 to September 1965, October 1983 to September 1984.

GAGE.--Water-stage recorder. Datum of gage is 571.24 ft above National Geodetic Vertical Datum of 1929. Prior to August 3, 1983, gage at site 45 ft downstream at elevation 5.90 ft higher.

REMARKS.--Records good except for those during periods of once-daily readings Oct. 1 to Feb. 8, and Feb. 23 to Mar. 9, which are fair. No regulation or diversion upstream from station.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 8,420 ft³/s Jan. 24, 1984, gage height, 12.96 ft, from high-water mark; a minimum, 58 ft³/s Oct. 10, 11, 1963.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 2,150 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Nov. 3	unknown	unknown	unknown	Jan. 4	unknown	unknown	unknown
Nov. 16	unknown	unknown	unknown	Jan. 24	unknown	*8,420	*12.96

Minimum discharge, 65 ft³/s Sept. 29, 30, gage height, 6.70 ft.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	104	118	442	231	570	241	406	369	731	609	147	76
2	104	190	357	550	537	258	375	876	673	573	138	77
3	106	2570	305	3080	413	241	347	712	648	587	130	70
4	167	1810	293	4300	368	224	333	569	711	576	125	66
5	129	970	248	2860	346	215	344	532	962	595	121	69
6	111	1120	231	1960	373	248	366	505	921	517	115	117
7	100	911	215	1530	357	277	396	479	903	434	104	120
8	100	751	215	1190	346	305	394	555	1120	393	103	169
9	93	626	244	894	328	352	372	629	1000	383	105	141
10	95	570	325	751	339	419	411	601	869	387	107	110
11	91	640	260	790	369	488	427	754	795	357	103	105
12	87	570	240	677	752	549	471	1270	792	348	104	133
13	87	591	425	537	815	556	464	1120	943	319	107	122
14	87	979	751	402	633	469	456	1120	1100	312	100	96
15	89	1400	570	305	536	492	766	930	1100	316	95	84
16	85	2130	413	290	455	466	734	770	845	329	96	79
17	93	2050	330	270	393	443	580	671	678	322	95	75
18	89	2050	285	250	350	439	514	631	651	286	93	71
19	93	1040	255	238	318	456	494	913	675	245	91	69
20	97	1130	221	224	312	882	466	1270	742	224	89	67
21	97	790	190	209	330	1230	449	862	1030	206	87	77
22	357	640	156	330	319	983	488	747	870	201	86	104
23	200	504	126	336	310	922	452	1100	924	196	86	115
24	156	640	121	2240	305	869	388	942	986	197	86	97
25	134	492	184	4390	297	748	347	770	904	197	84	86
26	121	530	200	1590	266	728	316	1130	871	194	82	78
27	116	760	170	1380	244	624	302	1150	799	175	89	72
28	109	744	140	1100	244	578	300	1110	765	166	103	67
29	106	537	231	945	238	509	303	1380	843	160	78	65
30	100	461	258	751	---	450	299	1400	742	154	71	65
31	137	---	285	640	---	428	---	955	---	150	69	---
TOTAL	3640	28314	8686	35240	11463	16089	12760	26822	25593	10108	3089	2742
MEAN	117	944	280	1137	395	519	425	865	853	326	99.6	91.4
MAX	357	2570	751	4390	815	1230	766	1400	1120	609	147	169
MIN	85	118	121	209	238	215	299	369	648	150	69	65
CFSM	1.78	14.3	4.25	17.3	5.99	7.88	6.45	13.1	12.9	4.95	1.51	1.39
IN.	2.05	15.98	4.90	19.89	6.47	9.08	7.20	15.14	14.45	5.71	1.74	1.55
AC-FT	7220	56160	17230	69900	22740	31910	25310	53200	50760	20050	6130	5440

WTR YR 1984 TOTAL 184546 MEAN 504 MAX 4390 MIN 65 CFSM 7.65 IN. 104.17 AC-FT 366000

SNOHOMISH RIVER BASIN

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12143700 BOXLEY CREEK NEAR CEDAR FALLS, WA

LOCATION.--Lat 47°25'58", long 121°45'04", in NE¼SW¼ sec.35, T.23 N., R.8 E., King County, Hydrologic Unit 17110012, on left bank 1.7 mi northeast of town of Cedar Falls, and 2.5 mi upstream from mouth.

DRAINAGE AREA.--1.57 mi².

PERIOD OF RECORD.--August 1945 to current year. Prior to October 1960 published in WSP 1932.

GAGE.--Water-stage recorder. Elevation of gage is 1,220 ft, from topographic map.

REMARKS.--Records good except those for periods of no gage-height record Oct. 21 to Jan. 12, and Feb. 29 to May 9, which are poor. No regulation or diversion upstream from station. Flow is mostly seepage from Chester Morse Lake.

AVERAGE DISCHARGE.--39 years, 24.3 ft³/s, 17,610 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 189 ft³/s Dec. 19, 1977, gage height, 2.88 ft, maximum gage height, 3.13 ft Feb. 28, 1982; no flow part or all of each day Oct. 28 to Nov. 9, 1966, Nov. 5-8, 1967.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 50 ft³/s June 4-9, gage height, 2.88 ft; minimum daily, 3.2 ft³/s Nov. 14, 15.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	13	5.6	15	9.5	32	16	14	19	48	42	38	20
2	12	5.3	17	10	36	15	14	19	48	42	38	20
3	12	5.1	17	11	38	15	14	20	48	42	37	19
4	12	4.9	18	11	38	15	14	20	48	43	37	19
5	11	4.7	18	10	39	15	15	21	49	44	36	18
6	11	4.4	18	10	38	15	15	22	50	44	35	18
7	11	4.2	18	9.8	38	14	15	22	50	45	35	18
8	11	3.9	18	9.6	38	14	15	23	50	45	34	18
9	9.9	3.7	17	9.6	37	14	15	24	49	45	34	17
10	9.9	3.6	17	10	36	14	15	25	48	45	33	17
11	9.6	3.5	17	10	35	14	15	26	47	45	32	17
12	8.9	3.3	17	11	34	14	15	27	47	44	32	16
13	8.6	3.3	16	11	33	14	16	28	46	44	31	16
14	8.6	3.2	16	13	31	14	16	29	45	44	31	16
15	8.4	3.2	16	13	30	14	16	31	44	44	30	16
16	8.1	3.3	16	15	28	14	17	32	44	44	29	16
17	8.1	3.5	15	17	28	14	17	33	44	44	28	15
18	7.6	3.8	14	18	26	15	17	35	43	44	28	15
19	7.6	4.2	14	20	25	15	17	37	42	44	28	15
20	7.4	4.5	13	22	24	15	18	39	42	44	27	14
21	7.1	5.0	13	24	24	15	18	40	43	44	27	14
22	7.0	5.6	12	24	22	15	18	41	41	44	26	14
23	6.9	6.6	12	25	21	15	18	43	41	44	25	14
24	6.7	7.4	11	28	21	15	18	44	41	42	25	13
25	6.5	7.0	12	30	20	15	18	44	42	42	24	13
26	6.3	7.8	12	28	20	15	19	46	42	41	24	13
27	6.1	8.8	11	28	19	14	19	46	42	41	23	13
28	5.8	10	11	28	18	14	19	46	42	40	22	13
29	5.6	11	11	28	17	14	19	47	42	40	21	13
30	5.4	13	10	29	---	14	19	47	42	39	21	12
31	5.8	---	10	31	---	14	---	47	---	39	21	---
TOTAL	264.9	163.4	452	553.5	846	450	495	1023	1350	1334	912	472
MEAN	8.55	5.45	14.6	17.9	29.2	14.5	16.5	33.0	45.0	43.0	29.4	15.7
MAX	13	13	18	31	39	16	19	47	50	45	38	20
MIN	5.4	3.2	10	9.5	17	14	14	19	41	39	21	12
AC-FT	525	324	897	1100	1680	893	982	2030	2680	2650	1810	936
CAL YR 1983	TOTAL	6401.3	MEAN	17.5	MAX	48	MIN	3.2	AC-FT	12700		
WTR YR 1984	TOTAL	8315.8	MEAN	22.7	MAX	50	MIN	3.2	AC-FT	16490		

SNOHOMISH RIVER BASIN

12143800 RATTLESNAKE LAKE AT CEDAR FALLS, WA

LOCATION.--Lat 47°25'39", long 121°46'29", in SW¼SW¼ sec.34, T.23 N., R.8 E., King County, Hydrologic Unit 17110012, on southeast shore, and 0.6 mi northeast of town of Cedar Falls.

DRAINAGE AREA.--1.86 mi².

PERIOD OF RECORD.--November to December 1945 (fragmentary), January 1953 to current year. Extremes prior to October 1960 published in WSP 1932 and daily gage heights are available in files of the Geological Survey.

GAGE.--Nonrecording gage. Datum of gage is 7.25 ft above National Geodetic Vertical Datum of 1929 (levels by city of Seattle).

REMARKS.--No diversions. Inflow is mostly seepage from Chester Morse Lake. Most outflow from lake is seepage; however, when the lake level exceeds 906 ft gage height, surface-water discharge flows through Rattlesnake Ditch toward Boxley Creek.

COOPERATION.--Gage readings furnished by city of Seattle.

EXTREMES FOR PERIOD OF RECORD.--Maximum gage height observed, 911.80 ft Nov. 25, 26, 1959; minimum observed, 852.80 ft Jan. 9, 1953, but may have been less during Dec. 13, 1965, to Jan. 3, 1966, and Nov. 10 to Dec. 23, 1970, when water was below gage.

EXTREMES FOR CURRENT YEAR.--Maximum gage height observed, 908.49 ft Jan. 28; minimum observed, 896.90 ft Nov. 29.

GAGE HEIGHT (FEET ABOVE DATUM), WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984
INSTANTANEOUS OBSERVATIONS AT 0730

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	902.24	897.76	896.94	902.30	907.99	905.61	903.86	902.74	906.10	905.66	904.62	903.03
2	902.14	897.60	896.96	902.30	907.70	905.58	903.76	902.74	906.16	905.62	904.60	902.94
3	901.98	897.50	897.08	902.58	907.54	905.56	903.66	902.78	906.16	905.58	904.62	902.84
4	901.90	897.58	897.16	902.88	907.40	905.36	903.64	902.76	906.20	905.66	904.58	902.76
5	901.82	897.65	897.32	903.46	907.30	905.26	903.48	902.76	906.24	905.70	904.54	902.66
6	901.70	897.76	897.44	904.08	907.18	905.14	903.40	902.82	906.26	905.70	904.52	902.58
7	901.58	897.80	897.58	904.46	907.08	905.02	903.30	902.84	906.30	905.68	904.48	902.48
8	901.44	897.80	897.80	904.76	906.98	904.86	903.27	902.86	906.24	905.60	904.46	902.40
9	901.30	897.78	898.08	904.90	906.94	904.76	903.18	902.90	906.24	905.56	904.38	902.28
10	901.18	897.65	898.46	904.96	906.85	904.60	903.26	903.02	906.20	905.50	904.34	902.20
11	901.06	897.58	898.74	905.06	906.86	904.50	903.28	903.08	906.30	905.42	904.38	902.11
12	900.88	897.40	899.06	905.04	906.84	904.34	903.32	903.20	906.20	905.40	904.30	902.02
13	900.74	897.20	899.44	905.00	906.85	904.30	903.40	903.28	906.18	905.38	904.26	901.90
14	900.63	897.09	899.82	904.96	906.84	904.20	903.48	903.38	906.14	905.30	904.22	901.80
15	900.52	896.98	900.10	904.92	906.82	904.08	903.48	903.68	906.10	905.30	---	901.64
16	900.28	896.94	900.46	904.90	906.58	904.01	903.44	903.88	906.06	905.26	904.10	901.52
17	900.18	896.94	900.78	904.88	906.70	903.90	903.48	904.00	906.20	905.20	904.04	901.40
18	900.04	897.00	901.08	904.86	906.60	903.79	903.48	904.16	905.98	905.18	904.00	901.26
19	899.96	897.04	901.32	904.86	906.48	903.70	903.50	904.16	905.92	905.10	903.94	901.12
20	899.78	897.18	901.52	904.84	906.40	903.68	903.46	904.38	905.84	905.08	903.88	901.00
21	899.64	897.14	901.70	904.94	906.32	903.66	903.40	904.50	905.86	905.06	903.80	900.90
22	899.60	897.10	901.88	905.10	906.26	903.65	903.36	904.61	905.84	905.06	903.76	900.81
23	899.32	897.10	901.96	905.22	906.18	903.68	903.30	904.82	905.80	905.00	903.68	900.68
24	899.18	897.10	902.00	905.56	906.12	903.76	903.26	905.00	905.80	905.00	903.62	900.56
25	899.06	897.04	902.15	907.08	906.04	903.80	903.20	905.18	905.78	904.98	903.56	900.40
26	898.83	896.95	902.50	908.12	905.94	903.90	903.11	905.32	905.72	904.94	903.48	900.28
27	898.65	896.96	902.20	908.48	905.95	903.90	903.00	905.62	905.70	904.88	903.40	900.12
28	898.46	896.92	902.50	908.49	905.60	903.96	902.84	905.76	905.70	904.40	903.38	900.01
29	898.28	896.90	902.50	908.40	905.73	903.98	902.88	905.92	905.72	904.84	903.28	899.89
30	898.01	896.94	902.48	908.24	---	903.96	902.78	906.00	905.70	904.74	903.20	899.76
31	897.88	---	902.48	908.08	---	903.94	---	906.18	---	904.70	903.12	---
MEAN	900.27	897.28	900.05	905.28	906.69	904.34	903.34	904.01	906.02	905.24	---	901.51
MAX	902.24	897.80	902.50	908.49	907.99	905.61	903.86	906.18	906.30	905.70	---	903.03
MIN	897.88	896.90	896.94	902.30	905.60	903.65	902.78	902.74	905.70	904.40	---	899.76

SNOHOMISH RIVER BASIN

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12143900 BOXLEY CREEK NEAR EDGEWICK, WA

LOCATION.--Lat 47°26'56", long 121°43'50", in SW¼SE¼NW¼ sec.25, T.23 N., R.8 E., King County, Hydrologic Unit 17110010, on right bank 4.0 mi southeast of North Bend, and at mile 0.9.

DRAINAGE AREA.--3.64 mi².

PERIOD OF RECORD.--August 1981 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 650 ft, from topographic map.

REMARKS.--Records fair except those for period of no gage-height record, Oct. 1 to Nov. 21, which are poor. Many small diversions for domestic use upstream from station. No regulation; flow is mostly seepage from Chester Morse Lake.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 173 ft³/s Feb. 24, 1982, gage height, 5.07 ft; minimum daily discharge, 11 ft³/s Nov. 13-15, 1983.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 134 ft³/s Jan. 25, gage height, 4.93 ft; minimum daily, 11 ft³/s Nov. 13-15.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	33	18	25	30	100	43	35	37	72	67	56	35
2	33	17	27	33	93	41	35	39	72	65	54	34
3	32	17	29	39	91	41	35	39	72	63	52	33
4	31	16	31	42	89	40	35	37	82	67	51	32
5	31	15	33	40	88	41	36	38	91	69	52	32
6	30	14	34	37	87	40	36	39	82	67	49	32
7	29	14	35	35	84	40	36	39	82	69	44	31
8	28	13	36	34	89	38	35	38	87	67	47	31
9	27	13	38	31	93	36	36	41	84	65	46	31
10	26	12	38	32	91	35	36	42	80	65	44	31
11	26	12	39	33	91	36	36	49	82	65	46	30
12	25	12	38	32	89	40	36	47	80	67	47	29
13	25	11	35	32	91	36	36	47	76	65	44	28
14	23	11	34	33	89	36	36	49	78	65	46	27
15	23	11	35	35	87	36	38	49	76	64	43	26
16	22	12	37	35	82	35	36	52	76	63	42	26
17	22	13	39	35	79	35	36	51	72	64	41	26
18	21	14	38	35	77	35	35	54	71	65	44	26
19	21	16	38	36	70	36	35	61	70	65	43	26
20	20	18	37	38	67	38	35	63	72	64	41	25
21	20	20	36	41	66	38	35	63	78	64	38	24
22	19	21	35	44	61	38	35	66	72	65	37	24
23	19	21	34	49	63	39	35	67	69	62	37	24
24	18	28	33	82	63	41	36	67	69	62	34	24
25	18	21	34	123	59	40	36	69	67	59	33	24
26	18	21	36	114	58	40	36	74	70	60	33	24
27	17	23	33	115	54	38	36	72	67	60	34	24
28	17	22	32	112	49	38	36	72	69	61	33	24
29	17	22	32	110	46	37	36	72	72	59	36	24
30	18	23	34	115	---	36	36	71	65	61	36	24
31	19	---	32	114	---	36	---	72	---	56	35	---
TOTAL	728	501	1067	1716	2246	1179	1071	1676	2255	1980	1318	831
MEAN	23.5	16.7	34.4	55.4	77.4	38.0	35.7	54.1	75.2	63.9	42.5	27.7
MAX	33	28	39	123	100	43	38	74	91	69	56	35
MIN	17	11	25	30	46	35	35	37	65	56	33	24
AC-FT	1440	994	2120	3400	4450	2340	2120	3320	4470	3930	2610	1650
CAL YR 1983	TOTAL	12017	MEAN	32.9	MAX	67	MIN	11	AC-FT	23840		
WTR YR 1984	TOTAL	16568	MEAN	45.3	MAX	123	MIN	11	AC-FT	32860		

SNOHOMISH RIVER BASIN

12144000 SOUTH FORK SNOQUALMIE RIVER AT NORTH BEND, WA

LOCATION.--Lat 47°29'35", long 121°47'20", in SW¼NE¼ sec.9, T.23 N., R.8 E., King County, Hydrologic Unit 17110010, on right bank on upstream side of Bendigo Street crossing at North Bend, and at mile 2.0.

DRAINAGE AREA.--81.7 mi².

PERIOD OF RECORD.--July 1907 to September 1926, February 1929 to September 1938, June 1945 to April 1950, October 1960 to August 1974, February to September 1984.

REVISED RECORDS.--WSP 1316: 1918-19(M). WSP 1932: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 439.33 ft above National Geodetic Vertical Datum of 1929. Prior to April 11, 1950, nonrecording gage or water-stage recorder at several sites within 0.5 mi upstream from present site at various datums. October 1, 1960 to March 10, 1965, at site 0.46 mi upstream at datum 1.86 ft lower. March 10, 1965 to August 31, 1974, at site 0.46 mi upstream at datum 6.86 ft lower.

REMARKS.--Records good except those for periods of no gage-height record Feb. 1-7, June 4-12, July 11-18, which are fair. City of North Bend diverts about 0.8 ft³/s daily from Clough Creek for municipal use. No regulation.

AVERAGE DISCHARGE.--45 years (1907-26, 1929-38, 1945-49, 1960-73), 549 ft³/s, 91.25 in/yr, 397,800 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge recorded, 9,280 ft³/s Nov. 20, 1962, gage height, 13.09 ft, site and datum then in use, from rating curve extended above 1,600 ft³/s on basis of slope-area measurement of peak flow; maximum gage height, 15.2 ft, from high-water mark, site and datum then in use, Oct. 25, 1934; minimum discharge, 63 ft³/s Oct. 22, 1925.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of Nov. 22, 1959, reached a stage of 14.49 ft, site and datum then in use, from floodmarks, discharge, 13,000 ft³/s, slope-area measurement.

EXTREMES FOR CURRENT YEAR.--Maximum discharge during period February to September, 1,750 ft³/s May 30, gage height, 10.34 ft; minimum discharge, 136 ft³/s Sept. 30, gage height, 7.42 ft.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1					870	334	508	419	887	722	226	152
2					810	334	485	887	819	692	223	152
3					680	325	463	806	800	686	214	151
4					570	313	452	674	880	674	208	149
5					540	305	447	633	1080	686	205	147
6					580	301	474	616	1040	622	203	153
7					550	324	519	576	1020	541	194	169
8					542	378	519	627	1280	496	191	194
9					524	441	491	698	1130	485	191	204
10					519	485	513	710	1000	496	191	180
11					530	570	553	770	910	450	188	173
12					930	639	593	1300	890	440	183	177
13					981	668	604	1190	1060	415	183	180
14					806	587	564	1140	1230	395	182	168
15					722	576	843	1050	1180	400	175	160
16					627	558	856	899	943	410	173	153
17					558	541	722	800	794	408	171	150
18					508	536	627	746	758	360	171	149
19					469	541	616	956	788	338	165	145
20					458	912	593	1390	837	309	164	145
21					452	1290	558	1000	1130	299	162	145
22					452	1080	576	856	981	286	160	157
23					447	1010	564	1180	1030	278	160	173
24					435	1010	502	1080	1060	271	160	168
25					424	868	474	912	987	271	158	160
26					393	856	435	1230	949	271	153	153
27					374	740	414	1310	887	261	152	148
28					342	698	393	1210	856	249	166	142
29					338	633	393	1430	924	244	158	139
30					---	570	393	1570	843	235	151	137
31					---	541	---	1130	---	229	151	---
TOTAL					16431	18964	16144	29795	28973	12919	5532	4773
MEAN					567	612	538	961	966	417	178	159
MAX					981	1290	856	1570	1280	722	226	204
MIN					338	301	393	419	758	229	151	137
CFSM					6.94	7.49	6.59	11.8	11.8	5.10	2.18	1.95
IN.					7.48	8.63	7.35	13.57	13.19	5.88	2.52	2.17
AC-FT					32590	37620	32020	59100	57470	25620	10970	9470

12145500 RAGING RIVER NEAR FALL CITY, WA

LOCATION.--Lat 47°32'24", long 121°54'28", on west line sec.27, T.24 N., R.7 E., King County, Hydrologic Unit 17110010, on right bank at highway bridge 2.0 mi southwest of Fall City, and 2.6 mi upstream from mouth.

DRAINAGE AREA.--30.6 mi².

PERIOD OF RECORD.--July 1945 to September 1950, water years 1951, and 1953-63 (annual maximum), December 1963 to June 1973, October 1973 to April 1974, October 1974 to current year.

REVISED RECORDS.--WSP 1316: Drainage area.

GAGE.--Water-stage recorder. Elevation of gage is 250 ft, from topographic map. Prior to Oct. 1, 1950, water-stage recorder on left bank at present site and datum. August 1951 and January 1953 to February 1963, crest-stage gage only on left bank at present site and datum.

REMARKS.--Records good. Some small diversions for irrigation and domestic use upstream from station. No regulation.

AVERAGE DISCHARGE.--23 years (water years 1946-50, 1965-72, 1975-84), 139 ft³/s, 61.69 in/yr, 100,700 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 3,960 ft³/s Jan. 24, 1984, gage height, 5.74 ft; maximum gage height, 6.75 ft Feb. 9, 1951; minimum daily discharge, 4.4 ft³/s Aug. 21, 1967.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 1,300 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Jan. 24	2400	*3,960	*5.74	No other peak greater than base discharge.			

Minimum discharge, 9.8 ft³/s on all or part of Aug. 26, 27, Sept. 4, 5, 15, 17-19, 29, 30, gage height, 0.81 ft.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP		
1	29	113	129	122	143	125	133	98	98	60	14	12		
2	27	161	118	263	125	117	118	171	87	55	14	11		
3	26	580	111	550	113	104	115	215	79	48	13	10		
4	40	535	98	658	104	95	107	167	101	43	13	10		
5	32	326	92	616	95	87	115	155	123	41	13	11		
6	29	366	84	370	89	81	157	149	101	39	15	14		
7	27	346	89	263	81	74	239	126	92	35	13	13		
8	26	254	135	208	80	72	224	113	146	33	13	20		
9	25	218	170	168	92	67	205	124	132	31	12	14		
10	24	188	378	178	107	70	310	133	111	30	12	15		
11	24	178	334	205	157	67	296	146	98	29	12	14		
12	24	155	260	188	330	141	293	149	86	29	12	14		
13	22	175	346	157	307	139	254	139	76	28	12	13		
14	25	462	370	133	221	118	200	157	69	26	12	11		
15	24	628	282	115	193	127	165	176	64	24	11	10		
16	23	714	213	102	159	111	145	156	62	23	11	10		
17	28	570	168	90	137	108	127	132	58	22	11	10		
18	26	404	141	81	122	117	115	114	51	20	11	9.8		
19	25	310	122	73	111	122	107	157	46	19	11	10		
20	30	952	104	70	125	224	96	161	54	19	10	11		
21	27	510	84	87	198	358	93	133	180	19	10	12		
22	86	303	78	175	185	242	90	161	122	18	10	40		
23	54	224	72	269	188	282	84	280	90	17	10	23		
24	43	326	66	1740	203	350	74	199	73	16	10	15		
25	37	239	73	1780	185	303	68	162	66	16	10	13		
26	33	198	80	550	161	272	63	281	67	16	10	13		
27	35	218	77	366	141	213	60	230	67	16	13	11		
28	33	205	62	279	133	215	60	177	55	15	16	11		
29	31	178	89	224	122	210	60	146	84	15	12	10		
30	58	151	180	188	---	180	74	126	73	15	11	10		
31	163	---	151	159	---	151	---	112	---	14	11	---		
TOTAL	1136	10187	4756	10427	4407	4942	4247	4945	2611	831	368	400.8		
MEAN	36.6	340	153	336	152	159	142	160	87.0	26.8	11.9	13.4		
MAX	163	952	378	1780	330	358	310	281	180	60	16	40		
MIN	22	113	62	70	80	67	60	98	46	14	10	9.8		
CFSM	1.20	11.1	5.00	11.0	4.97	5.20	4.64	5.23	2.84	.88	.39	.44		
IN.	1.38	12.38	5.78	12.68	5.36	6.01	5.16	6.01	3.17	1.01	.45	.49		
AC-FT	2250	20210	9430	20680	8740	9800	8420	9810	5180	1650	730	795		
CAL YR 1983	TOTAL	44875	MEAN	123	MAX	2000	MIN	19	CFSM	4.02	IN.	54.55	AC-FT	89010
WTR YR 1984	TOTAL	49257.8	MEAN	135	MAX	1780	MIN	9.8	CFSM	4.41	IN.	59.88	AC-FT	97700

SNOHOMISH RIVER BASIN

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12147500 NORTH FORK TOLT RIVER NEAR CARNATION, WA

LOCATION.--Lat 47°42'45", long 121°47'15", in SW¼NE¼ sec.28, T.26 N., R.8 E., King County, Hydrologic Unit 17110010, on right bank 2.9 mi upstream from confluence with South Fork, 7.4 mi northeast of Carnation, and at mile 11.7.

DRAINAGE AREA.--39.9 mi².

PERIOD OF RECORD.--October 1952 to December 1963, November 1967 to current year.

REVISED RECORDS.--WSP 1566: 1957. WSP 1932: Drainage area.

GAGE.--Water-stage recorder. Elevation of gage is 600 ft, from river-profile map.

REMARKS.--Records good except for periods of no gage-height record Oct. 1 to Nov. 22, Apr. 21-24, May 27 to June 1, July 25 to Aug. 21, Aug. 26 to Sept. 30, which are fair. No regulation or diversion upstream from station.

AVERAGE DISCHARGE.--27 years (water years 1953-63, 1969-84), 364 ft³/s, 123.89 in/yr, 263,700 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 9,560 ft³/s Dec. 15, 1959, gage height, 13.15 ft, from rating curve extended above 2,800 ft³/s; minimum, 38 ft³/s Sept. 13, 14, 1958, minimum gage height, 3.36 ft Sept. 25, 26, 27, 1979.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 3,000 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Jan. 4	1900	3,820	9.63	Jan. 25	0300	*5,460	*10.96

Minimum daily discharge, 73 ft³/s Aug. 26.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP		
1	120	270	320	414	438	293	314	338	380	270	108	80		
2	132	440	296	1310	383	314	290	630	340	250	115	82		
3	126	1220	275	2210	348	272	290	466	320	230	105	80		
4	180	1000	254	2750	327	245	275	383	350	220	100	79		
5	150	400	239	1300	338	236	293	338	500	215	100	80		
6	129	460	225	1270	338	254	278	366	480	205	105	200		
7	117	430	223	840	314	281	366	320	700	190	100	250		
8	110	400	372	675	314	299	314	366	940	180	96	290		
9	108	315	387	534	334	320	296	410	960	170	92	200		
10	106	365	510	542	323	394	317	387	700	170	90	135		
11	105	420	426	640	348	470	327	387	500	165	88	120		
12	105	325	338	498	956	530	376	605	430	160	88	125		
13	103	350	790	410	680	474	314	510	450	150	94	110		
14	113	465	938	358	450	454	466	640	430	150	88	98		
15	123	1080	562	320	366	478	554	458	400	155	86	92		
16	105	1100	394	296	314	358	352	422	350	160	84	88		
17	107	1090	323	275	281	317	293	369	300	155	83	85		
18	109	1130	293	257	263	334	293	320	270	145	82	84		
19	111	1060	266	248	251	394	299	600	285	135	81	85		
20	120	1110	242	236	390	980	275	760	337	130	80	92		
21	117	1060	220	263	466	920	280	458	666	125	79	90		
22	395	800	205	498	344	630	310	430	446	122	78	135		
23	280	418	190	944	314	685	420	760	399	124	77	120		
24	160	690	180	3300	317	550	340	486	379	122	76	110		
25	143	542	190	2680	296	478	290	376	330	120	74	100		
26	127	458	193	1040	266	438	266	1230	370	118	73	94		
27	121	805	180	1060	257	372	275	800	340	116	90	88		
28	117	615	174	845	284	450	266	640	300	114	110	86		
29	112	454	210	695	281	414	266	610	350	110	86	84		
30	145	369	820	550	---	366	299	580	320	112	80	82		
31	520	---	720	482	---	341	---	450	---	110	78	---		
TOTAL	4616	19641	10955	27740	10581	13341	9594	15895	13322	4898	2766	3444		
MEAN	149	655	353	895	365	430	320	513	444	158	89.2	115		
MAX	520	1220	938	3300	956	980	554	1230	960	270	115	290		
MIN	103	270	174	236	251	236	266	320	270	110	73	79		
CFSM	3.73	16.4	8.85	22.4	9.15	10.8	8.02	12.9	11.1	3.96	2.24	2.88		
IN.	4.30	18.31	10.21	25.86	9.86	12.44	8.94	14.82	12.42	4.57	2.58	3.21		
AC-FT	9160	38960	21730	55020	20990	26460	19030	31530	26420	9720	5490	6830		
CAL YR 1983	TOTAL	121361	MEAN	332	MAX	2970	MIN	91	CFSM	8.32	IN.	113.15	AC-FT	240700
WTR YR 1984	TOTAL	136793	MEAN	374	MAX	3300	MIN	73	CFSM	9.37	IN.	127.54	AC-FT	271300

NOTE.--No gage-height record Oct. 1 to Nov. 22; Aug. 26 to Sept. 30.

12147600 SOUTH FORK TOLT RIVER NEAR INDEX, WA

LOCATION.--Lat 47°42'25", long 121°35'56", in NE¼SW¼ sec.25, T.26 N., R.9 E., King County, Hydrologic Unit 17110010, on left bank 0.6 mi upstream from Phelps Creek, 8.1 mi south of Index, and at mile 12.9.

DRAINAGE AREA.--5.34 mi².

PERIOD OF RECORD.--December 1959 to December 1963, November 1967 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 1,850 ft, from topographic map. Prior to Oct. 1, 1961, at datum 0.85 ft higher.

REMARKS.--Records good except those for period of no gage-height record Dec. 20-31 and June 8-16, which are fair, and those above 900 ft³/s, which are poor. No regulation or diversion upstream from station.

AVERAGE DISCHARGE.--19 years (water years 1961-63, 1969-84), 55.8 ft³/s, 141.90 in/yr, 40,430 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 2,190 ft³/s Jan. 23, 1982; maximum gage height, 7.13 ft, present datum, Dec. 14, 1959; minimum daily discharge, 2.3 ft³/s Aug. 28-30, 1961.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 550 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Nov. 3	0800	550	3.16	Jan. 25	0115	*1,620	*4.64
Jan. 4	1815	1,070	4.01				

Minimum discharge, 4.4 ft³/s Aug. 26, 27, gage height, 0.48 ft.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP		
1	8.0	53	26	63	39	31	29	53	57	64	14	8.8		
2	7.5	110	22	231	32	29	27	111	50	56	13	8.4		
3	8.8	362	20	495	27	23	28	63	50	57	11	6.6		
4	34	167	18	753	26	21	27	46	77	60	10	5.7		
5	16	71	16	257	31	21	31	44	151	60	10	8.0		
6	12	148	15	236	34	28	30	41	89	46	9.6	55		
7	11	110	14	143	32	34	41	40	194	36	8.6	41		
8	9.4	84	27	97	36	40	35	62	195	33	8.3	153		
9	8.5	54	38	59	37	44	30	66	130	34	8.4	52		
10	8.0	90	41	54	38	53	33	56	90	35	8.1	30		
11	7.5	116	30	79	39	61	34	99	78	36	7.7	27		
12	7.3	72	23	50	196	97	41	158	73	33	8.0	25		
13	6.8	79	108	35	106	73	30	128	92	27	8.4	19		
14	6.5	185	115	26	55	59	41	166	105	29	7.6	14		
15	6.5	277	52	21	39	63	102	93	108	37	6.8	12		
16	6.0	270	30	18	31	45	67	72	72	42	6.4	11		
17	12	168	21	15	25	41	45	57	55	39	6.3	10		
18	11	229	18	13	23	43	39	54	54	32	6.0	9.5		
19	9.1	93	16	14	22	53	42	187	57	25	5.6	8.6		
20	17	87	14	12	35	164	40	173	78	22	5.3	10		
21	15	47	12	15	43	168	48	91	157	19	5.1	16		
22	116	36	11	52	31	108	58	101	103	18	5.0	28		
23	49	31	9.5	147	27	111	56	185	104	21	4.8	25		
24	28	52	9.0	719	24	74	39	90	101	21	4.8	22		
25	21	46	12	530	22	57	32	96	89	22	4.7	16		
26	16	41	11	121	19	49	28	357	112	20	4.5	13		
27	15	122	10	135	19	40	28	133	92	17	16	12		
28	13	79	9.5	115	24	45	28	134	80	15	15	10		
29	11	48	12	88	23	39	29	163	105	14	8.6	9.2		
30	24	33	105	57	---	34	33	126	80	14	6.9	8.5		
31	70	---	82	44	---	32	---	78	---	14	6.5	---		
TOTAL	590.9	3360	947.0	4702	1135	1780	1171	3323	2878	998	251.0	674.3		
MEAN	19.1	112	30.5	152	39.1	57.4	39.0	107	95.9	32.2	8.10	22.5		
MAX	116	362	115	753	196	168	102	357	195	64	16	153		
MIN	6.0	31	9.0	12	19	21	27	40	50	14	4.5	5.7		
CFSM	3.58	21.0	5.71	28.5	7.32	10.7	7.30	20.0	18.0	6.03	1.52	4.21		
IN.	4.12	23.41	6.60	32.76	7.91	12.40	8.16	23.15	20.05	6.95	1.75	4.70		
AC-FT	1170	6660	1880	9330	2250	3530	2320	6590	5710	1980	498	1340		
CAL YR 1983	TOTAL	20001.3	MEAN	54.8	MAX	640	MIN	5.6	CFSM	10.3	IN.	139.33	AC-FT	39670
WTR YR 1984	TOTAL	21810.2	MEAN	59.6	MAX	753	MIN	4.5	CFSM	11.2	IN.	151.94	AC-FT	43260

SNOHOMISH RIVER BASIN

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12148000 SOUTH FORK TOLT RIVER NEAR CARNATION, WA

LOCATION.--Lat 47°41'22", long 121°42'44", in SW¼SW¼ sec.31, T.26 N., R.9 E., King County, Hydrologic Unit 17110010, on left bank 0.1 mi upstream from private road bridge, 1.6 mi downstream from South Fork Tolt Reservoir, 9.8 mi northeast of Carnation, and at mile 6.8.

DRAINAGE AREA.--19.7 mi².

PERIOD OF RECORD.--October 1952 to December 1963, June 1969 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 1,300 ft, from river-profile map.

REMARKS.--Records good. Regulation by South Fork Tolt Reservoir since September 1963, capacity, 57,830 acre-ft. During the current water year the Seattle Water Department diverted an average daily discharge of about 72 ft³/s upstream from the station.

AVERAGE DISCHARGE.--11 years (water years 1953-63), 198 ft³/s, 143,300 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 6,500 ft³/s Dec. 15, 1959, gage height, 7.45 ft, from rating curve extended above 2,700 ft³/s; maximum gage height, 7.62 ft Nov. 20, 1958, backwater from debris; minimum discharge, 8.4 ft³/s Sept. 12, 1963, minimum gage height, 0.81 ft Aug. 23-27, 1958.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 806 ft³/s Jan. 5, gage height, 4.11 ft; minimum, 35 ft³/s Aug. 8, gage height, 2.00 ft.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	69	67	72	69	415	75	63	75	143	95	41	44
2	81	67	72	86	76	75	63	130	110	84	40	45
3	69	83	70	187	76	73	63	153	91	71	40	46
4	56	72	69	470	75	73	67	133	91	62	40	47
5	55	67	69	752	75	81	63	123	128	60	40	49
6	55	69	69	662	75	72	63	119	159	59	40	50
7	55	75	69	632	75	72	67	112	191	58	40	49
8	55	70	72	620	75	66	64	117	390	58	39	50
9	55	69	73	614	75	59	63	128	400	52	39	49
10	54	69	75	614	75	62	66	128	330	46	39	49
11	57	67	73	644	75	60	66	138	215	45	39	49
12	60	67	72	638	86	66	66	201	162	45	39	48
13	60	70	81	638	80	64	67	219	177	45	39	48
14	60	128	83	632	76	66	75	278	148	45	39	48
15	60	243	75	296	75	66	99	251	128	44	39	48
16	60	524	73	78	75	63	110	205	106	43	38	48
17	60	626	72	75	73	62	100	159	84	40	38	48
18	60	608	70	75	73	63	86	125	75	40	38	48
19	60	572	70	73	73	64	78	165	73	39	38	48
20	60	590	69	73	75	75	75	296	70	39	38	49
21	60	560	67	75	78	75	75	235	118	39	40	48
22	63	296	67	78	75	67	86	187	135	39	42	51
23	60	75	67	91	76	72	102	296	130	39	42	49
24	60	80	67	415	76	67	95	264	123	40	41	48
25	60	75	67	728	75	67	84	191	113	40	41	48
26	60	75	67	722	75	67	75	495	101	40	41	48
27	60	76	67	710	75	66	67	566	99	39	42	48
28	60	75	67	704	75	67	62	370	83	39	41	48
29	60	75	69	692	75	66	66	287	93	39	41	48
30	66	73	75	686	---	64	67	260	101	40	41	48
31	73	---	73	680	---	64	---	205	---	41	41	---
TOTAL	1883	5663	2201	13509	2533	2099	2243	6611	4367	1505	1236	1444
MEAN	60.7	189	71.0	436	87.3	67.7	74.8	213	146	48.5	39.9	48.1
MAX	81	626	83	752	415	81	110	566	400	95	42	51
MIN	54	67	67	69	73	59	62	75	70	39	38	44
AC-FT	3730	11230	4370	26800	5020	4160	4450	13110	8660	2990	2450	2860
CAL YR 1983	TOTAL	35672	MEAN	97.7	MAX	854	MIN	40	AC-FT	70760		
WTR YR 1984	TOTAL	45294	MEAN	124	MAX	752	MIN	38	AC-FT	89840		

SNOHOMISH RIVER BASIN

12148300 SOUTH FORK TOLT RIVER BELOW REGULATING BASIN, NEAR CARNATION, WA

LOCATION.--Lat 47°41'49", long 121°47'10", in SW¼NE¼ sec.33, T.26 N., R.8 E., King County, Hydrologic Unit 17110010, on right bank 2.3 mi upstream from mouth and 6.5 mi northeast of Carnation.

DRAINAGE AREA.--29.6 mi².

PERIOD OF RECORD.--March 1982 to current year. Published as "South Fork Tolt River below regulating pond, near Carnation" March 1982 through September 1983.

GAGE.--Water-stage recorder and crest-stage gage. Elevation of gage is 670 ft, from topographic map.

REMARKS.--Records good. Flow regulated by South Fork Tolt Reservoir 6.1 mi upstream, capacity, 57,830 acre-ft. During the 1984 water year the Seattle Water Department diverted an average daily discharge of about 72 ft³/s.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,230 ft³/s Jan. 25, 1984, gage height, 6.30 ft; minimum, 36 ft³/s Aug. 28, 29, 1982, gage height, 2.75 ft.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 1,230 ft³/s Jan. 25, gage height, 6.30 ft; minimum, 42 ft³/s Aug. 18-21, gage height, 2.74 ft.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	82	97	139	125	560	117	113	113	233	141	46	48
2	99	107	133	239	149	117	108	215	176	120	46	50
3	85	167	131	462	142	114	107	245	148	98	46	50
4	73	152	124	770	134	112	111	219	143	85	46	52
5	70	125	121	944	130	115	105	201	187	79	45	54
6	68	124	117	878	124	106	106	193	227	78	46	57
7	68	127	115	836	123	105	115	181	273	76	45	56
8	68	121	128	812	121	96	112	184	512	75	44	57
9	68	115	133	790	119	87	107	205	520	71	43	55
10	68	112	155	790	121	89	115	207	456	63	43	55
11	68	117	152	785	121	95	115	215	341	62	43	54
12	70	117	143	775	164	106	120	293	258	61	44	54
13	70	120	184	730	158	106	115	315	273	61	44	54
14	71	183	213	755	140	106	123	380	233	60	44	52
15	72	350	185	438	133	112	161	356	205	59	43	52
16	72	760	166	130	128	105	179	307	169	57	43	53
17	74	818	152	121	123	102	160	248	130	53	43	54
18	73	836	142	117	120	103	136	205	111	51	43	53
19	72	806	136	114	115	105	123	241	105	50	42	53
20	73	872	128	112	120	149	117	398	100	50	42	55
21	73	806	120	115	139	182	112	344	196	49	43	54
22	81	512	115	134	134	143	125	280	219	48	45	60
23	79	175	112	187	139	151	164	407	206	48	45	56
24	75	195	108	730	136	142	152	377	191	48	45	55
25	75	169	108	1060	133	140	130	295	173	48	44	54
26	74	155	108	908	128	136	113	600	151	48	44	54
27	73	176	107	866	123	125	100	700	148	48	47	53
28	73	170	106	842	120	138	90	488	119	47	45	53
29	73	155	113	818	119	133	99	401	136	47	44	52
30	84	145	140	795	---	123	100	374	150	45	44	52
31	109	---	136	785	---	117	---	315	---	45	44	---
TOTAL	2333	8884	4170	17963	4216	3677	3633	9502	6489	1971	1371	1611
MEAN	75.3	296	135	579	145	119	121	307	216	63.6	44.2	53.7
MAX	109	872	213	1060	560	182	179	700	520	141	47	60
MIN	68	97	106	112	115	87	90	113	100	45	42	48
AC-FT	4630	17620	8270	35630	8360	7290	7210	18850	12870	3910	2720	3200
CAL YR 1983	TOTAL	48832	MEAN	134	MAX	872	MIN	49	AC-FT	96860		
WTR YR 1984	TOTAL	65820	MEAN	180	MAX	1060	MIN	42	AC-FT	130600		

12148500 TOLT RIVER NEAR CARNATION, WA

LOCATION.--Lat 47°41'45", long 121°49'22", in SE¼NE¼ sec.31, T.26 N., R.8 E., King County, Hydrologic Unit 17110010, on right bank 500 ft downstream from the forks, 0.4 mi upstream from Stossel Creek, 5.5 mi northeast of Carnation, and at mile 8.7.

DRAINAGE AREA.--81.4 mi².

PERIOD OF RECORD.--August 1928 to January 1932, September 1937 to current year. Prior to October 1951, published as "near Tolt."

REVISED RECORDS.--WSP 1286: 1929(M), 1930, 1938(M), 1939, 1943(M), 1945(M), 1951(M). WSP 1932: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 348 ft above National Geodetic Vertical Datum of 1929 (river-profile survey). Prior to Oct. 31, 1928, nonrecording gage, and Oct. 31, 1928 to Jan. 3, 1932, water-stage recorder at site 350 ft upstream at datum 7.1 ft higher (river-profile survey). Sept. 1 to Oct. 6, 1937, nonrecording gage at present site at datum 1.64 ft higher.

REMARKS.--Records good. Some regulation by South Fork Reservoir, capacity, 57,830 acre-ft. During the current water year city of Seattle Water Department diverted an average daily discharge of about 69 ft³/s upstream from station for municipal use. Chemical analyses July 1960 to September 1970.

AVERAGE DISCHARGE.--50 years (water years 1929-31, 1938-84), 593 ft³/s, 429,600 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 17,400 ft³/s Dec. 15, 1959, gage height, 13.04 ft; minimum, 53 ft³/s Sept. 22, 23, 1951, gage height, 3.84 ft.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 3,400 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Jan. 4	2000	5,430	9.59	Jan. 25	0230	*8,140	*10.68

Minimum discharge, 115 ft³/s Aug. 26, 27, gage height, 4.26 ft.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	205	440	517	580	995	467	503	521	615	454	169	123
2	232	674	485	1580	565	485	467	873	535	404	180	128
3	213	1600	476	2700	535	440	454	696	494	371	158	122
4	309	1110	428	3750	508	408	454	595	530	353	155	120
5	249	663	420	2480	508	400	454	580	776	352	154	122
6	224	788	388	2260	499	400	458	570	718	322	174	277
7	195	740	376	1770	472	424	521	535	1050	296	155	334
8	190	674	545	1550	467	432	521	600	1380	288	145	427
9	185	535	580	1330	490	440	485	615	1420	272	143	273
10	180	620	764	1320	494	503	535	590	1050	265	141	206
11	178	729	696	1440	508	585	535	669	806	264	139	184
12	180	560	575	1260	1120	641	560	836	691	259	138	192
13	178	615	1010	1180	867	600	521	812	718	246	150	173
14	190	1090	1180	1120	625	585	555	946	685	240	139	154
15	210	1820	818	782	555	630	746	776	647	247	133	142
16	175	1940	636	467	517	526	600	729	550	252	130	138
17	185	1820	550	436	467	490	508	625	467	244	128	134
18	185	2170	499	424	436	499	463	555	428	232	126	129
19	190	1640	463	404	420	550	467	899	423	215	124	130
20	208	2080	420	388	550	1130	445	1050	465	206	122	143
21	200	1650	384	416	652	1150	449	776	854	203	122	141
22	517	1100	353	641	555	812	481	718	684	195	122	211
23	376	669	330	1120	550	854	600	1140	619	197	121	192
24	273	946	318	4350	555	734	517	854	584	197	120	173
25	238	776	339	4350	540	680	449	702	542	196	118	155
26	219	674	336	2070	494	615	420	1770	553	193	116	143
27	210	1000	318	1970	467	575	416	1390	536	182	140	135
28	202	812	305	1700	476	647	396	1050	489	174	165	130
29	192	647	353	1500	467	610	420	974	542	172	132	132
30	255	560	960	1320	---	560	454	919	504	172	123	123
31	702	---	860	1240	---	540	---	764	---	172	120	---
TOTAL	7445	31142	16682	47898	16354	18412	14854	25129	20355	7835	4302	5186
MEAN	240	1038	538	1545	564	594	495	811	679	253	139	173
MAX	702	2170	1180	4350	1120	1150	746	1770	1420	454	180	427
MIN	175	440	305	388	420	400	396	521	423	172	116	120
AC-FT	14770	61770	33090	95010	32440	36520	29460	49840	40370	15540	8530	10290
CAL YR 1983	TOTAL	185837	MEAN	509	MAX	3710	MIN	157	AC-FT	368600		
WTR YR 1984	TOTAL	215594	MEAN	589	MAX	4350	MIN	116	AC-FT	427600		

LOCATION.--Lat 47°39'58", long 121°55'27", in NW¼SW¼ sec.9, T.25 N., R.7 E., King County, Hydrologic Unit 17110010, on left bank 40 ft downstream from highway bridge, 1.3 mi northwest of Carnation, 1.9 mi downstream from Tolt River, and at mile 23.0.

PERIOD OF RECORD.--October 1928 to current year. Prior to October 1951, published as "near Tolt."

GAGE.--Water-stage recorder. Datum of gage is National Geodetic Vertical Datum of 1929. Prior to Dec. 20, 1933, nonrecording gage on old bridge, 100 ft upstream and Dec. 20, 1933, to Sept. 30, 1939, water-stage recorder at present site, at datum 42.96 ft higher.

AVERAGE DISCHARGE.--56 years, 3,785 ft³/s, 85.24 in/yr, 2,742,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.—Maximum discharge, 59,500 ft³/s Feb. 27, 1932, elevation, 59.88 ft, from graph based on gage readings; maximum elevation observed, 59.93 ft Nov. 13, 1932; minimum discharge, 239 ft³/s Aug. 21, 1945, but may have been less sometime during period of faulty intake action Sept. 13 or 14, 1949; minimum daily discharge, 396 ft³/s Sept. 24, 1938.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 16,000 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Elevation (ft)	Date	Time	Discharge (ft ³ /s)	Elevation (ft)
Jan. 3	2400	29,800	56.44	Jan. 25	1400	*42,600	*58.29
Minimum discharge, 673 ft ³ /s Aug. 26.							

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1170	2020	3320	5400	4990	2610	3270	2530	4920	4230	1500	826
2	1160	2900	3030	12500	3980	2700	3040	4850	4170	3820	1480	902
3	1130	9120	2820	24200	3530	2600	2870	4860	3860	3820	1380	846
4	1340	11400	2550	27000	3240	2370	2840	4080	4050	3780	1320	784
5	1490	7380	2410	15500	3130	2240	2780	3670	5470	3940	1290	769
6	1310	7240	2250	10600	3130	2220	3040	3850	6040	3760	1280	1010
7	1180	7090	2220	8300	3180	2420	3210	3460	5510	3140	1210	1640
8	1130	6500	2700	6700	2980	2540	3530	3670	8590	2800	1200	1810
9	1080	5090	3530	5950	3060	2810	3230	4180	7670	2700	1220	2110
10	1040	4760	5100	6500	3010	2990	3740	4130	6610	2740	1210	1490
11	1010	6020	4400	5920	3230	3650	3800	4030	5530	2660	1160	1290
12	989	5210	3920	5740	4870	3710	3920	7000	4970	2630	1110	1360
13	971	4970	6370	5060	7230	4400	4020	6420	5520	2440	1120	1450
14	965	6790	6780	4470	5130	3670	3510	7020	6060	2410	1100	1210
15	993	9950	5040	3730	4320	3860	4900	6370	6590	2440	1040	1050
16	940	12300	3960	2980	3700	3540	5200	5510	5530	2620	1020	965
17	959	11600	3280	2700	3230	3190	4090	4740	4450	2660	1000	907
18	1110	10800	2890	2450	2890	3250	3500	4130	3970	2590	970	868
19	1050	8880	2600	2320	2680	3350	3410	4690	4020	2310	910	838
20	1140	9240	2250	2180	2840	5550	3310	8020	4300	2070	840	852
21	1230	8030	2000	2160	3760	8360	3050	6090	6670	1920	846	885
22	2320	6230	1890	3150	3580	7140	3300	4990	6590	1820	827	1120
23	2840	4850	1710	4020	3450	6340	3270	7170	5820	1820	822	1410
24	1920	5660	1690	13800	3420	6450	2980	6460	6210	1830	813	1280
25	1540	5450	2010	35200	3220	5640	2640	5270	5760	1860	792	1160
26	1340	4510	1810	20200	2950	5570	2450	7480	5570	1920	769	1050
27	1320	5680	1620	10900	2710	4840	2340	9180	5520	1770	765	963
28	1300	5700	1550	8790	2630	4520	2270	7090	4960	1610	1140	894
29	1210	4670	3730	7590	2600	4460	2330	7520	5470	1570	1020	852
30	1190	3870	4830	6480	---	3880	2370	8230	5260	1510	874	802
31	2300	---	3910	5660	---	3530	---	6430	---	1520	822	---
TOTAL	40667	203910	98170	278150	102670	124400	98210	173120	165660	78710	32850	33393
MEAN	1312	6797	3167	8973	3540	4013	3274	5585	5522	2539	1060	1113
MAX	2840	12300	6780	35200	7230	8360	5200	9180	8590	4230	1500	2110

12150800 SNOHOMISH RIVER NEAR MONROE, WA
(National stream quality accounting network station)

LOCATION.--Lat 47°49'52", long 122°02'50", in NE¼NW¼ sec.16, T.27 N., R.6 E., Snohomish County, Hydrologic Unit 17110011, on left bank 150 ft upstream from State Highway 522 bridge, 0.1 mi downstream from confluence of Snoqualmie and Skykomish Rivers, 3.6 mi southwest of Monroe, and 6.0 mi south of Snohomish.

DRAINAGE AREA.--1,537 mi².

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--February 1963 to current year. Water years 1932, 1934, 1951, 1960, 1962-63 (annual maximum stage only) published in WSP 1932. Approximate annual maximum stages for water years 1921, 1949-50, 1952-59, and 1961 are on file in Washington office.

GAGE.--Water-stage recorder. Datum of gage is 13.25 ft above National Geodetic Vertical Datum of 1929. Prior to February 1963, crest-stage gage only at site about 800 ft downstream and Feb. 8, 1963, to May 27, 1964, water-stage recorder at site 100 ft upstream, both National Geodetic Vertical Datum of 1929.

REMARKS.--Water-discharge records good except those for period of no gage-height record May 8 to Sept. 30, which are fair. Some regulation by powerplant at Snoqualmie Falls, 40 mi upstream, and by Spada Lake, 30 mi upstream. Minor diversions for irrigation returned to river upstream from gage. During the current water year, City of Seattle Water Department diverted an average daily discharge of about 72 ft³/s upstream from station for municipal use and the City of Everett diverted an undetermined amount of discharge upstream from the station for municipal use.

AVERAGE DISCHARGE.--21 years, 9,877 ft³/s, 87.27 in/yr, 7,156,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum gage height, 35.8 ft Feb. 10, 1951, datum then in use (discharge not determined); maximum discharge since February 1963, 115,000 ft³/s Dec. 4, 1975, gage height, 22.92 ft; minimum, 1,140 ft³/s Sept. 29, 1967, Sept. 17, 1973.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of December 1921 reached a discharge of approximately 180,000 ft³/s. Floods in November or December 1897 and November 1906 are believed to be higher.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 33,000 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Nov. 4	0400	33,800	10.20	Jan. 5	0345	63,200	16.23
Nov. 16	0500	34,500	10.36	Jan. 25	1300	*66,800	*16.96

Minimum recorded discharge, 1,960 ft³/s Oct. 16, 17, gage height, 1.35 ft.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP		
1	2590	5490	8030	7600	12600	5890	7690	5980	16800	14000	4700	2300		
2	2530	7750	7180	15900	10500	6720	7290	9830	13600	12900	4400	2400		
3	2460	21800	6710	31000	8540	6100	6730	10900	12500	13000	4150	2250		
4	3080	32000	6120	54000	7710	5630	6550	9500	12800	13200	3900	2100		
5	3400	22100	5780	57100	7350	5320	6330	8410	16100	14000	3750	2100		
6	2990	17900	5500	45500	7280	5200	6640	8420	16100	12800	3500	4100		
7	2720	18400	5170	34500	7520	5500	6790	7820	17300	12000	3300	4600		
8	2550	16300	5780	26300	7660	5760	7630	8800	20600	9500	3050	5900		
9	2420	13000	6710	20200	8200	6390	7310	10400	18100	9400	3060	5400		
10	2320	11500	9280	16000	7280	6950	8030	10300	16800	9700	3120	4700		
11	2230	13800	10200	15100	7610	8390	8460	10100	15000	9600	2950	3750		
12	2180	12900	8660	13400	9770	9090	8730	18000	14100	9300	2850	3950		
13	2120	11800	9190	11300	16800	11000	8880	17000	16900	8400	2950	3900		
14	2070	14500	14000	9810	13200	9950	7950	18400	19000	8400	2850	3400		
15	2080	24800	13100	8570	11300	9610	9650	15500	20900	8600	2750	2850		
16	2030	34000	9830	7330	9520	8430	11900	13400	17800	9400	2650	2700		
17	2040	31100	8040	6610	8590	7760	9860	11300	15000	9800	2610	2450		
18	2450	28800	6880	5990	6960	7730	8630	10200	13100	9400	2550	2400		
19	2410	26000	6190	5630	6330	8050	8310	16400	12900	7500	2450	2300		
20	2450	24700	5680	5360	6470	12000	7800	23200	14800	6800	2290	2300		
21	2820	21900	4990	5190	9270	20900	7360	18000	21000	6000	2230	2500		
22	4740	16400	4350	6500	9480	19400	7670	14800	18300	5600	2210	3150		
23	7860	12300	4050	8500	8810	16500	8250	18800	19200	5700	2130	3650		
24	5750	12600	3700	27900	8990	16500	7710	16100	20400	5800	2100	3400		
25	4530	13300	3850	62200	8650	14300	6750	14200	19000	6000	2050	3600		
26	3830	11000	4150	56400	7860	13500	6140	20400	18200	6100	2000	2750		
27	3420	12000	3750	37100	6430	11800	5850	23000	18000	5650	2300	2550		
28	3210	13000	3500	26500	6120	10900	5650	20000	17400	5200	3500	2400		
29	2990	11200	3500	21700	6040	10600	5650	22900	17900	4850	2500	2250		
30	2890	9240	7500	18200	---	9490	5710	25000	16000	4650	2400	2200		
31	5300	---	8900	14700	---	9090	---	21000	---	4950	2200	---		
TOTAL	96460	521580	210270	682090	252840	304450	227900	458060	505600	268200	89450	94300		
MEAN	3112	17390	6783	22000	8719	9821	7597	14780	16850	8652	2885	3143		
MAX	7860	34000	14000	62200	16800	20900	11900	25000	21000	14000	4700	5900		
MIN	2030	5490	3500	5190	6040	5200	5650	5980	12500	4650	2000	2100		
CFSM	2.02	11.3	4.41	14.3	5.67	6.39	4.94	9.62	11.0	5.63	1.88	2.04		
IN.	2.33	12.62	5.09	16.51	6.12	7.37	5.52	11.09	12.24	6.49	2.16	2.28		
AC-FT	191300	1035000	417100	1353000	501500	603900	452000	908600	1003000	532000	177400	187000		
CAL YR 1983	TOTAL	3331240	MEAN	9127	MAX	60300	MIN	2030	CFSM	5.94	IN.	80.63	AC-FT	6608000
WTR YR 1984	TOTAL	3711200	MEAN	10140	MAX	62200	MIN	2000	CFSM	6.60	IN.	89.82	AC-FT	7361000

SNOHOMISH RIVER BASIN

12150800 SNOHOMISH RIVER NEAR MONROE, WA--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--December 1974 to January 1976, July 1979 to current year.

REMARKS.--Unpublished records of temperature and suspended-sediment concentration are available in the Washington Office.

WATER QUALITY DATA, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984

		STREAM- FLOW, INSTAN- TANEOUS (CFS)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH (STAND- ARD UNITS)	TEMPER- ATURE (DEG C)	TUR- BID- ITY (NTU)	OXYGEN, DIS- SOLVED (MG/L)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION)	COLI- FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)	STREP- TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML)	HARD- NESS (MG/L AS CAC03)
DATE	TIME										
DEC , 1983											
08...	1030	5680	54	--	4.5	1.2	12.4	96	E450	4800	19
FEB , 1984											
27...	1445	6370	46	7.1	6.5	2.1	12.5	101	E40	E52	18
MAY											
08...	1130	7930	41	7.1	10.0	2.7	10.6	93	160	E340	14
JUL											
10...	1120	9140	31	7.4	12.5	2.9	10.6	99	E29	K6	11
	HARD- NESS NONCAR- BONATE (MG/L AS CAC03)	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- LITY LAB (MG/L AS CAC03)	SULFATE DIS- SOLVED (MG/L AS S04)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	FLUO- RIDE, DIS- SOLVED (MG/L AS F)
DATE											
DEC , 1983											
08...	0	5.7	1.2	2.3	20	.2	.70	20	4.5	1.5	<.10
FEB , 1984											
27...	0	5.1	1.2	2.0	19	.2	.50	19	3.6	1.5	<.10
MAY											
08...	0	4.1	.90	1.6	19	.2	.40	14	3.3	1.2	<.10
JUL											
10...	1	3.4	.67	1.3	20	.2	.30	10	2.5	.80	<.10
	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 DIS- SOLVED (MG/L AS N)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N)	NITRO- GEN,AM- MONIA + ORGANIC TOTAL (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)
DATE											
DEC , 1983											
08...	8.2	37	36	.05	567	.45	.070	.70	<.010	<.010	<.010
FEB , 1984											
27...	7.9	33	33	.05	568	.39	.010	.20	.010	.010	<.010
MAY											
08...	6.1	36	26	.05	771	.20	.010	<.20	<.010	<.010	.010
JUL											
10...	4.9	20	20	.03	494	<.10	<.010	<.20	<.010	<.010	<.010

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

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

SNOHOMISH RIVER BASIN

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12150800 SNOHOMISH RIVER NEAR MONROE, WA--Continued

WATER QUALITY DATA, OCTOBER 1983 TO SEPTEMBER 1984

DATE	ALUM- INUM, DIS- SOLVED (UG/L AS AL)	ARSENIC DIS- SOLVED (UG/L AS AS)	BARIUM, DIS- SOLVED (UG/L AS BA)	BERYL- LIUM, DIS- SOLVED (UG/L AS BE)	CADMIUM DIS- SOLVED (UG/L AS CD)	CHRO- MIUM, DIS- SOLVED (UG/L AS CR)	COBALT, DIS- SOLVED (UG/L AS CO)	COPPER, DIS- SOLVED (UG/L AS CU)	IRON, DIS- SOLVED (UG/L AS FE)	LEAD, DIS- SOLVED (UG/L AS PB)	LITHIUM DIS- SOLVED (UG/L AS LI)
DEC , 1983											
08...	20	<1	10	<.5	<1	<1	<3	6	85	4	12
FEB , 1984											
27...	20	1	10	<.5	<1	<1	<3	3	56	4	<4
MAY											
08...	30	<1	12	.6	1	<1	<3	3	46	<1	4
JUL											
10...	20	<1	12	<.5	<1	<1	<3	4	28	<1	<4
DATE	MANGA- NESE, DIS- SOLVED (UG/L AS MN)	MERCURY DIS- SOLVED (UG/L AS HG)	MOLYB- DENUM, DIS- SOLVED (UG/L AS MO)	NICKEL, DIS- SOLVED (UG/L AS NI)	SELE- NIUM, DIS- SOLVED (UG/L AS SE)	SILVER, DIS- SOLVED (UG/L AS AG)	STRON- TIUM, DIS- SOLVED (UG/L AS SR)	VANA- DIUM, DIS- SOLVED (UG/L AS V)	ZINC, DIS- SOLVED (UG/L AS ZN)	SEDI- MENT, SUS- PENDE (MG/L)	SEDI- MENT, DIS- CHARGE, SUS- PENDE (T/DAY)
DEC , 1983											
08...	17	<.1	<10	<1	<1	<1	28	<6	10	6	92
FEB , 1984											
27...	12	<.1	<10	2	<1	<1	25	<6	23	7	120
MAY											
08...	5	<.1	<10	4	<1	<1	19	<6	11	7	150
JUL											
10...	2	<.1	<10	<1	<1	<1	14	<6	18	6	148

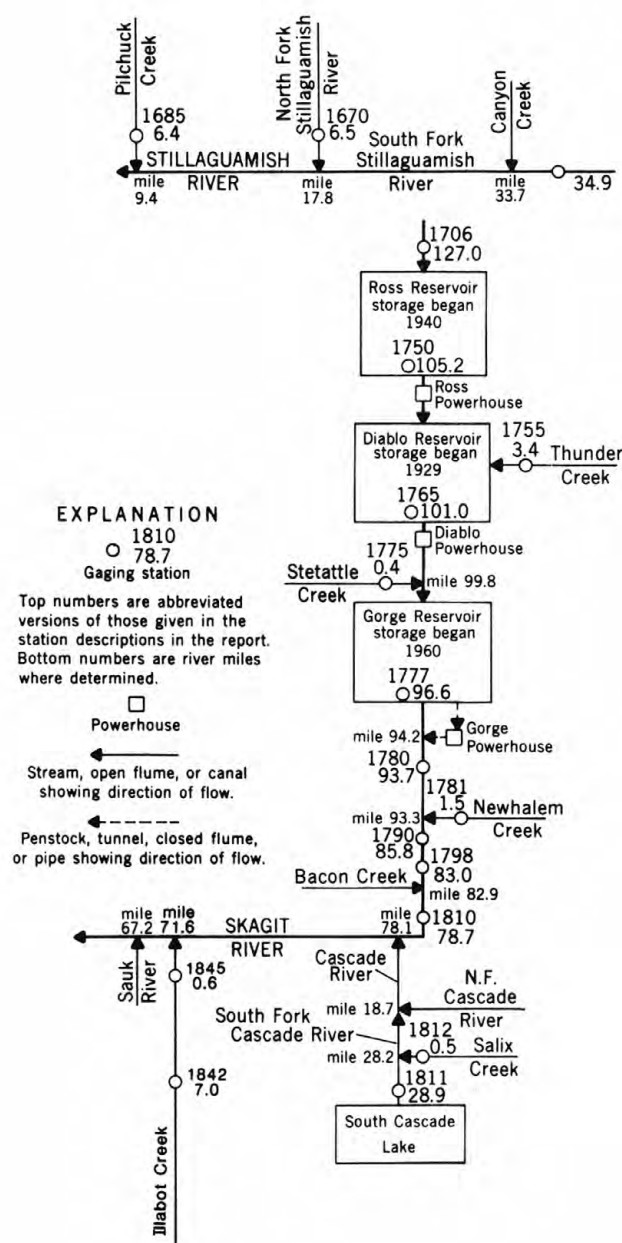


Figure 16.--Gaging stations in Stillaguamish and Skagit River (above Sauk River) basins.

STILLAGUAMISH RIVER BASIN

189

12167000 NORTH FORK STILLAGUAMISH RIVER NEAR ARLINGTON, WA

LOCATION.--Lat 48°15'42", long 122°02'47", in SW¼NW¼ sec.16, T.32 N., R.6 E., Snohomish County, Hydrologic Unit 17110008, on right bank 5.7 mi southeast of Arlington, 7.8 mi downstream from Deer Creek, and at mile 6.5.

DRAINAGE AREA.--262 mi².

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

REVISED RECORDS.--WSP 1286: 1938-39. WSP 1932: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 89.34 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--Records poor. No regulation. Small diversions for domestic use. National Weather Service radio telemeter at station. Chemical analyses November 1961 to September 1971, October 1973 to September 1974.

AVERAGE DISCHARGE.--56 years, 1,909 ft³/s, 98.95 in/yr, 1,383,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 36,300 ft³/s Dec. 3, 1982, gage height, 13.89 ft; minimum discharge, 117 ft³/s Sept. 23, 1938.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 13,000 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Nov. 15	2300	16,900	10.08	Jan. 25	0300	*31,800	*13.14
Jan. 4	1600	30,500	12.90				

Minimum discharge, 349 ft³/s Oct. 16, 17.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	389	1760	1640	2020	2350	1860	1570	1440	2240	1060	548	481
2	384	3270	1470	5740	2070	1870	1470	4410	1850	1150	536	478
3	403	8430	1330	13200	1850	1720	1420	4510	1700	940	520	441
4	805	8010	1220	22900	1720	1540	1390	3140	1760	990	509	427
5	505	3840	1150	10900	1730	1440	1440	2840	1840	910	503	651
6	442	3230	1060	6100	1790	1440	1580	2800	1890	860	504	2140
7	413	3360	1000	4530	1720	1530	1810	2350	2020	780	484	736
8	399	3060	1360	3910	1900	1630	1960	3030	2300	810	475	1820
9	389	2380	1380	2770	2460	1780	1710	3030	1910	830	482	984
10	380	2440	2090	2510	2480	2130	1670	3010	1710	800	482	718
11	375	3970	1860	2720	2580	2480	1700	3040	1570	810	475	676
12	366	3030	1560	2100	5600	3320	2010	3860	1530	760	468	2040
13	362	3250	2310	1710	5060	3650	2650	2950	1730	700	487	973
14	357	3360	3350	1470	3670	2710	2330	3270	1840	720	471	703
15	357	12500	2340	1280	2770	2460	2980	2780	1840	760	457	614
16	353	13500	1730	1180	2260	2150	2510	2350	1550	800	448	577
17	394	7650	1430	1050	1910	2110	1940	2010	1300	830	445	552
18	447	8910	1280	957	1710	2140	1710	1840	1220	710	442	527
19	389	5420	1150	941	1720	2280	1710	4660	1180	690	439	509
20	473	4660	992	882	4660	3300	1730	6170	1240	660	431	497
21	517	3350	900	924	4830	5760	1650	4260	1480	620	427	531
22	3250	2510	850	1760	3150	4890	1840	3450	1260	590	422	962
23	2330	2090	800	3000	2590	4330	1690	5000	1280	610	422	813
24	1400	3750	860	15200	2560	3740	1490	3970	1200	620	422	642
25	1160	4530	800	22000	2230	3200	1350	2930	1090	640	418	574
26	1000	3150	882	8080	1890	2970	1270	5000	1220	600	414	536
27	924	4740	783	6170	1860	2370	1220	3620	1100	570	601	510
28	874	3220	726	5280	1890	2370	1210	2950	1050	552	580	491
29	820	2380	798	4510	1920	2090	1200	3090	1200	541	473	474
30	1170	1920	3700	3200	---	1830	1300	3030	1270	541	443	461
31	2900	---	3220	2640	---	1690	---	2710	---	542	432	---
TOTAL	24727	137670	46021	161634	74930	78780	51510	103500	46370	22996	14660	22538
MEAN	798	4589	1485	5214	2584	2541	1717	3339	1546	742	473	751
MAX	3250	13500	3700	22900	5600	5760	2980	6170	2300	1150	601	2140
MIN	353	1760	726	882	1710	1440	1200	1440	1050	541	414	427
CFSM	3.05	17.5	5.67	19.9	9.86	9.70	6.55	12.7	5.90	2.83	1.81	2.87
IN.	3.51	19.55	6.53	22.95	10.64	11.19	7.31	14.70	6.58	3.27	2.08	3.20
AC-FT	49050	273100	91280	320600	148600	156300	102200	205300	91970	45610	29080	44700
CAL YR 1983	TOTAL	724729	MEAN	1986	MAX	26300	MIN	353	CFSM	7.58	IN.	102.90
WTR YR 1984	TOTAL	785336	MEAN	2146	MAX	22900	MIN	353	CFSM	8.19	IN.	111.51
AC-FT												1437000
AC-FT												1558000

NOTE.--No gage-height record June 24 to July 26.

STILLAGUAMISH RIVER BASIN

12168500 PILCHUCK CREEK NEAR BRYANT, WA

LOCATION.--Lat 48°15'58", long 122°09'46", in NE¼NE¼ sec.16, T.32 N., R.5 E., Snohomish County, Hydrologic Unit 17110008, on right bank 500 ft upstream from bridge on State Highway 9, 1.8 mi north of Bryant, and at mile 6.4.

DRAINAGE AREA.--52.0 mi².

PERIOD OF RECORD.--March 1929 to September 1931, June 1950 to September 1951, September 1952 to September 1975, June 1980 to current year (seasonal records only).

REVISED RECORDS.--WSP 1316: 1930-31(M). WSP 1932: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 119.8 ft above National Geodetic Vertical Datum of 1929 (stadia traverse). Prior to Oct. 1, 1931, nonrecording gage at site 100 ft downstream at different datum.

REMARKS.--Records good. No regulation or diversion upstream from station.

AVERAGE DISCHARGE.--26 years (water years 1930, 1931, 1951, 1953-75), 281 ft³/s, 73.38 in/yr, 203,600 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 6,900 ft³/s Jan. 30, 1971, gage height, 8.20 ft, from high-water mark in well, from rating curve extended above 3,900 ft³/s; minimum observed, 0.5 ft³/s Aug. 29 to Sept. 1, 1931, gage height, 0.90 ft, site and datum then in use.

EXTREMES FOR JUNE TO OCTOBER.--Maximum discharge, 1,740 ft³/s Oct. 25, gage height, 4.73 ft; minimum, 4.5 ft³/s on all or part of each day Aug. 22-27, gage height, 1.86 ft.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR JUNE TO OCTOBER 1984
MEAN VALUES

DAY	JUN	JUL	AUG	SEP	OCT
1	238	111	7.0	7.5	47
2	181	88	7.0	9.4	47
3	157	69	6.9	8.6	45
4	187	55	6.5	7.2	45
5	194	49	7.3	168	93
6	204	43	10	534	69
7	233	40	10	101	84
8	239	37	9.9	307	74
9	213	33	8.8	124	83
10	182	30	6.1	72	480
11	152	27	5.5	52	473
12	131	26	5.5	140	429
13	116	24	5.5	79	289
14	101	21	5.5	49	399
15	88	17	5.5	36	287
16	83	15	5.5	29	176
17	78	12	5.3	27	144
18	72	11	5.0	26	115
19	67	15	5.0	23	100
20	65	16	5.0	22	87
21	74	16	5.0	22	77
22	74	14	4.8	252	70
23	67	9.9	4.5	181	64
24	60	9.0	4.5	81	61
25	54	8.0	4.5	57	795
26	52	8.0	4.5	42	477
27	75	7.5	18	33	324
28	65	7.0	30	29	382
29	270	7.0	15	25	263
30	236	7.0	9.9	43	276
31	---	7.0	7.8	---	264
TOTAL	4008	839.4	241.3	2586.7	6619
MEAN	134	27.1	7.78	86.2	214
MAX	270	111	30	534	795
MIN	52	7.0	4.5	7.2	45
CFSM	2.58	.52	.15	1.66	4.12
IN.	2.87	.60	.17	1.85	4.74
AC-FT	7950	1660	479	5130	13130

12175000 ROSS RESERVOIR NEAR NEWHALEM, WA
(International gaging station)

LOCATION.--Lat 48°43'58", long 121°04'02", in SE¼ sec.35, T.38 N., R.13 E., Whatcom County, Hydrologic Unit 17110005, Ross Lake National Recreation Area, at Ross Dam on Skagit River, 1.0 mi downstream from Ruby Creek, 9.1 mi northeast of Newhalem, and at mile 105.2.

DRAINAGE AREA.--999 mi², of which 400 mi² is in Canada.

PERIOD OF RECORD.--March 1940 to current year (monthend elevations and contents only prior to October 1946). Prior to October 1945, published as "Ruby Reservoir near Newhalem."

REVISED RECORDS.--WSP 1932: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is city of Seattle Ross Dam datum; 1.79 ft above National Geodetic Vertical Datum of 1929; and 0.88 ft Geodetic Survey of Canada 1959 datum (by water level transfer of elevation from the international boundary). Prior to Sept. 24, 1940, nonrecording gage on west shore at site upstream from Ross Dam at same datum. June 29, 1943, to Apr. 29, 1948, nonrecording gage on right bank at site 500 ft upstream from dam at present datum.

REMARKS.--Reservoir is formed by concrete-arch dam completed to elevation 1,615 ft in 1949, storage began Mar. 11, 1940. Starting about July 1, 1967, taintor gates were extended to elevation 1,602.50 ft. Usable storage, 1,052,300 acre-ft between elevations 1,475 ft, lower limit of operation, and 1,602.5 ft, top of taintor gates. Dead storage below elevation 1,250 ft, 1,175 acre-ft. Water used by city of Seattle for power development. Figures given herein represent total contents.

COOPERATION.--Capacity table furnished by city of Seattle. This station is maintained by the United States under agreement with Canada.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 1,443,460 acre-ft July 20, 1981, elevation, 1,603.23 ft; minimum observed since dam was completed in 1949, 51,760 acre-ft Apr. 5, 1952, elevation, 1,348.50 ft.

EXTREMES FOR CURRENT YEAR.--Maximum contents, 1,432,489 acre-ft July 18, elevation, 1,602.31 ft; minimum, 787,434 acre-ft May 8, elevation, 1,538.41 ft.

Capacity table (elevation, in feet, and total contents, in acre-feet)
(Based on 25-foot contour intervals furnished by city of Seattle in 1943)

1,538	784,000	1,575	1,130,200
1,540	800,900	1,603	1,440,700
1,550	888,300		

ELEVATION (FEET NGVD), WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984
INSTANTANEOUS OBSERVATIONS AT 2400

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1592.48	1586.65	1587.36	1573.63	1583.78	1567.73	1549.41	1539.10	1554.69	1597.22	1602.15	1601.62
2	1592.57	1586.85	1586.96	1573.63	1583.37	1566.85	1548.83	1539.14	1555.63	1597.69	1602.12	1601.71
3	1592.15	1587.99	1586.48	1573.91	1583.12	1565.83	1547.90	1538.79	1556.50	1598.36	1602.10	1601.73
4	1591.89	1589.07	1586.17	1578.27	1583.07	1564.96	1546.90	1538.62	1557.48	1599.30	1601.86	1601.60
5	1591.49	1589.34	1585.72	1582.23	1582.89	1564.24	1545.99	1538.61	1558.60	1600.54	1601.81	1601.57
6	1591.07	1589.76	1585.28	1584.13	1582.90	1563.55	1545.59	1538.61	1559.71	1601.50	1601.62	1601.73
7	1590.65	1589.96	1584.84	1584.99	1582.84	1562.73	1545.18	1538.49	1560.88	1601.57	1601.49	1601.66
8	1590.43	1590.10	1584.66	1585.42	1582.65	1562.02	1544.59	1538.47	1562.17	1601.30	1601.49	1601.80
9	1590.51	1590.13	1584.53	1585.58	1582.13	1561.11	1543.59	1538.63	1563.31	1601.22	1601.69	1601.90
10	1590.25	1590.23	1584.29	1586.01	1581.55	1560.79	1542.85	1538.94	1564.55	1601.71	1602.00	1601.91
11	1589.97	1590.48	1584.24	1586.43	1581.01	1560.52	1542.29	1539.21	1565.69	1601.82	1601.98	1601.81
12	1589.68	1590.76	1583.99	1586.70	1581.09	1559.91	1541.78	1539.87	1567.16	1601.88	1602.01	1601.59
13	1589.40	1590.75	1583.82	1586.93	1580.35	1559.38	1541.29	1540.59	1569.14	1601.81	1602.03	1601.28
14	1589.07	1590.89	1583.53	1587.16	1579.59	1558.42	1541.30	1540.83	1571.66	1601.70	1601.85	1600.94
15	1588.97	1591.43	1583.07	1587.43	1578.93	1557.39	1541.49	1541.22	1574.26	1601.91	1601.80	1600.80
16	1589.03	1591.87	1582.60	1587.40	1578.19	1556.42	1541.47	1541.51	1576.60	1602.04	1601.82	1600.77
17	1588.93	1591.96	1582.32	1587.27	1577.28	1555.84	1541.39	1541.67	1578.15	1602.29	1601.85	1600.47
18	1588.71	1591.82	1582.20	1586.90	1576.86	1555.21	1541.49	1541.86	1579.52	1602.09	1601.86	1600.38
19	1588.45	1591.85	1581.71	1586.67	1576.66	1554.44	1541.56	1542.53	1580.54	1602.06	1601.84	1600.37
20	1588.33	1591.95	1580.84	1586.33	1576.06	1553.75	1541.53	1543.64	1581.93	1601.94	1601.94	1600.38
21	1588.17	1591.64	1579.81	1586.15	1575.21	1553.03	1541.50	1544.00	1583.51	1601.94	1601.93	1600.21
22	1588.23	1591.30	1578.91	1586.44	1574.13	1552.62	1541.63	1544.53	1585.33	1601.99	1601.91	1600.13
23	1588.30	1590.59	1578.11	1586.30	1573.48	1552.19	1541.39	1545.09	1586.98	1601.75	1601.88	1599.87
24	1587.84	1590.40	1576.99	1586.48	1572.87	1552.13	1541.16	1545.62	1588.84	1601.52	1601.89	1599.49
25	1587.71	1590.07	1576.77	1586.45	1571.95	1551.70	1541.01	1546.12	1590.60	1601.19	1601.93	1599.37
26	1587.55	1589.82	1576.16	1586.05	1570.79	1551.40	1540.79	1546.63	1592.10	1601.29	1602.10	1599.04
27	1587.16	1589.59	1575.57	1585.55	1570.02	1551.15	1540.50	1547.28	1593.61	1601.43	1602.05	1598.78
28	1586.74	1589.02	1574.85	1585.29	1569.10	1550.72	1540.31	1548.15	1595.13	1601.58	1602.07	1598.54
29	1586.39	1588.48	1574.45	1584.82	1568.32	1550.33	1540.25	1549.73	1596.47	1601.86	1602.07	1598.39
30	1586.49	1587.73	1574.20	1584.44	---	1549.98	1540.03	1551.94	1596.89	1601.89	1601.86	1598.30
31	1586.57	---	1573.92	1584.02	---	1549.89	---	1553.71	---	1601.72	1601.69	---
MEAN	1589.20	1590.08	1581.43	1584.48	1577.94	1557.30	1542.83	1542.68	1574.92	1601.23	1601.89	1600.60
MAX	1592.57	1591.96	1587.36	1587.43	1583.78	1567.73	1549.41	1553.71	1596.89	1602.29	1602.15	1601.91
MIN	1586.39	1586.65	1573.92	1573.63	1568.32	1549.89	1540.03	1538.47	1554.69	1597.22	1601.49	1598.30
†	1253770	1266530	1118976	1225918	1061900	887338	801176	921861	1369346	1425496	1425142	1385580
‡	-67734	+12760	-147554	+106942	-164018	-174562	-86162	+170685	+447485	+56150	-354	-39562
CAL YR 1983	MEAN	1572.19	MAX	1602.47	MIN	1516.20	‡	-23724				
WTR YR 1984	MEAN	1578.74	MAX	1602.29	MIN	1538.47	‡	+64076				

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

‡ Change in contents, in acre-feet.

12175500 THUNDER CREEK NEAR NEWHALEM, WA

LOCATION.--Lat 48°40'22", long 121°04'18", in SE¼ sec.23, T.37 N., R.13 E., (unsurveyed), Whatcom County, Hydrologic Unit 17110005, Ross Lake National Recreation Area, on right bank 0.4 mi upstream from high-water line of Diablo Reservoir, 9.0 mi east of Newhalem, and at mile 3.4.

DRAINAGE AREA.--105 mi².

PERIOD OF RECORD.--October 1930 to current year. Published as "above Colonial Creek, near Marblemount" 1930-31.

REVISED RECORDS.--WSP 1012: 1943. WSP 1286: 1931(M), 1932, 1933(M), 1935(M), 1938-39(M), 1941-42(M), 1944-46(M), 1950(M), 1952 (annual runoff in acre-ft). WSP 1932: Drainage area.

GAGE.--Water-stage recorder. Elevation of gage is 1,220 ft, from river-profile map.

REMARKS.--Records good except those for period of no gage-height record Nov. 26 to Dec. 29, which are fair. No regulation or diversion upstream from station. Large diurnal fluctuations caused by snowmelt during summer months.

AVERAGE DISCHARGE.--54 years, 615 ft³/s, 79.54 in/yr, 445,600 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 14,500 ft³/s Dec. 26, 1980, gage height, 14.5 ft, from rating curve extended above 3,500 ft³/s; minimum not determined, probably less than 50 ft³/s during period of ice effect or no gage-height record in February 1936.

EXTREMES OUTSIDE PERIOD OF RECORD.--Records for floods, prior to establishment of station, are given in WSP 1527.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 2,400 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Jan. 4	1715	*9,400	*11.98	June 28	2300	2,530	6.98

Minimum daily discharge, 84 ft³/s Dec. 28, during period of no gage-height record.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	212	446	190	112	318	165	215	187	810	1240	1870	748
2	200	442	180	321	291	163	207	215	675	1350	1700	520
3	213	1440	170	960	270	157	205	210	625	1360	1620	519
4	321	1130	160	6960	252	153	197	200	705	1500	1490	536
5	235	655	150	3640	245	149	193	191	774	1760	1570	749
6	205	538	145	2020	242	147	187	185	828	1480	1330	877
7	183	442	140	1440	240	151	187	183	828	1120	1120	555
8	173	375	145	1080	233	159	183	273	745	1050	1290	1030
9	165	339	147	834	230	177	177	357	625	1130	1600	843
10	157	321	150	700	225	193	175	348	595	1160	1600	690
11	153	360	145	585	218	207	169	342	762	1200	1380	533
12	153	336	140	510	240	223	169	333	1070	1190	1300	492
13	159	306	160	442	250	225	173	387	1520	1110	1090	406
14	155	294	180	381	237	220	173	546	1830	1130	933	366
15	145	550	165	342	225	218	294	486	1910	1350	890	371
16	139	828	150	327	213	213	381	430	1610	1620	1020	435
17	141	635	140	276	200	213	339	384	1190	1710	1140	574
18	137	546	130	255	191	207	309	372	1110	1480	989	771
19	137	474	122	247	185	202	291	645	1120	1260	803	623
20	161	406	115	242	223	245	267	840	1370	1090	727	554
21	163	360	105	240	240	434	260	605	1500	923	794	517
22	780	327	98	233	223	366	260	506	1520	929	867	414
23	381	297	92	225	210	357	247	510	1730	1100	791	347
24	258	285	86	381	200	333	233	466	2060	1350	706	303
25	306	276	90	780	189	309	218	426	2000	1740	726	269
26	384	252	96	530	183	282	205	426	2100	1910	791	244
27	330	280	88	434	177	260	197	426	2090	1560	1590	226
28	250	250	84	442	175	247	193	534	2240	1440	941	212
29	233	220	102	434	169	235	189	1070	2240	1450	684	202
30	430	200	117	375	---	225	187	1670	1440	1480	625	205
31	846	---	125	345	---	220	---	1190	---	1620	574	---
TOTAL	7905	13610	4107	26093	6494	7055	6680	14943	39622	41792	34551	15131
MEAN	255	454	132	842	224	228	223	482	1321	1348	1115	504
MAX	846	1440	190	6960	318	434	381	1670	2240	1910	1870	1030
MIN	137	200	84	112	169	147	169	183	595	923	574	202
CFSM	2.43	4.32	1.26	8.02	2.13	2.17	2.12	4.59	12.6	12.8	10.6	4.80
IN.	2.80	4.82	1.46	9.24	2.30	2.50	2.37	5.29	14.04	14.81	12.24	5.36
AC-FT	15680	27000	8150	51760	12880	13990	13250	29640	78590	82890	68530	30010

CAL YR 1983	TOTAL	220382	MEAN	604	MAX	4720	MIN	84	CFSM	5.75	IN.	78.08	AC-FT	437100
WTR YR 1984	TOTAL	217983	MEAN	596	MAX	6960	MIN	84	CFSM	5.68	IN.	77.23	AC-FT	432400

NOTE.--No gage-height record Nov. 26 to Dec. 29.

12178000 SKAGIT RIVER AT NEWHALEM, WA

LOCATION.--Lat 48°40'19", long 121°14'48", in SW¼SE¼ sec.21, T.37 N., R.12 E., Whatcom County, Hydrologic Unit 17110005, Ross Lake National Recreation Area, on right bank 0.4 mi upstream from Newhalem Creek, 0.5 mi downstream from city of Seattle powerplant at Newhalem, 10.8 mi upstream from Bacon Creek, and at mile 93.7.

DRAINAGE AREA.--1,175 mi², of which 400 mi² is in Canada.

PERIOD OF RECORD.--October 1908 to May 1914, October 1920 to current year. June 1914 to September 1920 (monthly discharge only), in State Water-Supply Bulletin 6. Published as "near Marblemount" 1908-14, 1920-31.

REVISED RECORDS.--WSP 512: 1909-14. WSP 1012: 1929. WSP 1316: 1914(M). WSP 1932: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 401.5 ft above National Geodetic Vertical Datum of 1929 (river-profile survey). Prior to May 24, 1914, nonrecording gages at site 0.5 mi upstream at datum 91 ft higher. Nov. 15, 1920, to June 4, 1923, nonrecording gage at site about 500 ft upstream at same datum.

REMARKS.--Records good. Water is diverted 2.9 mi upstream from station and is returned to river at city of Seattle powerplant 0.5 mi upstream from station. Flow regulated by Gorge powerplant since August 1924 and by Ross Reservoir (see sta 12175000) since March 1940, Diablo Reservoir (see sta 12176500) since October 1929, and Gorge Reservoir (see sta 12177700) since June 1960, having a combined total capacity of 1,533,000 acre-ft. Satellite telemeter at station.

AVERAGE DISCHARGE.--76 years (water years 1909-84), 4,461 ft³/s, 3,232,000 acre-ft/yr, adjusted for storage in Diablo Reservoir since October 1929, Ross Reservoir since March 1940, and Gorge Reservoir since June 1960.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 63,500 ft³/s Nov. 29, 1909, gage height, 22.0 ft from floodmark, site and datum then in use; minimum, 54 ft³/s Nov. 1, 1943, gage height, 78.15 ft; minimum daily, 136 ft³/s Aug. 24, 1930.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of 1815 reached a stage of approximately 20.5 ft, discharge about 115,000 ft³/s. Records for other floods, prior to establishment of station, are given in WSP 1527.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 16,800 ft³/s Jan. 4, gage height, 88.01 ft; minimum, 1,180 ft³/s Oct. 17, gage height, 80.97 ft; minimum daily, 1,200 ft³/s Oct. 15.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2830	1820	4260	2290	4490	5070	3430	4060	2610	6960	4970	2750
2	1250	1980	4260	2320	4910	6100	5210	3530	2830	7470	5250	1580
3	2840	4650	4870	3800	3730	6270	5540	3610	2450	4780	5570	2190
4	2950	3810	2570	10800	3120	4030	6360	3220	2340	4210	6270	2650
5	3120	3350	4330	8150	2610	6370	6260	2230	2180	4110	6530	2850
6	3190	2540	4070	5120	3490	5700	5500	2200	2240	4120	5580	2730
7	3350	3560	4450	6670	3280	5200	3420	2180	2340	6470	3940	2230
8	2220	2710	2750	6850	3440	6090	4800	2020	2170	7020	3850	2720
9	1210	2510	2260	6360	4850	6180	6270	2150	1760	7120	3650	3130
10	2560	2920	2850	4180	6180	5530	5080	2010	1510	5470	3360	3040
11	2510	2110	2410	3100	5230	3380	4560	2650	1720	6070	3320	2460
12	2660	1880	2570	3510	3450	5890	4170	2080	2670	6750	3890	2830
13	2380	2410	2410	3230	5640	5930	3710	2640	3170	6800	4170	2940
14	1950	3010	2700	2300	6530	6120	2510	3520	3490	6540	4920	3020
15	1200	4470	3350	2300	6820	7000	2300	3700	4140	5880	3580	2940
16	1250	6620	3870	3740	6340	6810	3220	3780	3350	6620	2040	2140
17	1890	6490	2950	3020	6970	6430	3330	3680	2820	6950	2500	2840
18	1620	6950	2730	4310	5550	5100	3290	3360	3140	8060	2750	2820
19	1870	4190	3970	4240	2540	6190	2770	2820	3480	7640	2530	2550
20	1760	3820	5280	3960	5670	5710	2470	3050	3970	6630	2430	2690
21	2380	4920	6030	4140	6690	6510	2210	3460	3300	4500	2380	2610
22	3090	4980	6000	2380	7140	6550	3040	2670	3020	4200	2380	2520
23	2010	6050	4850	2310	6650	5780	3710	2590	4170	6090	2340	2930
24	3340	4570	5480	3830	5580	2730	3420	2120	4530	6420	2200	3300
25	2300	5170	4180	6610	7040	5420	3510	2470	4690	9030	1800	2260
26	2550	4000	4180	6540	7200	4760	3020	2070	6020	6930	1440	3050
27	2940	3520	3680	6360	6990	3620	2800	2070	6400	5660	4990	2840
28	2860	5410	4950	5940	6740	4550	2430	1880	5850	4780	3900	2070
29	2690	5240	3820	6410	6470	4290	2560	3130	6800	4290	3580	1460
30	2570	5730	2390	6370	---	4510	4530	4010	6950	4530	3870	1470
31	2840	---	2370	5540	---	3010	---	3470	---	5700	2740	---
TOTAL	74180	121390	116840	146680	155340	166830	115430	88430	106110	187800	112720	77610
MEAN	2393	4046	3769	4732	5357	5382	3848	2853	3537	6058	3636	2587
MAX	3350	6950	6030	10800	7200	7000	6360	4060	6950	9030	6530	3300
MIN	1200	1820	2260	2290	2540	2730	2210	1880	1510	4110	1440	1460
AC-FT	147100	240800	231800	290900	308100	330900	229000	175400	210500	372500	223600	153900
†	-68629	+12368	-150148	+107011	-164464	-174499	-85437	+119080	+454925	+55733	-4665	-38708
MEAN‡	1276	4256	1328	6470	2496	2543	2413	4788	11186	6963	3560	1936
AC-FT‡	78471	253168	81652	397911	143636	156401	143563	294480	665425	428233	218935	115192
CAL YR 1983 TOTAL	1588220			4351	MAX 15700	MIN 1200	AC-FT 3150000	MEAN‡ 4316	AC-FT‡ 3125605			
WTR YR 1984 TOTAL	1469360			4015	MAX 10800	MIN 1200	AC-FT 2914000	MEAN‡ 4099	AC-FT‡ 2976567			

† Change in contents, in acre-feet, for Ross, Diablo, and Gorge Reservoirs.

‡ Adjusted for change in contents of Ross, Diablo, and Gorge Reservoirs.

12178100 NEWHALEM CREEK NEAR NEWHALEM, WA

LOCATION.--Lat 48°39'22", long 121°14'14", in SE1/4 sec.28, T.37 N., R.12 E., Whatcom County, Hydrologic Unit 17110005, North Cascades National Park, on left bank 1.2 mi south of Newhalem, 1.5 mi downstream from East Fork, and at mile 1.5.

DRAINAGE AREA.--27.9 mi².

PERIOD OF RECORD.--January 1961 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 1,080 ft, by barometer. Prior to October 1981, at datum 0.96 ft lower.

REMARKS.--Records good. No gage-height record Dec. 19 to Jan. 2. No regulation or diversion upstream from station.

AVERAGE DISCHARGE.--23 years, 176 ft³/s, 85.67 in/yr, 127,500 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 8,430 ft³/s Dec. 26, 1980, gage height, 9.14 ft present datum, from floodmarks, from rating curve extended above 5,570 ft³/s on basis of slope-area measurement of peak flow; minimum, 20 ft³/s Feb. 1, 1963, gage height, 1.07 ft.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 750 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Oct. 22	0600	864	4.09	Jan. 4	1500	*4,210	*6.97
Nov. 3	0800	1,270	4.69	May 30	2015	870	3.87
Nov. 15	1930	990	4.30				

Minimum discharge, 22 ft³/s Oct. 14, minimum gage height, 1.28 ft Sept. 30.

REVISIONS.--The minimum discharge for water year 1983 has been revised to 42 ft³/s Sept. 30; revised daily discharges, in cubic feet per second, for August and September 1983, are given below. These figures supersede those published in the report for 1983.

	Aug. 1....245	Aug. 9....150	Aug. 17.... 91	Aug. 25.... 68			
	2....220	10....180	18.... 84	26.... 66			
	3....180	11....210	19.... 78	27.... 65			
	4....150	12....200	20.... 75	28.... 66			
	5....135	13....165	21.... 72	29.... 69			
	6....128	14....135	22.... 71	30.... 84			
	7....124	15....118	23.... 71	31.... 70			
	8....132	16....102	24.... 70				
Sept. 1....188	Sept. 9.... 65	Sept. 17.... 74	Sept. 25.... 49				
2....237	10....215	18.... 72	26.... 49				
3....127	11....279	19.... 66	27.... 60				
4....113	12....146	20.... 61	28.... 50				
5.... 93	13....105	21.... 59	29.... 46				
6.... 72	14.... 86	22.... 57	30.... 43				
7.... 71	15.... 72	23.... 54					
8.... 66	16.... 70	24.... 51					
	TOTAL	MEAN	MAX	MIN	CFSM	IN.	AC-FT
August 1983	3674	119	245	65	4.27	4.90	7290
September 1983	2796	93.2	279	43	3.34	3.73	5550
Wtr Yr 1983	69722	190	1420	43	6.81	92.96	128300

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP		
1	41	170	95	38	138	83	86	74	255	311	273	121		
2	39	213	89	262	121	82	83	98	201	353	231	84		
3	39	936	83	864	109	78	80	97	180	373	201	74		
4	51	706	78	2920	103	73	77	90	216	432	180	72		
5	41	397	73	942	111	72	75	84	266	477	177	149		
6	38	369	70	717	121	74	73	82	283	349	165	231		
7	35	273	68	526	113	80	75	80	329	252	141	132		
8	33	216	68	401	109	90	77	143	307	243	150	264		
9	30	185	68	293	111	105	75	163	216	290	172	178		
10	28	188	71	255	107	117	74	138	195	318	172	147		
11	27	308	70	210	101	119	73	155	252	333	153	123		
12	25	234	68	168	150	121	78	168	373	307	148	142		
13	24	201	71	143	158	119	83	219	522	269	130	110		
14	24	204	84	121	125	117	97	311	615	300	107	91		
15	24	745	78	109	111	115	195	222	580	373	98	81		
16	23	734	69	100	98	109	182	170	437	428	100	77		
17	26	477	64	90	90	109	138	148	314	432	109	76		
18	27	389	61	83	84	107	123	143	318	341	100	79		
19	28	297	55	79	83	103	119	337	341	293	89	75		
20	45	234	51	75	158	170	111	369	410	240	83	86		
21	50	190	47	73	177	307	109	243	410	190	82	117		
22	365	163	43	74	136	213	113	201	423	204	83	106		
23	163	141	40	75	117	193	105	304	508	246	83	87		
24	101	143	37	222	107	165	95	255	585	290	77	76		
25	115	150	34	440	97	145	87	188	560	345	73	70		
26	105	127	39	255	90	127	83	240	590	333	73	65		
27	82	130	37	185	86	115	79	237	590	266	262	62		
28	71	125	34	249	86	109	78	300	580	249	123	58		
29	64	109	35	240	84	100	75	517	565	243	86	56		
30	97	103	38	175	---	93	74	565	355	243	78	54		
31	283	---	44	152	---	89	---	353	---	255	74	---		
TOTAL	2144	8857	1862	10536	3281	3699	2872	6694	11776	9578	4073	3143		
MEAN	69.2	295	60.1	340	113	119	95.7	216	393	309	131	105		
MAX	365	936	95	2920	177	307	195	565	615	477	273	264		
MIN	23	103	34	38	83	72	73	74	180	190	73	54		
CFSM	2.48	10.6	2.15	12.2	4.05	4.27	3.43	7.74	14.1	11.1	4.70	3.76		
IN.	2.86	11.81	2.48	14.05	4.37	4.93	3.83	8.93	15.70	12.77	5.43	4.19		
AC-FT	4250	17570	3690	20900	6510	7340	5700	13280	23360	19000	8080	6230		
CAL YR 1983	TOTAL	70398	MEAN	193	MAX	1420	MIN	23	CFSM	6.92	IN.	93.86	AC-FT	139600
WTR YR 1984	TOTAL	68515	MEAN	187	MAX	2920	MIN	23	CFSM	6.70	IN.	91.35	AC-FT	135900

SKAGIT RIVER BASIN

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12179000 SKAGIT RIVER ABOVE ALMA CREEK, NEAR MARBLEMOUNT, WA

LOCATION.--Lat 48°36'27", long 121°21'37", in SW¼NE¼ sec.15, T.26 N., R.11 E., Skagit County, Hydrologic Unit 17110005, Ross Lake National Recreation Area, on right bank 0.6 mi upstream from Alma Creek, 6.8 mi northeast of Marblemount, and at mile 85.8.

DRAINAGE AREA.--1,274 mi², of which 400 mi² is in Canada.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1950 to current year.

REVISED RECORDS.--WSP 1932: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 358.8 ft above National Geodetic Vertical Datum of 1929 (river-profile survey).

REMARKS.--Water-discharge records excellent. All diversions returned to river upstream from gage. Flow regulated by Ross Reservoir (see sta 12175000), Diablo Reservoir (see sta 12176500), and Gorge Reservoir (see sta 12177700) since 1960.

AVERAGE DISCHARGE.--34 years, 5,478 ft³/s, 3,969,000 acre-ft/yr, unadjusted.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 38,500 ft³/s June 21, 1967, gage height, 17.26 ft; minimum, 990 ft³/s Dec. 29, 1957, gage height, 4.55 ft; minimum daily, 1,110 ft³/s Oct. 7, 1979.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 36,600 ft³/s Jan. 4, gage height, 16.94 ft; minimum, 1,300 ft³/s Oct. 19, gage height, 5.15 ft.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3130	2470	4880	2490	5430	5720	3940	4560	3920	8490	6430	3480
2	1460	2810	4620	3020	5600	6660	5780	4090	3950	9360	6440	2110
3	2990	7530	4960	5770	4500	6970	6060	4260	3470	6550	6750	2620
4	3260	6600	2860	23200	3840	4340	6840	3910	3430	6040	7320	3160
5	3280	4990	4580	14000	3190	6960	6800	2740	3320	6140	7640	3630
6	3470	3760	4340	7950	4170	6300	6190	2670	3450	5590	6800	4050
7	3550	4660	4680	8820	3930	5770	3880	2670	3650	7700	4820	3040
8	2600	3580	3090	8680	4080	6710	5270	2730	3530	8270	4770	3810
9	1370	3230	2500	7950	5440	6860	6720	3060	2840	8500	4680	4060
10	2710	3640	3160	5470	6830	6350	5740	2840	2470	6950	4390	3910
11	2750	3340	2680	4210	6060	4060	5130	3670	2790	7480	4220	3170
12	2840	2960	2820	4450	4210	6600	4660	3410	4130	8160	4780	3430
13	2640	3200	2690	4080	6460	6710	4340	3970	5180	8150	5020	3570
14	2120	3680	3000	2990	7280	6780	3060	5070	5870	7970	5750	3600
15	1330	6830	3570	2900	7690	7740	3190	5100	6510	7480	4270	3540
16	1350	9470	4170	4350	6970	7540	4180	4890	5330	8400	2700	2650
17	2030	8160	3300	3570	7620	7330	4150	4730	4230	8880	3180	3350
18	1740	8910	2880	4740	6430	5690	4050	4430	4480	9790	3410	3390
19	1910	5650	4130	4850	3040	6890	3490	4280	4910	9280	3110	2950
20	2000	4580	5530	4460	6520	6550	3110	4890	5710	8010	3060	3230
21	2620	5680	6170	4700	7750	7890	2810	4820	5000	5620	2880	3350
22	4330	5630	6280	2840	8080	7620	3660	3660	4660	5300	2940	3110
23	2710	6720	5030	2820	7610	6990	4400	4140	6090	7300	2930	3460
24	3640	5150	5530	4630	6250	3640	4020	3350	6930	7750	2730	3860
25	3260	5770	4510	8620	7710	6160	4100	3520	6950	10800	2280	2720
26	2890	4610	4270	7870	7890	5710	3540	3210	8460	8870	1890	3440
27	3300	4150	3880	7580	7700	4300	3300	3200	8980	7120	6030	3280
28	3140	6050	5060	7280	7370	5180	2880	3170	8330	6100	4800	2570
29	3110	5930	4150	7620	7170	4930	3020	5100	9290	5550	4220	1810
30	3160	6020	2650	7530	---	5130	5000	6560	8680	5860	4540	1780
31	3880	---	2620	6500	---	3590	---	5240	---	6940	3330	---
TOTAL	84570	155760	124590	195940	176820	189670	133310	123940	156540	234400	138110	96130
MEAN	2728	5192	4019	6321	6097	6118	4444	3998	5218	7561	4455	3204
MAX	4330	9470	6280	23200	8080	7890	6840	6560	9290	10800	7640	4060
MIN	1330	2470	2500	2490	3040	3590	2810	2670	2470	5300	1890	1780
AC-FT	167700	308900	247100	388600	350700	376200	264400	245800	310500	464900	273900	190700
CAL YR 1983	TOTAL	1887360	MEAN	5171	MAX	18600	MIN	1330	AC-FT	3744000		
WTR YR 1984	TOTAL	1809780	MEAN	4945	MAX	23200	MIN	1330	AC-FT	3590000		

SKAGIT RIVER BASIN

12179000 SKAGIT RIVER ABOVE ALMA CREEK, NEAR MARBLEMOUNT, WA--Continued

WATER-QUALITY RECORDS

PERIOD OF DAILY RECORD.--

WATER TEMPERATURES: January 1953 to September 1973, September 1974 to current year.

INSTRUMENTATION.--Temperature recorder for period of daily record.

REMARKS.--Interruptions in the record were due to malfunctions of the instrument.

EXTREMES FOR PERIOD OF DAILY RECORD.--

WATER TEMPERATURES: Maximum, 15.0°C Aug. 3-5, 9, 12, 13, 20, 1977; minimum, 1.0°C Jan. 26, 27, 29-31, Feb. 1-3, 1972, Feb. 11, 1981, Feb. 7, 8, 20, 22-24, 1982.

EXTREMES FOR CURRENT YEAR.--

WATER TEMPERATURES: Maximum, 12.0°C Aug. 16, 18, 20-22, 25, 26; minimum recorded, 3.5°C Jan. 31, Feb. 3 to Mar. 8, Mar. 12, 13.

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
OCTOBER			NOVEMBER			DECEMBER			JANUARY			
1	10.0	9.0	9.5							---	---	---
2	10.5	9.0	9.5							---	---	---
3	10.0	9.5	10.0							---	---	---
4	10.5	9.5	10.0							---	---	---
5	10.5	9.0	9.5							---	---	---
6	10.0	9.0	9.5							---	---	---
7	10.5	9.0	9.5							---	---	---
8	10.0	9.0	9.5							---	---	---
9	10.0	9.0	9.5							---	---	---
10	10.5	8.5	9.5							---	---	---
11	10.0	8.5	9.5							---	---	---
12	10.5	9.0	9.5							---	---	---
13	9.5	9.0	9.5							---	---	---
14	10.0	9.5	9.5							---	---	---
15	10.0	9.0	9.5							---	---	---
16	10.0	8.5	9.0							---	---	---
17	9.5	9.0	9.5							---	---	---
18	10.0	9.0	9.5							---	---	---
19	9.5	9.0	9.5							---	---	---
20	10.0	9.0	9.5							---	---	---
21	---	---	---							---	---	---
22	---	---	---							---	---	---
23	---	---	---							---	---	---
24	---	---	---							---	---	---
25	---	---	---							---	---	---
26	---	---	---							4.0	4.0	4.0
27	---	---	---							4.0	4.0	4.0
28	---	---	---							4.5	4.0	4.5
29	---	---	---							4.5	4.0	4.5
30	---	---	---							4.0	4.0	4.0
31	---	---	---							4.0	3.5	4.0
MONTH	---	---	---							---	---	---

SKAGIT RIVER BASIN

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12179000 SKAGIT RIVER ABOVE ALMA CREEK, NEAR MARBLEMOUNT, WA--Continued

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984

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

SKAGIT RIVER BASIN

12181000 SKAGIT RIVER AT MARBLEMOUNT, WA

LOCATION.--Lat 48°32'02", long 121°25'43", in NE¼SW¼ sec.7, T.35 N., R.11 E., Skagit County, Hydrologic Unit 17110005, on right bank 0.5 mi north of Marblemount, 0.6 mi upstream from Cascade River, and at mile 78.7.

DRAINAGE AREA.--1,381 mi², which 400 mi² is in Canada.

PERIOD OF RECORD.--September 1943 to July 1944, October 1946 to September 1951, May 1976 to current year.

REVISED RECORDS.--WDR WA-76-1: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 305.1 ft above National Geodetic Vertical Datum of 1929 (river-profile survey).

REMARKS.--Records good. All diversions returned to river upstream from gage. Flow regulated by Ross Reservoir (see sta 12175000), Diablo Reservoir (see sta 12176500), and Gorge Reservoir (see sta 12177700) since 1960.

AVERAGE DISCHARGE.--13 years (water years 1947-51, 1977-84), 6,115 ft³/s, 4,430,000 acre-ft/yr, unadjusted for regulation.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 59,300 ft³/s Nov. 27, 1949, gage height, 11.37 ft, from rating curve extended above 20,000 ft³/s; minimum, 620 ft³/s Mar. 6, 1944, gage height, 0.55 ft; minimum daily, 1,190 ft³/s Feb. 25, 1944.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 59,000 ft³/s Jan. 4, gage height, 11.33 ft; minimum, 1,790 ft³/s Oct. 15-17, gage height, 1.81 ft; minimum daily, 1,810 ft³/s Oct. 16.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3590	3640	6090	3320	6440	6340	4340	4850	4970	10500	7750	3880
2	2000	4340	5640	4610	6160	7240	6160	4670	4760	11800	7410	2650
3	2080	11500	5850	9030	5210	7910	6580	4730	4340	8380	7760	2870
4	3050	9980	3860	39100	4520	4700	7320	4430	4370	7740	8290	3450
5	3890	7070	5360	20700	3890	7750	7390	3260	4290	8120	8760	4100
6	4070	5670	5240	12000	4790	6930	6900	3160	4430	6880	7740	5170
7	4180	6370	5570	12200	4550	6200	4260	3160	4820	9140	5280	3690
8	3300	5090	4020	11600	4670	7320	5570	3510	4970	9920	5220	4400
9	1970	4520	3320	10400	5880	7790	7210	3940	3940	10400	5230	4520
10	3120	5060	4070	6830	7670	7320	6340	3640	3420	8560	4980	4380
11	3280	5570	3560	5210	6900	4760	5480	4490	4010	9150	4680	3650
12	3440	4700	3660	5180	5030	7470	5090	4760	5360	10000	5190	3810
13	3210	4640	3610	4850	7470	7630	4910	5060	7070	9880	5390	3920
14	2770	5090	3960	3760	8390	7630	3740	6370	8300	9710	6020	3870
15	1860	10800	4430	3560	9070	8910	4230	6130	9070	9350	4700	3790
16	1810	13600	4970	4730	7790	8590	5420	5600	7050	10700	3310	3030
17	2080	11200	4320	4090	8670	8510	4700	5360	5280	11400	3620	3530
18	2090	11800	3690	5030	7320	6200	4670	5090	5430	11900	3820	3670
19	2040	7830	4850	5240	3660	7790	4090	5600	5870	11400	3490	3230
20	2590	6270	6270	4820	7990	7670	3690	6760	7050	9680	3470	3500
21	3280	7180	7000	5090	9670	10200	3420	5850	6320	6400	3160	3760
22	6200	7000	7110	3370	9750	9310	4180	4580	5850	5970	3290	3570
23	4070	7990	5850	3440	9070	8550	4820	5480	7980	8580	3290	3710
24	4460	6550	6270	5510	7000	4640	4490	4460	9520	9400	3090	4070
25	4180	7180	5510	12100	8910	6830	4490	4400	9480	12600	2700	3030
26	3660	5990	4820	10300	9070	6650	3960	4400	11400	11200	2280	3580
27	4090	5570	4700	9750	8870	4880	3740	4260	12000	8620	6970	3470
28	3940	7250	5780	9670	8390	5600	3320	4460	11300	7140	5390	2910
29	3840	7180	4940	9840	8150	5450	3420	7110	12500	6380	4470	2150
30	4090	7110	3710	9550	---	5480	5180	9270	11100	6780	4690	2050
31	5390	---	3560	7670	---	4090	---	6830	---	8130	3690	---
TOTAL	103620	213740	151590	262550	204950	216340	149110	155670	206250	285810	155130	107410
MEAN	3343	7125	4890	8469	7067	6979	4970	5022	6875	9220	5004	3580
MAX	6200	13600	7110	39100	9750	10200	7390	9270	12500	12600	8760	5170
MIN	1810	3640	3320	3320	3660	4090	3320	3160	3420	5970	2280	2050
AC-FT	205500	424000	300700	520800	406500	429100	295800	308800	409100	566900	307700	213000
CAL YR 1983	TOTAL	2302040	MEAN	6307	MAX	22300	MIN	1810	AC-FT	4566000		
WTR YR 1984	TOTAL	2212170	MEAN	6044	MAX	39100	MIN	1810	AC-FT	4388000		

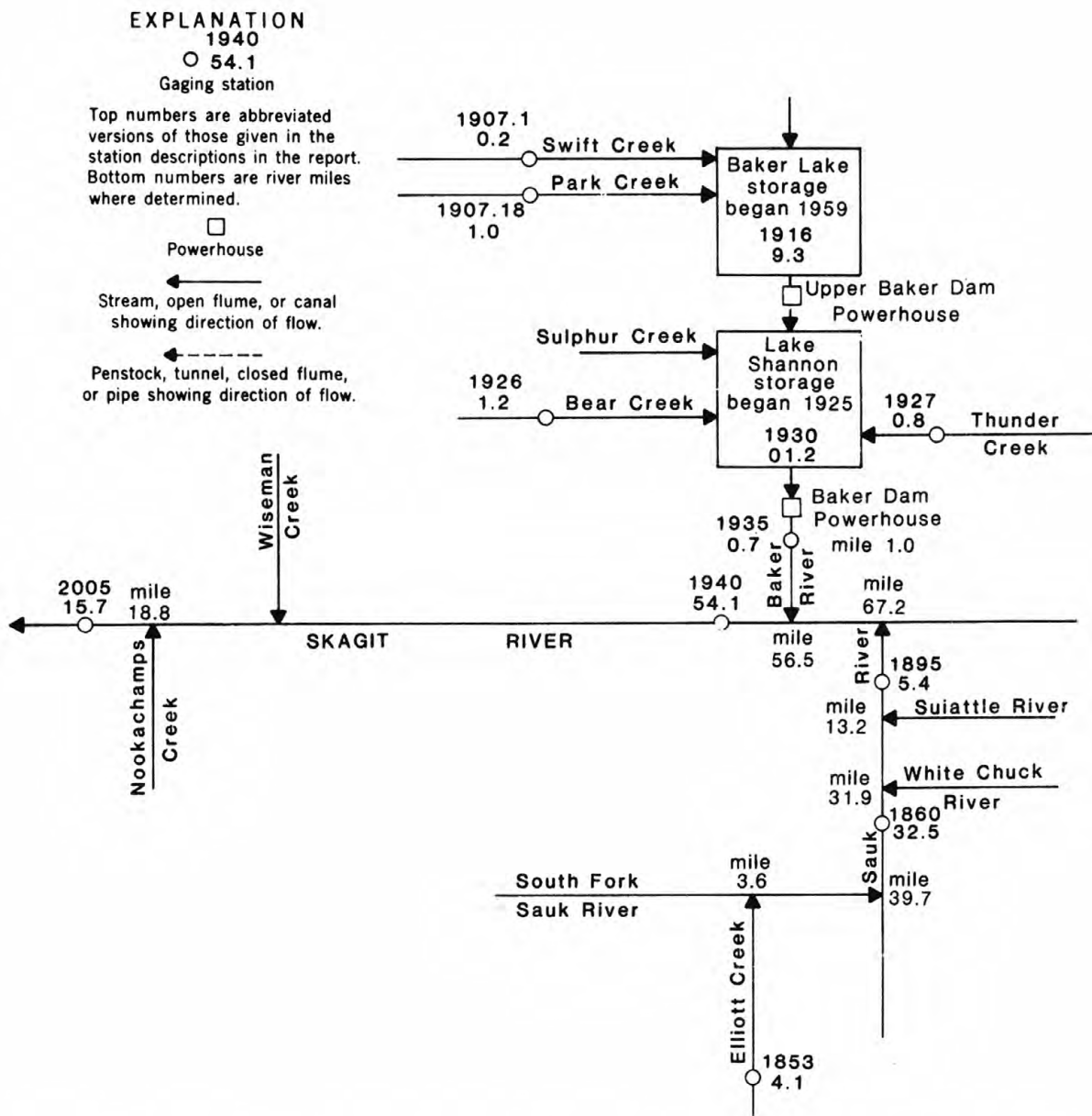


Figure 17.--Gaging stations in Skagit River basin below Cascade River.

SKAGIT RIVER BASIN

12184500 ILLABOT CREEK NEAR ROCKPORT, WA

LOCATION.--Lat 48°28'53", long 121°30'03", in NW¼NW¼ sec.34, T.35 N., R.10 E., Skagit County, Hydrologic Unit 17110005, on right bank at Rockport-Cascade county highway bridge, 4.5 mi east of Rockport, and 0.6 mi upstream from mouth.

DRAINAGE AREA.--42.4 mi².

PERIOD OF RECORD.--August to October 1943, July to November 1944, March 1982 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 320 ft, from topographic map. Aug. 23 to Oct. 31, 1943, at different datum, and July 1 to Nov. 3, 1944, at site 0.5 mi upstream at different datum.

REMARKS.--Records good except those for period of no gage-height record Oct. 1-25, and period of ice effect Dec. 20-25, which are fair. No regulation or diversion upstream from station.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 2,920 ft³/s Jan. 4, 1984, gage height, 6.67 ft; maximum gage height, 7.23 ft Dec. 24, 1983 due to ice jam; minimum observed, 58 ft³/s Sept. 8, 1944.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 2,920 ft³/s Jan. 4, gage height, 6.67 ft; maximum gage height, 7.23 ft Dec. 24 due to ice jam; minimum daily, 83 ft³/s Oct. 16, 18, 19.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP		
1	85	222	201	167	260	160	174	146	445	452	310	137		
2	90	280	190	459	232	155	169	264	398	459	284	123		
3	93	960	185	918	210	144	162	246	368	459	264	110		
4	194	918	172	2140	195	136	155	213	368	466	242	107		
5	154	520	167	1330	198	132	153	201	392	504	235	149		
6	135	459	157	960	204	132	151	201	417	466	225	299		
7	120	362	151	754	195	136	157	198	466	398	207	176		
8	110	300	172	608	201	148	157	280	528	345	201	192		
9	104	268	167	445	210	164	148	288	445	330	219	188		
10	96	292	190	380	198	179	153	264	392	362	222	173		
11	95	520	172	325	195	198	142	296	398	374	207	163		
12	94	417	162	280	340	216	155	305	410	368	201	290		
13	99	345	177	246	310	219	172	340	520	330	204	208		
14	95	330	192	216	246	198	195	431	617	325	177	172		
15	87	1270	179	195	216	190	288	362	646	386	162	151		
16	83	1180	164	185	195	179	280	300	544	431	155	141		
17	86	904	151	167	179	174	232	268	445	445	162	137		
18	83	778	144	157	167	172	207	253	424	410	160	139		
19	83	589	134	148	172	172	201	504	417	362	142	131		
20	90	459	121	142	280	232	192	617	445	325	136	132		
21	100	374	102	140	300	466	192	466	466	284	130	182		
22	190	315	98	164	239	386	207	417	445	272	132	186		
23	280	276	94	167	213	368	198	536	504	296	130	171		
24	140	320	90	473	198	335	177	480	607	325	122	147		
25	158	345	100	1040	187	288	162	404	617	368	117	133		
26	153	280	112	488	172	260	153	480	645	374	113	122		
27	142	280	103	392	169	232	146	445	626	325	229	113		
28	128	268	98	480	172	222	144	438	626	300	170	107		
29	119	239	110	438	167	207	142	589	699	288	132	104		
30	142	216	250	340	---	195	140	677	589	292	120	99		
31	305	---	204	292	---	185	---	544	---	300	114	---		
TOTAL	3933	14286	4709	14636	6220	6580	5304	11453	14909	11421	5624	4682		
MEAN	127	476	152	472	214	212	177	369	497	368	181	156		
MAX	305	1270	250	2140	340	466	288	677	699	504	310	299		
MIN	83	216	90	140	167	132	140	146	368	272	113	99		
CFSM	3.00	11.2	3.58	11.1	5.05	5.00	4.17	8.70	11.7	8.68	4.27	3.68		
IN.	3.45	12.53	4.13	12.84	5.46	5.77	4.65	10.05	13.08	10.02	4.93	4.11		
AC-FT	7800	28340	9340	29030	12340	13050	10520	22720	29570	22650	11160	9290		
CAL YR 1983	TOTAL	104275	MEAN	286	MAX	1270	MIN	83	CFSM	6.75	IN.	91.49	AC-FT	206800
WTR YR 1984	TOTAL	103757	MEAN	283	MAX	2140	MIN	83	CFSM	6.67	IN.	91.03	AC-FT	205800

LOCATION.--Lat 48°00'52", long 121°20'51", in NE¼ sec.11, T.29 N., R.11 E. (unsurveyed), at Goat Lake Inlet, Snohomish County, Hydrologic Unit 17110006, and 2.5 miles northeast of Monte Cristo.

REMARKS.--Quality of water analyses for dissolved aluminum and dissolved iron were determined from water filtered through a 0.10 micrometer filter. Discharge measured intermittingly at same site.

		STREAM- FLOW, INSTAN- TANEOUS (CFS)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH (STAND- ARD UNITS)	TEMPER- ATURE (DEG C)	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
DEC , 1983												
02...	0840	1.3	17	6.8	2.5	7	0	--	2.1	.47	.40	10
JAN , 1984												
26...	0850	--	16	6.6	3.0	6	0	<.1	1.7	.38	.50	15
FEB												
23...	1005	4.1	14	5.6	3.0	7	0	<.1	1.8	.49	.40	11
MAR												
19...	0855	--	15	6.1	4.0	7	0	<.1	1.9	.49	.40	11
APR												
23...	0840	6.5	15	6.0	2.5	7	0	<.1	1.9	.47	.40	11
MAY												
22...	0835	--	13	6.0	2.5	7	2	<.1	1.9	.50	.40	11
JUN												
12...	1000	29	14	6.8	3.0	7	2	<.1	1.9	.50	.30	8
AUG												
02...	1115	40	12	6.1	5.5	6	0	<.1	1.6	.40	.30	10
SEP												
10...	1105	23	15	6.2	6.0	6	0	<.1	1.8	.40	.40	12

DATE	SODIUM AD- SORP- TION RATIO	POTAS- SIUM, DIS- SOLVED (MG/L AS K)	ALKA- LITY 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)	BROMIDE DIS- SOLVED (MG/L AS BR)	SILICA, DIS- SOLVED AS SIO2)	SOLIDS, SUM OF CONSTI- TUENTS, DIS- SOLVED (MG/L)	SOLIDS, DIS- SOLVED (TONS PER AC-FT)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N)	NITRO- GEN, NITRATE DIS- SOLVED (MG/L AS N)
DEC , 1983												
02...	.0	.31	9.0	1.5	.28	<.01	<.05	2.9	14	.02	.046	.09
JAN , 1984												
26...	.0	.24	7.0	1.2	.46	<.01	<.05	2.8	12	.02	.025	.14
FEB												
23...	.0	.21	8.0	1.3	.36	.06	<.01	2.7	12	.02	.005	--
MAR												
19...	.0	.26	8.0	1.2	.40	.04	<.01	2.7	12	.02	.029	--
APR												
23...	.0	.22	6.0	1.3	.44	<.01	<.01	2.4	11	.01	.090	--
MAY												
22...	.0	.21	5.0	1.5	.41	.02	<.01	2.3	10	.01	.026	--
JUN												
12...	.0	.21	5.0	1.4	.35	<.01	<.01	2.1	10	.01	.057	--
AUG												
02...	.0	.19	5.0	1.2	.20	.01	<.01	1.8	9	.01	.033	--
SEP												
10...	.0	.20	10	1.3	.20	<.01	<.01	2.1	12	.02	.028	--

DATE	PHOS- PHORUS, ORTHO, DIS- SOLVED (MG/L AS P)	ALUM- INUM, DIS- SOLVED (UG/L AS AL)	IRON, DIS- SOLVED (UG/L AS FE)	MANGA- NESE, DIS- SOLVED (UG/L AS MN)	BROMIDE DISSOLV (UG/L)	CHLO- RIDE DISSOLV (UG/L)	FLUO- RIDE DISSOLV (UG/L)	NITRO- GEN NITRATE DISSOLV (UG/L)	PHOS- PHORUS, ORTHO, DIS- SOLVED (UG/L AS P)	SULFATE DISSOLV (UG/L)	POTAS- SIUM DIS- SOLVED (UG/L AS K)	CARBON, ORGANIC DIS- SOLVED (MG/L AS C)
DEC , 1983												
02...	<.100	10	9	6	<50.0	280	<10.0	90.0	<100	1540	310	1.0
JAN , 1984												
26...	<.006	<10	12	11	<50.0	460	<10.0	140	<100	1190	240	.40
FEB												
23...	<.010	<10	8	6	<10.0	360	60.0	110	<10.0	1280	210	1.5
MAR												
19...	<.010	<10	27	9	<10.0	400	40.0	110	<10.0	1200	260	.40
APR												
23...	<.010	10	12	5	<10.0	440	<10.0	100	<10.0	1310	220	.70
MAY												
22...	<.010	10	14	3	<10.0	410	20.0	150	<10.0	1480	210	.70
JUN												
12...	<.010	<10	5	2	<10.0	350	<10.0	110	<10.0	1380	210	.50
AUG												
02...	.018	10	3	4	<10.0	200	10.0	30.0	<10.0	1240	190	.80
SEP												
10...	<.010	<10	3	4	--	--	--	--	--	--	200	.40

SKAGIT RIVER BASIN

12185300 ELLIOTT CREEK AT GOAT LAKE OUTLET, NEAR MONTE CRISTO, WA

LOCATION.--Lat 48°01'20", long 121°21'19", in SW¼SE¼ sec.2, T.29 N., R.11 E. (unsurveyed), at Goat Lake outlet, Snohomish County, Hydrologic Unit 17110006, on left bank 50 ft upstream from falls, and 3.0 mi northeast of Monte Cristo.

DRAINAGE AREA.--3.03 mi² (revised).

WATER-DISCHARGE RECORDS

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

GAGE.--Water-stage recorder. Elevation of gage is 3,200 ft, from topographic map.

REMARKS.--Records good. No regulation or diversion upstream from station.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 782 ft³/s Jan. 4, 1984, gage height, 2.38 ft; minimum daily, 3.6 ft³/s Dec. 24, 1983.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 782 ft³/s Jan. 4, gage height, 2.38 ft; minimum daily, 3.6 ft³/s Dec. 24, gage height, 0.55 ft.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP		
1	11	27	10	8.7	24	12	16	14	73	84	60	19		
2	11	32	8.7	10	22	12	16	18	54	75	64	20		
3	10	198	8.7	33	20	11	15	19	44	73	55	20		
4	11	186	8.3	492	19	11	14	19	39	75	47	18		
5	12	105	8.3	278	18	10	14	19	39	84	42	18		
6	11	64	7.8	139	18	10	13	18	40	87	39	32		
7	11	51	7.8	100	19	10	13	17	42	75	34	34		
8	10	42	7.8	71	19	10	13	18	47	58	32	48		
9	9.8	33	7.8	53	20	10	12	20	49	56	40	56		
10	9.6	32	8.3	45	19	12	12	21	47	56	48	45		
11	9.3	30	8.1	30	19	13	12	23	47	56	49	33		
12	9.2	30	7.5	25	21	14	11	27	49	58	46	33		
13	8.7	30	7.6	21	22	15	11	33	73	58	42	34		
14	8.3	29	7.8	17	22	15	10	49	108	58	38	30		
15	7.8	51	7.4	15	22	15	15	53	135	61	32	27		
16	7.0	97	7.0	14	20	15	24	49	117	71	28	19		
17	6.5	92	6.4	13	17	15	25	39	89	78	27	17		
18	6.5	75	6.1	12	15	15	24	37	79	70	27	16		
19	6.5	56	5.6	12	14	14	22	44	73	64	27	16		
20	6.5	39	5.2	11	14	20	21	79	73	56	25	16		
21	7.0	34	4.9	11	15	44	18	75	97	48	23	16		
22	25	26	4.4	12	15	47	18	53	100	45	22	20		
23	30	20	4.0	13	15	39	18	47	105	50	22	22		
24	27	19	3.6	17	14	33	17	45	129	56	22	21		
25	25	17	3.9	49	13	29	15	40	129	64	21	18		
26	25	15	4.0	44	13	27	15	40	126	74	19	16		
27	22	14	3.9	39	12	26	14	42	126	64	23	14		
28	19	13	3.8	36	12	23	14	44	117	57	30	13		
29	17	13	4.3	34	12	20	14	71	117	54	28	12		
30	17	12	7.4	30	---	18	13	108	111	50	23	11		
31	26	---	8.5	27	---	17	---	95	---	55	20	---		
TOTAL	422.7	1482	204.9	1711.7	505	582	469	1276	2474	1970	1055	714		
MEAN	13.6	49.4	6.61	55.2	17.4	18.8	15.6	41.2	82.5	63.5	34.0	23.8		
MAX	30	198	10	492	24	47	25	108	135	87	64	56		
MIN	6.5	12	3.6	8.7	12	10	10	14	39	45	19	11		
CFSM	4.49	16.3	2.18	18.2	5.74	6.20	5.15	13.6	27.2	21.0	11.2	7.85		
IN.	5.19	18.19	2.52	21.01	6.20	7.15	5.76	15.67	30.37	24.19	12.95	8.77		
AC-FT	838	2940	406	3400	1000	1150	930	2530	4910	3910	2090	1420		
CAL YR 1983	TOTAL	12200.8	MEAN	33.4	MAX	284	MIN	3.6	CFSM	11.0	IN.	149.79	AC-FT	24200
WTR YR 1984	TOTAL	12866.3	MEAN	35.2	MAX	492	MIN	3.6	CFSM	11.6	IN.	157.96	AC-FT	25520

12185300 ELLIOTT CREEK AT GOAT LAKE OUTLET, NEAR MONTE CRISTO, WA--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--January 1983 to current year.

REMARKS.--Quality of water analyses for dissolved aluminum and dissolved iron were determined from water filtered through a 0.10 micrometer filter.

WATER QUALITY DATA, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984

		STREAM- FLOW, INSTAN- TANEOUS (CFS)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH (STAND- ARD UNITS)	TEMPER- ATURE (DEG C)	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
DEC , 1983												
02...	0905	8.5	16	6.9	1.5	7	0	<.1	2.0	.47	.50	13
JAN , 1984												
26...	0903	49	17	6.5	2.0	6	0	<.1	1.6	.38	.40	13
FEB												
23...	1030	15	15	5.8	2.5	7	0	<.1	2.0	.47	.50	13
MAR												
19...	0905	14*	16	6.0	2.5	7	0	<.1	2.1	.48	.50	12
APR												
23...	0910	19	18	6.0	4.0	8	0	<.1	2.2	.50	.50	12
MAY												
22...	0850	53*	17	5.9	5.5	8	2	<.1	2.2	.50	.50	12
JUN												
12...	1055	47	15	6.7	7.5	7	1	<.1	2.0	.50	.50	13
AUG												
02...	1245	64	11	6.2	11.0	6	0	<.1	1.7	.40	.50	15
SEP												
10...	1230	50*	15	6.2	10.0	6	0	<.1	1.9	.40	.50	14
DATE	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)	BROMIDE DIS- SOLVED (MG/L AS BR)	SILICA, DIS- SOLVED (MG/L AS SiO2)	SOLIDS, SUM OF CONSTI- TUENTS, DIS- SOLVED (MG/L)	SOLIDS, DIS- SOLVED (TONS PER AC-FT)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N)	NITRO- GEN, NITRATE DIS- SOLVED (MG/L AS N)
DEC , 1983												
02...	.0	.40	9.0	1.5	.37	.01	<.05	3.1	14	.02	.003	.09
JAN , 1984												
26...	.0	.34	7.0	1.4	.41	<.01	<.05	2.2	11	.02	.055	.12
FEB												
23...	.0	.33	9.0	1.3	.36	.07	<.01	3.4	14	.02	.018	--
MAR												
19...	.0	.37	9.0	1.5	.41	.05	<.01	3.6	14	.02	.029	--
APR												
23...	.0	.33	7.0	1.5	.39	<.01	<.01	3.5	13	.02	.086	--
MAY												
22...	.0	.34	6.0	1.5	.39	.02	<.01	3.4	13	.02	.031	--
JUN												
12...	.0	.29	6.0	1.4	.38	<.01	<.01	2.9	12	.02	.062	--
AUG												
02...	.0	.31	5.0	1.2	.28	.03	<.01	1.8	9	.01	.015	--
SEP												
10...	.0	.26	6.0	1.4	.20	<.01	<.01	2.0	10	.01	.012	--
DATE	PHOS- PHORUS, ORTHO, DIS- SOLVED (MG/L AS P)	ALUM- INUM, DIS- SOLVED (UG/L AS AL)	IRON, DIS- SOLVED (UG/L AS FE)	MANGA- NESE, DIS- SOLVED (UG/L AS MN)	BROMIDE DISSOLV (UG/L)	CHLO- RIDE DISSOLV (UG/L)	FLUO- RIDE DISSOLV (UG/L)	NITRO- GEN NITRATE DISSOLV (UG/L)	PHOS- PHORUS, ORTHO, DIS- SOLVED (UG/L AS P)	SULFATE DISSOLV (UG/L)	POTAS- SIUM DIS- SOLVED (UG/L AS K)	CARBON, ORGANIC DIS- SOLVED (MG/L AS C)
DEC , 1983												
02...	<.100	<10	15	9	<50.0	370	10.0	90.0	<100	1480	400	1.3
JAN , 1984												
26...	<.100	<10	3	3	<50.0	410	<10.0	80.0	<100	1350	340	1.0
FEB												
23...	<.010	10	12	12	<10.0	360	70.0	100	<10.0	1300	330	.80
MAR												
19...	<.010	<10	18	21	<10.0	410	50.0	100	<10.0	1490	370	.90
APR												
23...	<.010	<10	23	65	<10.0	390	<10.0	80.0	<10.0	1470	330	1.6
MAY												
22...	<.010	<10	35	23	<10.0	390	20.0	100	<10.0	1500	340	.70
JUN												
12...	<.010	<10	15	8	<10.0	380	<10.0	90.0	<10.0	1370	290	.90
AUG												
02...	<.010	20	19	4	<10.0	280	30.0	20.0	<10.0	1210	310	.50
SEP												
10...	<.010	<10	8	8	--	--	--	--	--	--	260	.40

* Daily mean discharge.

12186000 SAUK RIVER ABOVE WHITE CHUCK RIVER, NEAR DARRINGTON, WA

LOCATION.--Lat 48°10'08", long 121°28'10", on north line NE¼NE¼ sec.23, T.31 N., R.10 E., Snohomish County, Hydrologic Unit 17110006, Mount Baker National Forest, on right bank 0.6 mi upstream from White Chuck River, 8.4 mi southeast of Darrington, and at mile 32.5.

DRAINAGE AREA.--152 mi².

PERIOD OF RECORD.--August to November 1910 (fragmentary gage heights only), October 1917 to September 1922, August 1928 to current year.

REVISED RECORDS.--WSP 752: 1932. WSP 1286: 1918(M), 1920(M), 1921, 1922(M), 1932(M), 1934(M), 1946-47(M), 1949.

GAGE.--Water-stage recorder. Elevation of gage is 930 ft, from river-profile map. Prior to Nov. 18, 1910, nonrecording gage 0.5 mi downstream at different datum.

REMARKS.--Records good except those during period of no gage-height record, May 30 to June 15, July 13 to Aug. 28, Sept. 4-30, and during period of ice effect Dec. 19-29, which are fair. No regulation or diversion upstream from station.

AVERAGE DISCHARGE.--61 years (water years 1918-22, 1929-84), 1,144 ft³/s, 102.21 in/yr, 828,800 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 40,100 ft³/s Dec. 26, 1980, gage height, 16.03 ft, from rating curve extended above 15,000 ft³/s; minimum, 115 ft³/s Nov. 15, 16, 30, Dec. 1, 1936.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 4,500 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Nov. 3	1000	6,140	6.89	Jan. 4	1930	*12,600	*9.22
Nov. 15	2030	4,860	6.32	Jan. 25	0415	5,630	6.67

Minimum discharge, 164 ft³/s Oct. 16, 17, minimum gage height, 2.69 ft Oct. 16, 17.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	250	662	638	712	710	480	598	466	1800	2120	1400	313
2	240	967	590	1040	772	487	567	881	1500	1950	1300	326
3	230	4220	552	2710	703	466	545	790	1250	2080	1200	319
4	344	3600	515	8800	654	425	515	670	1400	2220	1100	303
5	326	2000	480	6520	646	399	501	606	1550	2390	1080	320
6	276	1860	452	3880	678	399	494	560	1650	1990	1010	740
7	250	1610	419	2990	695	432	508	530	1700	1580	890	590
8	235	1370	494	2420	687	487	508	654	2100	1650	870	760
9	220	1140	508	1830	729	598	508	826	1600	1620	940	660
10	210	1260	583	1530	720	687	530	764	1480	1500	990	552
11	200	1780	545	1330	695	772	515	881	1530	1600	940	573
12	191	1530	487	1130	1060	919	560	1140	1670	1700	820	641
13	186	1350	622	967	1170	948	545	1190	2410	1460	810	524
14	182	1490	844	835	1010	844	515	1590	2990	1520	750	413
15	172	3690	703	729	872	790	910	1360	3380	1700	670	360
16	168	4140	575	662	755	729	1060	1130	2640	1850	660	336
17	182	3230	494	598	646	720	854	997	2010	1950	690	327
18	210	3020	445	545	583	738	764	948	1880	1840	670	322
19	191	2260	390	508	545	772	746	1620	1920	1600	640	311
20	240	1790	340	473	720	1190	712	2660	2310	1380	590	309
21	298	1410	295	459	872	1900	678	1900	2970	1200	540	339
22	1020	1160	280	545	764	1530	695	1530	2450	1150	550	432
23	1060	987	240	622	695	1380	703	1790	2740	1280	540	438
24	670	1040	220	1750	638	1270	622	1710	3250	1420	510	417
25	545	1110	225	4300	590	1110	560	1420	3110	1580	495	385
26	494	919	230	2090	530	997	515	1880	3120	1780	480	358
27	425	977	220	1500	501	863	494	1760	2950	1500	590	330
28	380	929	210	1320	487	808	480	1760	2900	1350	640	306
29	350	808	230	1190	487	729	466	2550	3230	1300	428	283
30	368	720	870	1030	---	670	452	3200	2910	1320	363	270
31	910	---	820	938	---	638	---	2500	---	1300	325	---
TOTAL	11023	53029	14516	55953	20614	25177	18120	42263	68400	50880	23481	12557
MEAN	356	1768	468	1805	711	812	604	1363	2280	1641	757	419
MAX	1060	4220	870	8800	1170	1900	1060	3200	3380	2390	1400	760
MIN	168	662	210	459	487	399	452	466	1250	1150	325	270
CFSM	2.34	11.6	3.08	11.9	4.68	5.34	3.97	8.97	15.0	10.8	4.98	2.76
IN.	2.70	12.98	3.55	13.69	5.05	6.16	4.43	10.34	16.74	12.45	5.75	3.07
AC-FT	21860	105200	28790	111000	40890	49940	35940	83830	135700	100900	46570	24910

CAL YR 1983	TOTAL	391905	MEAN	1074	MAX	5670	MIN	168	CFSM	7.07	IN.	95.91	AC-FT	777300
WTR YR 1984	TOTAL	396013	MEAN	1082	MAX	8800	MIN	168	CFSM	7.12	IN.	96.92	AC-FT	785500

NOTE.--No gage-height record July 13 to Aug. 28.

12189500 SAUK RIVER NEAR SAUK, WA

LOCATION.--Lat 48°25'29", long 121°34'02", in NW¼NW¼ sec.19, T.34 N., R.10 E., Skagit County, Hydrologic Unit 17110006, on left bank, 4.4 mi southeast of Rockport, 7.6 mi southeast of Sauk, 7.8 mi downstream from Sulattle River, and at mile 5.4.

DRAINAGE AREA.--714 mi².

PERIOD OF RECORD.--August to October 1910 (fragmentary gage heights), March 1911 to August 1912, July 1928 to current year.
Published as "near Sulattle Crossing, near Sauk" 1910-12.

REVISED RECORDS.--WSP 1286: 1929, 1937, 1939.

GAGE.--Water-stage recorder. Datum of gage is 266 ft above National Geodetic Vertical Datum of 1929 (from river-profile survey). Prior to Aug. 4, 1912, nonrecording gages at several sites 1.0 mi downstream to 5.0 mi upstream from present site at various datums. July 24, 1928, to Sept. 16, 1929, nonrecording gage at present site and datum.

REMARKS.--Records excellent. No regulation. Small diversion for millpond at Darrington and for domestic use. Summer flows augmented by glacier melt at source.

AVERAGE DISCHARGE.--56 years (water years 1929-84), 4,375 ft³/s, 83.21 in/yr, 3,170,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 98,600 ft³/s Dec. 26, 1980, gage height, 18.24 ft, from rating extended above 50,000 ft³/s; minimum, 572 ft³/s Dec. 5, 1929, but may have been less during period of ice effect Jan. 10-27, 1930.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 16,000 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Nov. 3	1400	16,700	8.40	Jan. 5	0100	*39,600	*12.08
Nov. 16	0100	16,800	8.41	Jan. 25	0600	22,200	9.40

Minimum discharge, 1,030 ft³/s Oct. 17, gage height, 3.02 ft.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP		
1	1330	2600	2950	2610	4200	2610	2760	2180	6370	7750	5630	2120		
2	1290	3320	2790	5110	3780	2650	2640	3800	5430	7290	5120	2020		
3	1280	11000	2660	10300	3490	2500	2550	3750	5000	7580	4860	1800		
4	1780	11100	2510	27600	3290	2350	2490	3190	5050	8170	4430	1780		
5	1620	6860	2400	24400	3310	2270	2430	2920	5520	8780	4400	1850		
6	1410	6110	2300	13500	3400	2280	2420	2750	6010	8610	4140	3370		
7	1310	5340	2200	10600	3310	2380	2480	2650	6110	6930	3500	2560		
8	1260	4620	2600	8720	3310	2530	2520	3110	7020	6240	3490	3350		
9	1210	3940	2590	6960	3460	2810	2430	3640	5910	6260	3980	3030		
10	1180	4040	2980	5910	3360	3020	2500	3340	5430	6670	4190	2540		
11	1140	5930	2830	5290	3260	3310	2430	3440	5490	6740	3860	2390		
12	1130	5150	2580	4650	4760	3770	2570	4100	6010	6780	3560	3010		
13	1110	4590	3050	4090	5250	4200	2750	4080	8150	6060	3470	2580		
14	1090	4780	3540	3650	4430	3630	2590	5390	9980	6140	3070	2110		
15	1070	12200	3150	3300	3860	3410	3520	4710	11200	6890	2860	1870		
16	1050	14500	2720	3110	3430	3140	4040	4120	9470	7990	2770	1790		
17	1090	11100	2430	2850	3100	3100	3340	3680	7280	8300	2950	1800		
18	1230	10600	2200	2650	2870	3100	3050	3480	6800	7760	2850	1920		
19	1120	8450	2000	2560	2770	3130	3030	5330	6870	6550	2570	1960		
20	1280	6980	1800	2440	3900	4220	2920	8620	7830	5880	2380	1840		
21	1370	5620	1600	2410	4290	6770	2810	6700	9960	4940	2290	2190		
22	3470	4720	1400	2790	3620	5640	2950	5480	8580	4750	2370	2580		
23	3630	4080	1300	3000	3340	5210	2920	6740	9330	5100	2310	2390		
24	2400	4360	1150	6930	3150	4940	2690	6170	10900	5770	2160	1980		
25	2090	4870	1200	17600	2980	4380	2510	5190	10900	6420	2060	1770		
26	2090	4030	1250	9200	2760	4020	2380	6300	10900	7070	2040	1640		
27	1910	4420	1150	7000	2700	3600	2300	6080	10400	5990	2510	1550		
28	1720	4040	1100	6620	2690	3420	2250	5910	10100	5380	2830	1460		
29	1590	3550	1400	6050	2680	3190	2230	8090	11200	5310	2120	1400		
30	1670	3220	3500	5090	---	3000	2200	10200	10400	5400	1940	1350		
31	3710	---	3340	4590	---	2880	---	8160	---	5280	1860	---		
TOTAL	50630	186120	70670	221580	100750	107460	80700	153300	239600	204780	98570	64000		
MEAN	1633	6204	2280	7148	3474	3466	2690	4945	7987	6606	3180	2133		
MAX	3710	14500	3540	27600	5250	6770	4040	10200	11200	8780	5630	3370		
MIN	1050	2600	1100	2410	2680	2270	2200	2180	5000	4750	1860	1350		
CFSM	2.29	8.69	3.19	10.0	4.87	4.85	3.77	6.93	11.2	9.25	4.45	2.99		
IN.	2.64	9.70	3.68	11.54	5.25	5.60	4.20	7.99	12.48	10.67	5.14	3.33		
AC-FT	100400	369200	140200	439500	199800	213100	160100	304100	475200	406200	195500	126900		
CAL YR 1983	TOTAL	1509120	MEAN	4135	MAX	19500	MIN	1050	CFSM	5.79	IN.	78.63	AC-FT	2993000
WTR YR 1984	TOTAL	1578160	MEAN	4312	MAX	27600	MIN	1050	CFSM	6.04	IN.	82.22	AC-FT	3130000

RESERVOIRS IN SKAGIT RIVER BASIN, WA

12175000 ROSS RESERVOIR.--(See sta 12175000).

12176500 DIABLO RESERVOIR.--Lat 48°42'56", long 121°07'52", in SE¼ sec.5, T.37 N., R.13 E. (unsurveyed), Whatcom County, Hydrologic Unit 17110005, Ross Lake National Recreation Area, at Diablo Dam on Skagit River, 1.2 mi downstream from Thunder Creek, 6.0 mi northeast of Newhalem, and at mile 101.0. DRAINAGE AREA.--1,125 mi², includes 400 mi² in Canada. PERIOD OF RECORD.--October 1929 to current year. October 1929 to September 1938, monthly change in reservoir contents published with records for Skagit River at Newhalem. GAGE.--Water-stage recorder. Datum of gage is National Geodetic Vertical Datum of 1929 (city of Seattle datum). Prior to Oct. 1, 1964, at datum 0.28 ft higher.

REMARKS.--Reservoir is formed by concrete-arch dam, completed in 1930; storage began in October 1929. Usable storage, 8,820 acre-ft between elevations 1,195 ft, normal lower limit of operation, and 1,205 ft, top of taintor gates. Dead storage, below elevation 1,040 ft, 12,900 acre-ft. Crest of spillway is at elevation 1,187 ft. Water used by city of Seattle for power development at Diablo and Gorge powerplants. Capacity table furnished by city of Seattle. Figures given herein represent total contents.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 90,600 acre-ft July 14, 1933, elevation, 1,206.5 ft; minimum not determined.

EXTREMES FOR CURRENT YEAR.--Maximum contents, 89,836 acre-ft Jan. 4, elevation, 1,205.95 ft; minimum, 81,872 acre-ft Dec. 21, elevation, 1,196.93 ft.

12177700 GORGE RESERVOIR.--Lat 48°41'53", long 121°12'25", in NW¼ sec.14, T.37 N., R.12 E., Whatcom County, Hydrologic Unit 17110005, Ross Lake National Recreation Area, at Gorge Dam on Skagit River, 2.4 mi upstream from Gorge powerplant at Newhalem, and at mile 96.6. DRAINAGE AREA.--1,159 mi², includes 400 mi² in Canada. PERIOD OF RECORD.--June 1960 to current year. GAGE.--Water-stage recorder; prior to Apr. 1, 1962, reference point on Gorge Dam or water-stage indicator in powerhouse. Datum of gage is 0.00 ft city of Seattle Gorge High Dam datum, and 1.792 ft below National Geodetic Vertical Datum of 1929 (Corps of Engineers' bench mark).

REMARKS.--Reservoir is formed by concrete arch and gravity dam, completed Dec. 27, 1960; storage began June 27, 1960. Usable storage, 2,115 acre-ft between elevations 865 ft, normal lower limit of operation, and 875 ft, top of gates. Lowest outlet at elevation 760 ft. No dead storage. Crest of spillway is at elevation 825 ft. Water used by city of Seattle for power development at Gorge powerplant. Capacity table furnished by city of Seattle. Figures given herein represent total contents.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 9,761 acre-ft June 1, 1982, elevation, 880.01 ft; minimum since normal low operating level was reached in December 1960, 1,551 acre-ft July 20, 1965, elevation, 819.40 ft.

EXTREMES FOR CURRENT YEAR.--Maximum contents, 9,295 acre-ft Jan. 4, elevation, 878.24 ft; minimum, 6,255 acre-ft Aug. 15, elevation, 864.34 ft.

12191600 BAKER LAKE.--Lat 48°38'58", long 121°41'22", in SW¼ sec.31, T.37 N., R.9 E., Whatcom County, Hydrologic Unit 17110005, at upper Baker Dam on Baker River near center of dam, 0.3 mi upstream from Sulphur Creek, 8.0 mi north of Concrete, and at mile 9.3. DRAINAGE AREA.--215 mi². PERIOD OF RECORD.--July 1959 to current year. GAGE.--Water-stage recorder. Datum of gage is National Geodetic Vertical Datum of 1929.

REMARKS.--Reservoir is formed by concrete gravity dam, completed in June 1959; storage began July 9, 1959. Usable storage, 220,630 acre-ft between elevations 655 ft, minimum operating pool, and 724 ft, normal full pool. Dead storage below elevation 655 ft, 64,840 acre-ft. Crest of spillway is at elevation 694 ft. Water used by Puget Sound Power and Light Co. for power development. Capacity table furnished by Puget Sound Power and Light Co. Figures given herein represent total contents.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 287,930 acre-ft July 12, 1972, elevation, 724.49 ft; minimum since normal operating level was reached in August 1960, 102,621 acre-ft May 8, 1977, elevation, 674.81 ft.

EXTREMES FOR CURRENT YEAR.--Maximum contents, 284,728 acre-ft Aug. 2, elevation, 723.85 ft; minimum, 137,774 acre-ft Apr. 11, elevation, 687.60 ft.

12193000 LAKE SHANNON.--Lat 48°32'53", long 121°44'22", in SW¼ sec.2, T.35 N., R.8 E., Skagit County, Hydrologic Unit 17110005, at Baker Dam on Baker River near left bank, 0.7 mi north of Concrete, and at mile 1.2. DRAINAGE AREA.--297 mi². PERIOD OF RECORD.--November 1925 to current year. GAGE.--Water-stage recorder; prior to Nov. 11, 1959, water-stage indicator in powerplant. Datum of gage is National Geodetic Vertical Datum of 1929. Prior to March 1959, at datum 1.72 ft lower.

REMARKS.--Reservoir is formed by concrete arch and gravity dam, completed in June 1927; storage began in November 1925. Usable storage, 142,400 acre-ft between elevations 355 ft, minimum operating pool, and 438.6 ft, normal full pool. Dead storage unknown. Spillway crest is at elevation 424.9 ft. Water used by Puget Sound Power and Light Co. for power development. Prior to Nov. 11, 1959, gage-height record furnished by Puget Sound Power and Light Co. from powerplant log. Figures given herein represent contents above elevation 341.7 ft, center line of outlet tunnel.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 161,470 acre-ft Sept. 17, 1968, elevation, 439.50 ft; minimum since October 1953, 28,260 acre-ft Mar. 6, 1969, elevation, 363.7 ft, not determined prior to October 1953 because of incomplete records.

EXTREMES FOR CURRENT YEAR.--Maximum contents, 159,379 acre-ft Jan. 6, elevation, 438.56 ft; minimum, 72,191 acre-ft Apr. 13, elevation, 392.93 ft.

Reservoirs in Skagit River basin--Continued

MONTHEND ELEVATION AND CONTENTS AT 2400, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984

Date	Elevation (feet)	Contents (acre- feet)	Change in contents (acre-feet)	Elevation (feet)	Contents (acre- feet)	Change in contents (acre-ft)
12176500 Diablo Reservoir			12177700 Gorge Reservoir			
Sept. 30.....	1,203.09	87,241	--	872.54	7,909	--
Oct. 31.....	1,202.30	86,538	-703	871.69	7,717	-192
Nov. 30.....	1,201.52	85,851	-687	872.99	8,012	+295
Dec. 31.....	1,198.60	83,305	-2,546	872.78	7,964	-48
CAL YR 1983.....	--	--	-395	--	--	-276
Jan. 31.....	1,199.00	83,649	+344	871.56	7,689	-275
Feb. 29.....	1,198.35	83,090	-559	872.07	7,802	+113
Mar. 31.....	1,198.84	83,512	+422	870.44	7,443	-359
Apr. 30.....	1,198.69	83,383	-129	874.21	8,297	+854
May 31.....	1,197.88	82,686	-697	870.19	7,389	-908
June 30.....	1,204.59	88,592	+5,906	876.78	8,923	+1,534
July 31.....	1,204.89	88,865	+273	873.94	8,233	-690
Aug. 31.....	1,200.78	85,200	-3,665	871.10	7,587	-646
Sept. 30.....	1,201.22	85,587	+387	873.17	8,054	+467
WTR YR 1984.....	--	--	-1,654	--	--	+145
12191600 Baker Lake			12193000 Lake Shannon			
Sept. 30.....	720.05	266,143	--	435.67	153,046	--
Oct. 31.....	713.18	234,312	-31,831	434.96	151,510	-1,536
Nov. 30.....	704.53	197,603	-36,709	434.32	150,137	-1,373
Dec. 31.....	698.71	175,247	-22,356	429.57	140,148	-9,989
CAL YR 1983.....	--	--	-15,395	--	--	+5,881
Jan. 31.....	703.86	194,929	+19,682	432.79	146,876	+6,728
Feb. 29.....	695.69	164,385	-30,544	417.41	116,311	-30,565
Mar. 31.....	689.89	144,947	-19,438	418.66	118,649	+2,338
Apr. 30.....	693.16	155,675	+10,728	410.37	103,183	-15,466
May 31.....	704.62	197,963	+42,288	420.81	122,725	+19,542
June 30.....	718.30	257,820	+59,857	438.43	159,091	+36,366
July 31.....	723.33	282,147	+24,327	437.41	156,841	-2,250
Aug. 31.....	721.49	273,110	-9,037	435.16	151,942	-4,899
Sept. 30.....	720.43	267,975	-5,135	433.64	148,683	-3,259
WTR YR 1984.....	--	--	+1,832	--	--	-4,363

SKAGIT RIVER BASIN

12190718 PARK CREEK AT UPPER BRIDGE, NEAR CONCRETE, WA

LOCATION.--Lat 48°44'36", long 121°41'23", in NE¼NW¼ sec.31, T.38 N., R.9 E., Whatcom County, Hydrologic Unit 17110005, on left bank 80 ft downstream from U.S. Forest Service Road 1130 bridge, 17 mi north of Concrete, and 2.5 mi upstream from mouth at Baker Lake.

DRAINAGE AREA.--10.5 mi².

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

GAGE.--Water-stage recorder. Elevation of gage is 1,120 ft, from topographic map.

REMARKS.--Records good except those for period of no gage-height record May 5 to July 16, and for flows above 1,000 ft³/s, which are poor. No regulation or diversion upstream from station.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 2,400 ft³/s Jan. 4, 1984, computed by slope-area measurement, gage height, 10.77 ft from floodmark; minimum, 22 ft³/s Jan. 19, 21, 1984, gage height, 4.91 ft.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 2,400 ft³/s Jan. 4, computed by slope-area measurement, gage height, 10.77 ft, from floodmarks; minimum, 22 ft³/s Jan. 19, 21, gage height, 4.91 ft.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP		
1	36	131	36	52	45	50	38	54	160	245	275	101		
2	34	275	34	194	38	46	35	86	140	238	255	75		
3	65	740	32	580	34	38	38	59	122	240	225	79		
4	82	385	31	1090	38	33	36	49	140	248	205	86		
5	52	169	30	288	53	34	38	47	175	270	220	290		
6	40	178	29	187	62	40	35	45	180	238	189	227		
7	38	124	29	177	50	45	42	44	210	200	165	105		
8	33	98	43	139	77	58	43	66	212	238	209	151		
9	31	88	46	90	77	66	40	74	170	200	247	127		
10	30	125	60	85	63	82	44	73	158	225	226	117		
11	32	273	46	68	61	84	42	120	185	230	203	86		
12	40	152	37	55	118	77	56	185	168	215	175	76		
13	36	125	52	43	82	67	48	172	255	200	134	62		
14	36	148	53	37	57	75	72	180	305	216	116	60		
15	31	872	40	34	46	69	113	143	290	238	118	63		
16	30	468	34	31	39	57	84	112	240	270	161	82		
17	47	248	31	27	32	57	62	100	200	269	182	110		
18	34	176	29	28	30	66	53	91	190	209	139	136		
19	52	115	28	24	58	59	54	200	200	182	111	104		
20	106	90	28	24	293	183	53	225	220	140	107	93		
21	112	69	27	25	135	202	61	155	210	120	131	80		
22	234	58	27	39	72	105	59	160	225	154	153	87		
23	91	49	27	46	57	131	52	200	260	205	126	54		
24	63	109	26	150	51	83	41	170	300	240	105	42		
25	69	98	30	175	45	66	37	148	310	289	108	37		
26	76	74	32	86	39	56	35	190	340	263	126	33		
27	68	90	27	86	45	47	37	192	330	224	280	32		
28	51	63	27	146	52	48	40	200	360	210	126	32		
29	53	48	32	101	47	42	39	265	355	194	90	35		
30	278	41	180	63	---	40	42	270	280	200	82	38		
31	234	---	85	52	---	41	---	175	---	254	77	---		
TOTAL	2214	5679	1268	4222	1896	2147	1469	4250	6890	6864	5066	2700		
MEAN	71.4	189	40.9	136	65.4	69.3	49.0	137	230	221	163	90.0		
MAX	278	872	180	1090	293	202	113	270	360	289	280	290		
MIN	30	41	26	24	30	33	35	44	122	120	77	32		
CFSM	5.67	15.0	3.25	10.8	5.19	5.50	3.89	10.9	18.3	17.6	12.9	7.15		
IN.	6.54	16.78	3.75	12.47	5.60	6.34	4.34	12.56	20.36	20.28	14.97	7.98		
AC-FT	4390	11260	2520	8370	3760	4260	2910	8430	13670	13610	10050	5360		
CAL YR 1983	TOTAL	45954	MEAN	126	MAX	1150	MIN	25	CFSM	10.0	IN.	135.78	AC-FT	91150
WTR YR 1984	TOTAL	44665	MEAN	122	MAX	1090	MIN	24	CFSM	9.69	IN.	131.97	AC-FT	88590

SKAGIT RIVER BASIN

209

12192600 BEAR CREEK BELOW TRIBUTARIES, NEAR CONCRETE, WA

LOCATION.--Lat 48°37'11", long 121°44'09", in NW¼SE¼SW¼ sec.11, T.36 N., R.8 E., Skagit County, Hydrologic Unit 17110005, on left bank 0.15 mi downstream from highway bridge, and 5.3 mi north of Concrete.

DRAINAGE AREA.--14.4 mi².

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

GAGE.--Water-stage recorder. Elevation of gage is 450 ft, from topographic map.

REMARKS.--Records fair except for periods of no gage-height record Dec. 22 to Jan. 8, and May 3 to July 16, which are poor. No regulation or diversion upstream from station.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,270 ft³/s (revised) Dec. 3, 1982, gage height, 12.96 ft; minimum, 8.1 ft³/s Aug. 24-27, 1984, gage height, 10.34 ft.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 1,250 ft³/s Jan. 4, gage height, 12.95 ft from floodmark; minimum, 8.1 ft³/s Aug. 24-27, gage height, 10.34 ft.

REVISIONS.--The maximum discharge for the water year 1983 has been revised to 1,270 ft³/s.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP		
1	17	59	72	53	143	119	68	58	118	92	19	25		
2	16	155	59	160	114	114	61	160	100	91	17	13		
3	21	334	53	510	100	93	61	110	95	94	16	11		
4	25	312	45	900	88	82	54	65	110	80	15	10		
5	19	220	41	600	84	74	61	57	112	62	15	45		
6	16	196	37	280	93	70	70	55	112	52	15	80		
7	16	192	33	208	80	86	100	54	198	48	14	33		
8	15	176	56	183	93	72	95	80	208	48	13	33		
9	15	149	61	154	102	74	84	90	165	51	13	26		
10	14	143	93	160	119	88	91	87	128	53	12	24		
11	13	217	76	140	127	91	80	150	130	55	12	24		
12	13	186	63	119	262	164	124	230	160	51	13	28		
13	13	179	104	102	220	155	107	250	195	46	13	23		
14	13	206	114	91	192	127	102	220	238	46	12	20		
15	13	686	80	76	164	114	119	172	195	49	11	18		
16	12	652	63	67	129	97	116	107	152	52	10	17		
17	19	396	53	56	109	107	95	74	120	56	9.8	17		
18	16	448	47	48	93	129	84	73	118	45	9.8	16		
19	16	303	41	44	100	116	86	230	120	38	9.2	16		
20	26	217	33	39	235	183	74	350	135	33	9.2	16		
21	25	152	29	51	209	274	82	127	130	29	9.2	19		
22	119	119	27	138	155	199	86	118	128	27	8.6	28		
23	68	93	25	176	152	224	88	170	150	28	8.6	22		
24	50	199	24	575	161	170	70	135	168	28	8.6	19		
25	50	290	23	830	127	183	59	110	166	29	8.6	17		
26	39	209	26	443	107	146	53	158	165	27	8.1	16		
27	35	227	24	339	129	119	50	141	130	23	19	16		
28	33	146	23	411	138	116	47	160	122	21	13	15		
29	29	111	25	316	132	95	47	260	145	20	10	15		
30	56	88	170	209	---	82	51	315	98	19	9.8	14		
31	78	---	90	158	---	74	---	180	---	19	9.8	---		
TOTAL	910	7060	1710	7636	3957	3837	2365	4546	4311	1412	371.3	676		
MEAN	29.4	235	55.2	246	136	124	78.8	147	144	45.5	12.0	22.5		
MAX	119	686	170	900	262	274	124	350	238	94	19	80		
MIN	12	59	23	39	80	70	47	54	95	19	8.1	10		
CFSM	2.04	16.3	3.83	17.1	9.44	8.61	5.47	10.2	10.0	3.16	.83	1.56		
IN.	2.35	18.24	4.42	19.73	10.22	9.91	6.11	11.74	11.14	3.65	.96	1.75		
AC-FT	1800	14000	3390	15150	7850	7610	4690	9020	8550	2800	736	1340		
CAL YR 1983	TOTAL	32371	MEAN	88.7	MAX	895	MIN	12	CFSM	6.16	IN.	83.63	AC-FT	64210
WTR YR 1984	TOTAL	38791.3	MEAN	106	MAX	900	MIN	8.1	CFSM	7.36	IN.	100.21	AC-FT	76940

SKAGIT RIVER BASIN

12192700 THUNDER CREEK NEAR CONCRETE, WA

LOCATION.--Lat 48°36'08", long 121°42'17", in SE¼SW¼SE¼ sec.13, T.36 N., R.8 E., Skagit County, Hydrologic Unit 17110005, on left bank 0.6 mi downstream from bridge, 5 mi north of Concrete, and 0.3 mi upstream from Lake Shannon.

DRAINAGE AREA.--22.4 mi².

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

GAGE.--Water-stage recorder. Elevation of gage is 500 ft, from topographic map.

REMARKS.--Records fair except those for periods of ice effect Dec. 21-25 and shifting control Jan. 4, 5, which are poor. No regulation or diversion upstream from station.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge not determined, Jan. 4, 1984, gage height, 5.93 ft; minimum, 20 ft³/s Oct. 13-16, 1983.

EXTREMES FOR CURRENT YEAR.--Maximum discharge not determined, Jan. 4, gage height 5.93 ft; minimum, 20 ft³/s Oct. 13-16.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP		
1	25	92	107	91	216	149	133	115	213	250	83	88		
2	24	213	99	294	182	149	128	189	182	246	78	64		
3	33	450	92	450	155	144	120	152	173	238	73	60		
4	40	390	85	1000	152	133	115	133	199	242	71	57		
5	29	294	79	500	158	128	115	128	202	246	67	125		
6	26	303	73	413	189	125	115	123	202	195	67	192		
7	26	240	70	313	161	133	120	123	381	155	65	92		
8	24	200	79	327	192	141	128	182	407	146	67	94		
9	23	175	80	250	216	146	120	195	291	149	65	80		
10	22	240	102	202	192	179	118	189	238	155	64	78		
11	21	321	86	167	173	195	111	258	238	164	60	72		
12	21	255	78	141	309	179	120	407	283	149	57	92		
13	20	228	94	107	274	185	123	366	366	133	59	73		
14	20	225	107	101	206	176	135	327	469	141	55	64		
15	20	482	94	99	173	170	192	254	429	158	54	58		
16	20	466	80	95	149	161	185	192	327	173	51	57		
17	34	378	71	90	144	155	155	164	242	164	51	55		
18	28	338	58	85	135	152	141	167	238	135	49	54		
19	32	282	61	83	138	158	138	424	242	120	47	53		
20	61	225	52	81	435	250	133	544	278	103	46	57		
21	48	180	50	81	402	413	135	300	270	94	46	88		
22	228	156	48	85	254	270	149	274	258	92	45	111		
23	122	138	46	90	206	291	133	381	318	95	44	80		
24	83	165	44	266	182	238	125	318	366	99	43	70		
25	79	185	43	611	170	189	118	242	361	99	42	64		
26	62	152	48	413	155	170	111	351	392	99	41	60		
27	61	170	44	381	152	128	105	309	356	90	101	57		
28	53	158	41	618	152	152	105	361	346	88	44	57		
29	48	132	49	475	149	128	103	452	413	86	33	55		
30	73	118	150	266	---	144	105	418	278	88	31	54		
31	132	---	120	246	---	138	---	287	---	88	56	---		
TOTAL	1538	7351	2330	8421	5771	5469	3834	8325	8958	4480	1755	2261		
MEAN	49.6	245	75.2	272	199	176	128	269	299	145	56.6	75.4		
MAX	228	482	150	1000	435	413	192	544	469	250	101	192		
MIN	20	92	41	81	135	125	103	115	173	86	31	53		
CFSM	2.21	10.9	3.36	12.1	8.88	7.86	5.71	12.0	13.3	6.47	2.53	3.37		
IN.	2.55	12.21	3.87	13.98	9.58	9.08	6.37	13.83	14.88	7.44	2.91	3.75		
AC-FT	3050	14580	4620	16700	11450	10850	7600	16510	17770	8890	3480	4480		
CAL YR 1983	TOTAL	46962	MEAN	129	MAX	600	MIN	20	CFSM	5.76	IN.	77.99	AC-FT	93150
WTR YR 1984	TOTAL	60493	MEAN	165	MAX	1000	MIN	20	CFSM	7.37	IN.	100.46	AC-FT	120000

SKAGIT RIVER BASIN

211

12193500 BAKER RIVER AT CONCRETE, WA

LOCATION.--Lat 48°32'24", long 121°44'31", in NW¼NW¼ sec.11, T.35 N., R.8 E., Skagit County, Hydrologic Unit 17110005, on left bank at upstream side of fish barrier, 0.2 mi northeast of Concrete, 0.3 mi downstream from Baker River powerplant, and at mile 0.7.

DRAINAGE AREA.--297 mi².

PERIOD OF RECORD.--September 1910 to March 1915, September 1943 to current year.

REVISED RECORDS.--WSP 1286: 1911-13(M), 1945-46, drainage area.

GAGE.--Water-stage recorder. Datum of gage is National Geodetic Vertical Datum of 1929. Prior to Mar. 5, 1915, nonrecording gage at site 0.2 mi downstream at different datum. Sept. 1, 1943, to Jan. 22, 1958, water-stage recorder at site 700 ft upstream at datum 172.6 ft above National Geodetic Vertical Datum of 1929 (from river-profile survey). Jan. 23 to June 11, 1958, powerplant record. Supplementary water-stage recorder on left bank about 40 ft downstream from fish barrier and on tailrace of powerhouse at same datum.

REMARKS.--Records good except those below 1,500 ft³/s, which are fair, and those below 300 ft³/s, which are poor. Flows on occasion may be affected by backwater from Skagit River during high flows. All diversions returned to river upstream from gage; at times, power generation is shut down for maintenance at Baker River or the fish-barrier dam causing the stage to drop below the control. Water is released through a valve-controlled pipe to the fish ladder located on the left bank just downstream from the gage and control. Flow regulated by Baker and Shannon Lakes (see sta 12191600 and 12191300).

AVERAGE DISCHARGE.--45 years (water years 1911-14, 1944-84), 2,676 ft³/s, 1,939,000 acre-ft/yr, adjusted for storage in Lake Shannon since November 1925, and Baker Lake since July 1959.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 36,600 ft³/s Nov. 19, 1962, elevation, 186.6 ft, computation of peak flow over dam; minimum daily, 30 ft³/s Mar. 21-26, 1973, Apr. 26-28, May 7-9, 11, 1983.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 27,500 ft³/s Nov. 15, elevation, 184.01 ft; minimum, about 36 ft³/s Mar. 14; minimum daily, 86 ft³/s Apr. 17.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1630	3460	2090	2450	3990	3750	2940	2260	3100	5660	3000	778
2	1640	4010	1680	2220	3980	3540	2110	2780	3140	4720	4080	2920
3	1870	3910	1240	3400	3970	3490	3560	1650	2530	4100	4080	104
4	2200	4020	1880	7040	3970	3440	3810	784	2920	4080	4070	2000
5	1580	5400	1860	14100	3450	3330	3780	858	2570	4070	4070	2580
6	2120	6090	1080	6240	2540	2410	3770	1100	2030	4060	3600	3860
7	2200	4630	1450	5850	2090	2610	3760	613	1220	4040	2860	3850
8	2250	4030	1150	5440	2090	2630	3740	2040	2110	4040	2500	3850
9	2160	4700	2870	4340	2090	3230	3730	2570	2300	3350	2440	3690
10	2150	5950	3570	4040	2630	2380	3710	1280	2150	1720	3040	3260
11	2160	6080	3610	4030	3820	2300	3690	2470	2090	1960	2850	3720
12	1980	6210	3510	4020	3950	2490	3660	2260	1010	2110	2780	2650
13	817	6150	3330	4020	3910	2350	1770	2360	1430	2380	2690	1850
14	453	5690	2100	4010	3890	1840	96	2910	1840	4040	2130	1450
15	853	16700	1070	4010	3670	2200	96	3130	1010	4030	1580	828
16	1210	21500	1460	4000	3100	2590	90	2990	1490	3900	1650	105
17	1450	8400	876	2380	2950	2120	86	2790	800	4040	1920	491
18	1650	5850	1400	3110	3080	2450	87	1630	1620	4030	1680	1420
19	1780	4610	1200	2120	3660	2220	88	2970	2100	4030	1280	1740
20	988	4080	2580	1560	3820	2270	88	2910	2610	4030	1750	1710
21	1820	4050	1880	1940	3930	2810	88	2790	3410	2200	1790	1650
22	2570	4030	2720	1280	3930	2330	88	3370	3590	1700	1750	1280
23	1910	4030	1080	3060	3920	2150	89	3560	3780	2910	1440	366
24	1900	4030	1390	4000	3780	976	89	3160	3790	1950	968	1640
25	1800	4020	102	4020	2900	1960	89	3870	3590	2870	1240	706
26	1970	4020	634	4030	2720	2150	89	3650	3720	3390	1030	1860
27	1870	3280	470	4020	3670	1020	267	3680	3970	4050	2780	1370
28	1750	2920	852	4010	2350	1890	2390	1680	4070	2130	3330	1470
29	1670	3410	490	4020	3780	2460	2270	1840	4080	1350	2550	1400
30	2080	3020	2130	4020	---	2830	1710	2800	5450	690	1540	194
31	3570	---	2010	4000	---	2960	---	2610	---	625	674	---
TOTAL	56051	168280	53764	126780	97630	77176	51830	75365	79520	98255	73142	54792
MEAN	1808	5609	1734	4090	3367	2490	1728	2431	2651	3170	2359	1826
MAX	3570	21500	3610	14100	3990	3750	3810	3870	4450	5660	4080	3860
MIN	453	2920	102	1280	2090	976	86	613	800	625	674	104
AC-FT	111200	333800	106600	251500	193600	153100	102800	149500	157700	194900	145100	108700
MEAN†	1266	4971	1207	4519	2303	2211	1648	3436	4268	3528	2133	1686
CFSM†	4.26	16.7	4.06	15.2	7.75	7.44	5.55	11.6	14.4	11.9	7.18	5.68
IN.†	4.91	18.67	4.69	17.54	8.36	8.59	6.19	13.34	16.03	13.70	8.28	6.33
AC-FT†	77830	295700	74260	277900	132500	136000	98060	211300	253900	217000	131200	100300

CAL YR 1983 TOTAL 1002867 MEAN 2748 MAX 21500 MIN 85 AC-FT 1989000 MEAN† 2733 CFSM† 9.20 IN.† 124.99 AC-FT† 1979000
WTR YR 1984 TOTAL 1012585 MEAN 2767 MAX 21500 MIN 86 AC-FT 2008000 MEAN† 2761 CFSM† 9.30 IN.† 126.63 AC-FT† 2005000

† Adjusted for change in contents of Baker Lake and Lake Shannon.

SKAGIT RIVER BASIN

12194000 SKAGIT RIVER NEAR CONCRETE, WA

LOCATION.--Lat 48°31'28", long 121°46'11", in SE¼NE¼ sec.16, T.35 N., R.8 E., Skagit County, Hydrologic Unit 17110007, on right bank at Dalles Bridge 1.3 mi southwest of Concrete, 2.4 mi downstream from Baker River, and at mile 54.1.

DRAINAGE AREA.--2,737 mi², of which 400 mi² is in Canada.

PERIOD OF RECORD.--September 1924 to current year.

REVISED RECORDS.--WSP 1566: 1957. WSP 1736: 1948. WSP 1932: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 130.0 ft above National Geodetic Vertical Datum of 1929. Prior to Dec. 10, 1924, nonrecording gage 200 ft upstream and Dec. 10, 1924, to Sept. 30, 1937, water-stage recorder at present site; both gages at datum 12.7 ft higher.

REMARKS.--Records excellent. Flow regulated by Ross Reservoir (station 12175000), and Diablo and Gorge Reservoirs, Baker Lake, and Lake Shannon (stations 12176500, 12177700, 12191600, 12193000).

AVERAGE DISCHARGE.--60 years, 15,120 ft³/s, 10,954,000 acre-ft/yr, unadjusted.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 154,000 ft³/s Nov. 27, 1949, gage height, 40.8 ft; minimum, probably less than 2,160 ft³/s during period Oct. 1-24, 1925, when recorder was not operating and gates in Baker River Dam were first closed; minimum daily recorded, 2,610 ft³/s Nov. 14, 1936.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of about 1815 reached a stage of 69.3 ft present datum, from floodmarks at site 200 ft upstream, discharge about 500,000 ft³/s. Records of other floods, prior to establishment of station, are given in WSP 1527.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 109,000 ft³/s Jan. 5, gage height, 34.94 ft; minimum, 3,940 ft³/s Sept. 30; minimum gage height, 13.46 ft Oct. 21; minimum daily discharge, 4,060 ft³/s Sept. 30.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	7220	11300	12800	9270	17900	14600	11800	10600	18000	25200	18500	7480
2	6040	12800	10800	12000	16200	14300	11700	13000	16000	25400	18100	8990
3	6650	26800	10400	24300	15500	14900	13900	12200	14500	22700	18200	5160
4	8050	30500	9600	70200	14400	12100	14500	10500	14900	22600	17700	7700
5	7380	22600	9610	79600	12900	14300	14700	8920	14800	23800	18200	8530
6	7660	20400	9440	39900	12800	12900	14500	8590	15200	22800	17100	14000
7	7880	18300	9670	34300	12300	12500	12000	7900	14600	21200	13200	11700
8	7330	15600	8630	30700	12200	13100	13400	10100	18200	21100	12900	12400
9	6140	14700	9120	25500	13200	14900	14000	12400	15400	20800	13300	12700
10	6570	16100	11100	20700	15100	14400	14300	10500	13700	19000	14000	11500
11	6570	19900	10700	18500	15900	12400	12900	12200	13800	19100	12900	11000
12	6760	18600	10200	16800	16100	15100	12800	13900	14400	20300	12900	10700
13	5620	17000	10800	16000	19300	16000	11300	13400	19700	19400	13100	9560
14	5190	16700	10300	14300	18600	14700	8130	17500	23600	20900	12200	8280
15	5110	41000	9720	13300	18300	15600	9640	16700	25800	21600	10100	7290
16	5220	57800	9580	13600	16100	15500	11500	15200	22800	24100	9580	5810
17	5700	37000	8540	11900	15900	14900	10200	14100	16700	25500	9680	6190
18	5760	31700	7850	12200	15400	13500	9880	12300	16600	24800	9530	7650
19	5340	25400	8160	12100	12400	14400	9190	15700	17500	23700	8370	7620
20	5720	19800	10300	10600	16300	15300	8440	23100	19800	20900	8640	7660
21	6350	18900	10600	11200	19900	21900	7830	19000	23600	15800	7880	8490
22	12500	17200	11300	9520	18800	19600	8690	16400	21300	14300	8290	8560
23	12000	17000	8930	11300	17900	18300	9280	19400	23600	17300	7870	7270
24	9320	16600	8700	17800	15900	13900	8940	17300	27400	18300	7780	8510
25	9140	17500	8290	38900	15900	14800	8340	16200	27500	21800	6780	6360
26	8400	15800	6690	28400	15800	15500	7810	17200	28600	24100	6090	7420
27	8560	15200	7500	24300	16400	11700	7480	17300	29600	20700	11400	6930
28	8050	14800	7640	24100	15000	12700	9210	15100	28400	16800	13800	6650
29	7570	15400	7180	23500	16000	13300	9110	19900	30600	15200	10100	5520
30	7640	14200	10100	21900	---	13000	9520	26500	29700	14800	8830	4060
31	13900	---	9740	19100	---	11800	---	22300	---	15000	6960	---
TOTAL	231340	636600	293990	715790	458400	451900	324990	465410	616300	639000	363980	251690
MEAN	7463	21220	9484	23090	15810	14580	10830	15010	20540	20610	11740	8390
MAX	13900	57800	12800	79600	19900	21900	14700	26500	30600	25500	18500	14000
MIN	5110	11300	6690	9270	12200	11700	7480	7900	13700	14300	6090	4060
AC-FT	458900	1263000	583100	1420000	909200	896300	644600	923100	1222000	1267000	722000	499200
CAL YR 1983	TOTAL	5416950	MEAN	14840	MAX	61100	MIN	5110	AC-FT	10745000		
WTR YR 1984	TOTAL	5449390	MEAN	14890	MAX	79600	MIN	4060	AC-FT	10809000		

12200500 SKAGIT RIVER NEAR MOUNT VERNON, WA
(National stream quality accounting network station)

LOCATION.--Lat 48°26'42", long 122°20'03", in SE¼ sec.7, T.34 N., R.4 E., Skagit County, Hydrologic Unit 17110007, on draw west of and 150 ft downstream from bridge on former U.S. Highway 99, 1.5 mi north of Skagit Valley Junior College in Mount Vernon, and at mile 15.7.

DRAINAGE AREA.--3,093 mi², of which 400 mi² is in Canada.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1940 to current year. Monthly discharge only October 1940, published in WSP 1316.

REVISED RECORDS.--WSP 1932: Drainage area.

GAGE.--Water-stage recorder and crest-stage gage. Datum of gage is National Geodetic Vertical Datum of 1929. Supplementary water-stage recorder in bridge pier 0.2 mi downstream from base gage from Dec. 3, 1957, to Oct. 15, 1964.

REMARKS.--Water-discharge records good. Flow regulated by Ross Reservoir (station 12175000) and Diablo and Gorge Reservoirs, Baker Lake, and Lake Shannon (stations 12176500, 12177700, 12191600, 12193000). Small diversions for domestic and municipal use.

AVERAGE DISCHARGE.--44 years, 16,710 ft³/s, 12,110,000 acre-ft, unadjusted.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 144,000 ft³/s Feb. 11, 1951, elevation, 36.85 ft; minimum, 2,740 ft³/s Oct. 26, 1942, elevation, 7.37 ft.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of 1906 reached a stage of 37 ft, from Great Northern Railway highwater profile, discharge 180,000 ft³/s.

EXTREMES FOR CURRENT YEAR.--Peak discharge greater than base discharge of 50,000 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Nov. 16	1630	61,000	26.71	Jan. 25	1800	50,500	24.42
Jan. 5	1745	*88,200	*31.14				

Minimum discharge, 3,460 ft³/s Oct. 16, gage height 8.43 ft.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	7580	13400	16700	14900	21700	17700	13900	11700	22000	28200	18500	8590
2	7170	13800	13900	14400	19600	16500	12800	15100	18900	27100	19600	9960
3	5990	22700	13000	21200	19000	17200	15300	15900	17800	25300	19500	7400
4	8660	31000	12800	49600	17400	15900	16200	13800	16700	24000	19000	7080
5	7860	28000	11200	81300	16200	15600	16700	11800	17000	24700	19400	9340
6	7980	23000	12000	61000	15100	15100	16500	10700	17200	25400	18900	15100
7	8320	21000	11300	42100	15300	14600	15300	10400	16400	22900	15900	14300
8	8090	20000	11400	36800	14700	14700	14900	10800	19700	22700	14500	12900
9	7240	19000	11000	31500	15600	16500	15800	14800	18500	22500	14300	14700
10	5990	20000	13200	26300	17200	16900	16600	14400	16300	21400	15000	13000
11	6940	21800	13700	24200	18800	16000	15200	13500	15600	20000	14700	12600
12	7100	22400	12700	21400	19400	16000	15100	18700	15600	21500	14100	12700
13	6390	20600	11500	20200	23500	19400	15800	17200	21000	20900	14500	11400
14	5370	19900	10500	18500	22200	17600	11700	19300	22500	21900	13600	10300
15	4640	30900	10000	16800	21400	17800	12000	19900	26700	22500	12200	9120
16	4120	57900	12300	16100	19600	17900	13500	18000	25300	24100	11500	8070
17	4470	51100	11600	15600	18300	17900	12900	16800	23500	26000	10300	7070
18	5500	37300	9840	14100	18200	16100	11900	15400	18000	25900	10900	7980
19	5830	34000	10000	15100	16200	16400	11500	16100	18000	25400	10100	8750
20	4820	26000	10800	13600	18100	17200	10800	25300	19000	23000	9590	8770
21	6050	23400	12200	13500	24500	24000	10200	23200	20500	19100	9270	8990
22	10500	21400	12200	13600	22800	24200	10200	20000	25000	16300	9240	10400
23	14900	20000	13000	14100	21500	22800	10900	22300	22500	17400	9140	9760
24	10600	21000	13000	21600	19700	20200	10800	22300	26800	19300	8960	8940
25	10200	24000	13000	45200	18800	16900	9950	19800	28400	21700	8540	9170
26	9060	21400	11200	39100	18200	19400	9630	20500	28700	24800	7600	7400
27	9170	20700	12000	30300	19100	16400	8970	21800	30900	22800	8740	8750
28	8830	18900	11200	28600	17600	14500	9700	19700	29200	19400	16100	7850
29	8160	19300	11400	28600	18600	16200	10300	19700	31000	17700	12400	6920
30	7740	17500	14300	26400	---	15400	10700	26100	32600	16500	10200	5600
31	13000	---	15400	23500	---	15000	---	26300	---	15800	9140	---
TOTAL	238270	741400	378340	839200	548300	538000	385750	551300	661300	686200	405420	292910
MEAN	7686	24710	12200	27070	18910	17350	12860	17780	22040	22140	13080	9764
MAX	14900	57900	16700	81300	24500	24200	16700	26300	32600	28200	19600	15100
MIN	4120	13400	9840	13500	14700	14500	8970	10400	15600	15800	7600	5600
AC-FT	472600	1471000	750400	1665000	1088000	1067000	765100	1094000	1312000	1361000	804200	581000
CAL YR 1983	TOTAL	6024270	MEAN	16500	MAX	62800	MIN	4120	AC-FT	11949000		
WTR YR 1984	TOTAL	6266390	MEAN	17120	MAX	81300	MIN	4120	AC-FT	12429000		

SKAGIT RIVER BASIN

12200500 SKAGIT RIVER NEAR MOUNT VERNON, WA--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1959-70, 1974 to current year.

PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: February 1974 to November 1981.

WATER TEMPERATURES: July 1962 to August 1970, February 1974 to November 1981.

WATER QUALITY DATA, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984

DATE	TIME	STREAM- FLOW, INSTAN- TANEOUS (CFS)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH (STAND- ARD UNITS)	TEMPER- ATURE (DEG C)	TUR- BID- ITY (NTU)	OXYGEN, DIS- SOLVED (MG/L)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION)	COLI- FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)	STREP- TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML)	HARD- NESS (MG/L AS CAC03)	HARD- NESS NONCAR- BONATE (MG/L AS CAC03)
NOV , 1983												
10...	1100	18500	53	--	8.5	4.5	11.0	96	K20	200	22	0
JAN , 1984												
26...	1200	38700	44	--	6.5	60	12.8	102	K130	K1400	20	0
FEB												
28...	1100	15900	66	7.6	5.5	3.0	12.4	98	K50	380	28	0
MAY												
09...	0945	13700	58	7.7	9.0	4.6	11.0	95	38	120	25	2
JUL												
11...	0930	18600	44	7.7	12.0	4.8	11.3	104	K13	K7	19	2
SEP												
18...	1130	7680	59	7.9	13.5	1.8	10.2	97	48	76	25	1

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 CAC03)	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)
NOV , 1983												
10...	6.6	1.4	1.4	12	.1	.60	22	6.3	.70	<.10	6.8	35
JAN , 1984												
26...	5.7	1.3	1.2	11	.1	.50	19	4.9	.80	<.10	5.9	33
FEB												
28...	8.6	1.7	1.6	11	.1	.60	29	5.7	.90	<.10	7.6	40
MAY												
09...	7.4	1.6	1.4	11	.1	.60	23	5.6	2.2	<.10	6.6	47
JUL												
11...	6.0	1.0	1.0	10	.1	.40	17	4.0	.70	<.10	5.7	32
SEP												
18...	7.7	1.5	1.4	10	.1	.50	22	4.3	.90	<.10	7.1	37

DATE	SOLIDS, SUM OF CONSTITUENTS, DIS- SOLVED (MG/L)	SOLIDS, DIS- SOLVED (TONS PER AC-FT)	SOLIDS, DIS- SOLVED (TONS PER DAY)	SOLIDS, RESIDUE AT 105 DEG. C, SUS- PENDE (MG/L)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N)	NITRO- GEN,AM- MONIA + ORGANIC TOTAL (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)	ALUM- INUM, DIS- SOLVED (UG/L AS AL)
NOV , 1983											
10...	37	.05	1750	--	.17	.060	.70	.040	<.010	<.010	20
JAN , 1984											
26...	32	.05	3450	114	.29	.050	.20	.120	<.010	.030	60
FEB											
28...	44	.05	1720	6	.21	.020	<.20	.010	.010	<.010	--
MAY											
09...	40	.06	1740	23	.13	.010	<.20	.010	.010	.010	30
JUL											
11...	29	.04	1610	15	<.10	<.010	<.20	<.010	<.010	<.010	20
SEP											
18...	38	.05	767	3	<.10	<.010	<.20	<.010	<.010	<.010	--

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

SKAGIT RIVER BASIN

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12200500 SKAGIT RIVER NEAR MOUNT VERNON, WA--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984

DATE	ARSENIC DIS- SOLVED (UG/L AS AS)	BARIUM, DIS- SOLVED (UG/L AS BA)	BERYL- LIUM, DIS- SOLVED (UG/L AS BE)	CADMIUM DIS- SOLVED (UG/L AS CD)	CHRO- MIUM, DIS- SOLVED (UG/L AS CR)	COBALT, DIS- SOLVED (UG/L AS CO)	COPPER, DIS- SOLVED (UG/L AS CU)	IRON, DIS- SOLVED (UG/L AS FE)	LEAD, DIS- SOLVED (UG/L AS PB)	LITHIUM DIS- SOLVED (UG/L AS LI)	MANGA- NESE, DIS- SOLVED (UG/L AS MN)
NOV , 1983											
10...	1	12	<.5	<1	<1	<3	1	36	<1	9	6
JAN , 1984											
26...	<1	11	<.5	1	<1	<3	2	68	1	6	7
FEB											
28...	--	--	--	--	--	--	--	--	--	--	--
MAY											
09...	<1	17	.9	1	3	<3	100	67	190	4	7
JUL											
11...	<1	14	<.5	<1	<1	<3	3	29	<1	<4	6
SEP											
18...	--	--	--	--	--	--	--	--	--	--	--
DATE	MERCURY DIS- SOLVED (UG/L AS HG)	MOLYB- DENUM, DIS- SOLVED (UG/L AS MO)	NICKEL, DIS- SOLVED (UG/L AS NI)	SELE- NIUM, DIS- SOLVED (UG/L AS SE)	SILVER, DIS- SOLVED (UG/L AS AG)	STRON- TIUM, DIS- SOLVED (UG/L AS SR)	VANA- DIUM, DIS- SOLVED (UG/L AS V)	ZINC, DIS- SOLVED (UG/L AS ZN)	SEDI- MENT, SUS- PENDE (MG/L)	SEDI- MENT, DIS- CHARGE, SUS- PENDE (T/DAY)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM
NOV , 1983											
10...	<.1	<10	6	<1	<1	37	<6	6	94	4700	--
JAN , 1984											
26...	<.1	<10	24	<1	<1	31	<6	6	550	57500	--
FEB											
28...	--	--	--	--	--	--	--	--	31	1330	28
MAY											
09...	<.1	<10	9	<1	1	38	<6	34	27	999	34
JUL											
11...	<.1	<10	<1	<1	<1	29	<6	4	87	4370	38
SEP											
18...	--	--	--	--	--	--	--	--	12	249	--

LOCATION.--Lat 48°44'55", long 122°23'40", in SW¼SW¼ sec.26, T.38 N., R.3 E., Whatcom County, Hydrologic Unit 17110002, on west shore, 1.0 mi east of Bellingham, near Strawberry Point, at Geneva.

PERIOD OF RECORD.--February 1913 to September 1914, October 1978 to current year.

GAGE.--Staff gage. Datum of gage is 7.03 ft above National Geodetic Vertical Datum of 1929 (levels by city of Bellingham).

REMARKS.--Lake is formed by concrete control dam completed to elevation 315.00 ft in 1937. The dam has three 18 ft by 6 ft taintor gates that raise from the bottom. Water is diverted from Whatcom Lake at intake structure located near the intersection of Cable and Whatcom Boulevards. Water use is for both municipal and industrial supply for the city of Bellingham. Since April 1962, at times water is diverted from Middle Fork Nooksack River to Whatcom Lake via Anderson Creek to supplement Whatcom Creek.

COOPERATION.--Record furnished by city of Bellingham.

EXTREMES FOR PERIOD OF RECORD.--Maximum observed gage height, 315.75 ft Feb. 19, 1913; minimum observed, 310.37 ft Oct. 31, 1983.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum observed gage height, 316.22 ft Feb. 1, 1971; minimum observed, 308.38 ft Dec. 5, 1957, record furnished by city of Bellingham.

EXTREMES FOR CURRENT YEAR.--Maximum observed gage height, 314.24 ft May 29; minimum observed, 310.37 ft Oct. 31.

[illegible]

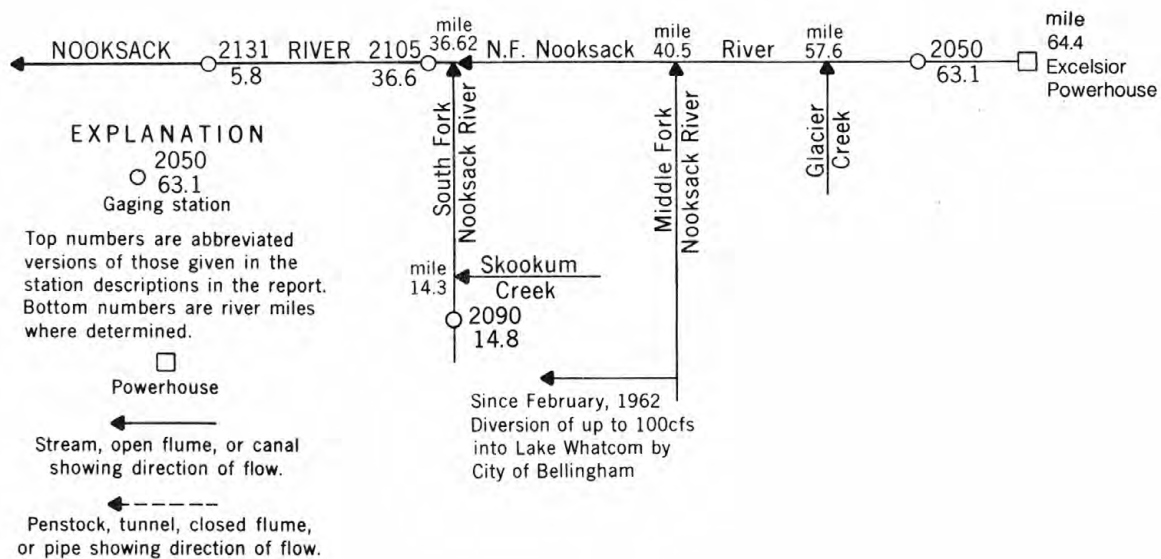


Figure 18.--Gaging stations in Nooksack River basin.

12205000 NORTH FORK NOOKSACK RIVER BELOW CASCADE CREEK, NEAR GLACIER, WA

LOCATION.--Lat 48°54'22", long 121°50'35", in SE¼SW¼ sec.36, T.40 N., R.7 E., Whatcom County, Hydrologic Unit 17110004, Mt. Baker National Forest, on right bank 0.2 mi downstream from Cascade Creek, 0.3 mi downstream from Deadhorse Creek, 4.8 mi east of Glacier, 5.5 mi upstream from Glacier Creek, and at mile 63.1.

DRAINAGE AREA.--105 mi².

PERIOD OF RECORD.--October 1937 to current year. Published as "Nooksack River above Cascade Creek, near Glacier" 1937-58 and as "Nooksack River below Cascade Creek, near Glacier" 1958-66.

REVISED RECORDS.--WSP 1092: 1946.

GAGE.--Water-stage recorder. Elevation of gage is 1,245 ft, from river-profile map. Supplementary gage on left bank, at datum 1.19 ft lower, used as principal gage prior to Oct. 1, 1953, and Oct. 8, 1958, to Sept. 30, 1959.

REMARKS.--Records good except those for periods of no gage-height record Oct. 8-15, Dec. 6 to Jan. 3, which are fair. No diversion upstream from station. Some regulation at low flow by powerplant at Excelsior. Summer flows augmented by glacier melt.

AVERAGE DISCHARGE.--47 years, 777 ft³/s, 100.49 in/yr, 563,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 10,300 ft³/s Nov. 26, 1949, gage height, 10.50 ft supplementary gage, from rating curve extended above 2,900 ft³/s on basis of contracted-opening measurement at gage height 8.13 ft, supplementary gage; minimum, 60 ft³/s Mar. 12, 1969; minimum daily, 98 ft³/s Jan. 8, 1979, result of freezeup.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 3,600 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Nov. 3	2300	4,300	6.11	Jan. 4	1535	*9,700	*9.15
Nov. 15	1800	4,730	6.41				

Minimum discharge, 175 ft³/s Oct. 16.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	252	809	500	280	618	421	378	357	1020	1610	1450	688
2	242	1430	471	820	549	403	361	509	866	1530	1310	520
3	270	3390	443	1540	500	369	365	430	791	1600	1180	487
4	325	2740	412	7500	466	345	357	395	847	1760	1080	522
5	273	1460	390	2960	480	333	357	369	980	1880	1090	1440
6	249	1440	365	1840	504	333	357	349	1030	1810	1010	1560
7	232	1060	340	1590	480	337	357	345	1150	1170	886	805
8	213	892	360	1400	560	365	365	628	1200	1050	993	833
9	198	791	380	1040	618	412	353	719	986	1130	1090	712
10	192	993	460	912	554	457	357	618	925	1240	1130	711
11	189	1900	440	803	524	466	341	662	1040	1230	986	636
12	187	1380	390	684	754	485	386	1090	1300	1240	1010	602
13	186	1190	480	601	678	452	386	1170	1850	1090	766	515
14	186	1050	660	534	565	434	439	1460	2250	1080	725	457
15	186	3300	580	490	514	421	673	1050	2240	1310	645	454
16	178	3080	500	457	462	403	713	841	1860	1540	725	529
17	210	2180	440	416	421	408	586	713	1350	1790	847	630
18	189	1700	390	386	399	403	524	656	1250	1450	866	675
19	198	1350	350	373	399	390	500	1170	1280	1290	656	554
20	395	1110	310	357	1270	554	485	1310	1410	1120	580	577
21	399	912	280	353	952	1050	480	912	1440	1070	601	598
22	1010	797	250	390	678	737	480	828	1630	1090	678	513
23	500	707	225	395	580	841	448	1010	1830	1160	612	432
24	378	873	200	1070	529	684	412	834	2060	1570	554	374
25	416	892	210	1550	485	607	382	713	2040	1680	634	347
26	434	760	220	892	443	539	357	912	2320	1630	554	320
27	434	760	205	879	439	490	345	847	2190	1290	1300	302
28	349	678	195	1450	452	471	337	959	2820	1240	772	286
29	325	601	230	1120	439	434	329	1500	2850	1150	575	274
30	1100	544	270	828	---	412	329	1940	1810	1170	534	273
31	1280	---	350	696	---	395	---	1380	---	1300	500	---
TOTAL	11175	40769	11296	34606	16312	14851	12539	26676	46615	42270	26339	17626
MEAN	360	1359	364	1116	562	479	418	861	1554	1364	850	588
MAX	1280	3390	660	7500	1270	1050	713	1940	2850	1880	1450	1560
MIN	178	544	195	280	399	333	329	345	791	1050	500	273
CFSM	3.43	12.9	3.47	10.6	5.35	4.56	3.98	8.20	14.8	13.0	8.10	5.60
IN.	3.96	14.44	4.00	12.26	5.78	5.26	4.44	9.45	16.52	14.98	9.33	6.24
AC-FT	22170	80870	22410	68640	32350	29460	24870	52910	92460	83840	52240	34960
CAL YR 1983	TOTAL	314981	MEAN	863	MAX	5160	MIN	178	CFSM	8.22	IN.	111.59
WTR YR 1984	TOTAL	301074	MEAN	823	MAX	7500	MIN	178	CFSM	7.84	IN.	106.67
											AC-FT	624800
											AC-FT	597200

NOOKSACK RIVER BASIN

219

12209000 SOUTH FORK NOOKSACK RIVER NEAR WICKERSHAM, WA

LOCATION.--Lat 48°39'52", long 122°09'56", In lot 2, SW¼SW¼ sec.26, T.37 N., R.5 E., Whatcom County, Hydrologic Unit 17110004, on left bank 0.5 mi upstream from Skookum Creek, 3.7 mi east of Wickersham, and at mile 14.8.

DRAINAGE AREA.--103 mi².

PERIOD OF RECORD.--October 1933 to October 1977, June to September 1978, October 1980 to current year (seasonal records only).

REVISED RECORDS.--WSP 832: 1935-36.

GAGE.--Water-stage recorder. Elevation of gage is 385 ft, from river-profile map. Prior to July 9, 1934, nonrecording gage, at same site and datum.

REMARKS.--Records good except those above 1,200 ft³/s, which are fair. No regulation or diversion upstream from station.

AVERAGE DISCHARGE.--44 years (water years 1934-77), 741 ft³/s, 97.70 in/yr, 536,900 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 19,300 ft³/s Nov. 3, 1955, gage height, 13.40 ft, from rating curve extended above 11,000 ft³/s; minimum, 66 ft³/s Oct. 9, 1940, Sept. 11-13, 1944; minimum gage height, 1.80 ft Sept. 16, 17, 1973.

EXTREMES FOR CURRENT YEAR.--Maximum discharge during period June to October, 3,850 ft³/s Oct. 25, gage height, 6.50 ft; minimum, 134 ft³/s Aug. 26, 27, gage height, 2.24 ft.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR JUNE TO OCTOBER 1984
MEAN VALUES

DAY	JUN	JUL	AUG	SEP	OCT
1	744	714	306	421	143
2	642	744	276	211	140
3	618	672	247	170	138
4	744	678	231	155	165
5	764	708	227	543	222
6	738	594	226	1190	167
7	1030	465	205	374	229
8	1060	416	197	417	188
9	799	452	216	325	206
10	696	475	216	310	992
11	684	475	206	264	899
12	778	475	195	383	627
13	1160	396	189	293	881
14	1280	404	174	229	879
15	1140	465	164	198	590
16	883	532	159	185	428
17	630	532	163	177	362
18	600	470	162	169	314
19	636	408	155	163	286
20	696	372	150	167	265
21	684	326	145	193	251
22	660	309	144	360	240
23	799	344	145	300	231
24	911	371	143	228	237
25	883	390	138	195	1710
26	992	394	135	179	893
27	976	325	419	167	638
28	925	301	239	158	696
29	1500	292	177	152	537
30	932	292	159	146	559
31	---	295	151	---	468
TOTAL	25584	14086	6059	8422	14581
MEAN	853	454	195	281	470
MAX	1500	744	419	1190	1710
MIN	600	292	135	146	138
CFSM	8.28	4.41	1.89	2.73	4.56
IN.	9.24	5.09	2.19	3.04	5.27
AC-FT	50750	27940	12020	16710	28920

NOOKSACK RIVER BASIN

12210500 NOOKSACK RIVER AT DEMING, WA

LOCATION.--Lat 48°48'38", long 122°12'13", in lot 12, NE¼SE¼ sec.6, T.38 N., R.5 E., Whatcom County, Hydrologic Unit 17110004, on left bank 800 ft downstream from South Fork, 1.1 mi southeast of Deming, and at mile 36.6.

DRAINAGE AREA.--584 mi², includes 5 mi² in Canada.

PERIOD OF RECORD.--September 1910 to March 1911 (gage heights only), July 1935 to September 1957, October 1957 to September 1964 (discharges above 3,500 ft³/s only), October 1964 to current year. Published as "near Deming" 1910-11.

REVISED RECORDS.--WSP 1286: 1951. WSP 1736: 1937(M). WSP 1932: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 204.2 ft above National Geodetic Vertical Datum of 1929. Prior to Dec. 5, 1910, nonrecording gage at site 1.1 mi downstream at different datum. Dec. 5, 1910, to Mar. 31, 1911, nonrecording gage at site 5 mi downstream at different datum. July 20 to Sept. 19, 1935, nonrecording gage at same site and datum.

REMARKS.--Records poor. Slight regulation by powerplant at Excelsior. Since February 1962, city of Bellingham diverts up to 100 ft³/s from the Middle Fork for municipal use. Summer flows augmented by glacier melt at source.

AVERAGE DISCHARGE.--42 years (water years 1936-57, 1965-84), 3,361 ft³/s, 78.15 in/yr, 2,435,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 43,200 ft³/s Feb. 10, 1951, gage height, 15.69 ft, from rating curve extended above 25,000 ft³/s; maximum gage height, 15.89 ft Dec. 3, 1975; minimum recorded discharge, 502 ft³/s Nov. 29, 1952, gage height, 3.72 ft.

EXTREMES OUTSIDE PERIOD OF RECORD.--Peak of Mar. 15, 1908, reportedly reached a stage of 20 ft. Peak of Feb. 27, 1932, reached a stage of 16.8 ft, from floodmarks, discharge, 49,300 ft³/s. Peak of November 1909 reached a stage about equal to that of the 1932 peak.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 16,000 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Nov. 16	0100	20,100	11.91	Jan. 25	0300	22,100	12.18
Jan. 4	1800	*33,300	*14.67				

Minimum daily discharge, 770 ft³/s Oct. 16.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP		
1	930	1980	2510	2240	4580	2770	2700	2400	4580	5470	3600	1800		
2	960	3600	2300	5540	4080	2700	2500	3780	4030	5430	3500	2000		
3	1040	10600	2150	9840	3710	2600	2400	3070	3810	5040	3400	1650		
4	1000	13600	1950	26000	3300	2450	2450	2800	4070	5080	3200	1600		
5	940	7380	1850	18400	3000	2300	2400	2500	4270	5290	3000	1800		
6	900	6090	1750	11200	3100	2270	2450	2400	4330	4760	2900	6860		
7	860	5200	1700	8780	3000	2220	2500	2300	5060	3970	2700	3290		
8	830	4600	1800	7690	3100	2200	2800	2600	6130	3600	2700	3250		
9	810	3910	1950	5690	3400	2220	2650	3480	4780	3700	2800	2670		
10	800	3860	2100	5090	3200	2300	2650	3350	4330	3900	2900	2510		
11	800	6280	1950	4800	3000	2400	2600	3560	4190	3900	2900	2310		
12	790	5650	1900	4120	4930	2550	2500	5950	4400	3870	2700	2760		
13	790	4760	2200	3590	5240	2600	2900	5560	5600	3540	2500	2220		
14	780	4270	2630	3200	4100	3000	2750	5830	6350	3540	2300	1840		
15	780	11600	2410	2940	3630	2800	4540	4890	6590	3880	2200	1690		
16	770	16800	2200	2770	3260	2650	4100	4260	5980	4400	2100	1720		
17	780	10200	2000	2550	2970	2500	3380	3810	4800	4570	2150	1870		
18	800	9070	1800	2370	2700	2550	2990	3520	4340	4280	2200	2020		
19	830	6840	1700	2310	2500	2700	2750	6020	4330	3830	2150	1850		
20	1060	5480	1600	2220	6220	3510	2700	8440	4430	3500	2100	1770		
21	1380	4290	1500	2240	6980	7280	2650	5810	4520	3300	2000	1850		
22	2300	3650	1400	2950	4840	5600	2990	5110	4650	3100	1960	2180		
23	2200	3240	1350	3570	4030	6170	2800	6480	5030	3300	1940	1960		
24	1700	4540	1300	12600	3650	5160	2600	5500	5500	3760	1900	1560		
25	1350	7070	1600	16400	3180	4610	2400	4610	5600	4060	1850	1380		
26	1300	4670	1800	9400	2850	4130	2300	7120	5870	4300	1800	1260		
27	1250	5030	1730	8010	2880	3510	2200	6130	6300	4000	2500	1200		
28	1200	3980	1550	10200	2940	3400	2100	5650	6270	3600	2900	1190		
29	1100	3260	1480	8570	2890	3160	2080	6260	8600	3300	2300	1190		
30	1200	2820	2800	6170	---	2950	2060	6930	6620	3200	1700	1170		
31	3070	---	2780	5200	---	2880	---	5560	---	3200	1600	---		
TOTAL	35300	184320	59740	216650	107260	100140	80890	145680	155360	124670	76450	62420		
MEAN	1139	6144	1927	6989	3699	3230	2696	4699	5179	4022	2466	2081		
MAX	3070	16800	2800	26000	6980	7280	4540	8440	8600	5470	3600	6860		
MIN	770	1980	1300	2220	2500	2200	2060	2300	3810	3100	1600	1170		
CFSM	1.95	10.5	3.30	12.0	6.33	5.53	4.62	8.05	8.87	6.89	4.22	3.56		
IN.	2.25	11.74	3.81	13.80	6.83	6.38	5.15	9.28	9.90	7.94	4.87	3.98		
AC-FT	70020	365600	118500	429700	212800	198600	160400	289000	308200	247300	151600	123800		
CAL YR 1983	TOTAL	1220920	MEAN	3345	MAX	23000	MIN	770	CFSM	5.73	IN.	77.77	AC-FT	2422000
WTR YR 1984	TOTAL	1348880	MEAN	3685	MAX	26000	MIN	770	CFSM	6.31	IN.	85.92	AC-FT	2676000

12213100 NOOKSACK RIVER AT FERNDAL, WA

LOCATION.--Lat 48°50'42", long 122°35'17", in NE¼NW¼ sec.29, T.39 N., R.2 E., Whatcom County, Hydrologic Unit 17110004, on right bank 300 ft downstream from highway bridge at Ferndale, and 5.8 mi upstream from mouth.

DRAINAGE AREA.--786 mi², of which 48.9 mi² is in Canada.

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

REVISED RECORDS.--WDR WA-83-1: 1971(M), 1976(M).

GAGE.--Water-stage recorder. Datum of gage is 4.61 ft above National Geodetic Vertical Datum of 1929. Prior to July 18, 1968, at site 220 ft upstream at datum 4.21 ft higher.

REMARKS.--Records good except those for period of ice effect Dec. 20-31, which are fair. Slight regulation by powerplant at Excelsior. City of Bellingham diverts up to about 100 ft³/s at times from Middle Fork Nooksack River for municipal use. City of Ferndale diverts unknown quantities for municipal use.

AVERAGE DISCHARGE.--18 years, 3,944 ft³/s, 68.14 in/yr, 2,857,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 52,700 ft³/s Dec. 3, 1975, gage height, 21.97 ft; minimum, 718 ft³/s Nov. 5, 1974, gage height, 3.03 ft.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 16,000 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Nov. 4	1100	17,500	14.55	Jan. 5	1200	*43,800	*21.08
Nov. 16	1600	21,300	16.22	Jan. 25	1700	24,300	17.28

Minimum discharge, 827 ft³/s Oct. 16, gage height, 2.81 ft.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1040	2520	3700	2900	5000	3510	3240	2370	4740	5010	3380	1860
2	1080	3160	3350	5610	4430	3410	3030	3610	4150	5240	3350	1980
3	1240	10300	3080	10400	4000	3170	2880	3350	3830	4780	3080	1610
4	1130	16300	2810	22700	3680	2910	2980	2960	3890	4680	2830	1590
5	1050	10300	2640	35600	3570	2760	2890	2720	4150	4920	2730	1760
6	1020	7310	2470	17600	3620	2700	3040	2670	4240	4810	2730	6650
7	981	6510	2300	11400	3580	2700	3020	2520	4340	3990	2490	3730
8	960	5780	2390	10000	3550	2740	3440	2650	6040	3530	2450	2880
9	932	4750	2500	7500	3870	2890	3220	3680	4800	3460	2670	2900
10	918	4170	2930	6320	3720	3000	3250	3580	4300	3610	2740	2510
11	918	6640	2800	5990	3500	3280	3110	3460	4070	3640	2660	2330
12	904	7800	2580	5260	4060	3210	3010	6400	4180	3630	2530	2540
13	890	6020	2830	4610	6230	3860	3570	5700	5320	3340	2380	2430
14	876	5190	3390	4120	4450	3480	3280	6670	6200	3220	2120	2040
15	860	9940	3480	3770	3940	3420	4480	5860	6550	3390	2050	1840
16	850	20600	2830	3540	3580	3250	4910	4800	5880	3890	2020	1780
17	870	15600	2460	3300	3220	3100	3920	4120	4680	4250	2080	1860
18	900	11800	2220	3080	3010	3110	3450	3610	4160	4180	2100	1960
19	940	10300	2030	2970	2890	3210	3250	4490	4060	3690	2030	1960
20	1040	8400	1970	2850	4770	3410	3180	8840	4160	3360	1980	1770
21	1410	6490	1850	2840	9100	8720	3020	5540	4270	3010	1880	1840
22	2750	5290	1800	3470	5970	7140	3260	4530	4360	2810	1850	1940
23	2730	4540	1750	4190	4850	6900	3110	6360	4690	2980	1850	2140
24	1750	5010	1700	8610	4550	6460	2840	5930	5350	3290	1810	1740
25	1510	10800	2100	22400	4120	5510	2630	4690	5380	3570	1750	1550
26	1490	7070	2400	14400	3620	5740	2480	6810	5600	3940	1700	1440
27	1450	7640	2100	9750	3530	4590	2370	7140	6140	3610	2770	1340
28	1410	6500	1900	11200	3600	4320	2300	5710	5810	3200	3070	1290
29	1250	5120	2200	10900	3700	4110	2260	6170	8130	3060	2060	1240
30	1300	4280	3600	7240	---	3680	2250	7040	7260	2990	1750	1220
31	3580	---	3400	5790	---	3450	---	5870	---	3030	1640	---
TOTAL	40029	236130	79560	270310	121710	123740	93670	149850	150730	116110	72530	63720
MEAN	1291	7871	2566	8720	4197	3992	3122	4834	5024	3745	2340	2124
MAX	3580	20600	3700	35600	9100	8720	4910	8840	8130	5240	3380	6650
MIN	850	2520	1700	2840	2890	2700	2250	2370	3830	2810	1640	1220
CFSM	1.64	10.0	3.26	11.1	5.34	5.08	3.97	6.15	6.39	4.76	2.98	2.70
IN.	1.89	11.18	3.77	12.79	5.76	5.86	4.43	7.09	7.13	5.50	3.43	3.02
AC-FT	79400	468400	157800	536200	241400	245400	185800	297200	299000	230300	143900	126400

CAL YR 1983	TOTAL	1411979	MEAN	3868	MAX	27900	MIN	850	CFSM	4.92	IN.	66.83	AC-FT	2801000
WTR YR 1984	TOTAL	1518089	MEAN	4148	MAX	35600	MIN	850	CFSM	5.28	IN.	71.85	AC-FT	3011000

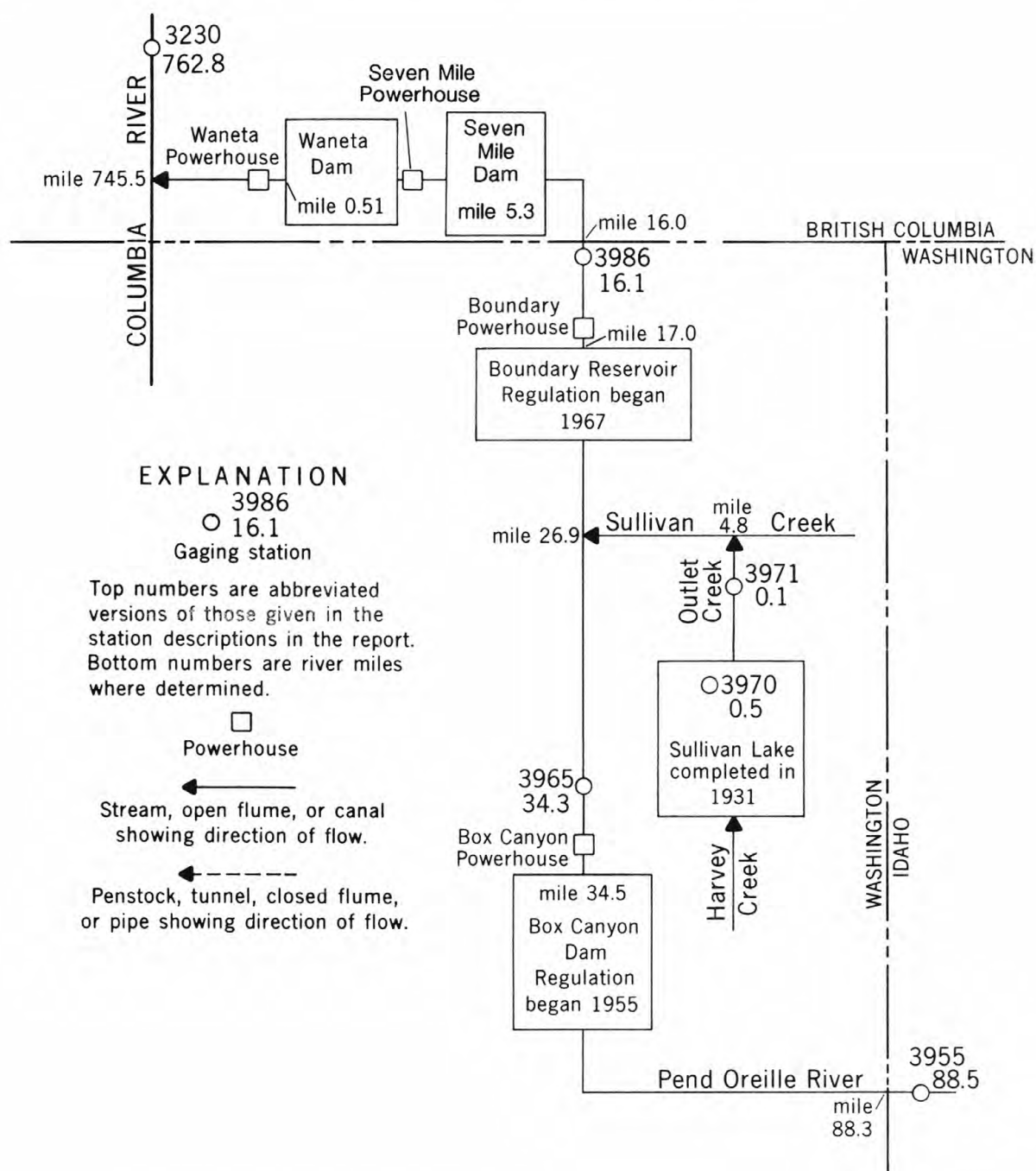


Figure 19.--Gaging stations in Pend Oreille River basin and Columbia River above international boundary.

COLUMBIA RIVER MAIN STEM

223

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 downstream from Sullivan Creek, 7 mi upstream from Trail, 11.7 mi downstream from Kootenay River, 17.4 mi upstream from international boundary, and at mile 762.4.

DRAINAGE AREA.--34,000 mi², 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 National Geodetic Vertical Datum of 1929, 1947 international joint adjustment, published as 1,338.00 ft prior to October 1948. Prior to Oct. 1, 1937, nonrecording gage on highway bridge at site 6.8 mi downstream at datum 16.27 ft 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.

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

AVERAGE DISCHARGE.--71 years, 71,140 ft³/s, 51,540,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 377,000 ft³/s June 9, 1961, gage height, 50.05 ft; maximum gage height, 50.62 ft June 11, 1948; minimum discharge observed, 8,940 ft³/s Feb. 3, 1937, gage height, 6.27 ft, site and datum then in use.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 124,000 ft³/s Aug. 3, gage height, 24.56 ft; minimum daily, 18,400 ft³/s Apr. 6.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	39500	27300	75200	101000	69600	103000	20500	32600	55400	74500	115000	61800
2	43800	27300	75600	98200	71300	102000	20800	45200	51200	72700	120000	51900
3	48700	27600	76300	92200	68500	101000	18500	59000	50500	70600	122000	51600
4	49400	28800	78700	91500	59700	100000	18600	68100	50100	69200	118000	52300
5	49400	27700	82300	92500	64600	94300	18800	68900	51200	67800	117000	53000
6	49800	32900	82300	77300	74900	84700	18400	70300	51900	63900	114000	56900
7	49800	48700	83000	69600	84000	75200	18600	70600	52600	59000	105000	67800
8	49800	57200	83300	58600	97800	75200	20300	72400	50500	57600	104000	70300
9	54700	56900	82600	61800	101000	72000	23200	72700	56100	55800	91100	65300
10	59700	56900	82600	68900	96800	64300	22500	65000	55400	55800	75200	63600
11	60000	56900	82600	70600	94300	63600	21000	62900	56900	55400	66000	76300
12	60000	57200	84000	68900	94300	67400	20800	60700	60400	55400	71300	75600
13	60000	53700	87600	68900	99200	68500	21900	58300	61800	55100	87200	72400
14	60700	49800	89300	68500	98200	68900	20500	60700	62100	54000	98200	65000
15	60000	49800	89000	68500	96400	68100	20100	62900	65000	53300	103000	57900
16	53700	48000	88600	68500	96400	67400	20100	62900	65700	51900	102000	46300
17	45900	51600	86500	71000	96400	65700	22400	68500	64300	50100	95700	40600
18	45900	54400	78400	74500	94600	58300	26200	71700	63200	54000	83000	46600
19	45900	55400	69600	73800	90400	47300	29500	72400	62500	67400	83300	53300
20	45900	56500	72400	74200	80900	35700	32800	73400	62900	75600	80500	57600
21	45900	51900	76600	73100	77700	28400	33200	70600	63200	80500	78400	62100
22	46300	50100	78700	76300	78400	31700	33900	69900	63200	79400	86900	47700
23	41000	49800	75200	91800	78400	34100	33900	67400	62100	76600	87900	42400
24	30700	49800	77700	102000	78700	31400	34500	71700	62100	69600	86500	38100
25	27000	55800	76300	103000	80200	27700	33400	68500	65700	60700	76300	33700
26	26700	55400	81200	102000	84400	27800	34000	64600	71300	64300	70600	34700
27	26700	61800	79800	99600	93600	28400	32700	61400	73400	77000	79100	33800
28	26900	72000	81900	89300	101000	29700	32200	63600	73100	93900	98900	34000
29	27000	75200	81900	76600	103000	28100	30300	65300	79100	96000	103000	34700
30	27000	75200	87600	68100	---	25300	30000	62900	78000	101000	95000	36000
31	27100	---	92500	70300	---	20500	---	60400	---	118000	84700	---
TOTAL	1384900	1521600	2519300	2471100	2504700	1795700	763600	2005500	1840900	2136100	2898800	1583300
MEAN	44670	50720	81270	79710	86370	57930	25450	64690	61360	68910	93510	52780
MAX	60700	75200	92500	103000	103000	103000	34500	73400	79100	118000	122000	76300
MIN	26700	27300	69600	58600	59700	20500	18400	32600	50100	50100	66000	33700
AC-FT	2747000	3018000	4997000	4901000	4968000	3562000	1515000	3978000	3651000	4237000	5750000	3140000
CAL YR 1983	TOTAL	27369100	MEAN	74980	MAX	133000	MIN	23000	AC-FT	54290000		
WTR YR 1984	TOTAL	23425500	MEAN	64000	MAX	122000	MIN	18400	AC-FT	46460000		

12395500 PEND OREILLE RIVER AT NEWPORT, WA

LOCATION.--Lat 48°10'56", long 117°02'00", in SE¼SE¼SW¼ sec.24, T.56 N., R.6 W. (Boise meridian), Bonner County, ID, Hydrologic Unit 17010216, on left bank at Newport, 0.2 mi upstream from bridge on U.S. Highway 2, 0.2 mi east of Idaho-Washington state line, 1.6 mi downstream from Albeni Falls Dam, and at mile 88.5.

DRAINAGE AREA.--24,200 mi², approximately.

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

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

GAGE.--Water-stage recorder. Datum of gage is 1,999.7 ft 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 National Geodetic Vertical Datum, and Oct. 1, 1935, to Sept. 30, 1941, at datum 2,000 ft National Geodetic Vertical Datum, water-stage recorder at Priest River. Since December 1952, auxiliary water-stage recorder 2.74 mi downstream from base gage.

REMARKS.--Records good. 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.

AVERAGE DISCHARGE.--70 years (1904-41, 1953-84), 26,000 ft³/s, 18,840,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 136,000 ft³/s June 15, 1913, June 21, 1933, June 12, 1972; minimum, 1,280 ft³/s Sept. 1, 1961.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of June 1894 reached a stage of about 64.0 ft present site and datum, discharge, about 200,000 ft³/s.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 70,400 ft³/s June 25, maximum gage height, 43.76 ft June 26; minimum discharge, 2,480 ft³/s Jan. 6, minimum gage height, 30.40 ft Jan. 8.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	22700	26400	16500	24200	23000	22300	26100	28900	40200	65600	17400	12300
2	22300	26600	15800	22100	23100	22000	20600	27800	40300	58900	16500	12600
3	22400	26600	15600	21200	23000	21700	15600	27500	40300	48800	15700	12800
4	22400	23900	15500	15000	22400	19500	16100	26300	42300	39400	13800	13000
5	21800	14400	15600	6030	22600	18600	19400	25800	44400	29300	10900	15600
6	22000	11200	16500	3230	22800	20900	21600	29100	47900	28600	9080	21100
7	21900	11200	17800	3220	22500	19200	18900	32500	48800	32200	9550	21400
8	21900	10800	17600	3270	22400	16300	16500	34800	48600	32600	11500	17400
9	21900	11200	16700	4770	22600	16300	18300	28700	48300	30600	12700	14600
10	23300	10800	15100	9120	22300	20900	20200	24600	48500	28400	14300	15200
11	26400	12100	18300	18500	22300	21500	19500	22400	48500	28400	15600	14600
12	26100	15800	22600	21700	22300	21400	19400	20500	49000	27900	15500	11800
13	26200	19800	26000	21700	22300	24000	19400	20400	49000	26300	10600	10900
14	25300	20000	17900	21500	22100	16800	19300	22500	51600	23400	9410	12000
15	26000	19700	15300	21900	22500	9490	19200	25200	55800	22500	9440	12800
16	25900	20000	15300	22600	22300	8190	17900	27000	60500	22400	9360	11600
17	25800	20300	15200	22800	22100	8140	16400	30300	63200	20900	10500	11900
18	26300	20000	13200	22400	20300	8150	18300	32600	62300	20200	11500	16800
19	26300	24300	12300	22400	19100	8000	22600	35000	57300	24300	11600	21700
20	26100	30100	12300	23000	18900	8100	31500	35200	56800	21800	9290	22200
21	26700	30500	12300	23700	17500	7960	37400	39300	62300	12500	9510	20900
22	26500	31800	16000	23100	17700	11800	39800	47700	66400	8580	9490	17500
23	26600	30600	15400	23000	22200	18500	34800	49100	68200	8190	9310	15600
24	26700	30700	14800	23600	19700	21000	32500	51600	67300	8190	11200	17200
25	26800	30300	14300	23500	15800	22900	34700	45900	68100	8100	13700	20600
26	23000	30200	11700	23100	12500	26900	34700	43100	65500	9080	14200	23200
27	15700	30400	10500	22800	12600	26600	32900	40200	56500	14000	12200	23200
28	15700	30100	13400	23200	16000	26000	30500	34900	55800	15300	8900	21500
29	15600	29800	17800	22900	21100	25900	30300	34700	61900	13100	8890	18600
30	15600	22600	25300	22900	---	26000	30000	37300	65400	10500	9700	18700
31	20400	---	26400	23300	---	26400	---	40700	---	9360	10600	---
TOTAL	722300	672200	509000	585740	596000	571430	734400	1021600	1641000	749400	361930	499300
MEAN	23300	22410	16420	18890	20550	18430	24480	32950	54700	24170	11680	16640
MAX	26800	31800	26400	24200	23100	26900	39800	51600	68200	65600	17400	23200
MIN	15600	10800	10500	3220	12500	7960	15600	20400	40200	8100	8890	10900
AC-FT	1433000	1333000	1010000	1162000	1182000	1133000	1457000	2026000	3255000	1486000	717900	990400
CAL YR 1983 TOTAL	9494060			MEAN 26010	MAX 69700	MIN 3850	AC-FT 18830000					
WTR YR 1984 TOTAL	8664300			MEAN 23670	MAX 68200	MIN 3220	AC-FT 17190000					

PEND OREILLE RIVER BASIN

225

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 downstream from Box Canyon Dam, 2.8 mi north of Ione, and at mile 34.3.

DRAINAGE AREA.--24,900 mi², approximately.

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

REVISED RECORDS.--WSP 1933: Drainage area. WDR WA-81-2: 1976.

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 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 downstream at same datum.

REMARKS.--Records good except those less than 10,000 ft³/s, which are fair. Discharge for Dec. 21-23 provided by Public Utility District No. 1 of Pend Oreille County through the Corps of Engineer's North Pacific Division Reservoir Control Center. Flow completely regulated by Box Canyon Reservoir, 1,000 ft upstream, since June 1955 and by Pend Oreille Lake, Flathead Lake, Hungry Horse Reservoir, and by several smaller reservoirs and powerplants. Numerous diversions above station for irrigation.

AVERAGE DISCHARGE.--32 years, 27,980 ft³/s, 20,270,000 acre-ft/yr, unadjusted.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 136,000 ft³/s June 13, 14, 1972; maximum elevation, 2,014.54 ft June 14, 1972; minimum observed discharge, 125 ft³/s Apr. 23, 1967 (result of regulation).

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of June 1948 reached an elevation of 2,018.00 ft, from floodmarks, discharge, 167,000 ft³/s.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 73,100 ft³/s June 25; maximum elevation, 2,002.34 ft June 25; minimum daily, 4,840 ft³/s Jan. 8; minimum elevation, 1,984.34 ft July 25.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	23000	23600	19300	19700	23400	22400	28100	32300	41800	65200	14000	10700
2	22800	26300	16900	19800	22800	23200	26700	30200	40700	65000	17600	12500
3	22600	27400	15500	19600	24000	22700	20400	28900	41700	55400	16800	12900
4	22300	27000	15200	17600	23500	22300	17100	28900	42100	47300	15700	12800
5	22600	20000	15300	13100	23300	19800	19000	28900	45700	37500	12400	13500
6	22600	14100	15500	6880	23200	20700	22400	29000	46000	28900	9780	17600
7	22900	12000	16800	5670	23300	21500	23400	31400	49100	33800	9130	21900
8	22800	11800	17600	4840	22500	18900	19200	33900	50200	33000	10100	20200
9	22400	11200	17400	5210	23800	16500	20400	34700	50300	32700	12600	16800
10	22500	11400	16700	7440	23600	19600	21200	30000	50500	30600	13000	14400
11	25000	12800	16500	14400	23000	21800	22100	28400	50500	30200	14900	15400
12	26400	13400	19200	20300	22600	22600	21900	25000	50500	28400	15700	13200
13	26800	19700	25400	23000	23600	24300	22000	22300	50600	28200	13400	11300
14	27200	20400	22700	23700	22200	22700	21600	22900	50800	25800	9400	10900
15	26600	21000	18100	23000	24500	14700	21200	26600	55100	24400	8960	12600
16	26700	21400	15600	22700	22800	10300	20700	28000	60600	24300	8930	12400
17	26700	22200	15500	23200	22800	9910	19400	30200	63700	23600	9450	10900
18	27100	21700	14200	22200	22900	9080	19500	32100	64900	21400	10600	14300
19	26900	22200	12300	21100	20200	8910	23400	34000	61800	22500	11100	18400
20	26900	28500	11100	22300	19800	9060	28500	36400	59500	24000	11800	22100
21	28100	29500	12500	23000	19200	9760	35400	37300	61800	17900	9740	22100
22	27600	30600	12500	22800	18100	11000	39900	44600	65700	10700	9250	20600
23	27000	31300	11900	22900	19900	16700	40400	49400	68200	9530	8890	16200
24	27100	31000	9840	23300	22800	21700	35800	51800	68800	9010	9400	16500
25	27300	30600	7710	23700	18500	23200	35900	52300	70600	7810	12000	21700
26	26400	30200	6200	23900	15200	27100	36500	46900	68700	8330	14200	22700
27	18600	30300	7670	24100	13100	28400	36600	48200	63300	9950	13700	22600
28	18800	30300	7860	24100	13400	28500	34100	40400	56600	17000	9860	23900
29	18200	30200	9360	23900	19100	28400	32600	38100	60300	13900	8730	20500
30	16400	28100	13600	24200	---	28100	32400	35200	63900	12200	8780	18800
31	18400	---	17700	23500	---	28200	---	40900	---	8800	9710	---
TOTAL	746700	690200	453640	595140	617100	612020	797800	1079200	1674000	807330	359610	500400
MEAN	24090	23010	14630	19200	21280	19740	26590	34810	55800	26040	11600	16680
MAX	28100	31300	25400	24200	24500	28500	40400	52300	70600	65200	17600	23900
MIN	16400	11200	6200	4840	13100	8910	17100	22300	40700	7810	8730	10700
AC-FT	1481000	1369000	899800	1180000	1224000	1214000	1582000	2141000	3320000	1601000	713300	992500
CAL YR 1983	TOTAL	9616460	MEAN	26350	MAX	73100	MIN	4700	AC-FT	19074000		
WTR YR 1984	TOTAL	8933140	MEAN	24410	MAX	70600	MIN	4840	AC-FT	17719000		

LOCATION.--Lat 48°50'21", long 117°17'15", in SW¼ sec.31, T.39 N., R.44 E., Pend Oreille County, Hydrologic Unit 17010216, Colville National Forest, 200 ft south of dam at outlet, and 4.0 mi southeast of Metaltine Falls.

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

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.

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

EXTREMES FOR CURRENT YEAR.--Maximum elevation observed, 2,588.78 ft July 19, 20, 22; minimum observed, 2,564.90 ft Mar. 9.

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2586.16	2586.30	2584.64	2578.20	2569.54	---	---	2569.48	---	2588.22	2588.68	2588.26
2	2586.15	---	2584.42	2577.90	---	---	---	2569.80	2583.06	2588.24	---	---
3	---	2586.50	2584.20	2577.44	2568.78	---	---	2570.04	2583.70	2588.26	2588.66	2588.26
4	2586.12	2587.00	2584.00	2577.12	2568.46	---	2565.46	2570.28	2584.00	2588.24	---	---
5	---	2586.86	2583.78	2576.80	2568.10	2564.96	---	2570.44	2584.60	2588.22	---	---
6	2586.12	2586.80	2583.54	2576.52	2567.76	2564.94	2565.50	2570.70	---	2588.20	2588.66	---
7	2586.12	2586.68	2583.30	2576.20	2567.48	---	---	2570.96	2585.78	---	2588.64	2588.28
8	---	2586.58	2583.12	2575.90	2567.20	2564.92	---	2571.10	2586.50	2588.20	---	---
9	2586.10	2586.44	2582.88	2575.56	2567.20	2564.90	2565.60	2571.36	2587.30	2588.20	2588.72	---
10	2586.10	2586.34	2582.70	2575.30	2566.80	---	---	2571.58	2587.60	2588.26	2588.70	2588.22
11	---	2586.34	2582.54	2574.94	2566.56	2564.92	2565.64	2571.80	2588.36	2588.38	---	---
12	2586.08	2586.30	2582.30	2574.66	2566.42	2564.94	---	2572.06	---	2588.48	2588.68	2588.20
13	---	2586.26	2582.32	2574.36	2566.38	---	2565.66	---	2588.26	2588.54	---	---
14	2586.06	2586.22	2582.36	2574.06	2566.16	2564.98	---	2572.66	2588.30	2588.62	2588.62	2588.18
15	---	2586.08	2582.38	2573.76	2566.00	---	2565.66	2573.08	2588.40	2588.68	---	---
16	2586.06	2585.94	2582.42	2573.36	2565.88	2564.98	2565.76	2573.58	2588.46	2588.70	2588.60	---
17	---	2585.80	2582.24	2573.16	2565.76	---	---	2573.90	2588.42	2588.76	2588.58	---
18	---	2585.74	2582.04	2572.86	2565.68	---	---	2574.30	2588.26	2588.76	---	---
19	2586.02	2585.66	2581.82	2572.56	2565.58	---	2566.18	2574.74	2588.16	2588.78	---	---
20	---	2585.58	2581.60	---	2565.50	2565.02	2566.60	2575.36	2588.02	2588.78	2588.56	---
21	---	2585.48	---	2572.10	---	2565.10	2567.04	2575.96	2587.98	---	---	---
22	2586.02	2585.40	2581.16	---	2565.42	---	2567.38	2576.50	2588.10	2588.78	---	2588.16
23	---	2585.34	2580.96	2571.56	2565.36	2565.24	2567.70	2577.00	2588.04	2588.76	2588.50	---
24	2586.20	2585.28	2580.68	2571.36	2565.30	---	2567.97	2577.70	2587.94	2588.76	---	2588.10
25	2586.20	2585.24	---	2571.10	2565.26	---	2568.20	2577.30	2587.86	2588.76	2588.46	2588.08
26	2586.20	2585.18	2580.24	2570.86	2565.20	2565.38	2568.44	2577.72	2587.90	---	2588.40	---
27	2586.22	2585.14	2580.06	2570.66	2565.17	---	2568.70	2579.20	2587.88	2588.74	---	---
28	---	2585.08	2579.64	2570.40	2565.10	2565.44	2568.88	2579.76	2587.84	---	---	---
29	2586.22	2585.04	2579.30	2570.16	---	---	2569.10	2580.20	2587.94	---	2588.36	---
30	---	2584.86	2579.00	2569.96	---	2565.44	2569.30	2580.96	2588.16	2588.72	---	---
31	2586.26	---	2578.60	2569.76	---	---	---	---	---	2588.70	2588.30	---
MEAN	---	---	---	---	---	---	---	---	---	---	---	---
MAX	---	---	---	---	---	---	---	---	---	---	---	---
MIN	---	---	---	---	---	---	---	---	---	---	---	---

PEND OREILLE RIVER BASIN

227

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 upstream from mouth, 0.4 mi downstream from Sullivan Lake Dam, and 4 mi east of Metaline Falls.

DRAINAGE AREA.--51.5 mi².

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 above National Geodetic Vertical Datum of 1929.

REMARKS.--Records good except those for Nov. 29 to Jan. 3, which are fair. Flow completely regulated by Sullivan Lake 0.4 mi upstream (see sta 12397000). No diversions.

AVERAGE DISCHARGE.--25 years, 76.7 ft³/s, 55,570 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 924 ft³/s May 31, 1969, gage height, 12.26 ft; minimum, 1.6 ft³/s part of each day Apr. 9-12, 1973; minimum gage height, 8.76 ft part of each day Apr. 9-12, 1973, and Mar. 4-10, 1980.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 716 ft³/s June 11, gage height, 11.74 ft; minimum, 3.0 ft³/s part or all of each day Apr. 24, 25, gage height, 8.82 ft.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	19	18	169	247	207	49	56	3.4	12	150	32	19
2	19	18	184	253	279	47	56	3.7	12	150	27	19
3	19	18	195	255	260	46	56	3.7	13	150	24	19
4	18	128	192	250	247	44	56	3.7	14	150	26	19
5	18	190	192	244	233	38	58	3.9	15	150	29	19
6	18	185	190	241	216	34	59	3.9	16	118	29	20
7	18	174	190	235	200	34	60	3.9	16	94	26	19
8	18	162	187	233	185	33	63	4.2	76	97	26	19
9	18	148	187	227	172	33	63	4.2	167	65	26	19
10	18	137	187	224	160	33	65	4.2	210	20	26	19
11	18	137	187	219	146	33	66	4.4	488	20	26	19
12	18	133	85	216	135	34	66	4.4	488	20	25	19
13	18	131	14	213	124	34	68	4.7	480	20	24	19
14	18	162	14	208	116	35	68	5.0	460	21	22	19
15	18	197	13	205	109	35	68	5.0	476	22	22	19
16	18	180	84	203	99	36	71	5.3	508	26	22	18
17	18	167	167	200	96	37	94	5.3	516	31	21	18
18	18	155	165	197	87	37	120	5.3	490	34	21	18
19	18	141	165	195	82	37	51	5.9	460	35	21	18
20	18	129	162	190	77	38	3.4	5.9	408	35	20	19
21	18	118	162	185	74	41	3.4	6.3	396	34	20	18
22	18	109	165	177	71	43	3.4	6.6	400	34	20	18
23	18	101	150	174	68	46	3.4	7.4	388	33	20	18
24	18	96	150	169	63	49	3.2	7.4	380	33	20	18
25	18	90	160	164	60	51	3.0	7.7	306	34	20	18
26	18	85	169	162	58	52	3.2	8.1	282	33	20	18
27	18	82	195	157	55	53	3.2	8.5	299	33	21	18
28	18	77	238	155	52	53	3.2	8.9	219	33	20	18
29	18	134	241	150	50	55	3.2	9.3	150	33	20	18
30	18	169	241	146	---	55	3.4	10	150	33	20	18
31	18	---	244	144	---	55	---	11	---	32	19	---
TOTAL	561	3771	5044	6238	3781	1300	1300.0	181.2	8295	1773	715	557
MEAN	18.1	126	163	201	130	41.9	43.3	5.85	277	57.2	23.1	18.6
MAX	19	197	244	255	279	55	120	11	516	150	32	20
MIN	18	18	13	144	50	33	3.0	3.4	12	20	19	18
AC-FT	1110	7480	10000	12370	7500	2580	2580	359	16450	3520	1420	1100
CAL YR 1983	TOTAL	35962.6	MEAN	98.5	MAX	647	MIN	3.4	AC-FT	71330		
WTR YR 1984	TOTAL	33516.2	MEAN	91.6	MAX	516	MIN	3.0	AC-FT	66480		

PEND OREILLE RIVER BASIN

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 upstream from international boundary, 0.9 mi downstream from Boundary Dam, 6.0 mi downstream from Slate Creek, 9.7 mi north of Metaltine Falls, and at mile 16.1.

DRAINAGE AREA.--25,200 mi², 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 Metaltine Falls," October 1928 to September 1937 as "Clark Fork below Z Canyon, near Metaltine Falls," and October 1938 to September 1964 as "below Z Canyon, near Metaltine 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 city of Seattle Boundary Dam datum. Prior to Dec. 20, 1928, nonrecording gage at Metaltine Falls at datum approximately 1,983.4 ft National Geodetic Vertical Datum of 1929. Dec. 20, 1928, to Sept. 30, 1964, water-stage recorder at site 1.3 mi upstream at datum 1,721.18 ft National Geodetic Vertical Datum of 1929 (levels by Corps of Engineers).

REMARKS.--Water-discharge records excellent except those for periods of no gage-height record (below 16.5 ft) which occurred on July 24-27, Aug. 19, which are poor. Flow regulated by Boundary Reservoir 0.9 mi upstream beginning April 1967 and by Box Canyon Reservoir beginning June 1955, Pend Oreille Lake beginning June 1952, Flathead Lake beginning April 1938, Hungry Horse Reservoir beginning September 1951, and by several smaller reservoirs and powerplants. In 1946 there were diversions for irrigation of 340,000 acres 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.--72 years, 27,330 ft³/s, 19,800,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 171,300 ft³/s June 13, 1948, gage height, 60.25 ft, site and datum then in use; minimum daily, 200 ft³/s Aug. 12, 1967, result of regulation; minimum observed, 109 ft³/s Apr. 23, 1967, result of regulation.

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

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 77,800 ft³/s June 25, gage height, 33.96 ft; minimum, less than 3,180 ft³/s on days having no gage-height record for part of day; minimum daily, 5,040 ft³/s Jan. 8.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	22600	24300	21200	21000	25000	24200	29300	33700	44800	70900	13200	10200
2	21700	25900	19000	21600	23800	26700	28500	33100	44900	71300	17200	13500
3	22800	27400	16000	21300	26100	24400	25500	31700	45400	60200	17300	13600
4	22700	27700	15600	21300	25600	21300	18600	31700	44000	49500	15200	13800
5	22900	20700	18000	13300	22200	21200	18000	29900	49000	38600	14700	15000
6	23500	15400	17600	6290	24500	20500	21700	29600	48400	31600	11200	18700
7	23600	13200	18400	6760	24200	21500	25900	33400	51500	35400	9580	22000
8	22300	12200	19700	5040	23500	18600	17700	33800	54700	33900	11400	19900
9	21600	12000	21000	6170	25200	16800	23300	35100	54900	35100	12200	16100
10	25400	11700	16900	10500	26400	18000	22200	32100	54300	34000	12900	16900
11	25400	12800	17900	17000	22700	23000	24000	31600	55800	31300	15200	15500
12	27000	16700	20800	22300	24100	24600	23700	28600	54100	30000	16600	14500
13	28200	17800	27700	24200	25000	26000	23300	21100	54400	28400	14300	13500
14	29400	23600	25800	22200	24400	23000	21600	25900	54300	29900	10400	12700
15	27300	26000	19100	21100	24800	16700	20600	25800	59600	24000	9400	11900
16	24800	23800	17200	21800	24000	12500	22600	29600	66000	26500	11000	9590
17	27600	22300	15400	25600	23000	8660	21800	33400	68300	24900	10000	13300
18	27500	22700	14000	23800	24200	9340	22300	34300	70300	22700	10500	15400
19	29700	26700	15300	22200	19600	10000	25300	34900	69000	23800	9720	18400
20	31400	28600	12500	23900	21000	10500	33300	37500	62300	25400	14300	22200
21	28900	28200	13400	23100	20800	11900	34900	42500	66200	17900	10100	21900
22	25800	29700	13400	22900	23200	12300	41400	47700	70200	11500	10400	19600
23	23900	33800	13900	25100	18400	18300	44000	53600	74700	13300	9950	13800
24	28900	33700	10700	24600	21500	22400	38900	55900	74700	11000	11200	20100
25	28400	33400	7230	24800	19100	26900	38700	55600	75000	8880	12500	19900
26	27900	32800	7130	24000	16600	28000	39200	50000	74400	8030	14100	23300
27	20900	33200	9940	26300	13200	30600	38800	52000	70000	10300	13500	23500
28	21200	32600	10100	26100	14800	30600	37000	43500	59900	15300	12500	23700
29	17800	32300	10100	24900	19200	30500	34900	41800	64600	15500	8910	23700
30	14500	29900	15000	25100	---	29200	33900	38900	69300	13400	8950	24200
31	22000	---	18000	26000	---	28600	---	44600	---	11400	9160	---
TOTAL	767600	731100	498000	630260	646100	646800	850900	1152900	1805000	863910	377570	520390
MEAN	24760	24370	16060	20330	22280	20860	28360	37190	60170	27870	12180	17350
MAX	31400	33800	27700	26300	26400	30600	44000	55900	75000	71300	17300	24200
MIN	14500	11700	7130	5040	13200	8660	17700	21100	44000	8030	8910	9590
AC-FT	1523000	1450000	987800	1250000	1282000	1283000	1688000	2287000	3580000	1714000	748900	1032000
CAL YR 1983	TOTAL	10189070	MEAN	27920	MAX	78400	MIN	4290	AC-FT	20210000		
WTR YR 1984	TOTAL	9490530	MEAN	25930	MAX	75000	MIN	5040	AC-FT	18824000		

PEND OREILLE RIVER BASIN

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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.

WATER TEMPERATURE: April 1974 to September 1981.

WATER QUALITY DATA, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984

		STREAM- FLOW, INSTAN- TANEOUS (CFS)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH (STAND- ARD UNITS)	TEMPER- ATURE (DEG C)	TUR- BID- ITY (NTU)	OXYGEN, DIS- SOLVED (MG/L)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION)	COLI- FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)	STREP- TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML)	HARD- NESS (MG/L AS CAC03)
DATE	TIME										
OCT , 1983											
04...	1330	24600	166	8.3	13.5	.90	9.5	98	K1	K5	83
FEB , 1984											
15...	1100	28200	172	8.3	2.5	1.1	12.5	98	K5	K5	83
JUN											
27...	1100	70800	130	8.1	16.0	2.3	9.2	99	K2	K9	64
AUG											
22...	1030	16100	150	8.5	22.5	1.3	8.0	99	<1	K5	75
	HARD- NESS NONCAR- BONATE (MG/L AS CAC03)	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 CAC03)	SULFATE DIS- SOLVED (MG/L AS S04)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	FLUO- RIDE, DIS- SOLVED (MG/L AS F)
OCT , 1983											
04...	2	23	6.2	2.8	7	.1	.90	81	7.7	1.1	<.10
FEB , 1984											
15...	0	23	6.3	2.9	7	.1	.90	86	9.4	1.0	<.10
JUN											
27...	2	18	4.7	2.6	8	.1	.80	62	6.8	.90	<.10
AUG											
22...	2	21	5.4	2.9	8	.2	1.5	73	7.2	1.0	<.10
DATE	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 DIS- SOLVED (MG/L AS N)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N)	NITRO- GEN,AM- MONIA + ORGANIC TOTAL (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)
OCT , 1983											
04...	5.9	102	96	.14	6770	<.10	.050	.50	<.010	.010	<.010
FEB , 1984											
15...	6.9	94	100	.13	7160	<.10	.040	.20	<.010	<.010	<.010
JUN											
27...	7.1	74	78	.10	14100	<.10	.010	.30	.010	.010	.010
AUG											
22...	6.3	79	89	.11	3430	<.10	.050	.40	<.010	.010	<.010

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

PEND OREILLE RIVER BASIN

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

WATER QUALITY DATA, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984

DATE	ALUM- INUM, DIS- SOLVED (UG/L AS AL)	ARSENIC DIS- SOLVED (UG/L AS AS)	BARIUM, DIS- SOLVED (UG/L AS BA)	BERYL- LIUM, DIS- SOLVED (UG/L AS BE)	CADMIUM DIS- SOLVED (UG/L AS CD)	CHRO- MIUM, DIS- SOLVED (UG/L AS CR)	COBALT, DIS- SOLVED (UG/L AS CO)	COPPER, DIS- SOLVED (UG/L AS CU)	IRON, DIS- SOLVED (UG/L AS FE)	LEAD, DIS- SOLVED (UG/L AS PB)	LITHIUM DIS- SOLVED (UG/L AS LI)
OCT , 1983 04...	<10	1	73	<.5	<1	<1	<3	3	6	13	5
FEB , 1984 15...	<10	<1	70	.5	<1	<1	<3	2	12	16	10
JUN 27...	<10	<1	54	1.0	<1	<1	<3	7	13	<1	6
AUG 22...	<10	<1	59	1.0	<1	<1	<3	4	9	20	6
DATE	MANGA- NESE, DIS- SOLVED (UG/L AS MN)	MERCURY DIS- SOLVED (UG/L AS HG)	MOLYB- DENUM, DIS- SOLVED (UG/L AS MO)	NICKEL, DIS- SOLVED (UG/L AS NI)	SELE- NIUM, DIS- SOLVED (UG/L AS SE)	SILVER, DIS- SOLVED (UG/L AS AG)	STRON- TIUM, DIS- SOLVED (UG/L AS SR)	VANA- DIUM, DIS- SOLVED (UG/L AS V)	ZINC, DIS- SOLVED (UG/L AS ZN)	SEDI- MENT, SUS- PENDED (MG/L)	SEDI- MENT, DIS- CHARGE, SUS- PENDED (T/DAY)
OCT , 1983 04...	2	.1	<10	1	<1	<1	57	<6	8	2	133
FEB , 1984 15...	1	<.1	<10	<1	<1	<1	58	<6	6	5	381
JUN 27...	4	<.1	<10	<1	<1	<1	47	<6	19	13	2490
AUG 22...	9	<.1	<10	1	<1	24	55	<6	13	2	87

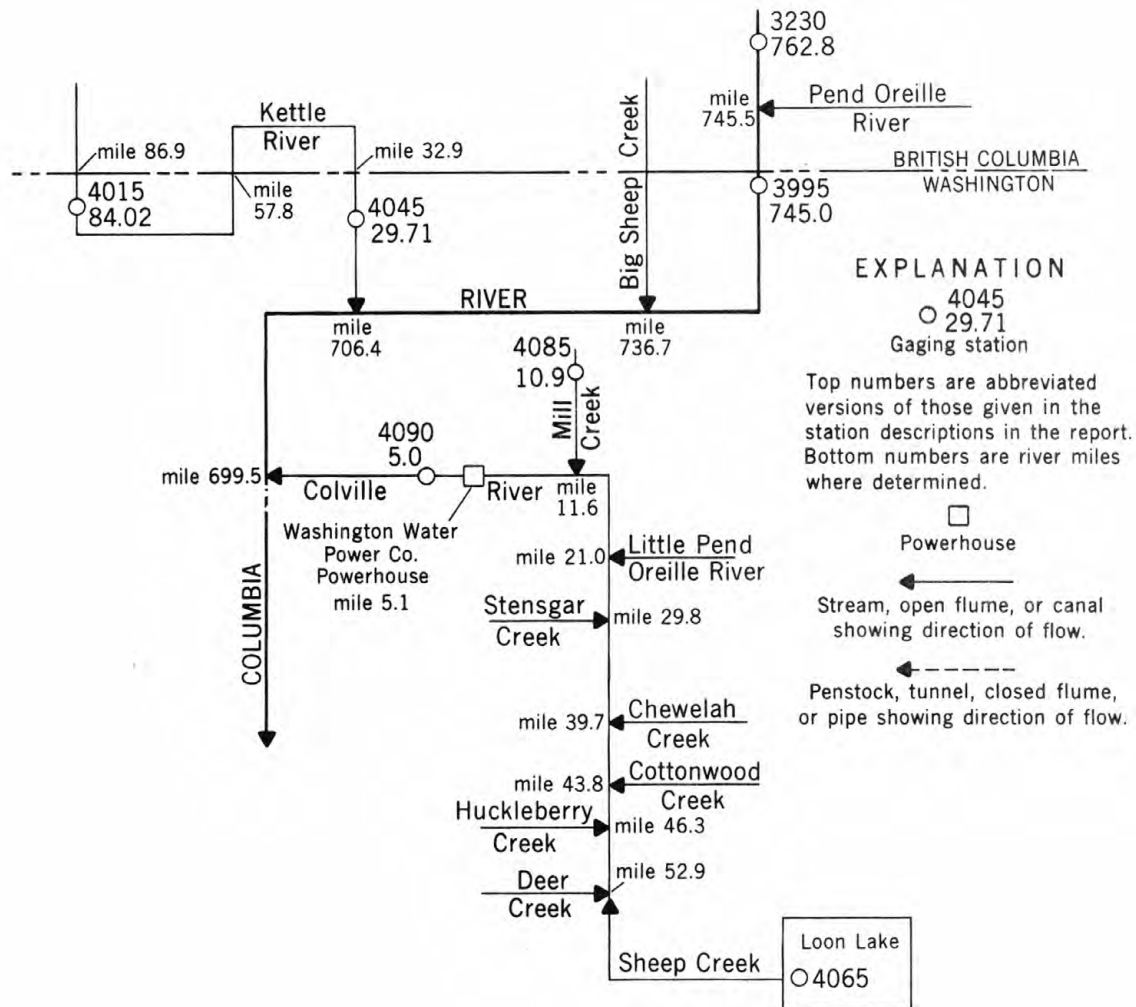


Figure 20.--Gaging stations in Columbia River basin from international boundary to Colville River.

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 downstream from Pend Oreille River, and at mile 745.0.

DRAINAGE AREA.--59,700 mi², 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 Bureau of Reclamation 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 downstream from base gage at same datum.

REMARKS.--Records good. Discharge for Mar. 15 to Apr. 3 computed from records provided by the Water Survey of Canada. Flow regulated by eight major reservoirs and numerous smaller reservoirs and powerplants. It was estimated that 346,700 acres were under irrigation in the United States in 1946 with diversions for irrigation of an additional 35,000 acres in Canada.

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

AVERAGE DISCHARGE.--47 years, 100,400 ft³/s, 72,740,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 550,100 ft³/s June 12, 1948, elevation, 1,338.13 ft; minimum, 18,900 ft³/s Feb. 7, 1954, elevation, 1,289.38 ft.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in June 1894 reached a stage of 1,346 ft, from information by Bureau of Reclamation, discharge, 680,000 ft³/s.

A discharge of about 12,900 ft³/s occurred Jan. 30 or 31, 1937, based on information from other gaging stations, elevation, 1,287.9 ft, from rating curve extended below 1,291.6 ft and may have been as low sometime in January 1930.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 160,000 ft³/s June 29, elevation, 1,309.84 ft; minimum discharge, 18,900 ft³/s Apr. 4, elevation, 1,289.88 ft.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	58800	51000	102000	123000	97000	124000	49300	67200	106000	148000	128000	70400
2	66100	53400	93400	121000	97900	129000	50500	78100	102000	146000	138000	66800
3	71900	54600	95300	114000	97000	126000	44800	94200	99800	136000	142000	66600
4	73600	62300	96600	113000	85900	125000	38200	102000	99800	122000	135000	66300
5	73800	50900	102000	108000	90000	118000	38300	101000	104000	110000	131000	69100
6	74100	51700	103000	86600	99100	109000	41000	98900	106000	101000	127000	73200
7	74600	59100	102000	78400	107000	97100	45900	107000	107000	96700	113000	91500
8	73500	73600	103000	65800	122000	98000	41900	107000	109000	95400	117000	94400
9	76500	69500	107000	64700	125000	93600	49000	115000	118000	93400	104000	87000
10	84600	72700	102000	78600	122000	83300	44100	98600	115000	93500	92100	78200
11	88200	69500	101000	90900	119000	87400	50300	96900	115000	92900	81800	96600
12	85900	76400	108000	93700	118000	91900	44900	94000	119000	86600	86800	89000
13	92000	76300	112000	95400	124000	93100	46700	83000	121000	86500	104000	86700
14	92200	74700	116000	93700	126000	95200	42800	90000	120000	80500	110000	80000
15	87600	77300	110000	90500	120000	87700	41800	93400	129000	80400	113000	73200
16	81300	74300	108000	93200	124000	81100	47800	94300	134000	82800	119000	57900
17	73200	74700	104000	96800	120000	73900	46500	105000	135000	78800	106000	52900
18	73700	78600	95400	102000	118000	66800	52100	107000	136000	76500	93000	62700
19	76700	85100	89100	100000	114000	56900	59300	111000	134000	90900	96300	72700
20	77200	90500	88100	98600	104000	46400	70200	117000	127000	103000	98800	77200
21	75300	79600	90700	98400	98300	41400	71300	116000	131000	104000	88600	86100
22	70600	80900	94000	99600	104000	47400	78200	121000	135000	91300	99200	71600
23	70400	85600	91300	115000	100000	51200	82400	122000	137000	92000	99900	55800
24	55100	84600	89700	126000	102000	53800	76000	129000	139000	83500	98100	57700
25	54100	89900	84600	125000	102000	53800	74500	126000	141000	67800	91100	53100
26	54600	91900	90100	125000	102000	56300	75600	117000	149000	70300	86700	56600
27	49400	92400	90100	125000	108000	59500	74900	115000	147000	81700	93700	57200
28	44900	105000	94700	116000	115000	60300	70000	109000	137000	105000	110000	57300
29	46800	107000	92000	103000	123000	59600	67900	111000	147000	115000	115000	57200
30	38700	106000	104000	95800	---	55300	66600	109000	152000	113000	106000	57900
31	44700	---	110000	97600	---	51100	---	112000	---	131000	98700	---
TOTAL	2160100	2299100	3069100	3134300	3184200	2473100	1682800	3247600	3751600	3055500	3322800	2122900
MEAN	69680	76640	99000	101100	109800	79780	56090	104800	125100	98560	107200	70760
MAX	92200	107000	116000	126000	126000	129000	82400	129000	152000	148000	142000	96600
MIN	38700	50900	84600	64700	85900	41400	38200	67200	99800	67800	81800	52900
AC-FT	4285000	4560000	6088000	6217000	6316000	4905000	3338000	6442000	7441000	6061000	6591000	4211000
CAL YR 1983	TOTAL 38117300		MEAN 104400		MAX 180000		MIN 38700		AC-FT 75606000			
WTR YR 1984	TOTAL 33503100		MEAN 91540		MAX 152000		MIN 38200		AC-FT 66453000			

12400520 COLUMBIA RIVER AT NORTHPORT, WA
(National stream quality accounting network station)

LOCATION.--Lat 48°55'21", long 117°46'32", in SW¼ sec.33, T.40 N., R.40 E., Stevens County, Hydrologic Unit 17020001, at State Highway 25 bridge at Northport, 9.9 mi downstream from gaging station at international boundary, and at mile 735.1.

DRAINAGE AREA.--60,200 mi², 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.

pH: November 1951 to September 1969.

WATER TEMPERATURES: November 1951 to September 1981.

SUSPENDED--SEDIMENT DISCHARGE: February 1910 to January 1911.

WATER QUALITY DATA, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984

DATE	TIME	STREAM- FLOW, INSTAN- TANEOUS (CFS)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH (STAND- ARD UNITS)	TEMPER- ATURE (DEG C)	TUR- BID- ITY (NTU)	OXYGEN, DIS- SOLVED (MG/L)	OXYGEN, DIS- SOLVED SATUR- ATION	COLI- FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)	STREP- TOCOCCI KF AGAR (COLS. PER 100 ML)	HARD- NESS (MG/L AS CACO3)
NOV , 1983											
16...	1100	73900	141	8.1	8.5	1.0	11.2	102	46	58	65
JAN , 1984											
11...	1400	91200	153	8.1	4.0	.60	12.6	100	K8	K5	75
MAR											
15...	1200	92800	152	8.0	4.0	1.6	12.3	100	E2	E60	75
MAY											
08...	1100	108000	149	8.0	7.5	2.0	12.0	104	K4	K19	77
JUL											
11...	1100	92600	138	7.9	16.5	1.6	10.4	112	K13	24	64
SEP											
12...	1100	88400	128	7.8	16.0	1.0	10.3	110	54	380	63

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)
NOV , 1983											
16...	6	19	4.2	2.0	6	.1	1.1	59	12	1.1	.10
JAN , 1984											
11...	9	22	4.8	1.8	5	.0	1.0	66	13	1.1	.10
MAR											
15...	8	22	4.9	1.6	4	.0	.70	67	15	.70	.10
MAY											
08...	13	23	4.8	1.9	5	.0	.70	64	12	1.1	.20
JUL											
11...	10	19	4.0	2.0	6	.1	.70	54	11	1.1	.20
SEP											
12...	11	19	3.7	1.4	5	.0	1.4	52	12	.60	.20

DATE	SILICA, DIS- SOLVED (MG/L AS SiO2)	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L)	SOLIDS, SUM OF CONSTITUENTS, DIS- SOLVED (MG/L)	SOLIDS, DIS- SOLVED (TONS PER AC-FT)	SOLIDS, DIS- SOLVED (TONS PER DAY)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N)	NITRO- GEN,AM- MONIA + ORGANIC TOTAL (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)
NOV , 1983											
16...	4.9	87	80	.12	17400	.13	.170	.60	.050	.050	.050
JAN , 1984											
11...	5.0	87	89	.12	21400	.13	.070	<.20	.030	.020	.020
MAR											
15...	4.8	93	90	.13	23300	.19	.050	<.20	.050	.040	.040
MAY											
08...	5.6	91	88	.12	26500	<.10	.010	.20	.050	.040	.030
JUL											
11...	5.4	71	76	.10	17800	<.10	.020	.40	.030	.030	.030
SEP											
12...	3.8	76	74	.10	18100	<.10	.040	.20	.070	.030	.050

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

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

COLUMBIA RIVER MAIN STEM

12400520 COLUMBIA RIVER AT NORTHPORT, WA--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984

DATE	ALUM- INUM, DIS- SOLVED (UG/L AS AL)	ARSENIC DIS- SOLVED (UG/L AS AS)	BARIUM, DIS- SOLVED (UG/L AS BA)	BERYL- LIUM, DIS- SOLVED (UG/L AS BE)	CADMIUM DIS- SOLVED (UG/L AS CD)	CHRO- MIUM, DIS- SOLVED (UG/L AS CR)	COBALT, DIS- SOLVED (UG/L AS CO)	COPPER, DIS- SOLVED (UG/L AS CU)	IRON, DIS- SOLVED (UG/L AS FE)	LEAD, DIS- SOLVED (UG/L AS PB)	LITHIUM DIS- SOLVED (UG/L AS LI)
NOV , 1983											
16...	20	<1	33	<.5	1	1	<3	8	10	14	16
JAN , 1984											
11...	20	<1	36	<.5	1	<1	<3	6	5	14	5
MAR											
15...	--	--	--	--	--	--	--	--	--	--	--
MAY											
08...	10	<1	36	<.5	2	<1	<3	4	15	11	<4
JUL											
11...	--	--	--	--	--	--	--	--	--	--	--
SEP											
12...	20	<1	26	<.5	10	<1	<3	5	6	14	<4
DATE	MANGA- NESE, DIS- SOLVED (UG/L AS MN)	MERCURY DIS- SOLVED (UG/L AS HG)	MOLYB- DENUM, DIS- SOLVED (UG/L AS MO)	NICKEL, DIS- SOLVED (UG/L AS NI)	SELE- NIUM, DIS- SOLVED (UG/L AS SE)	SILVER, DIS- SOLVED (UG/L AS AG)	STRON- TIUM, DIS- SOLVED (UG/L AS SR)	VANA- DIUM, DIS- SOLVED (UG/L AS V)	ZINC, DIS- SOLVED (UG/L AS ZN)	SEDI- MENT, SUS- PENDE (MG/L)	SEDI- MENT, DIS- CHARGE, SUS- PENDE (T/DAY)
NOV , 1983											
16...	5	7.0	<10	2	<1	<1	88	<6	32	--	--
JAN , 1984											
11...	4	1.2	<10	3	<1	<1	97	<6	26	1	246
MAR											
15...	--	.2	--	--	--	--	--	--	--	11	2760
MAY											
08...	8	<.1	<10	1	<1	<1	100	<6	42	6	1750
JUL											
11...	--	--	--	--	--	--	--	--	--	12	3000
SEP											
12...	5	<.1	<10	<1	<1	<1	100	<6	18	2	477

KETTLE RIVER BASIN

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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 upstream from Catherine Creek, 1.3 mi south of international boundary and Ferry, 3.2 mi upstream from Toroda Creek, and at mile 84.02.

DRAINAGE AREA.--2,200 mi², approximately.

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

GAGE.--Water-stage recorder. Datum of gage is 1,836.8 ft 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.--56 years, 1,540 ft³/s, 1,116,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 21,200 ft³/s May 29, 1948, gage height, 21.15 ft; minimum, 14 ft³/s, discharge measurement, Jan. 23, 1930, but may have been less during period of ice effect Jan. 18-23, 1930.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 10,800 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
May 31	1200	*13,200	*18.26	June 30	1030	10,900	17.27
June 15	1930	13,000	18.16				

Minimum daily discharge, 200 ft³/s Dec. 23.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	491	502	415	470	435	424	1680	3340	9480	6980	806	344
2	482	644	300	465	433	426	1730	3460	7560	6300	812	327
3	473	716	381	450	427	410	1820	3600	6780	5690	855	313
4	469	939	410	440	423	401	1880	3510	6650	5320	960	295
5	463	1170	501	449	411	439	2030	3460	7580	5050	856	283
6	458	1030	566	471	413	427	2350	3440	7920	4860	791	307
7	448	939	533	500	406	438	2410	3500	8560	4170	730	359
8	439	872	511	556	408	456	2350	3830	10200	3630	664	575
9	432	835	544	586	416	475	2270	4370	10200	3290	614	537
10	424	800	577	591	425	490	2210	4490	9970	3110	570	611
11	416	843	625	577	428	514	2130	4280	9000	3030	540	570
12	407	872	638	570	433	560	2070	4650	9360	2900	605	610
13	398	879	638	553	440	599	2020	4850	10600	2690	648	635
14	395	857	644	470	438	617	2000	5900	11500	2490	692	613
15	388	857	600	390	438	632	2310	7910	12300	2310	687	581
16	384	879	506	360	424	660	3630	7260	12300	2180	591	529
17	389	1020	386	340	412	714	5700	6650	10100	2070	530	489
18	390	1110	306	320	406	796	6370	6100	8350	1930	494	454
19	411	1090	257	310	404	834	6150	6440	7440	1750	463	423
20	414	1030	235	350	398	887	6290	8490	6920	1590	441	400
21	421	985	222	380	424	1130	6330	8210	7120	1460	423	383
22	429	947	212	413	423	1540	6170	7030	7340	1420	400	389
23	469	916	200	440	423	1700	5790	6860	6990	1320	381	425
24	571	901	228	443	422	1800	5180	6920	7680	1210	361	415
25	517	872	302	452	416	1830	4630	6310	8020	1120	344	400
26	478	850	359	453	375	1770	4220	6080	7690	1050	331	389
27	483	850	396	451	402	1710	3920	6380	7910	997	326	379
28	461	828	440	451	404	1690	3800	6630	7340	941	337	371
29	468	778	475	450	397	1660	3640	7850	8200	872	398	363
30	451	670	491	445	---	1630	3440	10600	10000	830	403	354
31	449	---	475	440	---	1650	---	12800	---	795	373	---
TOTAL	13788	26481	13373	14036	12104	29309	106520	185200	261060	83355	17426	13123
MEAN	445	883	431	453	417	945	3551	5974	8702	2689	562	437
MAX	571	1170	644	591	440	1830	6370	12800	12300	6980	960	635
MIN	384	502	200	310	375	401	1680	3340	6650	795	326	283
AC-FT	27350	52530	26530	27840	24010	58130	211300	367300	517800	165300	34560	26030
CAL YR 1983	TOTAL	882290	MEAN	2417	MAX	15200	MIN	200	AC-FT	1750000		
WTR YR 1984	TOTAL	775775	MEAN	2120	MAX	12800	MIN	200	AC-FT	1539000		

KETTLE RIVER BASIN

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 downstream from Deep Creek, 1.1 mi south of international boundary, 1.1 mi southeast of Laurier, and at mile 29.71.

DRAINAGE AREA.--3,800 mi², 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 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 except those for Dec. 17 to Feb. 10, which are fair. Diversions for irrigation of about 720 acres in the United States (for 1946 from United States reports), and 2,090 acres 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.--55 years, 2,938 ft³/s, 2,129,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 35,000 ft³/s May 29, 1948, gage height, 17.25 ft; minimum, 88 ft³/s Dec. 1, 1936, gage height, 2.20 ft, 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, from information by local residents.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 18,100 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
May 31	1830	*23,300	*13.85	June 30	1400	20,000	12.91
June 16	0400	22,600	13.65				

Minimum daily discharge, 430 ft³/s Dec. 24.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	864	851	1320	1080	1000	907	3880	6460	19300	14000	1600	678
2	847	979	1160	1050	990	921	3930	6520	15000	11600	1580	645
3	829	1170	880	1030	970	917	4040	6780	13500	10800	1600	622
4	812	1650	810	1010	960	894	4180	6690	13000	10000	1670	602
5	800	2110	985	1000	940	876	4380	6510	13900	9620	1650	580
6	788	2070	1250	1000	920	915	4890	6480	14600	9260	1540	612
7	777	1850	1240	1040	910	915	5190	6480	15000	8290	1440	657
8	765	1720	1220	1100	900	932	5130	6760	17200	7170	1350	752
9	754	1610	1210	1200	900	965	4960	7400	17600	6500	1260	897
10	740	1570	1310	1280	910	1010	4830	7830	17500	6090	1180	892
11	727	1630	1330	1290	937	1090	4650	7570	16400	5900	1110	950
12	718	1720	1340	1280	940	1210	4490	7800	16300	5740	1100	934
13	707	1760	1360	1250	949	1350	4410	8370	17900	5400	1150	987
14	700	1720	1350	1200	958	1430	4310	9450	19600	5000	1210	998
15	693	1750	1320	1100	952	1480	4550	12600	21100	4620	1220	971
16	684	1830	1150	920	933	1590	6130	12500	22300	4340	1150	929
17	691	2030	950	830	961	1770	9750	11600	19800	4130	1050	873
18	703	2360	800	760	904	2030	11900	10900	16500	3880	989	820
19	702	2380	650	730	853	2170	11400	11000	14700	3560	938	771
20	722	2280	550	710	903	2270	11400	14000	13800	3250	892	735
21	717	2150	500	780	919	2840	11500	14700	13600	3000	855	707
22	737	2070	470	850	932	4110	11300	12800	14500	2810	822	690
23	766	2000	450	910	927	4350	10800	12100	13500	2670	785	692
24	858	1930	430	950	934	4670	9810	12600	13800	2470	751	712
25	913	1910	550	970	926	4630	8880	11700	14500	2310	721	702
26	859	1850	650	990	887	4460	8120	11000	14100	2170	695	686
27	819	1840	750	1000	880	4190	7560	11100	14400	2050	670	669
28	813	1790	850	1000	894	4040	7240	11500	14100	1930	657	653
29	806	1720	950	1000	896	3980	7020	12800	14500	1820	676	643
30	795	1560	1000	1000	---	3870	6670	16600	18800	1730	714	633
31	795	---	1100	1000	---	3840	---	22000	---	1650	711	---
TOTAL	23901	53860	29885	31310	26885	70622	207300	322600	480800	163760	33736	22692
MEAN	771	1795	964	1010	927	2278	6910	10410	16030	5283	1088	756
MAX	913	2380	1360	1290	1000	4670	11900	22000	22300	14000	1670	998
MIN	684	851	430	710	853	876	3880	6460	13000	1650	657	580
AC-FT	47410	106800	59280	62100	53330	140100	411200	639900	953700	324800	66920	45010
CAL YR 1983	TOTAL	1659373	MEAN	4546	MAX	28500	MIN	430	AC-FT	3291000		
WTR YR 1984	TOTAL	1467351	MEAN	4009	MAX	22300	MIN	430	AC-FT	2910000		

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LOCATION.--Lat 48°01'42", long 117°36'14", in SW¼NW¼ sec.11, T.29 N., R.41 E., Stevens County, Hydrologic Unit 170200003, at south end of Loon Lake. 2.7 mi southeast of town of Loon Lake.

PERIOD OF RECORD.--April 1950 to June 1980. July 1980 to current year (fragmentary).

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 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 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 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, 2,381.43 ft Apr. 11; minimum observed, 2,380.02 ft Sept. 29.

[illegible]

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 northeast of Colville, 5.3 mi downstream from North Fork, and at mile 10.9.

DRAINAGE AREA.--83.0 mi².

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. Elevation of gage is 1,950 ft, 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 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 upstream at datum 0.47 ft higher.

REMARKS.--Records good except those above 200 ft³/s, which are fair. No regulation. Diversions for irrigation of about 50 acres upstream from station.

AVERAGE DISCHARGE.--40 years (water years 1940-72, 1978-84), 48.8 ft³/s, 7.98 in/yr, 35,360 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 694 ft³/s Apr. 24, 1969, gage height, 5.37 ft; maximum gage height, 5.65 ft May 10, 1961 (backwater from bridge); minimum discharge, 3.2 ft³/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.--Peak discharge greater than base discharge of 220 ft³/s (revised) and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Apr. 8	2030	250	3.86	May 23	1430	254	3.88
Apr. 17	0800	*445	*4.55	June 9	1500	283	4.00
May 2	0900	240	3.82				

Minimum daily, 10 ft³/s Dec. 22, 23.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP		
1	16	18	21	20	23	26	143	172	172	113	41	21		
2	15	20	20	22	23	29	141	225	160	109	42	20		
3	15	31	19	23	23	27	147	201	153	104	39	19		
4	15	52	18	24	22	26	153	190	160	100	37	19		
5	15	30	20	30	22	27	206	187	168	95	37	19		
6	15	32	21	29	22	29	235	192	160	91	35	26		
7	15	29	21	29	22	29	218	181	154	88	34	23		
8	15	25	24	29	22	32	237	179	199	85	33	21		
9	14	24	27	28	23	36	225	181	273	82	32	21		
10	14	26	28	28	23	40	225	177	244	78	32	20		
11	14	45	27	27	21	45	206	179	220	74	32	20		
12	14	34	26	26	23	50	197	177	206	73	30	21		
13	14	42	26	26	25	53	190	175	194	71	29	20		
14	14	39	26	16	26	56	187	190	183	67	29	19		
15	14	55	25	15	24	61	218	203	170	64	28	18		
16	14	62	24	17	24	73	302	218	162	61	27	18		
17	15	71	12	16	23	88	424	208	153	58	26	18		
18	15	68	13	15	22	91	418	194	145	56	26	16		
19	16	56	13	14	21	92	412	203	140	54	26	16		
20	17	53	12	15	23	98	388	220	136	52	26	18		
21	16	48	12	17	26	166	358	206	192	52	24	22		
22	17	43	10	19	27	187	328	192	179	51	24	20		
23	18	41	10	21	26	190	305	227	153	49	23	20		
24	16	40	12	24	25	199	273	222	141	48	23	19		
25	16	40	14	26	24	179	247	203	134	46	22	19		
26	15	37	14	27	24	164	227	206	125	44	21	18		
27	15	37	16	26	24	153	213	197	120	43	21	18		
28	15	35	14	25	24	149	201	185	115	41	21	18		
29	15	32	14	25	24	147	185	183	138	45	21	18		
30	15	29	16	24	---	147	177	190	124	48	21	18		
31	19	---	18	24	---	145	---	183	---	43	21	---		
TOTAL	476	1194	573	707	681	2834	7386	6046	4973	2085	883	583		
MEAN	15.4	39.8	18.5	22.8	23.5	91.4	246	195	166	67.3	28.5	19.4		
MAX	19	71	28	30	27	199	424	227	273	113	42	26		
MIN	14	18	10	14	21	26	141	172	115	41	21	16		
CFSM	.19	.48	.22	.27	.28	1.10	2.96	2.35	2.00	.81	.34	.23		
IN.	.21	.54	.26	.32	.31	1.27	3.31	2.71	2.23	.93	.40	.26		
AC-FT	944	2370	1140	1400	1350	5620	14650	11990	9860	4140	1750	1160		
CAL YR 1983	TOTAL	29773	MEAN	81.6	MAX	557	MIN	10	CFSM	.98	IN.	13.34	AC-FT	59050
WTR YR 1984	TOTAL	28421	MEAN	77.7	MAX	424	MIN	10	CFSM	.94	IN.	12.74	AC-FT	56370

COLVILLE RIVER BASIN

239

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 downstream from Washington Water Power Co.'s hydroelectric plant at foot of Meyers Falls, 1.0 mi south of town of Kettle Falls, and at mile 5.0.

DRAINAGE AREA.--1,007 mi².

PERIOD OF RECORD.--October 1922 to current year. Published as "at Meyer Falls" 1922-38.

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

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

REMARKS.--Records good. Several diversions upstream from station for irrigation. Regulation at low flow by powerplant. Bonneville Power Administration satellite telemeter at station.

AVERAGE DISCHARGE.--62 years, 309 ft³/s, 223,900 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 3,440 ft³/s Jan. 21, 1974, gage height, 9.84 ft; maximum gage height, 10.17 ft Apr. 23, 1956; minimum discharge observed, 0.5 ft³/s Aug. 15, 1930.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 1,820 ft³/s Apr. 18, gage height, 8.05 ft; minimum, 35 ft³/s Sept. 20, minimum gage height, 5.08 ft Oct. 30, result of regulation by powerplant.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	158	187	287	180	296	401	1120	1100	886	709	265	155
2	158	191	257	180	282	455	1080	1130	856	674	252	152
3	158	197	230	220	269	474	1050	1210	835	618	265	152
4	158	294	230	250	265	474	1040	1190	807	597	257	161
5	155	335	230	330	257	474	1070	1160	863	562	241	155
6	152	287	230	370	257	474	1160	1160	870	534	237	161
7	152	278	240	380	257	488	1170	1150	849	501	230	165
8	158	265	291	380	257	501	1210	1120	870	481	222	174
9	158	241	311	373	257	514	1290	1110	1060	474	211	171
10	158	237	291	373	274	548	1330	1080	1150	455	208	171
11	155	320	287	368	287	555	1360	1050	1100	431	208	168
12	155	373	291	356	291	597	1360	1050	1030	413	204	171
13	155	367	291	325	367	625	1350	1040	982	379	201	177
14	155	351	287	278	419	639	1330	1020	942	390	194	171
15	155	367	282	226	413	660	1290	1050	886	373	191	174
16	155	407	278	200	384	709	1330	1090	856	356	187	168
17	158	443	204	190	345	758	1450	1130	807	340	184	165
18	161	455	162	180	325	828	1620	1090	772	325	174	161
19	171	449	150	170	306	856	1680	1070	744	311	180	158
20	174	437	140	170	315	878	1710	1080	709	296	177	155
21	171	443	140	180	335	958	1690	1090	772	278	174	165
22	171	437	140	230	395	1200	1660	1060	1010	282	171	187
23	177	419	140	300	419	1270	1640	1040	998	278	165	184
24	180	407	140	368	413	1320	1560	1090	942	269	158	187
25	177	395	140	401	407	1330	1490	1070	856	261	158	180
26	171	395	150	443	395	1330	1400	1040	800	261	146	177
27	171	395	150	413	384	1320	1310	1040	730	257	152	176
28	168	384	140	379	373	1270	1230	998	716	248	158	174
29	165	373	140	351	384	1240	1200	966	709	248	155	173
30	158	335	150	340	---	1190	1140	934	751	282	149	171
31	180	---	180	315	---	1160	---	910	---	282	158	---
TOTAL	5048	10464	6579	9219	9628	25496	40320	33318	26158	12165	6032	5059
MEAN	163	349	212	297	332	822	1344	1075	872	392	195	169
MAX	180	455	311	443	419	1330	1710	1210	1150	709	265	187
MIN	152	187	140	170	257	401	1040	910	709	248	146	152
AC-FT	10010	20760	13050	18290	19100	50570	79970	66090	51880	24130	11960	10030
CAL YR 1983	TOTAL	184884	MEAN	507	MAX	2160	MIN	138	AC-FT	366700		
WTR YR 1984	TOTAL	189486	MEAN	518	MAX	1710	MIN	140	AC-FT	375800		

WATER RESOURCES DATA FOR WASHINGTON, 1984

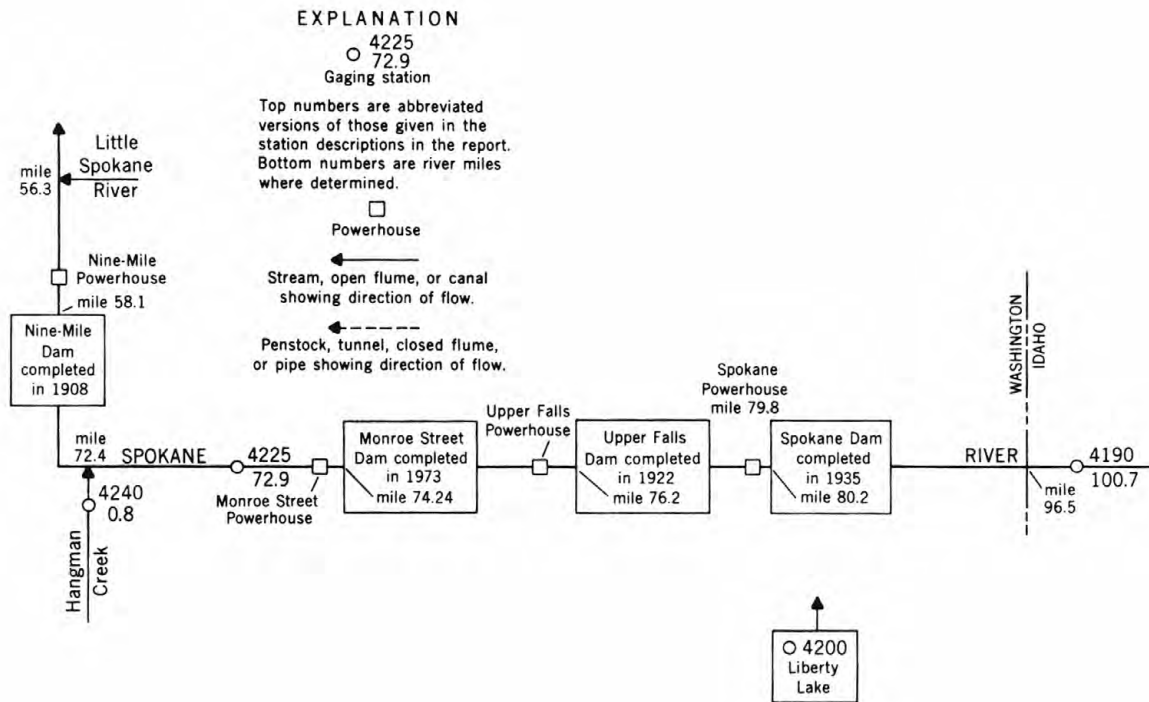


Figure 21.--Gaging stations in Spokane River basin above Little Spokane River.

SPOKANE RIVER BASIN

241

12419000 SPOKANE RIVER NEAR POST FALLS, ID

LOCATION.--Lat 47°42'11", long 116°58'37", in SW¼SW¼ sec.4, T.50 N., R.5 W., Kootenai County, Hydrologic Unit 17010305, on right bank 1.0 mi downstream from powerplant of Washington Water Power Co., 1.5 mi southwest of Post Falls, and at mile 100.7.

DRAINAGE AREA.--3,840 mi², approximately, of which about 122 mi² in the vicinity of Hayden Lake is noncontributing to this station.

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 2,050.00 ft referred to originally accepted elevation of 2,157.40 ft for the Geological Survey bench mark in southeast corner of Idaho First National Bank Building (see WSP 882). Datum of gage is 2,047.00 ft above National Geodetic Vertical Datum of 1929. Jan. 1, 1913, to Nov. 21, 1920, nonrecording gage and Nov. 22, 1920, to Sept. 15, 1934, recording gage 0.6 mi upstream. From Sept. 16, 1934, to Nov. 15, 1949, recording gage 0.8 mi upstream. From Nov. 16, 1949, at present site. Datum of all gages prior to Sept. 30, 1964, 50.0 ft lower.

REMARKS.--Records good. Rathdrum Prairie Canal (see sta 12418000) diverts water upstream from gage for irrigation. Figures for 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, 72 years, 6,297 ft³/s, 4,562,000 acre-ft/yr; combined river and diversions upstream from gage, 72 years, 6,379 ft³/s, 4,622,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 50,100 ft³/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 ft³/s July 25, 30, 1973; minimum gage height, 4.68 ft July 20, 21, 1977.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 20,400 ft³/s June 1, gage height, 18.03 ft; minimum, 231 ft³/s Aug. 2, gage height, 5.39 ft.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1970	1980	5090	4000	11200	5410	12200	12800	19500	6550	1490	1040
2	1960	1980	5270	4160	11000	5410	11600	12300	19500	4920	1260	1050
3	1960	1990	5280	4180	10700	5740	11600	12100	19100	4560	1380	1060
4	1860	1950	5280	4200	9900	5930	11200	12000	18600	4550	1170	1330
5	1610	1860	5190	5330	9290	5930	11000	11900	18200	4900	988	1670
6	1610	1880	5120	5770	8320	5880	10800	11800	17700	5110	1020	1740
7	1610	1870	5100	5420	7210	5910	10800	11600	17300	4720	974	1730
8	1600	1850	5130	5470	6770	5760	10800	11300	17000	4330	1040	1730
9	1610	1840	5120	5500	6740	5400	11000	11300	16700	3560	985	1730
10	1610	1850	5030	5520	6720	5440	11100	11200	16400	2700	951	1730
11	1830	2390	4930	5460	6670	5750	11200	11100	16200	2450	950	1730
12	1980	2890	4890	5410	6640	7330	11300	11200	15500	2350	946	1730
13	1970	3320	4910	5460	7230	8220	11100	11200	15300	2250	940	1730
14	1960	3710	5120	5460	8100	9380	11300	11500	15200	2580	800	1710
15	1960	3700	4860	5470	8400	8680	11300	12400	15000	2700	604	1710
16	1970	3610	4900	5460	8380	12000	11500	13300	14800	2180	652	1740
17	1970	3570	4890	5460	8400	12800	12700	13800	14600	2530	633	1740
18	1970	3630	4890	5420	8310	13200	14200	14100	14200	2730	630	1740
19	1960	3590	4880	5400	7770	13300	15500	14100	11600	2250	631	1720
20	1960	4000	4860	5410	7500	13300	16100	14400	8790	2050	637	1740
21	1960	4310	4910	5410	7410	14100	16500	15400	9150	1580	651	1760
22	1980	4150	5000	5450	7350	15100	16800	16100	11900	1430	820	1760
23	1980	4080	5030	5450	7300	16200	16900	16700	11600	999	1040	1760
24	1970	4370	5030	5470	6990	16600	16900	17100	9790	1340	1050	1770
25	1970	4640	5030	6770	6840	16600	16800	17500	7490	1540	1040	1770
26	1970	4660	5030	9020	6520	16300	16400	17900	7580	1560	1040	1770
27	1970	4660	4800	10800	6090	15900	15900	18100	7670	1920	1040	1770
28	1970	4650	4400	11300	5630	15200	15300	18200	7050	2150	1040	1770
29	1980	4640	4200	11400	5300	14700	14500	18300	6870	2160	1010	1770
30	1990	4810	4100	11400	---	13200	14000	18600	6890	1980	1050	1800
31	1990	---	4100	11300	---	12500	---	19000	---	1630	934	---
TOTAL	58660	98430	152370	197730	224680	327170	398300	438300	407180	88259	29396	49800
MEAN	1892	3281	4915	6378	7748	10550	13280	14140	13570	2847	948	1660
MAX	1990	4810	5280	11400	11200	16600	16900	19000	19500	6550	1490	1800
MIN	1600	1840	4100	4000	5300	5400	10800	11100	6870	999	604	1040
AC-FT	116400	195200	302200	392200	445700	648900	790000	869400	807600	175100	58310	98780
MEAN†	1892	3281	4951	6378	7748	10550	13280	14150	13600	2895	985	1674
AC-FT†	116400	195200	302200	392200	445700	648900	790000	869800	809600	178000	60580	99620
CAL YR 1983 TOTAL	2356363			MEAN 6456	MAX 18700	MIN 355	AC-FT 4674000	MEAN† 6466	AC-FT† 4681000			
WTR YR 1984 TOTAL	2470275			MEAN 6749	MAX 19500	MIN 604	AC-FT 4900000	MEAN† 6761	AC-FT† 4908000			

† Adjusted for diversion through Rathdrum Prairie Canal.

SPOKANE RIVER BASIN

243

12422500 SPOKANE RIVER AT SPOKANE, WA

LOCATION.--Lat 47°39'34", long 177°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 upstream from Hangman Creek, and at mile 72.9.

DRAINAGE AREA.--4,290 mi², 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: 1907-09.

GAGE.--Water-stage recorder. Datum of gage is 1,696.6 ft above 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 of present site at various datums.

REMARKS.--Records excellent. Flow partly regulated by powerplants of Washington Water Power Co. at Post Falls, Idaho, 28.8 mi upstream and at Spokane, 1.3 mi upstream, and by Coeur d'Alene Lake, Idaho. Rathdrum Prairie Canal diverts water above station for irrigation. In 1946, approximately 22,600 acres, of which about 15,000 acres 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 irrigated from the river.

AVERAGE DISCHARGE.--93 years, 6,862 ft³/s, 4,972,000 acre-ft/yr, unadjusted.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 49,000 ft³/s, estimated, May 31, 1894 (see WSP 532); minimum, 95 ft³/s Sept. 19, 1956, gage height, 15.60 ft.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 20,900 ft³/s June 1, gage height, 24.58 ft; minimum, 294 ft³/s Aug. 25, gage height, 16.21 ft.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2360	2410	5220	4620	11300	5990	12700	13800	20300	7380	2130	1530
2	2360	2440	5390	4660	11100	6000	12100	12900	20400	6030	2080	1520
3	2360	2460	5440	4730	10900	6140	12100	12700	20100	5450	1850	1520
4	2360	2500	5490	4770	10300	6400	11800	12600	19600	5360	1950	1600
5	2170	2330	5450	5340	9540	6380	11500	12500	19200	5510	1660	1990
6	2140	2390	5370	6090	8860	6380	11300	12400	18600	5730	1700	2120
7	2120	2370	5350	5750	7850	6350	11200	12200	18200	5580	1630	2130
8	2120	2380	5390	5800	7270	6340	11200	11900	17900	5090	1650	2130
9	2110	2360	5400	5830	7180	5960	11400	11800	17600	4590	1620	2170
10	2120	2410	5390	5870	7160	5980	11500	11700	17300	3740	1560	2170
11	2170	2570	5270	5860	7090	5980	11600	11600	17000	3350	1580	2160
12	2380	3160	5240	5730	7090	7340	11700	11600	16500	3250	1540	2170
13	2420	3360	5300	5860	7400	8160	11500	11700	16200	3070	1520	2190
14	2440	3890	5500	5840	8190	9130	11800	11900	16000	3160	1520	2190
15	2200	3910	5200	5840	8600	8700	11800	12600	15700	3520	1240	2140
16	1900	3880	5200	5850	8630	11800	11900	13600	15500	2960	1350	2200
17	1690	3880	5250	5840	8640	12700	12800	14200	15400	3050	1300	2200
18	1980	3900	5260	5850	8600	13300	14400	14500	15100	3450	1250	2200
19	2070	3910	5230	5850	8220	13500	15700	14600	12900	2940	1280	2130
20	2150	4080	5250	5830	7880	13600	16500	14800	10100	2840	1270	2200
21	2220	4500	5250	5870	7770	14100	17000	15700	9270	2410	1240	2170
22	2270	4450	5430	5890	7720	15300	17300	16600	12100	2320	1260	2200
23	2270	4310	5430	5880	7630	16000	17500	17200	12300	1890	1500	2220
24	2310	4460	5500	5890	7430	16100	17500	17700	11000	1920	1530	2210
25	2340	4860	5750	6550	7230	16100	17500	18100	8260	2260	1530	2240
26	2330	4840	5710	8400	7050	16100	17200	18600	8150	2160	1530	2220
27	2350	4880	4740	10400	6670	16300	16700	18800	8250	2340	1520	2250
28	2360	4880	4600	11100	6310	15900	16100	19000	7830	2640	1530	2240
29	2350	4900	4480	11300	5970	15300	15300	19100	7440	2700	1530	2220
30	2400	4970	4730	11500	---	14000	14700	19300	7440	2580	1490	2250
31	2480	---	4660	11400	---	13100	---	19700	---	2340	1480	---
TOTAL	69300	107640	162870	205990	235580	334430	413300	455400	431640	111610	47820	62880
MEAN	2235	3588	5254	6645	8123	10790	13780	14690	14390	3600	1543	2096
MAX	2480	4970	5750	11500	11300	16300	17500	19700	20400	7380	2130	2250
MIN	1690	2330	4480	4620	5970	5960	11200	11600	7440	1890	1240	1520
AC-FT	137500	213500	323100	408600	467300	663300	819800	903300	856200	221400	94850	124700
CAL YR 1983	TOTAL	2515010	MEAN	6890	MAX	19500	MIN	1110	AC-FT	4989000		
WTR YR 1984	TOTAL	2638460	MEAN	7209	MAX	20400	MIN	1240	AC-FT	5233000		

SPOKANE RIVER BASIN

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 downstream from bridge on Interstate 90 in Spokane, and at mile 0.8.

DRAINAGE AREA.--689 mi².

PERIOD OF RECORD.--April 1948 to September 1977; October 1977 to September 1978 (discharges above 20 ft³/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 National Geodetic Vertical Datum of 1929 (levels by Corps of Engineers). Prior to Nov. 22, 1948, nonrecording gage at site 0.5 mi upstream at different datum.

REMARKS.--Records good except those for Mar. 3 to Apr. 23, which are fair. No regulation. Some diversions for irrigation above station. National Weather Service telemeter at station.

AVERAGE DISCHARGE.--35 years (water years 1949-77, 1979-84), 250 ft³/s, 4.93 in/yr, 181,100 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 20,600 ft³/s Feb. 3, 1963, gage height, 13.35 ft; minimum, 1.4 ft³/s Sept. 6, 7, 9, 10, 14-17, 1973; minimum gage height, 1.43 ft 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 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Jan. 4	2200	*10,700	*11.79	Mar. 15	unknown	unknown	unknown
Jan. 24	2245	4,940	8.28	Mar. 22	unknown	unknown	unknown

Minimum discharge, 22 ft³/s Oct. 8, minimum gage height, 1.69 ft Aug. 29-31.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP		
1	23	46	160	76	334	551	500	187	138	81	37	25		
2	23	55	138	76	279	1000	430	230	132	78	35	25		
3	23	55	123	86	245	800	400	233	125	74	33	25		
4	23	52	120	6480	230	660	380	242	123	70	32	24		
5	23	55	99	5030	222	560	420	205	132	67	32	25		
6	23	60	101	2470	225	520	450	192	167	63	32	26		
7	23	60	96	1460	219	520	450	208	197	61	32	25		
8	23	78	92	1170	239	600	520	208	195	57	31	26		
9	23	71	99	741	257	800	620	190	214	54	29	26		
10	23	89	192	551	245	1400	570	179	306	57	29	26		
11	23	114	1500	456	230	2400	520	174	228	58	28	26		
12	23	177	925	431	279	2300	470	177	225	56	28	26		
13	23	134	614	356	2020	2200	470	170	395	51	28	26		
14	23	128	815	245	2110	2700	390	158	279	49	27	26		
15	23	125	1110	149	845	4400	390	153	219	46	27	26		
16	23	138	736	100	741	2800	410	177	182	44	26	26		
17	26	147	473	96	730	2400	430	182	158	45	26	26		
18	26	182	303	86	469	2100	400	172	140	43	26	26		
19	32	208	170	80	375	1800	380	156	128	42	26	26		
20	32	222	110	82	364	1900	350	158	120	41	26	30		
21	31	469	70	84	456	2900	320	200	121	39	26	30		
22	32	513	64	86	570	3100	300	174	132	39	25	32		
23	32	352	60	116	411	2000	280	179	158	38	24	32		
24	34	248	64	1740	487	1300	239	334	140	38	25	32		
25	34	435	68	3220	579	800	222	264	120	38	25	32		
26	34	504	76	1060	495	800	208	214	110	37	24	32		
27	34	360	76	650	411	700	195	195	97	36	24	32		
28	32	360	76	645	473	600	184	214	92	34	24	32		
29	34	352	76	570	523	700	184	179	91	35	23	31		
30	36	230	76	465	---	640	182	165	86	35	23	31		
31	41	---	76	371	---	600	---	151	---	37	24	---		
TOTAL	858	6019	8758	29228	15063	46551	11264	6020	4950	1543	857	833		
MEAN	27.7	201	283	943	519	1502	375	194	165	49.8	27.6	27.8		
MAX	41	513	1500	6480	2110	4400	620	334	395	81	37	32		
MIN	23	46	60	76	219	520	182	151	86	34	23	24		
CFSM	.04	.29	.41	1.37	.75	2.18	.54	.28	.24	.07	.04	.04		
IN.	.05	.32	.47	1.58	.81	2.51	.61	.33	.27	.08	.05	.04		
AC-FT	1700	11940	17370	57970	29880	92330	22340	11940	9820	3060	1700	1650		
CAL YR 1983	TOTAL	107526	MEAN	295	MAX	3350	MIN	21	CFSM	.43	IN.	5.81	AC-FT	213300
WTR YR 1984	TOTAL	131944	MEAN	361	MAX	6480	MIN	23	CFSM	.52	IN.	7.12	AC-FT	261700

NOTE.--No gage-height record Mar. 3 to Apr. 23.

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 upstream from county bridge, 0.5 mi east of Dartford, 1.7 mi downstream from Deadman Creek, 7.5 mi north of Spokane, and at mile 11.4.

PERIOD OF RECORD.--April 1929 to September 1932, December 1946 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 1,590 ft, 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 downstream at different datum.

AVERAGE DISCHARGE.--40 years (water years 1930-32, 1948-84). 312 ft³/s. 6.37 in/yr. 226,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 3,170 ft³/s Feb. 17, 1970, gage height, 7.29 ft; minimum observed, 63 ft³/s July 24, 1930, gage height, 1.07 ft, site and datum then in use.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 940 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Mar. 18	0030	1,180	5.05	Apr. 8	2300	1,160	5.02
Mar. 22	1300	*1,500	*5.59				

Minimum discharge, 161 ft³/s Oct. 5; minimum gage height, 2.21 ft Aug. 27, 28.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP		
1	165	221	327	260	358	567	895	627	437	364	192	167		
2	167	212	321	267	345	731	864	667	426	354	203	167		
3	167	226	320	283	339	695	836	663	412	342	200	167		
4	167	295	315	358	330	643	818	619	416	330	196	167		
5	165	275	318	615	327	623	836	603	495	321	194	165		
6	169	264	315	575	330	631	836	615	472	312	192	167		
7	167	312	306	523	327	639	811	607	447	300	185	167		
8	167	264	303	483	342	643	983	579	450	286	187	169		
9	167	248	312	447	339	651	995	559	591	278	185	167		
10	167	261	361	426	342	735	947	539	539	270	183	165		
11	167	367	419	412	345	801	967	535	499	264	181	165		
12	167	367	392	395	395	853	931	567	487	256	179	169		
13	167	324	376	364	727	888	1000	535	487	251	177	173		
14	167	336	373	324	719	899	923	515	461	241	175	171		
15	167	376	370	283	555	899	888	527	437	236	175	169		
16	167	440	358	280	511	975	874	551	419	229	173	169		
17	171	443	283	275	475	1030	885	535	402	224	173	167		
18	181	450	270	272	440	1120	885	503	386	219	171	163		
19	181	405	250	256	419	1040	878	491	376	214	171	163		
20	179	430	230	256	430	1020	871	527	367	209	171	167		
21	177	507	210	275	535	1120	857	507	426	203	169	179		
22	185	454	200	297	643	1420	825	487	555	200	171	181		
23	198	419	200	303	535	1270	797	535	491	198	171	183		
24	192	409	210	315	527	1270	769	555	437	198	169	181		
25	183	426	230	591	531	1200	743	511	409	196	171	177		
26	181	412	230	503	495	1250	715	495	395	189	167	177		
27	181	405	230	426	483	1170	683	507	383	187	165	175		
28	181	405	230	515	487	1080	663	487	373	185	163	173		
29	179	389	230	519	543	1060	655	465	370	187	165	171		
30	183	354	240	412	---	991	635	454	383	192	165	173		
31	207	---	250	370	---	935	---	443	---	192	169	---		
TOTAL	5429	10696	8979	11880	13174	28849	25265	16810	13228	7627	5508	5114		
MEAN	175	357	290	383	454	931	842	542	441	246	178	170		
MAX	207	507	419	615	727	1420	1000	667	591	364	203	183		
MIN	165	212	200	256	327	567	635	443	367	185	163	163		
CFSM	.26	.54	.44	.58	.68	1.40	1.27	.82	.66	.37	.27	.26		
IN.	.30	.60	.50	.66	.74	1.61	1.41	.94	.74	.43	.31	.29		
AC-FT	10770	21220	17810	23560	26130	57220	50110	33340	26240	15130	10930	10140		
CAL YR 1983	TOTAL	147101	MEAN	403	MAX	1530	MIN	155	CFSM	.61	IN.	8.23	AC-FT	291800
WTR YR 1984	TOTAL	152559	MEAN	417	MAX	1420	MIN	163	CFSM	.63	IN.	8.53	AC-FT	302600

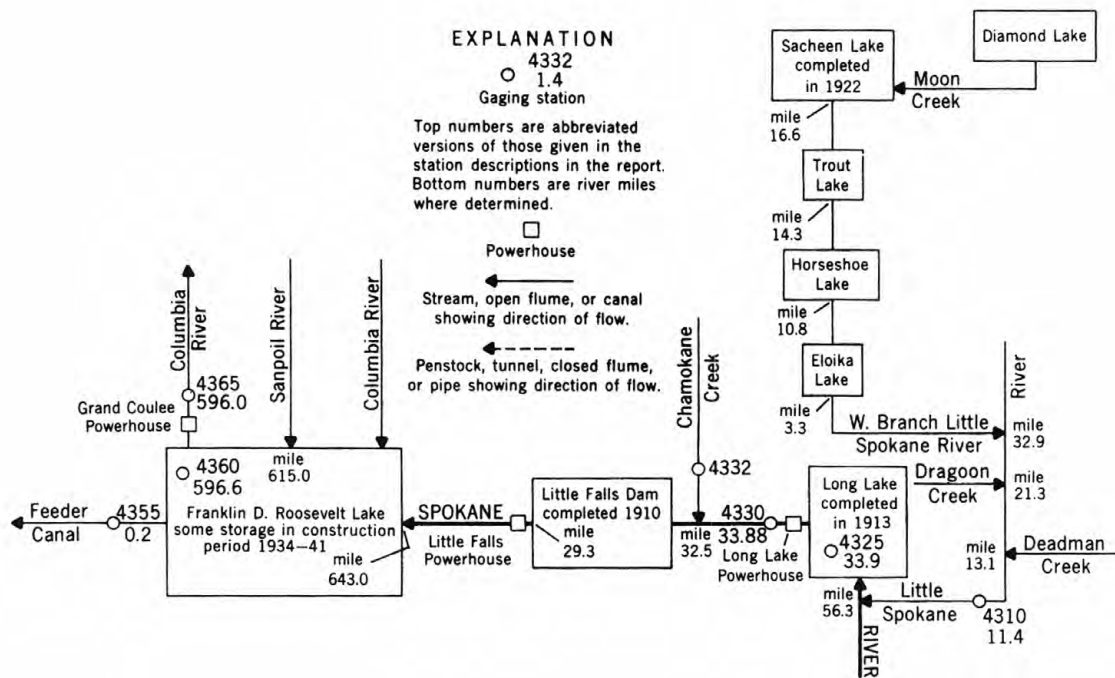


Figure 22.--Gaging stations in Spokane River basin from Little Spokane River downstream and at Grand Coulee Dam.

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, 12.0 mi north of Reardan, and at mile 33.9.

DRAINAGE AREA.--6,020 mi², 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 between elevations 1,512 ft and 1,536 ft, normal limits of operation. Contents at elevation 1,512 ft by capacity table used prior to October 1915, 148,600 acre-ft. Records given herein represent usable contents. Water used for power. About 25,000 acres irrigated above station, largely from wells in the Spokane Valley. Flow regulated by Coeur d'Alene Lake and powerplants along Spokane River.

COOPERATION.--Lake elevations and capacity table furnished by Washington Water Power Co. Records not reviewed.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 107,600 acre-ft Jan. 16, 1974, elevation, 1,536.67 ft; minimum, since filling reservoir in 1920, 5,400 acre-ft Mar. 8, 1966, elevation, 1,513.50 ft.

EXTREMES FOR CURRENT YEAR.--Maximum contents, 104,113 acre-ft July 3, elevation, 1,535.98 ft; minimum, 89,649 acre-ft May 31, elevation, 1,533.06 ft.

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 1983 TO SEPTEMBER 1984
INSTANTANEOUS OBSERVATIONS AT 2400

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1535.62	1535.73	1535.79	1535.52	1535.70	1535.78	1535.44	1535.05	1533.14	1535.82	1535.45	1535.39
2	1535.70	1535.69	1535.80	1535.70	1535.63	1535.74	1535.35	1535.18	1533.24	1535.88	1535.76	1535.63
3	1535.67	1535.81	1535.83	1535.65	1535.70	1535.71	1535.57	1535.23	1533.31	1535.93	1535.61	1535.52
4	1535.53	1535.51	1535.86	1534.66	1535.66	1535.77	1535.49	1535.21	1533.29	1535.83	1535.53	1535.42
5	1535.61	1535.52	1535.88	1534.00	1535.68	1535.76	1535.42	1535.22	1533.44	1535.86	1535.38	1535.42
6	1535.65	1535.60	1535.81	1534.55	1535.68	1535.75	1535.45	1535.17	1533.89	1535.86	1535.44	1535.48
7	1535.63	1535.77	1535.86	1535.36	1535.60	1535.80	1535.55	1535.42	1534.24	1535.83	1535.56	1535.45
8	1535.62	1535.69	1535.78	1535.45	1535.71	1535.78	1535.60	1535.40	1534.65	1535.80	1535.38	1535.45
9	1535.56	1535.64	1535.72	1535.46	1535.75	1535.68	1535.55	1535.34	1534.90	1535.80	1535.40	1535.42
10	1535.53	1535.59	1535.68	1535.59	1535.66	1535.64	1535.50	1535.35	1534.97	1535.70	1535.49	1535.32
11	1535.48	1535.26	1535.65	1535.69	1535.66	1535.64	1535.55	1535.34	1534.93	1535.53	1535.65	1535.53
12	1535.45	1535.14	1535.66	1535.72	1535.70	1535.74	1535.47	1535.29	1535.15	1535.80	1535.65	1535.50
13	1535.58	1535.01	1535.60	1535.71	1535.80	1535.70	1535.48	1535.27	1535.36	1535.72	1535.45	1535.55
14	1535.55	1535.10	1535.71	1535.68	1535.56	1535.78	1535.49	1535.37	1535.38	1535.67	1535.70	1535.56
15	1535.45	1535.22	1535.84	1535.56	1535.53	1535.52	1535.44	1535.51	1535.39	1535.79	1535.65	1535.56
16	1535.33	1535.27	1535.80	1535.57	1535.75	1535.81	1535.35	1535.50	1535.37	1535.70	1535.36	1535.59
17	1535.60	1535.43	1535.71	1535.74	1535.70	1535.76	1535.38	1535.53	1535.40	1535.54	1535.60	1535.60
18	1535.55	1535.53	1535.67	1535.74	1535.60	1535.79	1535.54	1535.40	1535.40	1535.67	1535.66	1535.55
19	1535.65	1535.68	1535.66	1535.70	1535.70	1535.61	1535.45	1535.30	1535.25	1535.64	1535.60	1535.60
20	1535.65	1535.65	1535.65	1535.72	1535.71	1535.61	1535.33	1535.35	1535.42	1535.50	1535.50	1535.48
21	1535.60	1535.70	1535.65	1535.76	1535.74	1535.68	1535.10	1535.30	1535.75	1535.58	1535.50	1535.10
22	1535.65	1535.81	1535.80	1535.70	1535.74	1535.76	1534.98	1535.39	1535.66	1535.62	1535.69	1534.85
23	1535.65	1535.70	1535.79	1535.65	1535.70	1535.33	1534.94	1535.42	1535.69	1535.59	1535.48	1534.55
24	1535.70	1535.80	1535.81	1535.69	1535.69	1535.00	1534.98	1535.30	1535.62	1535.53	1535.33	1534.55
25	1535.68	1535.79	1535.85	1535.40	1535.64	1534.85	1534.98	1534.95	1535.75	1535.57	1535.51	1534.46
26	1535.71	1535.82	1535.85	1535.49	1535.65	1535.00	1534.92	1534.57	1535.80	1535.66	1535.30	1534.45
27	1535.75	1535.67	1535.70	1535.60	1535.50	1535.30	1534.83	1534.24	1535.72	1535.46	1535.42	1534.54
28	1535.72	1535.65	1535.63	1535.73	1535.70	1535.38	1534.84	1533.86	1535.87	1535.50	1535.10	1534.69
29	1535.65	1535.75	1535.79	1535.74	1535.76	1535.45	1534.95	1533.52	1535.82	1535.55	1534.90	1534.48
30	1535.74	1535.86	1535.67	1535.67	---	1535.25	1535.13	1533.20	1535.82	1535.55	1534.87	1534.60
31	1535.74	---	1535.60	1535.66	---	1535.36	---	1533.10	---	1535.49	1534.91	---
MEAN	1535.61	1535.58	1535.75	1535.51	1535.68	1535.57	1535.30	1535.01	1534.99	1535.68	1535.45	1535.21
MAX	1535.75	1535.86	1535.88	1535.76	1535.80	1535.81	1535.60	1535.53	1535.87	1535.93	1535.76	1535.63
MIN	1535.33	1535.01	1535.60	1534.00	1535.50	1534.85	1534.83	1533.10	1533.14	1535.46	1534.87	1534.45
(†)	102908	103511	102206	102507	103009	101001	99847	89845	103310	101654	98749	97211
(‡)	+502	+603	-1305	+301	+502	-2008	-1154	-10002	+13465	-1656	-2905	-1538
CAL YR 1983	MEAN	1535.52	MAX	1535.88	MIN	1534.70	AC-FT†	-151				
WTR YR 1984	MEAN	1535.44	MAX	1535.93	MIN	1533.10	AC-FT‡	-5195				

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

‡ Change in contents, in acre-feet.

SPOKANE RIVER BASIN

12433000 SPOKANE RIVER AT LONG LAKE, WA
(National stream quality accounting network station)

LOCATION.--Lat 47°50'12", long 117°50'25", in NW¼ sec.13, T.27 N., R.39 E., Lincoln County, Hydrologic Unit 17010307, on left bank at Long Lake powerhouse, 1.4 mi upstream from Chamokane Creek, 12.0 mi north of Reardan, and at mile 33.88.

DRAINAGE AREA.--6,020 mi², 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 above National Geodetic Vertical Datum of 1929 (levels by Washington Water Power Co.). Oct. 1, 1978, to Sept. 30, 1981, published at datum 1,300 ft lower.

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

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

AVERAGE DISCHARGE.--45 years, 7,977 ft³/s, 5,779,000 acre-ft/yr, adjusted for storage in Long Lake.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 49,700 ft³/s Jan. 19, 1974, gage height, 78.40 ft; maximum recorded gage height, 78.66 ft May 24, 1948; minimum daily discharge, 114 ft³/s Sept. 2, 1956.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 21,500 ft³/s May 27, gage height, 69.25 ft; minimum, 150 ft³/s Aug. 31, gage height, 60.52 ft.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP		
1	3140	3260	6240	5520	12100	7640	14700	15800	21000	8690	2900	660		
2	2790	3210	6130	5080	12500	8670	14200	14000	21000	7290	2550	1640		
3	3130	3230	6090	5740	11700	8310	13500	14300	21000	6340	2920	2560		
4	3410	4130	6090	13400	11600	8050	14000	14200	20800	6600	2600	2240		
5	2800	3120	6520	14600	10600	8230	13600	14000	19600	6230	2890	2690		
6	2620	2820	6500	8680	10400	7980	13100	14100	18700	6640	2240	2470		
7	2870	2970	6290	6600	9410	7880	12700	13000	18500	6740	1860	2780		
8	2890	3380	6560	7700	8200	8000	13200	13200	18000	6160	2890	2850		
9	2940	3410	6450	7620	8490	7810	14600	13200	18100	5690	2260	2960		
10	2900	3570	6600	6950	8630	7870	14400	13000	18400	5080	2330	3000		
11	2880	4420	7530	6910	8340	7720	14400	13000	18400	4810	1930	2440		
12	3140	4640	7050	6960	8370	8670	14400	13000	18100	3480	2620	2830		
13	2610	4610	6950	7040	10200	10500	14400	13000	17000	4150	3020	2800		
14	3250	4640	6600	7040	12400	11100	14300	12800	17300	4150	2570	2810		
15	3330	4650	6670	6810	11100	12200	14200	13100	17000	4110	1680	2820		
16	3150	4620	7000	6580	10200	13800	14300	14700	16900	4090	2340	2800		
17	1420	4830	6670	6330	10800	15300	14500	15200	16300	4140	845	2810		
18	2820	4880	6400	6810	10600	15700	15500	15900	16100	4090	1520	2840		
19	2390	4680	6190	6670	9570	16100	17800	15900	15100	3850	1930	2810		
20	2850	5330	6090	6480	9530	15800	18100	15700	11600	3220	2210	3280		
21	2820	5370	5830	6510	9670	16100	19100	16600	10100	2340	1610	3810		
22	3000	5620	5750	7140	9730	19000	19200	17400	13000	2870	1600	3910		
23	3180	5850	6170	6820	9610	20200	19000	18000	13500	2670	2650	3710		
24	2830	5620	6060	7840	9540	20500	18900	19100	12800	2810	2470	3000		
25	3000	5740	6300	11900	9320	19900	18500	20000	9520	2870	1830	3210		
26	3200	6020	6550	10800	9190	19100	19000	20700	9430	2610	2350	2980		
27	2840	6560	6290	11600	8570	18400	17900	21100	9740	3390	1940	2780		
28	3010	6340	5560	12400	7300	18200	17200	21000	8840	3390	3290	2630		
29	3200	5700	5190	12700	7880	17300	16100	21100	8810	3380	2780	3450		
30	2940	6070	5740	13000	---	17500	15700	21000	8780	3330	2100	2840		
31	3360	---	5730	12600	---	15100	---	21000	---	3320	2190	---		
TOTAL	90710	139290	195790	262830	285550	408630	470500	498100	463420	138530	70915	84410		
MEAN	2926	4643	6316	8478	9847	13180	15680	16070	15450	4469	2288	2814		
MAX	3410	6560	7530	14600	12500	20500	19200	21100	21000	8690	3290	3910		
MIN	1420	2820	5190	5080	7300	7640	12700	12800	8780	2340	845	660		
AC-FT	179900	276300	388300	521300	566400	810500	933200	988000	919200	274800	140700	167400		
MEAN†	2933	4655	6293	8481	9853	13146	15667	15902	15679	4441	2241	2789		
AC-FT†	180400	276900	387000	521600	566900	808500	932000	978000	932700	273100	137800	165900		
CAL YR 1983	TOTAL	2943320	MEAN	8064	MAX	23000	MIN	1220	AC-FT	5838000	MEAN†	8062	AC-FT†	5838000
WTR YR 1984	TOTAL	3108675	MEAN	8494	MAX	21100	MIN	660	AC-FT	6166000	MEAN†	8490	AC-FT†	6161000

† Adjusted for change in contents in Long Lake.

SPOKANE RIVER BASIN

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12433000 SPOKANE RIVER AT LONG LAKE, WA--Continued
(National stream quality accounting network station)

WATER-QUALITY RECORDS

LOCATION.--Lat 47°50'26", long 117°51'11", in SE1/4NW1/4 sec.14, T.27 N., R.39 E., Lincoln County, Hydrologic Unit 17010307,
on right bank 0.7 mi downstream from Long Lake Dam, and 13 mi north of Reardan.

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

PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: March 1973 to September 1981.

WATER TEMPERATURES: July 1959 to September 1962, October 1966 to September 1970, March 1973 to September 1981.

WATER QUALITY DATA, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984

DATE	TIME	STREAM- FLOW, INSTAN- TANEOUS (CFS)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH (STAND- ARD UNITS)	TEMPER- ATURE (DEG C)	TUR- BID- ITY (NTU)	OXYGEN, DIS- SOLVED (MG/L)	OXYGEN, DIS- SOLVED SATUR- ATION	COLI- FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)	STREP- TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML)	HARD- NESS (MG/L AS CACO3)
NOV , 1983											
17...	0900	4720	178	8.0	10.0	1.0	9.3	89	K4	K3	85
JAN , 1984											
10...	1100	6800	123	8.2	3.0	23	11.9	93	330	K1100	56
MAR											
16...	1300	14700	119	7.3	5.5	8.5	12.2	103	<1	380	52
MAY											
15...	1145	13000	84	7.7	9.5	2.9	10.3	96	K1	K1	42
JUL											
17...	0900	5250	116	7.8	18.0	1.4	8.7	97	K1	K2	55
SEP											
13...	1300	3600	198	7.8	17.5	.70	7.1	77	<1	K1	97
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)
NOV , 1983											
17...	7	21	8.0	4.0	9	.2	1.8	79	10	2.8	<.10
JAN , 1984											
10...	4	14	5.0	3.3	11	.2	1.3	52	11	2.7	.10
MAR											
16...	0	13	4.7	3.3	12	.2	1.3	51	10	1.9	.20
MAY											
15...	5	11	3.5	2.6	12	.2	.90	37	7.7	1.3	.10
JUL											
17...	8	14	4.8	2.9	10	.2	1.2	47	7.6	1.6	<.10
SEP											
13...	10	24	8.9	4.3	9	.2	2.2	87	11	3.1	<.10
DATE	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 DIS- SOLVED (MG/L AS N)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N)	NITRO- GEN,AM- MONIA + ORGANIC TOTAL (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)
NOV , 1983											
17...	6.8	106	100	.14	1350	.62	.110	.60	.020	.010	.020
JAN , 1984											
10...	11	80	80	.11	1470	.63	.060	1.0	.090	.050	.040
MAR											
16...	12	77	77	.10	3060	.64	.070	.20	.060	.030	.050
MAY											
15...	11	68	61	.09	2390	.21	.060	.60	.030	.010	<.010
JUL											
17...	9.6	65	70	.09	921	.30	.060	.50	.010	<.010	.010
SEP											
13...	8.7	121	110	.16	1180	.64	.040	.30	.020	<.010	.020

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

SPOKANE RIVER BASIN

12433000 SPOKANE RIVER AT LONG LAKE, WA--Continued

WATER QUALITY DATA, OCTOBER 1983 TO SEPTEMBER 1984

DATE	ALUM- INUM, DIS- SOLVED (UG/L AS AL)	ARSENIC DIS- SOLVED (UG/L AS AS)	BARIUM, DIS- SOLVED (UG/L AS BA)	BERYL- LIUM, DIS- SOLVED (UG/L AS BE)	CADMIUM DIS- SOLVED (UG/L AS CD)	CHRO- MIUM, DIS- SOLVED (UG/L AS CR)	COBALT, DIS- SOLVED (UG/L AS CO)	COPPER, DIS- SOLVED (UG/L AS CU)	IRON, DIS- SOLVED (UG/L AS FE)	LEAD, DIS- SOLVED (UG/L AS PB)	LITHIUM DIS- SOLVED (UG/L AS LI)
NOV , 1983											
17...	<10	1	31	<.5	2	<1	<3	5	11	16	9
JAN , 1984											
10...	--	1	35	<.5	2	1	<3	6	--	--	<4
MAR											
16...	--	--	--	--	--	--	--	--	--	--	--
MAY											
15...	10	<1	22	<.5	<1	<1	<3	5	39	7	5
JUL											
17...	--	--	--	--	--	--	--	--	--	--	--
SEP											
13...	10	1	35	<.5	<1	1	<3	7	4	3	6

DATE	MANGA- NESE, DIS- SOLVED (UG/L AS MN)	MERCURY DIS- SOLVED (UG/L AS HG)	MOLYB- DENUM, DIS- SOLVED (UG/L AS MO)	NICKEL, DIS- SOLVED (UG/L AS NI)	SELE- NIUM, DIS- SOLVED (UG/L AS SE)	SILVER, DIS- SOLVED (UG/L AS AG)	STRON- TIUM, DIS- SOLVED (UG/L AS SR)	VANA- DIUM, DIS- SOLVED (UG/L AS V)	ZINC, DIS- SOLVED (UG/L AS ZN)	SEDI- MENT, SUS- PENDE (MG/L)	SEDI- MENT, DIS- CHARGE, SUS- PENDE (T/DAY)
NOV , 1983											
17...	5	<.1	<10	2	<1	<1	65	<6	16	3	38
JAN , 1984											
10...	--	<.1	<10	--	<1	1	49	<6	--	28	514
MAR											
16...	--	--	--	--	--	--	--	--	--	13	516
MAY											
15...	11	<.1	<10	5	1	<1	37	<6	100	6	211
JUL											
17...	--	--	--	--	--	--	--	--	--	2	28
SEP											
13...	4	<.1	<10	2	<1	<1	74	<6	13	5	49

		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)	URANIUM DIS- SOLVED, EXTRAC- TION (UG/L)
DATE	TIME									
MAY , 1984										
15...	1145	<1.2	<.4	1.4	<.4	1.2	<.4	.05	--	.29
SEP										
13...	1300	3.4	<.4	1.8	<.4	1.6	<.4	.05	2.4	--

SPOKANE RIVER BASIN

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12433200 CHAMOKANE CREEK BELOW FALLS, NEAR LONG LAKE, WA

LOCATION.--Lat 47°51'42", long 117°51'28", in SE¼SW¼ sec.2, T.27 N., R. 39 E., Stevens County, Hydrologic Unit 17010307, Spokane Indian Reservation, on right bank 800 ft downstream from Chamokane Falls, 1.4 mi upstream from mouth, and 1.8 mi north of town of Long Lake.

DRAINAGE AREA.--179 mi².

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--February 1971 to September 1978, April 25 to November 5, 1984 (seasonal records only).

GAGE.--Water-stage recorder. Datum of gage is 1,418.5 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--Water-discharge records excellent. No known regulation. Diversions upstream for irrigation, domestic use, and fish hatchery.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 2,200 ft³/s Apr. 25, 1975, gage height, 5.06 ft, from rating curve extended above 500 ft³/s on basis of slope-area measurement of peak flow; minimum, 16 ft³/s July 10, 1973, gage height, 0.87 ft.

EXTREMES FOR CURRENT YEAR.--Maximum discharge during period April 25 to November 5, 1984, 212 ft³/s May 2, gage height, 2.12 ft; minimum, 31 ft³/s during several days in August, gage height, 1.23 ft.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR MAY TO NOVEMBER 1984
MEAN VALUES

DAY	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV
1	---	122	67	51	33	34	35	35
2	---	175	65	48	35	34	35	44
3	---	166	64	48	34	33	35	39
4	---	150	68	45	34	33	35	39
5	---	142	75	45	34	33	35	39
6	---	142	71	44	34	34	35	---
7	---	134	67	43	33	34	35	---
8	---	125	67	42	33	34	34	---
9	---	120	70	40	33	34	35	---
10	---	113	67	40	33	34	35	---
11	---	113	65	39	33	34	36	---
12	---	115	62	39	33	35	36	---
13	---	107	62	38	33	34	35	---
14	---	102	64	37	32	34	35	---
15	---	104	61	37	32	34	35	---
16	---	107	57	37	32	34	35	---
17	---	100	54	36	32	34	35	---
18	---	94	53	36	32	34	35	---
19	---	92	51	35	33	34	35	---
20	---	96	51	35	33	36	35	---
21	---	90	67	35	33	35	35	---
22	---	86	84	35	33	36	35	---
23	---	90	79	35	32	35	35	---
24	---	90	65	34	33	35	35	---
25	152	84	60	34	33	35	35	---
26	144	84	61	34	33	35	35	---
27	135	82	60	33	33	34	35	---
28	130	77	54	33	33	35	36	---
29	129	73	53	34	33	35	35	---
30	123	71	53	33	34	35	35	---
31	---	68	---	33	34	---	35	---
TOTAL	----	3314	1897	1188	1025	1030	1087	----
MEAN	----	107	63.2	38.3	33.1	34.3	35.1	----
MAX	----	175	84	51	35	36	36	----
MIN	----	68	51	33	32	33	34	----
CFSM	----	.60	.35	.21	.18	.19	.20	----
IN.	----	.69	.39	.25	.21	.21	.23	----
AC-FT	----	6570	3760	2360	2030	2040	2160	----

SPOKANE RIVER BASIN

12433200 CHAMOKANE CREEK BELOW FALL, NEAR LONG LAKE, WA

WATER-QUALITY RECORDS

PERIOD OF DAILY RECORD.--

WATER TEMPERATURES: April 25 to November 5, 1984 (seasonal records only).

INSTRUMENTATION.--Temperature recorder since April 1984.

REMARKS.--Seasonal records, April 25 through November 5, 1984.

EXTREMES FOR PERIOD OF DAILY RECORD.--

WATER TEMPERATURES: Maximum, 22.5°C July 25, 1984; minimum, 3.0°C Nov. 1, 1984.

EXTREMES FOR CURRENT YEAR.--

WATER TEMPERATURES: Maximum during period April 25 to Nov. 5, 22.5°C July 25; minimum, 3.0°C Nov. 1.

TEMPERATURE, WATER (DEG. C), WATER YEAR APRIL 1983 TO NOVEMBER 1984

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

12433200 CHAMOKANE CREEK BELOW FALL, NEAR LONG LAKE, WA--Continued

TEMPERATURE, WATER (DEG. C), WATER YEAR APRIL TO NOVEMBER 1984

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

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 downstream from headworks structure, and 0.5 mi southwest of Grand Coulee Dam.

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

GAGE.--Recording flowmeters and water-stage recorder on rated pumps. Datum of gage is 1,500.00 ft above Bureau of Reclamation datum, adjustment of 1937. May 1, 1952, to Jan. 10, 1978, at datum 50.00 ft higher. Jan. 11, 1978, to Feb. 22, 1981, nonrecording gage at datum 1,500.00 ft lower. Water-stage recorder for Franklin D. Roosevelt Lake (see sta 12436000) also used to determine head. May 1, 1952, to Oct. 13, 1960, auxiliary gage 0.6 mi downstream from base gage at same datum.

REMARKS.--Since 1951, water has been pumped (lift about 280 ft) from Franklin D. Roosevelt Lake into the two-mile long Feeder Canal, which empties into Banks Lake. From Banks Lake, it is distributed through a system of canals to the Columbia Basin project for irrigation. Between May 1951, and December 1974, six pumps were used. Since December 1974, six pump generators, which can also generate power during peak demand periods by returning water from Banks Lake, via the Feeder Canal, to Franklin D. Roosevelt Lake have been added; two in December 1974 and one each in April, June, and November 1983 and April 1984. Discharge is computed from relationships between pump operation and head.

COOPERATION.--Discharge records furnished by U.S. Bureau of Reclamation; four discharge measurements made by Geological Survey.

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 14,600 ft³/s May 28, 1984; minimum daily discharge, 1,790 ft³/s Apr. 12, 1984, reverse flow from Banks Lake.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 14,600 ft³/s May 28; minimum daily discharge, 1,790 ft³/s Apr. 12, reverse flow from Banks Lake.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1600	-97	0	0	158	0	0	2740	6200	8870	8920	6960
2	1600	-99	0	0	136	99	9	1840	6250	8870	7510	7010
3	2000	-138	0	0	7	105	0	0	6300	7710	6910	6960
4	1600	0	0	0	0	296	0	3240	5240	4540	6960	6960
5	3660	0	0	0	0	212	36	6050	6350	7210	6960	6960
6	3290	0	0	0	0	514	24	6050	5190	9930	7010	6960
7	3210	0	0	0	56	766	0	6550	6200	10000	7010	4460
8	3210	0	0	0	0	0	0	5290	6450	8920	7010	3780
9	3210	0	0	0	0	0	0	1670	6500	8870	7010	3800
10	3210	0	0	0	0	0	0	4690	6600	8870	7010	4460
11	3070	0	0	0	0	0	-1130	13800	5700	8870	7010	7010
12	2900	0	0	0	0	0	-1790	14400	5090	8870	7010	7010
13	3140	0	0	-48	0	0	-1780	14400	5090	8820	7010	7010
14	3140	0	0	-103	0	0	-1780	14300	5290	7970	6960	7010
15	3220	0	0	0	0	0	-1780	13400	6000	6960	6960	7010
16	3230	0	0	-49	0	0	-1780	12800	7110	6910	9630	7010
17	3220	0	0	-198	0	0	-1790	12400	7160	7610	6500	6960
18	3150	0	0	-666	0	0	-1710	12200	7210	5290	5090	5650
19	3110	0	0	145	0	-154	-1410	12700	7210	0	5090	3770
20	2350	0	-188	580	0	-1640	0	12800	6810	-51	5090	3770
21	1540	0	0	0	0	-655	0	12900	5450	0	8120	3780
22	1620	0	0	0	0	-640	0	12500	5500	332	8820	3790
23	1620	0	0	0	0	-529	0	13700	5550	8020	8820	3790
24	1620	0	0	-96	0	19	82	13400	5550	10400	8570	3790
25	-90	0	0	-325	0	0	2490	13600	4510	11400	6760	3790
26	570	0	0	-620	0	-11	4260	12600	5040	11800	5040	3790
27	0	0	0	-47	0	0	4280	14500	6960	13500	1850	2990
28	0	0	0	-501	0	0	5010	14600	6960	13500	0	1890
29	0	0	0	0	0	0	4270	7870	7410	13600	0	1890
30	0	0	0	-635	---	0	2250	5140	8870	11700	2380	1890
31	473	---	0	307	---	0	---	5090	---	10500	5900	---
TOTAL	64473	-334	-188	-2256	377	-1618	7761	297220	185750	249791	194920	151910
MEAN	2080	-11.1	-6.06	-72.8	13.0	-52.2	259	9588	6192	8058	6288	5064
MAX	3660	0	0	580	158	766	5010	14600	8870	13600	9630	7010
MIN	-90	-138	-188	-666	0	-1640	-1790	0	4510	-51	0	1890
AC-FT	127900	-662	-373	-4470	748	-3210	15390	589500	368400	495500	386600	301300
CAL YR 1983	TOTAL	1035701	MEAN	2838	MAX	9470	MIN	-1850	AC-FT	2054000		
WTR YR 1984	TOTAL	1147806	MEAN	3136	MAX	14600	MIN	-1790	AC-FT	2277000		

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.

DRAINAGE AREA.--74,700 mi², 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. WDR WA-73-1: 1965, 1967. WDR WA-75-1: 1974 monthend contents.

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

REMARKS.--Elevations for May 30 to June 28, Aug. 24 to Sept. 30 provided by U.S. Bureau of Reclamation through the Corps of Engineer's North Pacific Division Reservoir Control Center. 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 between elevations, 1,208 ft, proposed lower limit of operation, and 1,288 ft, top of gates. Capacity increased to 5,185,452 acre-ft by use of 2 ft flashboards installed after high-water period each year beginning August 1961. Storage below 1,208 ft, 4,209,207 acre-ft. 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 sta 12435500) and for irrigation of about 350,000 acres in the United States plus an additional 37,000 acres in Canada.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents recorded, 9,586,200 acre-ft July 17, 1942, June 3, 1945, elevation, 1,290.3 ft; maximum elevation, 1,290.36 ft Aug. 6, 1976; minimum contents observed, 16,200 acre-ft Aug. 29, 1938, elevation, 956.1 ft.

EXTREMES FOR CURRENT YEAR.--Maximum contents, 9,370,004 acre-ft Nov. 17, elevation, 1,289.70 ft; minimum, 5,771,157 acre-ft May 18, elevation, 1,238.12 ft.

Capacity table dated October 24, 1975 (elevation, in feet, and contents, in acre-ft)
(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 1983 TO SEPTEMBER 1984
INSTANTANEOUS OBSERVATIONS AT 2400

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1284.12	1286.91	1288.02	1284.85	1288.21	1281.20	1281.24	1247.42	1253.00	1287.36	1282.37	1285.30
2	1283.99	1286.76	1287.44	1286.56	1287.68	1281.05	1280.82	1246.15	1254.60	1287.67	1283.29	1285.55
3	1283.86	1286.57	1286.35	1287.51	1287.08	1281.53	1279.37	1245.12	1256.05	1287.83	1284.49	1285.35
4	1283.83	1286.49	1285.55	1288.30	1286.01	1282.21	1278.02	1244.07	1256.80	1287.95	1285.82	1284.80
5	1283.86	1286.62	1284.77	1288.74	1285.15	1281.47	1276.45	1243.57	1257.80	1287.48	1287.06	1284.20
6	1283.97	1286.89	1284.00	1288.57	1284.58	1280.52	1275.09	1243.87	1258.75	1287.30	1288.01	1284.00
7	1283.69	1286.50	1283.44	1288.81	1283.90	1279.63	1274.47	1243.55	1259.60	1287.74	1288.07	1284.60
8	1283.76	1286.63	1283.54	1289.24	1283.37	1279.49	1274.13	1243.24	1260.65	1288.08	1288.14	1285.55
9	1284.23	1286.72	1283.95	1288.60	1282.87	1279.59	1272.76	1243.13	1262.80	1287.35	1287.90	1286.30
10	1284.55	1286.73	1284.84	1288.14	1282.77	1279.63	1271.44	1242.55	1265.40	1286.78	1287.37	1286.40
11	1284.78	1287.06	1285.58	1287.74	1283.33	1280.04	1270.32	1241.50	1266.70	1286.66	1287.22	1286.60
12	1285.31	1287.81	1286.02	1287.29	1284.41	1279.37	1269.08	1241.28	1268.20	1286.22	1286.99	1286.90
13	1285.21	1288.62	1286.68	1287.03	1285.32	1278.72	1267.96	1241.30	1270.05	1286.03	1286.87	1286.80
14	1285.39	1288.75	1287.40	1286.95	1286.44	1278.52	1266.90	1240.35	1271.35	1285.37	1286.69	1286.80
15	1285.92	1289.15	1287.95	1286.97	1286.91	1278.60	1265.66	1239.45	1272.60	1284.58	1286.59	1286.70
16	1286.95	1289.48	1287.82	1286.16	1286.64	1278.74	1264.19	1238.92	1273.80	1283.34	1286.45	1286.40
17	1287.11	1289.33	1287.30	1284.97	1286.16	1279.26	1262.98	1238.62	1275.20	1281.96	1286.34	1285.80
18	1287.00	1289.25	1286.54	1283.84	1286.01	1280.45	1262.18	1238.38	1276.15	1280.63	1286.53	1285.35
19	1286.82	1289.29	1285.66	1282.63	1286.45	1280.36	1261.18	1238.71	1277.15	1280.42	1286.66	1285.45
20	1287.15	1289.33	1284.63	1281.35	1285.97	1279.91	1260.15	1240.69	1277.70	1280.40	1286.26	1285.80
21	1287.46	1288.81	1283.54	1280.36	1285.03	1279.41	1258.91	1241.16	1278.80	1281.00	1285.89	1286.40
22	1287.75	1288.41	1282.61	1280.42	1284.28	1279.34	1258.10	1241.84	1280.00	1281.32	1285.40	1286.75
23	1288.52	1287.93	1281.42	1280.89	1283.33	1279.79	1257.48	1242.62	1281.50	1280.88	1285.22	1286.90
24	1288.22	1288.44	1280.13	1281.89	1282.63	1280.53	1256.25	1243.66	1283.00	1279.98	1284.75	1286.65
25	1288.28	1288.84	1280.21	1283.37	1282.25	1281.22	1254.84	1244.46	1284.00	1278.68	1284.90	1286.30
26	1288.13	1288.95	1281.09	1284.75	1282.51	1281.11	1253.58	1246.15	1284.80	1277.51	1284.90	1286.30
27	1287.96	1289.25	1281.17	1286.29	1282.62	1281.19	1252.37	1248.02	1285.40	1277.24	1284.10	1286.10
28	1287.75	1289.28	1280.85	1287.76	1282.04	1280.97	1251.12	1249.25	1285.50	1278.37	1284.20	1286.00
29	1287.83	1288.95	1280.67	1288.94	1281.35	1280.47	1250.37	1249.59	1285.58	1279.44	1284.70	1286.00
30	1287.71	1288.58	1281.43	1288.85	---	1280.27	1248.92	1250.30	1286.78	1280.01	1285.35	1286.00
31	1287.27	---	1282.69	1288.42	---	1280.79	---	1251.50	---	1281.57	1285.45	---
MEAN	1286.08	1288.08	1284.30	1286.01	1284.67	1280.17	1265.21	1243.56	1271.66	1283.46	1285.93	1285.94
MAX	1288.52	1289.48	1288.02	1289.24	1288.21	1282.21	1281.24	1251.50	1286.78	1288.08	1288.14	1286.90
MIN	1283.69	1286.49	1280.13	1280.36	1281.35	1278.52	1248.92	1238.38	1253.00	1277.24	1282.37	1284.00
(+)	9172430	9278471	8810259	9265460	8706792	8663883	6432760	6598039	9133048	8723702	9026922	9070672
(+)	+197756	+106041	-468212	+455201	-558668	-42909	-2231123	+165279	+2535009	-409346	+303220	+43750
CAL YR 1983	MEAN	1273.70	MAX	1290.04	MIN	1218.57	AC-FT+	+66533				
WTR YR 1984	MEAN	1278.73	MAX	1289.48	MIN	1238.38	AC-FT+	-95998				

+ 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 SW¼ 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 downstream from Grand Coulee Dam, 14.2 mi upstream from Nespelem River, and at mile 596.3.

DRAINAGE AREA.--74,700 mi², 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.

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

GAGE.--Water-stage recorder. Datum of gage is 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 upstream at datum 2.4 ft lower. Apr. 1, 1931, to Dec. 31, 1935, water-stage recorder at site 850 ft downstream at present datum. Since June 12, 1955, auxiliary water-stage recorder 5.3 mi downstream from base gage at datum 1.42 ft lower.

REMARKS.--Records good. Discharge provided by U.S. Bureau of Reclamation through the Corps of Engineer's North Pacific Division Reservoir Control Center. Flow is regulated by nine major reservoirs and numerous smaller reservoirs and powerplant Diversions by Feeder Canal for Columbia Basin project (see sta 12435500) and for irrigation of about 380,000 acres in the United States and an additional 35,000 acres in Canada.

AVERAGE DISCHARGE.--71 years, 110,200 ft³/s, 79,840,000 acre-ft/yr, unadjusted.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 637,800 ft³/s June 12, 1948, elevation, 987.90 ft; minimum, 14,900 ft³/s Dec. 17, 1956, elevation, 934.37 ft; minimum daily, 15,300 ft³/s Feb. 1, 1937.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in June 1894 reached a discharge of 725,000 ft³/s, estimated.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 165,000 ft³/s May 4; maximum elevation, 969.18 ft Mar. 5; minimum daily discharge, 44,000 ft³/s Oct. 16; minimum elevation, 954.34 ft Jan. 2.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	93100	76500	132000	55200	120000	148000	59500	148000	101000	139000	94800	71100
2	75400	69800	126000	61500	128000	144000	104000	144000	80500	149000	99000	57600
3	84400	71700	146000	86600	133000	115000	128000	153000	86500	143000	95200	72400
4	81400	73500	137000	93700	138000	110000	115000	165000	107000	133000	81500	85700
5	76500	58800	138000	110000	133000	164000	126000	141000	101000	146000	75600	89000
6	73100	50500	140000	104000	133000	157000	119000	106000	112000	114000	95000	75000
7	84700	84700	130000	73600	146000	146000	103000	143000	113000	89700	110000	60000
8	71900	77700	105000	65000	144000	110000	84300	137000	110000	91500	115000	51100
9	56300	70600	98300	105000	154000	104000	134000	150000	82400	131000	115000	55400
10	76800	82300	74000	107000	133000	91600	120000	143000	69000	122000	108000	67900
11	75900	59600	79100	114000	105000	85300	125000	138000	101000	104000	88500	85500
12	70600	51100	104000	121000	86500	131000	120000	115000	98900	108000	88400	69300
13	90600	54600	90900	118000	105000	135000	116000	93800	89400	104000	114000	86100
14	89400	82200	92900	101000	93400	124000	115000	141000	108000	114000	116000	76900
15	66100	71000	94500	95200	114000	109000	118000	138000	117000	115000	114000	73700
16	44000	71300	127000	136000	142000	97000	128000	135000	123000	135000	116000	70000
17	74100	91900	132000	145000	151000	85200	129000	139000	117000	134000	106000	76100
18	80600	89500	132000	153000	129000	52500	130000	139000	128000	136000	82200	79700
19	85100	96100	129000	152000	112000	94000	137000	123000	124000	108000	96400	72700
20	70500	95800	138000	155000	137000	92300	152000	84200	131000	109000	117000	55700
21	59200	109000	138000	142000	149000	97600	157000	132000	119000	96800	99400	64700
22	61800	107000	139000	106000	152000	84100	154000	130000	117000	83600	115000	54400
23	47800	111000	146000	106000	148000	79800	149000	126000	104000	110000	107000	49100
24	71500	71100	146000	92700	145000	68400	152000	126000	102000	120000	114000	69800
25	64500	81600	87800	79500	125000	63000	162000	128000	121000	121000	86600	64600
26	67400	95100	70700	78500	102000	99000	153000	93300	134000	110000	91600	53500
27	71700	88200	94800	78300	115000	92200	150000	72400	140000	92100	119000	74300
28	62800	118000	117000	77000	152000	103000	139000	98500	152000	64100	116000	56500
29	55100	127000	106000	73500	158000	107000	127000	135000	160000	65800	98500	54200
30	57300	130000	76500	117000	---	100000	146000	124000	122000	92200	84200	61800
31	72300	---	67600	125000	---	61800	---	120000	---	63500	91600	---
TOTAL	2211900	2517200	3535100	3227300	3782900	3250800	3851800	3961200	3370700	3444300	3150500	2033800
MEAN	71350	83910	114000	104100	130400	104900	128400	127800	112400	111100	101600	67790
MAX	93100	130000	146000	155000	158000	164000	162000	165000	160000	149000	119000	89000
MIN	44000	50500	67600	55200	86500	52500	59500	72400	69000	63500	75600	49100
AC-FT	4387000	4993000	7012000	6401000	7503000	6448000	7640000	7857000	6686000	6832000	6249000	4034000
CAL YR 1983	TOTAL	42483200	MEAN	116400	MAX	212000	MIN	41500	AC-FT	84264992		
WTR YR 1984	TOTAL	38337500	MEAN	104700	MAX	165000	MIN	44000	AC-FT	76042000		

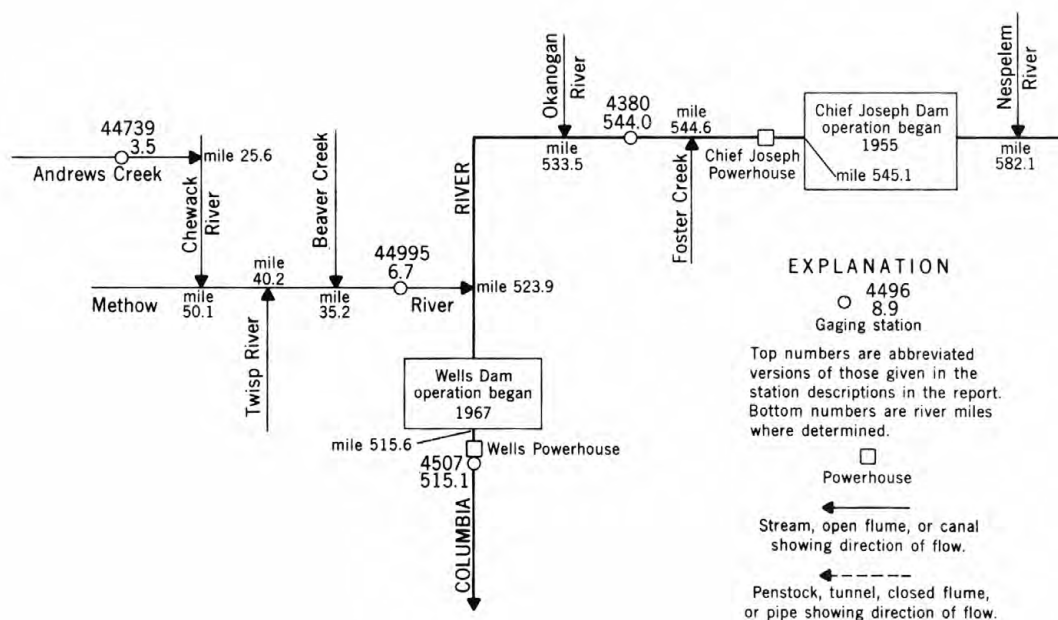


Figure 23.--Gaging stations in Columbia River basin from Chief Joseph Dam to Wells Dam.

COLUMBIA RIVER MAIN STEM

12438000 COLUMBIA RIVER AT BRIDGEPORT, WA

LOCATION.--Lat 48°00'34", 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 downstream from Foster Creek, 1.6 mi downstream from Chief Joseph Dam, and at mile 543.9.

DRAINAGE AREA.--75,700 mi², 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 upstream from base gage at same datum.

REMARKS.--Records fair. Flow regulated by nine major reservoirs and numerous smaller reservoirs and powerplants. Diversion by Feeder canal (see sta 12435500) for Columbia Basin project and for irrigation of about 380,000 acres in the United States and an additional 35,000 acres in Canada.

AVERAGE DISCHARGE.--32 years, 113,200 ft³/s, 82,013,000 acre-ft/yr, unadjusted.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 495,800 ft³/s June 11, 1961; maximum elevation, 792.20 ft June 7, 1956; minimum observed discharge, 4,200 ft³/s Mar. 22, 1966, elevation, 746.91 ft; minimum daily discharge, 22,300 ft³/s Nov. 11, 1973.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 170,000 ft³/s May 4; maximum elevation, 784.33 ft Dec. 19; minimum daily discharge, 42,900 ft³/s Oct. 23; minimum elevation, 773.08 July 8.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	92100	75900	124000	54900	119000	153000	53200	148000	92400	140000	92800	72600
2	71800	66900	141000	64100	132000	144000	101000	148000	70900	150000	98500	58100
3	83600	67600	142000	82200	135000	120000	128000	151000	87300	135000	85600	70300
4	79400	73200	121000	90800	137000	108000	118000	170000	106000	132000	72700	87000
5	74800	57900	133000	106000	141000	155000	124000	140000	98900	147000	70300	88200
6	72800	44700	142000	105000	138000	156000	109000	105000	104000	118000	86800	70700
7	84600	82600	123000	74200	152000	146000	102000	140000	105000	84600	105000	61900
8	70200	76600	102000	59500	149000	105000	78100	134000	104000	83600	110000	54100
9	52700	73300	93900	104000	158000	103000	128000	145000	73800	123000	113000	57200
10	74500	81900	75200	106000	140000	87300	118000	142000	59900	114000	108000	70300
11	76300	61000	78200	108000	107000	78100	121000	144000	95100	99100	89900	81400
12	67800	46700	104000	128000	78700	126000	123000	117000	98900	102000	86800	70100
13	88400	51500	88300	126000	105000	130000	121000	95500	85300	93300	112000	82500
14	88600	82600	91000	108000	93200	116000	116000	139000	104000	111000	111000	77600
15	64100	67000	93700	92100	114000	104000	119000	140000	112000	114000	107000	72800
16	43900	72100	125000	133000	141000	92600	131000	135000	124000	139000	112000	67500
17	70200	90100	127000	155000	153000	77600	131000	137000	117000	130000	103000	77300
18	77500	89600	130000	159000	134000	46600	131000	138000	127000	124000	79900	80200
19	81000	101000	138000	156000	112000	88500	134000	114000	120000	102000	92100	71700
20	69300	94300	141000	161000	138000	86300	151000	77400	125000	105000	110000	59400
21	59800	109000	135000	146000	152000	91100	157000	128000	110000	87500	107000	63200
22	62100	106000	144000	111000	157000	78800	155000	119000	113000	76600	102000	55300
23	42900	115000	153000	106000	148000	68000	153000	121000	104000	106000	98800	52600
24	71100	72200	141000	90800	140000	67300	155000	125000	102000	115000	115000	68300
25	62600	77600	75800	77400	134000	60400	167000	124000	120000	117000	80500	62500
26	62700	93300	66600	78600	107000	96500	154000	96000	129000	108000	84000	55700
27	68800	86400	90700	74400	115000	90200	153000	77500	134000	89700	115000	76500
28	60400	120000	119000	70200	151000	99300	142000	94800	144000	62700	112000	52700
29	54000	126000	105000	72800	156000	103000	125000	129000	157000	64500	92700	60100
30	56800	131000	76700	120000	---	91000	144000	118000	125000	89800	79900	61700
31	68800	---	59300	126000	---	58900	---	118000	---	63000	86200	---
TOTAL	2153600	2493000	3479400	3246000	3836900	3127500	3842300	3910200	3248500	3326400	3019500	2039500
MEAN	69470	83100	112200	104700	132300	100900	128100	126100	108300	107300	97400	67980
MAX	92100	131000	153000	161000	158000	156000	167000	170000	157000	150000	115000	88200
MIN	42900	44700	59300	54900	78700	46600	53200	77400	59900	62700	70300	52600
AC-FT	4272000	4945000	6901000	6438000	7610000	6203000	7621000	7756000	6443000	6598000	5989000	4045000
CAL YR 1983	TOTAL 42146600		MEAN 115500		MAX 224000		MIN 31400		AC-FT 83598000			
WTR YR 1984	TOTAL 37722800		MEAN 103100		MAX 170000		MIN 42900		AC-FT 74822992			

NOTE.--Discharge for Oct. 7, 9, 10, 12, 13, 17-19, 23, 31; Nov. 2, 3, 6, 7, 9, 10, 12-15, 17, 27; Dec. 27, 29-31; Jan. 2, 4-6, 8-11, 15, 16, 23-28; Feb. 3, 4, 11-17, 19; Mar. 4, 9, 15, 17; Apr. 7, 19, 30; May 3, 31; June 3-27, 30; July 1-15, 21, 31; Aug. 3, 7-10, 14, 15, 27, 28; Sept. 3, 5, 8, 9, and 27 provided by Corps of Engineers Chief Joseph Dam powerplant through North Pacific Division Reservoir Control Center.

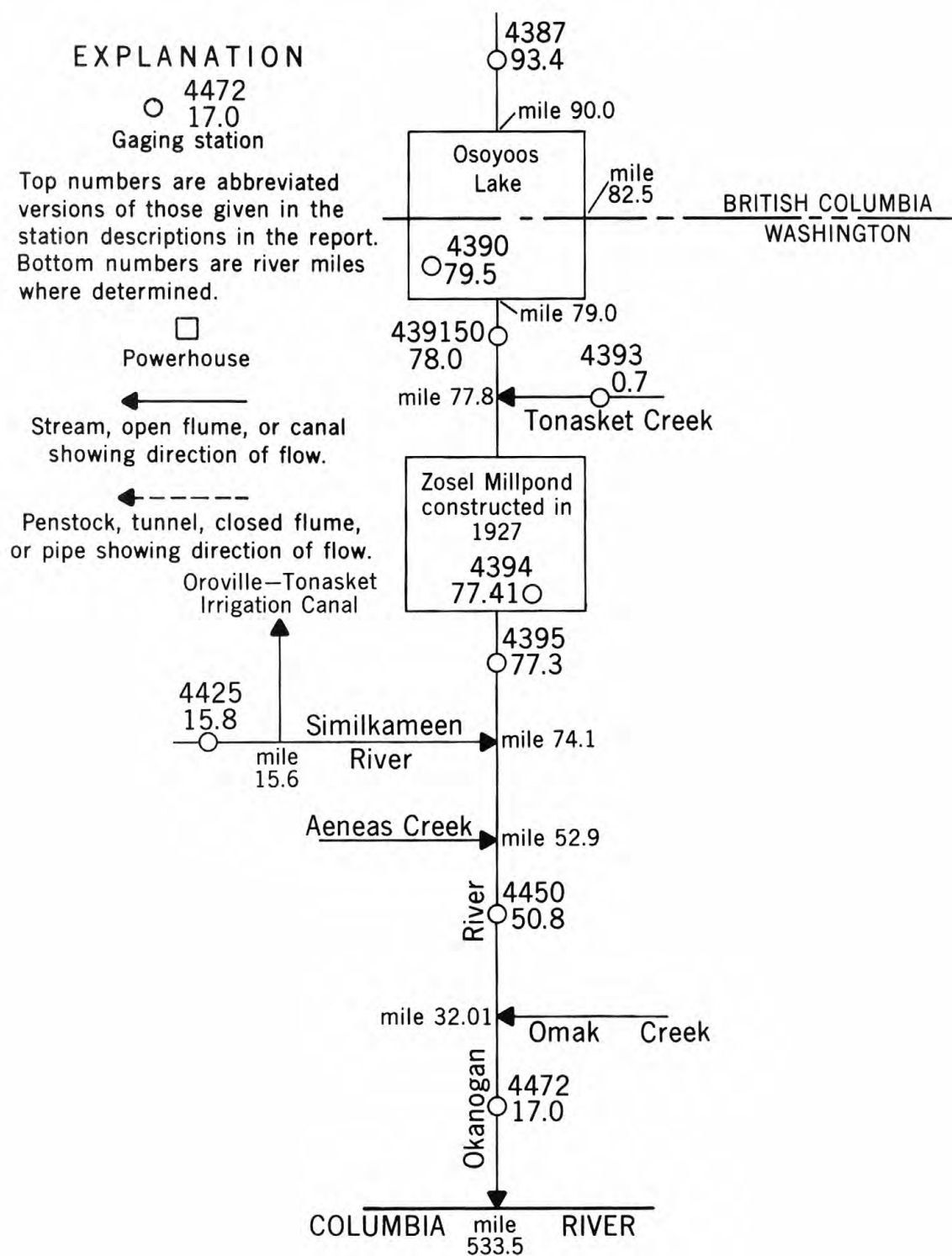


Figure 24.--Gaging stations in Okanogan River basin.

OKANAGAN RIVER BASIN

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

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

DRAINAGE AREA.--2,930 mi².

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 Water Survey of 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.--34 years (water years 1945-47, 1953-56, 1958-84), 647 ft³/s, 468,800 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 3,130 ft³/s May 27, 1974, gage height, 7.07 ft; minimum, 55.9 ft³/s Jan. 30, 1963, gage height, 0.63 ft.

EXTREMES FOR CURRENT YEAR.--Maximum discharge 2,710 ft³/s June 7, gage height, 6.73 ft; minimum daily, 263 ft³/s Dec. 23, 24.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	554	269	305	276	487	1470	597	1480	1750	1330	699	964
2	526	276	297	281	491	1470	597	1530	1920	1260	890	957
3	533	283	306	281	498	1450	597	1510	1890	1250	1010	950
4	551	288	311	335	498	1450	597	1490	1950	1450	1070	939
5	551	277	314	487	498	1450	604	1470	2320	1540	1070	879
6	523	270	316	498	494	1440	678	1460	2330	1870	1070	865
7	501	269	315	505	487	1430	1010	1500	2530	1930	1060	826
8	484	280	310	512	519	1230	1140	1720	2530	1930	1050	742
9	473	279	309	516	777	1090	1250	1810	2040	1910	1030	710
10	466	281	310	519	922	1050	1300	1800	1860	1790	1030	674
11	463	296	305	516	982	1060	1250	1790	1860	1660	1050	568
12	466	289	303	512	964	996	1220	1800	2210	1600	1060	508
13	463	286	302	516	1030	724	1210	1820	2260	1610	1080	498
14	445	287	298	508	1390	597	1200	2020	2260	1620	1060	501
15	434	290	302	508	1510	572	1210	2030	2270	1620	1030	494
16	434	325	302	501	1520	568	1270	1960	2210	1610	1020	487
17	452	332	297	491	1480	572	1310	1970	2100	1650	1020	487
18	455	329	291	487	1480	568	1310	2010	2040	1760	1020	484
19	455	320	284	484	1480	572	1310	2120	2100	1710	1010	480
20	455	315	281	484	1470	576	1340	2230	2220	1670	999	484
21	463	312	272	484	1480	604	1350	2120	2340	1670	953	498
22	466	311	267	484	1470	600	1350	2040	2340	1680	932	533
23	466	308	263	484	1470	607	1320	2060	2220	1650	922	554
24	463	316	263	491	1480	600	1190	2050	2170	1600	932	537
25	459	320	265	494	1470	604	692	2020	2110	1590	936	516
26	455	313	268	491	1470	604	777	2040	1960	1610	925	498
27	459	310	269	487	1480	597	1230	2060	1530	1530	950	491
28	455	308	269	484	1470	604	1390	2110	1330	1100	960	477
29	441	303	270	484	1470	611	1400	2200	1430	960	960	406
30	445	305	271	487	---	611	1390	2370	1450	724	960	385
31	403	---	273	487	---	607	---	1910	---	625	957	---
TOTAL	14659	8947	9008	14574	32237	26984	33089	58500	61530	47509	30715	18392
MEAN	473	298	291	470	1112	870	1103	1887	2051	1533	991	613
MAX	554	332	316	519	1520	1470	1400	2370	2530	1930	1080	964
MIN	403	269	263	276	487	568	597	1460	1330	625	699	385
AC-FT	29080	17750	17870	28910	63940	53520	65630	116000	122000	94230	60920	36480
CAL YR 1983 TOTAL	471597		MEAN	1292	MAX	2810	MIN	263	AC-FT	935400		
WTR YR 1984 TOTAL	356144		MEAN	973	MAX	2530	MIN	263	AC-FT	706400		

OKANOGAN RIVER BASIN

261

12439000 OSOYOOO 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 1.0 mi north of Oroville, 3.0 mi south of international boundary, and at mile 79.5.

DRAINAGE AREA.--3,132 mi².

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

REVISED RECORDS.--WSP 1346: Drainage area. WDR 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 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, nonrecording 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 1.0 mi south of international boundary. All elevations prior to Oct. 1, 1944, at datum 2.39 ft lower. To convert from present datum to Geodetic Survey of Canada 1934 datum, subtract 1.63 ft; 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.

REMARKS.--Approximately 44,000 acres 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 June 2, 3, 1972; minimum, 908.82 ft, present datum, Oct. 14, 1929.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of May 29, 1894, reached an elevation of 918.8 ft plus or minus 0.5 ft, present datum, 1.0 mi below present lake outlet, from floodmark on old Okanogan Hotel Building, documented in 1930 from the diary of Mr. and Mrs. Stansbury, operators of the hotel in 1894.

EXTREMES FOR CURRENT YEAR.--Maximum elevation, 913.61 ft June 8, 9; minimum, 909.87 ft Jan. 4.

ELEVATION (FEET NGVD), WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	910.81	910.39	910.03	909.96	910.42	911.86	910.90	911.80	913.22	912.69	911.94	911.61
2	910.79	910.36	910.00	909.93	910.42	911.86	910.88	911.90	913.13	912.58	911.82	911.63
3	910.76	910.33	909.99	909.93	910.42	911.86	910.87	911.97	913.09	912.46	911.80	911.64
4	910.76	910.30	909.98	909.91	910.42	911.85	910.89	912.01	913.06	912.39	911.82	911.65
5	910.75	910.25	909.98	909.92	910.42	911.85	910.94	912.04	913.13	912.37	911.83	911.65
6	910.74	910.22	909.97	909.98	910.42	911.84	910.99	912.07	913.23	912.42	911.85	911.67
7	910.72	910.18	909.96	910.04	910.41	911.84	911.02	912.07	913.35	912.53	911.83	911.67
8	910.68	910.14	909.96	910.10	910.41	911.81	911.15	912.11	913.54	912.63	911.82	911.63
9	910.67	910.10	909.97	910.16	910.46	911.74	911.26	912.21	913.59	912.72	911.80	911.56
10	910.64	910.09	909.98	910.21	910.56	911.65	911.39	912.30	913.50	912.77	911.79	911.49
11	910.62	910.13	909.98	910.26	910.70	911.58	911.48	912.35	913.37	912.77	911.77	911.41
12	910.60	910.11	909.96	910.30	910.85	911.52	911.55	912.43	913.31	912.76	911.78	911.31
13	910.59	910.09	909.96	910.33	910.97	911.45	911.59	912.48	913.34	912.72	911.75	911.20
14	910.57	910.08	909.96	910.36	911.12	911.34	911.61	912.59	913.37	912.68	911.74	911.11
15	910.54	910.09	909.95	910.37	911.32	911.25	911.64	912.73	913.42	912.68	911.74	911.03
16	910.51	910.11	909.94	910.37	911.49	911.17	911.70	912.79	913.49	912.68	911.73	910.96
17	910.49	910.13	909.93	910.38	911.64	911.13	911.76	912.84	913.49	912.68	911.71	910.90
18	910.48	910.14	909.92	910.40	911.72	911.06	911.80	912.88	913.44	912.69	911.72	910.88
19	910.46	910.14	909.92	910.40	911.76	911.01	911.84	912.93	913.36	912.71	911.69	910.86
20	910.46	910.14	909.97	910.41	911.83	910.96	911.88	913.05	913.32	912.70	911.68	910.84
21	910.45	910.13	910.04	910.41	911.87	911.00	911.90	913.12	913.33	912.67	911.67	910.81
22	910.45	910.11	910.11	910.41	911.87	910.99	911.93	913.14	913.40	912.67	911.66	910.81
23	910.45	910.09	910.10	910.41	911.87	910.99	911.96	913.16	913.42	912.68	911.64	910.82
24	910.44	910.09	910.08	910.41	911.87	910.99	911.94	913.18	913.42	912.67	911.60	910.83
25	910.43	910.09	910.06	910.42	911.87	910.97	911.83	913.17	913.40	912.66	911.59	910.88
26	910.42	910.09	910.07	910.43	911.86	910.98	911.64	913.17	913.33	912.66	911.57	910.92
27	910.42	910.10	910.07	910.43	911.85	910.96	911.56	913.18	913.21	912.65	911.56	910.95
28	910.43	910.09	910.05	910.43	911.86	910.95	911.61	913.18	913.01	912.59	911.57	910.97
29	910.42	910.07	910.03	910.43	911.86	910.94	911.69	913.21	912.88	912.45	911.57	910.97
30	910.41	910.05	910.03	910.43	---	910.93	911.73	913.30	912.79	912.29	911.58	910.96
31	910.41	---	910.00	910.42	---	910.91	---	913.33	---	912.10	911.60	---
MEAN	910.56	910.15	910.00	910.27	911.19	911.33	911.50	912.67	913.30	912.60	911.72	911.19
MAX	910.81	910.39	910.11	910.43	911.87	911.86	911.96	913.33	913.59	912.77	911.94	911.67
MIN	910.41	910.05	909.92	909.91	910.41	910.91	910.87	911.80	912.79	912.10	911.56	910.81

CAL YR 1983 MEAN 911.86 MAX 914.48 MIN 909.92
WTR YR 1984 MEAN 911.37 MAX 913.59 MIN 909.91

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 upstream from Cherry Street Bridge in Oroville, 700 ft upstream from Tonasket Creek, 1.0 mi downstream from Osoyoos Lake, and at mile 78.0.

DRAINAGE AREA.--3,133 m².

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 Washington office.

GAGE.--Water-stage recorder. Datum of gage is at 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 higher and Oct. 1, 1945, to Sept. 30, 1975, at datum 900.00 ft higher. To convert to Geodetic Survey of Canada 1934 datum, subtract 1.63 ft; to convert to 1947 joint adjustment of U.S. Coast and Geodetic Survey and Geodetic Survey of Canada, subtract 0.26 ft.

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

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

EXREMES FOR CURRENT YEAR.--Maximum elevation, 913.04 ft June 16; minimum, 907.86 ft Dec. 21.

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	910.38	910.01	909.66	909.64	910.15	911.36	910.66	911.38	912.62	912.08	911.37	911.23
2	910.36	909.97	909.64	909.61	910.15	911.37	910.65	911.47	912.55	911.97	911.27	911.25
3	910.33	909.94	909.63	909.61	910.16	911.37	910.63	911.55	912.51	911.87	911.29	911.26
4	910.33	909.90	909.61	909.60	910.16	911.36	910.70	911.58	912.48	911.82	911.34	911.27
5	910.31	909.86	909.61	909.64	910.16	911.35	910.78	911.60	912.54	911.79	911.35	911.27
6	910.30	909.82	909.61	909.70	910.16	911.35	910.77	911.63	912.63	911.88	911.38	911.33
7	910.27	909.78	909.59	909.76	910.14	911.35	910.76	911.62	912.75	911.99	911.36	911.30
8	910.23	909.73	909.59	909.82	910.14	911.32	910.88	911.66	912.92	912.09	911.35	911.22
9	910.22	909.69	909.60	909.87	910.19	911.26	910.94	911.75	912.97	912.17	911.33	911.15
10	910.20	909.68	909.62	909.93	910.30	911.18	910.90	911.83	912.88	912.20	911.33	911.06
11	910.18	909.74	909.62	909.99	910.45	911.10	911.12	911.88	912.76	912.20	911.30	910.97
12	910.17	909.71	909.60	910.03	910.59	911.08	911.19	911.94	912.70	912.19	911.32	910.85
13	910.15	909.69	909.60	910.07	910.71	911.07	911.22	911.99	912.73	912.15	911.29	910.74
14	910.14	909.68	909.60	910.09	910.84	911.03	911.24	912.09	912.78	912.11	911.28	910.64
15	910.11	909.69	909.59	910.09	911.03	910.97	911.27	912.21	912.89	912.11	911.28	910.61
16	910.08	909.73	909.59	910.12	911.22	910.90	911.32	912.26	913.02	912.12	911.27	910.54
17	910.06	909.75	909.57	910.13	911.29	910.85	911.36	912.30	912.97	912.11	911.26	910.51
18	910.04	909.77	909.56	910.14	911.29	910.77	911.40	912.33	912.84	912.12	911.29	910.60
19	910.03	909.76	909.60	910.14	911.34	910.72	911.44	912.37	912.74	912.12	911.26	910.59
20	910.03	909.77	909.26	910.14	911.39	910.69	911.48	912.49	912.69	912.12	911.25	910.56
21	910.02	909.76	907.94	910.14	911.40	910.76	911.48	912.55	912.69	912.10	911.24	910.53
22	910.03	909.74	908.74	910.15	911.37	910.75	911.50	912.56	912.75	912.09	911.22	910.53
23	910.04	909.71	909.45	910.16	911.36	910.75	911.54	912.59	912.77	912.08	911.21	910.55
24	910.02	909.72	909.51	910.16	911.37	910.75	911.52	912.60	912.77	912.06	911.17	910.62
25	910.01	909.72	909.51	910.16	911.37	910.73	911.42	912.58	912.74	912.06	911.15	910.70
26	910.00	909.72	909.62	910.17	911.36	910.74	911.25	912.59	912.67	912.06	911.14	910.76
27	910.03	909.73	909.69	910.16	911.35	910.72	911.17	912.60	912.56	912.05	911.12	910.78
28	910.04	909.74	909.70	910.17	911.37	910.71	911.21	912.59	912.38	911.99	911.13	910.78
29	910.											

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 downstream from road bridge, 1.0 mi northeast of Oroville, and 0.7 mi upstream from mouth.

DRAINAGE AREA.--60.1 mi².

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

REVISED RECORDS.--WDR WA-73-1: 1972(M).

GAGE.--Water-stage recorder. Elevation of gage is 960 ft, from topographic map.

REMARKS.--Records fair. Two small diversions for irrigation of 45 acres upstream from station.

AVERAGE DISCHARGE.--17 years, 3.73 ft³/s, 0.84 in/yr, 2,700 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 455 ft³/s Feb. 27, 1973, gage height, 5.47 ft, from rating curve extended above 50 ft³/s on basis of slope-area measurement of peak flow; no flow for many days most years.

EXTREMES OUTSIDE PERIOD OF RECORD.--Peak of Apr. 12, 1950, was 484 ft³/s at site 0.5 mi upstream.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 30 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Dec. 10	0215	----	*a4.07	Apr. 17	0115	56	3.19
Mar. 1	1615	34	3.05	May 5	2230	36	2.91
Mar. 7	2000	35	3.04	May 11	1730	34	2.90
Mar. 12	1915	40	3.09	June 21	2130	35	2.90
Mar. 21	1345	*66	3.39	June 29	1400	40	2.82
Apr. 5	2400	45	3.03				

Minimum daily discharge, 0.40 ft³/s Dec. 28.

a Backwater from ice.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP		
1	3.3	1.9	1.0	1.0	5.0	25	21	29	10	22	1.9	2.1		
2	3.3	2.9	.74	1.4	4.8	22	21	33	9.4	19	3.3	1.7		
3	8.8	4.8	.60	1.8	4.6	21	22	31	9.4	11	3.3	1.5		
4	10	4.4	.49	2.3	4.5	20	21	30	13	9.4	3.3	1.5		
5	5.3	2.1	.46	3.1	4.5	24	32	35	18	9.4	2.4	1.9		
6	2.4	1.9	.47	4.4	4.5	26	38	34	16	8.2	2.1	3.6		
7	2.7	1.5	.48	6.3	4.6	28	34	30	17	7.5	1.7	5.3		
8	2.7	1.2	.49	7.5	5.0	24	35	31	17	6.9	1.4	4.4		
9	2.7	1.1	.51	5.8	6.0	24	34	30	15	6.3	2.9	3.6		
10	2.7	1.1	.53	6.3	5.8	28	33	29	14	5.8	5.8	3.6		
11	4.4	10	.74	6.3	5.2	32	31	29	12	4.8	3.6	3.6		
12	4.4	4.8	.74	6.3	5.0	35	30	30	11	4.4	1.9	3.6		
13	2.7	2.4	.95	5.3	4.7	34	31	25	11	4.4	1.7	4.0		
14	2.9	1.9	.95	3.3	4.5	34	31	24	12	4.0	1.5	4.0		
15	2.9	3.6	.95	2.2	4.4	36	32	22	15	3.6	1.7	3.6		
16	2.9	14	1.7	3.0	4.4	37	37	22	15	3.6	1.5	5.8		
17	3.3	13	1.3	2.3	4.8	37	51	23	14	3.3	1.7	7.5		
18	3.6	10	1.3	1.9	4.8	41	43	22	14	2.9	1.5	6.9		
19	3.6	6.3	1.3	1.3	5.3	47	42	22	13	2.7	1.1	6.9		
20	4.0	5.3	1.4	1.5	6.9	47	44	24	13	2.7	1.1	6.3		
21	3.6	3.3	1.4	1.7	11	46	38	20	22	2.4	.95	5.8		
22	3.3	3.3	1.3	2.5	8.2	40	36	20	30	2.1	.84	6.3		
23	2.9	2.7	1.1	4.0	8.8	38	34	21	22	1.9	.84	6.9		
24	3.3	2.9	.90	5.6	8.8	33	31	20	20	1.7	.95	7.5		
25	3.6	2.7	.70	7.0	8.2	29	29	19	18	1.5	1.4	7.5		
26	3.6	1.7	.60	8.0	14	23	26	18	17	1.5	2.1	7.5		
27	3.3	2.1	.47	8.0	17	20	26	17	17	1.5	1.9	7.5		
28	2.9	1.7	.40	7.4	23	20	29	16	17	1.4	2.1	8.2		
29	2.7	.95	.45	6.8	21	24	29	13	29	1.2	2.4	7.5		
30	2.4	1.7	.60	6.0	---	21	28	14	29	1.2	2.4	6.3		
31	2.1	---	.80	5.4	---	20	---	11	---	1.1	1.9	---		
TOTAL	112.3	117.25	25.82	135.7	219.3	936	969	744	489.8	159.4	63.18	152.4		
MEAN	3.62	3.91	.83	4.38	7.56	30.2	32.3	24.0	16.3	5.14	2.04	5.08		
MAX	10	14	1.7	8.0	23	47	51	35	30	22	5.8	8.2		
MIN	2.1	.95	.40	1.0	4.4	20	21	11	9.4	1.1	.84	1.5		
CFSM	.06	.07	.01	.07	.13	.50	.54	.40	.27	.09	.03	.08		
IN.	.07	.07	.02	.08	.14	.58	.60	.46	.30	.10	.04	.09		
AC-FT	223	233	51	269	435	1860	1920	1480	972	316	125	302		
CAL YR 1983	TOTAL	3521.15	MEAN	9.65	MAX	79	MIN	.40	CFSM	.16	IN.	2.18	AC-FT	6980
WTR YR 1984	TOTAL	4124.15	MEAN	11.3	MAX	51	MIN	.40	CFSM	.19	IN.	2.55	AC-FT	8180

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 downstream from Tonasket Creek, 1.6 mi downstream from Osoyoos Lake, and at mile 77.41.

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 Washington office.

GAGE.--Water-stage recorder. Datum of gage is at 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 higher and Oct. 1, 1945, to Sept. 30, 1975, at datum 900.00 ft higher. To convert to Geodetic Survey of Canada 1934 datum, subtract 1.63 ft; to convert to 1947 joint adjustment of U.S. Coast and Geodetic Survey and Geodetic Survey of Canada, subtract 0.26 ft.

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

ELEVATION (FEET NGVD), WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	909.98	909.67	909.25	909.31	909.91	910.65	910.26	910.39	911.62	910.87	910.42	910.77
2	909.97	909.62	909.23	909.29	909.91	910.66	910.25	910.47	911.53	910.76	910.35	910.79
3	909.94	909.58	909.23	909.30	909.92	910.66	910.25	910.55	911.47	910.73	910.46	910.80
4	909.94	909.54	909.20	909.31	909.92	910.65	910.46	910.57	911.44	910.74	910.63	910.81
5	909.94	909.50	909.21	909.37	909.91	910.65	910.60	910.60	911.49	910.77	910.66	910.81
6	909.93	909.46	909.20	909.45	909.91	910.65	910.38	910.63	911.57	911.02	910.70	910.94
7	909.91	909.42	909.19	909.51	909.89	910.65	910.24	910.62	911.70	911.15	910.69	910.86
8	909.86	909.37	909.19	909.58	909.89	910.62	910.38	910.66	911.91	911.26	910.69	910.70
9	909.86	909.32	909.20	909.63	909.94	910.56	910.28	910.75	911.93	911.32	910.68	910.62
10	909.84	909.33	909.22	909.70	910.05	910.48	910.26	910.78	911.82	911.35	910.69	910.51
11	909.82	909.39	909.22	909.76	910.20	910.40	910.35	910.81	911.69	911.32	910.67	910.41
12	909.81	909.36	909.20	909.80	910.34	910.48	910.42	910.88	911.64	911.31	910.69	910.25
13	909.79	909.35	909.19	909.84	910.46	910.56	910.40	910.93	911.71	911.26	910.67	910.12
14	909.78	909.33	909.20	909.86	910.58	910.65	910.39	911.04	911.85	911.23	910.66	910.02
15	909.75	909.35	909.19	909.86	910.76	910.64	910.42	911.17	912.13	911.25	910.67	910.10
16	909.72	909.37	909.19	909.89	910.93	910.54	910.40	911.22	912.36	911.25	910.65	910.03
17	909.70	909.39	909.17	909.90	910.89	910.50	910.41	911.27	912.19	911.24	910.67	910.05
18	909.68	909.38	909.16	909.90	910.75	910.42	910.45	911.30	911.87	911.23	910.75	910.36
19	909.67	909.37	909.21	909.90	910.80	910.38	910.49	911.34	911.68	911.20	910.72	910.34
20	909.68	909.38	908.61	909.90	910.85	910.32	910.52	911.47	911.59	911.20	910.70	910.31
21	909.67	909.36	906.28	909.90	910.73	910.36	910.52	911.55	911.59	911.18	910.69	910.28
22	909.68	909.34	907.40	909.90	910.63	910.32	910.55	911.55	911.65	911.18	910.67	910.28
23	909.68	909.32	908.88	909.91	910.63	910.34	910.57	911.58	911.68	911.14	910.66	910.31
24	909.66	909.31	908.98	909.91	910.63	910.34	910.52	911.59	911.68	911.10	910.62	910.46
25	909.65	909.32	908.98	909.92	910.63	910.32	910.43	911.57	911.64	911.12	910.60	910.58
26	909.64	909.31	909.12	909.93	910.63	910.34	910.25	911.57	911.55	911.11	910.59	910.64
27	909.68	909.33	909.22	909.92	910.62	910.31	910.17	911.58	911.41	911.08	910.57	910.65
28	909.69	909.33	909.25	909.93	910.65	910.30	910.22	911.57	911.21	911.01	910.58	910.65
29	909.69	909.30	909.25	909.93	910.66	910.31	910.29	911.60	911.09	910.88	910.59	910.66
30	909.67	909.28	909.27	909.92	---	910.28	910.33	911.69	910.98	910.73	910.68	910.65
31	909.67	---	909.29	909.92	---	910.28	---	911.74	---	910.55	910.76	---
MEAN	909.77	909.39	909.01	909.75	910.40	910.47	910.38	911.13	911.66	911.08	910.64	910.49
MAX	909.98	909.67	909.29	909.93	910.93	910.66	910.60	911.74	912.36	911.35	910.76	910.94
MIN	909.64	909.28	906.28	909.29	909.89	910.28	910.17	910.39	910.98	910.55	910.35	910.02
CAL YR 1983	MEAN 910.61		MAX 913.80		MIN 906.28							
WTR YR 1984	MEAN 910.35		MAX 912.36		MIN 906.28							

OKANOGAN RIVER BASIN

265

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 downstream from Burlington Northern trestle, 0.5 mi downstream from Tonasket Creek, 1.7 mi downstream from Osoyoos Lake, 3.2 mi upstream from Similkameen River, and at mile 77.3.

DRAINAGE AREA.--3,195 mi².

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

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

GAGE.--Water-stage recorder. Datum of gage is National Geodetic Vertical Datum of 1929. Prior to Oct. 26, 1944, nonrecording gage at Zosel milldam 200 ft upstream, Oct. 26, 1944, to Mar. 6, 1948, water-stage recorder on railroad trestle 20 ft upstream, and Mar. 7, 1948, to Sept. 30, 1981, at present site, all at datum 900.00 ft higher. Auxiliary water-stage recorder 0.5 mi downstream at National Geodetic Vertical Datum of 1929, used during high-water periods. May 15, 1946, to Apr. 9, 1948, nonrecording gage at same site, and Apr. 10, 1948, to Sept. 30, 1981, at present site, both at datum 900.00 ft higher. To convert to 1947 joint adjustment of U.S. Coast and Geodetic Survey and Geodetic Survey of Canada, subtract 0.26 ft.

REMARKS.--Records good. Diversions made to irrigate approximately 44,000 acres in Canada and minor diversions in the United States above station. Natural regulation in several large lakes and artificial regulation in Okanogan Lake 46.7 mi upstream for flood control and irrigation; also regulated by Zosel milldam at Oroville, 200 ft above gage.

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

AVERAGE DISCHARGE.--42 years, 699 ft³/s, 506,400 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 3,730 ft³/s June 14, 1972; maximum gage height, 16.89 ft June 2, 1972, at datum then in use (backwater from Similkameen River); minimum daily discharge, 2,270 ft³/s reverse flow May 29, 1948; minimum gage height, 3.98 ft Mar. 1, 1948, at datum then in use.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 2,630 ft³/s May 30; maximum elevation, 911.79 ft June 16 (backwater from Similkameen River); minimum discharge, 12 ft³/s Dec. 21, elevation, 905.32 ft.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	645	502	396	411	540	1500	763	1400	2380	1670	1170	917
2	639	493	390	409	543	1500	745	1450	2310	1610	1120	923
3	626	484	390	407	543	1500	727	1510	2210	1530	1090	930
4	625	477	385	404	543	1490	643	1530	2120	1480	1060	930
5	618	465	386	513	543	1490	614	1550	2130	1450	1070	930
6	616	456	384	537	542	1490	775	1570	2200	1420	1090	891
7	608	446	381	418	538	1480	841	1580	2280	1460	1090	923
8	593	433	381	429	553	1470	891	1610	2420	1510	1090	962
9	593	423	384	447	581	1430	988	1670	2460	1570	1080	943
10	587	420	388	464	614	1380	1090	1750	2380	1600	1090	917
11	582	434	388	478	667	1340	1130	1800	2270	1610	1070	897
12	572	427	385	490	751	1250	1170	1860	2220	1620	1090	865
13	565	423	384	497	799	1160	1200	1900	2250	1580	1070	841
14	561	419	385	502	847	1030	1230	1990	2230	1550	1060	805
15	554	420	382	505	924	949	1240	2090	2130	1530	1060	739
16	545	427	381	512	1010	910	1300	2140	2070	1540	1050	715
17	538	430	380	509	1170	891	1360	2170	2170	1530	1030	661
18	532	427	379	515	1320	859	1380	2200	2280	1550	1030	564
19	520	422	380	519	1350	847	1410	2230	2260	1580	1010	559
20	520	425	136	521	1390	829	1430	2320	2230	1570	1010	548
21	516	420	23	521	1490	823	1430	2380	2230	1560	1000	537
22	520	414	213	523	1510	805	1450	2380	2270	1550	995	531
23	520	410	480	526	1510	805	1480	2400	2280	1560	988	520
24	514	410	519	527	1510	805	1480	2410	2270	1560	975	443
25	511	410	477	533	1510	793	1410	2400	2240	1550	969	403
26	504	410	521	536	1500	799	1300	2400	2170	1550	956	407
27	509	410	523	537	1480	787	1250	2400	2070	1550	943	425
28	510	413	504	537	1490	787	1280	2400	1900	1510	949	448
29	509	407	492	543	1500	781	1330	2420	1810	1440	956	449
30	506	403	479	542	---	775	1350	2510	1730	1350	930	444
31	505	---	424	542	---	769	---	2470	---	1250	917	---
TOTAL	17263	12960	12100	15354	29268	33524	34687	62890	65970	47390	32008	21067
MEAN	557	432	390	495	1009	1081	1156	2029	2199	1529	1033	702
MAX	645	502	523	543	1510	1500	1480	2510	2460	1670	1170	962
MIN	504	403	23	404	538	769	614	1400	1730	1250	917	403
AC-FT	34240	25710	24000	30450	58050	66490	68800	124700	130900	94000	63490	41790
CAL YR 1983	TOTAL	513676	MEAN	1407	MAX	3140	MIN	23	AC-FT	1019000		
WTR YR 1984	TOTAL	384481	MEAN	1050	MAX	2510	MIN	23	AC-FT	762600		

OKANOGAN RIVER BASIN

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 upstream from Oroville-Tonasket Irrigation District canal intake, 1.6 mi northeast of Nighthawk, 3.8 mi downstream from Palmer Creek, and at mile 15.8.

DRAINAGE AREA.--3,550 mi², 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 upstream.

REVISED RECORDS.--WSP 1183: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 1,137.70 ft National Geodetic Vertical Datum of 1929, international joint adjustment of 1947. Prior to Sept. 11, 1928, staff gages at sites 7 mi 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 in the United States in 1946 and approximately 10,500 acres in Canada in 1957. National Weather Service satellite telemeter at station.

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

AVERAGE DISCHARGE.--73 years, 2,300 ft³/s, 1,666,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 45,800 ft³/s June 1, 1972; maximum gage height, 18.78 ft May 31, 1972; minimum discharge, 65 ft³/s Jan. 3, 1974, gage height, 1.59 ft, result of freezeup.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 15,300 ft³/s June 16, gage height, 11.26 ft; minimum daily discharge, 200 ft³/s Dec. 23.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	677	653	674	691	1520	795	1090	1500	7220	7700	1380	674
2	671	750	534	712	1440	779	1090	1490	6580	7040	1390	644
3	666	791	493	740	1400	766	1050	1480	6330	6600	1510	662
4	660	977	479	754	1330	750	1070	1450	6170	6260	1600	650
5	658	1690	552	3890	1260	732	1080	1430	7240	6030	1530	615
6	674	1470	566	4770	1180	741	1100	1390	7940	5720	1410	595
7	672	1260	526	3240	1170	761	1080	1370	8660	5270	1500	590
8	657	1140	501	2810	1140	763	1060	1430	9860	4700	1350	662
9	647	1050	491	2940	1130	772	1040	1710	9550	4300	1230	650
10	648	1010	547	3620	1110	801	1030	1960	9310	4070	1130	638
11	645	993	639	3500	1070	859	1010	1900	9400	3850	1090	638
12	640	946	684	3030	1050	909	1010	1950	9820	3610	1040	644
13	640	937	672	2700	1030	925	979	2190	11000	3450	1090	620
14	628	922	658	2400	1010	924	972	2530	12500	3250	1190	600
15	610	897	652	1970	979	921	972	2940	14200	3090	1080	580
16	598	893	659	1570	962	901	1210	2860	15000	2940	993	565
17	586	1010	450	1480	918	914	1780	2790	13600	2820	923	545
18	574	1150	350	1230	872	906	1800	2740	12100	2690	874	530
19	562	1100	300	1070	842	902	1780	2820	11100	2520	836	510
20	568	1050	250	910	867	911	1750	3370	10500	2340	800	485
21	574	997	230	1030	905	1010	1720	3710	10400	2190	776	480
22	586	969	220	1180	906	1140	1740	3480	10500	2080	740	500
23	610	926	200	1400	863	1230	1790	3360	11000	1970	710	555
24	782	919	250	1580	845	1220	1710	3330	11000	1850	674	570
25	768	899	300	1610	834	1210	1640	3220	10900	1760	656	638
26	712	884	400	1640	813	1190	1600	3120	10600	1730	638	580
27	697	877	440	1640	787	1140	1530	3090	10200	1710	632	565
28	700	862	500	1620	765	1120	1510	3270	9510	1660	644	550
29	693	842	560	1730	807	1110	1520	4020	9600	1570	800	540
30	674	805	622	1930	---	1100	1490	6300	9100	1520	812	530
31	659	---	664	1770	---	1080	---	8220	---	1450	734	---
TOTAL	20136	29669	15063	61157	29805	29282	40203	86420	300890	107740	31762	17605
MEAN	650	989	486	1973	1028	945	1340	2788	10030	3475	1025	587
MAX	782	1690	684	4770	1520	1230	1800	8220	15000	7700	1600	674
MIN	562	653	200	691	765	732	972	1370	6170	1450	632	480
AC-FT	39940	58850	29880	121300	59120	58080	79740	171400	596800	213700	63000	34920
CAL YR 1983	TOTAL	882404	MEAN	2418	MAX	20200	MIN	200	AC-FT	1750000		
WTR YR 1984	TOTAL	769732	MEAN	2103	MAX	15000	MIN	200	AC-FT	1527000		

OKANOGAN RIVER BASIN

267

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 upstream from Chewiliken Creek, 5.2 mi south of Tonasket, and at mile 50.8.

DRAINAGE AREA.--7,260 mi², 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 National Geodetic Vertical Datum of 1929.

REMARKS.--Records good. Diversions above station for irrigation of about 10,700 acres in the United States and 55,000 acres in Canada. Flow affected by regulation of Okanogan and Skaha Lakes and by natural storage in other lakes.

AVERAGE DISCHARGE.--55 years, 2,969 ft³/s, 2,151,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 44,700 ft³/s June 2, 1972, gage height, 22.54 ft; minimum recorded, 126 ft³/s Sept. 5, 1931, gage height, 3.43 ft.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 16,300 ft³/s June 17, gage height, 14.15 ft³/s, from high-water mark; minimum daily, 280 ft³/s Dec. 21.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1320	1220	1260	1100	2340	2340	1970	3080	10000	9560	2450	1460
2	1290	1230	1150	1100	2220	2340	1960	3170	9000	8240	2360	1440
3	1280	1290	1030	1100	2120	2320	1950	3200	8800	7680	2420	1420
4	1270	1320	991	1100	2060	2300	1940	3200	8500	7260	2480	1450
5	1260	1600	967	1100	1990	2290	1840	3220	8500	6980	2520	1410
6	1250	2120	1010	5160	1930	2280	1890	3230	10000	6680	2420	1390
7	1250	1870	1030	4630	1840	2290	2040	3190	11000	6410	2370	1330
8	1250	1690	1000	3570	1810	2300	2090	3150	12000	6010	2360	1440
9	1230	1580	985	3190	1790	2290	2110	3240	12500	5620	2210	1500
10	1210	1510	985	3450	1780	2270	2240	3490	11500	5390	2090	1450
11	1210	1540	1020	3960	1780	2260	2280	3700	11000	5220	2020	1420
12	1210	1480	1100	3740	1800	2260	2310	3750	12000	5020	1970	1390
13	1210	1430	1140	3550	1830	2220	2320	3850	13000	4810	1950	1380
14	1210	1410	1130	3390	1840	2140	2340	3990	13500	4630	2010	1320
15	1200	1410	1120	3070	1880	1980	2340	4570	14500	4470	2020	1260
16	1190	1410	1100	2700	1930	1940	2420	4810	15500	4300	1910	1210
17	1180	1410	1060	2300	1990	1920	2870	4830	16000	4160	1850	1180
18	1160	1530	925	2000	2160	1900	3340	4850	15000	4060	1750	1060
19	1160	1620	700	1800	2180	1860	3340	4970	13500	3990	1700	991
20	1160	1580	400	1500	2210	1840	3320	5300	12500	3810	1650	973
21	1160	1510	280	1700	2290	1940	3330	5970	12100	3660	1600	967
22	1160	1460	480	1900	2400	2040	3340	5920	12100	3530	1560	979
23	1180	1430	580	2100	2400	2100	3370	5820	12300	3450	1520	1020
24	1200	1410	640	2100	2390	2170	3410	5750	12700	3300	1490	1070
25	1290	1400	740	2200	2370	2150	3360	5670	12600	3180	1450	1010
26	1290	1370	840	2200	2360	2150	3220	5550	12200	3140	1440	1030
27	1270	1360	940	2200	2330	2100	3050	5480	11900	3090	1410	1010
28	1250	1350	1000	2300	2300	2060	2970	5450	11200	3070	1410	1010
29	1250	1330	1000	2400	2300	2040	3000	5840	10600	2930	1430	1010
30	1250	1290	1000	2450	---	2020	3050	7070	10800	2770	1580	998
31	1240	---	1100	2430	---	1990	---	10500	---	2600	1520	---
TOTAL	38040	44160	28703	77490	60620	66100	79010	145810	356800	149020	58920	36578
MEAN	1227	1472	926	2500	2090	2132	2634	4704	11890	4807	1901	1219
MAX	1320	2120	1260	5160	2400	2340	3410	10500	16000	9560	2520	1500
MIN	1160	1220	280	1100	1780	1840	1840	3080	8500	2600	1410	967
AC-FT	75450	87590	56930	153700	120200	131100	156700	289200	707700	295600	116900	72550
CAL YR 1983	TOTAL	1379723	MEAN	3780	MAX	22300	MIN	280	AC-FT	2737000		
WTR YR 1984	TOTAL	1141251	MEAN	3118	MAX	16000	MIN	280	AC-FT	2264000		

NOTE.--No gage-height record June 6-20.

OKANOGAN RIVER BASIN

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 17020006, on right bank 75 ft upstream from highway bridge at Malott, 0.1 mi upstream from Loup Loup Creek, and at mile 17.0.

DRAINAGE AREA.--8,080 mi², 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 National Geodetic Vertical Datum of 1929. April 1958 to November 1965, water-stage recorder at site 3.9 mi downstream at National Geodetic Vertical Datum of 1929.

REMARKS.--Water-discharge records excellent. Diversions above station for irrigation of about 22,000 acres in the United States and 55,000 acres in Canada. Flow regulated by Okanogan and Skaha Lakes and by natural storage in other lakes.

AVERAGE DISCHARGE.--26 years, 3,142 ft³/s, 2,276,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 45,600 ft³/s June 3, 1972, gage height, 22.16 ft; minimum observed, 288 ft³/s Sept. 4, 1970, gage height, 2.03 ft.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 16,300 ft³/s June 17, gage height, 12.59 ft; minimum daily, 300 ft³/s Dec. 21.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1470	1420	1490	1200	2500	2580	2520	3620	10700	10600	2710	1640
2	1460	1440	1440	1200	2500	2600	2500	3860	9820	9260	2600	1590
3	1440	1480	1330	1200	2410	2580	2490	3820	9280	8510	2530	1570
4	1440	1530	1210	1200	2310	2540	2490	3740	9100	7990	2630	1560
5	1420	1550	1190	1500	2190	2530	2480	3700	9160	7630	2700	1570
6	1400	2070	1190	2390	2180	2530	2470	3680	10100	7340	2660	1560
7	1400	2140	1240	7210	2080	2530	2500	3650	10700	7030	2500	1530
8	1420	1940	1240	6620	2070	2540	2540	3590	11600	6650	2540	1500
9	1390	1820	1210	4150	2060	2560	2530	3650	12600	6220	2430	1600
10	1370	1760	1220	3880	2060	2570	2670	3960	12300	5880	2280	1630
11	1370	1830	1210	6010	2050	2560	2760	4340	12000	5660	2190	1570
12	1380	1770	1270	6110	2060	2560	2800	4370	11800	5470	2130	1560
13	1380	1690	1360	5200	2110	2560	2810	4440	12100	5210	2110	1540
14	1380	1660	1360	4300	2120	2480	2780	4770	13100	5030	2080	1510
15	1370	1700	1340	3600	2140	2410	2830	5180	14300	4810	2170	1470
16	1360	1800	1310	3100	2190	2360	2940	5610	15500	4600	2110	1400
17	1350	1840	1200	2600	2230	2400	3250	5570	16200	4420	2020	1360
18	1340	1810	1100	2300	2350	2400	3890	5500	15500	4290	1980	1320
19	1330	1890	1000	2000	2470	2350	4070	5540	14100	4230	1880	1180
20	1330	1880	600	1600	2490	2350	4040	5810	13100	4100	1830	1140
21	1320	1830	300	1800	2540	2660	4020	6380	12900	3910	1780	1130
22	1320	1770	400	2000	2630	2840	3970	6690	12900	3770	1740	1140
23	1330	1720	600	2200	2670	2830	3990	6560	12900	3660	1690	1170
24	1340	1740	800	2200	2690	2870	4020	6470	13200	3570	1650	1210
25	1390	1710	900	2200	2650	2830	3890	6380	13200	3420	1620	1240
26	1490	1660	1000	2300	2620	2800	3740	6290	12900	3350	1580	1200
27	1450	1650	1000	2300	2600	2690	3530	6170	12600	3300	1580	1200
28	1420	1640	1100	2300	2560	2630	3410	6110	12000	3260	1560	1180
29	1420	1600	1100	2400	2560	2600	3440	6310	11300	3200	1560	1190
30	1420	1550	1200	2500	---	2560	3480	7160	11400	3060	1620	1180
31	1420	---	1200	2500	---	2540	---	9440	---	2880	1720	---
TOTAL	43120	51890	34110	92070	68090	79840	94850	162360	368360	162310	64180	41640
MEAN	1391	1730	1100	2970	2348	2575	3162	5237	12280	5236	2070	1388
MAX	1490	2140	1490	7210	2690	2870	4070	9440	16200	10600	2710	1640
MIN	1320	1420	300	1200	2050	2350	2470	3590	9100	2880	1560	1130
AC-FT	85530	102900	67660	182600	135100	158400	188100	322000	730600	321900	127300	82590
CAL YR 1983	TOTAL	1524600	MEAN	4177	MAX	22000	MIN	300	AC-FT	3024000		
WTR YR 1984	TOTAL	1262820	MEAN	3450	MAX	16200	MIN	300	AC-FT	2505000		

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. Published as "near Brewster" prior to 1964 and as "near Malott" 1963-66 (station 12447300).

PERIOD OF DAILY RECORD.--

WATER TEMPERATURE: November 1969 to June 1971.

WATER QUALITY DATA, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984

		STREAM- FLOW, INSTAN- TANEOUS (CFS)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH (STAND- ARD UNITS)	TEMPER- ATURE (DEG C)	TUR- BID- ITY (NTU)	OXYGEN, DIS- SOLVED (MG/L)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION)	COLI- FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)	STREP- TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML)	HARD- NESS (MG/L AS CACO3)	HARD- NESS NONCAR- BONATE (MG/L AS CACO3)
DATE	TIME											
OCT , 1983												
13...	1500	1380	300	8.3	11.5	1.6	10.7	102	600	52	140	18
FEB , 1984												
08...	1200	2070	253	8.0	.5	3.6	13.4	96	K4	60	110	8
JUN												
20...	0800	13200	122	8.2	13.5	13	10.0	99	76	960	56	7
AUG												
17...	0900	2040	248	8.2	22.0	2.1	8.0	95	K20	52	110	13
	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)
DATE												
OCT , 1983												
13...	38	11	11	14	.4	2.4	123	37	3.1	.20	10	
FEB , 1984												
08...	32	8.4	8.2	13	.3	1.7	107	27	2.0	.20	9.8	
JUN												
20...	16	3.8	4.1	14	.2	.90	49	12	1.3	.10	9.4	
AUG												
17...	32	8.2	8.3	13	.4	4.8	101	26	1.9	.20	9.2	
	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L)	SOLIDS, SUM OF CONSTITUENTS, DIS- SOLVED (MG/L)	SOLIDS, DIS- SOLVED (TONS PER AC-FT)	SOLIDS, DIS- SOLVED (TONS PER DAY)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N)	NITRO- GEN,AM- MONIA + ORGANIC TOTAL (MG/L AS N)	PHOS- PHORUS, DIS- SOLVED TOTAL (MG/L AS P)	PHOS- PHORUS, DIS- SOLVED (MG/L AS P)	PHOS- PHORUS, DIS- SOLVED (MG/L AS P)	ALUM- INUM, DIS- SOLVED (UG/L AS AL)	
DATE												
OCT , 1983												
13...	183	190	.25	682	<.10	.100	.80	<.010	<.010	<.010	<10	
FEB , 1984												
08...	150	150	.20	838	.14	.040	.40	.010	<.010	<.010	10	
JUN												
20...	89	78	.12	3170	<.10	.100	.70	.050	.010	.020	60	
AUG												
17...	147	150	.20	810	.12	.010	.30	.010	<.010	<.010	10	

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

OKANOGAN RIVER BASIN

12447200 OKANOGAN RIVER AT MALOTT, WA--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984

DATE	ARSENIC DIS- SOLVED (UG/L AS AS)	BARIUM, DIS- SOLVED (UG/L AS BA)	BERYL- LIUM, DIS- SOLVED (UG/L AS BE)	CADMIUM DIS- SOLVED (UG/L AS CD)	CHRO- MIUM, DIS- SOLVED (UG/L AS CR)	COBALT, DIS- SOLVED (UG/L AS CO)	COPPER, DIS- SOLVED (UG/L AS CU)	IRON, DIS- SOLVED (UG/L AS FE)	LEAD, DIS- SOLVED (UG/L AS PB)	LITHIUM DIS- SOLVED (UG/L AS LI)	MANGA- NESE, DIS- SOLVED (UG/L AS MN)
OCT , 1983 13...	3	45	<.5	1	<1	<3	10	8	10	9	9
FEB , 1984 08...	4	37	<.5	<1	<1	<3	<1	16	5	7	11
JUN 20...	2	21	1.0	1	<1	<3	7	59	5	<4	60
AUG 17...	4	33	<.5	<1	<1	<3	2	<3	8	9	3
DATE	MERCURY DIS- SOLVED (UG/L AS HG)	MOLYB- DENUM, DIS- SOLVED (UG/L AS MO)	NICKEL, DIS- SOLVED (UG/L AS NI)	SELE- NIUM, DIS- SOLVED (UG/L AS SE)	SILVER, DIS- SOLVED (UG/L AS AG)	STRON- TIUM, DIS- SOLVED (UG/L AS SR)	VANA- DIUM, DIS- SOLVED (UG/L AS V)	ZINC, DIS- SOLVED (UG/L AS ZN)	SEDI- MENT, SUS- PENDE (MG/L)	SEDI- MENT, DIS- CHARGE, SUS- PENDE (T/DAY)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM
OCT , 1983 13...	1.6	<10	3	<1	<1	330	<6	15	6	22	--
FEB , 1984 08...	<.1	<10	2	<1	<1	260	<6	3	20	112	--
JUN 20...	<.1	<10	1	<1	<1	130	<6	10	145	5170	40
AUG 17...	<.1	<10	1	<1	11	260	<6	12	8	44	--

METHOW RIVER BASIN

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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 upstream from Blizzard Creek, 3.5 mi upstream from mouth, and 20 mi northeast of Mazama.

DRAINAGE AREA.--22.1 mi².

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. Elevation of gage is 4,300 ft, from topographic map.

REMARKS.--Water-discharge records good except those for Dec. 20 to Feb. 7, which are fair. No regulation or diversion.

AVERAGE DISCHARGE.--16 years, 33.1 ft³/s, 20.34 in/yr, 23,980 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,120 ft³/s June 10, 1972, gage height, 4.00 ft, from rating curve extended above 440 ft³/s; minimum, 1.2 ft³/s Nov. 4, 1968, Nov. 20, 1970, Apr. 7, 1975; minimum gage height, 0.27 ft Mar. 25-29, Apr. 6, 7, 1975.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 200 ft³/s and maximum (*), from high-water mark:

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
May 30	1700	208	2.47	June 23	1800	352	2.95
June 14	1800	*378	*3.02				

Minimum discharge, 3.7 ft³/s Nov. 29, gage height, 0.35 ft.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP		
1	10	8.4	7.0	8.0	6.6	4.8	7.3	16	105	153	25	11		
2	10	9.8	8.7	8.4	6.6	4.8	7.3	17	104	142	24	10		
3	11	16	8.1	9.6	6.6	4.8	7.3	16	95	135	24	9.7		
4	10	19	7.6	11	6.6	4.6	7.3	16	107	132	23	9.1		
5	10	14	7.8	17	6.6	4.6	7.3	16	107	129	24	9.3		
6	9.8	13	7.8	26	6.6	4.8	7.3	16	111	108	23	10		
7	9.2	11	7.3	21	6.5	4.8	7.3	18	110	95	21	9.1		
8	9.5	11	7.8	17	6.5	4.8	7.3	20	96	86	20	8.8		
9	9.2	11	7.8	15	6.5	5.5	7.3	21	90	82	19	8.2		
10	8.9	10	7.8	14	6.5	5.7	7.3	20	94	77	19	8.2		
11	8.7	11	7.6	13	6.5	5.7	7.2	20	108	73	19	8.1		
12	9.2	10	7.6	12	6.5	5.7	7.3	21	143	67	18	7.7		
13	8.7	10	7.3	11	6.5	5.7	7.0	24	195	62	19	7.6		
14	8.4	10	7.3	10	6.5	5.7	7.2	29	261	57	17	7.3		
15	7.8	10	7.0	9.8	6.2	5.7	9.2	28	284	54	17	7.0		
16	6.8	11	6.8	9.4	6.2	5.7	15	27	269	51	16	6.8		
17	7.0	11	6.8	8.8	6.0	6.0	18	27	232	48	16	6.5		
18	7.0	10	6.5	8.4	6.2	5.7	16	30	221	44	15	6.0		
19	7.0	9.2	6.5	8.0	6.0	5.7	16	37	208	41	14	5.7		
20	7.0	10	6.4	7.6	6.0	6.2	16	42	222	38	14	5.6		
21	7.3	9.5	6.2	7.4	5.7	8.9	16	38	220	36	13	6.3		
22	10	9.5	5.8	7.0	5.7	7.6	17	37	245	34	13	6.4		
23	8.9	9.2	5.6	6.8	5.5	7.6	17	36	283	32	12	6.8		
24	6.8	8.7	5.8	6.8	5.3	7.3	17	35	276	30	12	6.4		
25	8.4	9.8	6.0	6.6	5.3	7.3	17	34	268	29	13	6.3		
26	7.8	9.2	6.2	6.6	5.3	7.0	16	34	265	30	12	6.4		
27	7.8	8.9	6.6	6.6	5.0	7.0	16	37	248	28	15	6.2		
28	6.8	8.7	7.0	6.6	5.0	7.0	16	50	269	26	13	5.8		
29	6.8	5.5	7.2	6.8	4.8	7.0	16	83	256	27	12	5.9		
30	7.3	7.6	7.4	6.8	---	7.0	16	152	182	28	11	5.9		
31	8.4	---	7.8	6.6	---	7.3	---	130	---	25	11	---		
TOTAL	261.5	312.0	219.1	319.6	175.8	188.0	355.9	1127	5674	1999	524	224.1		
MEAN	8.44	10.4	7.07	10.3	6.06	6.06	11.9	36.4	189	64.5	16.9	7.47		
MAX	11	19	8.7	26	6.6	8.9	18	152	284	153	25	11		
MIN	6.8	5.5	5.6	6.6	4.8	4.6	7.0	16	90	25	11	5.6		
CFSM	.38	.47	.32	.47	.27	.27	.54	1.65	8.55	2.92	.76	.34		
IN.	.44	.53	.37	.54	.30	.32	.60	1.90	9.55	3.36	.88	.38		
AC-FT	519	619	435	634	349	373	706	2240	11250	3970	1040	445		
CAL YR 1983	TOTAL	13342.3	MEAN	36.6	MAX	350	MIN	4.1	CFSM	1.66	IN.	22.46	AC-FT	26460
WTR YR 1984	TOTAL	11380.0	MEAN	31.1	MAX	284	MIN	4.6	CFSM	1.41	IN.	19.16	AC-FT	22570

METHOW RIVER BASIN

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 1983 TO SEPTEMBER 1984

DATE	TIME	STREAM- FLOW, INSTAN- TANEOUS (CFS)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH (STAND- ARD UNITS)	TEMPER- ATURE (DEG C)	TUR- BID- ITY (NTU)	OXYGEN, DIS- SOLVED (MG/L)	OXYGEN, (PER- CENT SATUR- ATION)	COLI- FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)	STREP- TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML)	HARD- NESS (MG/L AS CACO3)
OCT 1983 13...	11:00	8.6	51	7.8	3.0	0.5	11.6	101	K2	K10	21
FEB 1984 07...	12:00	6.4	48	7.5	0.5	1.7	13.1	--	<1	K6	21
JUN 19...	11:00	189	24	7.5	3.0	0.4	11.7	102	<1	K4	10
AUG 15...	11:30	16	50	7.5	8.5	0.5	10.3	--	K5	32	22
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)	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 1983 13...	21	6.7	1.0	2.2	18	0.2	0.7	1.5	0.2	<0.1	10
FEB 1984 07...	21	6.8	0.98	2.2	18	0.2	0.5	1.3	0.5	<0.1	10
JUN 19...	10	3.1	0.5	1.2	21	0.2	0.1	2.0	0.6	<0.1	7.5
AUG 15...	22	7.0	1.0	2.1	17	0.2	0.6	1.2	<0.2	<0.1	10
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 DIS- SOLVED (MG/L AS N)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N)	NITRO- GEN,AM- MONIA + ORGANIC TOTAL (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)	ALUM- INUM, DIS- SOLVED (UG/L AS AL)
OCT 1983 13...	31	39	0.04	0.72	<0.10	0.02	0.5	<0.01	<0.01	<0.01	--
FEB 1984 07...	35	40	0.05	0.6	<0.10	0.04	0.3	<0.01	<0.01	<0.01	10
JUN 19...	23	21	0.03	12	<0.10	0.05	0.3	<0.01	<0.01	0.01	50
AUG 15...	25	--	--	--	<0.10	<0.01	<0.2	<0.01	<0.01	<0.01	--

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

12447390 ANDREWS CREEK NEAR MAZAMA, WA--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984

DATE	ARSENIC DIS- SOLVED (UG/L AS AS)	BARIUM, DIS- SOLVED (UG/L AS BA)	BERYL- LIUM, DIS- SOLVED (UG/L AS BE)	CADMIUM DIS- SOLVED (UG/L AS CD)	CHRO- MIUM, DIS- SOLVED (UG/L AS CR)	COBALT, DIS- SOLVED (UG/L AS CO)	COPPER, DIS- SOLVED (UG/L AS CU)	IRON, DIS- SOLVED (UG/L AS FE)	LEAD, DIS- SOLVED (UG/L AS PB)	LITHIUM DIS- SOLVED (UG/L AS LI)	MANGA- NESE, DIS- SOLVED (UG/L AS MN)
OCT 1983 13...	--	--	--	--	--	--	--	--	--	--	--
FEB 1984 07...	1	23	<0.5	<1	<1	<3	<1	4	7	<4	<1
JUN 19...	<1	11	<0.5	2	1	<3	1	16	6	<4	1
AUG 15...	--	--	--	--	--	--	--	--	--	--	--

DATE	MERCURY DIS- SOLVED (UG/L AS HG)	MOLYB- DENUM, DIS- SOLVED (UG/L AS MO)	NICKEL, DIS- SOLVED (UG/L AS NI)	SELE- NIUM, DIS- SOLVED (UG/L AS SE)	SILVER, DIS- SOLVED (UG/L AS AG)	STRON- TIUM, DIS- SOLVED (UG/L AS SR)	VANA- DIUM, DIS- SOLVED (UG/L AS V)	ZINC, DIS- SOLVED (UG/L AS ZN)	SEDI- MENT, SUS- PENDE (MG/L)	SEDI- MENT, DIS- CHARGE, SUS- PENDE (T/DAY)
OCT 1983 13...	--	--	--	--	--	--	--	--	5	0.12
FEB 1984 07...	<0.1	<10	1	<1	<1	70	<6	6	4	0.07
JUN 19...	<0.1	<10	<1	<1	<1	34	<6	10	1	0.51
AUG 15...	--	--	--	--	--	--	--	--	2	0.09

DATE	TIME	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 DIS- SOLVED, EXTRAC- TION (UG/L)
FEB , 1984 07...	1200	<.8	<.4	.7	<.4	.6	<.4	.05	.30

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 downstream from Black Canyon Creek, 4.3 mi northwest of Pateros, and at mile 6.7.

DRAINAGE AREA.--1,772 mi².

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

REVISED RECORDS.--WSP 1933: Drainage area.

GAGE.--Water-stage recorder. Elevation of gage is 900 ft, 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 above station (1959 Bureau of Reclamation land classification).

AVERAGE DISCHARGE.--25 years, 1,632 ft³/s, 1,182,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 28,800 ft³/s May 31, 1972, gage height, 12.25 ft; minimum daily, 150 ft³/s Jan. 8, 9, 10, 1974, result of freezeup.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum discharge since 1920, 46,700 ft³/s May 29, 1948, determined by slope-area measurement of peak flow at site 1 mi downstream.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 7,000 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
May 31	0815	7,920	6.58	June 21	1645	11,200	7.70
June 16	0630	*12,500	*8.07				

Minimum daily discharge, 380 ft³/s Dec. 23.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	642	584	572	620	895	636	1280	1600	6410	6160	1310	532
2	672	666	556	660	895	630	1280	1660	5780	5630	1430	522
3	660	708	572	740	895	624	1290	1580	5440	5380	1340	511
4	654	797	534	800	888	618	1290	1530	5630	5340	1280	492
5	648	846	595	1020	881	618	1290	1490	6200	5380	1220	485
6	642	818	612	2110	874	618	1280	1460	6250	5240	1220	492
7	630	783	589	1730	874	630	1250	1450	6480	4520	1170	499
8	624	755	584	1390	867	642	1240	1470	6180	4010	1080	483
9	618	748	612	1230	860	666	1220	1590	5680	3750	1010	466
10	612	797	618	1160	860	720	1220	1650	5300	3530	962	453
11	606	846	618	1110	860	790	1180	1690	5420	3380	930	450
12	600	818	630	1060	853	839	1180	1770	6180	3260	902	446
13	595	797	618	1010	825	895	1150	1820	7750	3110	876	442
14	595	790	612	954	762	909	1140	2060	9070	2900	857	440
15	589	804	612	825	755	930	1150	2310	11200	2760	828	435
16	584	853	556	811	734	962	1280	2350	11600	2750	786	426
17	584	902	501	790	720	1020	1540	2320	9640	2750	753	414
18	578	888	480	696	714	1040	1710	2340	8500	2560	726	403
19	578	860	480	672	708	1030	1800	2510	7900	2350	702	391
20	578	846	460	672	702	1050	1790	2970	8000	2160	682	383
21	573	818	420	678	696	1340	1790	3110	10300	1980	655	383
22	573	783	400	696	684	1460	1790	3000	10100	1840	633	402
23	578	776	380	714	672	1430	1770	2900	9670	1720	614	424
24	589	811	400	727	684	1450	1750	2760	10200	1630	600	425
25	584	783	440	748	666	1430	1710	2650	9790	1600	588	426
26	584	755	500	783	654	1390	1660	2610	9550	1640	571	434
27	578	741	520	804	648	1340	1600	2530	8920	1680	563	440
28	572	720	540	818	642	1320	1560	2680	8280	1560	575	433
29	567	702	560	839	636	1300	1560	3390	8980	1460	587	429
30	567	636	580	916	---	1280	1550	5970	7530	1430	572	426
31	567	---	600	902	---	1280	---	7600	---	1360	548	---
TOTAL	18621	23431	16751	28685	22404	30887	43300	76820	237930	94820	26570	13387
MEAN	601	781	540	925	773	996	1443	2478	7931	3059	857	446
MAX	672	902	630	2110	895	1460	1800	7600	11600	6160	1430	532
MIN	567	584	380	620	636	618	1140	1450	5300	1360	548	383
AC-FT	36930	46480	33230	56900	44440	61260	85890	152400	471900	188100	52700	26550
CAL YR 1983	TOTAL	804547	MEAN	2204	MAX	20600	MIN	340	AC-FT	1596000		
WTR YR 1984	TOTAL	633606	MEAN	1731	MAX	11600	MIN	380	AC-FT	1257000		

COLUMBIA RIVER MAIN STEM

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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 northeast of Azwell, and at mile 515.9.

DRAINAGE AREA.--86,100 mi², approximately.

PERIOD OF RECORD.--October 1967 to current year. October 1953 to September 1967 (monthly discharge only) on file in Washington 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 downstream at same datum. Auxiliary water-stage recorder 6.8 mi downstream from base gage at same datum.

REMARKS.--Records good except those above 240,000 ft³/s and those below 45,000 ft³/s, which are fair. Flow regulated by nine major reservoirs and numerous smaller reservoirs and powerplants. Diversion by Feeder Canal (see sta 12435500) for Columbia Basin project and for irrigation of about 380,000 acres in the United States and an additional 35,000 acres in Canada.

AVERAGE DISCHARGE.--31 years, 118,500 ft³/s, 85,850,000 acre-ft/yr, unadjusted.

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 402,000 ft³/s June 15, 1972; maximum elevation, 731.92 ft June 16, 1972; minimum discharge, 17,900 ft³/s Oct. 5, 1970 (from powerplant records); minimum elevation, 703.55 ft Sept. 28, 1980.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 227,000 ft³/s June 29, elevation, 720.81 ft; minimum daily, 35,100 ft³/s Oct. 16; minimum elevation, 705.61 ft July 8.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	96200	69000	131000	45400	123000	152000	55400	150000	114000	144000	95100	72400
2	75100	69800	149000	67200	135000	147000	106000	144000	102000	155000	105000	56400
3	87900	68200	146000	72500	138000	124000	129000	154000	118000	148000	92000	72100
4	79300	72100	129000	91400	143000	114000	126000	167000	125000	138000	78500	87700
5	73300	52600	137000	110000	142000	156000	129000	145000	117000	148000	71900	91900
6	70400	45200	145000	110000	139000	164000	117000	112000	123000	128000	94100	76900
7	83100	82500	127000	77400	151000	154000	114000	141000	125000	96800	108000	63600
8	68700	76700	110000	66200	152000	117000	88400	137000	124000	89900	112000	58000
9	49800	74600	99000	108000	157000	107000	136000	149000	93800	128000	117000	59700
10	75800	80600	74200	109000	144000	95800	131000	145000	75400	128000	113000	70900
11	77200	61800	77200	114000	113000	86900	128000	146000	114000	110000	91400	84900
12	69400	43400	106000	132000	84800	135000	129000	119000	119000	114000	89700	69400
13	91700	49900	94300	125000	110000	138000	124000	97000	108000	106000	117000	82100
14	93200	81600	92700	109000	95300	127000	117000	144000	127000	121000	114000	77200
15	62400	70300	94500	99800	117000	108000	131000	146000	138000	123000	113000	72200
16	35100	72900	128000	135000	143000	101000	127000	139000	148000	150000	119000	67300
17	74300	92700	128000	155000	158000	83700	132000	141000	136000	142000	110000	75800
18	79500	91800	135000	157000	137000	46900	135000	142000	151000	140000	82100	80900
19	83300	102000	145000	158000	118000	95900	137000	126000	147000	115000	91700	75400
20	65300	94000	134000	163000	134000	92100	146000	84300	146000	93700	113000	56800
21	57200	113000	136000	148000	151000	102000	150000	141000	132000	90300	109000	63600
22	62300	109000	140000	115000	157000	87800	151000	134000	138000	86000	107000	55300
23	42200	116000	152000	111000	146000	75300	153000	130000	128000	113000	104000	52600
24	70100	72100	145000	96300	141000	65100	154000	133000	119000	119000	112000	68600
25	57700	83800	76600	84800	137000	59300	166000	130000	140000	127000	80000	65100
26	60700	96000	64700	85000	110000	98100	160000	101000	146000	114000	88200	56100
27	64700	92100	91500	76800	111000	98300	158000	86500	153000	92800	122000	78900
28	56900	119000	120000	74600	154000	100000	140000	96700	162000	58900	116000	62100
29	45700	127000	111000	66700	158000	111000	126000	143000	175000	67800	100000	55400
30	50200	135000	78600	119000	---	99300	146000	134000	150000	87700	83500	64100
31	68500	---	60400	129000	---	58000	---	139000	---	66500	92900	---
TOTAL	2127200	2514700	3557700	3311100	3899100	3299500	3941800	4096500	3894200	3541400	3142100	2073400
MEAN	68620	83820	114800	106800	134500	106400	131400	132100	129800	114200	101400	69110
MAX	96200	135000	152000	163000	158000	164000	166000	167000	175000	155000	122000	91900
MIN	35100	43400	60400	45400	84800	46900	55400	84300	75400	58900	71900	52600
AC-FT	4219000	4988000	7057000	6568000	7734000	6545000	7819000	8125000	7724000	7024000	6232000	4113000
CAL YR 1983	TOTAL	45053400	MEAN	123400	MAX	222000	MIN	31900	AC-FT	89362992		
WTR YR 1984	TOTAL	39398700	MEAN	107600	MAX	175000	MIN	35100	AC-FT	78146992		

NOTE.--Discharge for Mar. 5; Apr. 26, 27; July 27; Sept. 2, 7-10, 16, 19, 21, 24, 25, and 30 provided by Public Utility District No. 1 of Douglas County through Corps of Engineers, North Pacific Division, Reservoir Control Center.

WATER RESOURCES DATA FOR WASHINGTON, 1984

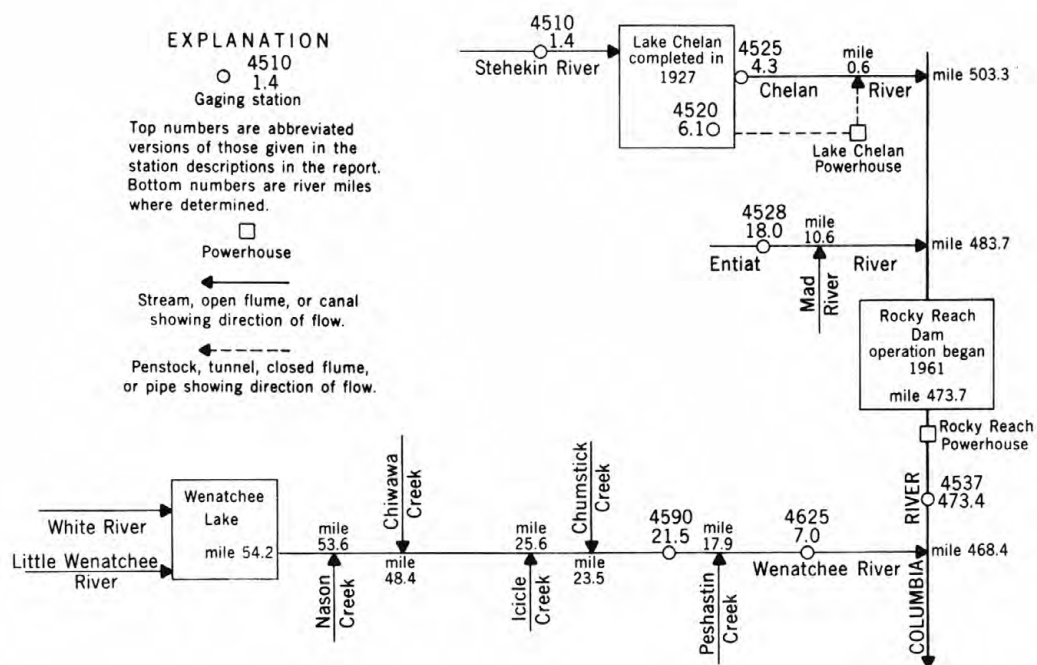


Figure 25.--Gaging stations in Columbia River basin from Chelan to Wenatchee Rivers.

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 upstream from Boulder Creek, 1.4 mi upstream from Lake Chelan, and 2.1 mi northwest of Stehekin.

DRAINAGE AREA.--321 mi².

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 National Geodetic Vertical Datum of 1929. Prior to Aug. 17, 1911, nonrecording gage 0.4 mi 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 downstream from Boulder Creek at different datum.

REMARKS.--Records good except those for Feb. 2 to Mar. 19, which are fair. No known regulation or diversion.

AVERAGE DISCHARGE.--63 years, 1,418 ft³/s, 55.98 in/yr, 1,027,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 18,900 ft³/s May 29, 1948, gage height, 29.00 ft, from rating curve extended above 11,000 ft³/s on basis of slope-area measurement of peak flow; minimum, 56 ft³/s Jan. 21, 1930.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 6,500 ft³/s and maximum (*), from rating curve extended above 11,000 ft³/s on basis of slope-area measurement of peak flow at gage height 29.00 ft:

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Jan. 4	2100	*9,660	*25.41	June 28	2315	7,560	23.94
June 14	2245	7,340	23.83				

Minimum discharge, 283 ft³/s Oct. 18, 19.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	369	610	509	400	1280	450	815	894	2710	3530	2870	774
2	358	717	514	420	1200	440	814	950	2390	3680	2680	669
3	354	1590	515	512	1100	440	831	925	2310	3890	2650	638
4	405	1900	496	4840	1000	450	821	902	2580	4290	2460	638
5	365	1360	499	5390	900	460	811	877	2790	4720	2500	720
6	347	1140	494	3050	840	470	798	864	2900	4250	2050	848
7	341	956	488	2640	780	490	800	900	2700	3260	1700	677
8	334	832	492	2130	730	510	772	1070	2490	3000	1780	922
9	326	773	491	1790	700	540	756	1220	2190	3110	2040	815
10	323	772	489	1570	680	600	749	1200	2220	3170	2060	735
11	316	765	475	1410	720	690	725	1270	2860	3180	1840	648
12	312	735	471	1310	740	740	720	1280	3870	3280	1690	602
13	305	718	468	1220	710	760	708	1410	4820	3060	1490	547
14	298	728	469	1140	680	740	713	1700	5800	2970	1300	507
15	295	779	461	1080	640	740	799	1700	6330	3330	1200	479
16	289	846	455	1000	600	740	1030	1620	5220	3860	1230	494
17	289	950	440	940	580	770	1100	1570	4080	3970	1340	556
18	286	973	420	890	560	750	1110	1600	3910	3510	1230	687
19	286	902	410	840	540	760	1120	2170	3840	2970	1070	630
20	289	837	390	870	520	824	1100	2560	4940	2650	977	585
21	289	767	380	910	520	979	1090	2200	6220	2240	959	599
22	671	726	370	980	540	957	1090	1980	5580	2130	987	553
23	486	688	350	1100	520	993	1050	1820	5810	2290	943	501
24	385	704	350	1250	510	980	995	1680	6540	2650	883	451
25	388	670	360	1900	500	954	955	1570	6280	3150	878	419
26	472	646	360	1580	490	902	921	1540	6110	3640	888	393
27	449	630	370	1460	480	856	896	1550	5590	3080	1270	373
28	406	607	370	1630	470	839	889	1840	5960	2830	993	350
29	391	566	370	1700	460	813	881	3240	6230	2760	807	345
30	430	543	380	1550	---	804	880	5380	4330	2640	751	341
31	832	---	390	1370	---	811	---	3670	---	2580	717	---
TOTAL	11686	25430	13496	48872	19990	22252	26739	53152	129600	99670	46233	17496
MEAN	377	848	435	1577	689	718	891	1715	4320	3215	1491	583
MAX	832	1900	515	5390	1280	993	1120	5380	6540	4720	2870	922
MIN	286	543	350	400	460	440	708	864	2190	2130	717	341
CFSM	1.17	2.64	1.36	4.91	2.15	2.24	2.78	5.34	13.5	10.0	4.64	1.82
IN.	1.35	2.95	1.56	5.66	2.32	2.58	3.10	6.16	15.02	11.55	5.36	2.03
AC-FT	23180	50440	26770	96940	39650	44140	53040	105400	257100	197700	91700	34700
CAL YR 1983	TOTAL	532204	MEAN	1458	MAX	10900	MIN	250	CFSM	4.54	IN.	61.68
WTR YR 1984	TOTAL	514616	MEAN	1406	MAX	6540	MIN	286	CFSM	4.38	IN.	59.64
											AC-FT	1056000
											AC-FT	1021000

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 west of Chelan.

DRAINAGE AREA.--924 mi².

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. Monthend 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 mean sea level, datum of 1912. To convert to National Geodetic Vertical Datum of 1929, subtract 1.73 ft. Prior to Jan. 1, 1900, nonrecording gage at Lakeside about 1 mi west of Chelan at datum 1,070.18 ft 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 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 ft and 1,100 ft 677,400 acre-ft. 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 ft and 1,100 ft during period Aug. 16 to Sept. 15 for scenic effect and recreational purposes. Diversions for irrigation of about 6,280 acres with an annual depletion of about 11,000 acre-ft, 1946 estimated.

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

EXTREMES FOR CURRENT YEAR.--Maximum elevation, 1,100.03 ft Aug. 12 (affected by seiche action); maximum contents, 676,000 acre-ft Aug. 12, elevation, 1,099.96 ft, mean of seiche; minimum elevation, 1,087.04 ft May 7, contents, 256,000 acre-ft.

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 1983 TO SEPTEMBER 1984
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1098.02	1095.26	1094.03	1090.97	1091.29	1089.66	1088.28	1087.25	1089.81	1099.02	1099.91	1099.28
2	1097.92	1095.24	1093.92	1090.88	1091.29	1089.60	1088.24	1087.26	1090.03	1099.19	1099.84	1099.20
3	1097.84	1095.28	1093.83	1090.85	1091.25	1089.50	1088.19	1087.25	1090.15	1099.40	1099.89	1099.13
4	1097.74	1095.31	1093.74	1090.92	1091.22	1089.40	1088.16	1087.21	1090.34	1099.61	1099.91	1099.08
5	1097.60	1095.27	1093.65	1091.28	1091.17	1089.33	1088.11	1087.17	1090.54	1099.80	1099.91	1099.02
6	1097.52	1095.26	1093.54	1091.47	1091.13	1089.24	1088.08	1087.11	1090.76	1099.80	1099.88	1099.02
7	1097.38	1095.21	1093.45	1091.61	1091.09	1089.16	1088.01	1087.05	1090.96	1099.73	1099.84	1098.94
8	1097.27	1095.12	1093.37	1091.68	1091.04	1089.09	1087.98	1087.08	1091.15	1099.71	1099.81	1098.87
9	1097.15	1095.04	1093.33	1091.72	1090.98	1089.02	1087.90	1087.14	1091.25	1099.82	1099.81	1098.86
10	1097.03	1095.04	1093.25	1091.73	1090.96	1088.95	1087.87	1087.20	1091.37	1099.82	1099.85	1098.81
11	1096.91	1095.06	1093.18	1091.74	1090.90	1088.89	1087.81	1087.24	1091.52	1099.78	1099.87	1098.75
12	1096.79	1094.97	1093.07	1091.74	1090.87	1088.84	1087.76	1087.33	1091.77	1099.82	1099.94	1098.71
13	1096.70	1094.90	1092.99	1091.73	1090.83	1088.80	1087.72	1087.39	1092.09	1099.77	1099.89	1098.66
14	1096.62	1094.88	1092.91	1091.67	1090.78	1088.76	1087.65	1087.51	1092.47	1099.77	1099.81	1098.58
15	1096.47	1094.90	1092.81	1091.64	1090.72	1088.72	1087.60	1087.59	1093.02	1099.83	1099.75	1098.56
16	1096.33	1094.90	1092.71	1091.58	1090.66	1088.69	1087.57	1087.64	1093.59	1099.83	1099.71	1098.52
17	1096.27	1094.87	1092.59	1091.51	1090.60	1088.66	1087.54	1087.65	1093.90	1099.77	1099.72	1098.47
18	1096.17	1094.84	1092.48	1091.45	1090.51	1088.62	1087.50	1087.67	1094.20	1099.77	1099.73	1098.44
19	1096.05	1094.80	1092.37	1091.39	1090.45	1088.58	1087.52	1087.73	1094.48	1099.74	1099.71	1098.43
20	1095.98	1094.77	1092.25	1091.33	1090.40	1088.55	1087.55	1087.82	1094.85	1099.81	1099.64	1098.46
21	1095.91	1094.73	1092.15	1091.27	1090.32	1088.64	1087.53	1087.91	1095.41	1099.83	1099.62	1098.45
22	1095.90	1094.65	1092.01	1091.22	1090.24	1088.62	1087.53	1087.99	1095.93	1099.82	1099.66	1098.39
23	1095.84	1094.59	1091.89	1091.19	1090.17	1088.60	1087.51	1088.12	1096.41	1099.84	1099.65	1098.35
24	1095.77	1094.56	1091.75	1091.15	1090.12	1088.59	1087.47	1088.23	1096.90	1099.90	1099.60	1098.30
25	1095.70	1094.52	1091.67	1091.23	1090.02	1088.56	1087.43	1088.31	1097.42	1099.92	1099.56	1098.23
26	1095.64	1094.44	1091.59	1091.26	1089.93	1088.53	1087.38	1088.41	1097.93	1099.87	1099.51	1098.15
27	1095.55	1094.37	1091.46	1091.25	1089.87	1088.50	1087.35	1088.51	1098.39	1099.85	1099.48	1098.10
28	1095.48	1094.29	1091.36	1091.27	1089.81	1088.47	1087.33	1088.61	1098.78	1099.83	1099.46	1098.07
29	1095.41	1094.22	1091.28	1091.31	1089.73	1088.43	1087.30	1088.75	1099.11	1099.86	1099.40	1098.05
30	1095.34	1094.12	1091.20	1091.31	---	1088.37	1087.26	1089.11	1099.07	1099.92	1099.35	1098.08
31	1095.29	---	1091.08	1091.32	---	1088.33	---	1089.54	---	1099.91	1099.35	---
MEAN	1096.50	1094.85	1092.61	1091.38	1090.63	1088.83	1087.70	1087.77	1093.79	1099.75	1099.71	1098.60
MAX	1098.02	1095.31	1094.03	1091.74	1091.29	1089.66	1088.28	1089.54	1099.11	1099.92	1099.94	1099.28
MIN	1095.29	1094.12	1091.08	1090.85	1089.73	1088.33	1087.26	1087.05	1089.81	1099.02	1099.35	1098.05
(+)	523100	483400	386100	394300	341200	296400	262600	342800	644400	674400	655300	615100
(-)	-91400	-39700	-97300	+8200	-53100	-44800	-33800	+80200	+301600	+30000	-19100	-40200

CAL YR 1983 MEAN 1093.55 MAX 1099.94 MIN 1086.00 AC-FT+ +35900
WTR YR 1984 MEAN 1093.52 MAX 1099.94 MIN 1087.05 AC-FT+ +600

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

- Change in contents, in acre-feet.

12452500 CHELAN RIVER AT CHELAN, WA

LOCATION.--Lat 47°48'31", long 119°59'08", in SE 1/4 sec. 30, T. 27 N., R. 23 E., Chelan County, Hydrologic Unit 17020009, at Chelan River powerplant tailrace, 4.3 mi downstream from control dam at outlet of Lake Chelan, and 3.0 mi southeast of Chelan.

DRAINAGE AREA.--924 mi².

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.

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 watt-hour meters on each turbine. Datum of gage is mean sea level, datum of 1912. To convert to National Geodetic Vertical Datum of 1929, subtract 1.62 ft. See WSP 1933 for history of changes prior to Mar. 20, 1939. Water-stage recorder for Lake Chelan at Chelan (see sta 12452000) also used to determine head and spill discharge. Mar. 20, 1939, to Sept. 30, 1981, gage at site 1.7 mi downstream from the Lake Chelan gage, at same datum, and published as the gage of record, used to determine head and spill discharge.

REMARKS.--Daily discharge determined from flow through turbines computed from relation between loading and head, plus flow through two irrigation pipes which divert water from the penstock just above the turbines, plus flow over the spillway computed from relation between discharge, Lake Chelan elevations, and gate openings. 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 near Chelan. This quantity is included in records of daily discharge. Diversions for irrigation of about 6,280 acres, depletion 11,000 acre-ft (1964 estimate). Flow regulated by Lake Chelan (station 12452000).

COOPERATION.--Records completely furnished by Public Utility District No. 1 of Chelan County except for partial records furnished during period of spill.

AVERAGE DISCHARGE.--80 years (water years 1905-84), 2,059 ft³/s, 30.26 in/yr, 1,492,000 acre-ft/yr, adjusted for storage since October 1911.

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 18,400 ft³/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, 8,540 ft³/s June 29; minimum daily, 54 ft³/s Sept. 29 and 30.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2060	1700	2050	2010	2000	2060	2030	2000	1350	4460	5140	1510
2	2060	1700	2050	2020	2050	1830	2030	2000	2030	2480	3030	1510
3	2050	1900	2050	2030	2060	2040	2030	2000	2030	2250	2270	1510
4	2010	2090	2050	2040	2030	2040	2030	1980	2020	2280	2980	1510
5	2060	2090	2050	2040	2050	2030	2020	1990	2010	7380	3340	1520
6	2060	2100	2050	2020	2050	2040	2030	2000	2020	6520	2990	1520
7	2000	2080	2050	2030	2060	2040	2020	1380	2070	5300	2280	1520
8	2050	2080	2040	2030	2050	2050	2030	934	2070	3300	2260	1520
9	2050	2080	2050	2040	2050	2050	2020	940	2060	2840	2040	1520
10	2050	2060	2050	2020	2060	2050	2020	940	2040	4880	2040	1520
11	2060	2090	2050	2020	2040	2050	2020	940	1980	4510	1710	1170
12	2080	2100	2050	2030	2010	2040	2010	940	1580	4270	1660	1200
13	2040	2090	2050	1850	2040	2040	2010	950	2010	4460	2810	1240
14	2100	2090	2030	2020	2000	2030	2010	940	2010	3370	2110	1160
15	2110	2080	2040	2020	2030	2050	2000	1240	2010	4000	2050	1150
16	2050	2080	2030	2010	2050	2040	2010	2000	2030	5870	1780	1150
17	2100	2080	2030	2080	2050	2040	2000	2000	2000	5520	1620	1150
18	1590	2080	2030	2090	2050	2050	2000	2000	2000	4730	1620	1140
19	1480	2090	2020	2060	2070	2040	2010	2010	1920	3300	1620	280
20	1740	2090	2030	1810	2040	2040	2000	2020	1870	2290	1580	460
21	1280	2080	2020	2030	2070	2040	1990	1740	1600	2280	971	1290
22	1240	2080	2020	2000	2070	2040	1990	1360	1640	2280	1120	1260
23	1720	2070	2010	2010	2070	2040	2000	964	2040	2280	1520	1510
24	1360	2080	2020	2010	2080	2040	2000	964	2040	2280	1490	1510
25	1500	2080	2020	2000	2070	2040	1990	964	1980	4150	1520	1510
26	1700	2070	2010	2030	2080	2040	1920	974	1980	5210	1520	1390
27	1770	2070	2000	2020	2080	2030	2000	974	1980	3910	1520	944
28	1780	2070	2000	2010	2060	2040	1990	964	2780	3060	1520	754
29	1720	2060	2050	2020	2050	2030	2000	954	8540	2270	1510	54
30	1770	1970	2020	2030	---	2030	1990	919	7770	2800	1510	54
31	1770	---	2020	1900	---	2030	---	919	---	3370	1510	---
TOTAL	57410	61380	63040	62330	59470	63050	60200	42900	71460	117900	62641	35536
MEAN	1852	2046	2034	2011	2051	2034	2007	1384	2382	3803	2021	1185
MAX	2110	2100	2050	2090	2080	2060	2030	2020	8540	7380	5140	1520
MIN	1240	1700	2000	1810	2000	1830	1920	919	1350	2250	971	54
AC-FT	113900	121700	125000	123600	118000	125100	119400	85090	141700	233900	124200	70490
MEAN†	366	1378	450	2143	1128	1306	1439	2688	7452	4291	1709	509
CFSM†	0.40	1.49	0.49	2.32	1.22	1.41	1.56	2.91	8.06	4.64	1.85	0.55
IN.†	0.46	1.66	0.56	2.68	1.32	1.63	1.74	3.36	9.00	5.36	2.13	0.62
AC-FT†	22500	82000	27700	131800	64900	80300	85600	165300	443300	263900	105100	30300

CAL YR 1983 TOTAL 812612.70 MEAN 2226 MAX 10800 MIN .30 AC-FT 1612000 MEAN† 2276 CFSM† 2.46 IN.† 33.45 AC-FT† 1648000
WTR YR 1984 TOTAL 757317 MEAN 2069 MAX 8540 MIN 54 AC-FT 1502000 MEAN† 2071 CFSM† 2.24 IN.† 30.51 AC-FT† 1503000

† Adjusted for change in contents of Lake Chelan.

ENTIAT RIVER BASIN

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 downstream from Stormy Creek, 6.0 mi northwest of Ardenvoir, and at mile 18.0.

DRAINAGE AREA.--203 mi².

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

REVISED RECORDS.--WSP 1933: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is above 1,560.97 ft National Geodetic Vertical Datum of 1929.

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

AVERAGE DISCHARGE.--27 years, 389 ft³/s, 26.02 in/yr, 281,800 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 6,430 ft³/s June 10, 1972, gage height, 8.98 ft; minimum daily, 25 ft³/s Dec. 17, 1964.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 1,750 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
June 16	0130	*2,570	*6.12	June 21	1530	2,510	6.06

Minimum daily discharge, 54 ft³/s Dec. 23.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP		
1	110	101	74	90	240	141	246	330	1400	1400	514	150		
2	107	122	90	95	233	139	246	337	1250	1300	505	146		
3	106	185	106	117	228	135	247	319	1160	1280	472	140		
4	106	217	99	172	222	134	246	313	1220	1360	449	136		
5	104	169	111	483	218	135	245	306	1220	1480	431	135		
6	102	162	113	516	215	137	241	302	1260	1490	428	170		
7	100	149	100	459	211	139	242	306	1200	1250	358	155		
8	99	140	106	400	208	145	236	321	1120	1110	330	140		
9	97	140	111	349	208	160	236	338	1080	1040	326	136		
10	95	146	114	322	202	173	231	333	1030	994	335	132		
11	93	154	116	300	200	180	226	358	1070	947	324	129		
12	92	146	106	280	198	186	228	371	1260	923	303	124		
13	91	141	106	265	193	188	220	398	1580	904	286	120		
14	90	151	108	243	188	186	221	466	1870	858	264	117		
15	89	154	96	200	185	196	242	495	2280	850	246	113		
16	88	181	75	180	180	197	284	502	2390	897	233	110		
17	89	186	74	170	169	206	298	509	2030	905	233	108		
18	89	167	72	170	171	201	316	527	1800	846	231	108		
19	87	159	72	170	170	201	345	599	1680	767	218	111		
20	89	154	66	180	166	253	341	701	1780	695	208	110		
21	88	146	60	200	163	281	350	704	2380	628	197	110		
22	100	140	56	225	158	267	355	691	2310	567	191	118		
23	107	136	54	277	157	270	350	659	2180	537	187	129		
24	92	139	56	270	157	267	346	627	2290	548	181	116		
25	91	135	70	380	150	268	339	605	2320	578	176	111		
26	90	132	74	284	142	261	331	583	2250	638	170	108		
27	89	130	78	267	149	257	325	576	2020	622	176	107		
28	87	127	80	268	145	255	323	618	1920	558	198	103		
29	85	108	80	266	142	250	319	850	2030	538	173	101		
30	86	91	84	254	---	250	318	1470	1670	583	161	99		
31	99	---	86	246	---	249	---	1620	---	503	152	---		
TOTAL	2937	4408	2693	8098	5368	6307	8493	17134	51050	27596	8656	3692		
MEAN	94.7	147	86.9	261	185	203	283	553	1702	890	279	123		
MAX	110	217	116	516	240	281	355	1620	2390	1490	514	170		
MIN	85	91	54	90	142	134	220	302	1030	503	152	99		
CFSM	.47	.72	.43	1.29	.91	1.00	1.39	2.72	8.38	4.38	1.37	.61		
IN.	.54	.81	.49	1.48	.98	1.16	1.56	3.14	9.35	5.06	1.59	.68		
AC-FT	5830	8740	5340	16060	10650	12510	16850	33990	101300	54740	17170	7320		
CAL YR 1983	TOTAL	167918	MEAN	460	MAX	4310	MIN	54	CFSM	2.27	IN.	30.77	AC-FT	333100
WTR YR 1984	TOTAL	146432	MEAN	400	MAX	2390	MIN	54	CFSM	1.97	IN.	26.83	AC-FT	290400

COLUMBIA RIVER MAIN STEM

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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 downstream from Rocky Reach Dam, 1.5 mi downstream from Swakane Creek, 7.4 mi north of Wenatchee, and at mile 473.4.

DRAINAGE AREA.--87,800 mi², 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 downstream from base gage at same datum.

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

AVERAGE DISCHARGE.--24 years, 118,100 ft³/s, 85,560,000 acre-ft/yr, unadjusted.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, about 535,000 ft³/s June 10, 1961, elevation, about 635.50 ft; minimum daily, 25,100 ft³/s Nov. 11, 1973.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 263,000 ft³/s June 29, elevation, 625.55 ft; minimum daily discharge, 43,300 ft³/s Oct. 16.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	96100	74500	134000	46200	125000	156000	57600	155000	120000	164000	101000	72600
2	73500	76000	153000	70700	137000	150000	109000	152000	104000	164000	108000	57100
3	86000	74200	150000	77200	143000	128000	132000	158000	124000	164000	97500	74800
4	75800	76200	134000	90100	145000	116000	132000	167000	131000	160000	79800	91900
5	78400	59000	137000	111000	147000	153000	132000	153000	123000	157000	73900	96000
6	71200	52700	151000	117000	142000	170000	121000	114000	127000	140000	98500	81700
7	87700	91500	131000	79700	153000	155000	119000	145000	126000	125000	115000	66300
8	72400	78600	115000	68200	158000	124000	87800	134000	127000	94500	116000	59400
9	57200	79100	102000	112000	159000	112000	140000	148000	98700	133000	119000	61600
10	77000	90500	75200	113000	150000	98500	135000	149000	76400	136000	118000	73000
11	77700	69000	78300	113000	120000	90600	131000	145000	112000	118000	91000	89200
12	69300	51800	109000	134000	83400	138000	132000	124000	122000	121000	90600	76600
13	93800	58700	97400	129000	111000	147000	129000	98000	115000	112000	119000	87600
14	94400	87900	95500	114000	99400	128000	120000	145000	132000	124000	115000	81800
15	67500	73600	98000	102000	120000	114000	129000	146000	145000	127000	115000	72600
16	43300	75500	131000	136000	145000	105000	127000	142000	161000	154000	122000	71200
17	70200	94000	131000	154000	160000	86000	138000	148000	154000	151000	113000	81000
18	88900	95100	137000	157000	142000	50600	137000	147000	161000	147000	86100	82800
19	87700	111000	147000	162000	124000	94100	141000	127000	157000	123000	96400	76100
20	66300	96500	136000	163000	136000	95900	147000	87100	154000	99500	116000	59000
21	58600	116000	140000	152000	152000	107000	157000	140000	141000	92900	111000	67700
22	60600	112000	141000	118000	160000	90900	158000	133000	150000	89000	109000	61500
23	46300	119000	156000	114000	153000	80600	156000	130000	140000	116000	109000	55700
24	73200	80800	148000	97100	141000	67100	160000	136000	136000	125000	117000	71400
25	55500	87000	79600	85200	140000	63200	167000	132000	152000	134000	82100	70500
26	69700	99300	66200	86800	116000	104000	161000	104000	160000	119000	93200	55900
27	70600	94700	91600	76600	109000	106000	159000	88500	165000	104000	126000	79700
28	59400	122000	120000	76500	156000	105000	145000	98300	165000	61900	118000	63000
29	52500	130000	113000	70800	159000	116000	133000	141000	193000	68000	104000	56600
30	56400	138000	82000	119000	---	101000	150000	137000	176000	90800	85900	63800
31	71000	---	63300	133000	---	58400	---	143000	---	69800	97100	---
TOTAL	2208200	2664200	3643100	3378100	3985800	3410900	4042400	4166900	4148100	3784400	3243100	2158100
MEAN	71230	88810	117500	109000	137400	110000	134700	134400	138300	122100	104600	71940
MAX	96100	138000	156000	163000	160000	170000	167000	167000	193000	164000	126000	96000
MIN	43300	51800	63300	46200	83400	50600	57600	87100	76400	61900	73900	55700
AC-FT	4380000	5284000	7226000	6700000	7906000	6766000	8018000	8265000	8228000	7506000	6433000	4281000
CAL YR 1983	TOTAL	45701900	MEAN	125200	MAX	219000	MIN	31000	AC-FT	90650000		
WTR YR 1984	TOTAL	40833300	MEAN	111600	MAX	193000	MIN	43300	AC-FT	80992992		

NOTE.--Discharge for Nov. 1, 8, 9; Jan. 29; Feb. 14; Mar. 18, 19, 24, 25; May 13, 18, 20, 23; and July 8 provided by Public Utility District No. 1 of Chelan County through Corps of Engineers, North Pacific Division, Reservoir Control Center.

WENATCHEE RIVER BASIN

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 northwest of Peshastin, 3.5 mi upstream from Peshastin Creek, 4.1 mi downstream from Icicle Creek, and at mile 21.5.

DRAINAGE AREA.--1,000 mi², 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 above National Geodetic Vertical Datum of 1929. Prior to Mar. 24, 1932, nonrecording gage at site 1.2 mi downstream at different datum.

REMARKS.--Records excellent except those for ice-affected period Dec. 18 to Jan. 3, which are fair. Numerous diversion upstream for irrigation of an estimated 3,200 acres upstream from station. Diversion from Icicle Creek 5.7 mi upstream from mouth is used for irrigation of a substantial part of the 22,000 acres irrigated downstream from station. Bonneville Power Administration telemeter at station.

AVERAGE DISCHARGE.--56 years, 3,112 ft³/s, 2,255,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 32,300 ft³/s May 28, 1948, gage height, 15.88 ft; minimum, 183 ft³/s Oct. 14, 1939; minimum gage height, 1.24 ft Nov. 1, 1952; minimum daily discharge, 270 ft³/s Oct. 2, 1929, Nov. 30, 1936, Dec. 1, 1952.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 14,400 ft³/s June 21, gage height, 9.89 ft; minimum, 530 ft³/s Oct. 16.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	688	904	1280	1300	3260	1340	2640	2530	8130	8680	3430	890
2	674	1040	1260	1400	3010	1330	2590	2790	7080	7950	3420	900
3	661	1950	1300	1800	2820	1300	2570	2810	6640	7890	3230	846
4	646	4000	1220	4720	2670	1280	2530	2680	6780	8170	3060	802
5	660	3550	1220	9610	2540	1270	2530	2560	7070	8880	2850	781
6	650	2990	1190	9130	2440	1280	2470	2470	7410	8840	2780	892
7	630	2600	1140	7950	2350	1320	2410	2450	7240	7610	2430	1130
8	618	2270	1140	6630	2280	1390	2370	2580	6970	6770	2200	1030
9	608	2050	1160	5490	2220	1560	2300	2900	6400	6480	2150	1020
10	593	1980	1170	4640	2160	1780	2280	2940	6120	6420	2200	956
11	577	1950	1140	4020	2090	1930	2210	3010	6450	6230	2140	894
12	566	1930	1090	3570	2070	2060	2210	3630	7410	6200	2020	837
13	560	1870	1100	3210	2060	2180	2150	3930	8940	5930	1870	809
14	565	1940	1140	2870	1970	2150	2090	4500	10700	5730	1730	769
15	548	2030	1100	2500	1920	2160	2270	4630	12800	5690	1600	725
16	538	2170	1000	2390	1850	2210	2730	4410	13100	6110	1490	695
17	541	2550	880	2140	1760	2320	2870	4210	11100	6380	1470	671
18	556	2640	820	1960	1710	2320	2920	4130	9640	6310	1440	659
19	558	2620	760	1800	1660	2330	3010	4570	9080	5670	1370	664
20	556	2470	720	1800	1630	2590	3010	6250	9660	5070	1280	666
21	567	2250	660	1800	1600	3540	2970	6080	13500	4440	1190	662
22	603	2030	640	1900	1560	3580	2990	5480	12900	3960	1130	738
23	913	1880	600	1960	1550	3510	2960	5140	12000	3790	1110	881
24	876	1880	560	2260	1540	3500	2840	4850	12600	3840	1050	824
25	814	1830	680	4890	1480	3590	2710	4470	13100	4100	1010	765
26	788	1720	780	4970	1410	3250	2580	4340	12900	4630	960	726
27	775	1660	860	4250	1410	3040	2490	4360	12100	4530	937	702
28	745	1630	920	4110	1380	2920	2470	4580	11400	4090	1170	715
29	716	1540	1000	4130	1360	2810	2450	5960	11800	3850	1130	689
30	700	1440	1100	3820	---	2720	2440	9240	10300	3740	1000	673
31	742	---	1200	3510	---	2680	---	9720	---	3510	938	---
TOTAL	20232	63364	30830	116530	57760	71040	77060	134200	291320	181490	55785	24011
MEAN	653	2112	995	3759	1992	2292	2569	4329	9711	5855	1800	800
MAX	913	4000	1300	9610	3260	3580	3010	9720	13500	8880	3430	1130
MIN	538	904	560	1300	1360	1270	2090	2450	6120	3510	937	659
AC-FT	40130	125700	61150	231100	114600	140900	152800	266200	577800	360000	110600	47630
CAL YR 1983	TOTAL	1166412	MEAN	3196	MAX	19900	MIN	538	AC-FT	2314000		
WTR YR 1984	TOTAL	1123622	MEAN	3070	MAX	13500	MIN	538	AC-FT	2229000		

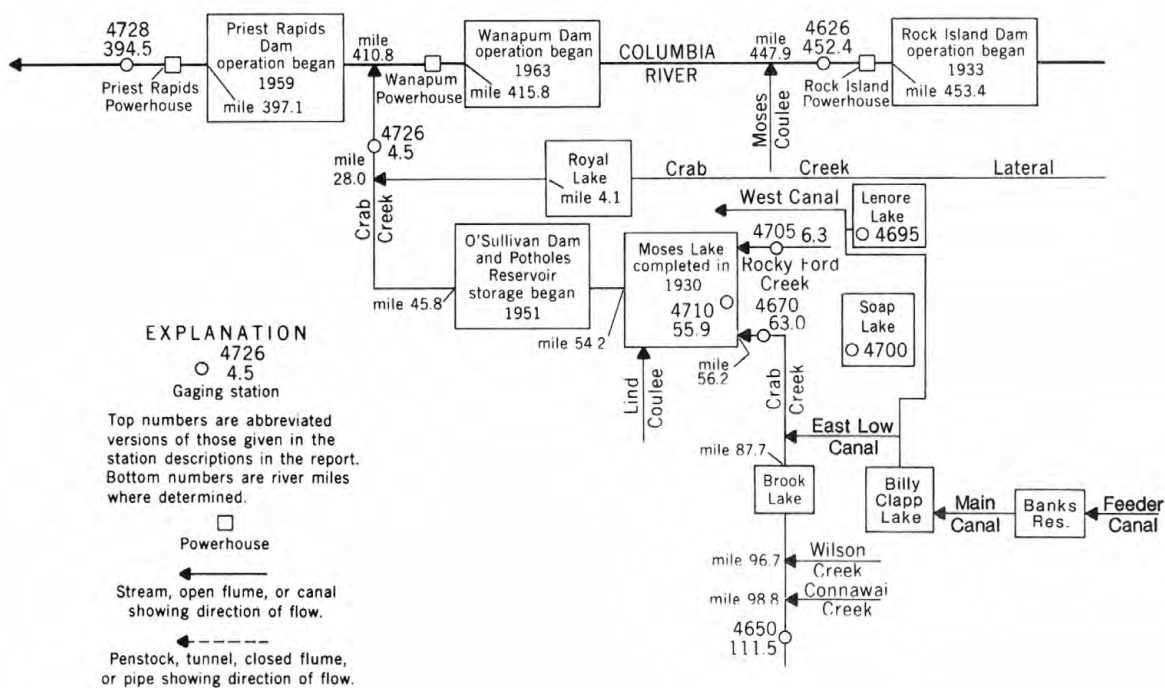


Figure 26.--Gaging stations in Columbia River basin from Rock Island Dam to Priest Rapids gage.

WENATCHEE RIVER BASIN

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 north of Monitor, 3.5 mi downstream from Mission Creek, and at mile 7.0.

DRAINAGE AREA.--1,301 mi².

PERIOD OF RECORD.--August to November 1897, October 1962 to current year. Published as "near Wenatchee" 1897.

GAGE.--Water-stage recorder. Elevation of gage is 680 ft, from topographic map. Aug. 7 to Nov. 7, 1897, nonrecording gage 1 mi downstream at different datum.

REMARKS.--Records excellent except those for ice-affected period Dec. 18 to Jan. 2, which are fair. No regulation. Diversions for irrigation of about 25,000 acres above station. Chelan County Public Utility District No. 1 gage-height telemeter at station.

AVERAGE DISCHARGE.--22 years, 3,377 ft³/s, 2,447,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 29,600 ft³/s Dec. 27, 1980, gage height, 27.23 ft; minimum, 357 ft³/s Oct. 12, 1979, gage height, 17.01 ft.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 15,400 ft³/s June 21, gage height, 23.95 ft; minimum, 571 ft³/s Oct. 13, 14.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	725	980	1440	1500	3660	1510	3060	2720	8990	9410	3420	846
2	707	1100	1390	1700	3390	1480	3000	3010	7700	8600	3440	864
3	689	1810	1450	2810	3170	1460	2910	3050	7170	8430	3220	831
4	671	4240	1360	6960	3000	1440	2860	2910	7320	8710	3050	774
5	680	3850	1380	11000	2840	1420	2840	2790	7650	9500	2840	742
6	680	3240	1340	10500	2740	1440	2790	2680	8040	9520	2770	793
7	653	2810	1290	9100	2640	1480	2710	2610	7820	8150	2420	1050
8	635	2470	1280	7510	2560	1570	2680	2720	7480	7120	2160	988
9	635	2220	1300	6150	2500	1780	2630	3060	6860	6750	2080	970
10	619	2150	1320	5190	2420	2080	2630	3130	6470	6670	2120	923
11	603	2120	1280	4500	2350	2290	2550	3190	6750	6420	2080	864
12	587	2090	1240	3980	2320	2390	2470	3810	7870	6390	1970	819
13	579	2040	1230	3580	2320	2550	2380	4200	9520	6100	1830	791
14	611	2110	1270	3220	2210	2500	2290	4800	11400	5890	1670	762
15	627	2220	1240	2790	2150	2520	2440	5000	13600	5790	1530	727
16	619	2450	1150	2640	2060	2580	2960	4750	14000	6220	1420	697
17	619	2840	1020	2380	1970	2710	3170	4520	12000	6540	1380	667
18	635	2910	960	2080	1910	2710	3210	4420	10400	6490	1350	650
19	653	2890	900	2050	1850	2710	3300	4780	9750	5820	1290	651
20	644	2740	860	1950	1810	3000	3300	6670	10300	5170	1200	660
21	653	2500	780	2060	1790	4240	3240	6570	14200	4560	1110	669
22	671	2250	700	2090	1740	4320	3260	5890	13900	4040	1050	760
23	950	2090	680	2130	1720	4160	3220	5480	12900	3830	1020	951
24	980	2090	660	2400	1720	4140	3100	5170	13500	3850	978	916
25	920	2020	800	5370	1660	4000	2940	4780	14000	4100	934	861
26	891	1910	920	5650	1590	3830	2790	4600	13800	4600	891	821
27	872	1840	1000	4800	1570	3570	2690	4620	12900	4580	863	791
28	844	1790	1100	4580	1540	3420	2660	4820	12200	4140	1050	772
29	815	1710	1200	4640	1520	3300	2640	6220	12700	3890	1080	742
30	797	1610	1300	4300	---	3170	2630	10100	11200	3810	962	723
31	815	---	1400	3960	---	3120	---	10800	---	3550	896	---
TOTAL	22079	69090	35240	133570	64720	82890	85350	143870	312390	188640	54074	24075
MEAN	712	2303	1137	4309	2232	2674	2845	4641	10410	6085	1744	803
MAX	980	4240	1450	11000	3660	4320	3300	10800	14200	9520	3440	1050
MIN	579	980	660	1500	1520	1420	2290	2610	6470	3550	863	650
AC-FT	43790	137000	69900	264900	128400	164400	169300	285400	619600	374200	107300	47750
CAL YR 1983	TOTAL	1294919	MEAN	3548	MAX	21700	MIN	579	AC-FT	2568000		
WTR YR 1984	TOTAL	1215988	MEAN	3322	MAX	14200	MIN	579	AC-FT	2412000		

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 downstream from Rock Island Dam, 2.0 mi downstream from Rock Island Creek, 12 mi southeast of Wenatchee, and at mile 452.4.

DRAINAGE AREA.--89,400 mi², 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 upstream from highway bridge at Wenatchee, at mile 466.3, at datum 583 ft 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, at datum 579.30 ft National Geodetic Vertical Datum of 1929. Oct. 1, 1930, to May 31, 1961, water-stage recorder 0.5 mi southwest of Trinidad, at mile 441.7, at datum 499.3 ft National Geodetic Vertical Datum of 1929 (river-profile survey). Since May 21, 1963, auxiliary water-stage recorder 2.0 mi downstream at same datum.

REMARKS.--Records fair. Discharge for the entire year provided by Public Utility District No. 1 of Chelan County through 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 (see sta 12435500) for Columbia Basin project and for irrigation of about 380,000 acres in the United States and an additional 35,000 acres in Canada.

AVERAGE DISCHARGE.--57 years (water years 1914-16, 1931-84), 121,300 ft³/s, 87,880,000 acre-ft/yr, unadjusted.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 692,600 ft³/s June 12, 1948, gage height, 59.35 ft, site and datum then in use; minimum, 4,120 ft³/s Feb. 10, 1932, gage height, 11.40 ft, site and datum then in use.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of June 7, 1894, reached a discharge of about 740,000 ft³/s, from floodmarks at Wenatchee.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 195,000 ft³/s June 30; maximum elevation, 580.07 ft June 29; minimum daily discharge, 41,600 ft³/s Oct. 16; minimum elevation, 563.99 ft Dec. 27.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	94300	72200	130000	51200	124000	153000	60200	148000	124000	165000	100000	72600
2	75700	74500	148000	70200	135000	148000	107000	150000	109000	164000	108000	57500
3	83900	72200	147000	75100	139000	129000	130000	156000	123000	167000	96900	72600
4	80400	77000	131000	94100	142000	114000	131000	164000	133000	162000	83100	89200
5	75100	62500	134000	118000	146000	149000	127000	152000	124000	161000	76600	90600
6	73100	51500	146000	120000	138000	167000	118000	113000	130000	144000	97200	78600
7	87200	86400	130000	88400	148000	152000	117000	145000	131000	129000	114000	65100
8	75600	80800	113000	75100	154000	123000	87000	136000	130000	101000	113000	58300
9	56100	79400	102000	113000	154000	108000	135000	147000	104000	134000	117000	58400
10	77600	90400	77200	115000	147000	96900	131000	150000	86500	139000	117000	74300
11	77800	67500	79900	114000	117000	90200	128000	146000	117000	121000	91500	85000
12	69400	52900	109000	135000	86300	133000	128000	125000	125000	122000	89700	75500
13	91800	56600	96500	128000	112000	144000	126000	101000	121000	115000	114000	83300
14	91700	85600	93400	115000	98200	126000	117000	146000	136000	127000	111000	80900
15	67100	72200	95400	102000	119000	113000	132000	149000	150000	129000	114000	71800
16	41600	75800	128000	134000	141000	105000	124000	140000	152000	156000	120000	68500
17	72800	93700	128000	151000	157000	86700	132000	150000	155000	155000	111000	79100
18	83600	93100	134000	152000	141000	54100	135000	146000	163000	149000	84700	79400
19	84000	110000	145000	158000	122000	95800	140000	132000	160000	126000	93700	73600
20	70200	96900	134000	152000	133000	95500	147000	95100	158000	101000	113000	58700
21	60800	115000	139000	145000	149000	106000	157000	141000	148000	94900	108000	63800
22	62000	110000	137000	117000	157000	92200	158000	142000	156000	90900	104000	59600
23	46400	118000	150000	112000	147000	81700	154000	133000	144000	116000	104000	54200
24	75300	83100	144000	96000	140000	70200	159000	135000	140000	124000	111000	70200
25	61700	86300	82500	90200	140000	68100	162000	138000	155000	135000	81500	69000
26	63300	95600	62200	90200	117000	102000	157000	105000	162000	121000	88600	54800
27	67700	93200	89800	79700	108000	105000	155000	90100	169000	105000	122000	77000
28	62400	121000	118000	81700	153000	102000	142000	103000	168000	69300	114000	63800
29	52600	128000	112000	72500	155000	115000	131000	140000	195000	74000	99800	55900
30	55100	134000	81500	119000	---	103000	149000	142000	177000	94300	83900	61300
31	71600	---	60900	133000	---	64400	---	148000	---	73400	93700	---
TOTAL	2207900	2635400	3578300	3397400	3919500	3392800	3976200	4208200	4255500	3864800	3175900	2102600
MEAN	71220	87850	115400	109600	135200	109400	132500	135700	141900	124700	102400	70090
MAX	94300	134000	150000	158000	157000	167000	162000	164000	195000	167000	122000	90600
MIN	41600	51500	60900	51200	86300	54100	60200	90100	86500	69300	76600	54200
AC-FT	4379000	5227000	7098000	6739000	7774000	6730000	7887000	8347000	8441000	7666000	6299000	4171000
CAL YR 1983	TOTAL	47093400	MEAN	129000	MAX	234000	MIN	41600	AC-FT	93410000		
WTR YR 1984	TOTAL	40714500	MEAN	111200	MAX	195000	MIN	41600	AC-FT	80756992		

CRAB CREEK BASIN

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 upstream from highway bridge at Irby, 5.4 mi downstream from Lake Creek, 7.5 mi west of Odessa, and at mile 11.5.

DRAINAGE AREA.--1,042 mi².

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

REVISED RECORDS.--WSP 1446: 1949-51. WSP 1933: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 1,386.30 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--Records good except those for May 19 to Aug. 2, which are fair. Pumpage from ground-water wells for irrigation has been on the increase above the station since 1964. No regulation.

AVERAGE DISCHARGE.--42 years, 73.0 ft³/s, 52,890 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 8,370 ft³/s Feb. 27, 1957, gage height, 11.94 ft; no flow several days during 1969, 1977, 1978, 1979, and 1980.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 300 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Jan. 5	2330	1,980	6.92	Feb. 13	2330	1,460	5.95
Jan. 26	0615	*2,330	*7.51	Feb. 22	2015	498	4.01

Minimum discharge, 2.10 ft³/s Nov. 30, gage height, 1.83 ft.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	5.0	4.5	2.8	8.0	316	293	228	153	54	33	21	13
2	5.0	5.0	2.8	11	258	281	225	151	54	32	20	13
3	5.0	5.0	2.8	45	220	290	220	149	52	32	19	13
4	5.0	5.0	2.4	174	189	281	223	138	50	31	19	13
5	5.0	5.0	2.8	1370	171	264	224	135	50	31	19	13
6	5.0	5.0	2.8	1730	157	247	220	135	49	30	19	14
7	5.0	5.0	2.8	1080	148	236	219	132	48	30	19	13
8	5.6	5.0	2.8	671	144	228	219	130	47	29	19	13
9	5.6	5.0	3.2	470	139	220	221	127	46	29	19	13
10	5.0	5.6	3.2	325	137	220	224	124	45	28	19	13
11	4.5	5.0	3.2	253	142	217	224	110	45	28	18	13
12	4.5	4.5	3.2	204	204	211	225	102	44	27	18	13
13	4.5	4.1	3.2	164	657	217	226	101	43	27	18	13
14	4.5	4.1	3.2	76	1080	217	225	93	43	27	18	12
15	4.5	3.6	3.2	74	685	220	219	98	42	26	17	12
16	4.5	3.6	3.2	72	514	222	213	93	41	26	16	12
17	5.0	4.0	3.2	72	415	217	211	85	41	26	16	12
18	5.0	3.6	3.2	70	342	225	210	83	40	25	16	11
19	5.0	3.6	3.2	70	293	233	207	80	40	25	16	12
20	5.0	3.6	3.2	70	258	236	201	80	39	25	16	12
21	5.0	3.6	3.1	100	267	225	200	76	44	24	15	11
22	5.0	3.6	3.0	140	419	230	198	76	42	24	15	12
23	5.0	3.2	2.9	189	438	239	187	72	40	23	15	13
24	4.5	3.6	3.1	220	363	236	184	70	38	23	15	11
25	4.5	3.2	3.3	974	356	239	180	68	37	23	15	11
26	4.5	3.2	3.4	2000	336	239	168	66	36	22	14	11
27	4.5	2.8	3.4	1050	329	239	159	64	35	22	14	11
28	4.5	2.8	3.7	626	300	241	160	62	34	22	14	10
29	4.5	2.8	4.0	570	284	241	154	60	34	21	13	10
30	5.0	2.8	4.5	498	---	239	154	58	33	21	13	10
31	5.0	---	6.0	385	---	239	---	56	---	21	13	---
TOTAL	150.2	121.4	100.8	13761.0	9561	7382	6128	3027	1286	813	518	363
MEAN	4.85	4.05	3.25	444	330	238	204	97.6	42.9	26.2	16.7	12.1
MAX	5.6	5.6	6.0	2000	1080	293	228	153	54	33	21	14
MIN	4.5	2.8	2.4	8.0	137	211	154	56	33	21	13	10
AC-FT	298	241	200	27290	18960	14640	12150	6000	2550	1610	1030	720
CAL YR 1983	TOTAL	16953.9	MEAN	46.4	MAX	154	MIN	1.0	AC-FT	33630		
WTR YR 1984	TOTAL	43211.4	MEAN	118	MAX	2000	MIN	2.4	AC-FT	85710		

CRAB CREEK BASIN

287

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, 3.0 mi upstream from Parker Horn, 4.0 mi north of town of Moses Lake, and at mile 63.0.

DRAINAGE AREA.--2,228 mi², of which 219 mi² in the vicinity of Long Lake Reservoir is noncontributing.

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

REVISED RECORDS.--WSP 1933: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 1,070.39 ft U.S. Bureau of Reclamation datum. Prior to July 14, 1956, at site 300 ft 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 ft³/s Feb. 28, 1957, gage height, 6.81 ft; 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, 820 ft³/s Jan. 31, gage height, 4.36 ft; minimum, 13 ft³/s Dec. 20, gage height, 1.86 ft.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	67	61	30	21	667	342	226	202	99	78	89	99
2	68	63	29	21	567	335	222	209	97	77	88	98
3	70	61	29	22	485	331	218	198	93	76	89	99
4	72	59	29	22	413	338	218	187	95	75	90	100
5	73	53	29	26	364	345	224	182	91	76	91	100
6	74	52	29	32	321	345	216	178	88	76	90	101
7	74	51	29	30	289	345	211	174	89	77	89	99
8	76	49	30	29	267	341	220	172	89	77	89	99
9	75	50	32	27	233	340	213	168	86	77	90	98
10	75	61	37	26	204	341	217	161	82	77	91	97
11	73	62	36	24	179	344	215	157	80	78	91	98
12	74	52	33	23	167	348	216	152	79	79	91	96
13	73	49	32	22	159	347	213	148	83	79	90	95
14	73	47	33	34	150	337	214	150	79	80	91	93
15	72	49	30	28	166	325	218	150	77	81	91	92
16	70	48	28	216	235	313	215	148	75	82	92	91
17	72	52	28	367	348	303	208	143	73	82	94	90
18	70	42	24	341	467	289	206	139	73	83	95	89
19	72	38	24	283	488	283	214	139	73	83	94	87
20	71	38	22	274	468	283	212	139	75	83	94	88
21	69	36	21	274	428	283	205	135	89	84	94	87
22	74	35	20	248	391	259	204	135	85	85	94	91
23	70	35	19	117	387	248	205	139	80	87	95	103
24	69	52	18	107	413	242	198	132	77	88	96	93
25	67	40	19	158	399	242	194	125	75	89	98	91
26	66	37	19	109	386	247	191	121	74	88	100	91
27	66	36	19	104	380	240	190	116	74	89	97	89
28	64	35	20	104	368	235	188	116	74	89	98	88
29	61	33	20	261	352	236	188	113	86	90	99	88
30	63	32	20	652	---	230	191	113	81	90	100	87
31	64	---	21	741	---	228	---	108	---	89	100	---
TOTAL	2177	1408	809	4743	10141	9265	6270	4649	2471	2544	2890	2817
MEAN	70.2	46.9	26.1	153	350	299	209	150	82.4	82.1	93.2	93.9
MAX	76	63	37	741	667	348	226	209	99	90	100	103
MIN	61	32	18	21	150	228	188	108	73	75	88	87
AC-FT	4320	2790	1600	9410	20110	18380	12440	9220	4900	5050	5730	5590
CAL YR 1983	TOTAL	20072	MEAN	55.0	MAX	84	MIN	14	AC-FT	39810		
WTR YR 1984	TOTAL	50184	MEAN	137	MAX	741	MIN	18	AC-FT	99540		

CRAB CREEK BASIN

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 1,000 ft downlake from outlet gate on Alkali Lake, and 8.8 mi north of town of Soap Lake.

DRAINAGE AREA.--367 mi², of which 281 mi² 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, nonrecording gages 0.90 mi uplake at same datum.

REMARKS.--Some diversion from tributaries for irrigation. During extreme high stages of Soap Lake, water is pumped from Soap Lake into Lenore Lake.

EXTREMES FOR PERIOD OF RECORD.--Maximum elevation observed, 1,087.73 ft June 12, 1953; minimum, 1,072.72 ft Jan. 2, 1959 (affected by wind).

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum elevation known, 1,092.2 ft, from well-defined alkali line at gage, date unknown.

EXTREMES FOR CURRENT YEAR.--Maximum elevation, 1,082.05 ft Mar. 21; minimum, 1,077.67 ft Sept. 30.

ELEVATION (FEET NGVD), WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1078.03	1078.07	1078.85	1079.67	1080.44	1081.36	1081.89	1081.59	1080.99	1080.67	1079.56	1078.60
2	1078.00	1078.10	1078.87	1079.69	1080.47	1081.39	1081.89	1081.61	1080.96	1080.64	1079.57	1078.59
3	1077.97	1078.12	1078.89	1079.73	1080.49	1081.41	1081.87	1081.57	1080.94	1080.61	1079.57	1078.60
4	1077.94	1078.15	1078.90	1079.75	1080.52	1081.44	1081.86	1081.55	1080.94	1080.58	1079.57	1078.59
5	1077.91	1078.14	1078.93	1079.78	1080.55	1081.47	1081.89	1081.54	1080.92	1080.55	1079.57	1078.57
6	1077.87	1078.16	1078.96	1079.80	1080.58	1081.50	1081.88	1081.52	1080.90	1080.50	1079.56	1078.51
7	1077.84	1078.17	1078.98	1079.82	1080.61	1081.52	1081.87	1081.50	1080.86	1080.46	1079.54	1078.47
8	1077.82	1078.17	1079.02	1079.84	1080.64	1081.55	1081.87	1081.49	1080.84	1080.42	1079.51	1078.41
9	1077.82	1078.19	1079.05	1079.86	1080.67	1081.59	1081.86	1081.47	1080.81	1080.38	1079.47	1078.37
10	1077.82	1078.25	1079.11	1079.89	1080.70	1081.61	1081.86	1081.45	1080.78	1080.35	1079.43	1078.33
11	1077.83	1078.34	1079.14	1079.91	1080.73	1081.65	1081.85	1081.43	1080.76	1080.32	1079.38	1078.29
12	1077.84	1078.34	1079.17	1079.93	1080.77	1081.68	1081.85	1081.41	1080.74	1080.28	1079.33	1078.24
13	1077.85	1078.36	1079.21	1079.96	1080.81	1081.70	1081.83	1081.39	1080.74	1080.22	1079.28	1078.20
14	1077.85	1078.39	1079.24	1079.98	1080.83	1081.73	1081.81	1081.37	1080.73	1080.19	1079.24	1078.16
15	1077.86	1078.42	1079.26	1079.99	1080.88	1081.77	1081.81	1081.34	1080.70	1080.16	1079.19	1078.13
16	1077.86	1078.46	1079.28	1080.02	1080.91	1081.80	1081.80	1081.33	1080.65	1080.14	1079.15	1078.11
17	1077.87	1078.51	1079.30	1080.04	1080.93	1081.85	1081.79	1081.30	1080.61	1080.10	1079.11	1078.07
18	1077.88	1078.53	1079.32	1080.06	1080.95	1081.87	1081.78	1081.28	1080.57	1080.05	1079.06	1078.04
19	1077.89	1078.54	1079.36	1080.08	1080.98	1081.89	1081.78	1081.29	1080.54	1080.00	1079.00	1077.99
20	1077.90	1078.58	1079.38	1080.10	1081.02	1081.94	1081.77	1081.27	1080.56	1079.94	1078.95	1077.97
21	1077.91	1078.59	1079.39	1080.13	1081.05	1082.01	1081.75	1081.24	1080.64	1079.89	1078.92	1077.93
22	1077.94	1078.61	1079.41	1080.17	1081.08	1082.00	1081.73	1081.22	1080.69	1079.85	1078.88	1077.90
23	1077.94	1078.63	1079.43	1080.20	1081.11	1081.98	1081.70	1081.22	1080.70	1079.82	1078.83	1077.92
24	1077.94	1078.73	1079.45	1080.22	1081.17	1081.97	1081.67	1081.19	1080.72	1079.79	1078.77	1077.89
25	1077.95	1078.76	1079.45	1080.25	1081.21	1081.97	1081.64	1081.17	1080.73	1079.76	1078.74	1077.85
26	1077.97	1078.77	1079.49	1080.28	1081.23	1081.97	1081.62	1081.15	1080.74	1079.74	1078.70	1077.81
27	1077.98	1078.80	1079.51	1080.31	1081.26	1081.95	1081.61	1081.12	1080.75	1079.70	1078.65	1077.78
28	1077.99	1078.80	1079.54	1080.33	1081.30	1081.95	1081.58	1081.10	1080.75	1079.66	1078.63	1077.74
29	1078.00	1078.82	1079.57	1080.36	1081.32	1081.94	1081.57	1081.09	1080.76	1079.63	1078.62	1077.72
30	1078.02	1078.83	1079.62	1080.38	---	1081.93	1081.56	1081.06	1080.72	1079.61	1078.62	1077.68
31	1078.05	---	1079.65	1080.41	---	1081.91	---	1081.02	---	1079.58	1078.61	---
MEAN	1077.91	1078.44	1079.25	1080.03	1080.87	1081.75	1081.77	1081.33	1080.76	1080.12	1079.13	1078.15
MAX	1078.05	1078.83	1079.65	1080.41	1081.32	1082.01	1081.89	1081.61	1080.99	1080.67	1079.57	1078.60
MIN	1077.82	1078.07	1078.85	1079.67	1080.44	1081.36	1081.56	1081.02	1080.54	1079.58	1078.61	1077.68
CAL YR 1983	MEAN	1079.83	MAX	1081.82	MIN	1077.82						
WTR YR 1984	MEAN	1079.96	MAX	1082.01	MIN	1077.68						

CRAB CREEK BASIN

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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 north of town of Soap Lake.

DRAINAGE AREA.--413 mi², of which 281 mi² 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 uplake. Feb. 4, 1953, to June 8, 1954, nonrecording gage at site 1.5 mi uplake and June 9, 1954, to June 21, 1957, water-stage recorder at site 0.2 mi uplake.

REMARKS.--Some diversion from tributaries for irrigation. During extreme high stages of Soap Lake, water is pumped from Soap Lake into Lenore Lake.

EXTREMES FOR PERIOD OF RECORD.--Maximum elevation observed, 1,079.20 ft Jan. 28, 1953; minimum observed, 1,070.87 ft Oct. 21, 1939.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum elevation known, 1,083.1 ft, from well-defined alkali line at gage, date unknown.

EXTREMES FOR CURRENT YEAR.--Maximum elevation, 1,076.40 ft Apr. 19; minimum, 1,074.46 ft Oct. 3.

ELEVATION (FEET NGVD), WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1074.48	1074.67	1075.19	1075.55	1075.86	1076.12	1076.32	1076.34	1076.19	1076.15	1075.74	---
2	1074.48	1074.69	1075.19	1075.57	1075.88	1076.13	1076.31	1076.35	1076.19	1076.13	1075.73	---
3	1074.48	1074.71	1075.20	1075.60	1075.89	1076.13	1076.32	1076.35	1076.17	1076.12	1075.72	---
4	1074.49	1074.72	1075.20	1075.61	1075.89	1076.13	1076.32	1076.34	1076.18	1076.11	1075.71	1075.42
5	1074.49	1074.73	1075.22	1075.63	1075.90	1076.13	1076.34	1076.33	1076.18	1076.10	1075.71	---
6	1074.49	1074.74	1075.23	1075.64	1075.90	1076.14	1076.34	1076.33	1076.18	1076.07	1075.68	---
7	1074.48	1074.74	1075.23	1075.65	1075.91	1076.14	1076.34	1076.33	1076.18	1076.04	---	---
8	1074.49	1074.74	1075.26	1075.67	1075.92	1076.14	1076.36	1076.33	1076.16	1076.02	---	---
9	1074.49	1074.75	1075.28	1075.68	1075.93	1076.15	1076.35	1076.32	1076.15	1076.01	---	---
10	1074.49	1074.81	1075.31	1075.69	1075.93	1076.15	1076.37	1076.31	1076.15	1076.00	---	1075.41
11	1074.49	1074.88	1075.33	1075.70	1075.94	1076.15	1076.37	1076.32	1076.14	1075.99	---	---
12	1074.50	1074.89	1075.35	1075.70	1075.95	1076.16	1076.37	1076.32	1076.14	1075.97	---	---
13	1074.50	1074.89	1075.38	1075.71	1075.97	1076.16	1076.37	1076.32	1076.14	1075.95	1075.68	---
14	1074.51	1074.90	1075.37	1075.72	1075.97	1076.17	1076.37	1076.32	1076.14	1075.93	---	---
15	1074.51	1074.93	1075.38	1075.73	1075.99	1076.18	1076.38	1076.31	1076.14	1075.93	---	---
16	1074.52	1074.95	1075.38	1075.74	1076.00	1076.18	1076.38	1076.30	1076.12	1075.93	---	---
17	1074.53	1075.00	1075.39	1075.75	1076.00	1076.19	1076.37	1076.29	1076.08	1075.92	---	1075.44
18	1074.53	1075.01	1075.40	1075.75	1076.01	1076.19	1076.38	1076.29	1076.08	1075.90	---	---
19	1074.53	1075.02	1075.41	1075.76	1076.01	1076.26	1076.39	1076.29	1076.07	1075.88	---	---
20	1074.54	1075.04	1075.40	1075.76	1076.02	1076.26	1076.37	1076.29	1076.06	1075.85	---	---
21	1074.55	1075.05	1075.40	1075.77	1076.03	1076.27	1076.37	1076.28	1076.14	1075.82	---	---
22	1074.57	1075.06	1075.40	1075.78	1076.03	1076.26	1076.37	1076.28	1076.18	1075.80	---	---
23	1074.57	1075.07	1075.39	1075.79	1076.04	1076.27	1076.36	1076.28	1076.17	1075.78	---	---
24	1074.58	1075.15	1075.40	1075.80	1076.08	1076.26	1076.34	1076.27	1076.17	1075.78	---	1075.51
25	1074.59	1075.16	1075.40	1075.81	1076.09	1076.28	1076.33	1076.26	1076.17	1075.78	---	---
26	1074.59	1075.17	1075.42	1075.81	1076.10	1076.31	1076.32	1076.26	1076.16	1075.77	---	---
27	1074.60	1075.19	1075.45	1075.82	1076.10	1076.31	1076.31	1076.24	1076.15	1075.76	---	---
28	1074.61	1075.19	1075.47	1075.84	1076.11	1076.31	1076.30	1076.24	1076.15	1075.76	---	---
29	1074.62	1075.19	1075.50	1075.85	1076.11	1076.31	1076.31	1076.24	1076.18	1075.77	---	---
30	1074.64	1075.19	1075.53	1075.85	---	1076.31	1076.31	1076.24	1076.16	1075.76	---	---
31	1074.65	---	1075.54	1075.86	---	1076.32	---	1076.22	---	1075.76	---	---
MEAN	1074.54	1074.94	1075.35	1075.73	1075.98	1076.21	1076.35	1076.30	1076.15	1075.92	---	---
MAX	1074.65	1075.19	1075.54	1075.86	1076.11	1076.32	1076.39	1076.35	1076.19	1076.15	---	---
MIN	1074.48	1074.67	1075.19	1075.55	1075.86	1076.12	1076.30	1076.22	1076.06	1075.76	---	---

CAL YR 1983 MEAN 1074.97 MAX 1075.54 MIN 1074.47

NOTE.--Elevations for Aug. 13, Sept. 4, 10, 17, and 24 provided by U.S. Bureau of Reclamation.

CRAB CREEK BASIN

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 downstream from source at Rocky Ford Springs, 5.0 mi east of Ephrata, and 6.3 mi upstream from mouth.

DRAINAGE AREA.--458 mi², of which 446 mi² 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 U.S. Bureau of Reclamation datum. Prior to Jan. 1, 1912, nonrecording gages at sites 4.5 mi to 5.5 mi downstream at different datums. Aug. 19, 1942, to May 23, 1945, water-stage recorder at site 3.5 mi downstream at datum 5.37 ft lower. May 23, 1945, to June 15, 1977, water-stage recorder at site 0.2 mi downstream at datum 3.53 ft lower.

REMARKS.--Records good. Base flow derived from Rocky Ford Springs, no known regulation or diversion.

AVERAGE DISCHARGE.--42 years (water years 1943-84), 76.3 ft³/s, 55,280 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 212 ft³/s Apr. 15-18, 1956, gage height, 3.58 ft datum then in use; minimum observed, 20 ft³/s Aug. 13-18, 1911.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 110 ft³/s Aug. 10-17, maximum gage height, 6.22 ft Aug. 9; minimum daily discharge, 52 ft³/s Feb. 5-8.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	85	80	72	66	53	61	69	77	87	87	106	93
2	85	79	72	65	53	61	66	77	87	87	106	91
3	85	79	73	63	53	61	66	77	88	88	106	91
4	84	79	73	64	53	61	66	74	90	88	108	90
5	84	79	73	63	52	61	66	72	90	89	109	91
6	84	79	72	63	52	62	67	72	90	89	109	91
7	84	79	72	63	52	62	66	73	90	89	108	91
8	83	78	72	61	52	62	67	74	90	90	109	90
9	83	77	72	61	53	63	68	75	90	91	109	90
10	83	78	71	61	53	63	68	75	89	92	110	90
11	82	78	71	60	53	64	68	76	88	93	110	90
12	82	76	71	59	54	63	70	77	90	94	110	90
13	82	76	70	59	55	64	70	77	90	94	110	90
14	82	75	69	58	55	64	70	78	89	95	110	90
15	81	76	70	58	55	65	71	79	88	96	110	91
16	82	76	69	57	55	66	71	78	88	96	110	91
17	82	77	68	57	57	66	71	79	87	96	110	91
18	82	75	68	56	57	66	72	79	86	97	109	92
19	80	75	68	56	57	66	74	80	86	98	109	91
20	80	75	67	56	58	64	74	80	86	99	109	91
21	81	75	67	56	58	64	74	81	88	100	106	91
22	80	75	67	55	58	64	74	82	88	102	106	93
23	80	78	68	55	58	64	74	83	87	103	99	94
24	80	78	66	55	58	65	75	83	86	104	100	92
25	79	74	65	55	59	66	75	83	86	102	98	93
26	80	73	65	55	60	66	74	83	86	103	100	93
27	79	75	64	54	60	66	74	84	86	103	96	92
28	80	74	64	54	60	67	75	84	86	104	95	93
29	80	74	63	54	60	68	75	85	88	105	94	94
30	81	73	63	54	---	67	77	86	87	105	93	95
31	81	---	63	53	---	68	---	87	---	105	93	---
TOTAL	2536	2295	2128	1806	1613	1990	2127	2450	2637	2984	3257	2745
MEAN	81.8	76.5	68.6	58.3	55.6	64.2	70.9	79.0	87.9	96.3	105	91.5
MAX	85	80	73	66	60	68	77	87	90	105	110	95
MIN	79	73	63	53	52	61	66	72	86	87	93	90
AC-FT	5030	4550	4220	3580	3200	3950	4220	4860	5230	5920	6460	5440
CAL YR 1983	TOTAL	24207	MEAN	66.3	MAX	92	MIN	42	AC-FT	48010		
WTR YR 1984	TOTAL	28568	MEAN	78.1	MAX	110	MIN	52	AC-FT	56660		

CRAB CREEK BASIN

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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 north of Interstate 90, 1.7 mi upstream from outlet, at town of Moses Lake, and at mile 55.9.

DRAINAGE AREA.--3,080 mi², of which 665 mi² 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 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 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 1,041 ft and 1,047 ft by two outlet structures at south end of lake. Many small diversions for irrigation.

EXTREMES FOR PERIOD OF RECORD.--Maximum elevation, 1,048.29 ft Mar. 10, 1950; minimum observed, 1,038.17 ft Aug. 27, 1910.

EXTREMES FOR CURRENT YEAR.--Maximum elevation, 1,047.26 ft July 1; minimum, 1,043.52 ft Dec. 3, 4.

ELEVATION (FEET NGVD), WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1046.78	1046.04	1043.55	1043.77	1045.00	1046.03	1046.61	1046.75	1046.83	1047.21	1046.93	1047.03
2	1046.76	1045.94	1043.53	1043.77	1045.07	1046.05	1046.61	1046.86	1046.84	1047.19	1046.92	1047.05
3	1046.74	1045.86	1043.53	1043.78	1045.12	1046.06	1046.62	1046.95	1046.84	1047.18	1046.92	1047.07
4	1046.73	1045.76	1043.52	1043.79	1045.16	1046.07	1046.62	1046.99	1046.87	1047.16	1046.93	1047.08
5	1046.72	1045.65	1043.56	1043.83	1045.20	1046.09	1046.63	1047.02	1046.88	1047.14	1046.94	1047.10
6	1046.71	1045.54	1043.58	1044.01	1045.25	1046.11	1046.63	1047.02	1046.88	1047.11	1046.94	1047.10
7	1046.70	1045.42	1043.61	1044.16	1045.29	1046.15	1046.63	1047.04	1046.90	1047.08	1046.94	1047.11
8	1046.69	1045.32	1043.64	1044.19	1045.34	1046.19	1046.64	1047.05	1046.91	1047.05	1046.95	1047.11
9	1046.68	1045.21	1043.68	1044.18	1045.37	1046.22	1046.63	1047.05	1046.92	1047.03	1046.96	1047.11
10	1046.66	1045.19	1043.72	1044.17	1045.39	1046.26	1046.64	1047.05	1046.93	1047.02	1046.96	1047.10
11	1046.65	1044.98	1043.76	1044.15	1045.41	1046.30	1046.63	1047.05	1046.94	1047.00	1046.97	1047.10
12	1046.65	1044.65	1043.78	1044.13	1045.43	1046.34	1046.64	1047.05	1046.97	1046.97	1046.97	1047.09
13	1046.64	1044.38	1043.80	1044.12	1045.46	1046.37	1046.62	1047.05	1047.03	1046.95	1046.97	1047.09
14	1046.63	1044.15	1043.80	1044.10	1045.50	1046.38	1046.62	1047.04	1047.04	1046.93	1046.97	1047.09
15	1046.62	1043.92	1043.80	1044.07	1045.53	1046.40	1046.62	1047.04	1047.05	1046.93	1046.98	1047.08
16	1046.62	1043.78	1043.81	1044.07	1045.56	1046.42	1046.61	1047.02	1047.05	1046.92	1046.99	1047.08
17	1046.62	1043.68	1043.80	1044.11	1045.60	1046.44	1046.62	1047.01	1047.04	1046.92	1046.99	1047.08
18	1046.61	1043.58	1043.80	1044.16	1045.65	1046.44	1046.60	1046.99	1047.05	1046.92	1047.00	1047.07
19	1046.61	1043.56	1043.80	1044.20	1045.71	1046.45	1046.59	1046.97	1047.05	1046.90	1046.99	1047.06
20	1046.61	1043.55	1043.80	1044.23	1045.76	1046.47	1046.57	1046.96	1047.07	1046.90	1047.00	1047.06
21	1046.61	1043.55	1043.78	1044.26	1045.81	1046.51	1046.54	1046.93	1047.13	1046.88	1047.01	1047.03
22	1046.61	1043.54	1043.78	1044.28	1045.84	1046.52	1046.51	1046.93	1047.18	1046.88	1047.02	1047.03
23	1046.62	1043.54	1043.77	1044.31	1045.87	1046.52	1046.49	1046.94	1047.19	1046.87	1047.02	1047.04
24	1046.63	1043.79	1043.77	1044.56	1045.92	1046.52	1046.45	1046.93	1047.20	1046.88	1047.02	1047.03
25	1046.70	1043.73	1043.76	1044.53	1045.94	1046.54	1046.39	1046.92	1047.19	1046.88	1047.03	1047.03
26	1046.80	1043.66	1043.77	1044.83	1045.95	1046.57	1046.36	1046.91	1047.19	1046.87	1047.03	1047.03
27	1046.88	1043.64	1043.76	1044.72	1045.97	1046.56	1046.41	1046.89	1047.19	1046.88	1047.04	1047.00
28	1046.78	1043.62	1043.76	1044.68	1045.99	1046.57	1046.50	1046.89	1047.19	1046.89	1047.02	1046.97
29	1046.61	1043.59	1043.77	1044.70	1046.01	1046.57	1046.58	1046.87	1047.22	1046.91	1047.03	1046.95
30	1046.41	1043.58	1043.78	1044.80	---	1046.58	1046.66	1046.86	1047.20	1046.91	1047.03	1046.94
31	1046.19	---	1043.78	1044.91	---	1046.60	---	1046.85	---	1046.93	1047.05	---
MEAN	1046.65	1044.41	1043.72	1044.24	1045.56	1046.36	1046.58	1046.96	1047.03	1046.98	1046.98	1047.06
MAX	1046.88	1046.04	1043.81	1044.91	1046.01	1046.60	1046.66	1047.05	1047.22	1047.21	1047.05	1047.11
MIN	1046.19	1043.54	1043.52	1043.77	1045.00	1046.03	1046.36	1046.75	1046.83	1046.87	1046.92	1046.94
CAL YR 1983	MEAN	1045.73	MAX	1047.24	MIN	1043.52						
WTR YR 1984	MEAN	1046.05	MAX	1047.22	MIN	1043.52						

CRAB CREEK BASIN

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 east of Beverly, and at mile 4.5.

DRAINAGE AREA.--4,842 mi², of which 665 mi² in the vicinity of Soap Lake is noncontributing.

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

REVISED RECORDS.--WSP 1933: Drainage area.

GAGE.--Water-stage recorder. Elevation of gage is 500 ft, from topographic map.

REMARKS.--Records good. Many diversions above station for irrigation. Flow largely regulated by Potholes Reservoir 41.3 mi upstream. A major portion of flow is return flows, including transbasin diversions, from parts of the Columbia Basin project.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 936 ft³/s Mar. 3, 1980, gage height, 6.46 ft; minimum, 10 ft³/s Jan. 10, 1963, result of freezeup.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 401 ft³/s Apr. 11, gage height, 4.73 ft; minimum daily discharge, 110 ft³/s Dec. 24, result of freezeup.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	296	277	241	135	311	375	358	225	222	229	253	290
2	294	274	235	140	331	374	359	248	211	235	259	290
3	291	275	234	140	348	374	360	243	211	245	250	292
4	296	273	233	148	352	371	364	248	214	239	261	297
5	300	256	232	205	352	368	368	233	224	213	267	297
6	291	249	234	232	352	367	367	233	238	198	259	297
7	286	249	234	250	354	286	370	231	233	191	264	301
8	285	246	235	232	355	226	377	234	230	196	272	306
9	286	245	242	260	359	218	383	233	231	207	278	309
10	290	266	260	269	360	211	393	215	230	212	278	319
11	290	305	278	262	364	209	398	215	234	210	268	322
12	291	303	279	258	363	205	389	214	236	202	250	323
13	285	278	268	248	364	209	366	214	224	200	253	322
14	289	265	259	235	367	213	351	216	222	205	260	314
15	295	265	250	212	370	210	342	223	210	209	264	305
16	302	264	242	220	368	215	340	223	195	215	266	300
17	309	269	227	214	368	268	342	225	186	213	262	296
18	317	269	200	209	364	286	346	227	185	205	260	284
19	324	258	180	198	356	300	346	224	189	196	262	283
20	331	256	145	205	352	307	345	227	193	200	266	278
21	334	254	130	202	350	324	348	234	233	205	268	283
22	336	248	120	207	351	330	343	236	254	208	267	295
23	338	247	115	210	354	320	336	242	267	213	259	312
24	346	279	110	242	354	324	343	241	275	222	255	318
25	355	302	115	332	363	336	300	234	269	226	255	320
26	360	281	120	371	367	341	254	230	260	222	261	318
27	358	260	125	386	371	348	234	239	241	219	273	326
28	326	252	130	337	375	345	211	238	215	222	281	329
29	296	248	130	317	377	351	208	226	216	226	278	330
30	284	245	135	314	---	356	211	215	229	232	289	332
31	281	---	135	303	---	358	---	219	---	245	284	---
TOTAL	9562	7958	6073	7493	10372	9325	10052	7105	6777	6660	8222	9188
MEAN	308	265	196	242	358	301	335	229	226	215	265	306
MAX	360	305	279	386	377	375	398	248	275	245	289	332
MIN	281	245	110	135	311	205	208	214	185	191	250	278
AC-FT	18970	15780	12050	14860	20570	18500	19940	14090	13440	13210	16310	18220
CAL YR 1983	TOTAL	86011	MEAN	236	MAX	360	MIN	110	AC-FT	170600		
WTR YR 1984	TOTAL	98787	MEAN	270	MAX	398	MIN	110	AC-FT	195900		

12472800 COLUMBIA RIVER BELOW PRIEST RAPIDS DAM, WA

LOCATION.--Lat 46°37'44", long 119°51'49", in SE¼NW¼ sec.7, T.13 N., R.24 E., Grant County, Hydrologic Unit 17020016, on left bank 2.6 mi downstream from Priest Rapids Dam, 14.7 mi south of Beverly, and at mile 394.5.

DRAINAGE AREA.--96,000 mi², approximately.

WATER-DISCHARGE RECORDS

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

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

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

REMARKS.--Water-discharge records excellent. Diversions for irrigation of about 500,000 acres upstream from station. Flow regulated by 10 major reservoirs and numerous smaller reservoirs and powerplants.

AVERAGE DISCHARGE.--67 years, 120,200 ft³/s, 87,080,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 692,600 ft³/s June 12, 1948, gage height, 59.35 ft, site and datum then in use; minimum, 4,120 ft³/s Feb. 10, 1932, gage height, 11.40 ft, site and datum then in use.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of June 7, 1894, reached a discharge of about 740,000 ft³/s, based on information obtained at other points.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 254,000 ft³/s June 29, elevation, 414.78 ft; minimum, 38,000 ft³/s Oct. 29, elevation, 396.65 ft.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	87600	69600	142000	71300	126000	157000	72900	153000	133000	173000	90500	70500
2	81400	73700	147000	74300	145000	155000	107000	159000	115000	173000	107000	59500
3	92200	74400	149000	71700	140000	148000	117000	164000	121000	174000	106000	74900
4	80200	82000	137000	71600	148000	114000	131000	169000	145000	169000	86700	96900
5	78500	64900	142000	103000	153000	140000	126000	168000	128000	161000	81300	93500
6	74500	59600	147000	125000	138000	170000	128000	123000	132000	158000	97600	75900
7	78200	76500	145000	116000	150000	158000	122000	148000	133000	150000	112000	71400
8	71900	102000	121000	97700	162000	140000	104000	138000	130000	113000	119000	64300
9	69700	87100	109000	98400	162000	115000	118000	157000	127000	117000	119000	56700
10	93400	83900	92800	114000	157000	109000	138000	155000	96600	132000	125000	76600
11	79000	76500	73700	120000	135000	118000	132000	151000	101000	130000	99500	87200
12	71800	62400	108000	121000	102000	126000	139000	134000	133000	121000	80400	77200
13	78500	58700	107000	126000	107000	127000	127000	114000	122000	120000	119000	83300
14	92800	64500	97100	136000	123000	121000	116000	141000	131000	122000	122000	97900
15	77700	75800	98600	126000	123000	126000	137000	148000	160000	133000	114000	74900
16	65100	95000	109000	140000	118000	117000	131000	161000	165000	150000	123000	64200
17	70000	84000	123000	116000	146000	81400	142000	147000	166000	162000	117000	88300
18	70500	106000	138000	154000	156000	75600	138000	146000	167000	153000	105000	84100
19	76300	104000	147000	167000	128000	82800	142000	138000	163000	142000	84300	77800
20	70500	100000	145000	158000	130000	94200	158000	119000	162000	124000	103000	67900
21	62800	118000	144000	163000	152000	105000	165000	135000	157000	97400	115000	67300
22	59300	120000	136000	137000	159000	91900	172000	140000	156000	85800	117000	62200
23	56200	113000	159000	121000	156000	86500	159000	138000	142000	112000	107000	49000
24	70500	115000	162000	98200	152000	81800	170000	142000	147000	114000	113000	72700
25	66100	103000	110000	101000	139000	73400	160000	139000	160000	134000	81900	73300
26	66400	76200	87900	89100	134000	92200	174000	118000	171000	137000	91400	69100
27	66700	77500	90000	102000	128000	110000	163000	92300	173000	129000	113000	61300
28	70300	109000	112000	92100	130000	110000	148000	102000	176000	77300	119000	69700
29	56900	124000	107000	76700	153000	113000	139000	140000	207000	60800	108000	59300
30	58400	137000	78800	93300	---	110000	162000	152000	190000	87500	86800	56300
31	64500	---	72000	121000	---	77500	---	148000	---	80700	96700	---
TOTAL	2257900	2693300	3736900	3501400	4052000	3526300	4137900	4379300	4409600	3992500	3260100	2183200
MEAN	72840	89780	120500	112900	139700	113800	137900	141300	147000	128800	105200	72770
MAX	93400	137000	162000	167000	162000	170000	174000	169000	207000	174000	125000	97900
MIN	56200	58700	72000	71300	102000	73400	72900	92300	96600	60800	80400	49000
AC-FT	4479000	5342000	7412000	6945000	8037000	6994000	8208000	8686000	8746000	7919000	6466000	4330000
CAL YR 1983	TOTAL	47775800	MEAN	130900	MAX	240000	MIN	45600	AC-FT	94762992		
WTR YR 1984	TOTAL	42130400	MEAN	115100	MAX	207000	MIN	49000	AC-FT	83566000		

COLUMBIA RIVER MAIN STEM

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

WATER-QUALITY RECORDS

PERIOD OF DAILY RECORD.--

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

INSTRUMENTATION.--Temperature recorder since December 1979.

REMARKS.--Recorder stopped Feb. 13, 21, Aug. 21 to Sept. 1.

EXTREMES FOR PERIOD OF DAILY RECORD.--

WATER TEMPERATURES: Maximum recorded, 20.0°C Aug. 25, 27, 1982, Aug. 27, 28, Sept. 3, 1983, and Aug. 19, 1984, but may have been greater during period of no record Aug. 21 to Sept. 1, 1984; minimum, 2.0°C Feb. 11, 12, 1982.

EXTREMES FOR CURRENT YEAR.--

WATER TEMPERATURES: Maximum recorded, 20.0°C Aug. 19, but may have been greater during period of no record Aug. 21 to Sept. 1; minimum recorded, 2.5°C Jan. 20-24, Feb. 3-10.

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984

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

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

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984

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

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 downstream from Priest Rapids Dam, and at mile 388.1.

DRAINAGE AREA.--96,000 mi², approximately.

PERIOD OF RECORD.--Water years 1962-63, 1972, 1974 to current year.

PERIOD OF DAILY RECORD.--

WATER TEMPERATURES: July 1974 to September 1980.

REMARKS.--October 1971 to September 1972, at site 6.4 mi upstream, published as 12472800 "below Priest Rapids Dam." Prior to October 1971 published as 12472800 "at Vernita Ferry."

WATER QUALITY DATA, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984

DATE	TIME	STREAM- FLOW, INSTAN- TANEOUS (CFS)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH (STAND- ARD UNITS)	TEMPER- ATURE (DEG C)	TUR- BID- ITY (NTU)	OXYGEN, DIS- SOLVED (MG/L)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION)	COLI- FORM, FECAL, 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)
NOV , 1983												
22...	1100	123000	138	7.5	11.0	1.0	9.6	89	K2	K6	67	10
JAN , 1984												
10...	1430	116000	147	7.4	4.5	2.0	--	--	--	--	72	13
MAR												
12...	1045	114000	155	7.9	4.5	2.5	12.3	97	<1	26	73	5
MAY												
09...	1030	146000	157	7.9	9.0	2.1	12.4	109	<1	E7	78	14
JUL												
03...	1045	175000	122	7.6	15.0	1.8	11.7	117	K3	K12	58	8
SEP												
11...	1220	48000	160	7.9	17.5	2.3	9.5	102	K1	--	65	9

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- LINEITY 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)
NOV , 1983											
22...	20	4.1	2.3	7	.1	.90	57	12	1.7	.10	5.2
JAN , 1984											
10...	21	4.7	2.6	7	.1	1.0	59	12	3.3	.10	6.0
MAR											
12...	21	5.0	2.4	7	.1	.80	68	12	1.7	.10	5.5
MAY											
09...	23	5.0	2.9	7	.1	1.0	64	16	1.3	.20	6.6
JUL											
03...	17	3.7	2.6	9	.2	.60	50	9.5	1.0	.10	6.3
SEP											
11...	19	4.2	2.6	8	.1	1.1	56	11	1.1	.10	4.7

DATE	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L)	SOLIDS, SUM OF CONSTITUENTS, 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)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N)	NITRO- GEN,AM- MONIA + ORGANIC TOTAL (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)
NOV , 1983											
22...	76	81	.10	25200	1	.13	.050	<.20	.010	.010	.010
JAN , 1984											
10...	79	86	.11	24700	1	.15	.180	.30	.040	.020	.020
MAR											
12...	86	90	.12	26500	15	.15	.080	.20	.020	.020	.030
MAY											
09...	94	95	.13	37100	8	<.10	.060	.20	.040	.020	.020
JUL											
03...	73	71	.10	34500	7	<.10	.020	.20	.020	.010	.010
SEP											
11...	98	77	.13	12700	8	<.10	.030	.60	.020	.010	.010

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

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

WATER QUALITY DATA, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984

[illegible]

COLUMBIA RIVER MAIN STEM

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 upstream from Yakima River, and at mile 340.2.

DRAINAGE AREA.--96,900 mi², approximately.

PERIOD OF DAILY RECORD.--

WATER TEMPERATURE: July 1974 to current year. Unpublished records of stage at site 2.3 miles downstream are available in files of the Geological Survey, and U.S. Army Corps of Engineers.

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 streamward from plant.

REMARKS.--Equipment malfunction July 16 to Sept. 10. 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, represents both horizontal and vertical cross section of the river.

EXTREMES FOR PERIOD OF DAILY RECORD.--

WATER TEMPERATURES: Maximum recorded, 21.5°C Aug. 17-20, 1977; minimum, 0.5°C Feb. 1-4, 1979.

EXTREMES FOR CURRENT YEAR.--

WATER TEMPERATURES: Maximum recorded, 19.5°C Sept. 15-18, but may have been greater during period of no record July 16 to Sept. 10; minimum, 2.0°C Jan. 21.

WATER QUALITY DATA, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984

		SPE- CIFIC CON- DUCT- ANCE	PH (STAND- ARD UNITS)	TEMPER- ATURE (DEG C)	TUR- BID- ITY (NTU)	OXYGEN, DIS- SOLVED (MG/L)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION)	COLI- FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)	STREP- TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML)
DATE	TIME	(US/CM)							
NOV , 1983									
21...	1340	136	7.4	11.0	1.0	9.6	88	K2	55
MAR , 1984									
13...	1015	157	8.2	4.5	2.7	12.3	98	K2	K230
MAY									
08...	1145	158	7.6	9.0	2.9	9.4	82	<1	K5
JUL									
02...	1045	122	7.3	15.0	3.7	11.8	118	K4	33
		HARD- NESS NONCAR- BONATE (MG/L AS CAC03)	CALCIUM DIS- SOLVED (MG/L AS CA)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG)	ALKA- LINEITY LAB (MG/L AS CAC03)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	SOLIDS, DIS- SOLVED (TONS PER AC-FT)	SOLIDS, RESIDUE AT 105 DEG. C, SUS- PENDED (MG/L)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N)
DATE									
NOV , 1983									
21...	61	3	18	3.9	58	1.8	.11	7	<.010
MAR , 1984									
13...	73	5	21	5.1	69	1.4	.12	16	<.010
MAY									
08...	76	13	22	5.1	63	2.0	.12	6	<.010
JUL									
02...	61	10	18	3.9	51	1.2	.10	10	<.010
		NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N)	NITRO- GEN, AMMONIA + ORGANIC TOTAL (MG/L AS N)	PHOS- PHORUS, TOTAL (MG/L AS P)	PHOS- PHORUS, ORTHO, DIS- SOLVED (MG/L AS P)	CHRO- MIUM, DIS- SOLVED (UG/L AS CR)	IRON, DIS- SOLVED (UG/L AS FE)	CARBON, ORGANIC TOTAL (MG/L AS C)	SEDI- MENT, SUS- PENDED (MG/L)
DATE									
NOV , 1983									
21...	.15	.050	.70	.030	<.010	<10	13	1.3	5
MAR , 1984									
13...	.15	.050	.20	.010	.030	20	13	6.6	7
MAY									
08...	<.10	.010	.30	.030	.020	<10	15	1.8	6
JUL									
02...	<.10	.040	.30	.010	.010	<10	11	2.9	5

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

12473520 COLUMBIA RIVER AT RICHLAND, WA--Continued

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984

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

COLUMBIA RIVER MAIN STEM

12473520 COLUMBIA RIVER AT RICHLAND, WA--Continued

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	JUNE			JULY			AUGUST			SEPTEMBER		
1	13.0	12.0	12.5	15.5	14.5	15.0				---	---	---
2	13.0	12.0	12.5	16.0	15.0	15.5				---	---	---
3	13.5	12.5	13.0	16.0	15.0	15.5				---	---	---
4	13.5	12.5	13.0	16.5	15.5	16.0				---	---	---
5	13.5	12.5	13.0	17.0	15.5	16.0				---	---	---
6	13.0	12.5	12.5	16.5	16.0	16.0				---	---	---
7	13.0	12.5	12.5	16.5	16.0	16.5				---	---	---
8	13.0	12.5	12.5	16.5	15.5	16.0				---	---	---
9	13.5	12.5	13.0	17.0	16.0	16.5				---	---	---
10	13.5	13.0	13.0	17.0	16.0	16.5				---	---	---
11	14.0	13.0	13.5	17.0	16.0	16.5				18.5	17.5	18.0
12	14.0	13.0	13.5	17.0	16.0	16.5				18.5	17.5	18.0
13	14.5	13.0	14.0	17.5	16.5	17.0				18.5	17.5	18.0
14	14.5	13.5	14.0	17.5	16.5	17.0				19.0	18.0	18.5
15	14.5	13.5	14.0	18.0	17.0	17.5				19.5	18.5	19.0
16	15.0	13.5	14.0	---	---	---				19.5	19.0	19.0
17	14.5	13.5	14.0	---	---	---				19.5	19.0	19.0
18	14.5	13.5	14.0	---	---	---				19.5	19.0	19.0
19	14.5	13.5	14.0	---	---	---				19.0	18.5	19.0
20	14.5	13.5	14.0	---	---	---				18.5	18.0	18.0
21	14.0	13.5	13.5	---	---	---				18.0	17.0	17.5
22	14.5	13.5	14.0	---	---	---				17.0	16.5	17.0
23	15.0	13.5	14.5	---	---	---				17.0	16.5	17.0
24	15.0	14.0	14.5	---	---	---				17.0	16.5	17.0
25	15.0	14.0	14.5	---	---	---				17.5	17.0	17.5
26	15.0	14.0	14.5	---	---	---				17.5	16.5	17.0
27	15.0	14.0	14.5	---	---	---				17.0	16.5	17.0
28	15.0	14.0	14.5	---	---	---				17.0	16.5	17.0
29	15.0	14.5	14.5	---	---	---				17.0	17.0	17.0
30	15.0	14.0	14.5	---	---	---				17.5	17.0	17.0
31	---	---	---	---	---	---				---	---	---
MONTH	15.0	12.0	13.5	---	---	---				---	---	---

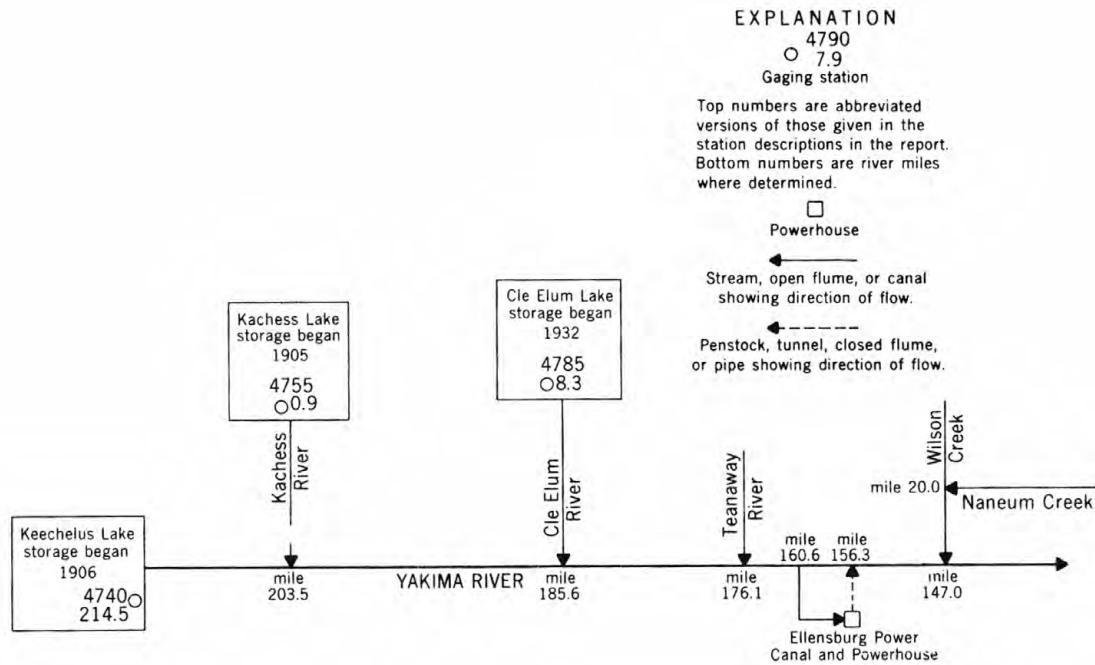


Figure 27.--Gaging stations in Yakima River basin between Keechelus Lake and Naneum Creek.

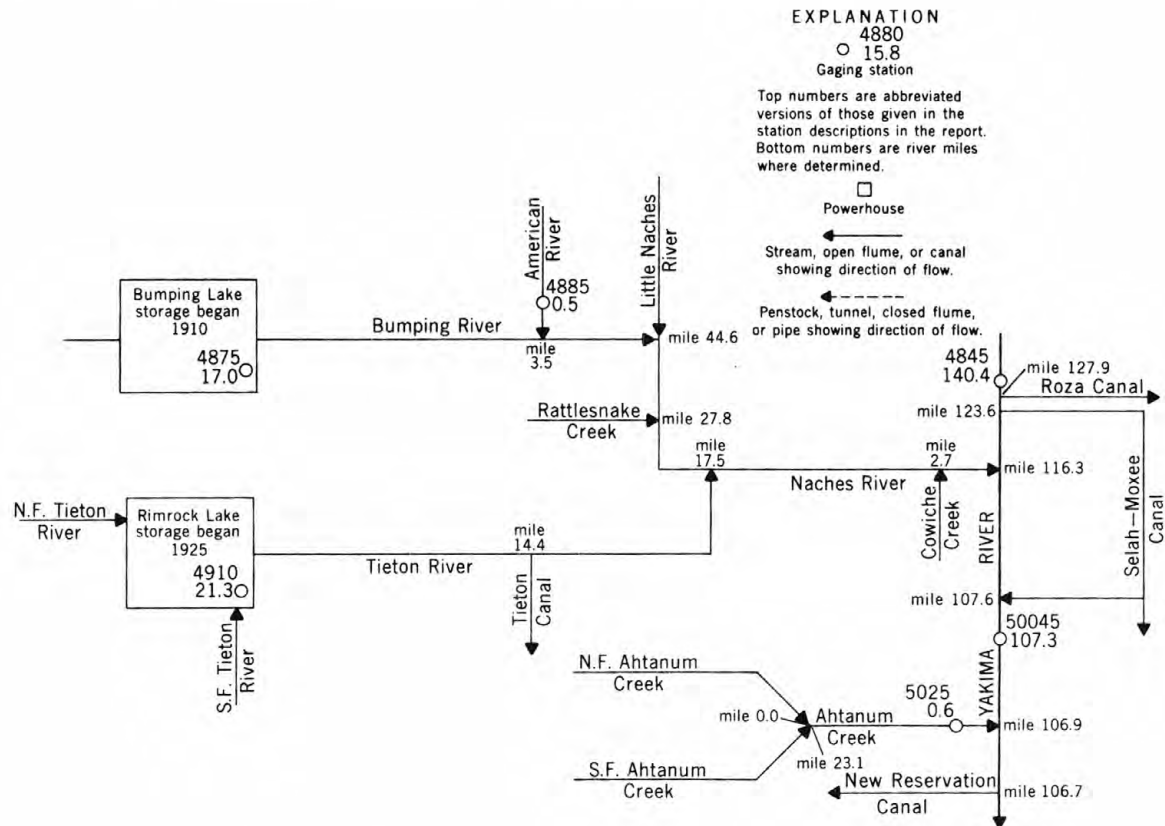


Figure 28.--Gaging stations in Yakima River basin between Bumping Lake and Ahtanum Creek.

YAKIMA RIVER BASIN

303

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 upstream from Umtanum Creek, 4.2 mi upstream from McPherson Canyon, 10 mi south of Ellensburg, and at mile 140.4.

DRAINAGE AREA.--1,594 mi².

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 above 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 upstream at datum 26.70 ft higher.

REMARKS.--Records excellent. Flow partly regulated by Keechelus, Kachess, and Cle Elum Lakes. Diversions upstream from station for irrigation of about 105,000 acres.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 41,000 ft³/s Nov. 15 or 16, 1906, gage height, 41.1 ft, from floodmarks, present datum; minimum recorded, 138 ft³/s Oct. 3, 1915, gage height, 2.86 ft, datum then in use.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 12,400 ft³/s Jan. 25, gage height, 35.44 ft; minimum daily, 600 ft³/s Dec. 23, 24, result of freezeup.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1170	647	951	940	3430	1680	2450	2320	3670	5270	4050	3740
2	1170	682	951	940	3050	1520	2370	2650	3250	4660	4100	3670
3	1150	736	951	1000	2790	1460	2300	2740	3110	3720	4030	3650
4	1130	1010	890	3370	2540	1410	2260	2600	3410	3110	4070	3610
5	1130	1060	880	7110	2400	1390	2280	2470	4760	2960	4070	3590
6	1140	1060	870	5760	2300	1390	2150	2370	5410	2830	4100	3590
7	1140	1040	983	4910	2230	1440	1930	2210	5430	2780	4140	3450
8	1160	951	993	4230	2150	1550	1870	1820	5380	2690	4120	3370
9	1160	870	1030	3550	2100	1880	1820	1750	5250	2650	4230	3290
10	1150	880	1030	3050	2020	2130	2120	1690	5140	2830	4160	2580
11	1140	962	1010	2700	1960	2260	2070	2020	5010	2850	4100	1630
12	1170	951	983	2470	1940	2280	2080	2870	4420	3170	4260	1510
13	1160	910	983	2230	2100	2330	2040	3230	4350	3250	4280	1470
14	1040	900	1060	1970	2070	2230	1960	3670	4560	3230	4230	1460
15	1000	1030	1110	1680	1960	2200	2070	4230	5380	3190	4210	1460
16	972	1180	1050	1620	1930	2210	2810	4640	7350	3290	4100	1460
17	951	1550	1010	1540	1810	2420	2810	4660	7890	3250	4070	1430
18	811	1690	951	1370	1750	2380	2700	4660	6960	3290	4100	1340
19	736	1700	920	1240	1940	2370	2810	4640	5650	3410	4120	1320
20	691	1610	850	1200	1960	2790	2740	5250	5350	3530	4100	1350
21	673	1480	730	1280	1960	4860	2760	5350	6240	3550	4050	1350
22	665	1270	640	1280	1930	4690	2780	5140	6640	3590	4030	1540
23	665	1170	600	1370	1900	4160	2510	5140	6410	3590	4050	2170
24	656	1230	600	2830	1910	3890	2330	4910	6270	3630	4190	1990
25	639	1180	640	10600	2040	3610	2510	4790	6290	3800	4190	2020
26	630	1110	700	9340	1870	3470	2490	4490	6610	3780	4160	1990
27	639	1090	760	6640	1810	3190	2350	4350	6690	3850	4140	1930
28	639	1200	800	5990	1780	2940	2300	4000	6270	4030	4100	1880
29	647	1160	900	5490	1750	2780	2280	4160	6040	4050	3670	1870
30	647	1060	950	4540	---	2630	2260	4490	5620	4120	3630	1870
31	639	---	950	3870	---	2540	---	4260	---	4070	3650	---
TOTAL	28310	33369	27726	106110	61380	78080	70210	113570	164810	108020	126500	67580
MEAN	913	1112	894	3423	2117	2519	2340	3664	5494	3485	4081	2253
MAX	1170	1700	1110	10600	3430	4860	2810	5350	7890	5270	4280	3740
MIN	630	647	600	940	1750	1390	1820	1690	3110	2650	3630	1320
AC-FT	56150	66190	54990	210500	121700	154900	139300	225300	326900	214300	250900	134000
CAL YR 1983	TOTAL	964414	MEAN	2642	MAX	9010	MIN	600	AC-FT	1913000		
WTR YR 1984	TOTAL	985665	MEAN	2693	MAX	10600	MIN	600	AC-FT	1955000		

YAKIMA RIVER BASIN

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 upstream from Bumping Lake Road bridge, 4.9 mi downstream from Hall Creek, 16.0 mi northwest of Nile, and at mile 0.5.

DRAINAGE AREA.--78.9 mi².

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.

REVISED RECORDS.--WSP 982: 1940-42. WSP 1216: Drainage area. WSP 1286: 1911.

GAGE.--Water-stage recorder. Datum of gage is 2,700 ft Washington State Highway Department datum. Prior to Sept. 12, 1915, nonrecording gage at site 300 ft downstream at different datum. Oct. 12 to Dec. 7, 1939, nonrecording gage at present site and datum.

REMARKS.--Records good except those for period of no gage-height record June 12 to July 11, which are fair. No regulation or diversion.

AVERAGE DISCHARGE.--47 years (water years, 1910-11, 1940-84), 244 ft³/s, 42.00 in/yr, 176,800 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 4,230 ft³/s Dec. 26, 1980, gage height, 77.99 ft; minimum, 20 ft³/s Nov. 22, 1940.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 1,160 ft³/s May 30, gage height, 74.91 ft; maximum gage height, 77.71 ft Jan. 4, (backwater from ice); minimum daily, 45 ft³/s Dec. 22, 23, result of freezeup.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP		
1	60	54	100	55	244	129	210	195	747	628	168	63		
2	59	80	95	60	228	127	201	231	643	638	158	63		
3	57	150	100	150	216	122	201	225	591	638	151	61		
4	56	250	95	350	210	121	198	213	607	628	142	60		
5	56	220	90	591	204	119	195	207	628	675	133	60		
6	55	200	85	560	198	122	189	201	612	633	129	75		
7	55	190	83	491	192	127	189	201	575	520	122	71		
8	54	184	85	427	189	135	186	216	545	463	115	68		
9	54	153	86	368	184	151	181	254	515	436	113	65		
10	53	146	88	321	175	168	178	250	496	427	111	63		
11	53	146	90	288	173	178	168	264	500	405	107	61		
12	51	145	90	257	178	186	168	332	550	405	103	64		
13	50	145	91	234	192	184	160	384	633	388	102	61		
14	50	155	89	200	175	181	163	500	735	364	96	59		
15	49	165	84	160	170	186	186	491	933	360	93	57		
16	49	200	75	150	165	184	216	440	940	388	89	56		
17	49	300	70	140	158	181	216	409	775	405	88	54		
18	49	280	65	135	153	178	219	388	702	364	84	54		
19	49	260	60	135	151	178	219	427	691	324	83	51		
20	48	250	55	145	153	207	216	565	708	291	81	51		
21	48	240	50	150	163	299	216	530	764	267	78	50		
22	51	230	45	155	156	291	219	491	787	244	77	53		
23	54	220	45	165	151	288	219	530	770	237	74	56		
24	54	205	47	372	151	284	216	496	877	241	72	54		
25	53	190	47	602	144	274	207	458	979	244	72	53		
26	52	170	50	486	137	257	198	454	979	250	69	51		
27	52	155	50	405	135	241	192	467	914	225	68	51		
28	51	142	50	348	135	234	189	515	877	207	67	50		
29	50	129	50	313	131	225	184	691	933	195	67	49		
30	52	122	55	288	---	219	184	1080	741	181	65	48		
31	52	---	55	264	---	216	---	979	---	175	64	---		
TOTAL	1625	5476	2220	8765	5011	5992	5883	13084	21747	11846	3041	1732		
MEAN	52.4	183	71.6	283	173	193	196	422	725	382	98.1	57.7		
MAX	60	300	100	602	244	299	219	1080	979	675	168	75		
MIN	48	54	45	55	131	119	160	195	496	175	64	48		
CFSM	.66	2.32	.91	3.59	2.19	2.45	2.48	5.35	9.19	4.84	1.24	.73		
IN.	.77	2.58	1.05	4.13	2.36	2.83	2.77	6.17	10.25	5.59	1.43	.82		
AC-FT	3220	10860	4400	17390	9940	11890	11670	25950	43140	23500	6030	3440		
CAL YR 1983	TOTAL	107360	MEAN	294	MAX	1930	MIN	45	CFSM	3.73	IN.	50.62	AC-FT	212900
WTR YR 1984	TOTAL	86422	MEAN	236	MAX	1080	MIN	45	CFSM	2.99	IN.	40.75	AC-FT	171400

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 northwest of Martin, 10 mi northwest of Easton, and at mile 214.5. DRAINAGE AREA.--54.7 mi². 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 between elevations 2,425.00 ft, invert of gate sill, and 2,517.00 ft, spillway crest. Spillway raised 2 ft Sept. 12, 1952. Figures given herein represent usable contents. Water is used for irrigation.

COOPERATION.--Records furnished by U.S. Bureau of Reclamation.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 160,940 acre-ft June 5, 1969, elevation, 2,518.23 ft; minimum observed, 448 acre-ft Sept. 6, 12, 13, 1906 (original crib dam); minimum elevation observed, 2,428.30 ft Sept. 20, 1926.

EXTREMES FOR CURRENT YEAR.--Maximum contents, 157,770 acre-ft June 16, elevation, 2,517.00 ft; minimum, 67,140 acre-ft Oct. 13, elevation, 2,474.00 ft.

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 northwest of Easton. DRAINAGE AREA.--63.6 mi². 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, 21,000 acre-ft, used Sept. 20, 1905, to June 30, 1911. Storage behind present dam began June 30, 1911. Usable capacity, 239,000 acre-ft between elevations 2,192.75 ft, invert of gate sill, and 2,262.00 ft, top of spillway gate. Figures given herein represent usable contents. Water is used for irrigation.

COOPERATION.--Records furnished by U.S. Bureau of Reclamation.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 244,800 acre-ft May 9, 1957, elevation, 2,263.29 ft; minimum observed, 525 acre-ft Sept. 14, 15, 1910 (original crib dam); minimum elevation observed, 2,197.73 ft Sept. 25, 27, 1915.

EXTREMES FOR CURRENT YEAR.--Maximum contents, 238,210 acre-ft May 31, elevation, 2,261.83 ft; minimum, 116,730 acre-ft Oct. 15, elevation, 2,232.27 ft.

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 northwest of Roslyn, and at mile 8.3. DRAINAGE AREA.--203 mi². 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 between elevations 2,110.00 ft, invert of gate sill, and 2,240.00 ft, top of spillway gate. Figures given herein represent usable contents. Water is used for irrigation.

COOPERATION.--Records furnished by U.S. Bureau of Reclamation.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents observed, 448,520 acre-ft May 8, 9, 1957, elevation, 2,241.98 ft; minimum observed, 2,380 acre-ft Aug. 31, 1906; minimum elevation observed, 2,114.35 ft Oct. 14, 1932. Storage was uncontrolled Oct. 3, 1931, to Feb. 26, 1932.

EXTREMES FOR CURRENT YEAR.--Maximum contents, 438,340 acre-ft June 15, elevation, 2,240.29 ft; minimum, 140,660 acre-ft Sept. 30, elevation, 2,166.36 ft.

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 southwest of Goose Prairie, 10 mi southwest of town of American River, 19 mi west of Niles, and at mile 17.0. DRAINAGE AREA.--69.3 mi². 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 between elevations 3,389.00 ft, invert of gate sill, and 3,426.00 ft, spillway crest. Figures given herein represent usable contents. Water is used for irrigation.

COOPERATION.--Records furnished by U.S. Bureau of Reclamation.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents observed, 39,840 acre-ft June 21, 22, 1925, elevation, 3,430.55 ft; minimum observed, 1,130 acre-ft Feb. 5-9, 1949, elevation, 3,390.80 ft.

EXTREMES FOR CURRENT YEAR.--Maximum contents, 33,970 acre-ft May 31, elevation, 3,426.20 ft; minimum, 2,850 acre-ft Dec. 20, elevation, 3,393.48 ft.

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 upstream from Wildcat Creek, 7.1 mi upstream from headworks on Tieton Canal, 21 mi west of Naches, and at mile 21.3. DRAINAGE AREA.--187 mi². 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 between elevations 2,766.00 ft, invert of tunnel entrance, and 2,926.00 ft, crest of spillway gates. Figures given herein represent usable contents. Water is used for irrigation.

COOPERATION.--Records furnished by U.S. Bureau of Reclamation.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 201,630 acre-ft June 18, 1974, elevation, 2,927.43 ft; minimum observed, 30 acre-ft Oct. 19, 20, 1979, elevation, 2,766.25 ft.

EXTREMES FOR CURRENT YEAR.--Maximum contents, 199,160 acre-ft June 4, elevation, 2,926.46 ft; minimum, 101,640 acre-ft Sept. 30, elevation, 2,880.54 ft.

YAKIMA RIVER BASIN

RESERVOIRS IN YAKIMA RIVER BASIN, WA--Continued

MONTHEND ELEVATION AND CONTENTS AT 2400, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984

Date	Elevation (feet)	Contents (acre- feet)	Change in contents (acre-feet)	Elevation (feet)	Contents (acre- feet)	Change in contents (acre-feet)
12474000 KEECHELUS LAKE			12475500 KACHESS LAKE			
Sept. 30.....	2,474.43	67,850	--	2,237.25	135,210	--
Oct. 31.....	2,475.93	70,340	+2,490	2,232.37	117,090	-18,120
Nov. 30.....	2,492.03	100,170	+29,830	2,238.26	139,050	+21,960
Dec. 31.....	2,491.34	98,780	-1,390	2,240.57	147,960	+8,910
CAL YR 1983.....	---	---	+34,060	---	---	-22,220
Jan. 31.....	2,508.67	137,080	+38,300	2,250.57	188,780	+40,820
Feb. 29.....	2,507.16	133,480	-3,600	2,253.60	201,770	+12,990
Mar. 31.....	2,512.19	145,660	+12,180	2,258.13	221,620	+19,850
Apr. 30.....	2,512.75	147,050	+1,390	2,260.00	229,960	+8,340
May 31.....	2,516.79	157,230	+10,180	2,261.83	238,210	+8,250
June 30.....	2,516.55	156,620	-610	2,261.50	236,710	-1,500
July 31.....	2,507.85	135,110	-21,510	2,257.22	217,590	-19,120
Aug. 31.....	2,495.11	106,550	-28,560	2,246.23	170,630	-46,960
Sept. 30.....	2,477.59	73,160	-33,390	2,235.68	129,310	-41,320
WTR YR 1984.....	---	---	+5,310	---	---	-5,900
12478500 CLE ELUM LAKE			12487500 BUMPING LAKE			
Sept. 30.....	2,168.48	147,590	--	3,401.39	8,340	--
Oct. 31.....	2,167.50	144,370	-3,220	3,395.03	3,870	-4,470
Nov. 30.....	2,181.37	191,900	+47,530	3,395.61	4,260	+390
Dec. 31.....	2,185.17	205,650	+13,750	3,395.02	3,860	-400
CAL YR 1983.....	---	---	-21,310	---	---	-2,340
Jan. 31.....	2,208.42	296,290	+90,640	3,411.64	17,200	+13,340
Feb. 29.....	2,214.65	322,330	+26,040	3,407.88	13,650	-3,550
Mar. 31.....	2,224.04	363,100	+40,770	3,412.07	17,620	+3,970
Apr. 30.....	2,232.83	403,030	+39,930	3,415.46	21,160	+3,540
May 31.....	2,236.83	421,800	+18,770	3,425.97	33,670	+12,510
June 30.....	2,238.73	430,850	+9,050	3,424.21	31,410	-2,260
July 31.....	2,222.90	358,050	-72,800	3,424.37	31,610	+200
Aug. 31.....	2,177.37	177,760	-180,290	3,422.49	29,270	-2,340
Sept. 30.....	2,166.36	140,660	-37,100	3,412.31	17,870	-11,400
WTR YR 1984.....	---	---	-6,930	---	---	+9,530
12491000 RIMROCK LAKE						
Sept. 30.....	2,902.71	144,530	--			
Oct. 31.....	2,892.17	123,220	-21,310			
Nov. 30.....	2,894.84	128,460	+5,240			
Dec. 31.....	2,892.50	123,860	-4,600			
CAL YR 1983.....	--	--	-17,140			
Jan. 31.....	2,906.02	151,560	+27,700			
Feb. 29.....	2,905.66	150,780	-780			
Mar. 31.....	2,912.70	166,260	+15,480			
Apr. 30.....	2,920.64	184,780	+18,520			
May 31.....	2,924.79	194,960	+10,180			
June 30.....	2,924.28	193,690	-1,270			
July 31.....	2,922.89	190,250	-3,440			
Aug. 31.....	2,915.11	171,750	-18,500			
Sept. 30.....	2,880.54	101,640	-70,110			
WTR YR 1984.....	---	---	-42,890			

YAKIMA RIVER BASIN

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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 upstream from Ahtanum Creek, 0.8 mi upstream from Wapato Dam, 1.4 mi southeast of Union Gap, and at about mile 107.3.

DRAINAGE AREA.--3,479 mi².

WATER-DISCHARGE RECORDS

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

GAGE.--Water-stage recorder. Datum of gage is 900.00 ft above National Geodetic Vertical Datum of 1929; gage readings have been reduced to elevations above National Geodetic Vertical Datum of 1929. Prior to Apr. 4, 1967, at site 1,200 ft downstream at same datum.

REMARKS.--Water-discharge records excellent. Diversions upstream from station for irrigation of about 212,000 acres. 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 ft³/s Dec. 3, 1977, elevation, 949.55 ft; minimum daily, 300 ft³/s Jan. 1, 1979.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 23,200 ft³/s Jan. 25, elevation, 947.34 ft; minimum discharge, 960 ft³/s Oct. 20, elevation, 937.26 ft.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1690	1320	2180	1550	6360	3390	3870	2900	7130	8470	3520	3030
2	1650	1350	2110	1550	5730	3240	3680	3410	5930	7760	3410	3010
3	1600	1430	2180	1700	5240	3100	3490	3640	5500	6250	3240	2980
4	1620	2210	2110	5000	4870	3030	3410	3390	6150	4890	3180	2930
5	1650	2390	2110	12400	4590	2980	3430	3270	8190	4510	3270	2930
6	1640	2300	1910	11100	4420	2990	3340	3140	8690	3680	3310	3020
7	1630	2390	1940	9150	4270	3060	3060	2950	8670	3480	3280	2940
8	1640	2080	1930	7900	4150	3200	3010	2900	8540	3250	3180	2890
9	1740	1970	1990	6400	4060	3320	2780	3020	8280	3280	3220	2780
10	1730	2020	2020	5680	3960	3710	3020	3050	8050	3320	3180	2930
11	1690	2150	2000	5540	4010	4090	3010	3140	7760	3280	3070	3250
12	1570	2140	1930	5110	3960	4150	2980	4100	6680	3460	3290	3030
13	1740	2150	1900	4710	4200	4100	2910	4850	6550	3640	3420	2790
14	1730	2130	1930	4290	4210	3680	2810	5630	7090	3550	3380	2700
15	1330	2110	2020	3620	4000	3860	2910	6340	7960	3430	3360	2700
16	1260	2490	1920	3350	3960	3960	3620	6720	10900	3510	3270	2700
17	1240	3340	1660	3180	3780	4260	4060	6700	12200	3430	3210	2680
18	1300	3580	1600	2540	3640	4270	3980	6530	11200	3340	3210	2560
19	1260	3510	1550	2410	3710	4150	4000	6570	9280	3390	3250	2580
20	1160	3490	1450	2490	3780	4530	3890	7550	8640	3430	3240	2650
21	1330	3270	1350	2530	3800	7130	3780	7840	9870	3430	3160	2630
22	1320	2890	1250	2730	3740	7920	3840	7350	11600	3430	3140	2770
23	1320	2690	1150	2830	3670	7050	3710	7310	11500	3420	3130	3430
24	1300	2830	1150	4040	3710	6550	3280	6990	11400	3510	3240	3290
25	1270	2830	1150	17200	3810	6020	3380	6640	11600	3490	3310	3220
26	1320	2650	1180	15700	3640	5750	3340	6450	11700	3410	3290	2830
27	1380	2550	1200	11800	3490	5230	3050	6280	11700	3280	3280	2720
28	1350	2610	1300	10300	3450	4800	2870	5950	10700	3390	3310	2540
29	1350	2600	1500	9780	3700	4480	2850	6360	10300	3450	3010	2530
30	1390	2390	1550	8260	---	4180	2860	7820	9350	3520	2870	2530
31	1350	---	1550	7170	---	4030	---	8390	---	3340	2930	---
TOTAL	45550	73860	52770	192010	119910	136210	100220	167180	273110	121020	100160	85570
MEAN	1469	2462	1702	6194	4135	4394	3341	5393	9104	3904	3231	2852
MAX	1740	3580	2180	17200	6360	7920	4060	8390	12200	8470	3520	3430
MIN	1160	1320	1150	1550	3450	2980	2780	2900	5500	3250	2870	2530
AC-FT	90350	146500	104700	380900	237800	270200	198800	331600	541700	240000	198700	169700
CAL YR 1983	TOTAL	1530520	MEAN	4193	MAX	15100	MIN	1150	AC-FT	3036000		
WTR YR 1984	TOTAL	1467570	MEAN	4010	MAX	17200	MIN	1150	AC-FT	2911000		

YAKIMA RIVER BASIN

12500450 YAKIMA RIVER ABOVE AHTANUM CREEK, AT UNION GAP, WA--Continued

WATER-QUALITY RECORDS

LOCATION.--Water-quality data obtained at the cableway 0.2 miles downstream from gage and 0.7 miles downstream from Moxee Drain.

PERIOD OF RECORD.--Water years 1969, 1971, March 1975 to current year.

PERIOD OF DAILY RECORD.--

WATER TEMPERATURE: March 1981 to December 1981.

REMARKS.--Water-quality records affected by Moxee Drain during the summer months when it accounts for about three percent of the flow of the Yakima River at the entry point of Moxee Creek, about 0.7 miles above the sampling point. Moxee Drain contributes significant suspended sediment load and nutrients to the river, during the irrigation season.

WATER QUALITY DATA, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984

DATE	TIME	STREAM- FLOW, INSTAN- TANEOUS (CFS)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH (STAND- ARD UNITS)	TEMPER- ATURE (DEG C)	TUR- BID- ITY (NTU)	OXYGEN, DIS- SOLVED (MG/L)	OXYGEN, DIS- SOLVED (MG/L)	COLI- FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)	STREP- TOCOCCI KF AGAR (COLS. PER 100 ML)	HARD- NESS (MG/L AS CACO3)	HARD- NESS NONCAR- BONATE (MG/L AS CACO3)
NOV , 1983												
07...	1540	2270	146	8.4	7.5	1.0	9.8	84	--	--	52	0
JAN , 1984												
09...	1630	5660	112	8.2	2.5	17	12.5	95	110	930	41	0
MAR												
06...	1540	3020	134	8.4	7.5	3.1	12.4	107	K4	180	52	0
APR												
30...	1445	2820	117	8.3	11.0	4.4	9.6	88	K24	67	44	0
JUL												
10...	1120	3390	--	7.9	15.5	6.2	10.4	107	52	53	39	0
SEP												
11...	1420	3290	107	7.4	15.5	9.1	10.2	104	180	--	42	--

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)
NOV , 1983											
07...	13	4.7	7.0	22	.4	1.0	54	5.9	3.3	<.10	16
JAN , 1984											
09...	11	3.4	4.9	20	.3	1.5	44	7.5	2.5	.10	17
MAR											
06...	13	4.8	7.0	22	.4	1.3	60	7.1	2.8	.10	18
APR											
30...	11	3.9	5.5	21	.4	1.0	52	5.8	2.6	<.10	16
JUL											
10...	9.9	3.5	4.9	21	.4	1.2	42	4.5	--	.10	14
SEP											
11...	11	3.6	5.7	22	.4	1.4	--	6.1	2.6	.10	17

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 DIS- SOLVED (MG/L AS N)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N)	NITRO- GEN,AM- MONIA + ORGANIC TOTAL (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)	ALUM- INUM, DIS- SOLVED (UG/L AS AL)
NOV , 1983											
07...	82	84	.11	503	.23	.150	.60	.050	.040	.040	30
JAN , 1984											
09...	69	75	.09	1050	.18	.120	.50	.140	.050	.030	--
MAR											
06...	86	90	.12	701	.27	.080	.40	.050	.050	.030	30
APR											
30...	73	77	.10	556	<.10	<.010	.40	.050	.050	.040	20
JUL											
10...	80	--	.11	732	.10	.030	.30	.050	.030	.030	30
SEP											
11...	100	--	.14	888	.18	.020	.30	.060	.020	.030	--

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

YAKIMA RIVER BASIN

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12500450 YAKIMA RIVER ABOVE AHTANUM CREEK, AT UNION GAP, WA--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984

DATE	ARSENIC DIS- SOLVED (UG/L AS AS)	BARIUM, DIS- SOLVED (UG/L AS BA)	BERYL- LIUM, DIS- SOLVED (UG/L AS BE)	CADMIUM DIS- SOLVED (UG/L AS CD)	CHRO- MIUM, DIS- SOLVED (UG/L AS CR)	COBALT, DIS- SOLVED (UG/L AS CO)	COPPER, DIS- SOLVED (UG/L AS CU)	IRON, DIS- SOLVED (UG/L AS FE)	LEAD, DIS- SOLVED (UG/L AS PB)	LITHIUM DIS- SOLVED (UG/L AS LI)	MANGA- NESE, DIS- SOLVED (UG/L AS MN)
NOV , 1983											
07...	1	13	<.5	<1	<1	<3	4	47	<1	9	7
JAN , 1984											
09...	--	--	--	--	--	--	--	--	--	--	--
MAR											
06...	<1	27	<.5	<1	1	<3	3	33	<1	5	10
APR											
30...	<1	13	<.5	<1	1	<3	8	19	7	<4	7
JUL											
10...	<1	16	<.5	1	<1	<3	21	38	<1	6	11
SEP											
11...	--	--	--	--	--	--	--	--	--	--	--
DATE	MERCURY DIS- SOLVED (UG/L AS HG)	MOLYB- DENUM, DIS- SOLVED (UG/L AS MO)	NICKEL, DIS- SOLVED (UG/L AS NI)	SELE- NIUM, DIS- SOLVED (UG/L AS SE)	SILVER, DIS- SOLVED (UG/L AS AG)	STRON- TIUM, DIS- SOLVED (UG/L AS SR)	VANA- DIUM, DIS- SOLVED (UG/L AS V)	ZINC, DIS- SOLVED (UG/L AS ZN)	SEDI- MENT, SUS- PENDE (MG/L)	SEDI- MENT, DIS- CHARGE, SUS- PENDE (T/DAY)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM
NOV , 1983											
07...	<.1	<10	1	<1	<1	59	<6	4	10	61	--
JAN , 1984											
09...	--	--	--	--	--	--	--	--	153	2340	59
MAR											
06...	.1	<10	5	<1	<1	60	<6	8	15	122	--
APR											
30...	.1	<10	1	<1	<1	52	<6	3	23	175	68
JUL											
10...	<.1	<10	<1	<1	<1	46	<6	13	42	384	--
SEP											
11...	--	--	--	--	--	--	--	--	36	320	--

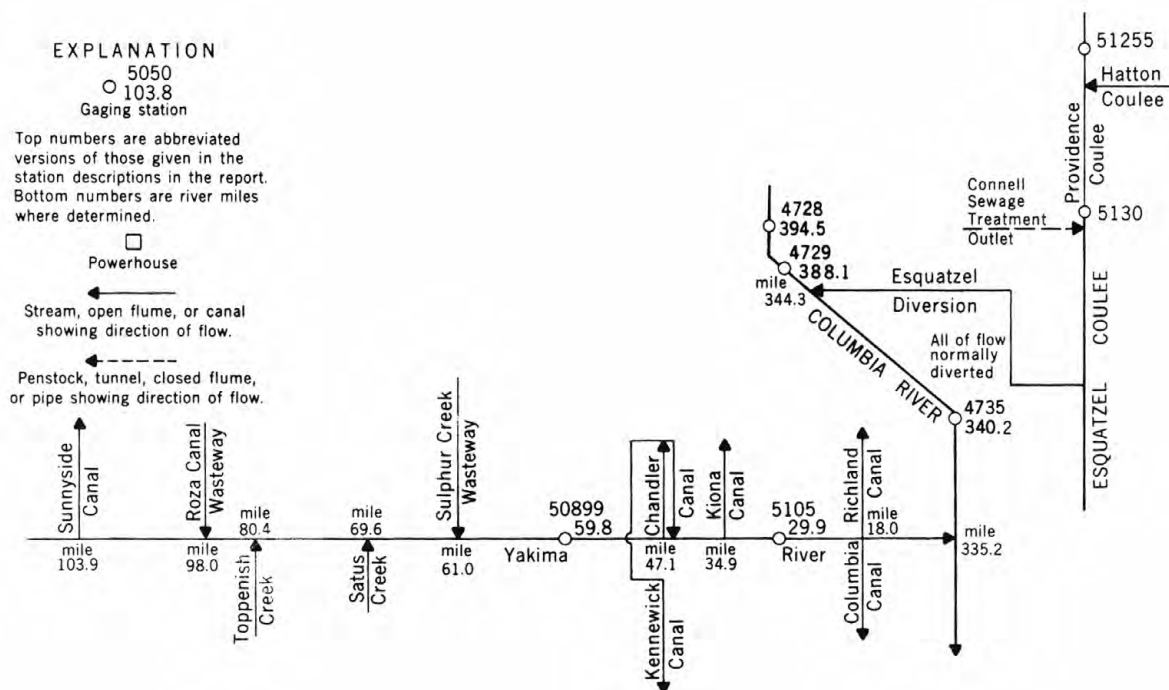


Figure 29.--Gaging stations in Yakima River basin downstream from Sunnyside Canal and in Esquatzel Coulee.

YAKIMA RIVER BASIN

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12502500 AHTANUM CREEK AT UNION GAP, WA

LOCATION.--Lat 46°32'08", long 120°28'20", in SE¼SW¼ sec.8, T.12 N., R.19 E., Yakima County, Hydrologic Unit 17030003, on right downstream wingwall of Union Pacific Railway bridge at Union Gap, 1.0 mi south of town of Union Gap, and at mile 0.6.

DRAINAGE AREA.--173 mi².

PERIOD OF RECORD.--May to November 1904, August 1907 to July 1908, March to October 1910, April 1911 to September 1914, May 1951 to April 1953, August 1960 to current year. Published as "near Yakima" 1904, 1907-08, 1910-12. Records for water years 1913-14 are published in WSP 1286.

REVISED RECORDS.--WSP 1933: Drainage area.

GAGE.--Water-stage recorder. Elevation of gage is 940 ft, from topographic map. Prior to Sept. 30, 1914, nonrecording gage at approximately same site at various datums. May 12, 1951 to Sept. 30, 1972, water-stage recorder at present site at datum 3.00 ft higher.

REMARKS.--Records good. Extreme high flows may include transbasin flow from Wide Hollow Creek. Diversions and ground-water withdrawals for irrigation of about 9,000 acres upstream from station. Return from transbasin irrigation flows contribute to base flow.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 3,100 ft³/s Jan. 16, 1974, gage height, 10.36 ft; no flow many days during September and October 1904.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 297 ft³/s Jan. 25, gage height, 5.18 ft; minimum, 8.0 ft³/s Aug. 11, 12.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	32	25	50	51	161	104	134	115	236	150	17	15
2	30	27	49	52	151	104	132	132	212	136	23	15
3	27	33	57	51	143	101	130	125	195	118	26	15
4	26	33	49	68	137	99	134	110	200	112	22	13
5	26	43	54	147	132	98	132	112	195	101	20	12
6	24	42	54	184	128	98	128	107	190	89	20	14
7	24	42	53	188	127	98	121	99	176	74	19	13
8	27	39	50	186	125	101	121	99	165	67	19	14
9	25	38	61	163	125	107	116	108	154	63	17	14
10	25	53	62	145	125	118	120	112	160	56	13	16
11	26	65	61	132	123	127	107	113	154	44	10	15
12	24	64	58	120	121	128	107	121	150	38	12	12
13	24	57	58	113	139	134	102	128	169	34	15	14
14	26	53	58	101	132	132	105	151	202	33	15	16
15	25	53	57	63	127	132	107	147	207	32	16	20
16	25	60	49	61	134	134	121	134	223	30	15	20
17	24	66	42	64	128	157	125	127	210	26	13	17
18	25	65	39	54	123	151	136	123	192	24	13	20
19	26	63	45	62	118	149	141	128	169	20	14	20
20	25	63	40	72	116	159	136	157	200	17	12	21
21	22	60	26	77	116	205	132	153	259	17	12	22
22	24	58	24	82	112	214	136	141	265	17	10	21
23	24	54	24	107	112	207	137	157	242	19	9.0	27
24	24	68	26	125	116	200	136	147	245	18	10	32
25	24	65	30	267	121	191	127	147	253	15	12	33
26	25	62	33	248	110	177	118	155	242	15	15	35
27	25	61	39	222	108	163	108	147	228	16	17	36
28	24	61	45	217	105	157	105	151	236	20	15	36
29	24	60	48	212	105	147	108	174	200	20	13	38
30	24	58	48	186	---	136	110	239	167	19	10	39
31	24	---	49	171	---	141	---	268	---	15	12	---
TOTAL	780	1591	1438	3991	3620	4369	3672	4327	6096	1455	466.0	635
MEAN	25.2	53.0	46.4	129	125	141	122	140	203	46.9	15.0	21.2
MAX	32	68	62	267	161	214	141	268	265	150	26	39
MIN	22	25	24	51	105	98	102	99	150	15	9.0	12
AC-FT	1550	3160	2850	7920	7180	8670	7280	8580	12090	2890	924	1260
CAL YR 1983	TOTAL	54304.0	MEAN	149	MAX	728	MIN	8.7	AC-FT	107700		
WTR YR 1984	TOTAL	32440.0	MEAN	88.6	MAX	268	MIN	9.0	AC-FT	64340		

YAKIMA RIVER BASIN

12508990 YAKIMA RIVER AT MABTON, WA

LOCATION.--Lat 46°13'53", long 119°59'54", in SW¼SW¼ sec.30, T.9 N., R.23 E., Yakima County, Hydrologic Unit 17030003, on right bank under county highway bridge, at east boundary of Yakima Indian Reservation, 1.1 mi north of Mabton, and at mile 59.8.

DRAINAGE AREA.--5,359 mi².

PERIOD OF RECORD.--October 1970 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 643 ft, from topographic map. Prior to Oct. 1, 1976, at datum 10 ft higher.

REMARKS.--Water-discharge records good. Flow affected by storage in five reservoirs and by diversions upstream from station for irrigation upstream and downstream from station of about 424,000 acres and by return flow from irrigated area.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 37,200 ft³/s Jan. 17, 1974, gage height, 25.30 ft present datum; minimum daily, 320 ft³/s Mar. 25, 1977.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 17,500 ft³/s Jan. 27, gage height, 18.82 ft; minimum, 1,150 ft³/s July 28, gage height, 10.43 ft.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1800	2080	3330	2400	8020	4720	4960	2400	6450	7300	1310	1690
2	1700	2070	3110	2400	7370	4410	4720	2520	5340	6300	1480	1810
3	1630	2090	3080	2420	6810	4260	4430	3040	4500	5200	1450	1860
4	1570	2200	3050	4890	6360	4120	4290	2990	4470	4000	1360	1830
5	1530	2850	3010	9540	6010	4030	4170	2800	5630	3130	1380	1720
6	1530	2850	2950	11700	5750	4000	4100	2720	7030	2660	1480	1730
7	1500	2800	2770	11000	5570	4000	3980	2600	7260	2020	1520	1870
8	1510	2740	2800	9830	5440	4070	3800	2280	7220	1770	1510	1830
9	1530	2600	2820	8870	5300	4170	3660	2170	7070	1600	1420	1760
10	1600	2590	2930	7770	5190	4340	3380	2260	6890	1480	1470	1730
11	1600	2770	3110	7370	5090	4790	3600	2160	6680	1420	1440	1850
12	1590	2800	3100	7050	5090	5050	3500	2400	5930	1350	1350	2070
13	1620	2820	2980	6570	5190	5020	3420	3340	5500	1440	1500	1960
14	1730	2790	3070	6100	5500	4890	3310	3960	5540	1540	1660	1820
15	2130	2790	3080	5440	5360	4560	3190	4650	5850	1500	1660	1770
16	1850	2870	3050	4740	5230	4780	3360	5150	6800	1470	1630	1760
17	1770	3360	2830	4590	5170	4960	4000	5440	9000	1450	1530	1760
18	1770	4050	2620	4070	4980	5280	4150	5320	9200	1350	1510	1730
19	1830	4200	2630	3580	4850	5240	4150	5230	8500	1240	1540	1650
20	2170	4340	2500	3540	4940	5210	4070	5650	7100	1250	1650	1660
21	2210	4310	2200	3550	4960	5870	3850	6470	7000	1270	1660	1730
22	2210	4050	1850	3620	4960	8320	3850	6300	8500	1320	1600	1830
23	2080	3780	1750	3900	4850	8320	3860	6010	9600	1350	1580	2130
24	2060	3810	1700	4260	4850	7920	3440	5950	9800	1350	1580	2730
25	2040	3930	1750	7560	4870	7530	3070	5590	9800	1280	1700	2700
26	2010	3830	1900	14100	4900	7220	2960	5500	9500	1310	1810	2600
27	2090	3660	2100	16600	4680	6810	2870	5480	9500	1240	1760	2340
28	2090	3580	2200	12700	4580	6220	2570	5150	9200	1170	1790	2240
29	2080	3650	2300	10900	4500	5750	2450	4920	8600	1270	1820	2170
30	2090	3500	2400	9940	---	5400	2450	5360	8100	1360	1720	2180
31	2130	---	2500	8830	---	5130	---	6680	---	1400	1620	---
TOTAL	57050	95760	81470	219830	156370	166390	109610	132490	221560	63790	48490	58510
MEAN	1840	3192	2628	7091	5392	5367	3654	4274	7385	2058	1564	1950
MAX	2210	4340	3330	16600	8020	8320	4960	6680	9800	7300	1820	2730
MIN	1500	2070	1700	2400	4500	4000	2450	2160	4470	1170	1310	1650
AC-FT	113200	189900	161600	436000	310200	330000	217400	262800	439500	126500	96180	116100
CAL YR 1983	TOTAL	1642200	MEAN	4499	MAX	16800	MIN	1500	AC-FT	3257000		
WTR YR 1984	TOTAL	1411320	MEAN	3856	MAX	16600	MIN	1170	AC-FT	2799000		

YAKIMA RIVER BASIN

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12510500 YAKIMA RIVER AT KIONA, WA
(National stream quality accounting network station)

LOCATION.--Lat 46°15'13", long 119°28'37", in SE¼NE¼ sec.19, T.9 N., R.27 E., Benton County, Hydrologic Unit 17030003, on left bank just upstream from abandoned highway bridge pier at Kiona, 0.1 mi upstream from highway bridge, 3.6 mi downstream from Corral Canyon Creek, 5.0 mi downstream from Intake of Kiona Canal, and at mile 29.9.

DRAINAGE AREA.--5,615 mi².

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--August to December 1895 (gage heights only, fragmentary), August 1896 to March 1915, February 1933 to current year.

REVISED RECORDS.--WSP 214: 1905. WSP 1122: 1934(M). WSP 1216: 1949-50. WSP 1286: 1907(M), 1909, 1936. WSP 1933: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 454.41 ft above National Geodetic Vertical Datum of 1929. Prior to Mar. 31, 1915, nonrecording gages at approximately same site and datum. Feb. 6, 1933, to July 26, 1934, nonrecording gage at present site and datum.

REMARKS.--Water-discharge records excellent. Diversion upstream from station for irrigation of about 424,000 acres. Flow affected by diversions and by Keechelus, Kachess, Cle Elum, Bumping, and Rimrock lakes. The Kiona Canal bypasses station with a mean flow of approximately 23 ft³/s for irrigation of about 1,100 acres downstream from station. Diversion by the Kennewick Canal, which bypasses station, began in August 1956, and diverted 92,080 acre-ft during the current water year.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 67,000 ft³/s Dec. 23, 1933, gage height, 21.57 ft, from high-water marks; minimum observed, 105 ft³/s Sept. 11, 1906.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 17,500 ft³/s Jan. 27, gage height, 12.58 ft; minimum, 1,190 ft³/s July 29, gage height, 3.06 ft.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2110	2340	3600	2800	8300	4740	5300	2480	6450	7510	1420	1620
2	1960	2300	3350	2700	7580	4530	5020	2530	5530	6720	1380	1710
3	1860	2320	3270	2740	6940	4410	4650	2880	4620	5970	1450	1830
4	1850	2370	3270	4260	6460	4260	4540	3130	4340	4660	1400	1840
5	1710	3010	3220	9180	6080	4160	4380	2930	5040	3530	1380	1780
6	1700	3330	3140	12200	5790	4090	4280	2790	6680	2930	1450	1740
7	1690	3250	3060	11900	5600	4080	4180	2690	7140	2360	1520	1820
8	1680	3230	3050	10300	5450	4120	4010	2460	7110	1950	1520	1910
9	1700	3050	3050	9220	5310	4210	3890	2200	7010	1790	1480	1820
10	1750	3020	3110	8040	5210	4320	3630	2140	6810	1640	1430	1770
11	1740	3170	3250	7410	5100	4620	3750	2250	6640	1540	1450	1760
12	1730	3250	3370	7110	5120	4990	3770	2140	6240	1490	1380	2080
13	1770	3210	3230	6640	5120	5130	3640	2850	5390	1430	1370	2080
14	1910	3180	3220	6120	5360	4980	3540	3650	5250	1570	1570	1950
15	2550	3170	3310	5600	5390	4680	3450	4340	5640	1620	1630	1850
16	2410	3190	3300	4890	5250	4780	3450	4960	6320	1570	1630	1800
17	2290	3570	3170	4650	5190	4930	3860	5310	8540	1510	1540	1820
18	2270	4400	2890	4400	5040	5250	4260	5280	9630	1460	1450	1780
19	2300	4590	2810	3670	4870	5280	4260	5150	8810	1340	1450	1730
20	2530	4600	2700	3670	4920	5240	4210	5330	7310	1260	1500	1690
21	2630	4630	2400	3640	5010	5530	4030	6140	7070	1290	1580	1760
22	2650	4380	2000	3600	4990	7830	3920	6300	8180	1360	1540	1890
23	2420	4060	1800	3790	4900	8480	3990	6000	9510	1430	1500	2160
24	2340	4060	1750	4080	4840	8130	3790	5930	9660	1460	1500	2790
25	2330	4060	1800	6140	4890	7740	3250	5620	9700	1380	1560	3070
26	2260	4080	1950	13100	4980	7380	3060	5470	9570	1280	1710	3030
27	2280	3880	2200	16900	4840	6960	3030	5400	9640	1310	1800	2700
28	2340	3770	2400	13800	4660	6510	2760	5280	9480	1220	1710	2540
29	2320	3820	2500	11500	4570	6030	2520	4870	8700	1200	1740	2460
30	2330	3820	2600	10600	---	5710	2510	5050	8250	1320	1710	2430
31	2350	---	2600	9310	---	5450	---	6110	---	1420	1610	---
TOTAL	65760	105110	87370	223960	157760	168550	114930	129660	220260	68520	47360	61210
MEAN	2121	3504	2818	7225	5440	5437	3831	4183	7342	2210	1528	2040
MAX	2650	4630	3600	16900	8300	8480	5300	6300	9700	7510	1800	3070
MIN	1680	2300	1750	2700	4570	4080	2510	2140	4340	1200	1370	1620
AC-FT	130400	208500	173300	444200	312900	334300	228000	257200	436900	135900	93940	121400
CAL YR 1983	TOTAL	1700520	MEAN	4659	MAX	16600	MIN	1620	AC-FT	3373000		
WTR YR 1984	TOTAL	1450450	MEAN	3963	MAX	16900	MIN	1200	AC-FT	2877000		

YAKIMA RIVER BASIN

12510500 YAKIMA RIVER AT KIONA, WA--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1953 to current year.

PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: December 1952 to September 1969 (composite samples), October 1969 to September 1977.

WATER TEMPERATURES: December 1952 to September 1980, March 1981 to February 1982.

SUSPENDED SEDIMENT: June 1977 to October 1980.

WATER QUALITY DATA, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984

DATE	TIME	STREAM- FLOW, INSTAN- TANEOUS (CFS)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH (STAND- ARD UNITS)	TEMPER- ATURE (DEG C)	TUR- BID- ITY (NTU)	OXYGEN, DIS- SOLVED (MG/L)	OXYGEN, (PER- CENT SATUR- ATION)	COLI- FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)	STREP- TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML)	HARD- NESS (MG/L AS CAC03)	HARD- NESS NONCAR- BONATE (MG/L AS CAC03)
NOV , 1983												
21...	1425	4630	210	8.4	7.0	12	11.2	93	K160	640	80	0
JAN , 1984												
17...	1330	4650	194	8.2	.0	6.6	14.4	99	120	--	76	0
MAR												
06...	1045	4090	200	7.8	7.5	5.9	12.2	102	83	660	77	0
MAY												
15...	1120	4320	--	7.8	14.5	9.8	8.8	87	210	160	72	0
JUL												
09...	1155	1770	249	7.9	11.0	7.4	11.8	109	54	53	100	0
SEP												
10...	1000	1740	294	8.0	17.5	9.9	9.4	103	K52	--	120	0

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 CAC03)	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)
NOV , 1983												
21...	20	7.2	11	23	.6	2.0	83	15	5.4	.10	22	129
JAN , 1984												
17...	19	7.0	11	23	.6	1.9	80	12	4.7	.10	23	131
MAR												
06...	19	7.2	11	23	.6	2.0	83	11	6.7	.10	22	129
MAY												
15...	18	6.5	9.5	22	.5	1.7	78	10	3.9	.10	20	129
JUL												
09...	26	8.8	14	23	.6	2.7	102	17	5.5	.20	22	153
SEP												
10...	30	10	16	23	.7	2.9	121	18	6.5	.20	24	178

DATE	SOLIDS, SUM OF CONSTITUENTS, 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)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N)	NITRO- GEN,AM- MONIA + ORGANIC TOTAL (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)	ALUM- INUM, DIS- SOLVED (UG/L AS AL)
NOV , 1983											
21...	130	.18	1610	24	.76	.080	.40	.130	.060	.030	20
JAN , 1984											
17...	130	.18	1640	23	.76	.190	<.20	.100	.050	.030	--
MAR											
06...	130	.18	1420	22	.69	.070	.60	.050	.050	.020	20
MAY											
15...	120	.18	1500	52	.55	.060	.60	.110	.050	.030	10
JUL											
09...	160	.21	731	10	.94	.010	.60	.070	.040	.030	40
SEP											
10...	180	.24	836	22	1.1	.030	.50	.070	.080	.050	--

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

YAKIMA RIVER BASIN

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12510500 YAKIMA RIVER AT KIONA, WA--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984

DATE	ARSENIC DIS- SOLVED (UG/L AS AS)	BARIUM, DIS- SOLVED (UG/L AS BA)	BERYL- LIUM, DIS- SOLVED (UG/L AS BE)	CADMIUM DIS- SOLVED (UG/L AS CD)	CHRO- MIUM, DIS- SOLVED (UG/L AS CR)	COBALT, DIS- SOLVED (UG/L AS CO)	COPPER, DIS- SOLVED (UG/L AS CU)	IRON, DIS- SOLVED (UG/L AS FE)	LEAD, DIS- SOLVED (UG/L AS PB)	LITHIUM DIS- SOLVED (UG/L AS LI)	MANGA- NESE, DIS- SOLVED (UG/L AS MN)
NOV , 1983											
21...	1	20	<.5	<1	<1	<3	3	36	1	8	7
JAN , 1984											
17...	--	--	--	--	--	--	--	--	--	--	--
MAR											
06...	<1	18	<.5	<1	1	<3	4	24	9	5	12
MAY											
15...	1	14	<.5	<1	2	<3	22	59	9	5	7
JUL											
09...	<1	40	<.5	<1	<1	<3	5	22	<1	7	5
SEP											
10...	--	--	--	--	--	--	--	--	--	--	--
DATE	MERCURY DIS- SOLVED (UG/L AS HG)	MOLYB- DENUM, DIS- SOLVED (UG/L AS MO)	NICKEL, DIS- SOLVED (UG/L AS NI)	SELE- NIUM, DIS- SOLVED (UG/L AS SE)	SILVER, DIS- SOLVED (UG/L AS AG)	STRON- TIUM, DIS- SOLVED (UG/L AS SR)	VANA- DIUM, DIS- SOLVED (UG/L AS V)	ZINC, DIS- SOLVED (UG/L AS ZN)	SEDI- MENT, SUS- PENDE (MG/L)	SEDI- MENT, DIS- CHARGE, SUS- PENDE (T/DAY)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM
NOV , 1983											
21...	<.1	<10	2	<1	<1	90	<6	8	84	1050	--
JAN , 1984											
17...	--	--	--	--	--	--	--	--	39	490	--
MAR											
06...	<.1	<10	6	<1	<1	86	<6	4	21	232	--
MAY											
15...	<.1	<10	6	<1	<1	82	<6	4	51	595	80
JUL											
09...	<.1	<10	<1	<1	<1	120	6	9	22	105	--
SEP											
10...	--	--	--	--	--	--	--	--	27	127	--

ESQUATZEL COULEE BASIN

12512550 PROVIDENCE COULEE NEAR CUNNINGHAM, WA

LOCATION.--Lat 46°48'11", long 118°48'55", in SE¼NE¼ sec.8, T.15 N., R.32 E., Adams County, Hydrologic Unit 17020016, on right bank 0.5 mi downstream from Gillis Road, 0.8 upstream from State Highway 26, and 1.4 mi southwest of Cunningham.

DRAINAGE AREA.--52.1 mi².

PERIOD OF RECORD.--October 1977 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 1,115 ft, from topographic map.

REMARKS.--Records fair. No known diversions.

AVERAGE DISCHARGE.--7 years, 0.66 ft³/s, 478 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 711 ft³/s Feb. 9, 1979, gage height, 5.40 ft; no flow most of the time.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of Feb. 21, 1956, reached a discharge of 2,160 ft³/s at a site 1.5 mi upstream, at station 12512500 Providence Coulee at Cunningham.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, about 676 ft³/s Jan. 24, gage height 5.25 ft; no flow most of the time.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
2	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
3	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
4	.00	.00	.00	17	.00	.00	.00	.00	.00	.00	.00	.00
5	.00	.00	.00	82	.00	.00	.00	.00	.00	.00	.00	.00
6	.00	.00	.00	45	.00	.00	.00	.00	.00	.00	.00	.00
7	.00	.00	.00	9.6	.00	.00	.00	.00	.00	.00	.00	.00
8	.00	.00	.00	1.1	.00	.00	.00	.00	.00	.00	.00	.00
9	.00	.00	.00	.75	.00	.00	.00	.00	.00	.00	.00	.00
10	.00	.00	.00	.36	.00	.00	.00	.00	.00	.00	.00	.00
11	.00	.00	.00	.02	.00	.00	.00	.00	.00	.00	.00	.00
12	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
13	.00	.00	.00	.00	1.4	.00	.00	.00	.00	.00	.00	.00
14	.00	.00	.00	.00	.38	.00	.00	.00	.00	.00	.00	.00
15	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
16	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
17	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
18	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
19	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
20	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
21	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
22	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
23	.00	.00	.00	14	.00	.00	.00	.00	.00	.00	.00	.00
24	.00	.00	.00	206	.00	.00	.00	.00	.00	.00	.00	.00
25	.00	.00	.00	67	.00	.00	.00	.00	.00	.00	.00	.00
26	.00	.00	.00	5.3	.00	.00	.00	.00	.00	.00	.00	.00
27	.00	.00	.00	2.4	.00	.00	.00	.00	.00	.00	.00	.00
28	.00	.00	.00	.61	.00	.00	.00	.00	.00	.00	.00	.00
29	.00	.00	.00	.30	.00	.00	.00	.00	.00	.00	.00	.00
30	.00	.00	.00	.00	---	.00	.00	.00	.00	.00	.00	.00
31	.00	---	.00	.00	---	.00	---	.00	---	.00	.00	---
TOTAL	.00	.00	.00	451.44	1.78	.00	.00	.00	.00	.00	.00	.00
MEAN	.00	.00	.00	14.6	.06	.00	.00	.00	.00	.00	.00	.00
MAX	.00	.00	.00	206	1.4	.00	.00	.00	.00	.00	.00	.00
MIN	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
AC-FT	.00	.00	.00	895	3.5	.00	.00	.00	.00	.00	.00	.00
CAL YR 1983	TOTAL	2.00	MEAN	.00	MAX	1.5	MIN	.00	AC-FT	4.0		
WTR YR 1984	TOTAL	453.22	MEAN	1.24	MAX	206	MIN	.00	AC-FT	899		

ESQUATZEL COULEE BASIN

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12513000 ESQUATZEL COULEE AT CONNELL, WA

LOCATION.--Lat 46°39'49", long 118°51'44", in SE¼SW¼SE¼ sec.36, T.14 N., R.31 E., Franklin County, Hydrologic Unit 17020016, on right bank at upstream end of Clark Street Bridge, in Connell, 2.3 mi downstream from left bank tributary, and 7.8 mi downstream from Hatton Coulee.

DRAINAGE AREA.--234 mi², approximately.

PERIOD OF RECORD.--January 1953 to current year. Records published for period August 1959 to September 1964 include effluent from sewage treatment plant 0.8 mi downstream; records adjusted to exclude effluent October 1964 to June 1967.

REVISED RECORDS.--WSP 1933: Drainage area.

GAGE.--Water-stage recorder. Elevation of gage is 830 ft, from topographic map. Prior to Aug. 7, 1959, at site 0.4 mi downstream at different datum, Aug. 7, 1959, to July 8, 1967, at site 0.9 mi downstream at different datum, and July 9, 1967, to Oct. 28, 1981, at site 0.7 mi downstream at different datum.

REMARKS.--Records good except for flow during winter period, which is poor. No diversion upstream from station.

AVERAGE DISCHARGE.--32 years, 1.39 ft³/s, 1,010 acre-ft/yr, adjusted for effluent from sewage treatment plant 1959-64.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 5,560 ft³/s Feb. 21, 1956, gage height, 12.68 ft, site and datum then in use; no flow most of the time.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 1,340 ft³/s Jan. 24, gage height, 5.90 ft. No flow many days.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.4	.00	.00	.00	.00	.00	.00	.08	.43	1.3	3.3	2.4
2	2.4	.00	.00	.00	.00	.00	.00	.00	1.5	.21	2.7	3.0
3	2.2	.00	.00	.00	.00	.00	.00	.00	.54	1.6	2.0	2.7
4	2.0	.00	.00	.11	.00	.00	.00	.05	2.6	2.3	2.7	2.3
5	1.0	.00	.00	146	.00	.00	.00	.59	3.8	2.7	1.7	1.4
6	1.7	.00	.00	117	.00	.00	.00	.03	2.9	2.2	2.4	3.3
7	1.9	.00	.00	11	.00	.00	.30	.00	1.5	2.9	1.2	1.6
8	.89	.00	.00	1.2	.00	.00	.05	.00	.92	2.7	2.9	1.2
9	1.0	.00	.00	.06	.00	.00	.00	.00	.98	2.4	2.5	2.3
10	.66	.00	.00	.00	.00	.00	.00	.00	.50	1.6	2.5	1.6
11	1.0	.00	.00	.00	.00	.00	.00	.00	1.0	1.5	2.9	1.6
12	1.5	.00	.00	.00	.00	.00	.00	2.2	.84	.59	2.7	1.6
13	1.8	.00	.00	.00	.20	.06	.00	.87	1.4	1.2	2.3	2.0
14	1.4	.00	.00	.00	.00	.00	.00	.05	.43	1.8	2.7	2.0
15	.76	.00	.00	.00	.00	.00	.00	.48	.59	1.6	1.8	2.3
16	.71	.00	.00	.00	.01	.04	.05	.81	.92	1.6	3.0	2.3
17	1.4	.00	.00	.00	.00	.00	.00	.30	.87	.48	2.6	1.7
18	1.3	.00	.00	.00	.00	.00	.00	.00	.81	.70	1.9	1.5
19	1.3	.00	.00	.00	.00	.13	.08	1.3	.70	.98	2.9	1.5
20	1.0	.00	.00	.00	.03	.13	.00	2.3	1.0	1.6	2.7	2.0
21	1.2	.00	.00	.00	.11	.39	.00	1.6	3.0	3.3	2.6	2.0
22	1.8	.00	.00	.00	.00	.00	.00	.87	2.9	2.9	2.4	2.3
23	1.7	.00	.00	.91	.00	.00	.00	1.8	2.7	2.3	2.8	2.3
24	1.7	.00	.00	535	.00	.00	.00	2.7	.81	2.9	2.0	2.0
25	.57	.00	.00	291	.00	.30	.00	.15	1.2	2.0	1.6	2.0
26	.00	.00	.00	11	.00	.00	.00	.43	.13	.70	1.8	2.1
27	.00	.00	.00	2.7	.00	.00	.00	.00	.00	.81	2.5	1.8
28	.00	.00	.00	.38	.00	.10	.00	.00	.98	2.6	2.1	2.2
29	.00	.00	.00	.04	.00	.00	.00	.00	1.8	2.7	2.8	2.3
30	.00	.00	.00	.00	---	.00	.00	.30	2.4	3.3	2.7	1.7
31	.00	---	.00	.00	---	.00	---	.43	---	3.0	2.6	---
TOTAL	35.29	.00	.00	1116.40	.35	1.15	.48	17.37	40.15	58.47	75.3	61.0
MEAN	1.14	.00	.00	36.0	.01	.04	.02	.56	1.34	1.89	2.43	2.03
MAX	2.4	.00	.00	535	.20	.39	.30	2.7	3.8	3.3	3.3	3.3
MIN	.00	.00	.00	.00	.00	.00	.00	.00	.00	.21	1.2	1.2
AC-FT	70	.00	.00	2210	.7	2.3	.9	34	80	116	149	121
CAL YR 1983	TOTAL	326.13	MEAN	.89	MAX	5.2	MIN	.00	AC-FT	647		
WTR YR 1984	TOTAL	1405.96	MEAN	3.84	MAX	535	MIN	.00	AC-FT	2790		

COLUMBIA RIVER MAIN STEM

12514000 COLUMBIA RIVER AT PASCO, WA

LOCATION.--Lat 46°13'40", long 119°08'03", in NW¼NW¼ sec.36, T.9 N., R.29 E., Franklin County, Hydrologic Unit 17020016, in bridge pier on U.S. Highway 12 between Pasco and Kennewick, 5.2 mi downstream from Yakima River, 5.8 mi upstream from Snake River, and at mile 330.0.

DRAINAGE AREA.--104,000 mi², approximately.

PERIOD OF RECORD.--October 1963 to September 1966 (discharge); October 1979 to current year (elevations only). Fragmentary records of gage height for other 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. Gage is within the pool formed by McNary Dam.

EXTREMES FOR PERIOD OF RECORD.--Maximum elevation, 346.09 ft June 17, 1964; minimum, 335.97 ft Jan. 27, 1984.

EXTREMES FOR CURRENT YEAR.--Maximum elevation, 341.89 ft June 22; minimum, 335.97 ft Jan. 27.

ELEVATION (FEET NGVD), WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	339.04	339.43	338.80	339.48	337.17	338.08	338.35	338.92	339.90	340.56	337.71	337.94
2	339.13	339.55	338.53	339.43	336.39	339.08	337.53	338.98	340.15	340.11	337.34	337.79
3	339.19	339.56	340.09	339.17	336.36	340.19	338.54	338.12	340.61	340.07	338.32	337.78
4	339.44	339.62	339.91	337.60	336.56	340.33	339.56	338.22	340.57	340.00	339.45	338.74
5	339.14	339.76	339.43	338.20	338.13	339.28	340.46	338.58	340.45	340.22	339.80	339.12
6	339.16	339.65	339.52	339.57	339.08	339.97	340.86	339.30	340.66	340.21	339.72	339.92
7	339.00	339.48	340.14	340.07	338.95	340.70	340.53	339.16	340.40	339.98	339.86	339.59
8	338.69	339.77	339.99	339.86	340.20	340.20	340.56	338.97	340.84	339.50	339.82	339.42
9	339.70	339.66	339.57	339.23	340.81	339.88	340.70	339.38	340.96	339.70	339.39	339.18
10	339.38	339.40	339.81	338.64	341.02	339.50	340.76	339.40	340.20	339.64	339.30	339.26
11	339.42	339.63	339.53	338.54	340.58	339.57	340.69	339.16	339.90	340.09	339.47	339.39
12	337.54	339.59	339.61	338.60	339.82	340.15	340.59	338.94	340.56	339.87	339.61	339.12
13	336.36	339.29	339.32	339.00	338.52	340.48	340.57	338.73	340.02	339.51	339.17	338.06
14	338.28	339.20	339.75	339.31	337.20	340.55	340.43	338.81	339.76	339.04	339.38	339.04
15	339.74	339.34	339.50	338.94	337.04	340.60	339.84	339.45	340.77	339.51	339.65	339.65
16	339.43	339.61	340.05	338.34	337.04	340.83	340.13	339.36	340.99	339.82	339.74	339.43
17	339.57	339.36	339.69	338.13	338.58	340.37	340.74	338.97	341.16	339.79	339.58	339.04
18	339.17	339.67	339.86	337.11	338.49	340.33	340.62	338.94	341.31	339.49	339.67	339.44
19	339.66	339.73	340.08	338.78	337.69	340.11	340.31	339.62	341.01	339.85	339.46	339.17
20	339.61	339.84	340.22	340.13	337.52	340.31	340.47	339.43	340.99	339.80	339.37	339.47
21	339.25	339.57	340.43	340.49	338.48	340.58	340.76	339.54	341.09	339.68	339.68	338.89
22	339.48	339.65	340.29	340.50	338.82	340.71	340.63	339.75	341.24	338.91	339.68	338.72
23	339.46	339.86	339.90	339.86	339.14	340.63	340.68	339.17	340.60	338.96	339.75	338.86
24	339.39	339.76	340.54	338.70	339.50	340.50	339.54	339.48	340.49	339.10	339.79	338.71
25	339.55	339.52	339.59	336.55	338.84	340.49	339.71	339.61	340.28	339.63	339.72	338.10
26	339.38	339.62	337.88	336.25	337.13	340.31	339.69	339.46	340.78	339.86	339.22	337.47
27	339.39	339.39	337.87	336.36	336.60	340.75	339.53	338.94	340.75	339.86	338.87	337.02
28	339.73	339.66	338.20	337.37	337.35	340.61	339.04	339.61	341.30	339.85	339.41	338.07
29	339.64	339.88	338.76	336.84	336.84	340.68	339.27	339.17	340.89	339.72	339.27	338.28
30	339.49	339.68	339.31	336.82	---	340.68	339.01	339.92	341.14	339.05	338.62	338.73
31	339.34	---	339.43	336.89	---	340.33	---	340.43	---	338.57	338.04	---
MEAN	339.19	339.59	339.54	338.54	338.27	340.22	340.00	339.21	340.66	339.68	339.29	338.78
MAX	339.74	339.88	340.54	340.50	341.02	340.83	340.86	340.43	341.31	340.56	339.86	339.92
MIN	336.36	339.20	337.87	336.25	336.36	338.08	337.53	338.12	339.76	338.57	337.34	337.02

WTR YR 1984 MEAN 339.42 MAX 341.31 MIN 336.25

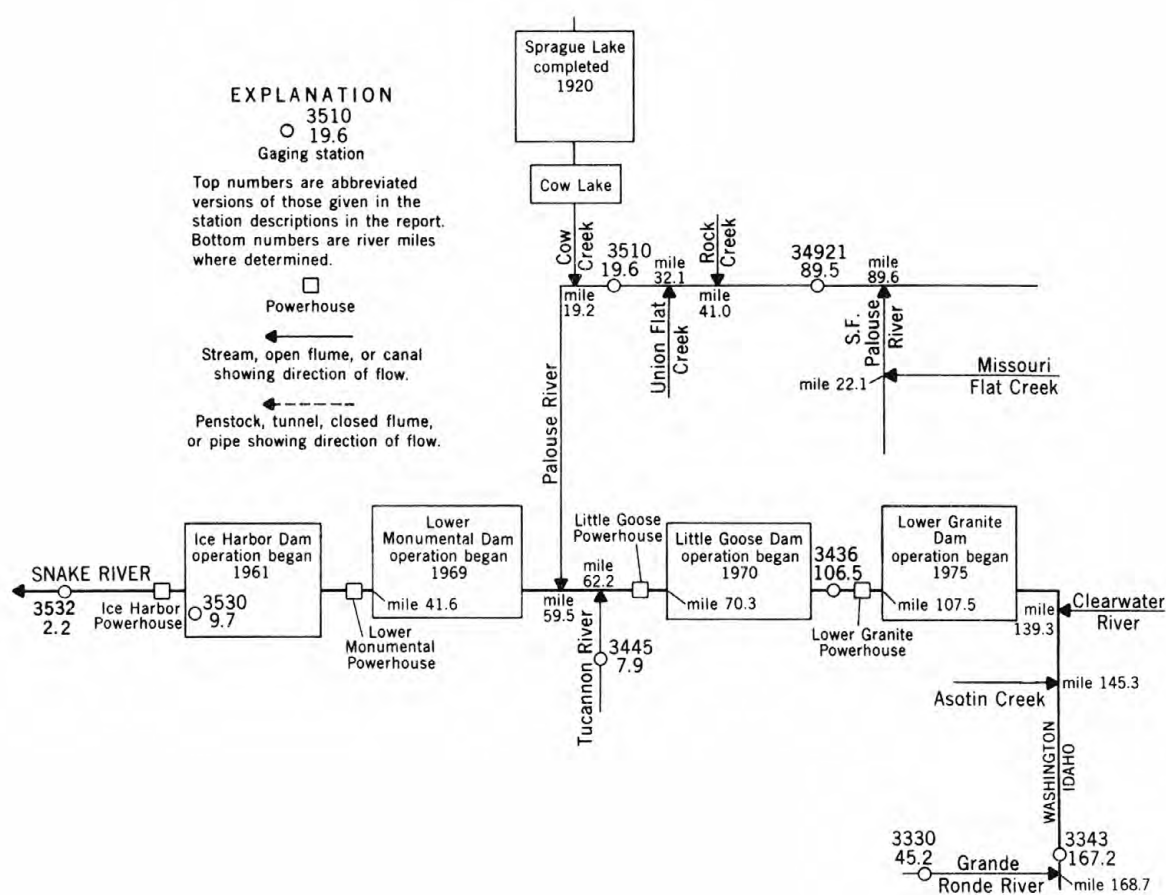


Figure 30.--Gaging stations in Snake River basin.

GRANDE RONDE RIVER BASIN

13333000 GRANDE RONDE RIVER AT TROY, OR

LOCATION.--Lat 45°56'47", long 117°26'54", in NE¼NW¼ sec.4, T.5 N., R.43 E., Wallowa County, Hydrologic Unit 17060106, on left bank 500 ft downstream from bridge at Troy, 600 ft downstream from Wenaha River, and at mile 45.2.

DRAINAGE AREA.--3,275 mi².

PERIOD OF RECORD.--August 1944 to current year. Monthly discharge only August 1944, published in WSP 1317.

REVISED RECORDS.--WSP 1397: 1946(M), 1948-50.

GAGE.--Water-stage recorder. Datum of gage is 1,585.98 ft National Geodetic Vertical Datum of 1929. Aug. 17, 1944, to Sept. 30, 1949, nonrecording gage at site 500 ft upstream at datum 10.85 ft lower. Oct. 1, 1949, to Sept. 5, 1963, water-stage recorder at site 500 ft upstream at datum 1.15 ft higher.

REMARKS.--Records excellent. Flow slightly regulated by Wallowa Lake (see station 13326000) and small reservoirs. Diversions for irrigation above station, chiefly in vicinity of La Grande, Enterprise, and Wallowa; one transbasin diversion from Big Sheep Creek and tributaries in Imnaha River basin for irrigation in Wallowa Valley.

AVERAGE DISCHARGE.--40 years, 3,154 ft³/s, 2,285,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 42,200 ft³/s Dec. 23, 1964, gage height, 11.25 ft; minimum, 344 ft³/s Aug. 19-21, 23, 1977.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 9,000 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Jan. 25	1730	11,000	6.65	May 14	0930	11,100	6.68
Mar. 15	0100	11,600	6.79	May 31	0530	*16,200	*7.71
Mar. 22	0430	13,500	7.17	June 29	0900	11,100	6.68
Apr. 17	1030	11,700	6.81				

Minimum daily, 600 ft³/s Dec. 24.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	805	846	981	1000	4070	1960	6330	5370	12300	7590	2210	2720
2	802	881	1010	1200	3610	2220	6280	6070	10600	6970	2200	2000
3	804	934	977	1800	3220	2480	6140	6450	9450	6620	2200	1690
4	802	1050	956	2590	2900	2510	5980	6600	9130	6270	2150	1540
5	782	1090	983	2750	2690	2470	6230	6580	9620	6040	2120	1420
6	773	1090	1020	2660	2520	2550	7180	6360	9710	6060	2070	1370
7	764	1190	978	2710	2470	2810	6930	6020	9650	5760	1930	1350
8	765	1080	1070	2530	2370	3180	7210	5950	9460	5320	1780	1380
9	819	1020	1130	2370	2280	3680	7150	6240	8910	4780	1650	1430
10	848	1020	1370	2210	2220	4800	7050	6360	8500	4440	1540	1380
11	841	1170	1650	2080	2100	6110	6790	6520	8540	4260	1480	1320
12	823	1200	1620	1960	2050	6610	6530	7680	9210	4440	1390	1290
13	819	1150	1610	1850	2790	6470	6370	8560	9170	4230	1300	1260
14	813	1100	1840	1720	4130	9400	6190	10700	9450	3850	1250	1220
15	804	1110	1890	1550	3790	10700	7170	10200	9540	3600	1190	1210
16	804	1160	1690	1410	3550	9570	9670	9380	9960	3570	1140	1160
17	805	1300	1440	1400	3200	9240	11500	8510	9630	3520	1110	1130
18	818	1360	1340	1370	2880	8430	11200	8150	9210	3390	1080	1100
19	825	1250	1240	1470	2560	7690	11400	8290	9050	3490	1060	1050
20	791	1200	1160	1610	2480	9380	10600	9110	9140	3300	1050	993
21	777	1160	1070	1620	2450	12800	9730	9290	9790	2880	1040	1020
22	791	1110	940	1860	2300	12900	9290	8690	8820	2590	1010	1030
23	854	1060	740	1880	2170	11600	9330	9740	8250	2440	1010	1100
24	870	1140	600	2390	2110	10900	8880	10100	8220	2410	982	1150
25	840	1170	740	7720	2070	9920	8110	9260	8910	2680	957	1120
26	828	1130	800	8680	2010	9360	7370	9960	9660	2610	929	1100
27	811	1100	740	7280	1930	8830	6680	10200	9950	2890	919	1080
28	799	1120	860	6580	1940	8170	6200	10300	9800	2750	917	1060
29	790	1110	1000	5860	1930	7590	5820	11100	10600	2920	901	1040
30	794	1050	980	5180	---	6920	5490	14300	9110	2640	920	1030
31	823	---	880	4630	---	6510	---	15100	---	2360	1450	---
TOTAL	25084	33351	35305	91920	76790	217760	230800	267140	283340	126670	42935	38743
MEAN	809	1112	1139	2965	2648	7025	7693	8617	9445	4086	1385	1291
MAX	870	1360	1890	8680	4130	12900	11500	15100	12300	7590	2210	2720
MIN	764	846	600	1000	1930	1960	5490	5370	8220	2360	901	993
AC-FT	49750	66150	70030	182300	152300	431900	457800	529900	562000	251200	85160	76850
CAL YR 1983	TOTAL	1197723	MEAN	3281	MAX	11900	MIN	600	AC-FT	2376000		
WTR YR 1984	TOTAL	1469838	MEAN	4016	MAX	15100	MIN	600	AC-FT	2915000		

SNAKE RIVER MAIN STEM

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13334300 SNAKE RIVER NEAR ANATONE, WA

LOCATION.--Lat 46°05'50", long 116°58'36", in SE¼SE¼NE¼ sec.12, T.7 N., R.46 E., Asotin County, Hydrologic Unit 17060103, on left bank 1.2 mi downstream from Grand Ronde River, 7.8 mi east of Anatone, 22 mi south of Clarkston, and at mile 167.2.

DRAINAGE AREA.--92,960 mi², approximately.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--July 1958 to current year.

REVISED RECORDS.--WDR WA-76-1: 1974 and 1975.

GAGE.--Water-stage recorder. Datum of gage is 806.78 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--Water-discharge records excellent. Diversions upstream from station for irrigation of about 4,090,000 acres of which about 750,000 acres are by withdrawal from ground water. Flow regulated by many reservoirs above station with a total usable capacity of more than 10,000,000 acre-feet, the most effective of which is Brownlee Reservoir 117.8 mi upstream (see sta 13289700). Diurnal fluctuations caused by Hells Canyon powerplant.

AVERAGE DISCHARGE.--26 years, 37,690 ft³/s, 27,310,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 195,000 ft³/s June 18, 1974, gage height, 24.45 ft; minimum, 6,010 ft³/s Sept. 2, 1958, gage height, 1.29 ft.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 183,000 ft³/s May 31, gage height, 23.39 ft; minimum, 15,500 ft³/s Oct. 1, gage height, 4.05 ft.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	18200	29600	35300	48800	50700	31600	72300	73100	167000	109000	34500	25000
2	16400	36100	34600	49500	49600	32900	72400	80600	154000	99600	29100	21400
3	18100	36800	34600	49100	48100	30100	72200	75200	141000	94600	33700	24100
4	21600	33800	34100	46800	47000	24500	71900	81000	134000	91000	32200	26300
5	23400	39200	35800	47900	45400	29300	72000	75300	132000	88100	32100	29600
6	23300	36500	35900	48400	44000	37200	74200	91200	131000	85500	33500	28800
7	22800	37200	35300	48700	42900	35300	75100	90100	130000	82300	34100	29600
8	23200	34000	37900	49200	42300	37600	75400	89700	127000	76400	33100	28100
9	21800	35000	37600	49600	44100	40100	77100	90500	123000	70800	33400	23400
10	21200	34700	36000	49300	44100	41800	77900	95100	119000	63800	33100	27300
11	26100	36600	35800	49500	44000	44700	80800	97700	118000	61200	26700	28100
12	26700	38300	34900	49100	43900	46300	79900	99800	122000	57700	25500	27400
13	26700	36700	36900	48900	44200	56500	79400	106000	123000	54900	22200	28400
14	27000	39200	39600	47900	45300	65500	78500	121000	124000	51100	20000	26700
15	27400	37400	40100	46700	45500	70400	79400	138000	128000	44300	20800	25900
16	26600	37500	39800	46000	42100	76600	85000	146000	135000	43900	19900	28700
17	28000	37500	40800	45200	44200	76100	96500	142000	140000	40100	19800	27400
18	31800	37400	40000	43700	41700	79100	101000	133000	140000	42300	21300	24600
19	32400	39500	39800	43200	41100	77500	104000	128000	138000	38100	18800	23900
20	31500	39100	39500	41800	40700	71300	103000	130000	139000	38400	20000	25100
21	30800	38900	39000	41500	40200	66100	104000	140000	148000	32600	22500	23700
22	31700	38600	37900	40900	38800	76100	101000	143000	150000	28800	23400	25300
23	31600	37900	35200	43800	38800	85500	100000	140000	140000	28300	25600	27600
24	32700	37700	34700	44100	38100	86000	101000	146000	135000	32400	26100	27900
25	34100	37200	35000	49900	34600	84700	101000	141000	136000	37000	24000	28800
26	31700	37500	35900	56300	33400	82900	99600	136000	136000	37800	20100	28800
27	34300	37200	36300	55100	33100	81800	96900	138000	134000	36300	21600	31000
28	33400	36800	37700	55500	32200	79400	94800	138000	133000	34900	25000	30800
29	30200	36500	40800	54600	30600	74900	93300	141000	127000	29200	27200	28200
30	25800	36500	43200	52900	---	73800	81600	157000	121000	31000	25300	28300
31	28600	---	43200	51600	---	72600	---	177000	---	35800	27100	---
TOTAL	839100	1106900	1163200	1495500	1210700	1868200	2601200	3680300	4025000	1697200	811700	810200
MEAN	27070	36900	37520	48240	41750	60260	86710	118700	134200	54750	26180	27010
MAX	34300	39500	43200	56300	50700	86000	104000	177000	167000	109000	34500	31000
MIN	16400	29600	34100	40900	30600	24500	71900	73100	118000	28300	18800	21400
AC-FT	1664000	2196000	2307000	2966000	2401000	3706000	5159000	7300000	7984000	3366000	1610000	1607000
CAL YR 1983 TOTAL	19444100			MEAN 53270	MAX 148000	MIN 16400	AC-FT 38567000					
WTR YR 1984 TOTAL	21309200			MEAN 58220	MAX 177000	MIN 16400	AC-FT 42270000					

SNAKE RIVER BASIN

13334300 SNAKE RIVER NEAR ANATONE, WA--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Oct. 1972 to current year.

PERIOD OF DAILY RECORD.--

WATER TEMPERATURES: October 1959 to current year.

INSTRUMENTATION.--Temperature recorder since October 1959.

COOPERATION.--Temperature records furnished by Corps of Engineers.

EXTREMES FOR PERIOD OF DAILY RECORD.--

WATER TEMPERATURES: Maximum (1959-68, 1970-83), 25.5°C July 15, 1981; minimum, 0.0°C several days during winter months.

EXTREMES FOR CURRENT YEAR.--

WATER TEMPERATURES: Maximum, 16.0°C Oct. 1, 5; minimum, 0.5°C Jan. 15, 16, 18, 25.

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984

DAY	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN
	OCTOBER		NOVEMBER		DECEMBER		JANUARY		FEBRUARY		MARCH	
1	16.0	15.0	13.0	12.0	7.5	7.0	3.0	2.5	2.0	1.5	4.0	3.5
2	15.0	14.5	13.0	12.5	7.0	6.5	2.5	2.5	1.5	1.5	4.5	4.0
3	15.0	14.5	13.0	13.0	7.0	6.5	3.0	2.5	1.5	1.5	4.5	4.0
4	15.5	15.0	13.0	12.5	6.5	6.0	2.5	2.0	1.5	1.0	5.0	4.0
5	16.0	15.5	13.0	12.5	6.5	6.0	2.0	1.5	1.5	1.0	4.5	4.0
6	15.5	15.0	12.5	12.0	6.5	5.5	2.0	1.5	1.5	1.5	5.0	4.0
7	15.5	14.5	12.0	11.5	6.0	6.0	2.0	1.5	2.0	1.5	5.0	4.5
8	15.0	14.5	11.5	11.0	6.0	6.0	2.0	1.5	2.0	2.0	5.0	5.0
9	15.0	14.5	11.5	10.5	6.5	6.0	1.5	1.5	2.0	2.0	5.5	5.0
10	15.0	14.5	11.0	10.0	6.0	6.0	2.0	1.5	2.0	2.0	6.0	5.5
11	15.0	14.5	11.0	11.0	6.0	6.0	2.0	2.0	2.5	2.0	6.0	5.5
12	14.5	14.5	11.0	10.0	6.0	5.5	2.0	2.0	2.5	2.0	5.5	5.5
13	14.5	14.0	10.0	9.0	6.0	5.0	2.0	2.0	3.0	2.5	5.5	5.0
14	15.0	14.5	10.0	9.5	6.0	6.0	1.5	1.0	3.0	2.5	5.5	5.0
15	14.5	14.0	10.5	10.0	6.0	5.0	1.0	.5	3.0	2.5	5.5	5.0
16	14.0	13.5	10.5	10.0	6.0	5.5	1.0	.5	3.0	3.0	6.0	5.0
17	14.0	13.5	10.5	10.0	5.5	5.0	1.0	1.0	3.0	2.5	6.5	6.0
18	14.0	13.5	10.0	9.5	5.0	4.5	1.0	.5	2.5	2.5	6.5	6.0
19	13.5	13.5	10.0	9.5	4.5	4.5	1.0	1.0	2.5	2.0	7.0	6.5
20	14.0	13.5	9.5	9.5	4.5	3.5	1.0	1.0	2.5	2.5	8.0	7.0
21	14.0	13.5	10.0	9.5	4.0	3.0	1.5	1.0	2.5	2.5	8.0	7.0
22	14.0	13.5	9.5	9.0	3.5	2.0	1.5	1.0	3.0	2.5	7.0	6.5
23	14.0	12.5	9.0	9.0	3.0	3.0	2.0	1.5	3.0	3.0	7.0	7.0
24	13.5	13.0	9.0	9.0	3.0	2.5	2.0	1.5	3.0	3.0	7.0	7.0
25	13.5	13.0	9.0	8.5	3.0	2.5	2.0	.5	3.0	3.0	7.0	6.5
26	13.0	13.0	8.5	8.0	3.0	3.0	2.5	1.5	3.5	3.0	7.0	6.0
27	13.0	13.0	8.5	8.0	3.0	2.5	3.0	2.5	4.0	3.5	7.5	6.5
28	13.0	12.5	8.5	8.0	3.0	3.0	3.0	2.5	4.0	3.5	7.0	6.5
29	12.5	12.5	8.0	7.5	3.0	2.5	2.5	2.5	4.0	3.5	7.5	7.0
30	12.5	11.5	7.5	7.0	3.0	2.5	2.5	2.0	---	---	8.0	7.0
31	13.0	12.0	---	---	2.5	2.5	2.0	1.5	---	---	8.5	7.5
MONTH	16.0	11.5	13.0	7.0	7.5	2.0	3.0	.5	4.0	1.0	8.5	3.5

13334300 SNAKE RIVER NEAR ANATONE, WA--Continued

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984

DAY	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN
	APRIL		MAY		JUNE		JULY		AUGUST		SEPTEMBER	
1	8.5	8.0	10.5	9.0								
2	8.5	8.0	10.0	9.5								
3	8.0	7.5	10.5	9.5								
4	8.5	8.0	10.0	9.5								
5	8.5	8.0	10.0	9.0								
6	8.5	8.0	10.0	9.5								
7	8.0	7.5	10.5	9.0								
8	8.0	7.5	11.0	10.0								
9	8.0	7.5	11.0	10.5								
10	8.0	7.5	11.0	10.5								
11	8.0	7.5	11.5	10.5								
12	8.5	7.5	12.0	11.0								
13	9.0	7.0	12.0	11.5								
14	10.0	8.5	12.0	10.5								
15	10.5	9.5	10.5	10.0								
16	10.5	10.0	10.5	9.5								
17	10.0	9.0	11.0	10.0								
18	9.0	8.5	12.0	11.0								
19	8.5	8.5	12.0	11.5								
20	9.0	8.5	12.5	11.5								
21	9.5	9.0	12.0	11.5								
22	10.5	9.5	11.5	11.0								
23	11.0	10.0	12.0	11.5								
24	10.5	9.5	11.5	11.0								
25	10.0	9.0	11.0	10.5								
26	9.0	8.5	12.0	11.0								
27	9.5	8.5	12.5	11.0								
28	9.0	9.0	13.0	12.0								
29	9.5	8.5	13.0	13.0								
30	9.5	9.0	---	---								
31	---	---	---	---								
MONTH	11.0	7.0	13.0	9.0								

SNAKE RIVER BASIN

13343600 SNAKE RIVER BELOW LOWER GRANITE DAM, WA

LOCATION.--Lat 46°40'04", long 117°26'38", in NE¼SE¼ sec.30, T.14 N., R.43 E., Garfield County, Hydrologic Unit 17060107, 1.0 mi below Lower Granite Dam, 16.0 mi northeast of Pomeroy, and at mile 106.5.

DRAINAGE AREA.--103,500 mi², approximately.

PERIOD OF RECORD.--October 1978 to current year.

GAGE.--Acoustic velocity meter (AVM) with water-stage and velocity-index recorder. Datum of gage is 600 ft above National Geodetic Vertical Datum of 1929 (levels by Corps of Engineers).

REMARKS.--Records good. Discharges for Oct. 7-24, 28-30, Nov. 1 to Dec. 20, Dec. 25 to Feb. 16, Feb. 24 to Mar. 12, Mar. 17 to Sept. 30 were provided by Corps of Engineers' Lower Granite Dam powerplant through North Pacific Division Reservoir Control Center. Regulation by Lower Granite Dam 1.0 mi upstream and by other storage reservoirs upstream from station. Diversions upstream from station for irrigation of over 4,090,000 acres.

AVERAGE DISCHARGE.--6 years, 57,510 ft³/s, 41,670,000 acre-ft/yr, unadjusted.

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 248,000 ft³/s May 31, 1984; minimum daily, 7,600 ft³/s Feb. 17, 1980.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 248,000 ft³/s May 31; minimum daily, 14,000 ft³/s Oct. 2.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	25100	45600	41700	57100	60500	41500	90800	90200	229000	135000	39800	29400
2	14000	38500	49100	53900	56200	55100	96300	105000	209000	126000	36000	28000
3	22600	41300	46900	50900	58700	51200	90400	97300	196000	108000	32400	25100
4	24400	37500	42400	55200	56800	35700	95000	112000	183000	114000	41000	31600
5	24600	46500	50600	60300	52000	45400	89600	97900	183000	107000	34800	33500
6	29500	48300	48500	60200	49600	48100	91500	118000	184000	99800	37200	41300
7	26900	43400	48500	60800	50200	53000	102000	112000	180000	101000	40900	42700
8	28300	43800	50300	59600	44500	43400	99500	111000	186000	90000	35900	37800
9	22100	39600	46900	60100	44200	48300	104000	119000	178000	84700	37100	32100
10	23400	39500	51000	59300	51500	53000	99800	123000	172000	78900	37200	36500
11	32600	45200	49300	57500	49400	56400	103000	121000	166000	77300	33400	40000
12	33000	43000	50600	58600	59400	66900	102000	122000	170000	71800	27900	39600
13	32900	42800	47300	55700	55600	65400	101000	132000	174000	69200	23000	39300
14	33200	50200	48800	61500	58600	79400	101000	157000	178000	64700	25100	41000
15	30800	45800	47700	57300	55300	89800	102000	194000	182000	47200	24300	35500
16	28000	48500	48000	54000	57600	96600	109000	200000	192000	58100	21300	31100
17	32800	46500	47500	61900	52100	97900	135000	186000	196000	56300	25600	39500
18	33800	50200	45400	58300	44100	99700	140000	173000	197000	41900	24200	36600
19	37600	47500	49300	54900	45100	96100	144000	158000	191000	53000	21800	35700
20	37400	52700	55600	56100	41200	94200	141000	166000	187000	42700	21500	35500
21	35700	53300	48400	50700	47500	95000	142000	189000	205000	39300	30800	34100
22	38100	51200	39100	40800	39400	108000	134000	189000	213000	39100	32100	35800
23	37300	52200	54700	60500	44800	123000	133000	183000	186000	28800	37000	37000
24	35600	51200	43900	53000	44600	110000	138000	197000	178000	38400	30600	37700
25	40200	52100	41000	62500	37400	116000	134000	187000	180000	42900	35800	39900
26	36200	50800	49200	79300	40100	112000	130000	176000	183000	42000	19700	39600
27	36400	47300	49200	69400	47400	112000	126000	180000	178000	42900	24700	40500
28	36400	54700	51800	70900	40400	106000	111000	180000	173000	50700	19500	45800
29	35300	49200	52400	64400	45800	101000	119000	182000	167000	41100	40700	39700
30	31100	53400	60800	62800	---	97200	118000	205000	152000	36100	27400	26800
31	33200	---	55300	59700	---	97200	---	248000	---	51100	33700	---
TOTAL	968500	1411800	1511200	1827200	1430000	2494500	3421900	4810400	5548000	2079000	952400	1088700
MEAN	31240	47060	48750	58940	49310	80470	114100	155200	184900	67060	30720	36290
MAX	40200	54700	60800	79300	60500	123000	144000	248000	229000	135000	41000	45800
MIN	14000	37500	39100	40800	37400	35700	89600	90200	152000	28800	19500	25100
AC-FT	1921000	2800000	2997000	3624000	2836000	4948000	6787000	9541000	11004000	4124000	1889000	2159000
CAL YR 1983	TOTAL	24314800	MEAN	66620	MAX	198000	MIN	14000	AC-FT	48228000		
WTR YR 1984	TOTAL	27543600	MEAN	75260	MAX	248000	MIN	14000	AC-FT	54633000		

TUCANNON RIVER BASIN

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13344500 TUCANNON RIVER NEAR STARBUCK, WA

LOCATION.--Lat 46°30'17", long 118°03'55", in NE¼SW¼ sec.21, T.12 N., R.38 E., Columbia County, Hydrologic Unit 17060107, on right bank 180 ft downstream from county road bridge, 0.5 mi downstream from Smith Hollow, 3.0 mi east of Starbuck, 3.3 mi downstream from Pataha Creek, and at mile 7.9.

DRAINAGE AREA.--431 mi².

PERIOD OF RECORD.--October 1914 to September 1917, August 1928 to September 1931, October 1958 to current year. Monthly discharge only for October and November 1914, published in WSP 1317.

REVISED RECORDS.--WSP 1347: 1930.

GAGE.--Water-stage recorder. Elevation of gage is 735.9 ft, from plane table survey. Nov. 8, 1914, to Sept. 30, 1917, nonrecording gage at site 2.8 mi upstream at different datum. Aug. 9, 1928, to Sept. 30, 1931, nonrecording gages at site 2.5 mi upstream at various datums.

REMARKS.--Records good. Many small diversions for irrigation upstream from the station.

AVERAGE DISCHARGE.--32 years (water years 1915-17, 1929-31, 1959-84), 175 ft³/s, 126,800 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 7,980 ft³/s Dec. 22, 1964, gage height, 9.84 ft, from rating curve extended above 2,500 ft³/s on basis of slope-area measurement of peak flow; minimum, 15 ft³/s July 11, 12, 1930.

EXTREMES FOR CURRENT YEAR.--Peak discharge greater than base discharge of 700 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Jan. 3	1715	*2,560	*5.04	No other peak greater than base discharge.			
Minimum, 43 ft ³ /s Dec. 22, gage height, 0.72 ft.							

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	76	97	106	102	182	135	244	185	383	157	78	93
2	76	97	102	97	197	148	240	197	338	149	78	84
3	76	97	102	716	180	148	237	200	304	134	91	80
4	78	117	102	529	171	145	228	200	298	129	85	76
5	78	121	102	355	163	145	231	200	316	126	84	75
6	78	119	102	352	158	145	234	194	343	118	84	76
7	76	131	102	328	156	145	221	191	350	116	82	78
8	76	112	110	310	156	143	234	188	353	113	76	78
9	85	97	95	260	150	143	228	197	340	112	73	78
10	91	104	148	240	148	145	231	200	329	105	71	76
11	85	156	180	221	143	153	221	203	330	97	68	73
12	82	138	174	200	138	156	218	224	315	93	68	73
13	80	150	166	185	156	166	212	244	330	93	70	73
14	82	133	161	169	177	188	209	317	316	94	68	73
15	83	124	161	140	171	209	215	332	310	92	70	73
16	83	124	158	140	174	215	250	310	302	89	66	73
17	82	131	153	135	171	228	302	264	294	84	64	73
18	83	133	140	110	161	224	313	250	274	81	63	73
19	83	131	138	112	156	228	310	250	250	76	63	73
20	83	128	128	110	156	264	285	285	251	74	66	73
21	83	124	93	128	156	317	257	310	282	73	64	75
22	87	117	82	163	150	359	244	292	255	75	61	75
23	95	115	75	158	143	363	247	317	236	74	61	86
24	91	112	70	343	145	371	237	340	221	78	61	88
25	87	115	80	278	140	359	228	313	213	76	63	84
26	85	110	88	313	140	355	215	317	196	78	63	81
27	85	108	93	313	135	317	203	321	191	78	64	82
28	83	108	93	288	133	302	191	310	180	78	61	81
29	85	108	87	267	133	288	191	332	177	95	61	80
30	87	108	104	240	---	267	188	384	170	93	63	79
31	95	---	108	221	---	254	---	425	---	82	78	---
TOTAL	2579	3565	3603	7523	4539	7025	7064	8292	8447	3012	2168	2335
MEAN	83.2	119	116	243	157	227	235	267	282	97.2	69.9	77.8
MAX	95	156	180	716	197	371	313	425	383	157	91	93
MIN	76	97	70	97	133	135	188	185	170	73	61	73
AC-FT	5120	7070	7150	14920	9000	13930	14010	16450	16750	5970	4300	4630
CAL YR 1983	TOTAL	57458	MEAN	157	MAX	408	MIN	58	AC-FT	114000		
WTR YR 1984	TOTAL	60152	MEAN	164	MAX	716	MIN	61	AC-FT	119300		

PALOUSE RIVER BASIN

13349210 PALOUSE RIVER BELOW SOUTH FORK, AT COLFAX, WA

LOCATION.--Lat 46°53'23", long 117°22'09", in NW¼ sec.11, T.16 N., R.43 E., Whitman County, Hydrologic Unit 17060108, on left bank at Colfax, 750 ft downstream from South Fork, 0.3 mi upstream from bridge on U.S. Highway 195, and at mile 89.5.

DRAINAGE AREA.--796 mi².

PERIOD OF RECORD.--October 1963 to June 1973, October 1973 to September 1975 (annual maximum only), October 1975 to current year.

REVISED RECORDS.--WSP 2134: 1967, 1968.

GAGE.--Water-stage recorder. Datum of gage is 1,932.22 ft above National Geodetic Vertical Datum of 1929 (levels by Corps of Engineers).

REMARKS.--Records fair. Small diversions for irrigation above station. Slight regulation by millpond and city of Moscow, Idaho, sewage disposal plant.

AVERAGE DISCHARGE.--18 years (water years 1964-72, 1976-84), 394 ft³/s, 285,500 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 16,800 ft³/s Jan. 16, 1974, gage height, 18.73 ft; minimum, 1.7 ft³/s Aug. 3, 23, 1966; minimum gage height, 0.88 ft Aug. 3, 1966.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of Feb. 3, 1963, reached a stage of 16.49 ft, discharge, 14,500 ft³/s, by slope-area measurement.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 3,000 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Jan. 4	0600	*7,450	*12.74	Mar. 15	0330	4,270	9.90
Jan. 24	2300	6,380	11.85	Mar. 21	1400	3,440	9.02
Feb. 13	2015	3,690	9.30				

Minimum discharge, 16 ft³/s Sept. 13, gage height, 1.91 ft.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	24	48	112	250	558	505	908	344	311	135	67	39
2	24	48	104	333	479	899	841	394	283	112	50	39
3	25	54	98	1190	425	800	772	385	258	110	42	44
4	26	78	100	4340	391	636	720	367	251	106	38	48
5	27	86	102	2410	367	548	780	344	293	96	37	43
6	31	162	104	1680	361	492	1130	333	457	90	37	39
7	34	139	104	1160	344	463	990	358	544	82	38	41
8	34	179	107	1050	358	460	1280	317	430	77	36	39
9	37	132	127	724	361	489	1500	298	620	74	32	38
10	49	109	849	648	353	756	1470	293	737	70	34	40
11	42	152	1190	586	344	1460	1260	296	616	67	31	41
12	45	263	818	596	364	1770	1100	301	600	64	29	42
13	50	333	593	523	2060	1590	1110	296	581	58	28	42
14	45	314	680	341	2450	2220	899	306	521	54	28	40
15	41	254	958	249	1450	3900	788	364	426	51	27	37
16	37	231	608	230	1270	2740	841	388	357	49	26	36
17	39	301	367	220	995	2150	1010	391	310	45	27	33
18	39	391	240	220	708	1750	1030	328	272	43	27	32
19	35	325	210	220	575	1440	939	304	244	43	27	31
20	34	336	180	220	537	1700	849	355	226	39	30	33
21	39	416	150	230	554	2650	712	391	249	39	30	32
22	50	311	130	240	568	2890	624	350	330	38	30	36
23	63	238	110	250	502	2170	568	416	280	35	32	45
24	52	215	100	1500	586	1730	547	636	233	35	29	55
25	78	245	110	3850	579	1430	513	495	199	33	28	50
26	60	238	110	2450	537	1760	463	428	169	38	31	54
27	50	202	110	1380	499	1410	412	469	158	36	28	43
28	46	189	110	1040	492	1210	376	469	146	36	29	40
29	44	185	120	845	492	1720	358	409	145	44	27	37
30	43	152	140	708	---	1230	338	370	143	59	29	38
31	46	---	200	620	---	1030	---	333	---	88	34	---
TOTAL	1289	6326	9041	30303	19559	45998	25128	11528	10389	1946	1018	1207
MEAN	41.6	211	292	978	674	1484	838	372	346	62.8	32.8	40.2
MAX	78	416	1190	4340	2450	3900	1500	636	737	135	67	55
MIN	24	48	98	220	344	460	338	293	143	33	26	31
AC-FT	2560	12550	17930	60110	38800	91240	49840	22870	20610	3860	2020	2390
CAL YR 1983	TOTAL	151597	MEAN	415	MAX	6130	MIN	18	AC-FT	300700		
WTR YR 1984	TOTAL	163732	MEAN	447	MAX	4340	MIN	24	AC-FT	324800		

13351000 PALOUSE RIVER AT HOOPER, WA

LOCATION.--Lat 46°45'31", long 118°08'52", in NE¼SE¼ sec.27, T.15 N., R.37 E., Whitman County, Hydrologic Unit 17060108, on left bank 150 ft downstream from bridge on State Highway 26 at Hooper, 0.3 mi upstream from Cow Creek, 3.5 mi downstream from right bank tributary, 6.0 mi downstream from Willow Creek, and at mile 19.6.

DRAINAGE AREA.--2,500 mi².

PERIOD OF RECORD.--April to August 1897 (gage heights only), September 1897 to December 1899, April 1900 to April 1907, June 1908 to July 1912, March 1913 to March 1916, February 1951 to current year. Prior to 1904 sometimes published as "near Hooper."

REVISED RECORDS.--WSP 1287: 1897-1904, 1910(M), 1915-16(M). WSP 1447: 1910. WSP 1934: Drainage area. WSP 1447: 1906(M). WSP 1567: 1908-09(M).

GAGE.--Water-stage recorder. Datum of gage is 1,040.8 ft National Geodetic Vertical Datum of 1929. Apr. 1 to Aug. 31, 1897, nonrecording gage at site 2.5 mi upstream at different datum. Sept. 9, 1897, to March 1916, various nonrecording gages at site 1.5 mi upstream from present site at different datums. Feb. 8 to Mar. 28, 1951, nonrecording gage at present site and datum.

REMARKS.--Records good. Diversions above station for irrigation and municipal use. Bonneville Power Administration satellite telemeter at station.

AVERAGE DISCHARGE.--46 years (water years 1898-99, 1901-06, 1909-11, 1914-15, 1952-84), 621 ft³/s, 449,900 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 33,500 ft³/s Feb. 4, 1963, gage height, 19.13 ft, from rating curve extended above 18,000 ft³/s on basis of slope-area measurement of peak flow; no flow part or all of each day June 25, 1910, Aug. 1-17, Aug. 28 to Sept. 4, 1968.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 3,700 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Jan. 4	2100	*14,400	*14.46	Mar. 15	1400	4,580	10.21
Jan. 24	1730	8,690	12.39	Mar. 22	0215	4,230	9.94
Feb. 14	0730	5,120	10.57				

Minimum discharge, 44 ft³/s Aug. 21, gage height, 3.21 ft.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	72	128	339	320	1220	1120	1770	690	516	258	142	58
2	76	130	283	342	1090	1210	1620	703	488	255	168	58
3	76	133	258	366	964	1590	1520	758	455	233	139	63
4	74	140	291	6570	875	1390	1420	739	441	215	115	65
5	76	148	303	8750	820	1200	1360	717	434	205	107	63
6	78	178	297	4860	775	1110	1500	695	473	196	101	65
7	78	222	280	3460	757	1030	1750	695	631	182	96	69
8	82	253	280	2580	739	982	1590	699	712	172	89	65
9	83	243	294	2170	753	958	2190	649	613	166	87	68
10	82	265	336	1630	757	1010	2110	609	790	162	87	71
11	81	245	1480	1430	735	1380	2170	604	845	155	85	71
12	85	253	1400	1300	730	2230	1870	592	762	149	73	69
13	92	330	1160	1210	1490	2150	1830	584	762	142	72	70
14	89	456	1060	988	4270	2170	1710	568	739	137	69	72
15	95	448	1200	749	2950	3770	1500	576	681	133	65	73
16	95	407	1370	641	2250	3920	1390	640	596	128	63	74
17	95	386	1020	576	2080	2930	1480	659	532	123	65	73
18	95	452	749	473	1700	2710	1600	636	480	118	63	68
19	95	544	584	438	1410	2240	1560	580	438	115	60	64
20	98	504	442	403	1240	2240	1490	564	403	107	60	67
21	98	504	192	396	1240	2650	1350	580	396	99	56	70
22	102	584	180	484	1310	3900	1190	613	406	98	53	72
23	112	504	170	805	1200	3180	1080	592	480	99	57	83
24	123	448	160	3860	1180	2630	1000	667	441	98	57	94
25	127	421	170	6790	1320	2260	952	845	382	98	56	98
26	120	438	190	5180	1300	2340	886	721	339	94	59	108
27	137	438	210	3070	1210	2440	825	663	312	92	60	106
28	128	410	230	2230	1140	2050	762	685	288	95	56	113
29	120	389	250	1860	1130	2410	726	672	275	95	58	106
30	116	379	270	1570	---	2320	708	600	268	243	59	100
31	121	---	300	1370	---	1970	---	548	---	155	59	---
TOTAL	3001	10380	15748	66871	38635	65490	42909	20143	15378	4617	2436	2296
MEAN	96.8	346	508	2157	1332	2113	1430	650	513	149	78.6	76.5
MAX	137	584	1480	8750	4270	3920	2190	845	845	258	168	113
MIN	72	128	160	320	730	958	708	548	268	92	53	58
AC-FT	5950	20590	31240	132600	76630	129900	85110	39950	30500	9160	4830	4550
CAL YR 1983	TOTAL	260950	MEAN	715	MAX	7190	MIN	49	AC-FT	517600		
WTR YR 1984	TOTAL	287904	MEAN	787	MAX	8750	MIN	53	AC-FT	571100		

SNAKE RIVER BASIN

13353000 SNAKE RIVER BELOW ICE HARBOR DAM, WA

LOCATION.--Lat 46°14'53", long 118°52'43", in NE¼SE¼, sec.24, T.9 N., R.31 E., Walla Walla County, Hydrologic Unit 17060110, in powerhouse forebay pier P-1 on south side of Bay 1 at Ice Harbor Dam, 8.0 mi northeast of Burbank, and at mile 9.7.

DRAINAGE AREA.--108,500 mi², approximately.

PERIOD OF RECORD.--October 1907 to March 1917 (gage heights only October 1907 to August 1909), March 1962 to current year.
Published as "at Burbank" prior to 1911 and as "near Burbank" 1912-17. For records collected at site 7.5 mi downstream see station 13353200.

REVISED RECORDS.--WSP 1317: Drainage area.

GAGE.--Water-hour meters on each turbine in Ice Harbor Dam powerhouse. Elevations are National Geodetic Vertical Datum of 1929.
Oct. 2, 1907, to Mar. 31, 1917, nonrecording gage at site approximately 2 mi downstream at datum 300 ft higher. Mar. 23, 1962, to Sept. 30, 1968, water-stage recorder 1.0 mi downstream at National Geodetic Vertical Datum of 1929.

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

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

AVERAGE DISCHARGE.--29 years (water years 1910-16, 1963-84), 56,640 ft³/s, 41,036,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 312,000 ft³/s June 19, 1974; no flow momentarily Aug. 27, 1965 (result of testing at Ice Harbor Dam).

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of May 30, 1948, reached an elevation of 361.9 ft at a site 0.7 mi downstream, from information by U.S. Corps of Engineers.

EXTREMES FOR CURRENT YEAR.--Maximum hourly discharge, 262,000 ft³/s May 31; maximum forebay elevation, 439.99 ft Mar. 23; minimum hourly discharge, 300 ft³/s Dec. 7; minimum forebay elevation, 437.01 ft Dec. 22.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	23000	38900	34500	54100	54000	47700	83200	101000	224000	136000	49800	26900
2	11300	34800	57000	52600	58100	58200	108000	106000	205000	107000	45200	26700
3	23200	41400	38900	66500	49800	47700	96200	87500	203000	116000	32700	27300
4	23200	40100	34000	51200	58500	31400	98300	101000	176000	107000	34500	32900
5	24000	47700	58400	64200	48700	52300	84800	94700	174000	108000	33100	31200
6	32800	45200	56800	76100	50700	36500	94300	120000	188000	106000	33700	38400
7	30600	46700	43200	61800	53600	46200	97900	106000	180000	99300	26700	44500
8	26700	44600	46100	61800	42900	46600	96500	104000	180000	91500	28300	40800
9	22300	43700	48800	66600	43800	50000	102000	114000	181000	90700	40500	28100
10	26900	35000	47700	65900	41900	51300	99500	119000	171000	78500	37400	42300
11	26100	41100	40600	56400	48000	58000	100000	120000	166000	74100	32000	38700
12	28800	42300	55900	58900	65900	77800	98700	120000	166000	68500	25100	38800
13	35600	43300	52200	54700	70100	71200	99800	132000	165000	68900	26600	39800
14	33100	42900	49400	59800	60300	78600	92700	156000	176000	69400	25200	37300
15	26300	44000	50500	44400	65700	86000	103000	189000	187000	37000	27700	31100
16	27500	45800	53200	64900	64000	100000	106000	197000	190000	66700	25900	29200
17	29700	52200	45700	62300	54800	100000	138000	185000	192000	58100	23000	41400
18	35900	56800	30400	63500	38600	100000	136000	166000	200000	31300	17500	37300
19	40000	39400	60700	55200	41800	101000	142000	160000	187000	42300	18900	34000
20	36400	44600	55500	58600	43200	96800	140000	160000	187000	47900	26400	37400
21	39900	58600	45900	25700	51400	85500	140000	188000	203000	38200	27700	38000
22	41000	51600	56900	43400	52000	106000	133000	194000	220000	37300	23500	33100
23	35500	56100	53700	61300	48500	135000	130000	174000	180000	30500	36300	27700
24	34500	49200	35000	51700	45900	105000	135000	197000	181000	36400	36600	42100
25	38000	58400	23300	72600	30800	119000	134000	189000	170000	35800	30600	40300
26	36300	52000	53600	88400	46300	114000	133000	176000	181000	34400	17400	37400
27	31200	39200	55600	83900	65200	114000	128000	166000	181000	40800	29200	41900
28	38800	57000	49300	70800	44400	106000	112000	178000	178000	52000	15200	42300
29	44200	52900	51700	67200	40200	102000	115000	180000	172000	42300	39600	41400
30	33400	51400	59800	68800	---	104000	119000	199000	152000	30800	26900	26200
31	33800	---	53900	59500	---	105000	---	248000	---	51700	31100	---
TOTAL	970000	1396900	1498200	1892800	1479100	2532800	3395900	4727200	5516000	2034400	924300	1074500
MEAN	31290	46560	48330	61060	51000	81700	113200	152500	183900	65630	29820	35820
MAX	44200	58600	60700	88400	70100	135000	142000	248000	224000	136000	49800	44500
MIN	11300	34800	23300	25700	30800	31400	83200	87500	152000	30500	15200	26200
AC-FT	1924000	2771000	2972000	3754000	2934000	5024000	6736000	9376000	10941000	4035000	1833000	2131000
CAL YR 1983	TOTAL	24487700	MEAN	67090	MAX	198000	MIN	11300	AC-FT	48571000		
WTR YR 1984	TOTAL	27442100	MEAN	74980	MAX	248000	MIN	11300	AC-FT	54431000		

SNAKE RIVER BASIN

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13353200 SNAKE RIVER AT BURBANK, WA
(National stream quality accounting network station)

LOCATION.--Lat 48°12'59", long 119°01'22", in NE¼SW¼ sec.35, T.9 N., R.30 E., Franklin County, Hydrologic Unit 17060110, at U.S. Highway 395/410 bridge at Burbank, 2.2 mi upstream from mouth, and 7.5 mi downstream from Ice Harbor Dam.

DRAINAGE AREA.--108,800 mi².

PERIOD OF RECORD.--Water years 1960-69, 1972 to current year.

PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: March 1973 to September 1979.

WATER TEMPERATURES: April 1973 to September 1981.

WATER QUALITY DATA, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984

DATE	TIME	STREAM- FLOW, INSTAN- TANEOUS (CFS)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH (STAND- ARD UNITS)	TEMPER- ATURE (DEG C)	TUR- BID- ITY (NTU)	OXYGEN, DIS- SOLVED (MG/L)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION)	COLI- FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)	STREP- TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML)	HARD- NESS (MG/L AS CACO3)	HARD- NESS NONCAR- BONATE (MG/L AS CACO3)
NOV , 1983												
21...	1040	80600	367	7.6	10.5	3.0	9.5	87	K2	51	130	2
MAR , 1984												
05...	1140	82500	287	7.8	4.0	14	12.0	92	K5	K5	110	3
MAY												
07...	1530	98100	--	7.8	10.0	18	11.4	102	K1	K5	81	16
AUG												
08...	1100	24600	159	7.7	22.5	5.7	8.3	97	K3	K7	59	0
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 SI02)
NOV , 1983												
21...	33	11	25	29	1	3.4	126	33	12	.40	21	
MAR , 1984												
05...	28	9.1	17	25	.7	2.7	105	24	12	.30	21	
MAY												
07...	23	5.6	11	22	.6	2.1	65	16	10	.30	21	
AUG												
08...	17	4.1	8.1	22	.5	1.7	59	13	4.6	.20	12	
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)	SOLIDS, RESIDUE AT 105 DEG. C, SUS- PENDE (MG/L)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N)	NITRO- GEN,AM- MONIA + ORGANIC TOTAL (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)
NOV , 1983												
21...	212	220	.29	46100	<1	.74	.060	.20	.060	.050	.050	
MAR , 1984												
05...	185	180	.25	41200	21	.99	.040	.30	.060	.040	.040	
MAY												
07...	141	130	.19	37300	17	.36	<.010	.40	.090	.050	.020	
AUG												
08...	88	96	.12	5840	2	.10	.060	.30	.040	.030	.030	

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

SNAKE RIVER BASIN

13353200 SNAKE RIVER AT BURBANK, WA--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984

DATE	ALUM- INUM, DIS- SOLVED (UG/L AS AL)	ARSENIC DIS- SOLVED (UG/L AS AS)	BARIUM, DIS- SOLVED (UG/L AS BA)	BERYL- LIUM, DIS- SOLVED (UG/L AS BE)	CADMIUM DIS- SOLVED (UG/L AS CD)	CHRO- MIUM, DIS- SOLVED (UG/L AS CR)	COBALT, DIS- SOLVED (UG/L AS CO)	COPPER, DIS- SOLVED (UG/L AS CU)	IRON, DIS- SOLVED (UG/L AS FE)	LEAD, DIS- SOLVED (UG/L AS PB)	LITHIUM DIS- SOLVED (UG/L AS LI)
NOV , 1983											
21...	120	3	39	<.5	<1	<1	<3	4	160	3	24
MAR , 1984											
05...	30	2	38	<.5	<1	<1	<3	110	26	23	20
MAY											
07...	10	1	39	1.3	1	<1	<3	27	19	4	14
AUG											
08...	40	1	28	1.0	1	3	<3	27	31	8	9
DATE	MANGA- NESE, DIS- SOLVED (UG/L AS MN)	MERCURY DIS- SOLVED (UG/L AS HG)	MOLYB- DENUM, DIS- SOLVED (UG/L AS MO)	NICKEL, DIS- SOLVED (UG/L AS NI)	SELE- NIUM, DIS- SOLVED (UG/L AS SE)	SILVER, DIS- SOLVED (UG/L AS AG)	STRON- TIUM, DIS- SOLVED (UG/L AS SR)	VANA- DIUM, DIS- SOLVED (UG/L AS V)	ZINC, DIS- SOLVED (UG/L AS ZN)	SEDI- MENT, SUS- PENDE (MG/L)	SEDI- MENT, DIS- CHARGE, SUS- PENDE (T/DAY)
NOV , 1983											
21...	18	<.1	<10	1	<1	<1	190	<6	4	6	1310
MAR , 1984											
05...	7	<.1	<10	7	<1	<1	160	<6	66	12	2670
MAY											
07...	7	<.1	<10	<1	<1	<1	110	<6	16	23	6090
AUG											
08...	3	<.1	<10	3	<1	<1	98	<6	11	10	664
DATE	TIME	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-90)	GROSS BETA, SUSP. TOTAL (PCI/L AS SR-90)	GROSS BETA, SUSP. TOTAL (PCI/L AS SR-90)	RADIUM 226, DIS- SOLVED, RADON METHOD (PCI/L)	URANIUM NATURAL DIS- SOLVED (UG/L AS U)	
NOV , 1983											
21...	1040	<6.2	<.4	3.5	.7	3.0	.6	.05	3.0		
MAY , 1984											
07...	1530	<2.7	1.0	2.6	1.3	2.3	1.1	.05	1.2		

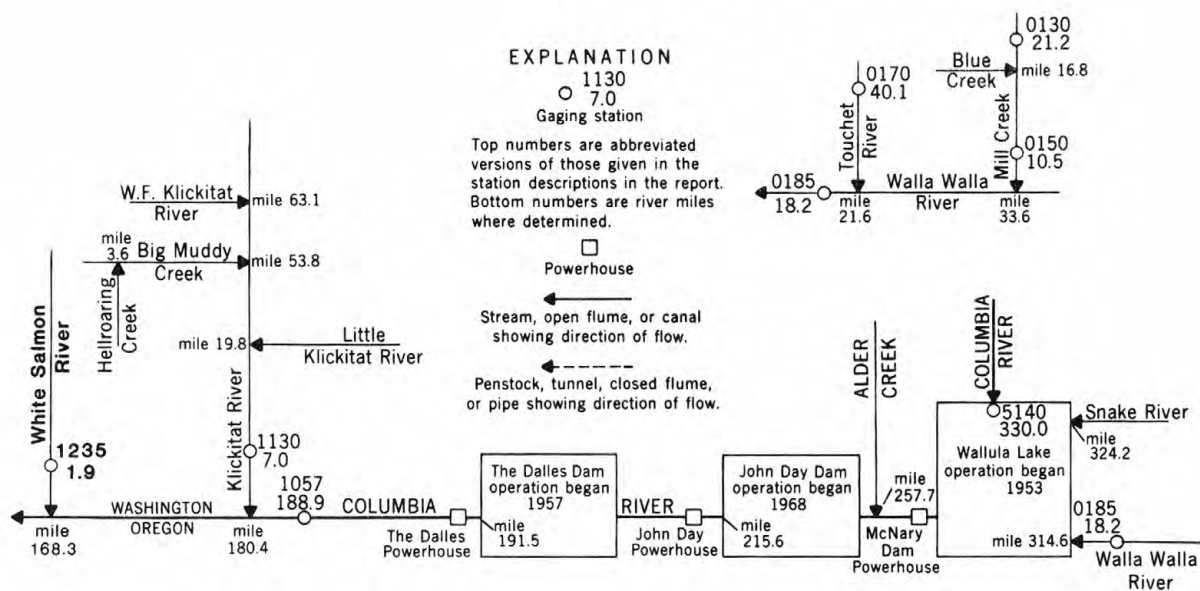


Figure 31.--Gaging stations in Columbia River basin between Wallula Lake and White Salmon River.

WALLA WALLA RIVER BASIN

14013000 MILL CREEK NEAR WALLA WALLA, WA

LOCATION.--Lat 46°00'29", long 118°07'03", in SW¼SW¼ sec.7, T.6 N., R.38 E., Walla Walla County, Hydrologic Unit 17070102, on left bank 0.1 mi downstream from Railroad Canyon, 4.0 mi downstream from city of Walla Walla diversion dam, 4.4 mi upstream from Blue Creek, 11.5 mi southeast of Walla Walla, and at mile 21.2.

DRAINAGE AREA.--59.6 mi².

PERIOD OF RECORD.--August 1913 to September 1917, April to September 1938, October 1939 to September 1976, October 1979 to current year. Maximum discharge and occasional discharge measurements 1977-79.

REVISED RECORDS.--WSP 1398: 1946-48(M), 1950 (M). WSP 1935: 1959, drainage area.

GAGE.--Water-stage recorder. Datum of gage is 1,995.85 ft above National Geodetic Vertical Datum of 1929 (levels by U.S. Corps of Engineers). Prior to Oct. 1, 1938, nonrecording gages at about same site at different datums.

REMARKS.--Records good. No regulation. City of Walla Walla diverts about 22 ft³/s 4.0 mi above station for municipal use.

AVERAGE DISCHARGE.--46 years (water years 1914-17, 1940-76, 1980-84), 98.2 ft³/s, 71,150 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 3,240 ft³/s Dec. 23, 1964, gage height, 19.26 ft; minimum daily, 9.5 ft³/s Dec. 9, 10, 1972.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of March 31 or April 1, 1931, reached a discharge of about 11,000 ft³/s, based on slope-area measurement about 900 ft upstream at old city of Walla Walla diversion dam.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 687 ft³/s, Jan. 25, gage height, 16.42 ft, no peak above base of 700 ft³/s; minimum daily, 20 ft³/s Oct. 2-4, 25-30, but may have been less during period of ice effect.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	21	22	38	30	100	120	157	82	94	48	32	34
2	21	22	37	35	90	181	148	90	87	47	33	33
3	20	22	36	199	81	165	136	128	81	46	36	33
4	21	67	34	436	76	136	128	154	94	44	33	33
5	22	34	34	314	73	116	131	166	136	42	33	34
6	22	48	34	242	72	105	135	166	145	41	33	40
7	21	47	33	196	68	102	126	153	181	42	32	35
8	21	37	38	165	67	103	151	146	352	42	32	34
9	26	33	85	133	67	120	151	152	310	40	32	33
10	24	46	249	114	67	157	158	144	229	38	31	33
11	22	61	181	100	64	196	150	143	196	38	31	33
12	22	54	120	88	105	184	143	149	179	36	31	33
13	22	58	105	81	401	179	127	165	176	36	32	33
14	22	51	126	72	423	295	120	175	160	36	32	33
15	22	57	124	64	256	380	152	144	140	35	32	33
16	22	57	102	59	193	322	195	119	124	34	33	33
17	23	73	78	55	152	277	185	104	107	32	32	33
18	23	73	64	51	129	229	162	102	94	32	32	33
19	23	67	54	48	114	210	153	109	87	32	32	33
20	22	58	46	44	102	259	135	119	92	32	32	30
21	22	51	37	44	98	389	121	110	87	33	32	31
22	30	44	31	47	90	458	118	103	80	33	32	32
23	25	41	30	50	87	389	121	142	75	33	32	35
24	21	46	29	314	85	306	115	133	72	34	32	33
25	21	48	29	603	85	249	103	120	70	33	31	31
26	20	46	29	368	80	229	93	122	65	34	32	31
27	20	44	29	236	80	207	86	118	62	34	31	30
28	20	43	28	181	85	199	83	116	59	34	31	30
29	20	42	29	150	92	190	82	123	58	36	31	30
30	20	40	30	129	---	179	79	131	52	33	34	30
31	23	---	31	114	---	168	---	112	---	32	43	---
TOTAL	684	1432	1950	4762	3482	6799	3944	4040	3744	1142	1007	982
MEAN	22.1	47.7	62.9	154	120	219	131	130	125	36.8	32.5	32.7
MAX	30	73	249	603	423	458	195	175	352	48	43	40
MIN	20	22	28	30	64	102	79	82	52	32	31	30
AC-FT	1360	2840	3870	9450	6910	13490	7820	8010	7430	2270	2000	1950
CAL YR 1983	TOTAL	29379	MEAN	80.5	MAX	790	MIN	19	AC-FT	58270		
WTR YR 1984	TOTAL	33968	MEAN	92.8	MAX	603	MIN	20	AC-FT	67380		

WALLA WALLA RIVER BASIN

333

14015000 MILL CREEK AT WALLA WALLA, WA

LOCATION.--Lat 46°04'35", long 118°16'21", in NE¼NW¼ sec.23, T.7 N., R.36 E., Walla Walla County, Hydrologic Unit 17070102, on left bank 200 ft downstream from diversion dam, 1.5 mi east of Walla Walla, and at mile 10.5.

DRAINAGE AREA.--95.7 mi².

PERIOD OF RECORD.--April 1941 to current year.

REVISED RECORDS.--WSP 1288: Drainage area. WSP 1348: 1943, 1945-46.

GAGE.--Water-stage recorder and concrete control. Datum of gage is 1,165.49 ft above National Geodetic Vertical Datum of 1929 (levels by U.S. Corps of Engineers). April 1941 to June 11, 1941, nonrecording gage, and June 11, 1941, to Jan. 22, 1957, water-stage recorder, at sites 0.8 mi downstream at different datum.

REMARKS.--Records good except those below 20 ft³/s, which are poor. Some regulation at diversion dam 200 ft upstream from station where water is diverted into Yellowhawk and Garrison Creeks for stock and irrigation. Since Nov. 19, 1941, water has been diverted 1.0 mi upstream into Mill Creek Reservoir for flood control with release of stored water after flood into Russell Creek, and is also diverted as required to replenish losses from seepage and evaporation from small recreation pool maintained in the reservoir. City of Walla Walla diverts water for municipal supply about 11 mi upstream. Other small diversions upstream from station for irrigation.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 2,760 ft³/s Dec. 28, 1945, gage height, 4.0 ft, site and datum then in use; no flow at times.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of March 31, April 1, 1931, discharge not determined, was greatest since at least 1913. Discharge about 11,000 ft³/s, based on a slope-area measurement made at old city of Walla Walla diversion dam 10.8 mi upstream.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 909 ft³/s Jan. 25, Feb. 13, gage height, 3.94 ft; no flow for many days.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3.1	.00	47	65	135	188	238	66	70	38	3.7	10
2	3.1	.57	42	65	118	302	216	59	61	31	4.2	6.9
3	2.6	1.7	42	220	106	277	195	60	57	27	5.8	5.0
4	2.9	60	42	668	95	224	130	60	72	27	8.1	3.7
5	3.7	27	42	466	94	188	128	59	110	26	9.2	2.0
6	2.1	34	41	348	89	162	101	60	184	21	5.0	8.1
7	.00	47	42	291	83	152	78	58	283	20	3.3	8.1
8	.00	29	51	242	79	147	80	58	439	19	2.8	6.9
9	.18	24	101	223	78	159	79	109	466	16	2.8	6.9
10	.03	30	384	173	78	196	79	149	368	14	1.5	5.8
11	.00	70	328	151	77	254	84	162	331	13	3.3	4.2
12	.00	60	258	133	83	243	81	161	292	13	3.7	3.7
13	.00	65	182	121	471	232	80	157	291	12	3.3	3.3
14	.00	56	210	106	689	373	96	148	259	13	2.8	2.8
15	.00	58	219	100	418	566	173	135	221	14	2.0	2.8
16	.00	60	182	87	323	486	159	98	186	10	1.1	2.8
17	.00	70	143	78	271	423	174	82	156	11	.60	3.3
18	.00	76	117	67	211	348	172	75	127	8.6	.60	1.1
19	.00	75	95	69	183	328	151	77	103	8.8	2.8	.00
20	.00	68	81	65	161	357	88	97	98	6.9	3.3	.00
21	.00	64	64	62	155	594	75	89	107	7.5	.60	.00
22	.00	52	55	67	140	705	77	77	91	9.6	1.1	.00
23	.00	39	45	67	130	599	76	119	80	9.7	2.0	.00
24	.00	51	45	321	125	476	74	124	72	8.1	2.0	.15
25	.00	54	44	838	137	404	82	105	67	5.0	2.8	.00
26	.00	52	44	547	126	373	82	98	59	5.0	2.8	.00
27	.00	49	46	370	124	351	76	94	53	5.0	2.0	.00
28	.00	56	50	253	141	318	77	89	50	5.8	2.0	.00
29	.00	50	60	202	153	308	79	93	53	10	2.0	.00
30	.00	38	80	177	---	289	76	99	45	5.0	4.2	.00
31	.00	---	75	156	---	264	---	87	---	3.7	14	---
TOTAL	17.71	1416.27	3257	6798	5073	10286	3356	3004	4851	423.7	105.40	87.55
MEAN	.57	47.2	105	219	175	332	112	96.9	162	13.7	3.40	2.92
MAX	3.7	76	384	838	689	705	238	162	466	38	14	10
MIN	.00	.00	41	62	77	147	74	58	45	3.7	.60	.00
AC-FT	35	2810	6460	13480	10060	20400	6660	5960	9620	840	209	174
CAL YR 1983	TOTAL	30638.73	MEAN	83.9	MAX	1050	MIN	.00	AC-FT	60770		
WTR YR 1984	TOTAL	38675.63	MEAN	106	MAX	838	MIN	.00	AC-FT	76710		

WALLA WALLA RIVER BASIN

14017000 TOUCHET RIVER AT BOLLES, WA

LOCATION.--Lat 46°16'28", long 118°13'13", on line between secs.7 and 8, T.9 N., R.37 E., Walla Walla County, Hydrologic Unit 17070102, on right bank just downstream from bridge on State Highway 124, 0.4 mi southeast of Bolles, 2.9 mi downstream from Coppel Creek, and at mile 40.1.

DRAINAGE AREA.--361 mi².

PERIOD OF RECORD.--February 1924 to October 1929, April 1951 to current year. Monthly discharge only for February and March 1929, published in WSP 1318.

REVISED RECORDS.--WSP 1448: 1952-53(M). WSP 1935: Drainage area.

GAGE.--Water-stage recorder. Elevation of gage is 1,150 ft, from topographic map. Prior to Oct. 5, 1929, water-stage recorder at site 0.5 mi upstream at different datum. Apr. 1 to May 6, 1951, October 1968 to September 1974, nonrecording gage.

REMARKS.--Records good. Diurnal fluctuation and some regulation at low flow caused by operation of flour mill at Waitsburg 3 mi upstream. Numerous small diversions for municipal, domestic, and irrigation use.

AVERAGE DISCHARGE.--38 years (water years 1925-29, 1952-84), 233 ft³/s, 168,800 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 9,350 ft³/s Dec. 23, 1964, gage height, 14.06 ft, from rating curve extended above 3,800 ft³/s on basis of slope-area measurement of peak flow; minimum, 1.4 ft³/s July 30, 1926.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 1,500 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Jan. 3	1500	*1,190	*4.80				

Minimum discharge, 31 ft³/s Aug. 21, gage height, 2.20 ft.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	47	79	120	135	309	368	461	222	252	108	44	50
2	45	79	115	130	276	535	433	241	225	103	44	44
3	45	79	115	650	255	456	385	269	206	96	45	42
4	48	146	105	1030	238	389	360	283	218	94	47	41
5	48	110	103	817	225	352	360	280	269	90	48	38
6	48	125	110	661	215	328	372	273	298	81	50	50
7	50	146	101	560	206	305	347	255	291	81	47	50
8	52	103	123	530	197	291	451	248	424	81	45	47
9	62	90	180	442	194	294	411	273	428	77	41	45
10	66	96	591	389	191	316	411	262	389	75	39	44
11	57	174	525	360	185	380	385	266	356	71	38	42
12	57	138	406	316	197	376	368	273	320	67	38	44
13	55	160	372	291	596	389	340	280	328	66	38	44
14	55	135	385	259	776	601	320	309	305	66	39	42
15	57	128	406	218	575	736	320	298	280	64	39	39
16	57	135	343	218	510	678	360	276	255	59	38	39
17	59	168	283	188	433	650	385	245	228	59	36	38
18	62	185	245	138	368	560	372	228	209	57	34	38
19	59	183	206	177	332	540	385	231	194	53	34	39
20	59	163	183	160	316	672	356	259	194	52	34	41
21	57	146	150	177	309	958	324	255	228	50	34	42
22	69	135	110	269	291	1030	305	228	200	50	34	45
23	85	128	85	225	273	926	298	305	180	48	34	60
24	69	141	80	525	273	828	287	305	165	48	34	64
25	64	146	85	882	287	748	269	283	154	48	35	57
26	59	135	95	748	273	748	252	287	143	44	36	55
27	59	130	95	580	269	650	235	280	135	44	35	55
28	62	130	100	485	283	607	222	269	128	45	35	52
29	66	133	110	420	301	585	222	276	128	57	35	52
30	67	125	120	364	---	535	218	294	120	52	39	50
31	75	---	140	332	---	500	---	283	---	45	50	---
TOTAL	1820	3971	6187	12676	9153	17331	10214	8336	7250	2031	1219	1389
MEAN	58.7	132	200	409	316	559	340	269	242	65.5	39.3	46.3
MAX	85	185	591	1030	776	1030	461	309	428	108	50	64
MIN	45	79	80	130	185	291	218	222	120	44	34	38
AC-FT	3610	7880	12270	25140	18150	34380	20260	16530	14380	4030	2420	2760
CAL YR 1983	TOTAL	77845	MEAN	213	MAX	1520	MIN	31	AC-FT	154400		
WTR YR 1984	TOTAL	81577	MEAN	223	MAX	1030	MIN	34	AC-FT	161800		

WALLA WALLA RIVER BASIN

335

14018500 WALLA WALLA RIVER NEAR TOUCHET, WA

LOCATION.--Lat 46°01'40", long 118°43'43", in NW¼SE¼ sec.6, T.6 N., R.33 E., Walla Walla County, Hydrologic Unit 17070102, on left bank 0.8 mi upstream from Gardena Creek, 2.8 mi southwest of Touchet, 3.4 mi downstream from Touchet River, and at mile 18.2.

DRAINAGE AREA.--1,657 mi².

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

REVISED RECORDS.--WSP 1935: Drainage area.

GAGE.--Water-stage recorder. Elevation of gage is 405 ft, from topographic map. Prior to Nov. 27, 1951, nonrecording gage at same site and datum.

REMARKS.--Records good. Many diversions upstream from station for irrigation.

AVERAGE DISCHARGE.--33 years, 600 ft³/s, 434,700 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 33,400 ft³/s Dec. 22, 1964, gage height, 18.90 ft, from rating curve extended above 15,000 ft³/s on basis of slope-area measurement of peak flow; no flow July 30 to Aug. 8, Aug. 12, 13, 1968.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 3,000 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Jan. 4	2145	*5,150	*10.61	Feb. 14	0600	3,490	9.15
Jan. 25	1400	4,360	9.95	Mar. 21	1145	4,400	9.99

Minimum discharge, 9.7 ft³/s Aug. 8.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	61	112	369	540	1060	1050	1430	664	652	234	39	44
2	53	103	371	559	967	1720	1310	726	556	197	36	53
3	52	103	369	962	891	1650	1200	786	498	173	33	50
4	38	132	361	4090	831	1420	1110	891	514	156	39	44
5	31	307	356	3150	800	1250	1080	872	764	139	42	33
6	28	217	371	2200	764	1130	1120	849	986	127	44	38
7	34	331	371	1780	764	1090	1030	795	1210	115	42	41
8	25	288	395	1510	747	1050	1280	756	1880	110	37	51
9	32	228	514	1320	705	1070	1290	854	2140	110	35	47
10	42	207	1790	1170	709	1180	1270	909	1750	99	33	51
11	44	291	1990	1070	688	1450	1250	923	1520	91	26	42
12	36	374	1440	957	684	1460	1160	986	1330	82	22	38
13	36	395	1210	886	1290	1360	1080	1030	1320	79	22	37
14	35	384	1220	804	3120	1910	991	1130	1170	73	22	39
15	35	343	1410	700	2200	2650	1090	1050	1010	72	20	40
16	39	356	1230	660	1800	2490	1350	900	872	66	21	45
17	43	384	1010	600	1570	2220	1440	760	756	63	20	42
18	43	471	854	530	1360	1910	1340	680	656	61	17	38
19	45	471	730	510	1220	1720	1380	648	549	58	15	32
20	42	439	625	500	1120	2000	1230	726	501	55	16	31
21	43	406	530	500	1090	3370	1060	730	614	54	17	33
22	49	390	420	933	1060	3510	996	652	589	51	16	42
23	85	358	350	928	981	3190	996	786	527	49	13	59
24	100	374	350	1860	957	2670	942	981	468	47	12	95
25	71	398	355	3800	1040	2280	881	840	422	46	11	88
26	61	398	360	3070	986	2370	813	831	353	42	12	72
27	62	382	370	2190	967	2020	726	840	324	39	17	58
28	61	376	380	1730	1010	1840	668	800	286	35	17	59
29	67	408	400	1460	1020	1830	672	804	263	37	18	58
30	72	379	450	1290	---	1670	660	872	268	49	21	62
31	86	---	490	1160	---	1550	---	849	---	45	27	---
TOTAL	1551	9805	21441	43419	32401	58080	32845	25920	24748	2654	762	1462
MEAN	50.0	327	692	1401	1117	1874	1095	836	825	85.6	24.6	48.7
MAX	100	471	1990	4090	3120	3510	1440	1130	2140	234	44	95
MIN	25	103	350	500	684	1050	660	648	263	35	11	31
AC-FT	3080	19450	42530	86120	64270	115200	65150	51410	49090	5260	1510	2900
CAL YR 1983	TOTAL	217808	MEAN	597	MAX	5060	MIN	15	AC-FT	432000		
WTR YR 1984	TOTAL	255088	MEAN	697	MAX	4090	MIN	11	AC-FT	506000		

COLUMBIA RIVER MAIN STEM

14105700 COLUMBIA RIVER AT THE DALLES, OR

LOCATION.--Lat 45°36'27", long 121°10'20", in SW¼SW¼ sec.34, T.2 N., R.13 E., Wasco County, Hydrologic Unit 17070105, Corps of Engineers land, on left bank 0.3 mi downstream from Mill Creek, 2.6 mi downstream from The Dalles Dam, and at mile 188.9.

DRAINAGE AREA.--237,000 mi², approximately.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1857 to September 1877 (annual maximum only, at Lower Cascades Landing, published in WSP 1318), June 1878 to current year. Published as "near The Dalles" 1936-56.

REVISED RECORDS.--WSP 534: 1920(m). WSP 1094: 1894. WSP 1248: 1866, 1888, 1899, 1909. WSP 1518: 1876(M).

GAGE.--Acoustic velocity meter (AVM) with water-stage and velocity-index recorder. Datum of gage is National Geodetic Vertical Datum of 1929. See WSP 1738 for history of changes prior to Mar. 16, 1957. Mar. 16, 1957, to Sept 30, 1968, water-stage recorder at site 0.4 mi upstream at same datum.

REMARKS.--Water-discharge records excellent. Considerable regulation by many large reservoirs. Diurnal fluctuations caused by powerplant and gates at The Dalles Dam. Many diversions for irrigation above station.

AVERAGE DISCHARGE.--106 years, 193,800 ft³/s, 140,400,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge (since 1858), 1,240,000 ft³/s June 6, 1894, elevation, 106.5 ft; minimum (since 1878), 12,100 ft³/s Apr. 16, 1968 (due to closure of John Day dam, recorded by AVM).

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 396,000 ft³/s June 27; maximum elevation, 82.6 ft May 16, 24; minimum daily discharge, 89,000 ft³/s Oct. 9.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	116000	112000	219000	123000	230000	185000	241000	319000	382000	370000	149000	119000
2	97800	111000	226000	139000	239000	199000	220000	282000	382000	327000	145000	124000
3	113000	122000	186000	153000	225000	218000	245000	300000	357000	271000	147000	101000
4	122000	127000	165000	175000	179000	225000	243000	282000	368000	255000	115000	114000
5	135000	130000	233000	186000	172000	195000	226000	244000	357000	296000	104000	103000
6	117000	126000	211000	205000	233000	193000	240000	271000	334000	269000	114000	122000
7	111000	128000	196000	208000	230000	205000	266000	269000	343000	262000	166000	122000
8	98000	142000	188000	208000	229000	212000	246000	294000	333000	265000	184000	126000
9	89000	147000	180000	227000	236000	198000	239000	267000	310000	207000	151000	102000
10	114000	141000	154000	210000	228000	184000	272000	336000	312000	195000	141000	110000
11	132000	137000	121000	197000	226000	203000	276000	340000	308000	200000	141000	130000
12	168000	126000	175000	198000	185000	225000	252000	293000	320000	202000	126000	150000
13	114000	126000	180000	200000	203000	235000	301000	273000	353000	207000	139000	127000
14	109000	124000	173000	204000	232000	212000	250000	322000	341000	204000	152000	115000
15	114000	117000	176000	206000	252000	258000	249000	379000	353000	191000	143000	125000
16	123000	134000	190000	231000	209000	257000	298000	383000	375000	211000	145000	122000
17	121000	150000	196000	238000	205000	258000	285000	363000	387000	210000	159000	130000
18	139000	164000	182000	236000	213000	242000	331000	355000	391000	187000	124000	135000
19	131000	177000	231000	216000	219000	221000	339000	357000	392000	194000	142000	125000
20	129000	150000	214000	254000	204000	199000	325000	325000	386000	176000	123000	127000
21	136000	177000	246000	181000	204000	215000	369000	338000	387000	165000	129000	118000
22	95100	199000	220000	166000	236000	248000	346000	356000	370000	158000	154000	117000
23	91400	198000	218000	205000	226000	268000	348000	371000	378000	140000	149000	91900
24	114000	167000	187000	202000	243000	271000	345000	382000	364000	138000	151000	114000
25	120000	167000	153000	202000	208000	250000	348000	376000	355000	147000	149000	118000
26	108000	161000	148000	228000	156000	218000	344000	335000	368000	146000	129000	135000
27	101000	140000	170000	218000	209000	256000	345000	295000	396000	174000	136000	117000
28	123000	156000	177000	200000	210000	271000	294000	317000	382000	186000	132000	125000
29	126000	187000	180000	187000	212000	248000	278000	340000	380000	147000	136000	122000
30	118000	225000	182000	200000	---	251000	301000	361000	373000	142000	159000	90500
31	113000	---	151000	198000	---	263000	---	390000	---	162000	120000	---
TOTAL	3638300	4468000	5828000	6201000	6253000	7083000	8662000	10115000	10837000	6404000	4354000	3577400
MEAN	117400	148900	188000	200000	215600	228500	288700	326300	361200	206600	140500	119200
MAX	168000	225000	246000	254000	252000	271000	369000	390000	396000	370000	184000	150000
MIN	89000	111000	121000	123000	156000	184000	220000	244000	308000	138000	104000	90500
AC-FT	7217000	8862000	11560000	12300000	12403000	14049000	17181000	20063000	21495000	12702000	8636000	7096000
CAL YR 1983	TOTAL	79686000	MEAN	218300	MAX	426000	MIN	89000	AC-FT	158057000		
WTR YR 1984	TOTAL	77420700	MEAN	211500	MAX	396000	MIN	89000	AC-FT	153564000		

14113000 KICKITAT RIVER NEAR PITT, WA
(National stream quality accounting network station)

LOCATION.--Lat 45°45'24", long 121°12'32", in SW¼ sec.8, T.3 N., R.13 E., Klickitat County, Hydrologic Unit 17070106, on left bank 2.8 mi south of Pitt, 4.8 mi southwest of Klickitat, 5.3 mi upstream from Silvias Creek, and at mile 7.0.

DRAINAGE AREA.--1,297 mi².

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--July 1909 to January 1912, October 1928 to current year. Published as "at Klickitat" 1909-12 and as "at Pitt" 1928-35.

REVISED RECORDS.--WSP 1348: 1910(M), 1929-33(M), 1934, 1935-38(M), 1940(M), 1942-43(M), 1946(M), 1948(M). WSP 1935: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 288.9 ft above National Geodetic Vertical Datum of 1929 (river-profile survey). July 3, 1909, to Jan. 31, 1912, nonrecording gage at site 7 mi upstream at different datum. Oct. 1, 1928, to Sept. 30, 1935, nonrecording gage at site 3.5 mi upstream at different datum.

REMARKS.--Water-discharge records excellent. Several small diversions above station for irrigation of about 7,500 acres, mostly in vicinity of Glenwood. The largest of these is Hellroaring Irrigation Canal with a maximum flow of 74.5 ft³/s Aug. 13, 1974, which at times diverts the entire flow of Hellroaring Creek (tributary to Big Muddy Creek). No regulation.

AVERAGE DISCHARGE.--58 years (water years 1910-11, 1929-84), 1,662 ft³/s, 1,204,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 47,400 ft³/s Jan. 15, 1974, gage height, 17.12 ft from high-water mark in well, from rating curve extended above 13,000 ft³/s on basis of slope-area measurement at gage height 14.34 ft; minimum, 412 ft³/s Jan. 16, 1979, gage height, 3.81 ft.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 4,000 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Jan. 5	1930	*5,190	*7.57	Feb. 13	1400	4,720	7.33
Jan. 25	1245	4,600	7.27	Mar. 21	0530	4,680	7.31

Minimum discharge, 768 ft³/s Sept. 28, 29, gage height, 4.45 ft.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	876	916	1300	1080	2350	2020	2310	1920	2690	1810	1090	806
2	876	1030	1290	1060	2210	1980	2260	2460	2480	1810	1090	806
3	876	1270	1270	1400	2130	1910	2210	2210	2420	1790	1070	806
4	852	1740	1240	3340	2030	1840	2170	2090	2540	1790	1050	806
5	884	1300	1250	4830	1980	1790	2210	2020	2620	1770	1040	806
6	884	1300	1250	4250	1940	1770	2090	1970	2530	1770	1010	860
7	868	1240	1220	3580	1890	1740	2040	1920	2380	1620	974	868
8	860	1110	1200	3220	1880	1760	2160	1950	2280	1520	974	892
9	860	1090	1370	2880	1880	1800	2030	2070	2210	1470	991	892
10	852	1210	2020	2620	1840	1890	2230	2020	2140	1440	999	852
11	844	1730	2140	2500	1830	1960	2140	2080	2070	1420	991	829
12	837	1410	1880	2320	2310	2000	2380	2310	2110	1400	966	813
13	844	1290	2360	2170	3990	2240	2320	2380	2180	1380	932	806
14	837	1310	2550	1950	3700	2530	2240	2550	2240	1350	908	798
15	837	1420	2210	1640	3390	2550	2310	2500	2380	1340	900	798
16	837	1850	1810	1630	3410	2710	2400	2400	2480	1340	900	806
17	837	2390	1550	1520	2990	3070	2390	2310	2320	1360	916	806
18	844	2120	1460	1410	2760	2850	2420	2260	2210	1340	924	813
19	837	1900	1420	1450	2600	2810	2430	2280	2170	1280	884	829
20	829	2020	1300	1420	2580	3050	2280	2510	2190	1240	876	852
21	829	1790	1050	1410	2600	4250	2230	2430	2280	1210	868	813
22	860	1620	924	1530	2390	3820	2210	2360	2240	1180	860	798
23	916	1550	880	1960	2280	3570	2180	2540	2140	1140	852	813
24	868	2030	840	3440	2440	3360	2130	2440	2190	1150	852	798
25	852	1900	860	4320	2350	3230	2040	2320	2310	1170	837	806
26	868	1690	850	3620	2160	3190	1980	2420	2300	1190	837	783
27	900	1580	900	3170	2090	2910	1900	2400	2240	1160	852	776
28	837	1530	900	2980	2030	2810	1880	2420	2120	1120	844	768
29	837	1460	930	2790	1980	2640	1830	2610	2130	1100	821	768
30	860	1400	970	2610	---	2500	1830	3050	2000	1120	829	768
31	982	---	1060	2460	---	2420	---	3050	---	1090	829	---
TOTAL	26680	46196	42254	76560	70010	78970	65230	72250	68590	42870	28766	24435
MEAN	861	1540	1363	2470	2414	2547	2174	2331	2286	1383	928	815
MAX	982	2390	2550	4830	3990	4250	2430	3050	2690	1810	1090	892
MIN	829	916	840	1060	1830	1740	1830	1920	2000	1090	821	768
AC-FT	52920	91630	83810	151900	138900	156600	129400	143300	136000	85030	57060	48470
CAL YR 1983	TOTAL	881666	MEAN	2416	MAX	11700	MIN	829	AC-FT	1749000		
WTR YR 1984	TOTAL	642811	MEAN	1756	MAX	4830	MIN	768	AC-FT	1275000		

KLICKITAT RIVER BASIN

14113000 KLICKITAT RIVER NEAR PITT, WA--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1950-70, 1973, 1975 to current year.

PERIOD OF DAILY RECORD.--

WATER TEMPERATURE: October 1950 to September 1970.

WATER QUALITY DATA, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984

		STREAM- FLOW, INSTAN- TANEOUS (CFS)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH (STAND- ARD UNITS)	TEMPER- ATURE (DEG C)	TUR- BID- ITY (NTU)	OXYGEN, DIS- SOLVED (MG/L)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION)	COLI- FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)	STREP- TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML)	HARD- NESS (MG/L AS CAC03)	HARD- NESS NONCAR- BONATE (MG/L AS CAC03)
DATE	TIME											
NOV , 1983												
10...	0945	1130	79	7.9	6.5	2.2	9.7	81	K22	240	29	0
MAR , 1984												
07...	1225	1830	77	8.1	9.5	4.8	12.2	108	K12	K20	31	0
MAY												
02...	1230	2480	70	7.6	9.0	4.9	10.4	92	K9	73	27	0
AUG												
22...	0930	884	78	7.7	14.0	3.1	10.9	107	K12	--	31	0
		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 CAC03)	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)
DATE												
NOV , 1983												
10...	6.4	3.2	3.9	21	.3	1.6	39	2.6	1.2	<.10	27	
MAR , 1984												
07...	6.8	3.4	4.0	21	.3	1.4	41	2.2	1.6	<.10	29	
MAY												
02...	6.2	2.9	3.4	20	.3	1.1	35	2.2	1.1	<.10	27	
AUG												
22...	7.0	3.3	4.1	21	.3	1.6	39	1.9	1.0	<.10	29	
		SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L)	SOLIDS, SUM OF CONSTITUENTS, DIS- SOLVED (MG/L)	SOLIDS, DIS- SOLVED (TONS PER AC-FT)	SOLIDS, DIS- SOLVED (TONS PER DAY)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N)	NITRO- GEN,AM- MONIA + ORGANIC TOTAL (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)	ALUM- INUM, DIS- SOLVED (UG/L AS AL)
DATE												
NOV , 1983												
10...	75	70	.10	229	<.10	.060	.40	.030	.030	.030	30	
MAR , 1984												
07...	62	74	.08	306	<.10	.060	<.20	.030	.020	.020	80	
MAY												
02...	72	65	.10	482	<.10	.090	1.0	.040	.030	.030	80	
AUG												
22...	62	72	.08	148	<.10	.050	.70	.040	.020	.030	30	

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

KLICKITAT RIVER BASIN

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14113000 KLICKITAT RIVER NEAR PITT, WA--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984

DATE	ARSENIC DIS- SOLVED (UG/L AS AS)	BARIUM, DIS- SOLVED (UG/L AS BA)	BERYL- LIUM, DIS- SOLVED (UG/L AS BE)	CADMIUM DIS- SOLVED (UG/L AS CD)	CHRO- MIUM, DIS- SOLVED (UG/L AS CR)	COBALT, DIS- SOLVED (UG/L AS CO)	COPPER, DIS- SOLVED (UG/L AS CU)	IRON, DIS- SOLVED (UG/L AS FE)	LEAD, DIS- SOLVED (UG/L AS PB)	LITHIUM DIS- SOLVED (UG/L AS LI)	MANGA- NESE, DIS- SOLVED (UG/L AS MN)
NOV , 1983											
10...	<1	8	<.5	<1	<1	<3	3	55	<1	9	4
MAR , 1984											
07...	<1	11	<.5	<1	1	<3	33	81	150	<4	5
MAY											
02...	<1	12	<.5	<1	1	<3	2	86	<1	<4	3
AUG											
22...	<1	11	1.0	<1	<1	<3	1	42	6	6	3
DATE	MERCURY DIS- SOLVED (UG/L AS HG)	MOLYB- DENUM, DIS- SOLVED (UG/L AS MO)	NICKEL, DIS- SOLVED (UG/L AS NI)	SELE- NIUM, DIS- SOLVED (UG/L AS SE)	SILVER, DIS- SOLVED (UG/L AS AG)	STRON- TIUM, DIS- SOLVED (UG/L AS SR)	VANA- DIUM, DIS- SOLVED (UG/L AS V)	ZINC, DIS- SOLVED (UG/L AS ZN)	SEDI- MENT, SUS- PENDE (MG/L)	SED- MENT, DIS- CHARGE, SUS- PENDE (T/DAY)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM
NOV , 1983											
10...	<.1	<10	<1	<1	<1	38	<6	8	10	31	--
MAR , 1984											
07...	<.1	<10	7	<1	<1	43	<6	20	11	54	--
MAY											
02...	<.1	<10	<1	<1	<1	39	<6	6	17	114	68
AUG											
22...	<.1	<10	5	<1	<1	40	<6	7	7	17	--

14123500 WHITE SALMON RIVER NEAR UNDERWOOD, WA

LOCATION.--Lat 45°45'08", long 121°31'33", in NW¼NW¼ sec.14, T.3 N., R.10 E., Skamania County, Hydrologic Unit 17070105, on right bank 300 ft downstream from bridge, 1,000 ft downstream from Pacific Power & Light Co.'s Condit powerplant, 1.7 mi north of Underwood, and at mile 1.9.

DRAINAGE AREA.--386 mi².

PERIOD OF RECORD.--October 1912 to February 1913 (published as "at Condit Dam, near Underwood"), March 1915 to September 1930, September 1935 to current year.

REVISED RECORDS.--WSP 484: 1915-17. WSP: 1348 1936-41(M). WSP 1638: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 112.96 ft above National Geodetic Vertical Datum of 1929. Prior to March 1913, reference point at dam 1 mi upstream at different datum. March 1915, to July 16, 1918, water-stage recorder at site 200 ft upstream at datum 3.24 ft higher, and July 17, 1918, to Sept. 30, 1930, at datum 2.24 ft higher than present datum.

REMARKS.--Records excellent except those for period Oct. 1 to Nov. 7, which are fair. Diversions for irrigation of about 4,500 acres in Trout Lake area. Low and medium flows regulated by powerplant of Pacific Power & Light Co.

AVERAGE DISCHARGE.--64 years (water years 1916-30, 1936-84), 1,134 ft³/s, 821,600 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 15,300 ft³/s Jan. 15, 1974, gage height, 12.85 ft, from rating curve extended above 6,000 ft³/s; practically no flow at times when powerplant is shut down; minimum daily, 158 ft³/s Jan. 17, 1950.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 3,260 ft³/s Jan. 25, gage height, 6.16 ft; minimum daily, 616 ft³/s Oct. 21.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	680	700	1090	1000	1600	1350	1510	1420	1580	1170	844	672
2	680	800	1080	977	1500	1330	1470	1770	1490	1180	838	672
3	680	1100	1030	1250	1450	1290	1470	1750	1480	1100	801	666
4	670	1600	1030	1720	1400	1280	1420	1610	1510	1110	807	646
5	700	1250	1030	1960	1360	1240	1470	1520	1600	1120	813	656
6	720	1100	1020	1960	1320	1250	1400	1460	1570	1100	801	713
7	720	991	997	1910	1320	1240	1420	1420	1490	1050	782	735
8	710	883	991	1790	1280	1230	1480	1440	1470	1030	782	759
9	710	819	1100	1660	1260	1250	1420	1490	1420	1080	801	759
10	710	1000	1420	1590	1270	1280	1510	1480	1390	1000	770	724
11	703	1500	1540	1510	1260	1330	1500	1530	1370	977	764	698
12	687	1300	1410	1450	1580	1420	1630	1690	1360	991	741	692
13	661	1130	1460	1380	2240	1570	1590	1720	1340	991	747	698
14	651	1230	1630	1330	2160	1650	1610	1730	1380	970	741	677
15	651	1390	1510	1220	2030	1720	1680	1680	1400	956	741	692
16	646	1950	1410	1210	1990	1750	1690	1600	1410	949	724	677
17	651	2620	1300	1180	1810	1880	1650	1530	1350	963	724	672
18	621	2180	1250	1130	1700	1820	1630	1500	1290	949	724	656
19	636	1910	1210	1130	1630	1790	1610	1480	1250	916	713	651
20	646	1940	1160	1120	1600	1940	1540	1560	1250	916	687	682
21	616	1570	1040	1100	1580	2330	1530	1540	1400	916	698	661
22	626	1370	977	1190	1500	2300	1500	1470	1430	896	687	641
23	626	1280	956	1270	1460	2190	1500	1710	1320	876	687	677
24	636	1580	949	1890	1510	2060	1460	1710	1310	883	692	646
25	631	1630	970	2770	1440	1960	1420	1600	1290	876	682	651
26	631	1380	1010	2690	1370	1880	1370	1710	1290	922	672	646
27	626	1290	1050	2210	1350	1760	1310	1700	1260	883	677	631
28	626	1250	1010	2030	1330	1720	1330	1660	1230	851	677	631
29	625	1200	997	1910	1310	1620	1320	1700	1250	857	661	631
30	630	1150	997	1760	---	1580	1310	1780	1250	857	661	626
31	650	---	1030	1670	---	1540	---	1720	---	844	672	---
TOTAL	20456	41093	35654	48967	44610	50550	44750	49680	41430	30179	22811	20238
MEAN	660	1370	1150	1580	1538	1631	1492	1603	1381	974	736	675
MAX	720	2620	1630	2770	2240	2330	1690	1780	1600	1180	844	759
MIN	616	700	949	977	1260	1230	1310	1420	1230	844	661	626
AC-FT	40570	81510	70720	97130	88480	100300	88760	98540	82180	59860	45250	40140
CAL YR 1983	TOTAL	552996	MEAN	1515	MAX	5460	MIN	616	AC-FT	1097000		
WTR YR 1984	TOTAL	450418	MEAN	1231	MAX	2770	MIN	616	AC-FT	893400		

COLUMBIA RIVER MAIN STEM

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14128910 COLUMBIA RIVER AT WARRENDALE, OR
(National stream quality accounting network station)

LOCATION.--Lat 45°36'45", long 122°01'35", in NE¼SE¼ sec.35, T.2 N., R.6 E., Multnomah County, Hydrologic Unit 17080001, on left bank 0.1 mi downstream from Tumult Creek, 1.0 mi west of Warrendale, 5.1 mi downstream from Bonneville Dam, and at mile 141.0.

DRAINAGE AREA.--240,000 mi², approximately.

WATER-STAGE RECORDS

PERIOD OF RECORD.--October 1971 to current year.

GAGE.--Water-stage recorder. Datum of gage is National Geodetic Vertical Datum of 1929.

REMARKS.--Flow regulated by many reservoirs upstream.

EXTREMES FOR PERIOD OF RECORD.--Maximum gage height recorded, 30.91 ft June 20, 1972; minimum, 4.49 ft July 10, 1977.

EXTREMES FOR CURRENT YEAR.--Maximum gage height, 22.06 ft June 29; minimum, 6.19 ft Sept. 24.

GAGE HEIGHT (FEET ABOVE DATUM), WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	OCTOBER			NOVEMBER			DECEMBER			JANUARY		
1	7.87	7.26	7.58	8.98	7.70	8.35	15.31	12.68	14.24	11.32	10.15	10.59
2	8.04	6.65	7.34	9.24	8.07	8.58	16.03	12.97	14.45	11.41	10.21	10.99
3	8.32	6.85	7.71	11.16	8.38	9.58	14.27	12.56	13.44	13.03	10.45	11.52
4	9.45	7.62	8.50	11.04	9.73	10.31	13.66	11.70	12.50	15.08	12.27	13.37
5	10.22	8.01	9.41	10.83	10.06	10.39	15.52	12.26	13.97	15.34	15.05	15.18
6	9.69	8.63	9.08	11.37	9.58	10.29	15.50	13.35	14.79	15.21	14.77	14.99
7	8.88	7.45	8.20	11.31	10.15	10.63	13.87	12.27	12.88	14.99	14.65	14.77
8	8.49	7.10	7.76	10.82	9.82	10.19	13.79	13.33	13.51	14.85	14.42	14.56
9	8.26	6.72	7.39	10.64	10.06	10.27	13.88	12.75	13.48	14.79	13.92	14.37
10	8.72	6.91	7.85	10.88	9.24	9.95	14.12	12.56	13.10	15.00	13.78	14.39
11	9.52	7.96	8.60	11.09	9.89	10.35	12.57	11.94	12.18	15.11	14.06	14.73
12	11.46	9.37	10.13	10.00	9.08	9.59	12.84	11.45	12.04	14.07	13.07	13.60
13	11.50	7.36	9.04	10.12	8.88	9.54	13.74	12.85	13.35	13.53	12.83	13.21
14	7.72	7.11	7.37	10.12	9.69	9.94	13.88	13.65	13.80	13.57	13.11	13.33
15	7.84	6.87	7.35	10.60	9.29	9.84	13.90	13.66	13.77	13.72	13.16	13.40
16	8.51	7.84	8.19	11.35	9.60	10.51	13.92	13.42	13.68	14.59	13.58	14.20
17	8.36	6.91	7.60	12.81	11.16	11.84	13.87	13.47	13.70	14.88	14.29	14.56
18	9.47	8.08	8.67	13.75	12.49	13.18	13.80	13.38	13.60	15.03	13.84	14.30
19	9.39	8.50	8.91	15.42	13.28	13.89	15.69	13.26	14.59	15.04	13.79	14.20
20	9.21	8.32	8.74	15.14	13.81	14.32	15.42	13.26	14.05	14.81	14.33	14.52
21	9.65	8.81	9.20	15.18	13.72	14.45	16.06	14.21	15.35	14.49	12.44	13.13
22	9.59	7.37	8.25	15.04	14.37	14.69	15.56	13.93	14.64	12.68	12.15	12.42
23	8.15	6.92	7.51	14.58	13.29	14.05	14.79	13.52	13.95	14.53	12.06	13.06
24	8.51	6.98	7.61	14.21	13.16	13.69	13.75	11.11	12.35	15.72	13.42	14.63
25	9.06	7.56	8.31	13.96	13.29	13.61	12.67	8.47	9.39	15.91	14.56	15.22
26	8.80	7.16	7.88	13.98	13.22	13.53	9.77	9.07	9.45	16.36	15.87	16.17
27	8.05	6.74	7.27	13.31	12.21	12.58	11.73	9.52	10.90	16.16	15.49	15.87
28	8.30	7.42	7.90	12.44	11.82	12.19	11.38	10.44	10.92	15.72	13.74	14.97
29	8.67	8.05	8.39	13.54	12.28	12.87	11.80	10.72	11.14	13.70	13.02	13.36
30	8.78	7.81	8.32	15.46	12.21	13.80	13.02	11.65	12.22	14.19	12.14	13.08
31	8.58	7.77	8.24	---	---	---	12.93	11.33	11.90	14.29	12.96	13.46
MONTH	11.50	6.65	8.20	15.46	7.70	11.57	16.06	8.47	13.01	16.36	10.15	13.88

GAGE HEIGHT (FEET ABOVE DATUM), WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	FEBRUARY			MARCH			APRIL			MAY		
1	15.16	12.49	13.90	14.16	12.91	13.37	17.10	15.26	16.43	18.57	17.72	18.26
2	15.52	14.89	15.14	14.16	12.90	13.60	15.25	14.46	14.80	18.47	17.47	17.80
3	15.55	13.04	14.32	14.69	12.91	13.68	15.91	14.84	15.41	19.17	18.06	18.76
4	12.90	10.86	11.67	15.33	14.27	14.64	15.93	14.96	15.50	19.01	17.95	18.28
5	11.69	10.32	11.01	14.73	12.70	13.88	16.07	13.51	15.09	18.18	16.09	17.05
6	13.95	11.82	13.28	13.69	12.03	13.06	15.93	13.29	14.87	17.37	16.01	16.75
7	13.91	12.94	13.35	13.49	12.09	12.98	16.68	15.94	16.36	17.46	16.56	16.98
8	13.83	13.24	13.56	13.71	13.48	13.59	16.45	15.19	15.87	17.64	16.50	17.18
9	14.61	13.73	14.32	13.79	12.61	13.38	16.08	15.00	15.49	17.58	16.03	16.94
10	14.61	14.16	14.42	12.61	12.06	12.33	17.17	15.35	16.73	19.68	17.14	18.48
11	14.78	14.17	14.50	13.71	11.94	12.73	18.46	16.97	17.71	20.26	18.64	19.61
12	14.11	13.15	13.51	14.68	13.73	14.25	18.07	16.58	17.39	18.72	18.24	18.46
13	16.30	13.37	14.45	15.41	14.60	14.94	18.48	16.59	17.73	18.40	17.22	17.87
14	17.16	16.15	16.68	15.34	14.24	14.84	18.51	16.85	17.42	19.54	16.92	18.15
15	18.09	16.19	17.15	16.63	14.76	15.70	16.99	16.40	16.69	21.41	19.54	20.53
16	17.86	15.93	17.07	17.08	16.45	16.70	18.58	16.86	17.95	21.73	21.31	21.55
17	16.55	15.22	15.91	17.28	16.98	17.14	18.88	18.01	18.52	21.77	20.91	21.45
18	15.62	15.38	15.50	17.27	16.69	16.93	19.97	18.02	18.91	21.53	20.00	20.89
19	15.88	14.94	15.39	16.76	15.82	16.26	20.63	19.77	20.10	20.51	20.24	20.41
20	15.25	14.42	14.86	15.94	15.20	15.50	20.08	19.22	19.50	20.42	18.62	19.52
21	14.85	14.04	14.42	16.18	14.33	15.27	20.80	19.29	20.44	20.09	19.04	19.58
22	16.14	14.69	15.18	17.30	16.23	16.66	20.87	20.19	20.41	20.75	19.63	20.09
23	16.47	15.38	15.81	17.88	17.19	17.64	20.41	19.46	19.90	21.08	20.66	20.92
24	16.04	15.38	15.77	18.12	17.22	17.84	20.50	19.41	20.02	21.52	20.98	21.29
25	16.11	14.27	15.28	17.28	16.95	17.07	19.93	19.08	19.60	21.58	21.11	21.38
26	14.25	12.73	13.28	16.97	14.97	16.40	19.95	19.57	19.77	21.83	19.56	21.20
27	13.28	12.41	12.93	17.27	14.56	15.91	19.81	19.52	19.68	19.51	18.21	18.72
28	14.42	12.90	13.79	17.66	16.48	17.12	19.66	17.38	18.37	19.24	17.97	18.51
29	14.67	13.99	14.33	17.69	16.15	16.91	17.37	16.86	17.02	20.01	19.25	19.71
30	---	---	---	17.03	15.63	16.34	17.71	16.66	17.15	20.84	19.82	20.41
31	---	---	---	17.51	17.03	17.23	---	---	---	21.60	20.85	21.37
MONTH	18.09	10.32	14.51	18.12	11.94	15.29	20.87	13.29	17.69	21.83	16.01	19.29
DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
JUNE												
1	21.66	21.43	21.56	21.21	20.60	21.00	11.09	9.86	10.35	9.00	7.95	8.34
2	21.66	21.46	21.58	21.12	18.69	20.19	10.40	9.56	10.00	9.13	7.81	8.47
3	21.63	20.04	21.15	18.71	16.02	17.59	10.32	9.46	9.89	8.41	6.85	7.49
4	21.07	20.02	20.58	16.13	15.54	15.77	10.15	7.36	8.81	7.85	6.88	7.29
5	21.27	20.27	20.97	17.24	16.11	16.91	8.32	6.46	7.37	7.90	7.00	7.46
6	20.22	19.72	20.02	17.34	16.36	16.68	7.87	6.67	7.58	8.52	7.22	8.10
7	20.49	19.75	20.12	16.46	15.07	15.92	10.56	7.41	9.41	9.03	8.22	8.67
8	20.69	19.92	20.22	16.67	15.84	16.50	12.41	10.51	11.71	9.29	8.51	8.89
9	20.17	19.23	19.60	15.82	13.75	15.07	12.52	10.07	11.32	8.93	7.48	8.22
10	19.64	19.22	19.47	14.48	12.31	13.54	10.07	8.44	9.27	8.26	7.21	7.73
11	19.60	18.80	19.26	13.32	12.28	12.63	9.82	8.30	9.22	9.32	8.06	8.57
12	19.96	19.28	19.58	13.28	12.31	12.66	9.80	8.65	9.29	10.40	9.21	9.73
13	20.73	19.15	19.59	13.17	12.02	12.52	9.65	8.43	9.06	10.38	8.01	9.43
14	21.59	19.91	20.94	12.56	12.20	12.34	10.26	9.38	9.73	8.01	6.36	7.09
15	20.51	19.12	19.83	12.44	12.03	12.25	10.27	9.30	9.61	9.08	7.21	8.01
16	21.46	20.34	20.88	13.11	11.45	12.40	9.94	9.41	9.63	9.11	8.23	8.58
17	21.67	21.37	21.50	13.83	12.19	12.90	10.38	9.84	10.06	9.01	8.19	8.55
18	21.77	21.57	21.66	13.27	12.63	12.85	10.45	7.49	8.83	8.95	8.32	8.62
19	21.85	21.59	21.69	12.84	12.33	12.67	9.42	8.14	9.00	8.86	8.03	8.38
20	21.80	21.56	21.72	12.27	10.03	10.85	9.69	7.72	8.80	8.72	8.16	8.45
21	21.99	21.70	21.84	11.32	10.03	10.63	8.28	7.86	8.03	8.88	8.23	8.54
22	21.91	21.34	21.72	11.23	9.41	10.29	9.36	8.07	9.18	8.67	7.60	8.09
23	21.49	20.90	21.19	9.40	8.92	9.21	10.07	9.27	9.71	8.59	6.66	7.55
24	21.07	20.64	20.81	9.90	8.71	9.28	10.57	9.65	10.04	8.55	6.19	7.83
25	20.79	20.38	20.62	9.65	8.72	9.37	10.75	9.52	10.19	8.92	7.78	8.43
26	21.34	20.47	20.85	10.44	9.22	9.80	10.19	8.44	9.38	9.60	8.02	8.84
27	21.87	21.30	21.56	11.79	9.85	11.05	10.21	9.02	9.57	9.37	8.36	8.74
28	22.02	21.72	21.87	12.67	11.36	12.19	9.83	8.91	9.40	8.86	7.43	7.94
29	22.06	20.75	21.67	12.54	9.72	10.85	10.16	9.18	9.72	9.01	7.29	7.82
30	21.30	20.72	20.96	10.20	9.54	9.93	10.79	10.01	10.34	8.98	6.91	7.87
31	---	---	---	11.49	9.62	10.61	10.69	7.78	9.12	---	---	---
MONTH	22.06	18.80	20.83	21.21	8.71	13.11	12.52	6.46	9.47	10.40	6.19	8.26
YEAR	22.06	6.19	13.75									

COLUMBIA RIVER MAIN STEM

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WATER-QUALITY RECORDS

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

PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: October 1975 to current year.

WATER TEMPERATURES: October 1975 to current year.

INSTRUMENTATION.--Specific conductance and temperature recorders since October 1975.

EXTREMES FOR PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: Maximum, 242 microsiemens May 15, 1977; minimum, 95 microsiemens June 26, 27, 1982.

WATER TEMPERATURES: Maximum, 22.5°C Aug. 17, 18, 1977, Aug. 11, 1980; minimum recorded, 0.0°C many days in January and February, 1979.

EXTREMES FOR CURRENT YEAR.--

SPECIFIC CONDUCTANCE: Maximum, 219 microsiemens Jan. 14; minimum observed, 124 microsiemens June 27.

WATER TEMPERATURES: Maximum recorded, 21.5°C Aug. 9-12, 25-27; minimum, 1.5°C Dec. 29.

WATER QUALITY DATA, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984

		DIS- CHARGE, IN CUBIC FEET PER SECOND	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH (STAND- ARD UNITS)	TEMPER- ATURE (DEG C)	OXYGEN, DIS- SOLVED (MG/L)	COLI- FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)	STREP- TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML)	HARD- NESS (MG/L AS CAC03)	HARD- NESS, NONCAR- BONATE (MG/L CAC03)	CALCIUM DIS- SOLVED (MG/L AS CA)
OCT 20...	1145	120000	178	8.2	15.0	9.7	<1	K910	73	3	20
JAN 23...	1130	205000	201	8.0	3.5	9.2	K1	84	81	6	22
APR 25...	1200	348000	166	8.0	9.0	12.2	K10	K6	68	0	18
SEP 25...	1200	118000	158	8.1	16.5	8.8	K4	760	67	5	19
DATE	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG)	SODIUM, DIS- SOLVED (MG/L AS NA)	POTAS- SIUM, DIS- SOLVED (MG/L AS K)	ALKA- LINITY FIELD (MG/L AS CAC03)	SULFATE DIS- SOLVED (MG/L AS SO4)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	FLUO- RIDE, DIS- SOLVED (MG/L AS F)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N)	NITRO- GEN,AM- MONIA + ORGANIC TOTAL (MG/L AS N)	PHOS- PHATE, ORTHO, DIS- SOLVED (MG/L AS PO4)
OCT 20...	5.5	7.6	1.5	70	16	3.8	.20	.050	.15	.70	.06
JAN 23...	6.4	8.5	1.7	76	15	4.9	.20	.040	.44	.30	.12
APR 25...	5.5	8.2	1.6	69	15	3.6	.20	.020	.35	.50	.25
SEP 25...	4.8	6.0	1.5	62	13	3.3	.20	.040	<.10	.20	.06
DATE	PHOS- PHORUS, DIS- SOLVED (MG/L AS P)	PHOS- PHORUS, TOTAL (MG/L AS P)	SILICA, DIS- SOLVED (MG/L AS SiO2)	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L)	SOLIDS, SUM OF CONSTITUENTS, DIS- SOLVED (MG/L)	SOLIDS, DIS- SOLVED (TONS PER DAY)	TUR- BID- ITY (NTU)	SEDI- MENT, SUS- PENDE (MG/L)	SEDI- MENT, DIS- CHARGE, SUS- PENDE (T/DAY)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM	
OCT 20...	.030	.050	8.9	109	110	35300	1.8	7	2270	80	
JAN 23...	.040	.060	13	117	120	64800	8.0	13	7200	96	
APR 25...	.030	.070	17	124	110	117000	17	27	25400	90	
SEP 25...	.010	.020	8.4	95	94	30300	2.3	--	--	--	

COLUMBIA RIVER MAIN STEM

14128910 COLUMBIA RIVER AT WARRENDALE, OR--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984

DATE	ALUM- INUM, DIS- SOLVED (UG/L AS AL)	ARSENIC DIS- SOLVED (UG/L AS AS)	BARIUM, DIS- SOLVED (UG/L AS BA)	BERYL- LIUM, DIS- SOLVED (UG/L AS BE)	CADMIUM DIS- SOLVED (UG/L AS CD)	CHRO- MIUM, DIS- SOLVED (UG/L AS CR)	COBALT, DIS- SOLVED (UG/L AS CO)	COPPER, DIS- SOLVED (UG/L AS CU)	IRON, DIS- SOLVED (UG/L AS FE)	LEAD, DIS- SOLVED (UG/L AS PB)
OCT 20...	<10	1	29	<.5	<1	<1	<3	4	8	2
JAN 23...	30	<1	33	<.5	<1	<1	<3	8	40	3
APR 25...	70	1	23	1.0	<1	1	<3	2	99	<1
SEP 25...	<10	1	34	<.5	<1	<1	<3	3	6	<1
DATE	LITHIUM DIS- SOLVED (UG/L AS LI)	MANGA- NESE, DIS- SOLVED (UG/L AS MN)	MERCURY DIS- SOLVED (UG/L AS HG)	MOLYB- DENUM, DIS- SOLVED (UG/L AS MO)	NICKEL, DIS- SOLVED (UG/L AS NI)	SELE- NIUM, DIS- SOLVED (UG/L AS SE)	SILVER, DIS- SOLVED (UG/L AS AG)	STRON- TIUM, DIS- SOLVED (UG/L AS SR)	VANA- DIUM, DIS- SOLVED (UG/L AS V)	ZINC, DIS- SOLVED (UG/L AS ZN)
OCT 20...	7	2	<.1	<10	4	<1	1	110	<6	16
JAN 23...	12	2	<.1	<10	2	<1	<1	110	<6	9
APR 25...	7	<1	<.1	<10	<1	<1	<1	100	<6	7
SEP 25...	8	2	<.1	<10	4	<1	<1	99	<6	11

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

14128910 COLUMBIA RIVER AT WARRENDALE, OR--Continued

SPECIFIC CONDUCTANCE (MICROSIEMENS/CM AT 25 DEG. C), WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	167	177	208	186	178	184	200	164	147		---	140
2	166	176	204	186	183	186	199	160	144		---	140
3	165	173	205	181	191	187	201	157	141		---	140
4	166	170	204	180	199	186	204	157	140		---	141
5	168	174	201	180	206	186	203	158	140		---	142
6	170	173	199	176	211	185	200	161	141		---	143
7	172	176	202	174	210	184	191	164	142		---	144
8	172	179	204	183	---	192	183	164	142		---	145
9	172	183	202	193	---	196	179	162	139		---	146
10	173	185	195	193	---	194	177	160	134		---	148
11	174	183	189	196	---	190	177	159	130		---	147
12	175	183	184	202	---	187	173	158	127		---	147
13	178	183	178	209	---	186	170	159	126		---	149
14	182	183	176	216	---	183	166	162	126		---	149
15	185	183	176	218	---	182	164	163	128		---	149
16	185	184	176	215	---	181	164	162	129		---	150
17	184	184	179	210	---	178	166	161	130		---	150
18	183	184	183	207	---	179	167	160	132		---	152
19	179	187	185	208	---	183	167	160	132		---	153
20	175	188	184	207	---	185	165	165	133		---	155
21	171	194	187	201	---	187	165	169	133		---	157
22	167	205	194	197	---	190	165	172	133		---	158
23	166	204	199	193	---	194	165	172	131		139	158
24	167	198	199	188	188	196	166	169	129		139	158
25	169	196	196	185	190	195	167	163	127		139	160
26	172	201	195	190	190	193	170	153	126		139	163
27	174	208	195	199	189	194	173	148	---		139	166
28	175	209	194	200	184	198	174	147	---		139	169
29	174	208	187	196	184	201	171	149	---		139	171
30	174	210	185	190	---	200	168	151	---		139	172
31	175	---	186	183	---	198	---	151	---		140	---
MEAN	173	188	192	195	---	189	177	160	---		---	152

COLUMBIA RIVER MAIN STEM

14128910 COLUMBIA RIVER AT WARRENDALE, OR--Continued

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984

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

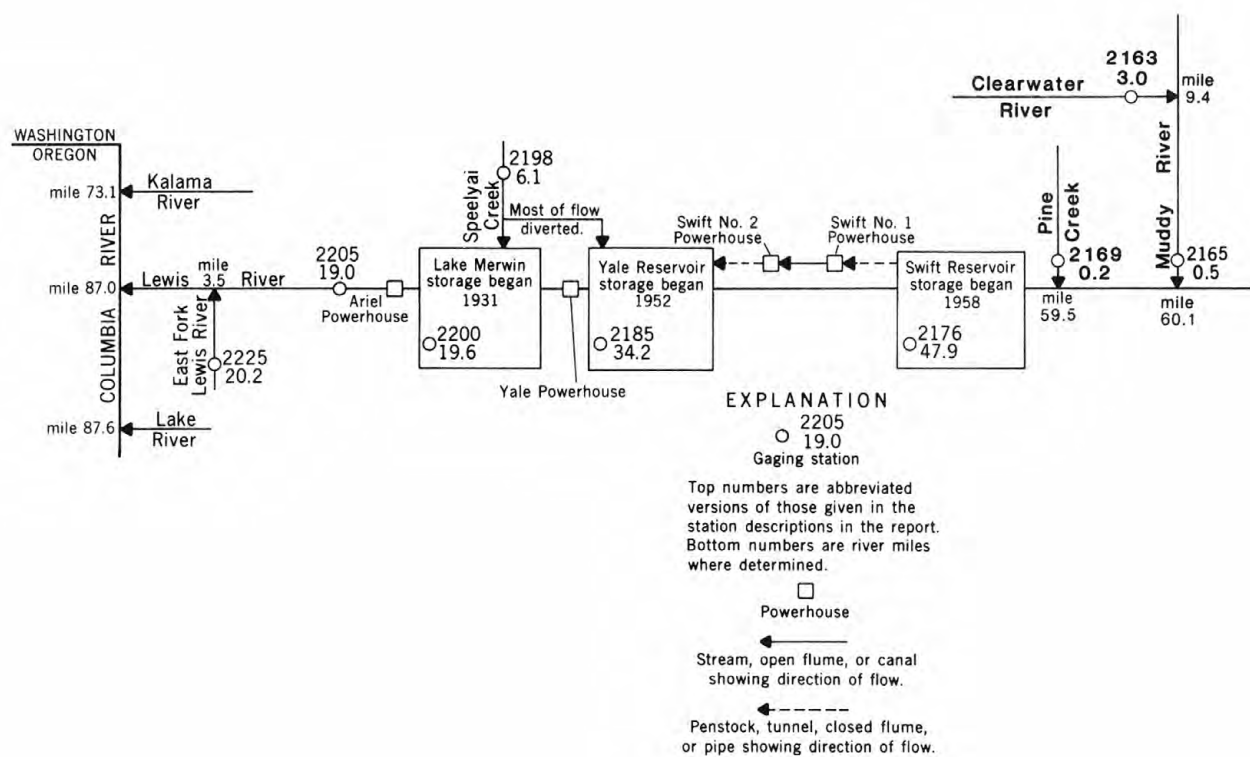


Figure 32.--Gaging stations in Lewis River basin.

LEWIS RIVER BASIN

14216300 CLEARWATER RIVER NEAR MOUTH, NEAR COUGAR, WA

LOCATION.--Lat 46°12'07", long 122°00'54", in SW¼NW¼ sec.1, T.8 N., R.6 E., Skamania County, Hydrologic Unit 17080002, Gifford Pinchot National Forest, 3 mi upstream from mouth, and 17.0 mi northeast of Cougar.

DRAINAGE AREA.--33 mi².

PERIOD OF RECORD.--October 1981 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 1,520 ft, from topographic map.

REMARKS.--Records poor. No regulation or diversion upstream from station.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 8,220 ft³/s Feb. 20, 1982, gage height, 16.67 ft; minimum daily, 26 ft³/s Sept. 29, 30, 1984.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 1,680 ft³/s (estimated) Nov. 17; minimum daily, 26 ft³/s Sept. 29, 30.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	52	70	283	219	321	222	272	277	370	109	50	34
2	52	159	257	262	291	218	259	359	342	103	49	34
3	52	698	235	626	272	206	254	348	321	100	48	33
4	52	516	220	751	263	196	246	342	311	98	48	32
5	51	408	221	713	254	189	246	326	296	94	47	36
6	49	475	200	638	246	196	233	301	286	90	46	42
7	49	434	187	569	233	196	238	291	272	88	46	43
8	49	386	202	497	238	210	229	291	277	84	46	43
9	49	350	235	422	242	225	229	296	263	80	45	38
10	48	437	389	432	250	250	229	296	254	76	44	36
11	47	566	362	407	254	263	225	337	254	73	44	35
12	46	576	343	382	400	321	242	382	263	72	44	34
13	46	598	365	342	439	342	233	420	272	70	44	33
14	46	703	377	291	400	388	259	439	267	69	43	31
15	45	1080	348	265	370	426	301	426	267	67	43	31
16	45	1490	314	246	331	446	311	388	254	65	42	31
17	46	1680	283	225	291	453	316	382	229	64	42	30
18	45	1300	257	210	268	432	316	376	214	63	42	29
19	44	1050	229	203	246	400	311	388	203	62	39	29
20	44	881	197	199	263	446	296	407	197	60	39	29
21	44	684	160	199	272	541	291	407	257	59	39	28
22	85	542	147	222	259	525	291	388	224	58	38	30
23	54	454	138	259	250	510	281	407	204	57	38	30
24	49	641	139	525	246	466	267	407	205	56	38	30
25	48	571	144	778	233	426	254	394	198	56	37	29
26	47	506	138	717	222	407	238	413	192	55	35	28
27	46	454	137	767	210	342	225	413	177	54	35	27
28	45	403	137	466	210	331	222	420	161	53	35	27
29	45	355	202	394	203	306	214	474	162	52	34	26
30	92	322	290	365	---	286	214	517	146	51	34	26
31	68	---	262	348	---	277	---	446	---	50	34	---
TOTAL	1580	18789	7398	12939	7977	10442	7742	11758	7338	2188	1288	964
MEAN	51.0	626	239	417	275	337	258	379	245	70.6	41.5	32.1
MAX	92	1680	389	778	439	541	316	517	370	109	50	43
MIN	44	70	137	199	203	189	214	277	146	50	34	26
CFSM	1.55	19.0	7.24	12.6	8.33	10.2	7.82	11.5	7.42	2.14	1.26	.97
IN.	1.78	21.18	8.34	14.59	8.99	11.77	8.73	13.25	8.27	2.47	1.45	1.09
AC-FT	3130	37270	14670	25660	15820	20710	15360	23320	14550	4340	2550	1910
CAL YR 1983	TOTAL	112516	MEAN	308	MAX	2580	MIN	44	CFSM	9.33	IN.	126.84
WTR YR 1984	TOTAL	90403	MEAN	247	MAX	1680	MIN	26	CFSM	7.48	IN.	101.91
AC-FT											AC-FT	223200
												179300

NOTE.--No gage-height record Oct. 1 to Jan. 9, June 20 to Aug. 15.

14216500 MUDDY RIVER BELOW CLEAR CREEK, NEAR COUGAR, WA

LOCATION.-- Lat 46°04'33", long 122°59'51", in NE¼SE¼ sec.24, T.7 N., R.6 E., Skamania County, Hydrologic Unit 17080002, Gifford Pinchot National Forest, on left bank 3.9 mi downstream from Clear Creek, approximately 14 mi northeast of Cougar, and 0.5 mi upstream from mouth.

DRAINAGE AREA.--135 mi².

PERIOD OF RECORD.--August 1927 to September 1934, October 1954 to December 1973 (destroyed by flood of January 1974), October 1983 to September 1984. Published as "near Cougar" 1927-34. Records for August to October 1909, published in WSP 272 and 492, have been found to be unreliable and should not be used. Records for August 1980 to September 1981 (discharge measurements only), October 1981 to September 1983 at site 4.5 mi upstream published as "above Clear Creek" (station 14216350) is not equivalent due to inflow between sites.

GAGE.--Water-stage recorder. Elevation of gage is 1,080 ft, from topographic map.

AVERAGE DISCHARGE.--27 years (1928-34, 1954-73, 1984), 879 ft³/s, 88.42 in/yr, 636,800 acre-ft/yr.

REMARKS.--Records good. No regulation or diversion upstream from station.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 17,500 ft³/s Dec. 21, 1933, gage height, 14.0 ft from high-water marks, site and datum then in use, from rating curve extended above 4,500 ft³/s; minimum recorded, 94 ft³/s Dec. 5-7, 1929.

EXTREMES OUTSIDE PERIOD OF RECORD.--A flood occurred about 0900 hours on May 18, 1980, from a mudflow caused by the eruption of Mount St. Helens.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 3,500 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Nov. 3	0745	4,830	21.89	Jan. 25	0500	4,600	21.52
Nov. 17	0200	*8,110	*24.28				

Minimum daily discharge, 158 ft³/s Sept. 29, 30.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP		
1	218	292	1180	912	1180	1040	906	1120	1170	546	248	196		
2	216	663	1070	1090	1100	1010	846	1470	1060	514	246	190		
3	216	2910	978	2610	1030	900	820	1360	980	498	242	187		
4	218	2150	918	3130	996	858	800	1230	1020	489	238	185		
5	211	1700	924	2970	972	835	800	1140	985	470	234	208		
6	206	1980	835	2660	966	852	743	1040	955	450	230	235		
7	206	1810	780	2370	924	858	982	970	930	440	228	246		
8	204	1610	842	2070	959	906	979	1080	885	420	228	230		
9	204	1460	979	1760	1010	990	984	1140	865	400	226	207		
10	199	1820	1620	1590	1030	1090	1100	1080	830	380	222	196		
11	195	2360	1510	1420	1150	1120	1090	1450	834	365	220	192		
12	193	2400	1430	1260	2280	1480	1280	1540	882	360	220	194		
13	193	2490	1520	1120	2160	1570	1210	1580	907	350	218	185		
14	191	2930	1570	978	1820	1810	1290	1600	915	343	216	180		
15	186	4500	1450	852	1600	1900	1570	1480	960	336	214	178		
16	186	6210	1310	795	1360	1830	1540	1290	905	326	210	176		
17	191	6980	1180	720	1220	1730	1420	1150	810	322	210	173		
18	186	5400	1070	655	1160	1620	1310	1070	756	314	208	173		
19	182	4390	954	624	1140	1670	1220	1190	732	310	205	171		
20	182	3670	820	596	1320	1970	1110	1270	822	298	203	170		
21	185	2850	665	589	1270	2380	1070	1210	1070	295	201	166		
22	354	2260	612	967	1160	2280	1030	1310	934	290	201	181		
23	223	1890	576	1470	1180	2100	984	1510	850	286	201	178		
24	206	2670	580	2780	1230	1820	906	1370	855	281	199	176		
25	199	2380	600	3620	1120	1650	846	1360	825	278	198	165		
26	197	2110	576	2840	1010	1480	775	1600	800	274	196	163		
27	193	1890	570	2260	920	1280	705	1510	736	271	196	160		
28	188	1680	570	1850	950	1180	708	1520	672	264	192	160		
29	186	1480	840	1620	900	1080	674	1640	676	259	190	158		
30	385	1340	1210	1400	---	1020	713	1720	608	257	190	158		
31	283	---	1090	1260	---	960	---	1470	---	252	190	---		
TOTAL	6582	78275	30829	50838	35117	43269	30411	41470	26229	10938	6620	5537		
MEAN	212	2609	994	1640	1211	1396	1014	1338	874	353	214	185		
MAX	385	6980	1620	3620	2280	2380	1570	1720	1170	546	248	246		
MIN	182	292	570	589	900	835	674	970	608	252	190	158		
CFSM	1.57	19.3	7.36	12.1	8.97	10.3	7.51	9.91	6.47	2.61	1.59	1.37		
IN.	1.81	21.57	8.50	14.01	9.68	11.92	8.38	11.43	7.23	3.01	1.82	1.53		
AC-FT	13060	155300	61150	100800	69650	85820	60320	82260	52030	21700	13130	10980		
WTR YR 1984	TOTAL	366115	MEAN	1000	MAX	6980	MIN	158	CFSM	7.41	IN.	100.89	AC-FT	726200

LEWIS RIVER BASIN

14216900 PINE CREEK AT MOUTH, NEAR COUGAR, WA

LOCATION.--Lat 46°04'24", long 122°00'57", in NW¼SW¼ sec.24, T.7 N., R.6 E., Skamania County, Hydrologic Unit 17080002, at Forest Service Road 125 bridge, approximately 13 mi east of Cougar.

DRAINAGE AREA.--26.0 mi².

PERIOD OF RECORD.--May 1980 to September 1981 (discharge measurements only), October 1981 to September 1984 (discontinued).

GAGE.--Water-stage recorder. Elevation of gage is 1,040 ft, from topographic map.

REMARKS.--Records poor. No regulation or diversion upstream from station.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 4,170 ft³/s Feb. 20, 1982, gage height, 18.60 ft; minimum daily, 110 ft³/s Sept. 17, 18, 1982.

EXTREMES OUTSIDE PERIOD OF RECORD.--A flood occurred at about 0900 hours on May 18, 1980, from a mudflow caused by the eruption of Mount St. Helens.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 2,110 ft³/s (estimated) Nov. 17, gage height, 11.27 ft; minimum daily, 126 ft³/s (estimated) Oct. 19, 20.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	130	201	238	198	296	223	192	290	261	170	142	142
2	132	460	234	229	270	234	188	351	265	167	142	137
3	136	700	219	620	253	230	192	351	242	164	142	134
4	139	540	202	603	234	223	188	332	261	164	142	137
5	139	440	202	485	219	219	188	327	246	164	139	147
6	138	475	188	404	209	212	179	287	230	158	139	152
7	138	430	185	371	192	209	221	278	223	158	137	164
8	138	385	202	346	176	209	204	282	219	158	137	161
9	137	350	219	327	179	212	218	282	223	155	139	142
10	137	420	356	309	188	246	244	276	219	152	139	139
11	136	500	361	253	218	270	251	344	209	150	139	137
12	136	525	332	234	498	404	314	323	212	150	137	142
13	133	550	371	223	531	418	312	314	205	150	137	137
14	132	575	382	216	444	466	311	305	192	147	137	137
15	128	590	346	202	382	487	309	296	188	147	137	137
16	128	1490	300	195	337	444	300	282	185	147	139	137
17	132	1680	249	188	296	403	287	274	185	147	139	134
18	128	1380	226	182	261	389	278	265	182	144	139	134
19	126	1080	216	179	249	406	265	278	182	147	139	134
20	126	780	198	170	257	459	257	265	198	147	137	134
21	128	475	188	170	249	533	245	250	198	144	137	134
22	244	530	176	237	242	484	242	288	182	144	137	139
23	154	585	170	389	242	366	234	314	179	147	137	137
24	142	640	170	783	238	314	226	284	179	147	137	134
25	137	580	170	995	226	296	223	305	179	144	139	134
26	136	525	167	747	219	265	216	356	179	144	139	134
27	133	470	158	597	212	238	212	327	179	142	139	132
28	130	410	152	498	216	238	212	309	176	144	139	132
29	128	350	205	433	212	219	212	314	179	142	139	132
30	266	295	216	361	---	205	227	309	173	142	137	130
31	195	---	226	327	---	202	---	270	---	142	134	---
TOTAL	4462	18411	7224	11471	7745	9723	7147	9328	6130	4668	4292	4156
MEAN	144	614	233	370	267	314	238	301	204	151	138	139
MAX	266	1680	382	995	531	533	314	356	265	170	142	164
MIN	126	201	152	170	176	202	179	250	173	142	134	130
CFSM	5.54	23.6	8.96	14.2	10.3	12.1	9.15	11.6	7.85	5.81	5.31	5.35
IN.	6.38	26.34	10.34	16.41	11.08	13.91	10.23	13.35	8.77	6.68	6.14	5.95
AC-FT	8850	36520	14330	22750	15360	19290	14180	18500	12160	9260	8510	8240
CAL YR 1983	TOTAL	103547	MEAN	284	MAX	1680	MIN	121	CFSM	10.9	IN.	148.15
WTR YR 1984	TOTAL	94757	MEAN	259	MAX	1680	MIN	126	CFSM	9.96	IN.	135.58
											AC-FT	205400
											AC-FT	188000

NOTE.--No gage-height record Oct. 1 to Nov. 30.

14219800 SPEELYAI CREEK NEAR COUGAR, WA

LOCATION.--Lat 46°00'28", long 122°20'46", in NW¼NW¼ sec.17, T.6 N., R.4 E., Cowlitz County, Hydrologic Unit 17080002, on right bank 3.8 mi southwest of Cougar, and at mile 6.1.

DRAINAGE AREA.--12.6 mi².

PERIOD OF RECORD.--May 1959 to May 1978, October 1978 to current year.

REVISED RECORDS.--WSP 1718: 1959. WDR WA-81-1: 1978-80(P).

GAGE.--Water-stage recorder. Elevation of gage is 500 ft, from topographic map. Prior to Nov. 21, 1959, at site 250 ft downstream at different datum.

REMARKS.--Records good. No regulation or diversion upstream from station. A diversion structure 1,000 ft downstream from station diverts the flow into Yale Reservoir. At extreme high stages, some flow will overtop the diversion structure into the original channel.

AVERAGE DISCHARGE.--24 years (water years 1960-77, 1979-84), 107 ft³/s, 115.32 in/yr, 77,500 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 3,600 ft³/s probably Nov. 20, 1962 (by slope-area measurement, gage height not determined); minimum observed, 1.8 ft³/s Sept. 24-29, 1967, gage height, 0.24 ft.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 700 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Nov. 3	0745	874	4.17	Jan. 25	0330	762	3.98
Nov. 18	0200	886	4.12	Feb. 12	1445	*1,030	*4.41

Minimum discharge, 2.9 ft³/s Sept. 4, gage height, 1.00 ft.

REVISIONS.--Revised figures of discharge for the water year 1983, superseding those published in the report for 1983, are given below.

EXTREMES FOR WATER YEAR 1983.--Peak discharges greater than base discharge of 700 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Dec. 3	2000	*2,480	*6.00	Jan. 5	1215	2,060	5.56
Dec. 16	0330	820	3.96	Jan. 7	2030	2,090	5.59

Minimum discharge, 4.9 ft³/s Oct. 5, 6, gage height, 1.13 ft.

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

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP		
1	5.8	109	351	47	109	159	261	39	18	119	17	31		
2	6.5	85	298	48	92	132	227	37	17	197	16	28		
3	5.9	70	1280	56	79	111	193	36	16	149	16	25		
4	5.4	80	904	436	69	97	163	32	14	103	14	23		
5	5.0	162	375	1350	60	94	133	32	13	78	14	21		
6	12	217	251	1040	72	107	110	31	13	63	13	18		
7	23	182	168	1770	80	215	95	37	12	53	12	17		
8	35	136	128	1040	74	419	84	61	11	47	12	17		
9	34	102	102	593	170	599	77	70	12	41	11	16		
10	25	85	82	655	272	523	74	67	33	36	11	57		
11	20	66	70	417	334	317	66	62	27	32	13	89		
12	16	55	67	251	390	221	61	55	23	44	12	58		
13	14	47	67	173	490	206	59	50	20	225	10	45		
14	12	42	102	129	385	304	59	58	17	219	9.4	37		
15	11	37	412	103	289	262	60	95	22	143	9.1	32		
16	13	82	717	89	378	199	61	83	18	101	8.7	29		
17	24	296	555	84	451	150	60	73	20	78	8.4	27		
18	22	274	407	90	512	114	59	61	36	63	8.1	33		
19	19	323	284	129	381	93	56	54	71	57	7.8	28		
20	16	272	249	126	405	80	52	48	58	48	7.8	24		
21	19	183	269	106	342	73	48	43	45	41	7.6	22		
22	68	133	248	103	491	67	47	38	40	37	7.2	20		
23	68	101	192	194	539	71	53	34	41	34	7.5	19		
24	61	79	143	215	392	72	61	31	44	31	7.4	18		
25	58	66	113	197	278	75	52	28	42	29	7.0	17		
26	91	56	97	232	308	72	56	26	40	27	6.5	16		
27	121	57	81	345	270	69	52	24	36	26	6.5	15		
28	237	282	70	255	201	108	48	22	33	24	7.9	15		
29	586	302	63	186	---	708	44	20	31	22	39	14		
30	214	410	56	172	---	785	42	18	31	20	48	13		
31	133	---	51	134	---	418	---	18	---	19	28	---		
TOTAL	1980.6	4391	8252	10765	7913	6920	2513	1383	854	2206	402.9	824		
MEAN	63.9	146	266	347	283	223	83.8	44.6	28.5	71.2	13.0	27.5		
MAX	586	410	1280	1770	539	785	261	95	71	225	48	89		
MIN	5.0	37	51	47	60	67	42	18	11	19	6.5	13		
CFSM	5.07	11.6	21.1	27.5	22.5	17.7	6.65	3.54	2.26	5.65	1.03	2.18		
IN.	5.85	12.96	24.36	31.78	23.36	20.43	7.42	4.08	2.52	6.51	1.19	2.43		
AC-FT	3930	8710	16370	21350	15700	13730	4980	2740	1690	4380	799	1630		
CAL YR 1982	TOTAL	45012.9	MEAN	123	MAX	1510	MIN	2.3	CFSM	9.76	IN.	132.90	AC-FT	89280
WTR YR 1983	TOTAL	48404.5	MEAN	133	MAX	1770	MIN	5.0	CFSM	10.6	IN.	142.91	AC-FT	96010

LEWIS RIVER BASIN

14219800 SPEELYAI CREEK NEAR COUGAR, WA--Continued

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP		
1	14	46	104	118	78	105	81	211	62	35	8.6	7.2		
2	14	94	88	153	69	109	73	254	55	33	8.4	4.5		
3	13	662	75	544	61	102	70	204	50	31	7.8	3.8		
4	14	450	66	488	55	90	65	161	85	29	7.6	3.5		
5	13	256	72	330	51	82	63	143	94	27	7.5	6.6		
6	12	362	75	229	48	79	59	124	97	26	7.4	11		
7	11	283	78	180	45	78	121	106	94	24	6.9	24		
8	11	216	140	149	47	79	162	102	88	23	6.5	24		
9	10	178	175	122	53	87	161	94	100	22	6.3	12		
10	9.7	183	445	132	70	102	202	84	92	21	6.1	8.5		
11	9.4	221	371	139	127	101	207	133	81	21	5.9	8.4		
12	9.0	227	287	120	625	144	262	133	72	20	5.8	8.9		
13	8.8	329	317	101	505	163	224	115	65	19	5.9	7.0		
14	9.5	452	297	86	295	304	188	105	58	18	5.6	5.9		
15	8.5	495	217	74	212	323	184	100	52	17	5.3	5.3		
16	8.1	541	163	66	167	305	151	96	47	16	5.6	5.0		
17	12	726	123	58	133	281	121	84	44	15	4.9	5.4		
18	8.9	712	99	52	110	317	104	75	40	15	4.8	4.8		
19	8.3	483	83	48	99	340	95	82	37	14	4.8	4.6		
20	8.6	577	68	44	111	392	86	89	41	13	4.6	4.6		
21	8.7	438	60	43	151	501	81	79	58	13	4.5	4.3		
22	49	277	55	96	136	414	76	97	48	12	4.4	8.4		
23	25	206	50	241	144	280	72	136	44	13	4.5	6.7		
24	19	440	47	543	205	203	65	123	41	11	4.5	6.9		
25	17	353	45	634	184	179	61	118	37	11	4.2	5.2		
26	15	262	45	378	148	191	55	167	40	11	3.9	4.8		
27	14	278	45	243	119	168	50	153	37	9.9	3.8	4.5		
28	13	223	45	176	105	151	49	124	34	9.6	4.0	4.1		
29	12	170	70	138	97	127	59	101	41	9.4	3.8	3.9		
30	30	132	127	111	---	106	92	84	39	9.1	3.6	3.7		
31	45	---	142	93	---	92	---	71	---	8.7	3.8	---		
TOTAL	460.5	10272	4074	5929	4250	5995	3339	3748	1773	556.7	171.3	217.5		
MEAN	14.9	342	131	191	147	193	111	121	59.1	18.0	5.53	7.25		
MAX	49	726	445	634	625	501	262	254	100	35	8.6	24		
MIN	8.1	46	45	43	45	78	49	71	34	8.7	3.6	3.5		
CFSM	1.18	27.1	10.4	15.2	11.7	15.3	8.81	9.60	4.69	1.43	.44	.58		
IN.	1.36	30.33	12.03	17.50	12.55	17.70	9.86	11.07	5.23	1.64	.51	.64		
AC-FT	913	20370	8080	11760	8430	11890	6620	7430	3520	1100	340	431		
CAL YR 1983	TOTAL	48587.4	MEAN	133	MAX	1770	MIN	6.5	CFSM	10.6	IN.	143.45	AC-FT	96370
WTR YR 1984	TOTAL	40786.0	MEAN	111	MAX	726	MIN	3.5	CFSM	8.81	IN.	120.42	AC-FT	80900

LEWIS RIVER BASIN

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RESERVOIRS IN LEWIS RIVER BASIN, WA

14217600 SWIFT RESERVOIR.--Lat 46°03'38", long 122°11'44", in NE¼SW¼ sec.28, T.7 N., R.5 E., Skamania County, Hydrologic Unit 17080002, at the intake structure near left bank on Swift Dam on Lewis River, 5.0 mi east of Cougar, and at mile 47.9. DRAINAGE AREA.--481 mi². PERIOD OF RECORD.--September 1958 to current year. GAGE.--water-stage recorder and long distance indicator in powerhouse. Datum of gage is National Geodetic Vertical Datum of 1929 (levels by Pacific Power & Light Co.).

REMARKS.--Reservoir is formed by rock and earthfill dam; storage began Sept. 29, 1958; dam completed in December 1958. Usable capacity, 446,550 acre-ft between elevations 878 ft, lower limit for economic operation, and 1,000.5 ft, maximum operating limit. Dead storage unknown. Figures given herein represent total contents. Water is used by Pacific Power & Light Co., for power development. Capacity table furnished by Pacific Power & Light Co., but may be revised after bathymetric survey for period after May 18, 1980 eruption of Mt. St. Helens.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 759,100 acre-ft Nov. 15, 1973, elevation, 1,000.77 ft; minimum since reservoir was first filled, 325,100 acre-ft May 1, 1967, elevation, 883.60 ft.

EXTREMES FOR CURRENT YEAR.--Maximum contents, 755,350 acre-ft July 9, elevation, 999.95 ft; minimum, 515,553 acre-ft Jan. 23, elevation, 941.79 ft.

14218500 YALE RESERVOIR.--Lat 45°57'50", long 122°19'53", in SE¼NE¼ sec.32, T.6 N., R.4 E., Clark County, Hydrologic Unit 17080002, at left end of Yale Dam on Lewis River just upstream from intake, 500 ft upstream from powerhouse, 1.0 mi upstream from Canyon Creek, 3.2 mi southeast of Yale, and at mile 34.2. DRAINAGE AREA.--596 mi². PERIOD OF RECORD.--August 1952 to current year. GAGE.--water-stage recorder with supplementary water-stage recorder and long distance indicator in powerhouse. Datum of gage is National Geodetic Vertical Datum of 1929 (levels by Pacific Power & Light Co.). Prior to Feb. 1, 1954, nonrecording indicator gage at same site and datum.

REMARKS.--Reservoir is formed by rock and earthfill dam; storage began July 31, 1952, dam completed in 1952. Usable capacity, 189,530 acre-ft between elevations 430 ft, lower limit for economic operation, and 490 ft, top of spillway gates. Dead storage below elevation 417 ft, 178,050 acre-ft. Figures given herein represent total contents. Water is used by Pacific Power & Light Co., for power development. Capacity table furnished by Pacific Power & Light Co.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 402,500 acre-ft May 13, 1961, elevation, 490.15 ft; minimum observed since reservoir was first filled, 227,600 acre-ft Feb. 22, 1957, elevation, 435.65 ft.

EXTREMES FOR CURRENT YEAR.--Maximum contents, 401,554 acre-ft July 6, elevation, 489.94 ft; minimum, 310,327 acre-ft Oct. 1, elevation, 463.66 ft.

14220000 LAKE MERWIN.--Lat 45°57'23", long 122°33'13", in SW¼SW¼ sec.34, T.6 N., R.2 E., Clark County, Hydrologic Unit 17080002, on left end of dam on Lewis River at Ariel, and at mile 19.6. DRAINAGE AREA.--730 mi². PERIOD OF RECORD.--March 1931 to current year. GAGE.--water-stage recorder with supplementary water-stage recorder and long distance indicator in powerhouse. Datum of gage is National Geodetic Vertical Datum of 1929 (levels by Pacific Power & Light Co.).

REMARKS.--Reservoir is formed by combination gravity-concrete-arch dam; some storage began March 1931; completed May 13, 1931. Usable capacity, 246,000 acre-ft between elevations 165 ft, lower limit of regulation set by Federal Energy Regulatory Commission, and 235 ft, top of spillway gates. Additional storage of 18,200 acre-ft is provided by flashboards to elevation 239.6 ft. Unused storage below elevation 165 ft, 159,000 acre-ft. Figures given herein represent total contents. Water is used by Pacific Power & Light Co., for power development. Capacity table furnished by Pacific Power & Light Co.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents during the period 1931-52 not determined; maximum since 1953, 424,000 acre-ft Jan. 24, 1959, elevation, 239.86 ft; minimum observed since reservoir was first filled, 164,200 acre-ft Dec. 5, 1936, elevation, 166.7 ft.

EXTREMES FOR CURRENT YEAR.--Maximum contents, 422,367 acre-ft July 13, elevation, 239.49 ft; minimum, 381,905 acre-ft Mar. 26, elevation, 229.13 ft.

MONTHEND ELEVATION AND CONTENTS AT 2400, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984

Date	Elevation (feet)	Contents (acre-feet)	Change in contents (acre-feet)	Elevation (feet)	Contents (acre-feet)	Change in contents (acre-feet)	Elevation (feet)	Contents (acre-feet)	Change in contents (acre-feet)
	14217600 SWIFT RESERVOIR			14218500 YALE RESERVOIR			14220000 LAKE MERWIN		
Sept. 30.....	974.15	642,360	-	463.68	310,390	-	236.22	409,397	-
Oct. 31.....	957.07	573,403	-68,957	467.85	323,756	+13,366	235.53	406,681	-2,716
Nov. 30.....	985.66	691,334	+117,931	486.53	388,782	+65,026	232.83	396,139	-10,542
Dec. 31.....	957.45	574,885	-116,449	468.25	325,056	-63,726	234.27	401,743	+5,604
CAL YR 1983	-	-	-36,305	-	-	-22,657	-	-	+4,985
Jan. 31.....	960.60	587,230	+12,345	473.96	344,062	+19,006	235.17	405,266	+3,523
Feb. 29.....	980.57	669,381	+82,151	472.76	340,000	-4,062	235.97	408,410	+3,144
Mar. 31.....	982.69	678,497	+9,116	482.89	375,433	+35,433	232.55	395,055	-13,355
Apr. 30.....	983.01	679,873	+1,376	486.63	389,152	+13,719	237.60	414,854	+19,799
May 31.....	992.92	723,570	+43,697	489.09	398,356	+9,204	238.39	417,988	+3,134
June 30.....	998.97	750,844	+27,274	489.54	400,049	+1,693	238.84	419,777	+1,789
July 31.....	997.62	744,720	-6,124	488.99	397,979	-2,070	238.77	419,499	-278
Aug. 31.....	998.74	749,797	+5,077	486.34	388,080	-9,899	239.00	420,413	+914
Sept. 30.....	984.05	684,345	-65,452	468.37	325,447	-62,633	235.02	404,677	-15,736
WTR YR 1984	-	-	+41,985	-	-	+15,057	-	-	-4,720

LEWIS RIVER BASIN

14220500 LEWIS RIVER AT ARIEL, WA
(National stream quality accounting network station)

LOCATION.--Lat 45°57'07", long 122°33'46", in NW¼NE¼ sec.4, T.5 N., R.2 E., Cowlitz County, Hydrologic Unit 17080002, on right bank 0.4 mi southeast of Ariel, 0.5 mi downstream from Ariel Dam and powerplant, 3.3 mi upstream from Cedar Creek, and at mile 19.0.

DRAINAGE AREA.--731 mi².

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--July to October 1909, November 1909 (gage heights only), July to October 1922, July 1923 to current year. Published as "near Ariel" water years 1922-29. Prior to October 1952, discharge measurements made at site 0.5 mi downstream; low discharges not equivalent due to local inflow.

REVISED RECORDS.--WSP 884: 1938. WSP 984: 1936-37, 1940-42. WSP 1318: 1924-30(M).

GAGE.--Water-stage recorder. Datum of gage is 44.0 ft above National Geodetic Vertical Datum of 1929 (levels by Pacific Power and Light Co.). July to November 1909, nonrecording gage at site 4 mi upstream at different datum. July 27 to Oct. 29, 1922, and July 31, 1923, to Apr. 20, 1930, nonrecording gages at site 0.5 mi downstream at datums 3.90 ft and 0.90 ft higher respectively, than present datum.

REMARKS.--Water-discharge records excellent. No diversion upstream from station. Flow regulated by Swift and Yale Reservoirs, and Lake Merwin (stations 14217600, 14218500, 14220000).

AVERAGE DISCHARGE.--61 years (water years 1924-84), 4,876 ft³/s, 90.58 in/yr, 3,533,000 acre-ft/yr, adjusted for storage in Lake Merwin Reservoir since March 1931, Yale Reservoir since August 1952, and Swift Reservoir since October 1958.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 129,000 ft³/s Dec. 22, 1933, gage height, 35.0 ft, from floodmarks, from rating curve extended above 56,000 ft³/s on basis of computation of peak flow over dam; no flow at times June 30, July 1-3, 6-9, 1931 (caused by regulation during construction of Ariel Dam); minimum daily, 1 ft³/s July 6, 1931.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 17,100 ft³/s Nov. 17, gage height, 9.50 ft; minimum, 726 ft³/s Sept. 13.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3560	3740	5100	6650	4430	2960	5930	4620	5840	3900	1770	1220
2	2060	3900	8890	6290	3030	2810	5640	2930	3030	3610	1050	1220
3	1390	3100	8910	10100	3200	2800	5460	2450	3070	3030	1040	1230
4	3060	4420	8910	12000	3240	2780	6170	4700	4190	3010	1020	1220
5	2810	4420	8910	11400	3220	2810	6160	6110	6710	3050	1020	1760
6	1350	4420	8930	10100	2660	2830	5470	6130	7300	3020	1010	3040
7	1390	4430	8690	6600	1750	2840	4670	6100	6860	2240	1080	4010
8	1360	5930	5360	8340	1740	2870	4650	5030	5830	2250	1220	3230
9	1350	8590	9030	9780	1770	2890	4650	5930	4470	2150	1230	3110
10	1360	5640	11100	9800	1800	2950	4650	5880	4470	1860	1210	2200
11	1350	8360	11500	9310	1800	2960	4660	5860	4480	1880	1230	1940
12	1350	6110	10300	6400	2200	5430	4680	5840	4510	1860	1230	1440
13	1350	6180	9880	8840	7510	9120	4670	5790	4440	1850	1210	869
14	1360	8060	9900	8690	11000	9820	4670	5930	3280	1840	1220	2260
15	1430	8970	9180	8690	11200	10800	4670	6190	3290	1860	1210	6070
16	2830	10600	8930	8780	9970	10200	4640	6180	3310	1850	1210	6060
17	2860	12900	8670	9310	7870	10100	4660	6170	3280	1890	1210	5990
18	2860	16900	8600	11300	6080	10100	4650	6160	3100	1850	1220	5980
19	2860	16800	8420	10000	6080	10100	4650	6160	2910	1830	1220	5940
20	2380	16800	8460	10200	7910	10400	4630	6170	2560	1860	1230	7140
21	2940	13600	9760	6340	6010	11400	4630	6170	2770	1840	1220	9130
22	2950	11500	9400	5160	5970	11500	4640	6160	3540	1830	1210	6330
23	2940	11500	10100	6990	5990	11500	4620	6170	3900	1860	1210	6110
24	2960	13100	6800	7140	6320	11500	4650	6130	3850	1860	1220	5920
25	2950	13400	5780	8200	6010	11400	4650	6160	3350	1870	1210	3180
26	2920	11500	6120	8990	6080	10300	4710	6190	3280	1840	1210	2760
27	2140	11500	5300	6020	4820	8890	4630	6190	3270	1850	1220	3020
28	2880	11500	7980	6050	2830	8660	4620	6200	3260	1880	1220	3040
29	2900	11400	8440	6140	2870	7630	4610	6190	3670	1860	1230	3040
30	2950	10600	8260	6020	---	5830	4620	6150	3900	1860	1220	3070
31	2920	---	9140	6180	---	5830	---	5960	---	1860	1220	---
TOTAL	71770	279870	264750	255810	145360	222010	146410	178000	121720	67100	37230	111529
MEAN	2315	9329	8540	8252	5012	7162	4880	5742	4057	2165	1201	3718
MAX	3560	16900	11500	12000	11200	11500	6170	6200	7300	3900	1770	9130
MIN	1350	3100	5100	5160	1740	2780	4610	2450	2560	1830	1010	869
AC-FT	142400	555100	525100	507400	288300	440400	290400	353100	241400	133100	73850	221200
MEAN†	1368	12230	5701	8819	6424	7670	5467	6654	4574	2027	1137	1300
CFSM†	1.87	16.7	7.80	12.1	8.79	10.5	7.48	9.10	6.26	2.77	1.56	1.78
IN.†	2.16	18.67	8.99	13.91	9.48	12.10	8.35	10.50	6.98	3.20	1.79	1.99
AC-FT†	84090	727500	350500	542300	369500	471600	325300	409100	272200	124600	69940	77380

CAL YR 1983 TOTAL 2167660 MEAN 5939 MAX 24800 MIN 1220 AC-FT 4300000 MEAN† 5865 CFSM† 8.02 IN.† 108.94 AC-FT† 4246000
WTR YR 1984 TOTAL 1901559 MEAN 5196 MAX 16900 MIN 869 AC-FT 3772000 MEAN† 5268 CFSM† 7.21 IN.† 98.12 AC-FT† 3824000

† Adjusted for change in contents of Lake Merwin, Swift Reservoir, and Yale Reservoir.

LEWIS RIVER BASIN

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14220500 LEWIS RIVER AT ARIEL, WA--Continued

(National stream quality accounting network station)

WATER-QUALITY RECORDS

PERIOD OF RECORD.--July 1959 to June 1960, April 1979 to current year. Additional data from April to August 1980 are published in U.S. Geological Survey Open-File Report 81-1007.

PERIOD OF DAILY RECORD.--

WATER TEMPERATURES: October 1950 to September 1963.

WATER QUALITY DATA, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984

		STREAM- FLOW, INSTAN- TANEOUS (CFS)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH (STAND- ARD UNITS)	TEMPER- ATURE (DEG C)	TUR- BID- ITY (NTU)	OXYGEN, DIS- SOLVED (MG/L)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION)	COLI- FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)	STREP- TOCOCCE- FECAL, KF AGAR (COLS. PER 100 ML)	HARD- NESS (MG/L AS CACO3)	
NOV 1983	22...	1400	11700	50	--	8.5	1.1	13.3	114	K1	690	15
MAR 1984	27...	1415	8610	34	--	6.5	3.7	13.0	--	<4	140	14
JUN	26...	1130	3270	42	7.9	10.0	1.0	10.5	92	K10	K21	15
AUG	21...	1200	1260	41	7.4	12.0	1.3	10.2	95	K4	90	15
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- LITY FIELD (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)
NOV 1983	22...	15	4.2	1.0	3.1	31	0.4	0.6	--	2.6	1.9	<0.1
MAR 1984	27...	14	4.0	1.0	2.8	29	0.3	0.6	--	2.8	1.7	<0.1
JUN	26...	15	4.2	1.0	2.9	29	0.3	0.4	17	2.4	1.8	<0.1
AUG	21...	15	4.5	1.0	3.0	29	0.3	0.6	17	2.6	1.7	<0.1
DATE		SILICA, DIS- SOLVED (MG/L AS SiO2)	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L)	SOLIDS, SUM OF CONSTITU- ENTS, DIS- SOLVED (MG/L)	SOLIDS, DIS- SOLVED (TONS PER AC-FT)	SOLIDS, DIS- SOLVED (TONS PER DAY)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N)	NITRO- GEN,AM- MONIA + ORGANIC TOTAL (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)
NOV 1983	22...	14	34	39	0.05	1070	0.13	0.08	0.4	0.01	<0.01	<0.01
MAR 1984	27...	14	34	37	0.05	790	0.12	0.06	0.4	0.01	0.01	0.02
JUN	26...	14	36	37	0.05	318	<0.10	<0.01	0.4	<0.01	<0.01	0.02
AUG	21...	14	30	38	0.04	102	<0.10	0.03	<0.2	<0.01	<0.01	0.01

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

LEWIS RIVER BASIN

14220500 LEWIS RIVER AT ARIEL, WA--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984

DATE	ALUM- INUM, DIS- SOLVED (UG/L AS AL)	ARSENIC DIS- SOLVED (UG/L AS AS)	BARIUM, DIS- SOLVED (UG/L AS BA)	BERYL- LIUM, DIS- SOLVED (UG/L AS BE)	CADMIUM DIS- SOLVED (UG/L AS CD)	CHRO- MIUM, DIS- SOLVED (UG/L AS CR)	COBALT, DIS- SOLVED (UG/L AS CO)	COPPER, DIS- SOLVED (UG/L AS CU)	IRON, DIS- SOLVED (UG/L AS FE)	LEAD, DIS- SOLVED (UG/L AS PB)	LITHIUM DIS- SOLVED (UG/L AS LI)
NOV 1983 22...	30	<1	9	<0.5	<1	<1	<3	2	19	3	7
MAR 1984 27...	30	<1	7	<0.5	<1	<1	<3	9	28	9	<4
JUN 26...	10	<1	9	2	<1	1	<3	6	7	<1	<4
AUG 21...	60	<3	9	<1	<1	<1	<3	5	44	2	<4
DATE	MANGA- NESE, DIS- SOLVED (UG/L AS MN)	MERCURY DIS- SOLVED (UG/L AS HG)	MOLYB- DENUM, DIS- SOLVED (UG/L AS MO)	NICKEL, DIS- SOLVED (UG/L AS NI)	SELE- NIUM, DIS- SOLVED (UG/L AS SE)	SILVER, DIS- SOLVED (UG/L AS AG)	STRON- TIUM, DIS- SOLVED (UG/L AS SR)	VANA- DIUM, DIS- SOLVED (UG/L AS V)	ZINC, DIS- SOLVED (UG/L AS ZN)	SEDI- MENT, SUS- PENDE (MG/L)	SEDI- MENT, DIS- CHARGE, SUS- PENDE (T/DAY)
NOV 1983 22...	3	0.1	<10	2	<1	<1	19	<6	13	--	--
MAR 1984 27...	12	<0.1	<10	<1	<1	<1	19	<6	35	9	209
JUN 26...	4	<0.1	<10	<1	<1	<1	18	<6	43	--	--
AUG 21...	11	<0.1	<10	5	<1	<1	21	<6	19	4	14

LEWIS RIVER BASIN

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14222500 EAST FORK LEWIS RIVER NEAR HEISSON, WA

LOCATION.--Lat 45°40'13", long 122°27'54", in NE¼NW¼ sec.17, T.4 N., R.3 E., Clark County, Hydrologic Unit 17080002, on right bank 60 ft downstream from Basket Creek, 1.5 mi northeast of Heisson, 3.4 mi southwest of Yacolt, and at mile 20.2.

DRAINAGE AREA.--125 mi².

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

GAGE.--Water-stage recorder. Datum of gage is 366.8 ft above National Geodetic Vertical Datum of 1929 (from river-profile survey).

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

AVERAGE DISCHARGE.--55 years, 756 ft³/s, 82.13 in/yr, 547,700 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 19,300 ft³/s Dec. 2, 1977, gage height, 12.95 ft; minimum, 29 ft³/s Nov. 3, 1935, Sept. 27, 28, 1967; minimum gage height, 0.04 ft Nov. 3, 1935.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 6,100 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Jan. 25	0530	*4,990	*7.15				

Minimum discharge, 65 ft³/s Aug. 30, Sept. 5, gage height, 0.41 ft.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP		
1	99	305	904	1000	731	901	809	1070	525	401	116	116		
2	102	411	801	875	645	905	720	2140	478	372	112	87		
3	103	3150	705	3040	582	831	674	1730	440	344	108	73		
4	120	2920	641	3360	530	742	622	1340	636	320	106	69		
5	107	1530	796	2300	488	670	612	1240	631	301	109	97		
6	100	2080	932	1700	460	627	579	1110	608	284	110	194		
7	97	1770	930	1380	429	594	1200	974	685	268	103	324		
8	93	1340	1420	1150	420	583	1850	943	791	255	99	268		
9	92	1110	1490	959	467	606	1480	890	1020	244	95	174		
10	92	1130	2290	1000	522	709	1630	817	914	233	94	131		
11	90	1360	2340	1100	706	704	1480	1030	762	225	92	117		
12	89	1300	1940	958	2430	1090	1560	1010	646	221	92	120		
13	88	1610	2070	825	2940	1220	1370	903	580	209	94	102		
14	100	2230	2200	711	2060	1480	1200	818	530	199	89	90		
15	99	2240	1710	622	1620	1690	1270	738	471	188	87	85		
16	92	2560	1320	562	1340	1700	1060	661	427	178	84	84		
17	129	3640	1050	509	1080	1550	878	593	392	171	83	83		
18	114	3450	888	468	911	1510	787	547	364	165	82	79		
19	100	2660	768	435	806	1820	704	562	339	159	80	78		
20	99	2950	663	406	832	2280	670	653	405	155	79	83		
21	97	2090	575	404	1130	2580	610	574	1160	151	77	79		
22	558	1580	500	632	1010	2350	585	665	1020	144	76	113		
23	325	1360	450	1370	1100	1870	579	1220	758	137	76	123		
24	230	2210	420	4050	1720	1480	532	1050	619	135	78	107		
25	192	2110	400	4410	1620	1440	506	916	529	131	75	93		
26	171	1710	400	2990	1290	2030	473	1180	511	135	73	85		
27	158	1770	400	2010	1050	1730	436	1070	476	127	70	80		
28	148	1620	450	1520	935	1510	414	906	415	126	74	74		
29	139	1320	600	1210	843	1220	433	774	513	126	71	70		
30	181	1080	1200	998	---	1040	565	687	454	121	68	70		
31	323	---	1300	849	---	920	---	599	---	117	74	---		
TOTAL	4527	56596	32553	43803	30697	40382	26288	29410	18099	6342	2726	3348		
MEAN	146	1887	1050	1413	1059	1303	876	949	603	205	87.9	112		
MAX	558	3640	2340	4410	2940	2580	1850	2140	1160	401	116	324		
MIN	88	305	400	404	420	583	414	547	339	117	68	69		
CFSM	1.17	15.1	8.40	11.3	8.47	10.4	7.01	7.59	4.82	1.64	.70	.90		
IN.	1.35	16.84	9.69	13.04	9.14	12.02	7.82	8.75	5.39	1.89	.81	.00		
AC-FT	8980	112300	64570	86880	60890	80100	52140	58330	35900	12580	5410	6640		
CAL YR 1983	TOTAL	314912	MEAN	863	MAX	8230	MIN	88	CFSM	6.90	IN.	93.72	AC-FT	624600
WTR YR 1984	TOTAL	294771	MEAN	805	MAX	4410	MIN	68	CFSM	6.44	IN.	87.72	AC-FT	584700

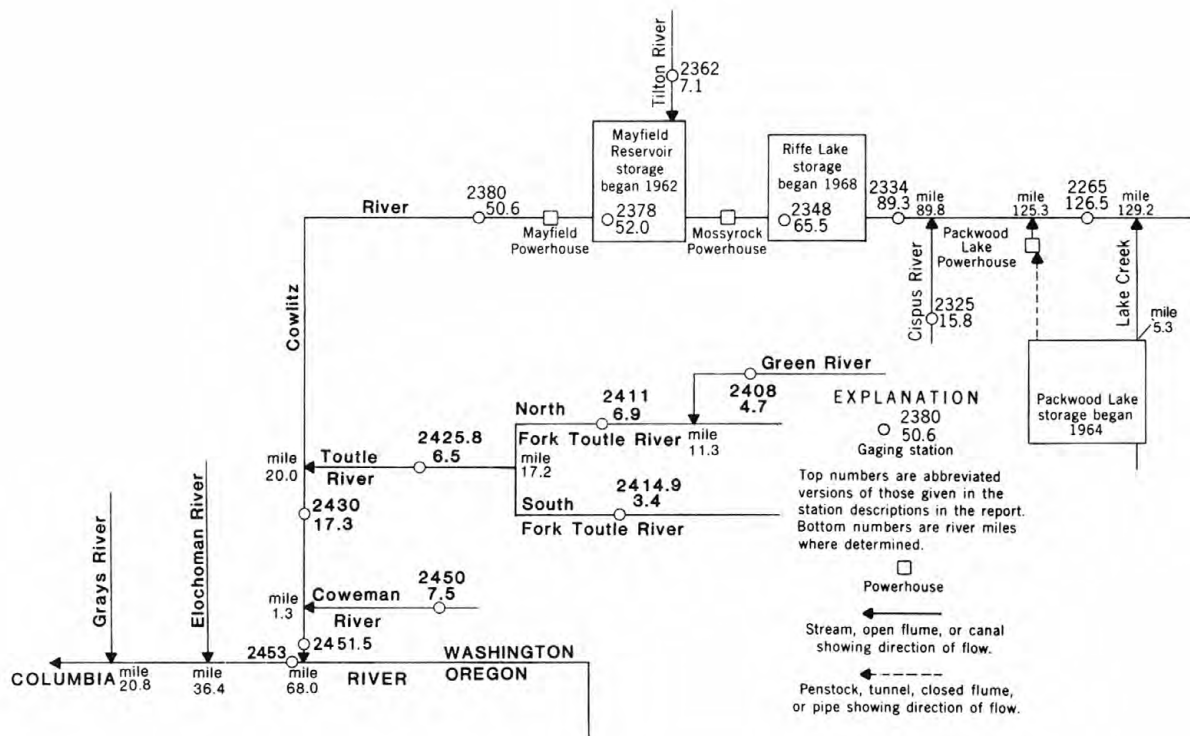


Figure 33.--Gaging stations in Cowlitz River basin and downstream to mouth of Columbia River.

COWLITZ RIVER BASIN

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14226500 COWLITZ RIVER AT PACKWOOD, WA

LOCATION.--Lat 46°36'47", long 121°40'41", in SE¼SE¼ sec.16, T.13 N., R.9 E., Lewis County, Hydrologic Unit 17080004, on right bank on upstream side of Forest Service bridge, 0.6 mi northwest of Packwood, 0.8 mi upstream from Skate Creek, and at mile 126.5.

DRAINAGE AREA.--287 mi².

PERIOD OF RECORD.--July 1911 to December 1919, September 1929 to current year. Published as "at Lewis" 1911-19.

REVISED RECORDS.--WSP 884: 1938. WSP 1348: 1916-18(M), 1934. WSP 1638: 1947(P).

GAGE.--Water-stage recorder. Datum of gage is 1,048.0 ft above National Geodetic Vertical Datum of 1929 (Bureau of Public Roads bench mark). July 1, 1911, to Dec. 31, 1919, nonrecording gages at site about 1 mi upstream at different datums. Sept. 30, 1929, to Jan. 1, 1930, nonrecording gage at present site and datum. Feb. 8, 1978, to Jan. 5, 1981, on left bank downstream side of bridge at present datum.

REMARKS.--Records good except those for period of shifting control May to September, which are fair. Minor regulation by Packwood Lake beginning June 1964. Small diversions for domestic use. U.S. Geological Survey satellite telemeter at station. Water is diverted from Packwood Lake for power generation and is discharged into Cowlitz River about 1 mi downstream from this station. Monthly mean diversion in cubic feet per second for the current water year, as furnished by the Washington Power Supply System, is as follows:

October.....	7.21	January.....	176	April.....	60.6	July.....	176
November.....	146	February.....	80.2	May.....	127	August.....	72.7
December.....	60.0	March.....	53.0	June.....	206	September.....	103

AVERAGE DISCHARGE.--63 years, (water years 1912-19, 1930-84), 1,623 ft³/s, 1,176,000 acre-ft/yr, unadjusted.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 36,600 ft³/s Dec. 21, 1933, gage height, 13.0 ft; maximum gage height, 13.73 ft Dec. 2, 1977; minimum discharge, 130 ft³/s Nov. 29, 1952.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 7,500 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Jan. 3	2400	*13,300	*9.08	Jan. 25	0600	12,700	8.91

Minimum discharge, 310 ft³/s Oct. 21, gage height, 2.89 ft.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	420	545	1090	1090	1490	787	1080	864	1960	2260	1120	564
2	401	779	1010	1500	1320	774	1010	1320	1670	2660	1070	529
3	395	4400	940	8350	1210	758	961	1270	1550	2790	1010	533
4	454	4530	865	11300	1140	738	912	1150	1770	2900	957	544
5	440	2420	824	8780	1140	719	922	1070	2700	3290	929	563
6	419	2810	777	6050	1150	738	871	994	2100	2760	873	716
7	396	2280	745	5040	1160	769	912	984	1920	2000	814	613
8	384	1780	760	3760	1140	845	886	1240	1840	1800	850	726
9	364	1470	818	2650	1150	1020	871	1450	1670	1780	897	611
10	351	1450	1270	2160	1110	1140	910	1300	1660	1750	905	541
11	351	1980	1310	1840	1090	1200	910	1640	1770	1700	848	510
12	352	1820	1220	1590	1440	1260	981	3020	2200	1630	810	508
13	342	1640	1400	1390	1880	1240	990	2990	2770	1540	736	465
14	337	1790	1620	1200	1670	1230	1040	3440	3310	1560	708	443
15	339	2900	1400	1060	1490	1250	1500	2340	3970	1710	693	441
16	331	4140	1200	1000	1320	1180	1680	1810	3210	2070	705	456
17	348	4100	1030	885	1170	1110	1500	1520	2110	2020	746	480
18	336	3560	939	792	1050	1060	1380	1410	2190	1750	709	518
19	320	2770	876	768	984	1170	1280	2340	2540	1480	643	547
20	323	2590	784	720	1100	2890	1190	3760	2940	1310	624	541
21	313	2040	666	688	1280	4480	1140	2330	3540	1190	624	470
22	633	1640	631	760	1170	3170	1130	1950	3210	1150	648	455
23	517	1410	590	939	1100	2600	1090	2580	3560	1170	625	431
24	425	1840	550	4560	1050	2170	1010	2060	4400	1280	586	408
25	395	1900	704	9500	984	1870	937	1740	4530	1420	575	402
26	391	1620	652	5060	912	1670	864	2120	4430	1380	593	398
27	378	1610	610	3440	858	1510	809	2260	4040	1210	636	398
28	364	1560	568	2720	832	1430	797	2990	4110	1110	608	394
29	367	1390	645	2250	796	1320	770	4730	4380	1090	575	392
30	489	1230	1470	1910	---	1230	772	5230	2910	1130	581	392
31	685	---	1280	1680	---	1160	---	3290	---	1150	564	---
TOTAL	12360	65994	29244	95432	34186	44488	31105	67192	84960	54040	23262	14989
MEAN	399	2200	943	3078	1179	1435	1037	2167	2832	1743	750	500
MAX	685	4530	1620	11300	1880	4480	1680	5230	4530	3290	1120	726
MIN	313	545	550	688	796	719	770	864	1550	1090	564	392
AC-FT	24520	130900	58010	189300	67810	88240	61700	133300	168500	107200	46140	29730
CAL YR 1983	TOTAL	583282	MEAN	1598	MAX	7770	MIN	313	AC-FT	1157000		
WTR YR 1984	TOTAL	557252	MEAN	1523	MAX	11300	MIN	313	AC-FT	1105000		

14232500 CISPUS RIVER NEAR RANDLE, WA

LOCATION.--Lat 46°26'50", long 121°51'46", in NW¼ sec.18, T.11 N., R.8 E., (unsurveyed), Lewis county, Hydrologic Unit 17080004, Gifford Pinchot National Forest, on left bank 60 ft upstream from bridge to Tower Rock ranger station, 4.1 mi downstream from North Fork, 8.0 mi southeast of Randle, and at mile 15.8.

DRAINAGE AREA.--321 mi².

PERIOD OF RECORD.--October 1910 to February 1912, September 1929 to current year.

REVISED RECORDS.--WSP 794: 1934. WSP 1288: Drainage area. WSP 1935: 1950-53, 1954(M), 1955-56, 1957(M), 1960.

GAGE.--Water-stage recorder. Datum of gage is 1,221.60 ft above National Geodetic Vertical Datum of 1929. Prior to Mar. 1, 1912, nonrecording gage at site 1.0 mi upstream at different datum. Sept. 28, 1929, to Nov. 26, 1949, Oct. 1-24, 1950, water-stage recorder at site 450 ft upstream at datum 0.26 ft higher.

REMARKS.--Records good. No regulation or diversion upstream from station. U.S. Geological Survey satellite telemeter at station.

AVERAGE DISCHARGE.--56 years (water years 1911, 1930-84), 1,349 ft³/s, 57.07 in/yr, 977,400 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 21,700 ft³/s Jan. 15, 1974, gage height, 12.58 ft, from rating curve extended above 8,700 ft³/s on basis of slope-area measurement of peak flow; minimum, 183 ft³/s Dec. 30, 1936; minimum gage height, 2.55 ft Oct. 25, 1942, site and datum then in use.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 4,000 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Nov. 17	0500	*6,980	*7.93	Jan. 25	0830	5,920	7.58
Jan. 4	0830	5,590	7.47	May 30	0245	4,300	7.01

Minimum discharge, 387 ft³/s Oct. 11-13, 15-17, 19-22, 28-30; gage height, 3.78 ft.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP		
1	409	444	1240	800	1560	1010	1250	1090	2410	1680	712	498		
2	409	589	1170	885	1440	975	1200	1670	2160	1680	717	480		
3	404	2490	1090	2540	1340	939	1150	1600	2070	1640	702	468		
4	426	3190	1010	5470	1280	903	1110	1480	2240	1600	680	462		
5	415	1950	970	4960	1240	885	1130	1400	2360	1640	666	493		
6	409	2000	925	4060	1230	894	1080	1310	2190	1570	631	575		
7	404	1700	875	3440	1200	921	1100	1260	2120	1360	610	554		
8	398	1400	890	2810	1190	966	1120	1370	2120	1270	617	610		
9	398	1200	950	2350	1210	1060	1090	1510	2040	1230	617	540		
10	393	1700	1220	2070	1180	1190	1120	1450	1980	1200	626	492		
11	393	2540	1280	1860	1150	1240	1090	1640	1980	1160	610	480		
12	387	2350	1160	1670	1600	1360	1130	2110	2120	1100	596	480		
13	387	2210	1260	1500	2050	1400	1100	2320	2250	1080	568	462		
14	393	2300	1320	1330	1830	1410	1170	2570	2480	1040	547	450		
15	387	3840	1260	1190	1680	1430	1570	2320	2680	1050	540	444		
16	387	5830	1170	1150	1540	1400	1690	2020	2560	1080	547	444		
17	393	6260	1070	1050	1400	1370	1560	1860	2210	1080	558	444		
18	393	4570	1010	984	1300	1300	1440	1760	2050	1010	554	444		
19	387	3260	966	966	1210	1290	1420	1950	2070	945	528	450		
20	387	2930	876	912	1290	1610	1330	2240	2180	891	525	450		
21	387	2270	752	912	1410	2300	1280	2050	2750	846	516	444		
22	486	1940	700	948	1300	2110	1240	1980	2530	806	510	456		
23	462	1690	670	1000	1250	2010	1240	2480	2390	804	510	456		
24	420	2250	640	2210	1240	1910	1180	2320	2500	816	504	450		
25	404	2150	784	5130	1190	1790	1120	2110	2470	864	498	444		
26	398	1860	760	3740	1110	1730	1050	2320	2370	860	498	438		
27	393	1740	704	2740	1060	1620	1000	2400	2170	780	510	432		
28	393	1660	666	2360	1050	1560	1000	2600	2090	753	504	426		
29	387	1520	688	2090	1010	1450	966	3400	2210	747	492	420		
30	409	1360	894	1870	---	1370	948	4100	1890	741	492	414		
31	468	---	885	1720	---	1320	---	3080	---	723	486	---		
TOTAL	12566	71193	29855	66717	38540	42723	35874	63770	67640	34046	17671	14100		
MEAN	405	2373	963	2152	1329	1378	1196	2057	2255	1098	570	470		
MAX	486	6260	1320	5470	2050	2300	1690	4100	2750	1680	717	610		
MIN	387	444	640	800	1010	885	948	1090	1890	723	486	414		
CFSM	1.26	7.39	3.00	6.70	4.14	4.29	3.73	6.41	7.02	3.42	1.78	1.46		
IN.	1.46	8.25	3.46	7.73	4.47	4.95	4.16	7.39	7.84	3.95	2.05	1.63		
AC-FT	24920	141200	59220	132300	76440	84740	71160	126500	134200	67530	35050	27970		
CAL YR 1983	TOTAL	576935	MEAN	1581	MAX	7080	MIN	387	CFSM	4.93	IN.	66.86	AC-FT	1144000
WTR YR 1984	TOTAL	494695	MEAN	1352	MAX	6260	MIN	387	CFSM	4.21	IN.	57.33	AC-FT	981200

COWLITZ RIVER BASIN

361

14233400 COWLITZ RIVER NEAR RANDLE, WA

LOCATION.--Lat 46°28'13", long 122°05'51", in NE¼ sec.6, T.11 N., R.6 E., Lewis County, Hydrologic Unit 17080005, on right bank 0.5 mi downstream from Clispus River, 8.1 mi southwest of Randle, and at mile 89.3.

DRAINAGE AREA.--1,030 mi².

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1947 to current year. Prior to October 1967, published as "near Kosmos." Records published for both sites October 1967 to September 1968. Monthly discharge only for some period published in WSP 1318.

GAGE.--Water-stage recorder. Datum of gage is 799.42 ft above National Geodetic Vertical Datum of 1929. Prior to Dec. 3, 1948, nonrecording gage at site 0.9 mi downstream at different datum. Dec. 3, 1948, to September 1967, at site 1.4 mi downstream at datum 40.13 ft lower (levels by city of Tacoma).

REMARKS.--Water-discharge records excellent except for periods of no gage-height record Dec. 20-25 and Jan. 24, 25, which are good. Minor regulation by Packwood Lake (14225400) beginning June 1964. Small diversions for domestic use and irrigation upstream from station. U.S. Geological Survey satellite telemeter at station.

AVERAGE DISCHARGE.--37 years, 4,983 ft³/s, 65.70 in/yr, 3,610,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 89,300 ft³/s Dec. 3, 1977, gage height, 26.54 ft; minimum, 518 ft³/s Nov. 29, 1952, gage height, 2.34 ft, site and datum then in use.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 16,000 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Nov. 17	0830	16,800	13.97	Jan. 25	1615	24,900	16.08
Jan. 4	1645	*25,700	*16.28				

Minimum discharge, 996 ft³/s Oct. 21, gage height, 6.16 ft.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP		
1	1280	1520	4930	4030	6460	3720	4880	3620	8790	6640	2990	1490		
2	1220	1710	4590	4280	5820	3670	4640	5260	7520	6550	2920	1460		
3	1190	5060	4260	12000	5340	3520	4410	5660	6970	6640	2790	1410		
4	1250	12000	3940	24700	4980	3380	4230	5320	7100	6480	2640	1390		
5	1260	7930	3760	23200	4800	3270	4210	5000	8000	6750	2500	1410		
6	1210	7280	3540	17600	4750	3270	4070	4730	8000	6730	2410	1820		
7	1180	7210	3330	14200	4680	3360	4160	4520	7430	5740	2250	1870		
8	1150	6060	3410	11900	4570	3520	4410	4680	7610	5240	2170	1920		
9	1120	5180	3480	9800	4570	3910	4190	5480	7230	4970	2280	1880		
10	1090	5240	4680	8410	4500	4350	4370	5440	7030	4910	2350	1640		
11	1070	6990	5280	7580	4370	4710	4430	5500	6900	4730	2280	1520		
12	1070	7230	4890	6700	5400	4950	4550	7690	7360	4640	2170	1490		
13	1060	6700	5380	6000	7880	5240	4680	8700	7950	4430	2050	1420		
14	1050	7100	6510	5360	7280	5180	4700	9600	8670	4320	1930	1330		
15	1040	9470	6160	4790	6570	5280	5960	8890	9960	4350	1850	1390		
16	1030	13800	5520	4520	5960	5160	6790	7580	9470	4640	1820	1450		
17	1040	16300	4860	4160	5360	4980	6350	6730	7830	4910	1850	1450		
18	1060	14300	4430	3840	4930	4770	5920	6180	7280	4570	1890	1280		
19	1030	11800	4100	3700	4610	4700	5580	6510	7320	4190	1770	1310		
20	1010	10900	3730	3490	4660	6290	5200	9010	7810	3800	1680	1330		
21	1000	9150	3100	3400	5240	9780	4930	8360	9390	3490	1640	1290		
22	1250	7500	2800	3560	5000	9420	4820	7360	9390	3300	1630	1290		
23	1670	6440	2600	3880	4800	8700	4750	8740	8860	3220	1630	1290		
24	1350	7720	2500	9100	4710	8170	4500	8700	9600	3380	1580	1220		
25	1230	8670	2700	22500	4460	7410	4260	7810	9930	3490	1530	1150		
26	1170	7540	3010	18800	4170	7010	3990	7810	9650	3740	1520	1100		
27	1140	7010	2930	13500	3980	6510	3760	8550	9060	3380	1550	1060		
28	1140	6730	2640	11200	3880	6180	3620	8960	8530	3090	1590	1030		
29	1140	6120	2590	9520	3750	5780	3490	11100	9180	2950	1500	1050		
30	1160	5520	3960	8240	---	5460	3430	13700	8020	2970	1480	1050		
31	1550	---	4440	7250	---	5160	---	11400	---	3000	1460	---		
TOTAL	36210	236180	124050	291210	147480	166810	139280	228590	247840	141240	61700	41790		
MEAN	1168	7873	4002	9394	5086	5381	4643	7374	8261	4556	1990	1393		
MAX	1670	16300	6510	24700	7880	9780	6790	13700	9960	6750	2990	1920		
MIN	1000	1520	2500	3400	3750	3270	3430	3620	6900	2950	1460	1030		
CFSM	1.13	7.64	3.89	9.12	4.94	5.22	4.51	7.16	8.02	4.42	1.93	1.35		
IN.	1.31	8.53	4.48	10.52	5.33	6.02	5.03	8.26	8.95	5.10	2.23	1.51		
AC-FT	71820	468500	246100	577600	292500	330900	276300	453400	491600	280100	122400	82890		
CAL YR 1983	TOTAL	1832560	MEAN	5021	MAX	25900	MIN	1000	CFSM	4.87	IN.	66.19	AC-FT	3635000
WTR YR 1984	TOTAL	1862380	MEAN	5088	MAX	24700	MIN	1000	CFSM	4.94	IN.	67.26	AC-FT	3694000

COWLITZ RIVER BASIN

14233400 COWLITZ RIVER NEAR RANDLE, WA--Continued

WATER-QUALITY RECORDS

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

PERIOD OF DAILY RECORD.--

WATER TEMPERATURES: November 1952 to August 1968, April 1969 to September 1982.

WATER QUALITY DATA, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984

DATE	DATE OF SAMPLE	TIME	TEMPER- ATURE (DEG C)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	OXYGEN, DIS- SOLVED (MG/L)	PH (STAND- ARD UNITS)	NITRO- GEN,AM- MONIA + ORGANIC TOTAL (MG/L AS N)	NITRO- GEN, NO2+NO3 TOTAL (MG/L AS N)	PHOS- PHORUS, TOTAL (MG/L AS P)	COLI- FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)
OCT , 1983										
19...		1030	9.0	80	10.8	--	.50	.40	.010	20
NOV										
22...		1200	5.5	65	12.3	7.1	.40	<.10	.020	K4
DEC										
13...		1530	5.0	59	12.5	7.4	<.20	<.10	.010	K20
JAN , 1984										
18...		1130	1.5	70	13.5	7.1	.40	<.10	<.010	K1
FEB										
15...		0900	5.0	58	12.7	7.8	<.20	<.10	.010	<1
MAR										
22...		1500	7.0	47	12.3	7.8	.20	<.10	.020	K2
APR										
19...		0900	7.0	60	11.5	7.9	.20	<.10	.010	K3
MAY										
17...		1330	7.5	53	11.7	7.8	.50	<.10	.010	K1
JUN										
14...		1130	9.5	44	11.2	7.6	.20	<.10	.010	22
JUL										
24...		1330	14.5	51	9.8	7.5	.20	<.10	.020	K17
AUG										
22...		1600	15.5	64	9.1	7.8	.40	<.10	.030	K7
SEP										
12...		1330	12.0	67	11.0	7.8	3.5	<.10	.010	K18

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

COWLITZ RIVER BASIN

363

14234800 RIFFE LAKE NEAR MOSSYROCK, WA

LOCATION.--Lat 46°32'07", long 122°25'25", in SE¼SW¼ sec.10, T.12 N., R.3 E., Lewis County, Hydrologic Unit 17080005, in emergency generator room on top of Mossyrock Dam on Cowlitz River, 2.8 mi east of Mossyrock, and at mile 65.5.

DRAINAGE AREA.--1,154 mi².

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

REVISED RECORDS.--WDR WA-74-1: 1973.

GAGE.--Water-stage recorder; nonrecording gage prior to July 25, 1968. Datum of gage is National Geodetic Vertical Datum of 1929 (levels by city of Tacoma).

REMARKS.--Reservoir is formed by concrete arch dam, completed in April 1968; storage began Apr. 3, 1968. Usable capacity, 1,297,400 acre-ft between elevations 600 ft, minimum operating level, and 770 ft, normal operating pool. Unused storage below elevation 600 ft, 288,900 acre-ft. Crest of spillway is at elevation 728.5 ft and top of tailrator gates are at elevation 778.5 ft. Water used by city of Tacoma for power development. Elevation records collected in cooperation with city of Tacoma. Figures given herein represent total contents. Capacity table furnished by city of Tacoma.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 1,686,300 acre-ft July 31, 1972, elevation, 778.63 ft; minimum since normal low operating level was attained, 658,503 acre-ft Mar. 17, 1977, elevation, 666.88 ft.

EXTREMES FOR CURRENT YEAR.--Maximum contents, 1,682,274 acre-ft June 26, elevation, 778.29 ft; minimum, 1,038,860 acre-ft Dec. 30, elevation, 714.86 ft.

MONTHEND ELEVATION AND CONTENTS AT 2400, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984

Date	Elevation (feet)	Contents (acre-feet)	Change in contents (acre-feet)
Sept. 30.....	766.70	1,549,329	--
Oct. 31.....	753.77	1,410,698	-138,631
Nov. 30.....	743.79	1,309,537	-101,161
Dec. 31.....	715.22	1,042,045	-267,492
CAL YR 1983.....	--	--	-250,504
Jan. 31.....	743.45	1,305,180	+263,135
Feb. 29.....	747.57	1,347,327	+42,147
Mar. 31.....	758.66	1,462,017	+114,690
Apr. 30.....	764.41	1,524,074	+62,057
May 31.....	777.74	1,675,787	+151,713
June 30.....	777.88	1,677,437	+1,650
July 31.....	772.96	1,620,102	-57,335
Aug. 31.....	765.50	1,536,056	-84,046
Sept. 30.....	757.81	1,453,006	-83,050
WTR YR 1984.....	--	--	-96,323

COWLITZ RIVER BASIN

14236200 TILTON RIVER ABOVE BEAR CANYON CREEK, NEAR CINEBAR, WA

LOCATION.--Lat 46°35'44", long 122°27'30", in NE¼SW¼ sec.20, T.13 N., R.3 E., Lewis County, Hydrologic Unit 17080005, on right bank 0.9 mi upstream from Bear Canyon Creek, 3.5 mi southeast of Cinebar, and at mile 7.1.

DRAINAGE AREA.--141 mi².

PERIOD OF RECORD.--October 1956 to current year.

REVISED RECORDS.--WDR WA-72-1: 1957(M), 1959(P), 1960(P), 1961(M), 1963(P), 1964(M), 1965, 1967(P), 1971(P).

GAGE.--Water-stage recorder. Elevation of gage is 600 ft, from topographic map.

REMARKS.--Water-discharge records good. Several small diversions for municipal and domestic use upstream from station. No regulation. U.S. Geological Survey satellite telemeter at station.

AVERAGE DISCHARGE.--28 years, 850 ft³/s, 81.87 in/yr, 615,800 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 22,500 ft³/s Dec. 2, 1977, gage height, 17.00 ft, from rating curve extended above 10,500 ft³/s on basis of slope-area measurement at gage height of 14.79 ft; minimum, 52 ft³/s Sept. 27-29, 1967; minimum gage height, 1.96 ft Aug. 31, 1970.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 6,200 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Jan. 3	1430	6,730	9.08	Jan. 25	0515	*9,240	*10.48

Minimum discharge, 81 ft³/s Sept. 4, 5, gage height, 2.19 ft.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP		
1	176	338	1010	1360	934	904	880	856	670	467	136	100		
2	170	442	898	1740	832	968	808	2160	605	426	136	94		
3	170	2360	802	5220	748	904	754	1730	560	392	132	86		
4	192	2970	718	5110	680	814	706	1320	630	364	129	82		
5	170	1710	695	3350	625	748	706	1190	826	341	127	91		
6	162	2400	660	2210	605	730	680	1110	814	322	129	198		
7	157	2230	630	1700	560	724	1020	968	754	307	123	177		
8	151	1760	892	1370	560	718	1210	934	772	291	119	273		
9	146	1430	1070	1140	580	724	1090	922	989	278	115	215		
10	144	1250	2700	1170	625	808	1280	898	928	268	111	160		
11	139	1200	2190	1260	796	814	1460	1240	802	257	109	143		
12	136	1100	1660	1110	2390	1080	1580	1350	712	254	111	197		
13	134	1310	2230	975	2460	1200	1520	1130	665	247	118	174		
14	134	2780	2260	868	1800	1310	1440	1080	590	235	110	145		
15	134	3040	1730	766	1460	1480	1730	1050	535	224	106	127		
16	129	3540	1390	695	1210	1210	1470	996	496	214	102	118		
17	146	4010	1160	635	1020	1120	1170	886	464	204	99	111		
18	144	4970	980	585	892	1240	1000	796	428	198	97	106		
19	134	3030	830	545	814	1440	898	880	402	192	96	101		
20	141	3050	680	510	996	2070	826	1170	433	189	94	98		
21	134	2370	590	530	1300	2980	784	1020	640	184	92	96		
22	358	1760	490	838	1120	2850	772	1060	570	178	90	131		
23	313	1440	420	1590	1040	2420	742	1580	491	173	90	134		
24	245	2520	380	5690	1090	2100	680	1400	446	166	90	117		
25	215	2660	380	7300	1020	1790	640	1180	415	161	88	106		
26	195	2010	483	3850	904	1720	585	1810	433	160	87	100		
27	184	2230	455	2510	826	1520	540	1540	455	154	87	95		
28	173	1840	419	1910	826	1420	520	1180	394	151	96	91		
29	165	1470	665	1530	820	1260	510	975	486	150	88	87		
30	203	1210	1440	1270	---	1100	575	856	526	144	84	85		
31	406	---	1710	1080	---	975	---	766	---	139	85	---		
TOTAL	5600	64430	32617	60417	29533	41141	28576	36033	17931	7430	3276	3838		
MEAN	181	2148	1052	1949	1018	1327	953	1162	598	240	106	128		
MAX	406	4970	2700	7300	2460	2980	1730	2160	989	467	136	273		
MIN	129	338	380	510	560	718	510	766	394	139	84	82		
CFSM	1.28	15.2	7.46	13.8	7.22	9.41	6.76	8.24	4.24	1.70	.75	.91		
IN.	1.48	17.00	8.61	15.94	7.79	10.85	7.54	9.51	4.73	1.96	.86	1.01		
AC-FT	11110	127800	64700	119800	58580	81600	56680	71470	35570	14740	6500	7610		
CAL YR 1983	TOTAL	326398	MEAN	894	MAX	8310	MIN	118	CFSM	6.34	IN.	86.11	AC-FT	647400
WTR YR 1984	TOTAL	330822	MEAN	904	MAX	7300	MIN	82	CFSM	6.41	IN.	87.28	AC-FT	656200

COWLITZ RIVER BASIN

365

14237800 MAYFIELD RESERVOIR NEAR SILVER CREEK, WA

LOCATION.--Lat 46°30'13", long 122°35'11", in SE¼SW¼ sec.20, T.12 N., R.2 E., Lewis County, Hydrologic Unit 17080005, on right bank at Mayfield Dam on Cowlitz River, 0.3 mi downstream from Silver Creek, 4 mi south of town of Silver Creek, and at mile 52.0.

DRAINAGE AREA.--1,392 mi².

PERIOD OF RECORD.--April 1962 to current year.

GAGE.--Water-stage recorder. Datum of gage is National Geodetic Vertical Datum of 1929. Prior to Mar. 5, 1963, nonrecording gage at same site and datum.

REMARKS.--Reservoir is formed by concrete arch dam, completed April 1962; storage began Apr. 14, 1962. Usable capacity, 21,380 acre-ft between elevation 415 ft, lower limit of operation, and 425 ft, top of tailwater gates. Dead storage below elevation 415 ft, 112,340 acre-ft. Crest of spillway is at elevation 385 ft. Water is used by city of Tacoma for power development. Figures given herein represent total contents. Capacity table furnished by city of Tacoma.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 134,850 acre-ft Dec. 9, 1971, elevation, 425.50 ft; minimum since normal operating level was attained, 112,830 acre-ft June 4, 1969, elevation, 415.24 ft.

EXTREMES FOR CURRENT YEAR.--Maximum contents, 133,808 acre-ft July 23, elevation, 425.04 ft; minimum, 123,312 acre-ft Oct. 6, elevation, 420.26 ft.

MONTHEND ELEVATION AND CONTENTS AT 2400, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984

Date	Elevation (feet)	Contents (acre-feet)	Change in contents (acre-feet)
Sept. 30.....	423.54	130,458	--
Oct. 31.....	424.35	132,265	+1,807
Nov. 30.....	424.10	131,700	-565
Dec. 31.....	423.88	131,216	-484
CAL YR 1983.....	--	--	+4,188
Jan. 31.....	422.89	129,028	-2,188
Feb. 29.....	423.26	129,842	+814
Mar. 31.....	423.40	130,150	+308
Apr. 30.....	423.66	130,722	+572
May 31.....	424.00	131,480	+758
June 30.....	424.08	131,656	+176
July 31.....	423.90	131,260	-396
Aug. 31.....	424.29	132,128	+868
Sept. 30.....	423.91	131,282	-846
WTR YR 1984.....	--	--	+824

COWLITZ RIVER BASIN

14237900 MAYFIELD POWERPLANT TAILWATER NEAR SILVER CREEK, WA

LOCATION.--Lat 46°30'15", long 122°35'12", in SE¼SW¼ sec.20, T.12 N., R.2 E., Lewis County, Hydrologic Unit 17080005. Sampling site is at the downstream side of the powerhouse about 1.4 mi upstream from gaging station (14238000).

PERIOD OF RECORD.--Water years 1978 to current year.

REMARKS.--Water discharge obtained by routing flow from downstream gaging station; discharge values are excellent.

WATER QUALITY DATA, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984

DATE	DATE OF SAMPLE	TIME	TEMPER- ATURE (DEG C)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	OXYGEN, DIS- SOLVED (MG/L)	PH (STAND- ARD UNITS)	NITRO- GEN,AM- MONIA + ORGANIC TOTAL (MG/L AS N)	NITRO- GEN, NO2+NO3 TOTAL (MG/L AS N)	PHOS- PHORUS, TOTAL (MG/L AS P)	COLI- FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)
OCT , 1983										
19...		1215	10.0	55	11.0	--	.60	<.10	<.010	K1
NOV										
22...		1400	8.0	55	11.7	8.0	.40	.20	.010	K10
DEC										
13...		1350	8.5	55	11.4	8.0	<.20	.20	<.010	<2
JAN , 1984										
18...		1355	5.0	60	12.3	8.1	<.20	.20	.010	<1
FEB										
15...		1200	6.5	56	12.3	7.7	<.20	.30	.010	K4
MAR										
22...		1215	7.5	53	12.4	7.8	<.20	.30	.010	K12
APR										
19...		1230	8.5	53	12.0	7.8	<.20	.20	.010	<1
MAY										
17...		1120	10.0	55	11.5	7.5	.20	.20	.010	K1
JUN										
14...		1600	9.0	60	11.5	7.3	.20	.10	<.010	K4
JUL										
24...		1100	11.5	61	10.2	7.4	.40	.10	.010	<1
AUG										
22...		1215	12.5	61	11.1	7.4	.20	<.10	<.010	<1
SEP										
12...		1030	12.0	55	10.7	7.9	.20	<.10	<.010	K1

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

14238000 COWLITZ RIVER BELOW MAYFIELD DAM, WA

LOCATION.--Lat 46°30'38", long 122°36'54", in SE¼ sec.24, T.12 N., R.1 E., Lewis County, Hydrologic Unit 17080005, on right bank 1.1 mi upstream from fish barrier dam, 1.4 mi downstream from Mayfield Dam, 1.5 mi upstream from Mill Creek, 2.1 mi downstream from Winston Creek, and at mile 50.6.

DRAINAGE AREA.--1,400 mi².

PERIOD OF RECORD.--August to October 1910, December 1910 to September 1911, October to November 1911 (monthly discharge only), April 1934 to current year. Published as "at Mayfield" water years 1910-11 and "near Mayfield" water years 1934-61.

REVISED RECORDS.--WSP 1318: 1949(M). WSP 1348: Drainage area. WSP 1718: 1943, 1947.

GAGE.--Water-stage recorder. Datum of gage is 226.6 ft above National Geodetic Vertical Datum of 1929. August 1910 to November 1911 nonrecording gage at site 2.5 mi upstream at different datum. Apr. 27 to July 2, 1934, nonrecording gage at present site and datum.

REMARKS.--Records excellent. Flow regulated by Riffe Lake (station 14234800) at mile 65.5 and Mayfield Reservoir (station 14237800) at mile 52.0. Minor diversions for domestic and farm use upstream from station. U.S. Geological Survey satellite telemeter at station.

AVERAGE DISCHARGE.--50 years (water years 1935-84), 6,335 ft³/s, 61.45 in/yr, 4,590,000 acre-ft/yr, adjusted for storage in Mayfield Reservoir since April 1962, and Riffe Lake since April 1968.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 67,000 ft³/s Dec. 13, 1946; maximum gage height, 25.26 ft Dec. 4, 1975; minimum discharge, 37 ft³/s Apr. 16, 1962, gage height, 6.42 ft; minimum daily, 451 ft³/s Apr. 16, 1962.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in December 1933 is known to have exceeded that of Dec. 13, 1946.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 31,200 ft³/s Nov. 16, gage height, 18.97 ft; minimum, 2,170 ft³/s Sept. 19, gage height, 9.29 ft.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3620	3590	14100	6150	6080	5720	5020	5940	11900	7190	4290	2560
2	3630	3770	9260	6340	6360	5730	5500	7330	11800	6820	3690	2570
3	3630	4310	7770	9020	5970	5700	5600	7490	11000	7070	3680	2590
4	3640	5380	8530	9820	5970	5700	5590	6840	11100	6680	3430	2820
5	3660	5850	10400	8220	5970	5700	5000	5740	10800	7430	3440	2930
6	3660	5060	10600	6190	5980	6070	4990	5730	9260	7160	4060	2930
7	3640	7550	10600	5700	5850	5780	5200	5700	9290	7480	3740	2870
8	3620	10200	13900	5680	5710	6160	5700	5710	8740	8300	3380	2610
9	3620	10600	14400	5670	5720	5790	5850	6240	8280	7340	3630	2580
10	3620	10500	14300	5670	5730	5780	6400	6580	8300	5230	3540	2590
11	3620	10500	12200	5740	5720	5790	6160	5790	8320	4990	2800	2910
12	3620	10400	10500	10400	6170	6580	5740	5730	8320	5010	2910	2900
13	3620	10400	10600	10700	7510	6460	5720	5720	8310	5010	3170	2900
14	3610	13200	10900	10700	7930	5850	5640	6150	8660	4990	3110	2820
15	3620	21200	14300	14000	7920	5790	5020	5720	10400	4980	3420	2570
16	3600	28600	14300	14300	7520	5800	5040	5770	10900	4980	3600	2550
17	3610	30300	13700	14000	6860	5810	5000	5740	10900	4970	3470	2770
18	3610	26900	10600	10600	5690	5800	4990	5760	10100	5000	3500	2800
19	3630	22800	10600	10700	5710	5650	4980	5760	8600	4970	2950	2590
20	3610	21800	11400	11000	5870	5450	4980	5760	8070	4980	3340	2580
21	3590	19700	14200	14300	7180	6390	4990	5780	6850	5000	3390	2790
22	3610	15900	14200	14300	7600	7040	4990	5780	8820	4980	3590	3050
23	3600	14900	14200	14000	6730	6200	5400	6230	9540	4980	3390	2930
24	3600	14300	11500	10700	6730	5800	5730	8040	10000	4980	3560	3270
25	3580	16500	6950	12800	5800	5810	5720	9880	11000	4990	2980	3820
26	3600	16700	5930	10300	5890	5840	5610	11000	10900	5000	2920	3890
27	3590	14800	5910	9990	6230	5860	5250	11000	10800	4990	3460	3750
28	3580	14300	5920	6770	6660	5860	4990	10800	11000	4980	3540	3750
29	3590	14300	7990	6700	6830	5860	4980	9270	10700	4970	3470	3760
30	3600	14200	8720	6670	---	5840	5510	11300	10700	4990	3280	3750
31	3610	---	5740	6730	---	5590	---	11900	---	4950	3370	---
TOTAL	112040	418510	334220	293860	185890	183200	161290	222180	293360	175390	106100	89200
MEAN	3614	13950	10780	9479	6410	5910	5376	7167	9779	5658	3423	2973
MAX	3660	30300	14400	14300	7930	7040	6400	11900	11900	8300	4290	3890
MIN	3580	3590	5740	5670	5690	5450	4980	5700	6850	4950	2800	2550
AC-FT	222200	830100	662900	582900	368700	363400	319900	440700	581900	347900	210400	176900
MEAN†	1388	12244	6421	13720	7155	7778	6430	9645	9812	4719	2068	1563
CFSM†	0.99	8.75	4.59	9.80	5.11	5.56	4.59	6.89	7.01	3.37	1.48	1.12
IN.†	1.14	9.76	5.29	11.31	5.52	6.41	5.13	7.95	7.82	3.89	1.70	1.25
AC-FT†	85380	728400	394900	843800	411700	478400	382500	593200	583700	290200	127200	93000

CAL YR 1983 TOTAL 2551000 MEAN 6989 MAX 30300 MIN 2950 AC-FT 5060000 MEAN† 6648 CFSM† 4.75 IN.† 64.50 AC-FT† 4814000
WTR YR 1984 TOTAL 2575240 MEAN 7036 MAX 30300 MIN 2550 AC-FT 5108000 MEAN† 6903 CFSM† 4.93 IN.† 67.17 AC-FT† 5013000

† Adjusted for change in contents in Riffe Lake and Mayfield Reservoir.

COWLITZ RIVER BASIN

14238543 INLET TO BLUE CREEK TROUT HATCHERY PONDS NEAR TOLEDO, WA

LOCATION.--Lat 46°29'07", long 122°43'38", in SW¼NE¼ sec. 31, T.12 N., R.1 E., Lewis County, Hydrologic Unit 17080005.
Sampling site is in feeder canal to trout rearing ponds.

PERIOD OF RECORD.--Water year 1980 to current year.

REMARKS.--Records for August and September 1980 published as a miscellaneous site.

WATER QUALITY DATA, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984

DATE	DATE OF SAMPLE	TIME	TEMPER- ATURE (DEG C)	PH (STAND- ARD UNITS)	NITRO- GEN, AMMONIA TOTAL (MG/L AS N)
OCT , 1983					
19...		1350	11.5	--	<.010
NOV					
22...		1450	10.0	--	.010
DEC					
13...		1235	8.5	8.0	<.010
JAN , 1984					
18...		1500	5.0	7.2	<.010
FEB					
15...		1300	7.0	7.7	.260
MAR					
22...		1120	7.0	7.8	.150
APR					
19...		1400	8.0	8.0	.060
MAY					
17...		1025	9.5	7.9	<.010
AUG					
22...		1045	12.0	7.4	<.010
SEP					
12...		0935	11.5	7.7	<.010

14238544 BLUE CREEK HATCHERY TROUT POND NO. 1 NEAR TOLEDO, WA

LOCATION.--Lat 46°29'07", long 122°43'38", in SW¼NE¼ sec.31, T.12 N., R.1 E., Lewis County, Hydrologic Unit 17080005. Sampling site is in the most shoreward trout rearing pond from right bank of Cowlitz River.

PERIOD OF RECORD.--Water year 1980 to current year.

REMARKS.--Records for August and September 1980 published as a miscellaneous site.

WATER QUALITY DATA, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984

DATE	DATE OF SAMPLE	TIME	SAM- PLING DEPTH (FEET)	TEMPER- ATURE (DEG C)	PH (STAND- ARD UNITS)	NITRO- GEN, AMMONIA TOTAL (MG/L AS N)
OCT , 1983						
	19...	1425	1.00	11.5	6.4	.110
	19...	1435	7.00	11.5	6.5	.100
NOV						
	22...	1500	1.00	9.5	7.4	.190
	22...	1505	7.00	9.5	7.6	.200
DEC						
	13...	1250	1.00	8.0	7.4	.320
	13...	1255	7.00	8.0	7.6	.240
JAN , 1984						
	18...	1445	1.00	4.0	6.8	.100
	18...	1450	7.00	4.0	6.8	.070
FEB						
	15...	1315	1.00	8.5	7.4	.020
	15...	1330	7.00	8.0	7.3	.020
MAR						
	22...	1055	1.00	8.0	7.4	.040
	22...	1105	7.00	8.5	7.3	.060
APR						
	19...	1330	1.00	9.5	7.6	.130
	19...	1345	7.00	9.5	7.6	.130
MAY						
	17...	0945	1.00	11.5	7.8	<.010
	17...	1015	7.00	11.0	7.7	<.010
AUG						
	22...	1015	1.00	15.0	7.6	.070
	22...	1030	7.00	13.0	7.4	.020
SEP						
	12...	0915	1.00	13.0	7.8	.160
	12...	0920	7.00	12.5	7.7	.130

LOCATION.--Lat 46°22'55", long 122°31'21", in SE¼NW¼ sec.2, T.10 N., R.2 E., Cowlitz County, Hydrologic Unit 17080005, on right bank 0.1 mi downstream from logging bridge, 4.5 mi northeast of Kid Valley.

PERIOD OF RECORD.--September 1980 to current year.

GAGE.--Water-stage recorder. Datum of gage is 824.60 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--Records good. No regulation or diversion upstream from station. Some quality of water data available for this station.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 10,300 ft³/s Jan. 24, 1982, gage height, 12.11 ft from floodmark; minimum, 57 ft³/s Sept. 3, 1982, gage height, 4.15 ft.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 4,940 ft³/s Jan. 25, gage height, 9.82 ft; minimum daily, 66 ft³/s Sept. 30.

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	109	168	632	560	696	492	676	486	644	536	132	92
2	105	225	584	855	614	508	656	722	584	514	130	84
3	107	1130	536	2770	542	502	590	815	542	480	120	75
4	138	1270	475	2870	486	460	548	715	602	465	113	71
5	125	843	460	2100	460	430	572	734	682	445	111	76
6	113	920	445	1440	455	420	530	767	608	407	113	157
7	109	955	435	1210	420	394	736	676	845	348	105	148
8	107	850	542	990	407	380	885	741	1030	331	101	165
9	103	722	548	836	445	394	850	774	998	319	97	132
10	99	850	957	794	425	480	934	722	913	315	95	109
11	97	1020	906	794	445	502	906	919	836	295	93	101
12	95	906	815	722	884	566	906	1200	794	284	93	113
13	93	1080	976	638	1100	602	850	1090	822	278	95	97
14	97	1240	1090	554	983	741	850	1100	794	264	90	87
15	99	1420	955	497	836	829	1040	983	808	253	85	81
16	97	1810	822	460	715	689	969	913	715	250	84	76
17	109	2180	696	398	602	702	840	787	578	242	82	76
18	111	2110	608	362	524	656	680	708	572	232	81	75
19	101	1770	548	335	497	696	560	760	566	210	79	73
20	103	1810	475	323	590	937	520	892	761	195	78	72
21	99	1370	376	323	787	1440	492	774	1400	180	76	71
22	283	1060	331	444	728	1210	460	866	1090	168	75	95
23	189	920	311	1030	656	1150	455	1200	927	162	75	103
24	150	1530	288	4180	663	1030	407	1050	899	160	75	90
25	132	1330	331	3980	626	962	394	941	801	160	73	82
26	122	1110	323	2460	572	1050	358	976	760	162	71	76
27	115	1050	292	1820	514	962	319	934	682	150	71	73
28	113	955	270	1370	514	982	327	934	596	142	81	71
29	113	829	780	1110	486	927	394	1070	829	138	73	68
30	113	722	864	934	---	822	389	1130	670	132	71	66
31	204	---	682	794	---	734	---	850	---	130	73	---
TOTAL	3750	34155	18353	37953	17672	22649	19093	27229	23348	8347	2791	2755
MEAN	121	1139	592	1224	609	731	636	878	778	269	90.0	91.8
MAX	283	2180	1090	4180	1100	1440	1040	1200	1400	536	132	165
MIN	93	168	270	323	407	380	319	486	542	130	71	66
CFSM	.94	8.83	4.59	9.49	4.72	5.67	4.93	6.81	6.03	2.09	.70	.71
IN.	1.08	9.85	5.29	10.94	5.10	6.53	5.51	7.85	6.73	2.41	.80	.79
AC-FT	7440	67750	36400	752								

COWLITZ RIVER BASIN

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14241100 NORTH FORK TOUTLE RIVER AT KID VALLEY, WA

LOCATION.--Lat 46°21'55", long 122°37'40", in NE¼SW¼ sec.12, T.10 N., R.1 E., Cowlitz County, Hydrologic Unit 17080005, on right bank at downstream side of bridge on State Highway 504, 0.8 mi southwest of Kid Valley, and 6.9 mi upstream from confluence with South Fork.

DRAINAGE AREA.--284 mi², of which approximately 21 mi² is noncontributing. Prior to July 7, 1981, the noncontributing portion was approximately 40 mi².

PERIOD OF RECORD.--June 1980 to current year.

GAGE.--Water-stage recorder. Datum of gage is 575.80 ft above National Geodetic Vertical Datum of 1929 (levels by Corps of Engineers).

REMARKS.--Records fair. No regulation or diversion upstream from station. Some quality of water data available from Washington Office for this station.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 34,000 ft³/s Mar. 19, 1982, gage height, 30.47 ft, gage height was affected by backwater from mudflow caused by an eruption of Mount St. Helens; minimum daily, 114 ft³/s Oct. 17, 1980.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage, 45.5 ft May 18, 1980 (1700 hours), from floodmarks, due to backwater from mudflow resulting from eruption of Mount St. Helens; discharge not determined.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 14,700 ft³/s Jan. 25, gage height, 26.09 ft; minimum daily, 224 ft³/s Sept. 29.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP		
1	456	825	1840	1550	1800	1380	1840	1660	1650	1360	420	276		
2	463	1000	1740	2120	1570	1400	1890	2120	1570	1290	401	268		
3	449	4190	1580	4530	1400	1360	1670	2170	1500	1250	368	264		
4	479	3360	1390	4480	1290	1280	1560	2130	1560	1210	363	251		
5	474	2130	1300	4040	1210	1250	1680	2260	1630	1170	364	280		
6	470	2270	1260	3080	1110	1230	1780	2170	1570	1120	357	265		
7	475	2360	1350	2600	1140	1220	2760	2010	1680	1040	345	280		
8	482	2170	1330	2330	1240	1220	2680	2200	1770	995	341	383		
9	480	2020	1400	2030	1490	1270	2520	2160	1770	943	328	338		
10	487	2530	1800	1960	1570	1430	2580	2080	1670	929	333	340		
11	459	2980	1850	1910	1800	1440	2380	2430	1600	892	336	359		
12	469	2810	2080	1800	3150	1700	2480	2660	1550	846	328	318		
13	484	3840	2380	1810	3040	1700	2300	2400	1540	811	322	297		
14	518	3470	2480	1640	2660	2060	2330	2440	1510	776	309	277		
15	518	3810	2190	1470	2380	2110	2480	2370	1460	749	291	254		
16	526	4730	1860	1330	2130	1950	2290	2330	1410	730	271	248		
17	593	6090	1630	1160	1900	2010	2050	2070	1250	750	260	249		
18	441	5350	1480	1040	1790	1920	1870	1930	1160	740	248	261		
19	464	3760	1360	981	1690	1980	1780	1980	1090	710	254	270		
20	514	3760	1200	1010	1830	2500	1640	2100	1520	680	258	271		
21	461	2970	1080	1280	2010	3370	1560	1910	3310	660	262	278		
22	716	2670	1090	1950	1790	2990	1510	2110	2680	650	248	280		
23	584	3370	1070	3730	1760	2980	1490	2360	2340	630	252	280		
24	560	5750	1010	9380	1820	2700	1430	2200	2200	620	295	270		
25	640	4220	1060	8930	1610	2560	1380	2000	2060	620	287	260		
26	600	3250	1120	5880	1500	2600	1280	2200	1980	620	275	254		
27	601	2780	1100	4610	1400	2460	1220	2000	1830	590	262	237		
28	622	2500	1100	3320	1390	2580	1250	1850	1690	580	251	244		
29	641	2180	1870	2650	1360	2300	1360	1920	1830	560	241	224		
30	713	1930	2550	2310	---	2020	1340	1980	1520	540	231	236		
31	848	---	1740	2020	---	1900	---	1820	---	510	247	---		
TOTAL	16687	95075	48290	88931	50830	60870	56380	66020	51900	25571	9348	8312		
MEAN	538	3169	1558	2869	1753	1964	1879	2130	1730	825	302	277		
MAX	848	6090	2550	9380	3150	3370	2760	2660	3310	1360	420	383		
MIN	441	825	1010	981	1110	1220	1220	1660	1090	510	231	224		
CFSM	1.89	11.2	5.49	10.1	6.17	6.92	6.62	7.50	6.09	2.90	1.06	.98		
IN.	2.19	12.45	6.33	11.65	6.66	7.97	7.38	8.65	6.80	3.35	1.22	1.09		
AC-FT	33100	188600	95780	176400	100800	120700	111800	131000	102900	50720	18540	16490		
CAL YR 1983	TOTAL	533140	MEAN	1461	MAX	8000	MIN	320	CFSM	5.14	IN.	69.83	AC-FT	1057000
WTR YR 1984	TOTAL	578214	MEAN	1580	MAX	9380	MIN	224	CFSM	5.56	IN.	75.74	AC-FT	1147000

LOCATION.--Lat 46°19'05", long 122°40'01", in NE¼SW¼ sec.35, T.10 N., R.1 E., Cowlitz County, Hydrologic Unit 17080005, on right bank 0.9 mi downstream from Johnson Creek, 1.2 mi southeast of Toutle, and at mile 3.4.

PERIOD OF RECORD.--February 1981 to current year.

REMARKS.--Records fair. No regulation or diversion upstream from station. Quality of water data on file in Washington office.

EXTREMES OUTSIDE PERIOD OF RECORD.--A flood occurred at about 1000 hours on May 18, 1980, from a mudflow caused by the eruption of Mount St. Helens. Another flood, on Dec. 26, 1980, reached a stage of 17.50 ft, discharge not determined.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 5,590 ft³/s Jan. 25, gage height, 15.09 ft; minimum daily, 94 ft³/s Aug. 30.

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	131	337	674	643	602	701	692	821	454	344	131	125
2	134	641	621	800	533	696	683	1320	415	319	130	107
3	134	3050	557	1760	490	641	639	1130	393	299	127	101
4	154	2520	504	1920	448	576	593	881	489	283	125	98
5	134	1460	533	1530	418	525	611	856	477	270	125	121
6	131	1450	497	1190	407	511	606	818	465	255	127	184
7	128	1300	511	1010	381	504	1180	721	532	243	120	185
8	128	1040	759	857	398	511	1270	797	564	232	116	205
9	125	893	789	733	506	541	1040	781	619	223	113	147
10	128	892	1570	771	520	634	1190	691	553	216	112	130
11	128	1220	1460	747	679	629	1200	910	507	210	110	129
12	128	1350	1320	666	2380	864	1330	1030	465	206	109	147
13	128	2380	1390	597	2350	910	1170	938	438	198	111	125
14	140	3280	1450	532	1560	1310	1090	937	420	192	105	115
15	133	3190	1180	479	1260	1390	1230	906	386	188	103	110
16	128	3510	965	440	1040	1210	1030	797	357	184	101	108
17	144	4380	799	396	845	1190	835	688	333	181	101	104
18	138	3300	701	368	732	1140	755	611	312	175	100	104
19	132	2570	611	348	653	1140	695	661	300	171	98	101
20	136	3050	518	332	869	1460	629	704	507	167	97	101
21	129	1970	434	350	1110	2010	587	596	1250	162	96	99
22	341	1410	380	557	901	1640	557	713	837	158	96	131
23	210	1190	323	1220	836	1460	530	916	635	152	97	125
24	169	2190	300	3770	1100	1200	491	767	522	148	100	122
25	147	2020	330	3850	986	1090	470	710	450	144	97	110
26	147	1480	340	2310	829	1220	425	843	439	146	95	107
27	137	1270	310	1580	723	1050	389	724	404	140	96	104
28	134	1110	280	1200	707	1080	396	651	363	140	100	101
29	128	930	480	970	656	977	422	610	492	137	96	96
30	197	789	985	813	---	852	473	600	398	134	94	96
31	332	---	820	683	---	749	---	525	---	131	100	---
TOTAL	4733	56172	22391	33422	24919	30411	23208	24653	14776	6148	3328	3638
MEAN	153	1872	722	1078	859	981	774	795	493	198	107	121
MAX	341	4380	1570	3850	2380	2010	1330	1320	1250	344	131	205
MIN	125	337	280	332	381	504	389	525	300	131	94	96
CFSM	1.31	16.0	6.17	9.21	7.34	8.38	6.62	6.79	4.21	1.69	.91	1.03
IN.	1.50	17.86	7.12	10.63	7.92	9.67	7.38	7.84	4.7			

CAL YR 1983	TOTAL	278161	MEAN	762	MAX	4790	MIN	116	CFSM	6.51	IN.	88.44	AC-FT	551700
WTR YR 1984	TOTAL	247799	MEAN	677	MAX	4380	MIN	94	CFSM	5.79	IN.	78.79	AC-FT	491500

COWLITZ RIVER BASIN

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14242580 TOUTLE RIVER AT TOWER ROAD, NEAR SILVER LAKE, WA

LOCATION.--Lat 46°20'02", long 122°50'20", in NW¼SW¼ sec.20, T.10 N., R.1 W., Cowlitz County, Hydrologic Unit 17080005, on right bank 10 mi downstream from confluence of North and South Forks, 2.9 mi northwest of Silver Lake, and at mile 6.5.

DRAINAGE AREA.--496 mi², of which approximately 21 mi² is noncontributing. Prior to July 7, 1981, the noncontributing portion was approximately 40 mi².

PERIOD OF RECORD.--March 1981 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 160 ft, from topographic map.

REMARKS.--Records fair. No regulation or diversion upstream from station. Some quality of water data available from Washington Office for this station.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 38,000 ft³/s Dec. 3, 1982, gage height, 28.03 ft; minimum daily, 286 ft³/s Sept. 15, 1981, Aug. 25, 1982.

EXTREMES OUTSIDE PERIOD OF RECORD.--Floods occurred on May 18, 1980, from mudflows caused by the eruption of Mount St. Helens. A flood about 1200 hours was due to mudflow from South Fork Toutle River and a larger flood about 2100 hours was due to mudflow from North Fork Toutle River.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 17,500 ft³/s Jan. 25, gage height, 23.55 ft; minimum daily, 346 ft³/s Sept. 24.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP		
1	668	1060	2760	2400	2370	2490	2430	2490	2160	1950	571	524		
2	682	1370	2520	3140	2080	2510	2500	3880	2000	1780	548	508		
3	666	5870	2300	7810	1900	2460	2310	3500	1890	1700	521	507		
4	718	5910	2000	9430	1800	2180	2130	3050	2120	1660	499	532		
5	680	3260	2020	6800	1740	2040	2230	3100	2190	1610	489	576		
6	655	4000	1840	4540	1680	1900	2110	3140	2140	1530	482	700		
7	641	4170	1790	3310	1580	1830	3370	2620	2360	1410	456	692		
8	629	3740	2380	2840	1650	1790	3970	2870	2950	1350	434	699		
9	620	3180	2360	2320	1980	1810	3470	2890	2940	1290	421	585		
10	607	3420	4430	2470	2120	1970	4030	2600	2650	1250	414	526		
11	584	4420	4150	3010	2500	2000	3870	3080	2450	1190	410	516		
12	594	4510	4160	2780	5150	2420	4220	3850	2300	1180	412	543		
13	597	6190	4680	2660	5800	2520	3710	3470	2340	1150	428	488		
14	638	6850	4720	2310	4440	3110	3440	3610	2210	1120	413	455		
15	631	6330	4050	1970	3610	3630	3820	3490	2150	1090	412	444		
16	616	7750	3490	1800	2890	3320	3480	3260	2000	1060	406	442		
17	665	10300	2920	1570	2330	3300	2940	2690	1840	1060	408	434		
18	651	10300	2470	1460	2020	3130	2670	2380	1730	1040	404	424		
19	642	6130	2220	1300	1910	3190	2330	2530	1670	1000	395	398		
20	652	8150	1910	1200	2450	3920	2220	2840	2190	953	388	384		
21	624	5960	1570	1210	3600	6350	2090	2390	4920	928	381	360		
22	1150	4540	1390	1920	3010	5040	2040	2620	3570	917	381	380		
23	968	4000	1260	3610	2820	4340	2030	3830	2930	885	383	373		
24	825	7080	1150	12800	3690	3640	1920	3180	2610	872	379	346		
25	731	5840	1280	12500	3230	3280	1860	2970	2390	867	380	348		
26	697	4060	1310	8310	2920	3860	1730	3270	2220	868	397	360		
27	681	4160	1210	5580	2720	3460	1650	2910	2010	837	413	365		
28	671	4020	1080	3450	2520	3650	1670	2700	1950	828	434	364		
29	666	3590	1850	2740	2240	3510	1820	2730	2580	809	429	362		
30	737	3170	3760	2950	---	3010	1750	2900	2170	789	446	363		
31	1110	---	3000	2770	---	2730	---	2600	---	749	467	---		
TOTAL	21696	153330	78030	122960	78750	94390	79810	93440	71630	35722	13401	13998		
MEAN	700	5111	2517	3966	2716	3045	2660	3014	2388	1152	432	467		
MAX	1150	10300	4720	12800	5800	6350	4220	3880	4920	1950	571	700		
MIN	584	1060	1080	1200	1580	1790	1650	2380	1670	749	379	346		
CFSM	1.41	10.3	5.07	8.00	5.48	6.14	5.36	6.08	4.81	2.32	.87	.94		
IN.	1.63	11.50	5.85	9.22	5.91	7.08	5.99	7.01	5.37	2.68	1.01	1.05		
AC-FT	43030	304100	154800	243900	156200	187200	158300	185300	142100	70850	26580	27770		
CAL YR 1983	TOTAL	875091	MEAN	2398	MAX	15100	MIN	440	CFSM	4.83	IN.	65.63	AC-FT	1736000
WTR YR 1984	TOTAL	857157	MEAN	2342	MAX	12800	MIN	346	CFSM	4.72	IN.	64.29	AC-FT	1700000

14243000 COWLITZ RIVER AT CASTLE ROCK, WA

LOCATION.--Lat 46°16'30", long 122°54'48", in SW¼SE¼ sec.10, T.9 N., R.2 W., Cowlitz County, Hydrologic Unit 17080005, on left bank 40 ft downstream from Arkansas Valley Road bridge in Castle Rock, 2.7 mi downstream from Toutle River, and at mile 17.3.

DRAINAGE AREA.--2,238 mi², of which approximately 21 mi² is noncontributing. Prior to July 7, 1981, the noncontributing portion was approximately 40 mi².

PERIOD OF RECORD.--December 1926 to current year.

REVISED RECORDS.--WSP 1218: Drainage area. WSP 1638: 1947(P), 1951.

GAGE.--Water-stage recorder. Datum of gage is 20.20 ft above National Geodetic Vertical Datum of 1929. Prior to Dec. 18, 1933, nonrecording gage at site 2 mi upstream at datum 14.93 ft higher. Dec. 18, 1933, to June 13, 1934, nonrecording gage, and June 14 to Sept. 30, 1934, water-stage recorder, at present site at datum 5.0 ft higher. Oct. 1, 1934, to May 21, 1980, water-stage recorder, on right bank at present site and datum.

REMARKS.--Records good. Flow regulated by Riffe Lake (station 14234800) at mile 65.5, and Mayfield Reservoir (station 14237800) at mile 52.0. Minor diversions for domestic and farm use upstream from station.

AVERAGE DISCHARGE.--57 years, 9,294 ft³/s, 56.40 in/yr, 6,734,000 acre-ft/yr, adjusted for storage in Mayfield Reservoir since April 1962, and Riffe Lake since April 1968.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge observed, 139,000 ft³/s Dec. 23, 1933, gage height, 31.6 ft present datum, from rating curve extended above 80,000 ft³/s; minimum, 998 ft³/s Nov. 7, 8, 1935.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 49,600 ft³/s Nov. 18, gage height, 24.30 ft; minimum daily discharge, 3,080 ft³/s Sept. 3.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	4620	4970	17600	8770	9700	10000	8740	9700	14200	10900	5520	3400
2	4490	5880	13900	9530	8510	10200	8570	12300	14100	9290	4900	3130
3	4550	10800	10800	15800	8970	9900	8800	12700	13700	10200	4650	3080
4	4620	14800	10500	19800	8970	9390	8870	11700	13900	9330	4450	3140
5	4490	13000	12100	15400	8900	9260	8570	10800	14000	9160	4270	3500
6	4620	12300	12700	12500	8740	9360	8570	10500	13000	8970	4650	3810
7	4570	12400	12800	11400	8640	8440	9590	9950	12900	9060	4690	3810
8	4520	14200	17500	10800	8250	8250	11300	9960	13000	9490	4000	3730
9	4220	13900	19100	10100	8510	6890	11300	10100	12400	9490	4000	3450
10	4520	14400	21700	9660	8670	6890	12500	10500	12200	7540	4000	3380
11	4290	16300	19600	10200	9390	7000	12400	10300	11800	6770	3500	3590
12	4150	15400	15800	12000	14400	8870	12600	11000	11500	6690	3500	3770
13	4340	16900	17700	13800	18600	11000	12100	10800	11500	6600	3500	3690
14	4490	23200	18200	13900	15500	10800	11300	11400	11400	6520	3500	3550
15	4490	27200	20100	15100	15100	11600	10800	11100	12500	6440	3500	3370
16	4520	37500	19400	16300	14100	10900	10100	10800	13000	6410	4130	3170
17	4570	46400	18700	16300	13400	11300	9460	10300	13000	6350	4000	3230
18	4680	47000	14500	13600	11500	11300	9160	10100	12700	6320	4180	3390
19	4700	36400	13700	12800	11100	11100	8830	10200	11400	6240	3500	3270
20	4600	36800	13000	12100	11600	11400	8670	10600	11500	6240	3500	3090
21	4490	30600	16500	14700	13000	14000	8370	10500	13600	6220	3900	3130
22	5060	20800	16000	16000	13000	14000	8280	10800	13400	6220	4230	3440
23	5080	20300	15900	17900	12700	13100	8310	12700	12900	6220	4000	3670
24	4760	26600	14200	31400	13500	12100	8630	12800	12900	6190	4170	3500
25	4680	27200	10800	31500	12000	11700	8570	13600	13200	6220	3840	4160
26	4680	24400	8700	23700	11500	11800	8440	15000	13000	6240	3460	4240
27	4570	23900	8350	18900	11300	11200	8120	14500	12800	6190	3760	4300
28	4600	21000	8060	15100	11400	11100	7850	14100	12600	6160	4130	4190
29	4420	19900	9670	13500	11400	11000	8030	12800	13300	6130	4080	4220
30	4470	18000	16300	11700	---	10200	8370	13800	13300	6130	3770	4240
31	5220	---	10200	11100	---	9670	---	14200	---	6130	4070	---
TOTAL	142080	652450	454080	465360	332350	323720	285200	359610	384700	226060	125350	107640
MEAN	4583	21750	14650	15010	11460	10440	9507	11600	12820	7292	4044	3588
MAX	5220	47000	21700	31500	18600	14000	12600	15000	14200	10900	5520	4300
MIN	4150	4970	8060	8770	8250	6890	7850	9700	11400	6130	3460	3080
AC-FT	281800	1294000	900700	923000	659200	642100	565700	713300	763100	448400	248600	213500
MEAN†	2358	20040	10290	19250	12210	12310	10560	14080	12850	6354	2690	2178
CFSM†	1.05	8.95	4.60	8.60	5.46	5.50	4.72	6.29	5.74	2.84	1.20	.97
IN.†	1.22	9.99	5.30	9.92	5.88	6.34	5.26	7.26	6.41	3.27	1.39	1.09
AC-FT†	144976	1192274	632724	1183947	702161	757098	628329	865771	764926	390669	165422	129604

CAL YR 1983 TOTAL 3889350 MEAN 10660 MAX 47000 MIN 3670 AC-FT 7715000 MEAN† 10290 CFSM† 4.60 IN.† 62.59 AC-FT† 7469000
WTR YR 1984 TOTAL 3858600 MEAN 10540 MAX 47000 MIN 3080 AC-FT 7654000 MEAN† 10410 CFSM† 4.65 IN.† 63.34 AC-FT† 7558000

† Adjusted for change in contents in Riffe Lake and Mayfield Reservoirs.

COWLITZ RIVER BASIN

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14244200 COWLITZ RIVER AT KELSO, WA
(National stream quality accounting network station)

WATER-QUALITY RECORDS

LOCATION.--Lat 46°08'44", long 122°54'47", near center of SE¼ sec.27, T.8 N., R.2 W., Cowlitz County, Hydrologic Unit 17080005, at Main Street bridge between Kelso and West Kelso, 3.6 mi upstream from Coweman River, and at mile 4.9.

DRAINAGE AREA.--2,349 mi².

PERIOD OF RECORD.--Water years 1960-1966, 1971-75, 1977 to current year. Additional data from April to August 1980 are published in U.S. Geological Survey Open-File Report 81-1007 and miscellaneous quality of water data are available from the Washington Office.

REMARKS.--Water discharges obtained by routing flows from upstream station (see sta 14243000). Station is tidally-influenced, and discharge values are poor.

WATER QUALITY DATA, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984

DATE	TIME	STREAM- FLOW, INSTAN- TANEOUS (CFS)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH (STAND- ARD UNITS)	TEMPER- ATURE (DEG C)	TUR- BID- ITY (NTU)	OXYGEN, DIS- SOLVED (MG/L)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION)	COLI- FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)	STREP- TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML)	HARD- NESS (MG/L AS CAC03)	HARD- NESS NONCAR- BONATE (MG/L AS CAC03)
NOV 1983												
23...	1330	20300	79	--	8.5	100	13.5	116	<1	K180	26	26
FEB 1984												
02...	1330	8190	102	8.3	10.5	170	11.4	100	230	900	31	31
MAR												
29...	1100	11100	--	7.8	8.0	140	11.8	--	K25	200	36	36
JUN												
27...	1130	12900	100	7.9	11.5	90	10.8	98	K20	40	30	30
AUG												
14...	1130	E3500	124	7.6	16.5	8.1	9.8	101	22	48	37	37
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 FIELD (MG/L AS CAC03)	SULFATE DIS- SOLVED (MG/L AS SO4)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	FLUO- RIDE, DIS- SOLVED (MG/L AS F)	SILICA, DIS- SOLVED (MG/L AS SiO2)
NOV 1983												
23...		7.7	1.7	5.6	31	0.5	0.8	--	11	4.0	<0.1	13
FEB 1984												
02...		9.0	2.1	8.1	35	0.7	0.9	--	19	7.1	<0.1	14
MAR												
29...	11		2.0	7.3	30	0.6	1.1	--	17	6.0	<0.1	13
JUN												
27...		9.1	1.8	6.5	31	0.5	0.8	25	15	5.3	<0.1	14
AUG												
14...	11		2.2	9.1	34	0.7	0.9	26	19	8.1	<0.1	14
DATE		SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L)	SOLIDS, SUM OF CONSTITUENTS, DIS- SOLVED (MG/L)	SOLIDS, DIS- SOLVED (TONS PER AC-FT)	SOLIDS, DIS- SOLVED (TONS PER DAY)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N)	NITRO- GEN,AM- MONIA + ORGANIC TOTAL (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)	ALUM- INUM, DIS- SOLVED (UG/L AS AL)
NOV 1983												
23...		58	57	0.08	3180	0.28	0.05	0.5	0.52	<0.01	<0.01	50
FEB 1984												
02...		68	76	0.09	1500	0.70	0.04	0.3	0.23	<0.01	0.02	80
MAR												
29...		69	71	0.09	2070	0.31	0.01	0.2	0.39	0.03	0.02	--
JUN												
27...		72	68	0.1	2510	0.12	<0.01	0.4	0.27	<0.01	0.02	30
AUG												
14...		77	80	0.1	--	<0.10	<0.01	0.2	0.04	<0.01	<0.01	--

E - Estimated value.

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

COWLITZ RIVER BASIN

14244200 COWLITZ RIVER AT KELSO, WA--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984

DATE	ARSENIC DIS- SOLVED (UG/L AS AS)	BARIUM, DIS- SOLVED (UG/L AS BA)	BERYL- LIUM, DIS- SOLVED (UG/L AS BE)	CADMIUM DIS- SOLVED (UG/L AS CD)	CHRO- MIUM, DIS- SOLVED (UG/L AS CR)	COBALT, DIS- SOLVED (UG/L AS CO)	COPPER, DIS- SOLVED (UG/L AS CU)	IRON, DIS- SOLVED (UG/L AS FE)	LEAD, DIS- SOLVED (UG/L AS PB)	LITHIUM DIS- SOLVED (UG/L AS LI)	MANGA- NESE, DIS- SOLVED (UG/L AS MN)
NOV 1983 23...	<1	12	<0.5	<1	1	<3	10	51	3	9	40
FEB 1984 02...	<1	10	<0.5	<1	<1	<3	7	79	3	9	47
MAR 29...	--	--	--	--	--	--	--	--	--	--	--
JUN 27...	<1	9	2	<1	1	<3	6	7	<1	10	4
AUG 14...	--	--	--	--	--	--	--	--	--	--	--
DATE	MERCURY DIS- SOLVED (UG/L AS HG)	MOLYB- DENUM, DIS- SOLVED (UG/L AS MO)	NICKEL, DIS- SOLVED (UG/L AS NI)	SELE- NIUM, DIS- SOLVED (UG/L AS SE)	SILVER, DIS- SOLVED (UG/L AS AG)	STRON- TIUM, DIS- SOLVED (UG/L AS SR)	VANA- DIUM, DIS- SOLVED (UG/L AS V)	ZINC, DIS- SOLVED (UG/L AS ZN)	SEDI- MENT, DIS- SUS- PENDE (MG/L)	SED- MENT, DIS- CHARGE, SUS- PENDE (T/DAY)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM
NOV 1983 23...	<0.1	<10	2	<1	<1	34	<6	9	--	--	--
FEB 1984 02...	<0.1	<10	1	<1	<1	42	<6	8	3080	68100	46
MAR 29...	--	--	--	--	--	--	--	--	1040	31200	46
JUN 27...	<0.1	<10	1	<1	<1	18	<6	43	--	--	--
AUG 14...	--	--	--	--	--	--	--	--	139	--	41

COWLITZ RIVER BASIN

377

14245000 COWEMAN RIVER NEAR KELSO, WA

LOCATION.--Lat 45°07'42", long 122°50'14", in SE¼SW¼ sec.32, T.8 N., R.1 W., Cowlitz County, Hydrologic Unit 17080005, on right bank 3.4 mi southeast of Kelso High School, 3.9 mi downstream from Goble Creek, and at mile 7.5.

DRAINAGE AREA.--119 mi².

PERIOD OF RECORD.--July 1950 to September 1984 (discontinued).

GAGE.--Water-stage recorder. Elevation of gage is 30 ft, from topographic map.

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

AVERAGE DISCHARGE.--34 years, 427 ft³/s, 48.73 in/yr, 309,400 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 9,940 ft³/s Dec. 2, 1977, gage height, 14.67 ft, from rating curve extended above 4,900 ft³/s on basis of slope-area measurement at gage height 12.8 ft; minimum, 22 ft³/s Sept. 22, 1951; minimum gage height, 2.54 ft Aug. 14, 15, 1975.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of Feb. 24, 1950, reached a stage of 12.8 ft from floodmarks, discharge, 7,730 ft³/s by slope-area measurement.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 2,600 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Jan. 25	0530	*3,310	*8.39	No other peak greater than base discharge.			
Minimum discharge, 44 ft ³ /s Sept. 29, 30, gage height, 2.80 ft.							

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP		
1	68	190	539	558	416	544	507	716	250	233	78	70		
2	71	365	481	671	373	498	453	971	227	211	78	57		
3	71	1390	429	1340	342	453	420	862	214	205	76	50		
4	74	1180	382	1250	316	407	390	705	298	205	72	46		
5	73	693	489	930	298	377	386	633	278	188	73	49		
6	67	835	516	752	272	353	350	553	265	180	77	83		
7	66	824	498	649	257	327	682	462	272	169	71	105		
8	66	666	705	558	257	309	953	485	285	159	70	103		
9	65	539	742	489	342	298	792	443	342	152	67	74		
10	64	494	1040	548	377	312	965	403	312	150	65	63		
11	62	539	1050	530	572	298	1020	425	278	143	65	67		
12	63	582	936	476	1270	382	1240	434	243	143	66	85		
13	63	1120	995	439	1670	448	1090	457	217	140	68	64		
14	66	1850	1060	399	1250	710	873	476	205	134	64	56		
15	67	1380	895	353	1040	862	757	485	188	125	63	51		
16	64	1420	742	331	873	722	623	502	174	119	60	51		
17	73	1950	612	305	705	742	516	420	162	109	59	50		
18	74	2210	516	288	602	803	481	365	150	107	58	49		
19	70	1790	462	272	530	851	439	373	140	104	57	48		
20	74	2300	407	257	623	1030	407	407	247	104	56	49		
21	68	1700	338	261	1030	1570	382	342	846	102	55	48		
22	217	1160	285	338	907	1400	365	448	649	102	54	61		
23	136	924	254	710	840	1100	342	628	443	95	54	71		
24	99	1270	278	2150	1320	856	316	516	338	92	55	55		
25	89	1360	338	2680	1230	787	302	462	282	90	54	52		
26	81	1080	302	1690	936	901	282	516	265	92	51	50		
27	78	977	275	1110	762	829	257	448	250	87	50	48		
28	76	862	237	835	655	829	243	390	211	86	52	46		
29	74	752	369	671	563	777	278	342	353	84	50	45		
30	84	633	602	563	---	688	390	312	282	83	49	44		
31	162	---	633	489	---	592	---	278	---	80	51	---		
TOTAL	2525	33035	17407	22892	20628	21055	16501	15259	8666	4073	1918	1790		
MEAN	81.5	1101	562	738	711	679	550	492	289	131	61.9	59.7		
MAX	217	2300	1060	2680	1670	1570	1240	971	846	233	78	105		
MIN	62	190	237	257	257	298	243	278	140	80	49	44		
CFSM	.68	9.25	4.72	6.20	5.97	5.71	4.62	4.13	2.43	1.10	.52	.50		
IN.	.79	10.33	5.44	7.16	6.45	6.58	5.16	4.77	2.71	1.27	.60	.56		
AC-FT	5010	65520	34530	45410	40920	41760	32730	30270	17190	8080	3800	3550		
CAL YR 1983	TOTAL	175378	MEAN	480	MAX	3580	MIN	62	CFSM	4.03	IN.	54.82	AC-FT	347900
WTR YR 1984	TOTAL	165749	MEAN	453	MAX	2680	MIN	44	CFSM	3.81	IN.	51.81	AC-FT	328800

COWLITZ RIVER BASIN

14245150 COWLITZ RIVER AT LONGVIEW, WA

LOCATION.--Lat 46°06'13", long 122°53'30", in NE¼SE¼ sec.11, T.7 N., R.2 W., Cowlitz County, Hydrologic Unit 17080005, near left bank on downstream side of railroad bridge, 0.3 mi downstream from Coweman River, 3.2 mi southeast of Longview City Hall, and at mile 1.0.

DRAINAGE AREA.--2,480 mi², at mouth, 1.0 mi downstream.

PERIOD OF RECORD.--May to September 1984 (gage heights only).

GAGE.--Water-stage recorder. Datum of gage is Columbia River Datum.

REMARKS.--Flow regulated by many reservoirs upstream.

EXTREMES FOR CURRENT PERIOD.--Maximum gage height May to September, 11.02 ft June 29; minimum, 4.01 ft Sept. 3, 4, 20, 21.

GAGE HEIGHT (FEET ABOVE DATUM), WATER YEAR MAY TO SEPTEMBER 1984

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	FEBRUARY			MARCH			APRIL			MAY		
1										---	---	---
2										---	---	---
3										---	---	---
4										---	---	---
5										---	---	---
6										---	---	---
7										---	---	---
8										---	---	---
9										---	---	---
10										---	---	---
11										---	---	---
12										---	---	---
13										---	---	---
14										---	---	---
15										---	---	---
16										---	---	---
17										---	---	---
18										---	8.47	---
19										9.93	8.14	8.99
20										9.57	7.93	8.71
21										8.83	7.64	8.24
22										9.01	7.74	8.17
23										9.35	8.51	8.79
24										9.52	8.71	9.02
25										9.94	9.04	9.37
26										10.59	9.51	9.90
27										10.31	8.85	9.42
28										9.74	8.54	9.00
29										9.80	8.47	9.02
30										10.08	8.60	9.27
31										10.36	8.98	9.57
MONTH										---	---	---

COWLITZ RIVER BASIN

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14245150 COWLITZ RIVER AT LONGVIEW, WA--Continued

GAGE HEIGHT (FEET ABOVE DATUM), WATER YEAR MAY TO SEPTEMBER 1984

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	JUNE			JULY			AUGUST			SEPTEMBER		
1	10.59	9.09	9.71	10.50	8.63	9.42	6.98	5.11	5.79	6.16	4.21	4.91
2	10.58	9.07	9.69	10.02	8.20	8.99	6.57	4.79	5.44	5.91	4.06	4.54
3	10.46	8.89	9.56	9.32	7.82	8.48	6.41	4.68	5.17	5.45	4.01	4.38
4	10.21	8.74	9.45	8.40	7.27	7.83	6.10	4.62	5.02	5.55	4.01	4.32
5	10.13	8.88	9.49	8.46	7.16	7.56	5.74	4.53	4.79	5.75	4.16	4.59
6	9.97	8.61	9.35	8.40	7.03	7.48	5.80	4.51	4.77	6.06	4.33	4.83
7	9.95	8.61	9.19	8.31	7.07	7.38	5.88	4.61	4.96	6.20	4.43	4.99
8	10.07	8.81	9.28	8.30	6.96	7.39	6.30	4.51	5.08	6.49	4.34	5.10
9	10.41	8.79	9.41	8.51	7.09	7.44	6.86	4.50	5.27	6.43	4.20	4.91
10	10.37	8.66	9.30	8.19	6.34	6.90	6.78	4.45	5.19	5.99	4.13	4.75
11	10.47	8.52	9.27	7.75	6.07	6.52	6.50	4.19	5.00	6.14	4.10	4.86
12	10.36	8.38	9.19	7.59	6.03	6.44	6.51	4.18	4.92	6.24	4.33	5.01
13	10.33	8.27	9.11	7.48	5.96	6.37	6.19	4.19	4.82	6.22	4.29	4.97
14	10.21	8.46	9.24	7.25	5.90	6.26	6.16	4.23	4.91	5.78	4.22	4.68
15	10.16	8.28	9.10	7.10	5.84	6.18	6.04	4.28	4.94	6.15	4.21	4.78
16	9.85	8.51	9.09	6.93	5.79	6.14	6.12	4.39	4.95	6.03	4.04	4.65
17	9.80	8.63	9.17	6.80	5.75	6.12	5.99	4.39	4.90	5.90	4.04	4.55
18	9.67	8.70	9.18	6.59	5.74	6.03	5.74	4.47	4.80	5.41	4.16	4.49
19	9.45	8.49	9.00	6.41	5.67	5.88	5.53	4.23	4.61	5.45	4.14	4.44
20	9.59	8.53	8.97	6.21	5.58	5.75	5.44	4.11	4.42	5.82	4.01	4.43
21	9.96	9.00	9.36	6.23	5.46	5.63	5.50	4.16	4.53	5.84	4.01	4.53
22	9.99	9.20	9.47	6.24	5.39	5.56	6.01	4.43	4.70	6.21	4.21	4.82
23	10.05	9.09	9.42	6.31	5.35	5.52	6.09	4.28	4.83	6.40	4.33	5.00
24	9.91	8.88	9.25	6.34	5.32	5.54	6.54	4.45	5.08	6.17	4.23	4.87
25	9.81	8.79	9.20	6.68	5.30	5.64	6.99	4.28	5.22	6.55	4.35	5.21
26	10.00	8.73	9.26	6.88	5.31	5.73	7.19	4.16	5.24	7.00	4.72	5.45
27	10.24	8.88	9.47	7.23	5.32	5.88	7.28	4.20	5.33	7.02	4.74	5.46
28	10.63	9.01	9.71	7.66	5.34	6.07	7.17	4.44	5.45	6.66	4.70	5.26
29	11.02	9.33	10.00	7.83	5.35	6.08	6.91	4.51	5.38	6.78	4.68	5.24
30	10.78	9.12	9.78	7.22	5.36	5.87	7.15	4.39	5.38	6.37	4.71	5.17
31	---	---	---	7.07	5.33	5.91	6.78	4.46	5.26	---	---	---
MONTH	11.02	8.27	9.36	10.50	5.30	6.58	7.28	4.11	5.04	7.02	4.01	4.84

COLUMBIA RIVER MAIN STEM

14245300 COLUMBIA RIVER AT LONGVIEW, WA

LOCATION.--Lat 46°06'22", long 122°57'14", in SE¼NE¼ sec.8, T.7 N., R.2 W., Cowlitz County, Hydrologic Unit 17080003, on right bank, at the Port of Longview, 2,000 ft upstream from Longview Bridge, 2.1 mi downstream from Cowlitz River and at mile 66.2.

DRAINAGE AREA.--256,700 mi², approximately.

PERIOD OF RECORD.--November 1983 to September 1984 (gage heights only).

GAGE.--Water-stage recorder. Datum of gage is Columbia River Datum, 0.34 ft below National Geodetic Vertical Datum of 1929.

REMARKS.--Flow regulated by many reservoirs upstream.

EXTREMES FOR CURRENT PERIOD.--Maximum gage height November 1983 to September 1984, 10.66 ft Feb. 16; minimum recorded gage height, 1.22 ft Sept. 19, 20, but may have been less during period of no gage-height record Aug. 6, 7, 21, 22 and Sept. 4, 5, 24.

GAGE HEIGHT (FEET ABOVE DATUM), WATER YEAR NOVEMBER 1983 TO SEPTEMBER 1984

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	OCTOBER			NOVEMBER			DECEMBER			JANUARY		
1				---	---	---	8.52	4.77	6.32	7.88	3.43	5.52
2				---	---	---	8.97	5.01	6.61	8.05	3.63	5.60
3				---	---	---	9.21	4.64	6.65	8.49	3.67	6.14
4				---	---	---	8.53	3.78	6.15	8.64	4.52	6.60
5				---	---	---	8.84	3.78	6.26	8.75	5.05	7.00
6				---	---	---	8.81	4.66	6.75	8.24	5.40	6.80
7				---	---	---	8.08	4.86	6.30	7.79	5.05	6.54
8				---	---	---	8.49	4.68	6.78	7.35	4.69	6.10
9				---	---	---	8.25	4.99	6.82	7.15	4.43	5.85
10				---	---	---	7.84	5.49	6.76	7.50	4.54	5.88
11				---	---	---	7.52	4.98	6.28	7.21	4.45	5.60
12				---	---	---	6.93	4.45	5.80	7.03	4.19	5.24
13				---	---	---	7.68	4.70	6.02	6.83	3.83	5.00
14				---	---	---	7.85	5.04	6.19	7.08	3.60	5.07
15				---	---	---	7.93	5.14	6.19	7.22	3.56	5.12
16				---	---	---	8.04	5.10	6.26	8.03	3.90	5.62
17				---	---	---	8.28	5.01	6.41	8.39	4.12	5.93
18				---	---	---	8.66	4.77	6.51	8.71	4.13	6.10
19				---	---	---	9.13	5.07	6.74	8.76	4.11	6.19
20				---	---	---	8.77	4.73	6.66	8.68	3.94	6.16
21				---	---	---	8.92	4.67	6.76	8.20	4.30	6.08
22				---	---	---	8.63	5.16	6.64	8.22	3.52	5.82
23				9.37	---	---	7.65	4.70	6.11	7.67	3.46	5.58
24				10.27	5.49	8.01	6.44	4.10	5.17	8.17	4.49	6.20
25				8.55	6.02	7.26	6.11	3.22	4.64	8.58	5.34	6.62
26				7.90	5.24	6.62	6.76	2.38	4.53	8.28	5.56	6.56
27				7.57	4.91	6.17	7.11	2.52	4.58	8.08	5.04	6.33
28				7.45	4.21	5.65	6.71	2.78	4.34	7.78	4.47	6.01
29				7.45	3.98	5.56	7.15	2.98	4.66	7.36	3.64	5.43
30				8.14	4.17	5.91	8.22	3.94	5.65	7.40	3.43	5.29
31				---	---	---	8.16	3.76	5.77	7.95	3.73	5.58
MONTH				---	---	---	9.21	2.38	6.04	8.76	3.43	5.92

14245300 COLUMBIA RIVER AT LONGVIEW, WA--Continued

GAGE HEIGHT (FEET ABOVE DATUM), WATER YEAR NOVEMBER 1983 TO SEPTEMBER 1984

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
FEBRUARY			MARCH			APRIL			MAY			
1	7.62	3.61	5.46	7.89	3.83	5.97	8.13	5.13	6.69	8.53	5.36	7.08
2	7.45	3.59	5.47	7.69	3.77	5.69	7.74	4.41	6.00	9.30	6.01	7.43
3	7.35	3.65	5.44	7.17	3.70	5.32	7.59	4.39	5.87	9.09	6.11	7.51
4	6.76	3.17	4.88	6.96	3.66	5.36	7.80	4.45	5.90	9.19	6.31	7.64
5	6.58	2.84	4.67	6.87	3.79	5.29	7.71	4.52	5.88	8.90	5.91	7.27
6	6.35	2.60	4.58	6.86	3.38	5.00	7.23	3.64	5.28	7.94	5.20	6.53
7	6.61	3.07	4.83	6.94	3.28	4.85	7.49	4.46	5.86	7.49	5.06	6.30
8	7.00	3.37	4.99	6.85	3.43	4.80	7.77	4.86	6.18	7.37	5.01	6.29
9	7.22	3.79	5.38	6.82	3.32	4.72	7.25	4.65	5.99	7.49	4.98	6.33
10	7.65	4.00	5.38	6.48	2.89	4.43	7.93	5.45	6.64	8.37	5.37	6.42
11	7.30	4.04	5.34	6.15	2.77	4.38	8.23	5.91	7.09	8.98	6.48	7.64
12	8.19	4.27	5.91	7.51	3.80	5.43	9.14	6.26	7.67	9.30	6.19	7.54
13	8.80	5.19	6.56	7.55	4.22	5.73	8.73	6.24	7.41	9.54	6.20	7.57
14	9.41	6.27	7.56	8.51	4.55	6.34	9.31	6.43	7.89	9.51	5.83	7.46
15	10.24	6.95	8.33	9.21	5.29	6.86	9.68	6.00	7.73	9.68	6.47	7.98
16	10.66	6.74	8.72	9.63	5.91	7.48	9.51	6.04	7.65	10.11	7.26	8.54
17	10.06	6.23	8.08	10.03	6.27	8.05	9.84	6.43	7.97	10.23	7.50	8.70
18	9.61	6.06	7.66	9.70	6.24	7.91	9.99	6.45	8.08	9.81	7.23	8.40
19	9.11	5.75	7.41	9.72	6.13	7.74	10.13	7.02	8.35	9.36	6.85	8.10
20	9.22	5.55	7.28	9.71	5.88	7.55	9.43	6.55	7.83	8.88	6.45	7.66
21	9.21	5.39	6.92	9.68	5.79	7.33	8.56	6.34	7.38	8.03	6.04	7.10
22	8.55	5.14	6.53	8.82	5.76	7.02	8.34	6.47	7.41	8.13	6.12	7.03
23	8.50	5.40	6.63	8.76	6.17	7.23	7.79	5.99	7.03	8.51	6.78	7.48
24	8.45	5.54	6.80	8.19	6.01	7.03	7.55	6.11	6.93	8.87	7.07	7.71
25	8.07	5.05	6.56	7.78	5.68	6.77	7.61	5.70	6.66	9.55	7.52	8.09
26	7.06	4.02	5.64	7.60	5.40	6.64	7.58	5.80	6.67	9.73	7.78	8.53
27	7.23	3.94	5.55	7.06	4.77	5.94	7.83	5.82	6.74	9.25	6.61	7.69
28	7.72	4.17	5.83	7.77	5.43	6.53	8.01	5.50	6.76	8.64	6.10	7.21
29	7.85	4.38	6.00	7.81	5.36	6.68	7.76	4.84	6.15	8.84	6.32	7.52
30	---	---	---	7.75	5.22	6.50	7.78	4.72	6.18	9.35	6.62	7.92
31	---	---	---	8.24	5.68	6.87	---	---	---	9.49	7.00	8.18
MONTH	10.66	2.60	6.22	10.03	2.77	6.24	10.13	3.64	6.86	10.23	4.98	7.51

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
JUNE			JULY			AUGUST			SEPTEMBER			
1	9.74	7.26	8.40	9.74	6.89	8.17	6.72	2.08	4.37	6.15	1.79	3.65
2	9.75	7.31	8.41	9.44	6.74	7.97	6.44	1.79	4.00	5.87	1.57	3.36
3	9.59	7.18	8.30	8.54	5.59	7.09	6.26	1.66	3.68	5.35	1.39	3.14
4	9.42	6.90	8.18	7.43	4.26	5.98	5.94	1.63	3.42	5.46	---	---
5	9.22	7.12	8.22	7.66	4.33	5.73	5.50	1.36	3.04	5.80	---	---
6	9.18	6.92	8.12	7.67	4.26	5.67	5.52	---	---	5.99	1.23	3.50
7	9.16	6.95	7.96	7.57	4.00	5.36	5.62	---	---	6.10	1.52	3.77
8	9.40	7.21	8.02	7.54	4.10	5.41	6.11	1.66	3.83	6.42	1.81	4.00
9	9.67	7.31	8.25	7.80	4.01	5.38	6.78	2.20	4.27	6.39	1.63	3.82
10	9.68	7.13	8.14	7.48	3.18	4.99	6.72	1.74	3.97	5.94	1.29	3.58
11	9.84	6.98	8.16	7.34	2.66	4.69	6.44	1.39	3.78	6.10	1.65	3.82
12	9.79	6.76	8.08	7.21	2.52	4.63	6.48	1.71	3.92	6.14	1.89	3.96
13	9.77	6.62	8.01	7.10	2.41	4.58	6.14	1.33	3.67	6.15	2.06	3.92
14	9.61	6.96	8.17	6.79	2.28	4.38	6.04	1.59	3.79	5.72	1.48	3.39
15	9.51	6.50	7.89	6.62	2.16	4.26	5.91	1.72	3.83	6.13	1.47	3.63
16	8.98	6.49	7.68	6.42	2.18	4.27	5.97	1.70	3.73	6.01	1.97	3.71
17	8.86	6.77	7.80	6.25	2.51	4.40	5.83	1.80	3.64	5.85	1.87	3.55
18	8.69	6.93	7.83	5.91	2.49	4.25	5.48	1.83	3.42	5.28	1.62	3.27
19	8.58	6.95	7.81	5.62	2.24	3.88	5.32	1.47	2.96	5.32	1.22	3.05
20	8.63	7.00	7.79	5.29	1.78	3.44	5.19	1.51	2.94	5.76	1.22	3.25
21	8.70	7.28	7.90	5.43	1.60	3.05	5.30	---	---	5.75	1.27	3.40
22	8.89	7.35	7.90	5.55	1.98	3.20	5.93	---	---	6.17	1.45	3.63
23	8.91	7.41	7.93	5.74	1.66	3.23	5.95	1.39	3.52	6.38	1.37	3.62
24	8.93	7.11	7.74	5.93	1.46	3.34	6.48	1.70	3.92	6.16	---	---
25	8.81	6.73	7.61	6.27	1.61	3.71	6.95	1.82	4.16	6.44	1.51	3.91
26	9.06	6.69	7.74	6.53	1.67	3.90	7.19	1.95	4.37	6.95	1.75	4.17
27	9.38	6.94	8.11	7.00	1.84	4.27	7.31	2.12	4.52	6.96	1.91	4.14
28	9.93	7.34	8.54	7.49	2.42	4.74	7.16	1.94	4.45	6.60	1.78	3.84
29	10.38	7.61	8.81	7.69	2.43	4.71	6.88	1.81	4.31	6.74	1.48	3.80
30	10.04	7.17	8.45	6.99	1.81	4.23	7.12	2.16	4.42	6.23	1.77	3.82
31	---	---	---	6.83	1.96	4.33	6.73	2.16	4.27	---	---	---
MONTH	10.38	6.49	8.07	9.74	1.46	4.75	---	-	---	---	---	---

COLUMBIA RIVER BASIN

Discharge at ungaged sites

Monthly records for the following sites have been computed by routing methods described in USGS Circular 550. Circular 550 contains monthly records for these sites for water years 1928-65, including monthly flows adjusted for major upstream storage. Figures given here represent unadjusted flows, and are rated fair. Adjusted records are available from the Oregon office of the U.S. Geological Survey, Portland, Oregon.

- 14144700 COLUMBIA RIVER AT VANCOUVER, WA.--Lat 45°37'15", long 122°40'20", in NE¼NW¼ sec.34, T.2 N., R.1 E., Clark County, Hydrologic Unit 17080001, 5.0 mi upstream from Willamette River, and at mile 106.5. Drainage area, 241,000 mi², approximately. Records available, monthly discharge October 1927 to current year. Daily discharge for October 1963 to September 1969, published in annual data reports for Oregon, 1965-67, 1969.
- 14222870 COLUMBIA RIVER AT SAINT HELENS, OR.--Lat 45°51'58", long 122°47'00", Columbia County, Hydrologic Unit 17080003, center of channel at intersection of Township (4/5N) line and Oregon-Washington boundary, 0.6 mi east of Saint Helens and at mile 86.0. Drainage area, 253,900 mi², approximately. Records available, monthly discharge October 1927 to current year.
- 14245300 COLUMBIA RIVER AT LONGVIEW, WA.--Lat 46°06'22", long 122°57'14", Cowlitz County, Hydrologic Unit 17080003, at Longview Bridge, 1.0 mi south of Longview, 2.0 mi downstream from Cowlitz River, and at mile 66.0. Drainage area, 256,700 mi², approximately. Records available, monthly discharge October 1927 to current year.
- 14280000 COLUMBIA RIVER AT MOUTH, NEAR ASTORIA, OR.--Lat 46°15', long 124°05', Clatsop County, Hydrologic Unit 17080006, center of channel at river mouth, due north from original end of south jetty, 12.3 mi northwest of Astoria, and at mile 0. Drainage area, 258,000 mi², approximately. Records available, monthly discharge October 1927 to current year.

MONTHLY AND ANNUAL MEAN DISCHARGE IN CUBIC FEET PER SECOND
WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984

OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT	ANNUAL
14144700 COLUMBIA RIVER AT VANCOUVER, WA												
122,200	157,600	206,800	220,700	233,000	244,900	302,000	336,000	372,300	219,100	146,200	124,300	224,000
14222870 COLUMBIA RIVER AT SAINT HELENS, OR												
139,600	232,100	292,100	287,600	300,100	307,800	351,700	385,200	416,300	233,700	156,200	142,300	270,500
14245300 COLUMBIA RIVER AT LONGVIEW, WA												
145,100	265,000	310,400	306,700	315,600	322,200	364,200	399,300	431,900	241,200	160,200	146,300	284,100
14280000 COLUMBIA RIVER AT MOUTH, NEAR ASTORIA, OR												
146,900	280,300	324,700	317,300	326,000	332,000	370,700	404,000	438,300	256,400	162,700	149,000	291,900

Crest-stage partial-record stations

The following table contains annual maximum discharge for crest-stage stations. A crest-stage gage is a device which will register the peak stage occurring between inspections of the gage. A stage-discharge relation for each gage is developed from discharge measurements made by indirect measurements of peak flow or by current meter. The date of the maximum discharge is not always certain but is usually determined by comparison with nearby continuous-record stations, weather records, or local inquiry. Only the maximum discharge for each water year is given. Information on some lower floods may have been obtained and discharge measurements may have been made for purposes of establishing the stage-discharge relation, but these are not published herein. The years given in the period of record represent water years for which the annual maximum has been determined.

Annual maximum discharge at crest-stage partial-record stations during water year 1984

Station no.	Station name	Location	Drainage area (mi ²)	Period of record	Date	Annual maximum Gage height (ft)	Discharge (ft ³ /s)
Quillayute River basin							
12042900	Grader Creek near Forks, WA	Lat 47°55'40", long 124°24'25", in SW1/4 sec.17, T.28 N., R.13 W., Clallam County, at U.S. Highway 101, 2 mi southwest of Forks.	1.67	1950-	11-15-83	20.64	297
McAllister Creek basin							
12081300	Eaton Creek near Yelm, WA	Lat 46°58'05", long 122°43'30", in S1/2 sec.7, T.17 N., R.1 E., Thurston County, at county road, 6 mi northwest of Yelm.	2.28	1960-	1-25-84	5.32	35
Lake Washington basin							
12115300	Green Point Creek near Cedar Falls, WA	Lat 47°23'20", long 121°40'30", in SE1/4 sec.17, T.22 N., R.9 E., King County, at road crossing near mouth, 5 mi southeast of Cedar Falls.	.89	1957-	1-24-84	15.14	113
Skagit River basin							
12189400	Sauk River tributary near Darrington, WA	Lat 48°20'30", long 121°33'00", in SE1/4 sec.18, T.33 N., R.10 E., Skagit County, at old country road, 6.5 mi northeast of Darrington.	1.30	1951-70, 1978-	1- 4-84	75.49	106
Nooksack River basin							
12204400	Nooksack River tributary near Glacier, WA	Lat 48°54'30", long 121°48'20", in SW1/4 sec.32, (unsurveyed), T.40 N., R.8 E., Whatcom County, at State Highway 542, 6.5 mi east of Glacier.	1.15	1956-60, 1962-	6-15-74 7- 8-75 1-18-77 12- 2-77 5-21-80 12-26-80 6-19-82 1- 4-84	15.94 15.80 15.88 16.06 15.85 16.01 15.82 16.43	a45 a36 a42 a52 a44 a50 a43 68
12212800	Tenmile Creek tributary no. 2 near Bellingham, WA	Lat 48°50'35", long 122°24'30", 0.2 mi north from center of sec.27, T.39 N., R.3 E., Whatcom County, at Starry Road, 2.8 mi northwest of Noon, and 7 mi northeast of Bellingham.	.24	1956-	12- 3-75 1- 4-84	7.96 7.72	a40 38
Pend Oreille River basin							
12396000	Calispell Creek near Dalkena, WA	Lat 48°14'40", long 117°20'26", in NE1/4 sec.26, T.32 N., R.43 E., Pend Oreille County, 2.4 mi upstream from Calispell Lake, and 4.8 mi west of Dalkena.	68.3	1950-73†, 1974-84	4-18-84	7.70	590
12396100	Winchester Creek near Cusick, WA	Lat 48°16'52", long 117°21'44", in NW1/4 sec.15, T.32 N., R.43 E., Pend Oreille County, at county road around Calispell Lake, and 4.8 mi southwest of Cusick.	16.8	1954-84	4-18-84	10.77	83
Methow River basin							
12447380	Pine Creek near Mazama, WA	Lat 48°34'48", long 120°37'33", in NE1/4 sec.32, T.36 N., R.18 E., Okanogan County, at State Highway 20, 10 mi west of Mazama.	4.63	1966-84	5-30-84	19.53	124
Wenatchee River basin							
12461200	East Branch Mission Creek tributary near Cashmere, WA	Lat 47°22'50", long 120°29'20", in SW1/4 sec.20, T.22 N., R.19 E., Chelan County, at U.S. Forest Service road, 9.7 mi south of Cashmere.	2.49	1955-84	3-20-84	10.82	4.7

† Operated as a continuous-record gaging station.

a Revised.

DISCHARGE AT PARTIAL-RECORD STATIONS AND MISCELLANEOUS SITES

Crest-stage partial-record stations--Continued

Annual maximum discharge at crest-stage partial-record stations during water year 1984

Station no.	Station name	Location	Drainage area (mi ²)	Period of record	Date	Annual maximum Gage height (ft)	Dis- charge (ft ³ /s)
Yakima River basin							
12491700	Hause Creek near Rimrock, WA	Lat 46°40'33", long 121°04'49", in NE¼ sec.28, T.14 N., R.14 E., Yakima County, at State Highway 14, 0.1 mi west of Tieton Ranger Station, and 2.5 mi east of Rimrock.	3.91	1955-84	1- 4-84	6.72	32
Palouse River basin							
13349300	Palouse River tributary at Colfax, WA	Lat 46°53'22", long 117°22'59", in SE¼SW¼ sec.10, T.16 N., R.43 E., Whitman County, at U.S. Highway 295, about 1 mi west of Colfax.	2.10	1955-84	3-15-84	17.73	33
Klickitat River basin							
14112200	Little Klickitat River tributary near Goldendale, WA	Lat 45°50'15", long 120°47'50", in NW¼ sec.15, T.4 N., R.16 E., Klickitat County, at county at county road, 1.5 mi northeast of Goldendale.	.71	1960-84	1- 4-84	8.70	16
Cowlitz River basin							
14226900	Skate Creek trib- utary no. 2 near Packwood, WA	Lat 46°40'30", long 121°45'10", in NE¼ sec.26, T.14 N., R.8 E., Lewis County, at Skate Creek Road, 6 mi northwest of Packwood.	1.82	1959-75, 1978-	1-24-84	10.23	74

DISCHARGE AT PARTIAL-RECORD STATIONS AND MISCELLANEOUS SITES

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Discharge measurements made at miscellaneous sites during water year 1984

Stream	Tributary to	Location	Drainage area (mi ²)	Measured previously (water years)	Measurements Date	Discharge (ft ³ /s)
Willapa River basin						
12011500 Willapa River	Willapa Bay	Lat 46°33'50", long 123°33'49", in SW¼SW¼ sec.33, T.13 N., R.7 W., Pacific County, 0.2 mi downstream from bridge on State Highway 6, 0.5 mi west of Lebam, and at mile 33.9.	41.4	1948-71†, a 1972-74, 1978-83	11-15-83 1-10-84 2-29-84 5- 9-84 7-12-84 9-11-84	2,190 183 256 173 35.0 13.5
Chehalis River basin						
12020565 Chehalis River	Grays Harbor	Lat 46°37'54", long 123°14'51", in NW¼NE¼ sec.12, T.13 N., R.5 W., Lewis County, at Chandler Road bridge, 1.0 mi west of Rainbow Falls State Park bridge, 1.3 mi east of Doty, and at mile 97.8.	---	1978-83	11-15-83 1- 9-84 5-10-84 9-11-84	6,300 1,000 728 96.9
12022250 Chehalis River	do.....	Lat 46°37'40", long 123°03'35", in SW¼NE¼ sec.9, T.13 N., R.3 W., Lewis County, at State Highway 6 bridge at Adna, and at mile 81.3.	383	1972, 1975-83	7-16-84 8-14-84	228 104
12024100 South Fork Newaukum River	Newaukum River	Lat 46°36'14", long 122°51'15", in NW¼NE¼ sec.19, T.13 N., R.1 W., Lewis County, at county bridge 0.3 mi northeast of Forest, 0.2 mi upstream from North Fork Newaukum River, and at mile 11.1.	66.2	1976-83	7-16-84 8-14-84	66.1 37.2
12024500 North Fork Newaukum River	do.....	Lat 46°39'17", long 122°46'45", in NW¼SW¼ sec.35, T.14 N., R.1 W., Lewis County, at county road 1.4 mi upstream from Lucas Creek, 5.5 mi northeast of Forest, and at mile 6.6.	31.5	1942-43, 1944-45†, 1957-66†, 1967, 1976-83	7-16-84 8-14-84	27.8 12.4
12029500 Garrard Creek	Chehalis River	Lat 46°48'34", long 123°16'15", in SW¼SE¼ sec. 2, T.15 N., R.5 W., Grays Harbor County, at county road 2.8 mi southwest of Oakville, and at mile 2.6.	26.5	1942-43, 1944-45†, 1958, 1961, 1976-83	7-16-84 8-14-84	13.9 5.26
12032500 Cloquallum Creek	do.....	Lat 47°00'17", long 123°23'11", in SW¼NW¼ sec.36, T.18 N., R.6 W., Grays Harbor County, 10 ft downstream from State Highway 12 bridge, 1.7 mi east of Elma, 1.9 mi downstream from Wildcat Creek, and at mile 1.9.	64.9	1942-43†, 1944-72†, a 1973-79, 1974-83	7-17-84 8-15-84	58.6 39.6
12038005 Wishkah River	do.....	Lat 47°04'20", long 123°46'09", in NE¼SW¼ sec.2, T.18 N., R.9 W., Grays Harbor County, at Wishkah Road, 0.1 mi upstream from East Fork, 1.0 mi north of Aberdeen Gardens, and at mile 12.3.	59.9	1956, 1962-64, 1966, 1976-83	7-17-84 8-15-84	74.7 47.0
Hoquiam River basin						
12038660 East Fork Hoquiam River	Hoquiam River	Lat 47°03'32", long 123°50'04", in NW¼SW¼ sec.8, T.18 N., R.9 W., Grays Harbor County, 0.2 mi upstream from Berryman Creek, 3.0 mi west of Aberdeen Gardens, and at mile 7.3.	25.8	1942-43, 1976-83	7-17-84 8-15-84	35.4 22.7
Humtullips River basin						
12039000 Humtullips River	Grays Harbor	Lat 47°13'42", long 123°56'23", in NE¼NE¼ sec.17, T.20 N., R.10 W., Grays Harbor County, on right bank, 1.0 mi southeast of Humtullips, 2.3 mi upstream from Stevens Creek, 3.3 mi downstream from confluence of East and West Forks, and at mile 24.8.	130	1933-35†, 1942, 1942-79†, 1980-82	12- 8-83 1-11-84 5- 7-84 7-10-84 9- 7-84	1,490 1,710 1,090 332 332
Hamma Hamma River basin						
12054500 Hamma Hamma River	Hood Canal	Lat 47°35'18", long 123°06'57", in SE¼NW¼ sec.7, T.24 N., R.3 W., Mason County, Olympic National Forest, 0.3 mi downstream from Watson Creek, 4.6 mi northwest of Eldon, and at mile 6.2.	51.3	1952-71†, a 1972-79, 1977, 1981-83	1-12-84 4-20-84 6-20-84 8-17-84	429 320 458 124
Skokomish River basin						
12062500 Purdy Creek	Skokomish River	Lat 47°17'56", long 123°10'50", in NW¼NW¼ sec.22, T.21 N., R.4 W., Mason County, 0.2 mi upstream from State Fish Hatchery, 5.5 mi southwest of Union, and at mile 1.4.	---	1954-60†, 1981-83	6-28-84 8-17-84	23.2 18.3

† Operated as a continuous-record gaging station.

a Operated as a crest-stage gage.

DISCHARGE AT PARTIAL-RECORD STATIONS AND MISCELLANEOUS SITES

Discharge measurements made at miscellaneous sites during water year 1984--Continued

Stream	Tributary to	Location	Drainage area (mi ²)	Measured previously (water years)	Measurements Date Discharge (ft ³ /s)
Deschutes River basin					
12079004 Deschutes River	Budd Inlet	Lat 46°52'23", long 122°43'44", in SE¼NW¼ sec.18, T.16 N., R.1 E., Thurston County, at State High- way 507, 2.2 mi southwest of Rainier, and at mile 21.6.	101	1980-83	11-10-83 384 1- 6-84 581 3-14-84 429 5-10-84 229 7-16-84 74.1 9- 6-84 67.5
12080010 Deschutes River	do.....	Lat 47°00'42", long 122°54'07", in NW¼ Land Grant 60, T.18 N., R.2 W., Thurston County, at "E" Avenue Bridge in Tumwater, 0.2 mi upstream from Capitol Boulevard, and at mile 2.4.	162	1971-72, 1975, 1977-83	11-14-83 1,390 1- 5-84 1,110 3-14-84 598 5-10-84 395 7-19-84 162 9- 6-84 119
McAllister Creek basin					
12081300 Easton Creek	Lake St. Clair	Lat 46°58'05", long 122°43'30", in S-1/2 sec.7, T.17 N., R.1 E., Thurston County, at county road, 6.0 mi northwest of Yelm.	2.28	a1960-83 1968,1975	11-14-83 9.98
Chambers Creek basin					
12091500 Chambers Creek	Puget Sound	Lat 47°11'55", long 122°31'45", in NE¼NE¼ sec.27, T.20 N., R.2 E., Pierce County, 300 ft downstream from Leach Creek, 1.5 mi downstream from outlet of Stellacoom Lake, and 4.0 mi northeast of Stellacoom.	104	1938-40†, 1941, 1943-65‡, 1966, 1972,1973 1975,1976	9-27-83 48.1 11- 1-83 68.0 12-14-83 165 3-29-84 194 6- 1-84 115 8-23-84 63.8
Puyallup River basin					
12093900 Carbon River	Puyallup River	Lat 47°00'47", long 122°00'42", in SW¼SW¼ sec.26, T.18 N., R.6 E., Pierce County, at Fairfax, 0.7 mi downstream from Evans Creek, and at mile 17.7.	76.2	1906, 1911-12‡, 1966-78‡, 1979-83	2-15-84 369 4- 3-84 260 6-12-84 524 8- 1-84 474
12096500 Puyallup River	Commencement Bay	Lat 47°11'07", long 122°13'42", on line between sec.25, T.20 N., R.4 E., and sec.30, T.20 N., R.5 E., Pierce County, at State Highway 162, 1.0 mi north of Alderton, 1.0 mi south of Sumner, and at mile 12.2.	438	1914, 1915-27‡, 1944-57, 1982,1983	10- 5-83 739 10-17-83 454 11-18-83 4,190 5-16-84 2,900 6- 8-84 2,920 8-10-84 1,550
12101110 White River	Puyallup River	Lat 47°12'15", long 122°14'10", in NW¼SW¼ sec.24, T.20 N., R.4 E., Pierce County, at Main Street bridge on northwest edge of Sumner, and at mile 0.7.	494	1972, 1977-83	10-18-83 1,880 12-13-83 1,970 2-16-84 2,400 3- 7-84 1,800 4- 6-84 1,840 6-14-84 2,190 8-10-84 1,100
Snohomish River basin					
Tye River	South Fork Skykomish River	Lat 47°42'38", long 121°09'22", in SW¼SW¼ sec.29, T.26 N., R.13 E., King County, Snoqualmie National Forest, at road bridge, 0.2 mi upstream from Surprise Creek at Scenic, and at mile 77.3.	---	1983	10-14-83 18.2 11-15-83 113 12-15-83 38.6 1-18-84 71.0 2-14-84 66.7 3-15-84 71.0 4-15-84 110 5-15-84 169 6-15-84 397 7-16-84 132 8-15-84 24.2 9-15-84 24.1
12131500 West Fork Miller River	do.....	Lat 47°40'17", long 121°23'28", in NE¼NE¼ sec.16, T.25 N., R.11 E., King County, Snoqualmie National Forest, at road bridge 0.3 mi upstream from East Fork Miller River, and 3.3 mi southwest of Skykomish.	13.8	1911‡, 1983	10-14-83 9.47 11-18-83 370 12-15-83 80.6 1-18-84 26.2 2-14-84 95.5 3-15-84 90.3 4-15-84 174 5-15-84 180 6-15-84 334 7-16-84 147 8-15-84 21.0 9-15-84 19.0

† Operated as a continuous-record gaging station.

a Operated as a crest-stage gage.

DISCHARGE AT PARTIAL-RECORD STATIONS AND MISCELLANEOUS SITES

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Discharge measurements made at miscellaneous sites during water year 1984--Continued

Stream	Tributary to	Location	Drainage area (mi ²)	Measured previously (water years)	Measurements Discharge Date (ft ³ /s)
Snohomish River basin--Continued					
12133500 Troublesome Creek	North Fork Skykomish River	Lat 47°54'00", long 121°23'50", SW¼NE¼ sec.21, T.28 N., R.11 E., King County, 0.25 mi upstream from mouth, and 9.0 mi northeast of Index.	12.8	1929-41†, 1942, 1946, 1947	9-14-84 83.9
12141100 Skykomish River	Snohomish River	Lat 47°51'08", long 121°57'29", in NE¼NE¼ sec.12, T.27 N., R.6 E., Snohomish County, at State High- way 203 bridge, at south city limits of Monroe.	834	1922, 1951, 1955, 1958-67, 1959, 1967-83	10- 5-83 1,740 1-19-84 3,150 7- 3-84 8,670 9- 4-84 1,150
12143100 North Fork Snoqualmie River	Snoqualmie River	Lat 47°31'19", long 121°46'07", in SE¼NW¼ sec.34, T.24 N., R.8 E., King County, at highway bridge 2 mi northeast of North Bend, and 0.3 mi upstream from confluence with Middle Fork Snoqualmie River.	103	1907, 1908-26†, 1929-38†, 1939, 1981-83	5- 2-84 1,210 8-22-84 102
12145000 Tokul Creek	do.....	Lat 47°33'13", long 121°50'09", in SW¼NW¼ sec.19, T.24 N., R.8 E., King County, 200 ft upstream from fish hatchery diversion, 600 ft downstream from State Highway 522, and 1.8 mi northeast of Snoqualmie.	32.2	1907-14†, 1926, 1927, 1929-31†, 1945, 1957, a 1959-61, 1962-83	11- 9-83 122 1-17-84 135 3- 5-84 95.2 4-30-84 81.5 7-12-84 60.2 9- 4-84 32.9
12150700 Snoqualmie River	Snohomish River	Lat 47°48'14", long 122°00'07", in NE¼NW¼ sec.26, T.27 N., R.6 E., Snohomish County, at county bridge 4.5 mi southeast of Monroe, 4.5 mi north of Duvall, and 1.5 mi upstream from confluence with Skykomish River.	688	1981-83	8- 6-84 1,200 9- 5-84 751
12155400 Pilchuck River	do.....	Lat 47°54'47", long 122°04'56", in NW¼SE¼ sec.18, T.28 N., R.6 E., Snohomish County, at bridge on U.S. Highway 2 at east city limits of Snohomish, and at mile 1.9.	132	1971-74, 1978-83	12- 7-83 408 1-19-84 320 5- 3-84 719 6-21-84 528 8-22-84 60.7
Stillaguamish River basin					
12164200 Jim Creek	South Fork Stillaguamish River	Lat 48°11'02", long 122°04'30", in NE¼SE¼ sec.7, T.31 N., R.6 E., Snohomish County, at Jordan Road bridge 2.3 mi southeast of Arlington, and 300 ft upstream from confluence with mouth.	46.8	1981-83	5-30-84 223 7-26-84 26.1 9-27-84 42.2
12164510 South Fork Stillaguamish River	Stillaguamish River	Lat 48°12'03", long 122°07'04", in NE¼SE¼ sec.2, T.31 N., R.5 E., Snohomish County, at State High- way 530 bridge near northeast corner of Arlington, 0.4 mi upstream from the confluence with the North Fork Stillaguamish River, and at mile 18.2.	255	1966, 1973-75, 1978-83	11-22-83 2,220 3-27-84 2,100 5-16-84 2,390 7-26-84 723 9-26-84 508
12167700 Stillaguamish River	Port Susan	Lat 48°11'48", long 122°12'33", in SW¼SE¼ sec.6, T.31 N., R.5 E., Snohomish County, at Interstate 5, 1.5 mi east of Silvana, 6.7 mi downstream from confluence of North and South Forks of Stillaguamish River, and at mile 11.1.	557	1975†, 1976-83	1-13-83 7,000 11-22-83 4,920 1-24-84 14,000 3-27-84 4,830 5-16-84 5,330 7-26-84 1,360 9-26-84 1,200
Samish River basin					
12201500 Samish River	Samish Bay	Lat 48°32'44", long 122°20'19", in SE¼SE¼ sec.6, T.35 N., R.4 E., Skagit County, 500 ft downstream from bridge on old U.S. Highway 99, 0.5 mi downstream from Friday Creek, 5.0 mi north of Burlington, and at mile 10.3.	87.8	1944-71†, a 1972-79, 1972-74, 1976-83	5- 1-84 178 7-19-84 49.7 8-31-84 31.2
Minor basins between Samish and Nooksack Rivers					
12203000 Whatcom Creek	Bellingham Bay	Lat 48°45'10", long 122°25'40", in NW¼SE¼ sec.28, T.38 N., R.3 E., Whatcom County, in Whatcom Falls Park, 0.7 mi downstream from Lake Whatcom, and 2 mi east of Bellingham.	56.0	1910-14†, 1939-46†, 1973-75, 1981-83	10-18-83 4.11 7-18-84 2.54 9-12-84 0.96

† Operated as a continuous-record gaging station.

a Operated as a crest-stage gage.

DISCHARGE AT PARTIAL-RECORD STATIONS AND MISCELLANEOUS SITES

Discharge measurements made at miscellaneous sites during water year 1984--Continued

Stream	Tributary to	Location	Drainage area (mi ²)	Measured previously (water years)	Measurements Date	Discharge (ft ³ /s)
Nooksack River basin						
North Fork Nooksack River	Nooksack River	Lat 48°50'20", long 122°09'06", in NW¼SW¼ sec.27, T.39 N., R.5 E., Whatcom County, at county bridge (Mosquito Lake Road) 3.3 mi northeast of Deming, and 0.4 mi upstream from confluence with Middle Fork Nooksack River.	293	1948, 1954, 1981-83	10-18-83 7-18-84	409 2,990
Clearwater Creek	Middle Fork Nooksack River	Lat 48°46'30", long 122°02'36", in NW¼NW¼ sec.21, T.38 N., R.6 E., Whatcom County, at county bridge (Mosquito Lake Road) 6.5 mi southeast of Van Zandt, and 3.4 mi northeast of Deming.	21.1	1954-55 1979-83	10-15-83 11-14-83 12-16-83 1-16-84 2-15-84 3-18-84 4-17-84	20.8 176 60.5 84.0 114 95.4 129
12208000 Middle Fork Nooksack River	North Fork Nooksack River	Lat 48°47'06", long 122°06'39", in SW¼NW¼ sec.13, T.38 N., R.5 E., Whatcom County, at county bridge (Mosquito Lake Road) 800 ft downstream from Helsiers Creek, 5.6 mi southeast of Deming, and at mile 5.0.	75.4	1911, 1920, 1920-21+, 1934, 35+, 1955, 1959, 1973, 1979-83	10-10-83 7-18-84 8-28-84	158 551 347
Pend Oreille River basin						
12396000 Callispell Creek	Pend Oreille River	Lat 48°14'40", long 117°20'26", in NE¼SW¼ sec.26, T.32 N., R.43 E., Pend Oreille County, 2.4 mi upstream from Callispell Lake, and 4.8 mi west of Dalkena.	68.3	1950-73+, 1974, 1976-83 a 1974-83	2-29-84 4-26-84 9- 6-84	47.4 242 30.1
12396100 Winchester Creek	Callispell Creek	Lat 48°16'52", long 117°21'44", in NW¼ sec.15, T.32 N., R.43 E., Pend Oreille County, at county road around Callispell Lake, and 4.8 mi southwest of Cusick.	16.8	1957+, 1964-68, 1975, 1977, 1980-83 a 1954-83	4-26-84	60.9
Colville River basin						
12408000 Colville River	Franklin D. Roosevelt Lake	Lat 48°19'11", long 117°49'05", in NW¼NW¼ sec.31, T.33 N., R.40 E., Stevens County, upstream from county road bridge, just downstream from mouth of Blue Creek at town of Blue Creek, 5.5 mi northwest of Chewelah.	428	1923-24+, 1926, 1958-59, 1960-65+, 1975-77, 1979+, 1980-83	7-24-84	114
Spokane River basin						
Little Spokane River	Spokane River	Lat 48°01'01", long 117°16'32", in NW¼NE¼ sec.17, T.29 N., R.44 E., Spokane County, at county road crossing at Elk.	115	1980-82	7-24-84	61.9
Little Spokane River	do.....	Lat 47°53'22", long 117°21'16", in NE¼ sec.34, T.28 N., R.43 E., Spokane County, at county road crossing at Chattaroy.	301	1948+, 1952, 1955-58, 1960-70, 1973, 1977, 1979-81	7-24-84	122
12432000 Little Spokane River	do.....	Lat 47°46'59", long 117°31'43", in SE¼NW¼ sec.5, T.26 N., R.42 E., Spokane County, at State Highway 291 crossing, 1.1 mi upstream from mouth, and 5.3 mi west of Dartford.	700	1903-05, 1912, 1913-14+, 1920-21, 1923-24, 1930-32, 1947-48, 1953, 1955-58, 1960-73, 1977-83	10-13-83 2-23-84 4-18-84	437 823 1,160

+ Operated as a continuous-record gaging station.

a Operated as a crest-stage gage.

Discharge measurements made at miscellaneous sites during water year 1984--Continued

Stream	Tributary to	Location	Drainage area (mi ²)	Measured previously (water years)	Measurements Date	Discharge (ft ³ /s)
Sanpoil River basin						
12434590 Sanpoil River	Franklin D. Roosevelt Lake	Lat 48°05'04", long 118°41'25", in NW¼SW¼ sec.20, T.30 N., R.33 E., Ferry County, Colville Indian Reservation, at county highway bridge 0.4 mi upstream from Jack Creek, and 0.5 mi north of Keller.	900	1963, 1975-77, 1980-83	10-14-83 4-11-84 7-30-84	77.5 1,330 180
Nespelem River basin						
12437505 Nespelem River	do.....	Lat 48°09'55", long 118°58'46", on south line of SE¼SE¼ sec.24, T.31 N., R.30 E., Okanogan County, Colville Indian Reservation, at county bridge at Nespelem, 0.2 mi downstream from millpond, and 3.9 mi upstream from Little Nespelem River.	123	1972-74†, a 1975-79, 1981-83	10-14-83 4-11-84 7-30-84	14.8 309 36.7
Okanogan River basin						
12443600 Similkameen River at Oroville	Okanogan River	Lat 48°56'05", long 119°26'27", in NE¼SW¼ sec.28, T.40 N., R.27 E., Okanogan County, at Twelfth Avenue bridge in Oroville.	3,590	1929-30, 1935, 1937, 1939-40, 1943-44, 1975-83	4-11-84 6-6-84 9-26-84	1,060 7,940 588
12446000 Okanogan River	Columbia River	Lat 48°21'48", long 119°34'36", in SW¼NW¼ sec.16, T.33 N., R.26 E., Okanogan County, at Oak Street (formerly U.S. Highway 97) bridge in Okanogan, 150 ft northwest of Burlington Northern Railway depot, and 0.3 mi upstream from Salmon Creek.	67,900	1911-25†, 1976, 1979-83	5-23-84 7-13-84 9-13-84	6,560 5,690 1,580
Methow River basin						
12447380 Pine Creek	Early Winters Creek	Lat 48°34'48", long 120°37'33", in NE¼ sec.32, T.36 N., R.18 E., Okanogan County, at State Highway 20, 10 mi west of Mazama.	4.63	1967-68, 1971-72, 1975, 1982, 1983 a 1966-83	8-14-84	2.37
Early Winters Creek	Methow River	Lat 48°35'55", long 120°26'31", in NE¼NE¼ sec.26, T.10 N., R.19 E., Okanogan National Forest, Okanogan County, at State Highway 20 bridge at Early Winters Ranger Station, 0.3 mi upstream from mouth, and 1.7 mi northwest of Mazama. Note.--New bridge is at slightly different location than Mazama quad sheet indicates.	---	1975-83	10-12-83 8-16-84	22.1 35.6
Methow River	Columbia River	Lat 48°35'23", long 120°24'20", in NE¼SE¼ sec.25, T.36 N., R.19 E., Okanogan County, Okanogan National Forest, at State Highway 20 bridge 0.2 mi southwest of Mazama, and at mile 65.3.	363	1942, 1967, 1970-72, 1975-83	10-12-83 8-16-84	52.4 177
Chewack River	Methow River	Lat 48°33'53", long 120°10'35", in SE¼NW¼ sec.2, T.35 N., R.21 E., Okanogan County, at road crossing 0.9 mi downstream from Boulder Creek, and 5.4 mi north of Winthrop.	466	1942, 1978-83	10-12-83 8-15-84	98.6 149
12448500 Methow River	Columbia River	Lat 48°28'26", long 120°10'35", in NE¼SW¼ sec.2, T.34 N., R.21 E., Okanogan County, at state highway road crossing, 1,500 ft downstream from Chewack River, at south end of Winthrop.	1,007	1912†, 1948, 1971-72†, 1977-83	10-12-83 8-15-84	338 525
12448998 Twisp River	Methow River	Lat 48°22'12", long 120°08'51", in SE¼SE¼ sec.12, T.33 N., R.21 E., Okanogan County, at county road crossing 0.8 mi west of Twisp city limits, and at mile 1.6.	245	1975-79†, 1980-82	10-13-82 8-2-83 10-12-83 8-16-84	c69.0 c246 75.8 86.3
12449510 Methow River	do.....	Lat 48°21'55", long 120°06'54", in NE¼NW¼ sec.17, T.33 N., R.22 E., Okanogan County, 1,300 ft down- stream from mouth of Twisp River, 0.3 mi east of center of Twisp, and at mile 40.0	1,301	1919-62†, 1967, 1970, d 1975-76, d 1978-79, 1980-83	10-11-83 6-19-84 8-16-84	404 6,760 549
Entiat River basin						
12452990 Entiat River	Columbia River	Lat 47°39'48", long 120°14'58", in NW¼SE¼ sec.18, T.25 N., R.21 E., Chelan County, at bridge 1.2 mi west of Entiat High School, and at mile 1.5.	419	1971-72, 1975-83	11-17-83 3-1-84 4-25-84 8-16-84	320 215 502 294

† Operated as continuous-record gaging station.

a Operated as a crest-stage gage.

b Approximately.

c Not previously published.

d Published these years as at a site 2.7 miles farther downstream, in error.

DISCHARGE AT PARTIAL-RECORD STATIONS AND MISCELLANEOUS SITES

Discharge measurements made at miscellaneous sites during water year 1984--Continued

Stream	Tributary to	Location	Drainage area (mi ²)	Measured previously (water years)	Measurements Date	Discharge (ft ³ /s)
Wenatchee River basin						
12457800 Wenatchee River	do.....	Lat 47°40'34", long 120°43'58", in NE¼SW¼ sec.9, T.25 N., R.17 E., Chelan County, Wenatchee National Forest, at U.S. Highway 2 crossing and Tumwater Campground, 0.4 mi downstream from mouth of Chlwaikum Creek, 4.1 mi south of Winton, and at mile 35.5.	---	1977-83	3- 7-84 8-21-84	944 1,020
12461200 East Branch Mission Creek tributary	East Branch Mission Creek	Lat 47°22'54", long 120°29'20", in NE¼SW¼ sec.20, T.22 N., R.19 E., Chelan County, Wenatchee National Forest, at road crossing, 9.7 mi south of Cashmere.	2.49	1975-77, 1983 a1955-83	5- 2-84 6-22-84	.60 .36
Douglas Creek basin						
Rattlesnake Springs	Rattlesnake Creek	Lat 47°27'03", long 119°45'29", in NW¼NE¼ sec.36, T.23 N., R.24 E., Douglas County, at spring 7.8 mi northeast of Palisades.	---	1978-83	10-19-83 2- 7-84 4- 3-84	.56 .51 1.07
Crab Creek basin						
Sinking Creek	Wilson Creek	Lat 47°40'18", long 118°43'13", in SE¼SW¼ sec. 7, T.25 N., R.33 E., Lincoln County, at State Highway 21 crossing, 7.0 mi south of Wilbur.	---	1961, 1977, 1981-83	1- 6-84 2- 6-84 4- 2-84	3.54 6.83 15.9
Yakima River basin						
12491700 Hause Creek	Tieton River	Lat 46°40'33", long 121°04'49", in NE¼ sec.28, T.14 N., R.14 E., Yakima County, at State Highway 14, 0.1 mi west of Tieton Ranger Station, and 2.5 mi east of Rimrock.	3.91	a1955-83	5- 1-84	e3.2
12511520 Yakima River	Columbia River	Lat 46°21'32", long 119°23'42", in NW¼NE¼ sec.14, T.10 N., R.27 E., Benton County, 2.4 mi downstream from Horn Rapids Dam, 4.0 mi northwest of Richland, and at mile 16.15.	---	1978-83	10-12-83 4-23-84 9-12-84	1,640 3,770 1,800
Palouse River basin						
13348000 South Fork Palouse River	Palouse River	Lat 46°43'57", long 117°10'48", in NE¼NE¼ sec.6, T.14 N., R.45 E., Whitman County, on right bank at State Street crossing in Pullman, 600 ft upstream from Missouri Flat Creek, and at mile 22.2.	132	1934-42†, 1948, 1954, 1958-59, 1959-82†, 1983	1- 6-84 6- 8-84 9-26-84	249 21.9 6.23
Walla Walla River basin						
14017600 Touchet River	Walla Walla River	Lat 46°02'29", long 118°40'59", in NE¼NE¼ sec.33, T.7 N., R.33 E., Walla Walla County, at U.S. High- way 12 crossing 0.5 mi west of Touchet, 0.6 mi upstream from mouth.	747	1962-65, 1972-75, 1977-83	10- 5-83 2- 8-84 4- 3-84 5-31-84 7-24-84 9-20-84	10.8 215 412 251 14.7 6.62
Klickitat River basin						
14112200 Little Klickitat River tributary	Little Klickitat River	Lat 45°50'15", long 120°47'50", in NW¼ sec.15, T.4 N., R.16 E., Klickitat County, at county road 1.5 mi northeast of Goldendale.	0.71	a1960-83	1-11-84 5- 2-84	.58 e.05

† Operated as a continuous-record gaging station.

a Operated as a crest-stage station.

e Estimate.

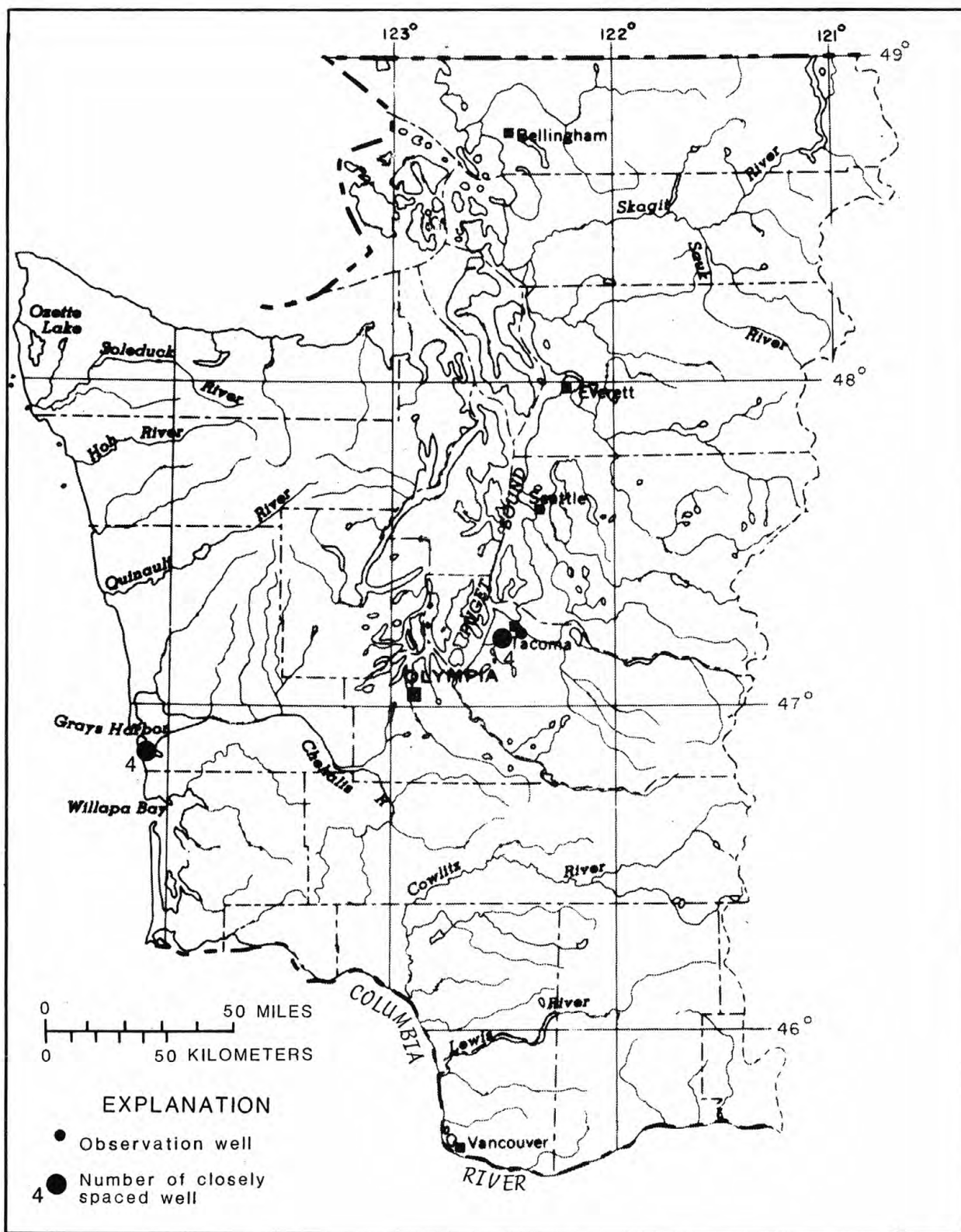


Figure 34a.--Map of Western Washington showing locations of ground-water level observations.

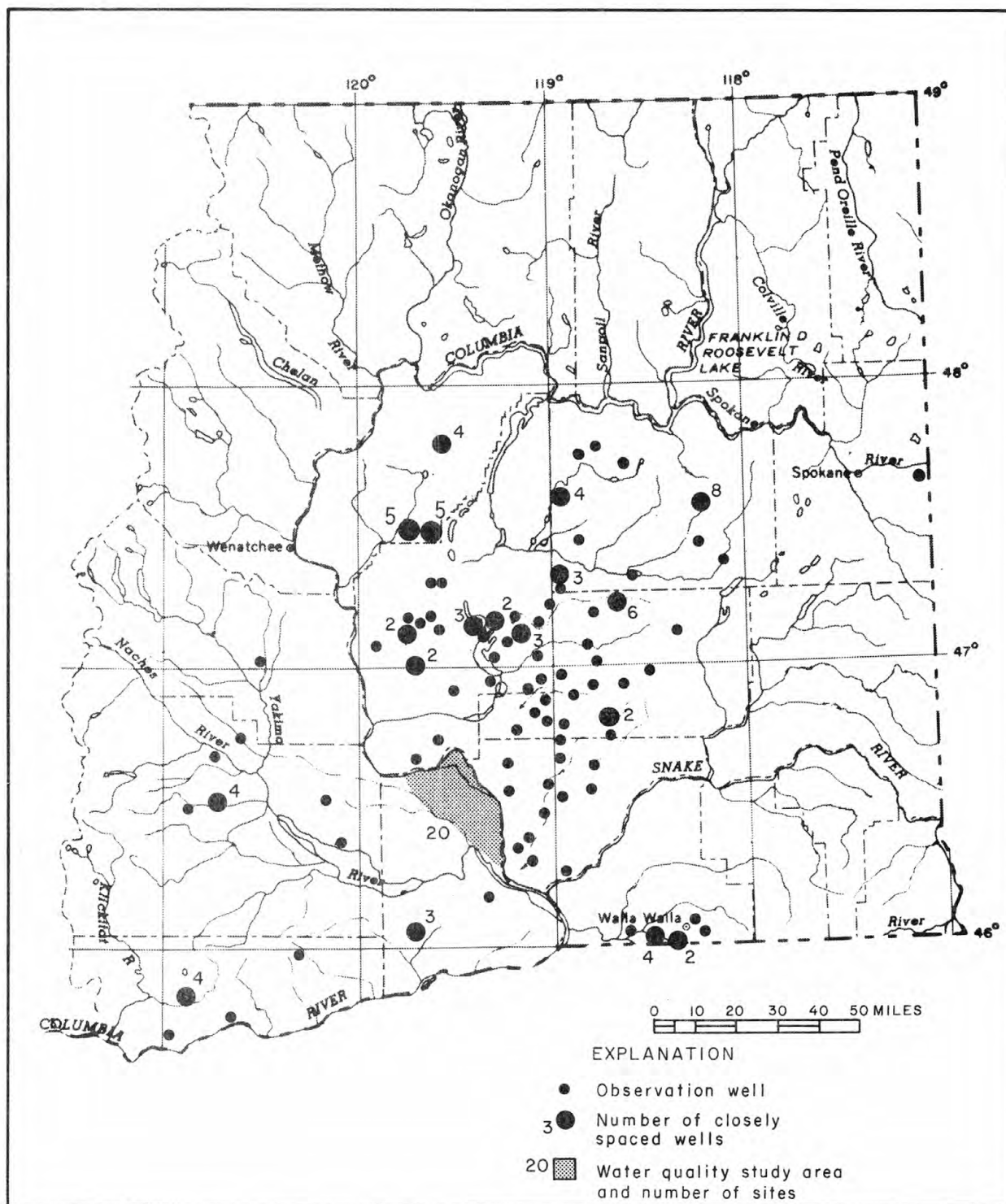


Figure 34b.--Map of Eastern Washington showing locations of ground-water level observations.

GROUND-WATER LEVELS

393

ADAMS COUNTY

464603119085201. Local number, 15/29-26C1.

LOCATION.--Lat 46°46'03", long 119°08'52", Hydrologic Unit 17020016, at Othello.

Owner: Brick Patterson.

AQUIFER.--Basalt of Miocene to Pliocene Age.

WELL CHARACTERISTICS.--Drilled domestic water-table well. Diameter 6 in, depth 257 ft, cased to 150 ft.

DATUM.--Altitude of land-surface datum is 1,030 ft.

PERIOD OF RECORD.--September 1960 to August 1984 (discontinued).

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 59.1 ft below land-surface datum, Sept. 3, 1981; lowest measured, 201.6 ft below land-surface datum, May 6, 1982.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984

Date	Water Level	Date	Water Level	Date	Water Level	Date	Water Level
OCT 21	123.2	FEB 8	91.6	JUN 7	112.4	AUG 9	116.2
DEC 15	134.4	APR 5	118.83				

464740118444001. Local number 15/32-13D1.

LOCATION.--Lat 46°47'40", long 118°44'40", Hydrologic Unit 17020016, near Hatton.

Owner: State of Washington, Department of Highways.

AQUIFER.--Basalt of Miocene to Pliocene Age.

WELL CHARACTERISTICS.--Drilled domestic water-table well, diameter 12 in, depth 602 ft, cased to 63 ft.

DATUM.--Altitude of land-surface datum is 1,216 ft.

PERIOD OF RECORD.--June 1962 to August 1984 (discontinued).

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 170.12 ft below land-surface datum, Nov. 2, 1962; lowest measured, 226.0 ft below land-surface datum, Feb. 8, 1984.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984

Date	Water Level	Date	Water Level	Date	Water Level	Date	Water Level
OCT 24	224.5	FEB 8	226.0	JUN 7	227.2	AUG 9	222.4
DEC 15	225.0	APR 5	222.0				

464445118461002. Local number, 15/32-35E2.

LOCATION.--Lat 46°44'34", long 118°46'05", Hydrologic Unit 17020016, near Connell.

Owner: REHCO

AQUIFER.--Grande Ronde Basalt of Miocene Age.

WELL CHARACTERISTICS.--1½ in diameter open-ended pipe to 845 ft in 12 in diameter plugged off open section of drilled artesian well, total depth 966 ft, uncased depth interval from 840 to 966 ft.

DATUM.--Altitude of land-surface datum is 1,242 ft.

PERIOD OF RECORD.--October 1980 to current year.

REMARKS.--Water level measured in one of five piezometers.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 578.0 ft below land-surface datum, Jan. 26, 1983; lowest measured, 607 ft below land-surface datum, Sept. 27, 1982.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984

Date	Water Level
DEC 1	595.3

464445118461003. Local number, 15/32-35E3.

LOCATION.--Lat 46°44'34", long 118°46'05", Hydrologic Unit 17020016, near Connell.

Owner: REHCO

AQUIFER.--Grande Ronde Basalt of Miocene Age.

WELL CHARACTERISTICS.--1½ in diameter open-ended pipe to 719 ft in 16 to 12 in diameter plugged off open section of drilled artesian well, total depth 825 ft, uncased depth interval from 714 to 825 ft.

REMARKS.--Water level measured in one of five piezometers.

DATUM.--Altitude of land-surface datum is 1,242 ft.

PERIOD OF RECORD.--October 1980 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 579.7 ft below land-surface datum, May 26, 1982; lowest measured, 601.9 ft below land-surface datum, Sept. 30, 1980.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984

Date	Water Level	Date	Water Level
DEC 1	595.4	FEB 15	590.6

GROUND-WATER LEVELS

ADAMS COUNTY--Continued

464445118461005. Local number, 15/32-35E5.

LOCATION.--Lat 46°44'34", long 118°46'05", Hydrologic Unit 17020016, near Connell.

Owner: REHCO

AQUIFER.--Wanapum Basalt of Miocene Age.

WELL CHARACTERISTICS.--1½ in diameter open-ended pipe to 383 ft in plugged off open section of 16-in diameter drilled artesian well, total depth 573 ft, uncased depth interval from 378 to 573 ft.

DATUM.--Altitude of land-surface datum is 1,242 ft.

REMARKS.--Water level measured in one of five piezometers.

PERIOD OF RECORD.--October 1980 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 295.2 ft below land-surface datum, Nov. 30, 1982; lowest measured, 355.3 ft below land-surface datum, Oct. 31, 1980.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984

Date	Water Level	Date	Water Level
DEC 1	300.4	FEB 15	302.2

464445118461006. Local number, 15/32-35E6.

LOCATION.--Lat 46°44'34", long 118°46'05", Hydrologic Unit 17020016, near Connell.

Owner: REHCO

AQUIFER.--Wanapum Basalt of Miocene Age.

WELL CHARACTERISTICS.--1½ in diameter open-ended pipe to 295 ft inside a 16 in diameter drilled water-table well, cased to 36.5 ft, total depth 362 ft, uncased depth interval from 36.5 to 362 ft.

DATUM.--Altitude of land-surface datum is 1,242 ft.

REMARKS.--Water level measured in one of five piezometers.

PERIOD OF RECORD.--November 1980 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 292.2 ft below land-surface datum, May 25, 1983; lowest measured, 324.9 ft below land-surface datum, Mar. 23, 1981.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984

Date	Water Level	Date	Water Level
DEC 6	301.9	FEB 15	304.4

465149119062801. Local number, 16/30-19E1.

LOCATION.--Lat 46°51'49", long 119°06'28", Hydrologic Unit 17020016, near Othello.

Owner: K. Summerville.

AQUIFER.--Basalt of Miocene to Pliocene Age.

WELL CHARACTERISTICS.--Drilled domestic water-table well, diameter 6 in, depth 487 ft.

DATUM.--Altitude of land-surface datum is 1,160 ft.

PERIOD OF RECORD.--May 1958, March 1963, March 1968, April 1974 to August 1984 (discontinued).

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 41.16 ft below land-surface datum, Jan. 26, 1983; lowest measured, 189.90 ft below land-surface datum, May 12, 1958.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984

Date	Water Level	Date	Water Level	Date	Water Level	Date	Water Level
OCT 21	42.72	FEB 8	41.19	JUN 7	43.44	AUG 9	41.22
DEC 15	43.44	APR 4	42.86				

465100119001502. Local number, 16/30-26A2.

LOCATION.--Lat 46°51'00", long 119°00'15", Hydrologic Unit 17020016, near Othello.

Owner: Warden Hutterian Brethren

AQUIFER.--Basalt of Miocene to Pliocene Age.

WELL CHARACTERISTICS.--Drilled irrigation water-table well, diameter 8 in, depth 1,120 ft.

DATUM.--Altitude of land-surface datum is 1,359 ft.

PERIOD OF RECORD.--April 1975 to August 1984 (discontinued).

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 238 ft below land-surface datum, Oct. 7, 1982; lowest measured, 501 ft below land-surface datum, Dec. 10, 1981.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984

Date	Water Level	Date	Water Level	Date	Water Level	Date	Water Level
FEB 8	372	APR 5	374	JUN 7	a508	AUG 9	a492

a Well being pumped.

GROUND-WATER LEVELS

395

ADAMS COUNTY--Continued

465250118450002. Formerly 4652250118450001. Local number, 16/32-14A1D1. Formerly local number, 16/32-14A1.
LOCATION.--Lat 46°52'48", long 118°45'01", Hydrologic Unit 17020016, near Beatrice.

Owner: D. E. Phillips.

AQUIFER.--Basalt of Miocene to Pliocene Age.

WELL CHARACTERISTICS.--Drilled irrigation water-table well, diameter 16 in, depth 910 ft cased to 67 ft, prior to November 1977, depth 765 ft cased to 67 ft..

DATUM.--Altitude of land-surface datum is 1,463 ft.

PERIOD OF RECORD.--October 1966 to August 1984 (discontinued).

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 275.4 ft below land-surface datum, Feb. 7, 1978; lowest measured, 503 ft below land-surface datum, Aug. 25, 1980.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984

Date	Water Level	Date	Water Level	Date	Water Level	Date	Water Level
OCT 24	332	APR 5	452	JUN 7	a496	AUG 9	a514
FEB 8	454						

465910118581001. Local number, 16/32-25A1.

LOCATION.--Lat 46°51'00", long 118°43'53", Hydrologic Unit 17020016, near Hatton.

Owner: D. E. Phillips

AQUIFER.--Basalt of Miocene to Pliocene Age.

WELL CHARACTERISTICS.--Drilled irrigation water-table well, diameter 16 in, 812 ft, cased to 82 ft.

DATUM.--Altitude of land-surface datum is 1,457 ft.

PERIOD OF RECORD.--April 1966 to August 1984 (discontinued).

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured 312.16 ft below land-surface datum, Sept. 3, 1974; lowest measured, 491 ft below land-surface datum, Aug. 25, 1980.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984

Date	Water Level	Date	Water Level	Date	Water Level	Date	Water Level
OCT 24	320	APR 5	463	JUN 7	486	AUG 9	a505
FEB 8	465						

465700118510001. Local number, 17/32-19E1.

LOCATION.--Lat 46°57'00", long 118°51'00", Hydrologic Unit 17020015, at Roxboro.

Owner: State of Washington, Department of Natural Resources.

AQUIFER.--Basalt of Miocene to Pliocene Age.

WELL CHARACTERISTICS.--Drilled unused water-table well, diameter 6 in, depth 258 ft.

DATUM.--Altitude of land-surface datum is 1,260 ft.

PERIOD OF RECORD.--June 1962 to August 1984 (discontinued).

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 104.96 ft below land-surface datum, Jan. 29, 1963; lowest measured, 227.2 ft below land-surface datum, Sept. 4, 1981.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984

Date	Water Level	Date	Water Level	Date	Water Level	Date	Water Level
OCT 21	225.2	FEB 8	214.8	JUN 7	208.8	AUG 8	215.0
DEC 15	217.5	APR 5	207.9				

465730118410001. Local number, 17/33-17R1.

LOCATION.--Lat 46°57'30", long 118°41'00", Hydrologic Unit 17020015, near Lind.

Owner: D. E. Phillips

AQUIFER.--Basalt of Miocene to Pliocene Age.

WELL CHARACTERISTICS.--Drilled domestic water-table well, diameter 10 in, depth 184 ft, cased to 80 ft.

DATUM.--Altitude of land-surface datum is 1,310 ft.

REMARKS.--Pump installed December 1974.

PERIOD OF RECORD.--April 1963 to August 1984 (discontinued).

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 30.60 ft below land-surface datum, Dec. 5, 1976; lowest measured, 101.0 ft below land-surface datum, Aug. 9, 1984.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984

Date	Water Level	Date	Water Level	Date	Water Level	Date	Water Level
OCT 24	a87.6	FEB 8	a86.8	JUN 7	a100.0	AUG 9	101.0
DEC 15	a88.5	APR 5	a87.7				

a Well being pumped.

GROUND-WATER LEVELS

ADAMS COUNTY--Continued

465824118354903. Local number, 17/34-7N1.

LOCATION.--Lat 46°58'24", long 118°35'49", Hydrologic Unit 17020015, at Lind.

Owner: City of Lind.

AQUIFER.--Basalt of Miocene to Pliocene Age.

WELL CHARACTERISTICS.--Drilled unused water-table well, diameter 16 to 12 in, depth 686 ft, cased to 75 ft.

DATUM.--Altitude of land-surface datum is 1,404 ft.

PERIOD OF RECORD.--June 1968 to August 1984 (discontinued).

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 105.60 ft below land-surface datum, Apr. 7, 1969; lowest measured, 140.89 ft below land-surface datum, Mar 10, 1980.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984

Date	Water Level	Date	Water Level	Date	Water Level	Date	Water Level
OCT 24	133.95	FEB 8	128.87	JUN 7	131.38	AUG 9	134.65
DEC 15	133.87	APR 5	126.47				

470232118572901. Local number, 18/31-20D1.

LOCATION.--Lat 47°02'32", long 118°57'29", Hydrologic Unit 17020015, near Warden.

Owner: J. Fox Estate.

AQUIFER.--Basalt of Miocene to Pliocene Age.

WELL CHARACTERISTICS.--Drilled unused water-table well, diameter 6 in, depth 150 ft.

DATUM.--Altitude of land-surface datum is 1,255 ft.

PERIOD OF RECORD.--October 1973 to August 1984 (discontinued).

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 54.32 ft below land-surface datum, Oct. 4, 1973; lowest measured, 110.4 ft below land-surface datum, Mar. 9, 1982.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984

Date	Water Level	Date	Water Level	Date	Water Level	Date	Water Level
OCT 24	76.60	APR 5	101.80	JUN 7	85.28	AUG 8	75.62
DEC 15	92.9						

471347118410101. Local number, 20/33-16E1.

LOCATION.--Lat 47°13'47", long 118°41'01", Hydrologic Unit 17020015, near Odessa.

Owner: State of Washington, Department of Ecology.

AQUIFER.--Basalt of Miocene to Pliocene Age.

WELL CHARACTERISTICS.--Drilled observation-test water-table well, diameter 10 in, total depth 750 ft, uncased depth interval from 70 to 94 ft.

DATUM.--Altitude of land-surface datum is 1,670 ft.

REMARKS.--Water level measured in piezometer.

PERIOD OF RECORD.--April 1971 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 80.34 ft below land-surface datum, June 20, 1975; lowest measured, 93.38 ft below land-surface datum, Apr. 23, 1971.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984

Date	Water Level	Date	Water Level	Date	Water Level
OCT 18	84.77	DEC 12	85.0	MAR 7	85.4

471347118410102. Local number, 20/33-16E2.

LOCATION.--Lat 47°13'47", long 118°41'01", Hydrologic Unit 17020015, near Odessa.

Owner: State of Washington, Department of Ecology.

AQUIFER.--Basalt of Miocene to Pliocene Age.

WELL CHARACTERISTICS.--Drilled observation-test artesian well, diameter 10 in, total depth 750 ft, uncased depth interval from 158 to 183 ft.

DATUM.--Altitude of land-surface datum is 1,670 ft.

REMARKS.--Water level measured in piezometer.

PERIOD OF RECORD.--April 1971 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 107.35 ft below land-surface datum, Mar. 23, 1972; lowest measured, 142.2 ft below land-surface datum, June 23, 1980.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984

Date	Water Level	Date	Water Level	Date	Water Level
OCT 18	138.25	DEC 12	138.5	MAR 7	135.7

GROUND-WATER LEVELS

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ADAMS COUNTY--Continued

471347118410103. Local number, 20/33-16E3.

LOCATION.--Lat 47°13'47", long 118°41'01", Hydrologic Unit 17020015, near Odessa.

Owner: State of Washington, Department of Ecology.

AQUIFER.--Basalt of Miocene to Pliocene Age.

WELL CHARACTERISTICS.--Drilled observation-test artesian well, diameter 10 in, total depth 750 ft, uncased depth interval from 282 to 299 ft.

DATUM.--Altitude of land-surface datum is 1,670 ft.

REMARKS.--Water-level measured in piezometer.

PERIOD OF RECORD.--April 1971 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 109.89 ft below land-surface datum, Feb. 23, 1972; lowest measured, 153.1 ft below land-surface datum, Dec. 12, 1984.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984

Date	Water Level	Date	Water Level	Date	Water Level
OCT 18	148.12	DEC 12	153.1	MAR 7	145.7

471347118410104. Local number, 20/33-16E4.

LOCATION.--Lat 47°13'47", long 118°41'01", Hydrologic Unit 17020015, near Odessa.

Owner: State of Washington, Department of Ecology.

AQUIFER.--Basalt of Miocene to Pliocene Age.

WELL CHARACTERISTICS.--Drilled observation-test, artesian well, diameter 10 in, total depth 750 ft, uncased depth interval from 352 to 401 ft.

DATUM.--Altitude of land-surface datum is 1,670 ft.

REMARKS.--Water level measured in piezometer.

PERIOD OF RECORD.--April 1971 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 106.46 ft below land-surface datum, Mar. 23, 1972; lowest measured, 138.32 ft below land-surface datum, Mar. 7, 1983.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984

Date	Water Level	Date	Water Level	Date	Water Level
OCT 18	134.82	DEC 12	134.9	MAR 7	132.5

471347118410105. Local number, 20/33-16E5.

LOCATION.--Lat 47°13'47", long 118°41'01", Hydrologic Unit 17020015, near Odessa.

Owner: State of Washington, Department of Ecology.

AQUIFER.--Basalt of Miocene to Pliocene Age.

WELL CHARACTERISTICS.--Drilled observation-test, artesian well, diameter 10 in, total depth 750 ft, uncased depth interval from 586 to 616 ft.

DATUM.--Altitude of land-surface datum is 1,670 ft.

REMARKS.--Water level measured in piezometer.

PERIOD OF RECORD.--April 1971 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 112.35 ft below land-surface datum, Feb 23, 1972; lowest measured, 299.9 ft below land-surface datum, June 25, 1979.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984

Date	Water Level	Date	Water Level	Date	Water Level
OCT 18	239.17	DEC 12	264.1	MAR 7	246.9

471347118410106. Local number, 20/33-16E6.

LOCATION.--Lat 47°13'47", long 118°41'01", Hydrologic Unit 17020015, near Odessa.

Owner: State of Washington, Department of Ecology.

AQUIFER.--Basalt of Miocene to Pliocene Age.

WELL CHARACTERISTICS.--Drilled observation-test, artesian well, diameter 10 in, total depth 750 ft, uncased depth interval from 676 to 701 ft.

DATUM.--Altitude of land-surface datum is 1,670 ft.

REMARKS.--Water level measured in piezometer.

PERIOD OF RECORD.--April 1971 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 279.19 ft below land-surface datum, Apr. 21, 1971; lowest measured, 413.2 ft below land-surface datum, June 29, 1982.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984

Date	Water Level	Date	Water Level	Date	Water Level
OCT 18	392.8	DEC 12	372.2	MAR 7	358.7

GROUND-WATER LEVELS

BENTON COUNTY

460237119383001. Local number, 7/25-36N1.

LOCATION.--Lat 46°02'37", long 119°38'30", Hydrologic Unit 17070101, near Paterson.

Owner: State of Washington, Department of Ecology.

AQUIFER.--Basalt of Miocene to Pliocene Age.

WELL CHARACTERISTICS.--Drilled observation-test, water-table well, diameter 10 in, total depth 860 ft, uncased depth interval from 105 to 185 ft.

DATUM.--Altitude of land-surface datum is 730 ft.

REMARKS.--Water level measured in piezometer.

PERIOD OF RECORD.--November 1972 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 91.18 ft below land-surface datum, Feb. 23, 1984; lowest measured, 133.50 ft below land-surface datum, Nov. 1, 1972.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984

Date	Water Level	Date	Water Level
NOV 10	91.88	FEB 23	91.18

460237119383003. Local number, 7/25-36N3.

LOCATION.--Lat 46°02'37", long 119°38'30", Hydrologic Unit 17070101, near Paterson.

Owner: State of Washington, Department of Ecology.

AQUIFER.--Basalt of Miocene to Pliocene Age.

WELL CHARACTERISTICS.--Drilled observation-test, artesian well, diameter 10 in, total depth 860 ft, uncased depth interval from 720 to 755 ft.

DATUM.--Altitude of land-surface datum is 730 ft.

PERIOD OF RECORD.--November 1972 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 362.5 ft below land-surface datum, Jan. 18, 1979; lowest measured, 388.7 ft below land-surface datum, Sept. 14, 1982.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984

Date	Water Level	Date	Water Level
NOV 10	383.03	FEB 23	386.68

460237119383004. Local number, 7/25-36N4.

LOCATION.--Lat 46°02'37", long 119°38'30", Hydrologic Unit 17070101, near Paterson.

Owner: State of Washington, Department of Ecology.

AQUIFER.--Basalt of Miocene to Pliocene Age.

WELL CHARACTERISTICS.--Drilled observation-test, artesian well, diameter 10 in, total depth 860 ft, uncased depth interval from 770 to 860 ft.

DATUM.--Altitude of land-surface datum is 730 ft.

REMARKS.--Water level measured in piezometer.

PERIOD OF RECORD.--November 1972 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 361.9 ft below land-surface datum, Jan. 18, 1979; lowest measured, 391.32 ft below land-surface datum, Nov. 10, 1983.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984

Date	Water Level	Date	Water Level
NOV 10	391.32	FEB 23	383.20

DOUGLAS COUNTY

472741119402202. Local number, 23/25-27L2.

LOCATION.--Lat 47°27'41", long 119°40'22", Hydrologic Unit 17020012, near Ephrata.

Owner: Washington Department of Ecology - Sagebrush Flat

AQUIFER.--Grande Ronde Basalt of Miocene Age.

WELL CHARACTERISTICS.--Casing diameter 1.25 in to 1,260 ft, screened 1,260 to 1,265 ft in a 16-in to 10-inch diameter drilled artesian observation-test well, depth interval 1,205 to 1,300 ft.

DATUM.--Altitude of land-surface datum is 1,700 ft.

REMARKS.--Water level measured in piezometer.

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

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 427.6 ft below land-surface datum, Mar. 6, 1984; lowest measured, 440.33 ft below land-surface datum, Sept. 29, 1982.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984

Date	Water Level	Date	Water Level
OCT 19	430.8	MAR 6	427.6

GROUND-WATER LEVELS

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DOUGLAS COUNTY--Continued

472741119402203. Local number, 23/25-27L3.

LOCATION.--Lat 47°27'41", long 119°40'22", Hydrologic Unit 17020012, near Ephrata.

Owner: Washington Department of Ecology - Sagebrush Flat.

AQUIFER.--Grande Ronde Basalt of Miocene Age.

WELL CHARACTERISTICS.--Casing diameter 1.25 in to 1,155 ft, screened 1,155 to 1,160 ft in a 16-in to 10-in diameter drilled artesian observation-test well, depth interval 1,039 to 1,196 ft.

DATUM.--Altitude of land-surface datum is 1,700 ft.

REMARKS.--Water level measured in piezometer.

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

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 387.1 ft below land-surface datum, Mar. 22, 1983; lowest measured, 441.0 ft below land-surface datum, Oct. 19, 1984.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984

Date	Water Level	Date	Water Level
OCT 19	441.0	MAR 6	437.7

472741119402204. Local number, 23/25-27L4.

LOCATION.--Lat 47°27'41", long 119°40'22", Hydrologic Unit 17020012, near Ephrata.

Owner: Washington Department of Ecology - Sagebrush Flat

AQUIFER.--Grande Ronde Basalt of Miocene Age.

WELL CHARACTERISTICS.--Casing diameter 1.25 in to 987 ft, screened 987 to 992 ft in a 16-in to 10-in diameter drilled artesian observation-test well, depth interval 963 to 1,030 ft.

DATUM.--Altitude of land-surface datum is 1,700 ft.

REMARKS.--Water level measured in piezometer.

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

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 390.3 ft below land-surface datum, Mar. 22, 1983; lowest measured, 441.40 ft below land-surface datum, Sept. 19, 1982.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984

Date	Water Level	Date	Water Level
OCT 19	439.4	MAR 6	439.3

472741119402205. Local number, 23/25-27L5.

LOCATION.--Lat 47°27'41", long 119°40'22", Hydrologic Unit 17020012, near Ephrata.

Owner: Washington Department of Ecology - Sagebrush Flat.

AQUIFER.--Grande Ronde Basalt of Miocene Age.

WELL CHARACTERISTICS.--Casing diameter 1.25 in to 850 ft, screened 850 to 855 ft in a 16-in to 10-in diameter drilled artesian observation-test well, depth interval 834 to 958 ft.

DATUM.--Altitude of land-surface datum is 1,700 ft.

REMARKS.--Water level measured in piezometer.

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

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 436.7 ft below land-surface datum, Mar. 6, 1984; lowest measured, 441.42 ft below land-surface datum, Sept. 29, 1982.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984

Date	Water Level	Date	Water Level
OCT 19	439.2	MAR 6	436.7

472741119402206. Local number, 23/25-27L6.

LOCATION.--Lat 47°27'41", long 119°40'22", Hydrologic Unit 17020012, near Ephrata.

Owner: Washington Department of Ecology - Sagebrush Flat.

AQUIFER.--Grande Ronde Basalt of Miocene Age.

WELL CHARACTERISTICS.--Drilled artesian observation-test well, casing diameter 16 in to 12 in, cased to 801 ft, depth 827 ft.

DATUM.--Altitude of land-surface datum is 1,700 ft.

REMARKS.--Water level measured in casing.

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

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 439.1 ft below land-surface datum, Oct. 19, 1984; lowest measured, 441.32 ft below land-surface datum, Sept. 29, 1982.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984

Date	Water Level	Date	Water Level
OCT 19	439.1	MAR 6	439.2

DOUGLAS COUNTY--Continued

472857119354004. Local number, 23/26-20D2.

LOCATION.--Lat 47°28'57", long 119°35'48", Hydrologic Unit 17020012, near Ephrata.

Owner: Washington Department of Ecology - Pixlee.

AQUIFER.--Grande Ronde Basalt of Miocene Age.

WELL CHARACTERISTICS.--Casing diameter 1.25 in to 1,260 ft, screened 1,260 to 1,265 ft in a 16-in to 8-in diameter drilled artesian well, depth interval 1,207 to 1,315 ft.

DATUM.--Altitude of land-surface datum is 1,920 ft.

REMARKS.--Water level measured in piezometer.

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

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 595.9 ft below land-surface datum, Mar. 6, 1984; lowest measured, 603.0 ft below land-surface datum, Jan. 28, 1983.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984

Date	Water Level	Date	Water Level
OCT 19	602.1	MAR 6	595.9

472857119354005. Local number, 23/26-20D3.

LOCATION.--Lat 47°28'57", long 119°35'48", Hydrologic Unit 17020012, near Ephrata.

Owner: Washington Department of Ecology - Pixlee.

AQUIFER.--Grande Ronde Basalt of Miocene Age.

WELL CHARACTERISTICS.--Casing diameter 1.25 in to 935 ft, screened 935 to 940 ft in a 16-in to 8-in diameter drilled artesian well, depth interval 856 to 992 ft.

DATUM.--Altitude of land-surface datum is 1,920 ft.

REMARKS.--Water level measured in piezometer.

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

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 489.6 ft below land-surface datum, Mar. 6, 1984; lowest measured, 516.20 ft below land-surface datum, Oct. 1, 1982.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984

Date	Water Level	Date	Water Level
OCT 19	491.6	MAR 6	489.6

472857119354006. Local number, 23/26-20D4.

LOCATION.--Lat 47°28'57", long 119°35'48", Hydrologic Unit 17020012, near Ephrata.

Owner: Washington Department of Ecology - Pixlee.

AQUIFER.--Grande Ronde Basalt of Miocene Age.

WELL CHARACTERISTICS.--Casing diameter 1.25 in to 798 ft, screened 798 to 803 ft in a 16-in to 8-in diameter drilled artesian well, depth interval 693 to 846 ft.

DATUM.--Altitude of land-surface datum is 1,920 ft.

REMARKS.--Water level measured in piezometer.

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

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 492.4 ft below land-surface datum, Mar. 6, 1984; lowest measured, 523.35 ft below land-surface datum, Oct. 1, 1982.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984

Date	Water Level	Date	Water Level
OCT 19	494.3	MAR 6	492.4

472857119354007. Local number, 23/26-20D5.

LOCATION.--Lat 47°28'57", long 119°35'48", Hydrologic Unit 17020012, near Ephrata.

Owner: Washington Department of Ecology - Pixlee.

AQUIFER.--Grande Ronde Basalt of Miocene Age.

WELL CHARACTERISTICS.--Casing diameter 1.25 in to 588 ft, screened 588 to 593 ft in a 16-in to 8-in diameter drilled artesian well, depth interval 551 to 615 ft.

DATUM.--Altitude of land-surface datum is 1,920 ft.

REMARKS.--Water level measured in piezometer.

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

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 538.6 ft below land-surface datum, Mar. 6, 1984, lowest measured, 567.1 ft below land-surface datum, Oct. 1, 1982.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984

Date	Water Level	Date	Water Level
OCT 19	541.7	MAR 6	538.6

GROUND-WATER LEVELS

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DOUGLAS COUNTY--Continued

472857119354008. Local number, 23/26-20D6.

LOCATION.--Lat 47°28'57", long 119°35'48", Hydrologic Unit 17020012, near Ephrata.

Owner: Washington Department of Ecology - Pixlee.

AQUIFER.--Grande Ronde Basalt of Miocene Age.

WELL CHARACTERISTICS.--Casing diameter 1.25 in to 504 ft, screened 504 to 509 ft in a 16-in to 8-in diameter drilled artesian well, depth interval 479 to 541 ft.

DATUM.--Altitude of land-surface datum is 1,920 ft.

REMARKS.--Water level measured in piezometer.

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

EXTREMES FOR PERIOD OF RECORD.--All readings are dry.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984

Date	Water Level	Date	Water Level
OCT 19	dry	MAR 6	dry

472857119354009. Local number, 23/26-20D7.

LOCATION.--Lat 47°28'57", long 119°35'48", Hydrologic Unit 17020012, near Ephrata.

Owner: Washington Department of Ecology - Pixlee.

AQUIFER.--Grande Ronde Basalt of Miocene Age.

WELL CHARACTERISTICS.--Drilled artesian well, casing diameter 16 in to 55 ft, depth 466 ft.

DATUM.--Altitude of land-surface datum is 1,920 ft.

REMARKS.--Water level measured in casing.

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

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 356.8 ft below land-surface datum, Mar. 22, 1983; lowest measured, 373.5 ft below land-surface datum, Oct. 1, 1982.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1982 TO SEPTEMBER 1984

Date	Water Level	Date	Water Level
OCT 19	obstructed	MAR 6	obstructed

474855119303901. Local number, 27/26-25D1.

LOCATION.--Lat 47°48'55", long 119°30'39", Hydrologic Unit 17020012, near Mansfield.

Owner: State of Washington, Department of Ecology.

AQUIFER.--Basalt of Miocene to Pliocene Age.

WELL CHARACTERISTICS.--Drilled observation-test, water-table well, diameter 10 in, total depth 760 ft, completed depth interval from 38 to 53 ft.

DATUM.--Altitude of land-surface datum is 2,215 ft.

REMARKS.--Water level measured in casing.

PERIOD OF RECORD.--April 1974 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 9.97 ft below land-surface datum, May 27, 1983; lowest measured, 22.95 ft below land-surface datum, Oct. 4, 1977.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984

Date	Water Level	Date	Water Level
NOV 8	14.74	MAR 2	13.75

474855119303902. Local number, 27/26-25D2.

LOCATION.--Lat 47°48'55", long 119°30'39", Hydrologic Unit 17020012, near Mansfield.

Owner: State of Washington, Department of Ecology.

AQUIFER.--Basalt of Miocene to Pliocene Age.

WELL CHARACTERISTICS.--Drilled observation-test, artesian well, diameter 10 in, total depth 760 ft, completed depth interval from 70 to 152 ft, uncased.

DATUM.--Altitude of land-surface datum is 2,215 ft.

REMARKS.--Water level measured in piezometer.

PERIOD OF RECORD.--April 1974 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 80.23 ft below land-surface datum, May 27, 1983; lowest measured, 102.48 ft below land-surface datum, Jan. 20, 1975.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984

Date	Water Level	Date	Water Level
NOV 8	82.78	MAR 2	83.03

GROUND-WATER LEVELS

DOUGLAS COUNTY--Continued

474855119303904. Local number, 27/26-25D4.

LOCATION.--Lat 47°48'55", long 119°30'39", Hydrologic Unit 17020012, near Mansfield.

Owner: State of Washington, Department of Ecology.

AQUIFER.--Basalt of Miocene to Pliocene Age.

WELL CHARACTERISTICS.--Drilled observation-test, artesian well, diameter 10 in, total depth 760 ft, completed depth

Interval from 490 to 610 ft, uncased, and perforated from 465 to 485 ft.

DATUM.--Altitude of land-surface datum is 2,215 ft.

REMARKS.--Water level measured in piezometer.

PERIOD OF RECORD.--April 1974 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 277.40 ft below land-surface datum, Apr. 20, 1974; lowest measured, 324.95 ft below land-surface datum, July 23, 1975.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984

Date	Water Level	Date	Water Level
NOV 8	316.0	MAR 2	317.6

474855119303905. Local number, 27/26-25D5.

LOCATION.--Lat 47°48'55", long 119°30'39", Hydrologic Unit 17020012, near Mansfield.

Owner: State of Washington, Department of Ecology.

AQUIFER.--Basalt of Miocene to Pliocene Age.

WELL CHARACTERISTICS.--Drilled observation-test, artesian well, diameter 10 in, total depth 760 ft, completed depth interval from 630 to 687 ft uncased, and screened from 750 to 760 ft.

DATUM.--Altitude of land-surface datum is 2,215 ft.

REMARKS.--Water level measured in piezometer.

PERIOD OF RECORD.--April 1974 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 315.8 ft below land-surface datum, Nov. 8, 1983; lowest measured, 327.90 ft below land-surface datum, Apr. 20, 1974.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984

Date	Water Level	Date	Water Level
NOV 8	315.8	MAR 2	319.1

FRANKLIN COUNTY

462030119062001. Local number, 10/30-19E1.

LOCATION.--Lat 46°20'13", long 119°06'34", Hydrologic Unit 17020016, near Pasco.

Owner: Andrus and Roberts Produce Company.

AQUIFER.--Basalt of Miocene to Pliocene Age.

WELL CHARACTERISTICS.--Drilled industrial water-table well, diameter 6 in, depth 395 ft.

DATUM.--Altitude of land-surface datum is 503 ft.

PERIOD OF RECORD.--April 1960 to November 1981, January to September 1983.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 82.1 ft below land-surface datum, Sept. 28, 1977; lowest measured, 141.73 ft below land-surface datum, Apr. 28, 1960.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984

Date	Water Level	Date	Water Level	Date	Water Level	Date	Water Level
DEC 6	91.88	APR 24	92.38	JUN 29	92.55	AUG 30	92.27
FEB 16	91.62						

462343119092802. Local number, 11/29-34J2.

LOCATION.--Lat 46°23'43", long 119°09'28", Hydrologic Unit 17020016, near Eltopia.

Owner: Bob Ransome.

AQUIFER.--Glacial gravel of Pliocene Age.

WELL CHARACTERISTICS.--Drilled domestic water-table well, diameter 8 in, depth 211 ft, cased to 211 ft.

DATUM.--Altitude of land-surface datum is 692 ft.

PERIOD OF RECORD.--June 1976 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 99.36 ft below land-surface datum, Aug. 29, 1984; lowest measured, 187.0 ft below land-surface datum, June 1, 1976.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984

Date	Water Level	Date	Water Level	Date	Water Level	Date	Water Level
DEC 6	b101.8	APR 24	b101.05	JUN 29	b105.3	AUG 29	b99.36
FEB 16	b101.3						

b Well recently pumped.

GROUND-WATER LEVELS

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FRANKLIN COUNTY--Continued

462830119043301. Local number, 11/30-5B1.

LOCATION.--Lat 46°28'30", long 119°04'33", Hydrologic Unit 17020016, near Eltopia.

Owner: Fred Holmes Community.

AQUIFER.--Basalt of Miocene to Pliocene Age.

WELL CHARACTERISTICS.--Drilled public-supply water-table well, diameter 8 in, depth 110 ft, cased to 29 ft.

DATUM.--Altitude of land-surface datum is 753 ft.

PERIOD OF RECORD.--January 1958 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 31.2 ft below land-surface datum, Sept. 29, 1972; lowest measured, 62.1 ft below land-surface datum, Mar. 24, 1982.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984

Date	Water Level	Date	Water Level	Date	Water Level	Date	Water Level
DEC 6	b35.6	APR 24	b39.4	JUN 29	a33.4	AUG 29	a34.0
FEB 16	b33.7						

463339119125601. Local number, 12/29-5D1.

LOCATION.--Lat 46°33'39", long 119°12'56", Hydrologic Unit 17020016, near Mesa.

Owner: James Reynolds.

AQUIFER.--Basalt of Miocene to Pliocene Age.

WELL CHARACTERISTICS.--Drilled domestic water-table well, diameter 6 in, depth 181 ft, cased to 157 ft.

DATUM.--Altitude of land-surface datum is 610 ft.

PERIOD OF RECORD.--January 1958 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 111.5 ft below land-surface datum, May 24, 1983; lowest measured, 147.1 ft below land-surface datum, Sept. 29, 1976.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984

Date	Water Level	Date	Water Level	Date	Water Level	Date	Water Level
DEC 6	b114.3	FEB 16	b114.2	JUN 29	b131.6	AUG 29	b115.0

463231119001601. Local number, 12/30-12E1.

LOCATION.--Lat 46°32'31", long 119°00'16", Hydrologic Unit 17020016, at Eltopia.

Owner: Lea Hailey.

AQUIFER.--Basalt of Miocene to Pliocene Age.

WELL CHARACTERISTICS.--Drilled stock water-table well, diameter 6 in, depth 121 ft, cased to 120 ft.

DATUM.--Altitude of land-surface datum is 676 ft.

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

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 92.3 ft below land-surface datum, Oct. 2, 1970; lowest measured, 108.69 ft below land-surface datum, Apr. 16, 1959.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984

Date	Water Level	Date	Water Level	Date	Water Level	Date	Water Level
DEC 7	102.87	FEB 13	103.5	APR 24	103.41	JUN 29	b108.1

463641119001001. Local number, 13/30-13M1.

LOCATION.--Lat 46°36'41", long 119°00'10", Hydrologic Unit 17020016, at Mesa.

Owner: P. H. Taylor.

AQUIFER.--Basalt of Miocene to Pliocene Age.

WELL CHARACTERISTICS.--Drilled domestic and stock water-table well, diameter 6 in, depth 186 ft, cased to 11 ft.

DATUM.--Altitude of land-surface datum is 956 ft.

PERIOD OF RECORD.--March 1961 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 93.1 ft below land-surface datum, Sept. 20, 1983; lowest measured, 141.72 ft below land-surface datum, May 25, 1961.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984

Date	Water Level	Date	Water Level	Date	Water Level	Date	Water Level
DEC 7	111.6	APR 24	122.5	JUN 29	122.9	AUG 30	108.0
FEB 15	119.5						

a Well pumping.

b Well recently pumped.

GROUND-WATER LEVELS

FRANKLIN COUNTY--Continued

463440118473001. Local number, 13/32-27N1.

LOCATION.--Lat 46°34'40", long 118°47'30", Hydrologic Unit 17020016, at Connell.

AQUIFER.--Basalt of Miocene to Pliocene Age.

WELL CHARACTERISTICS.--Drilled unused water-table well, diameter 6 in, depth 323 ft.

DATUM.--Altitude of land-surface datum is 1,155 ft.

PERIOD OF RECORD.--October 1952, August 1956, June 1958, April 1961 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 156.9 ft below land-surface datum, June 29, Aug. 30, 1984; lowest measured, 281.47 ft below land-surface datum, Oct. 4, 1950.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984

Date	Water Level	Date	Water Level	Date	Water Level	Date	Water Level
DEC 7	177.4	FEB 13	172.9	JUN 29	156.9	AUG 30	156.9

464028119101601. Local number, 14/29-27E1.

LOCATION.--Lat 46°40'28", long 119°10'16", Hydrologic Unit 17020016, near Othello.

Owner: U.S. Bureau of Reclamation.

AQUIFER.--Basalt of Miocene to Pliocene Age.

WELL CHARACTERISTICS.--Drilled public-supply water-table well, diameter 8 in, depth 498 ft, cased to 435 ft.

DATUM.--Altitude of land-surface datum is 947 ft.

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

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 57.2 ft below land-surface datum, Nov. 29, 1982; lowest measured, 235.79 ft below land-surface datum, Mar. 24, 1960.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984

Date	Water Level	Date	Water Level	Date	Water Level	Date	Water Level
DEC 6	b61.0	APR 24	63.45	JUN 29	b72.7	AUG 29	a135.2
FEB 15	61.84						

GRANT COUNTY

465539119332101. Local number, 17/26-34D1.

LOCATION.--Lat 46°55'39", long 119°33'21", Hydrologic Unit 17020015, near Royal City.

Owner: J. P. Needham.

AQUIFER.--Basalt of Miocene to Pliocene Age.

WELL CHARACTERISTICS.--Drilled unused water-table well, diameter 6 in, depth 240 ft, cased to 60 ft.

DATUM.--Altitude of land-surface datum is 1,085 ft.

PERIOD OF RECORD.--September 1940, March 1956 to December 1958, March 1963 to August (discontinued).

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 0.06 ft below land-surface datum, Mar. 3, 1971; lowest measured, 177.66 ft below land-surface datum, Sept. 22, 1956.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984

Date	Water Level	Date	Water Level	Date	Water Level	Date	Water Level
OCT 21	3.60	FEB 8	2.01	JUN 6	1.80	AUG 9	2.17
DEC 8	3.71	APR 4	2.78				

465851119161601. Local number, 17/28-11F1.

LOCATION.--Lat 46°58'51", long 119°16'16", Hydrologic Unit 17020015, near Moses Lake.

Owner: U.S. Bureau of Reclamation.

AQUIFER.--Basalt of Miocene to Pliocene Age.

WELL CHARACTERISTICS.--Drilled unused artesian test well, diameter 2 in, depth 168 ft, cased to 8 ft.

DATUM.--Land-surface datum is 1,051.6 ft National Geodetic Vertical Datum of 1929.

PERIOD OF RECORD.--March 1950 to March 1984 (discontinued).

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 79.96 ft below land-surface datum, Mar. 5, 1980; lowest measured, 141.01 ft below land-surface datum, Jan. 31, 1951.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984

Date	Water Level	Date	Water Level
OCT 26	108.02	MAR 7	105.18

a Well pumping.

b Well recently pumped.

GROUND-WATER LEVELS

405

GRANT COUNTY--Continued

465903119070901. Local number, 17/29-12C1.

LOCATION.--Lat 46°59'03", long 119°07'09", Hydrologic Unit 17020015, near Warden.

Owner: Robert Hayes.

AQUIFER.--Basalt of Miocene to Pliocene Age.

WELL CHARACTERISTICS.--Drilled domestic water-table well, diameter 6 in, depth 315 ft.

DATUM.--Altitude of land-surface datum is 1,212 ft.

PERIOD OF RECORD.--September 1949 to August 1984 (discontinued).

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 33.35 ft below land-surface datum, Oct. 17, 1967; lowest measured, 220.13 ft below land-surface datum, Aug. 31, 1951.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984

Date	Water Level	Date	Water Level	Date	Water Level	Date	Water Level
OCT 26	39.24	FEB 8	46.37	JUN 6	49.47	AUG 8	42.7
DEC 9	40.16	APR 4	50.11				

465626119010601. Local number, 17/30-26C1.

LOCATION.--Lat 46°56'26", long 119°01'06", Hydrologic Unit 17020015, near Warden.

Owner: Albert Widmer.

AQUIFER.--Basalt of Miocene to Pliocene Age.

WELL CHARACTERISTICS.--Drilled unused water-table well diameter 6 in, depth 400 ft.

DATUM.--Altitude of land-surface datum is 1,402 ft.

PERIOD OF RECORD.--August 1955, June 1962 to August 1984 (discontinued).

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 236.15 ft below land-surface datum, Feb. 28, 1973; lowest measured, 292.03 ft below land-surface datum, Oct. 3, 1973.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984

Date	Water Level	Date	Water Level	Date	Water Level	Date	Water Level
OCT 24	255.6	FEB 8	271.78	JUN 7	256.0	AUG 8	255.8
DEC 9	255.7	APR 4	270.29				

470352119433201. Local number, 18/25-8M1.

LOCATION.--Lat 47°03'52", long 119°43'32", Hydrologic Unit 17020015, near George.

Owner: Stetner Brothers.

AQUIFER.--Glacial sand of Pleistocene Age.

WELL CHARACTERISTICS.--Dug unused water-table well, diameter 36 in, depth 112 ft, lined with concrete to 112 ft.

DATUM.--Altitude of land-surface datum is 1,179 ft.

PERIOD OF RECORD.--November 1949 to August 1984 (discontinued).

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 2.83 ft below land-surface datum, June 21, 1960; lowest measured, 98.76 ft below land-surface datum, Apr. 27, 1953.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984

Date	Water Level	Date	Water Level	Date	Water Level	Date	Water Level
OCT 21	38.95	FEB 8	30.09	JUN 6	31.03	AUG 9	31.11
DEC 8	39.98	APR 4	29.79				

470308119405801. Local number, 18/25-15E1.

LOCATION.--Lat 47°03'08", long 119°40'58", Hydrologic Unit 17020015, near George.

Owner: State of Washington, Department of Ecology.

AQUIFER.--Wanapum basalt of Miocene Age.

WELL CHARACTERISTICS.--Drilled observation-test well, diameter 10 in, total depth 976 ft, cased to 976 ft, perforated at intervals from 350 to 900 ft.

DATUM.--Altitude of land-surface datum is 1,156.69 ft.

PERIOD OF RECORD.--August 1975 to December 1977, February 1979 to current year.

REMARKS.--Well deepened to 1,610 ft in February 1978, then backfilled when piezometers 18/25-15E6, 7, & 8 were installed in the well.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 69.1 ft below land-surface datum, Mar. 12, 1981; lowest measured, 231.40 ft below land-surface datum, June 27, 1979.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984

Date	Water Level	Date	Water Level	Date	Water Level
OCT 21	134.9	DEC 8	89.19	MAR 6	70.49

GROUND-WATER LEVELS

GRANT COUNTY--Continued

470308119405802. Local number, 18/25-15E6.

LOCATION.--Lat 47°03'08", long 119°40'58", Hydrologic Unit 17020015, near George.

Owner: State of Washington, Department of Ecology.

AQUIFER.--Grand Ronde basalt of Miocene Age.

WELL CHARACTERISTICS.--Drilled observation-test well, total depth 1,610 ft, casing diameter 1.25 in, casing depth 1,168 ft, screened 1,163 to 1,168 ft.

DATUM.--Altitude of land-surface datum is 1,156.69 ft.

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

REMARKS.--Water level measured in piezometer.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 376.9 ft below land-surface datum, Dec. 8, 1983; lowest measured, 382.39 ft below land-surface datum, Mar. 22, 1979.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984

Date	Water Level	Date	Water Level	Date	Water Level
OCT 2	377.5	DEC 8	376.9	MAR 6	377.7

470308119405803. Local number, 18/25-15E7.

LOCATION.--Lat 47°03'08", long 119°40'58", Hydrologic Unit 17020015, near George.

Owner: State of Washington, Department of Ecology.

AQUIFER.--Grande Ronde basalt of Miocene Age.

WELL CHARACTERISTICS.--Drilled observation-test well, total depth 1,610 ft, casing diameter 1.25 in, casing depth 1,411 ft, screened 1,406 to 1,411 ft.

DATUM.--Altitude of land-surface datum is 1,156.69 ft.

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

REMARKS.--Water level measured in piezometer.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 377.2 ft below land-surface datum, Dec. 8, 1983; lowest measured, 383.0 ft below land-surface datum, June 27, 1979.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984

Date	Water Level	Date	Water Level	Date	Water Level
OCT 21	378.0	DEC 8	377.2	MAR 6	377.9

470308119405804. Local number, 18/25-15E8.

LOCATION.--Lat 47°03'08", long 119°40'58", Hydrologic Unit 17020015, near George.

Owner: State of Washington, Department of Ecology.

AQUIFER.--Grande Ronde basalt of Miocene Age.

WELL CHARACTERISTICS.--Drilled observation-test well, total depth 1,610 ft, casing diameter 1.25 in, casing depth 1,546 ft, screened 1,541 to 1,546 ft.

DATUM.--Altitude of land-surface datum is 1,156.69 ft.

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

REMARKS.--Water level measured in piezometer.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 380.0 ft below land-surface datum, Dec. 8, 1983; lowest measured, 382.69 ft below land-surface datum, Mar. 22, 1979.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984

Date	Water Level	Date	Water Level	Date	Water Level
OCT 21	380.2	DEC 8	380.0	MAR 6	380.8

470148119412601. Local number, 18/25-28B1.

LOCATION.--Lat 47°01'48", long 119°41'26", Hydrologic Unit 17020015.

Owner: Farm Management Service.

AQUIFER.--Basalt of Miocene to Pliocene Age.

WELL CHARACTERISTICS.--Drilled irrigation water-table well, depth 735 ft.

DATUM.--Altitude of land-surface datum is 1,151 ft.

PERIOD OF RECORD.--June 1975 to August 1984 (discontinued).

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 48.13 ft below land-surface datum, Feb. 11, 1976; lowest measured, 225.8 ft below land-surface datum, Sept. 9, 1975.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984

Date	Water Level	Date	Water Level	Date	Water Level	Date	Water Level
OCT 21	85.8	FEB 8	49.3	JUN 6	a266	AUG 9	a219
DEC 8	60.3	APR 4	48.95				

a Well being pumped.

GROUND-WATER LEVELS

407

GRANT COUNTY--Continued

470030119390301. Local number, 18/25-35K1.

LOCATION.--Lat 47°00'30", long 119°39'03", Hydrologic Unit 17020015, near George.

Owner: Farm Management Service.

AQUIFER.--Basalt of Miocene to Pliocene Age.

WELL CHARACTERISTICS.--Drilled irrigation water-table well, depth 960 ft.

DATUM.--Altitude of land-surface datum is 1,140 ft.

PERIOD OF RECORD.--May 1975 to June 1984 (discontinued).

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 56.4 ft below land-surface datum, Feb. 15, 1977; lowest measured, 248 ft below land-surface datum, Dec. 10, 1981.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984

Date	Water Level	Date	Water Level	Date	Water Level	Date	Water Level
OCT 21	131.5	FEB 8	61.3	APR 4	57.93	JUN 6	132.57
DEC 8	76.17						

470445119160301. Local number, 18/28-2L1.

LOCATION.--Lat 47°04'45", long 119°16'03", Hydrologic Unit 17020015, near Moses Lake.

Owner: Arlo Dunning.

AQUIFER.--Basalt of Miocene to Pliocene Age.

WELL CHARACTERISTICS.--Drilled unused water-table well, diameter 6 in, depth 184 ft.

DATUM.--Altitude of land-surface datum is 1,128 ft.

PERIOD OF RECORD.--October 1949 to March 1984 (discontinued).

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 0.45 ft below land-surface datum, Sept. 4, 1970; lowest measured, 74.25 ft below land-surface datum, May 14, 1951.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984

Date	Water Level	Date	Water Level
OCT 25	3.90	MAR 7	5.08

470233119115601. Local number, 18/29-20B1.

LOCATION.--Lat 47°02'33", long 119°11'56", Hydrologic Unit 17020015, near Moses Lake.

Owner: R. DeBeaumont.

AQUIFER.--Basalt of Miocene to Pliocene Age.

WELL CHARACTERISTICS.--Drilled domestic water-table well, diameter 6 in, depth 219 ft.

DATUM.--Altitude of land-surface datum is 1,179 ft.

PERIOD OF RECORD.--October 1949 to February 1950, August 1954 to October 1964, March 1966 to August 1984 (discontinued).

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 4.71 ft below land-surface datum, Apr. 24, 1961; lowest measured, 210.79 ft below land-surface datum, Sept. 17, 1949.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984

Date	Water Level	Date	Water Level	Date	Water Level	Date	Water Level
OCT 26	47.44	FEB 8	54.12	JUN 6	56.53	AUG 8	51.15
DEC 9	48.96	APR 3	57.84				

470417119043401. Local number, 18/30-8C1.

LOCATION.--Lat 47°04'17", long 119°04'34", Hydrologic Unit 17020015, near Warden.

Owner: Wayne Goff.

AQUIFER.--Basalt of Miocene to Pliocene Age.

WELL CHARACTERISTICS.--Drilled domestic water-table well, diameter 8 in, depth 228 ft.

DATUM.--Altitude of land-surface datum is 1,225 ft.

PERIOD OF RECORD.--May 1951 to October 1951, October 1954 to April 1956, February 1958 to August 1984 (discontinued).

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 52.25 ft below land-surface datum, Sept. 16, 1969; lowest measured, 181.26 ft below land-surface datum, Aug. 31, 1951.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984

Date	Water Level	Date	Water Level	Date	Water Level	Date	Water Level
OCT 24	58.51	FEB 8	68.97	JUN 7	68.34	AUG 8	59.33
DEC 9	59.05	APR 3	72.83				

GROUND-WATER LEVELS

GRANT COUNTY--Continued

470022119023801. Local number, 18/30-34M1.

LOCATION.--Lat 47°00'22", long 119°02'38", Hydrologic Unit 17020015, near Warden.

Owner: H. Yamamoto.

AQUIFER.--Basalt of Miocene to Pliocene Age.

WELL CHARACTERISTICS.--Drilled domestic water-table well, diameter 6 in, depth 147 ft.

DATUM.--Altitude of land-surface datum is 1,174 ft.

PERIOD OF RECORD.--February 1943 to August 1984 (discontinued).

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 35.10 ft below land-surface datum, Feb. 28, 1973; lowest measured, 108.70 ft below land-surface datum, Oct. 29, 1947.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984

Date	Water Level	Date	Water Level	Date	Water Level	Date	Water Level
OCT 24	44.95	FEB 8	47.12	JUN 7	45.43	AUG 8	42.87
DEC 9	45.27	APR 4	47.67				

470519119550801. Local number, 19/23-34R1.

LOCATION.--Lat 47°05'19", long 119°55'08", Hydrologic Unit 17020015, near George.

Owner: Nate Defriesse.

AQUIFER.--Basalt of Miocene Age.

WELL CHARACTERISTICS.--Drilled domestic bedrock well, diameter 6 in depth 243 ft.

DATUM.--Altitude of land-surface datum is 1,302 ft.

PERIOD OF RECORD.--November 1949 to August 1984 (discontinued).

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 21.70 ft below land-surface datum, Aug. 18, 1983; lowest measured, 229.19 ft below land-surface datum, Oct. 24, 1951.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984

Date	Water Level	Date	Water Level	Date	Water Level	Date	Water Level
OCT 21	30.18	FEB 8	43.44	JUN 6	42.62	AUG 9	24.8
DEC 8	36.72	APR 4	48.35				

470627119393701. Local number, 19/25-26N1.

LOCATION.--Lat 47°06'27", long 119°39'37", Hydrologic Unit 17020015, near George.

Owner: Rudy Stetner.

AQUIFER.--Basalt of Miocene to Pliocene Age.

WELL CHARACTERISTICS.--Drilled unused water-table well, diameter 6 in, depth 110 ft.

DATUM.--Altitude of land-surface datum is 1,185 ft.

PERIOD OF RECORD.--September 1949 to August 1984 (discontinued).

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 49.09 ft below land-surface datum, Mar. 5, 1971; lowest measured, 106.63 ft below land-surface datum, Mar. 3, 1951.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984

Date	Water Level	Date	Water Level	Date	Water Level	Date	Water Level
OCT 21	58.98	FEB 8	52.32	JUN 6	53.69	AUG 9	56.37
DEC 8	52.93	APR 4	49.84				

470631119420501. Local number, 19/25-28M1.

LOCATION.--Lat 47°06'31", long 119°42'05", Hydrologic Unit 17020015, near George.

Owner: Edwin A. Wyatt.

AQUIFER.--Glacial sand of Pleistocene Age.

WELL CHARACTERISTICS.--Drilled unused water-table well, diameter 8 in, depth 124 ft.

DATUM.--Altitude of land-surface datum is 1,194 ft.

PERIOD OF RECORD.--November 1949 to August 1984 (discontinued).

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 36.61 ft below land-surface datum, June 6, 1984; lowest measured, 114.47 ft below land-surface datum, Apr. 7, 1951.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984

Date	Water Level	Date	Water Level	Date	Water Level	Date	Water Level
OCT 21	42.54	FEB 8	36.88	JUN 6	36.61	AUG 9	38.50
DEC 8	42.98						

GROUND-WATER LEVELS

409

GRANT COUNTY--Continued

470608119331502. Local number, 19/26-34D1.

LOCATION.--Lat 47°06'08", long 119°33'15", Hydrologic Unit 17020015, near Moses Lake.

Owner: Washington State Highway.

AQUIFER.--Glacial sand of Pleistocene Age.

WELL CHARACTERISTICS.--Drilled unused water-table well, diameter 6 in, depth 96 ft, cased to 65 ft.

DATUM.--Altitude of land-surface datum is 1,168 ft.

PERIOD OF RECORD.--March 1939 to July 1963, November 1965 to August 1984 (discontinued).

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 22.46 ft below land-surface datum, Mar. 11, 1981; lowest measured, 101.53 ft below land-surface datum, Sept. 16, 1959.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984

Date	Water Level	Date	Water Level	Date	Water Level	Date	Water Level
OCT 20	23.79	FEB 7	23.59	JUN 6	23.58	AUG 9	23.90
DEC 8	23.52	APR 4	23.52				

470805119263801. Local number, 19/27-16N1.

LOCATION.--Lat 47°08'05", long 119°26'38", Hydrologic Unit 17020015, near Moses Lake.

Owner: Wes Avara.

AQUIFER.--Glacial gravel of Pleistocene Age.

WELL CHARACTERISTICS.--Dug irrigation water-table well, diameter 84 in, depth 74 ft, lined with concrete to 65 ft.

DATUM.--Altitude of land-surface datum is 1,094 ft.

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

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 46.95 ft below land-surface datum, Mar. 11, 1982; lowest measured, 81.77 ft below land-surface datum, Oct. 28, 1947.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984

Date	Water Level	Date	Water Level
OCT 25	47.15	MAR 6	47.66

470652119230301. Local number, 19/27-26A1.

LOCATION.--Lat 47°06'52", long 119°23'03", Hydrologic Unit 17020015, near Moses Lake.

Owner: C. M. Grant.

AQUIFER.--Glacial gravel of Pleistocene Age.

WELL CHARACTERISTICS.--Dug domestic and irrigation water-table well, diameter 48 to 6 in, depth 52 ft.

DATUM.--Altitude of land-surface datum is 1,073 ft.

PERIOD OF RECORD.--November 1949 to March 1984 (discontinued).

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 24.68 ft below land-surface datum, Mar. 14, 1974; lowest measured, 41.86 ft below land-surface datum, July 22, 1953.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984

Date	Water Level	Date	Water Level
OCT 25	31.88	MAR 6	26.41

470658119261401. Local number, 19/27-28B1.

LOCATION.--Lat 47°06'58", long 119°26'14", Hydrologic Unit 17020015, near Moses Lake.

Owner: Jose Betes.

AQUIFER.--Gravel of Pleistocene Age.

WELL CHARACTERISTICS.--Drilled domestic water-table well, diameter 12 in, depth 90 ft.

DATUM.--Altitude of land-surface datum is 1,101 ft.

PERIOD OF RECORD.--December 1975 to March 1984 (discontinued).

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 58.59 ft below land-surface datum, Mar. 6, 1984; lowest measured, 63.84 ft below land-surface datum, Mar. 8, 1978.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984

Date	Water Level	Date	Water Level
OCT 25	62.27	MAR 6	58.59

GROUND-WATER LEVELS

GRANT COUNTY--Continued

471020119210701. Local number, 19/28-6C1.

LOCATION.--Lat 47°10'20", long 119°21'07", Hydrologic Unit 17020015, near Moses Lake.

Owner: Ray Turpinseed.

AQUIFER.--Glacial gravel of Pleistocene Age.

WELL CHARACTERISTICS.--Dug irrigation water-table well, diameter 48 in, depth 37 ft, lined with concrete to 37 ft.

DATUM.--Altitude of land-surface datum is 1,078 ft.

PERIOD OF RECORD.--March 1939 to April 1942, August 1949 to August 1984 (discontinued).

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured 29.10 ft below land-surface datum, June 24, 1971; lowest measured, 40.83 ft below land-surface datum, Feb. 7, 1980.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984

Date	Water Level	Date	Water Level	Date	Water Level	Date	Water Level
OCT 25	34.80	FEB 7	34.50	JUN 5	33.11	AUG 8	33.39
DEC 8	34.91	APR 4	33.33				

470913119192401. Local number, 19/28-8H2.

LOCATION.--Lat 47°09'13", long 119°19'24", Hydrologic Unit 17020014, at Moses Lake.

Owner: Mr. Baker.

AQUIFER.--Glacial gravel of Pleistocene Age.

WELL CHARACTERISTICS.--Dug irrigation and domestic water-table well, diameter 10 in, depth 48 ft.

DATUM.--Altitude of land-surface datum is 1,090 ft.

PERIOD OF RECORD.--November 1949 to August 1984 (discontinued).

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 39.43 ft below land-surface datum, Aug. 3, 1977; lowest measured, 48.4 ft below land-surface datum, Mar. 11, 1981.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984

Date	Water Level	Date	Water Level	Date	Water Level	Date	Water Level
OCT 25	43.88	FEB 7	44.36	JUN 5	a45.70	AUG 8	b43.61
DEC 9	44.63	APR 3	43.14				

470935119174201. Local number, 19/28-10D1.

LOCATION.--Lat 47°09'35", long 119°17'42", Hydrologic Unit 17020015, at Moses Lake.

Owner: Harold Mathenia.

AQUIFER.--Glacial gravel of Pleistocene Age.

WELL CHARACTERISTICS.--Dug and drilled domestic water-table well, diameter 40 to 6 in, depth 102 ft.

DATUM.--Altitude of land-surface datum is 1,114 ft.

PERIOD OF RECORD.--November 1949 to March 1984 (discontinued).

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 47.1 ft below land-surface datum, Sept. 12, 1967; lowest measured, 62.08 ft below land-surface datum, Aug. 30, 1951.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984

Date	Water Level	Date	Water Level
OCT 25	49.25	MAR 6	51.79

470753119192402. Local number, 19/28-20A1.

LOCATION.--Lat 47°07'53", long 119°19'24", Hydrologic Unit 17020015, at Moses Lake.

Owner: M. C. Wilson.

AQUIFER.--Glacial sand of Pleistocene Age.

WELL CHARACTERISTICS.--Dug unused water-table well, diameter 36 in, depth 39 ft, lined with concrete to 38 ft.

DATUM.--Altitude of land-surface datum is 1,080 ft.

PERIOD OF RECORD.--November 1949 to August 1984 (discontinued).

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 31.75 ft below land-surface datum, Oct. 10, 1980; lowest measured, 46.95 ft below land-surface datum, Mar. 1, 1972.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984

Date	Water Level	Date	Water Level	Date	Water Level	Date	Water Level
OCT 25	35.52	FEB 7	37.65	JUN 5	38.08	AUG 8	38.89
DEC 9	36.15	APR 3	35.45				

a Well being pumped.

b Well recently pumped.

GROUND-WATER LEVELS

411

GRANT COUNTY--Continued

470621119144401. Local number, 19/28-25L1.

LOCATION.--Lat 47°06'21", long 119°14'44", Hydrologic Unit 17020015, at Moses Lake.

Owner: Paul Landis.

AQUIFER.--Basalt of Miocene to Pliocene Age.

WELL CHARACTERISTICS.--Drilled unused water-table well, diameter 12 in, depth 492 ft.

DATUM.--Altitude of land-surface datum is 1,192 ft.

PERIOD OF RECORD.--October 1949 to August 1984 (discontinued).

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 40.3 ft below land-surface datum, Sept. 5, 1974; lowest measured, 185.88 ft below land-surface datum, Aug. 29, 1951.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984

Date	Water Level	Date	Water Level	Date	Water Level	Date	Water Level
OCT 25	42.52	FEB 7	44.57	JUN 6	45.45	AUG 8	43.13
DEC 8	44.35	APR 3	45.65				

471027119124902. Local number, 19/29-6A1.

LOCATION.--Lat 47°10'27", long 119°12'49", Hydrologic Unit 17020015, near Wheeler.

Owner: Donald C. Lust.

AQUIFER.--Alluvial sand and gravel of Quaternary Age.

WELL CHARACTERISTICS.--Dug domestic water-table well, diameter 48 in, concrete, depth 48.5 ft.

DATUM.--Altitude of land-surface datum is 1,190 ft.

REMARKS.--Dug to 48 ft, drilled 48 to 150 ft, backfilled to approximately 30 ft, and dug out to 48.5 ft.

PERIOD OF RECORD.--April 1942, September 1949 to March 1984 (discontinued).

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 12.97 ft below land-surface datum, June 23, 1966; lowest measured, 47.56 ft below land-surface datum, Apr. 14, 1942.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984

Date	Water Level	Date	Water Level
OCT 25	17.68	MAR 6	18.52

470811119074301. Local number, 19/29-14J1.

LOCATION.--Lat 47°08'11", long 119°07'43", Hydrologic Unit 17020015, near Wheeler.

Owner: Ron Hanson.

AQUIFER.--Basalt of Miocene to Pliocene Age.

WELL CHARACTERISTICS.--Drilled domestic water-table well, diameter 12 in, depth 368 ft.

DATUM.--Altitude of land-surface datum is 1,357 ft.

PERIOD OF RECORD.--December 1950 to August 1984 (discontinued).

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 132.21 ft below land-surface datum, Dec. 30, 1964; lowest measured, 234.03 ft below land-surface datum, Oct. 27, 1951.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984

Date	Water Level	Date	Water Level	Date	Water Level	Date	Water Level
OCT 25	170.77	FEB 8	a141.47	JUN 6	157.14	AUG 8	153.68
DEC 8	171.45	APR 3	174.26				

470729119101501. Local number, 19/29-22E1.

LOCATION.--Lat 47°07'29", long 119°10'15", Hydrologic Unit 17020015, near Wheeler.

Owner: Carnation Company.

AQUIFER.--Basalt of Miocene to Pliocene Age.

WELL CHARACTERISTICS.--Drilled irrigation water-table well, diameter 14 in, depth 560 ft.

DATUM.--Altitude of land-surface datum is 1,293 ft.

PERIOD OF RECORD.--June 1975 to March 1984 (discontinued).

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 48 ft below land-surface datum, Oct. 18, 1978, Oct. 18, 1979, and Oct. 20, 1981; lowest measured, 94.10 ft below land-surface datum, Mar. 11, 1982.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984

Date	Water Level	Date	Water Level
OCT 25	53.07	MAR 6	78.63

a Well being pumped.

GROUND-WATER LEVELS

GRANT COUNTY--Continued

470626119101801. Local number, 19/29-28J1.

LOCATION.--Lat 47°06'26", long 119°10'18", Hydrologic Unit 17020015, near Wheeler.

Owner: J. E. Anderson.

AQUIFER.--Basalt of Miocene to Pliocene Age.

WELL CHARACTERISTICS.--Drilled domestic water-table well, depth 800 ft.

DATUM.--Altitude of land-surface datum is 1,235 ft.

PERIOD OF RECORD.--June 1975 to March 1984 (discontinued).

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 32.8 ft below land-surface datum, Oct. 14, 1977; lowest measured, 49.3 ft below land-surface datum, Oct. 18, 1979.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984

Date	Water Level	Date	Water Level
OCT 25	46.40	MAR 6	48.54

470952118592701. Local number, 19/30-1L1.

LOCATION.--Lat 47°09'52", long 118°59'27", Hydrologic Unit 17020015, near Ruff.

Owner: A. L. Ramm.

AQUIFER.--Basalt of Miocene to Pliocene Age.

WELL CHARACTERISTICS.--Drilled irrigation water-table well, diameter 12 in, depth 523 ft, cased to 37 ft.

DATUM.--Altitude of land-surface datum is 1,420 ft.

PERIOD OF RECORD.--January 1968 to August 1984 (discontinued).

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 257.0 ft below land-surface datum, Apr. 2, 1976; lowest measured, 424 ft below land-surface datum, Aug. 8, 1984.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984

Date	Water Level	Date	Water Level	Date	Water Level	Date	Water Level
DEC 16	391	APR 3	412	JUN 6	a435	AUG 8	424
FEB 8	410						

471955119324701. Local number, 21/26-10L2.

LOCATION.--Lat 47°19'55", long 119°32'47", Hydrologic Unit 17020015, at Ephrata.

Owner: D. L. Nelson.

AQUIFER.--Basalt of Miocene to Pliocene Age.

WELL CHARACTERISTICS.--Drilled unused water-table well, diameter 8 in, depth 122 ft, cased to 100 ft.

DATUM.--Altitude of land-surface datum is 1,260 ft.

PERIOD OF RECORD.--September 1949 to August 1984 (discontinued).

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 18.85 ft below land-surface datum, June 5, 1984; lowest measured, 68.27 ft below land-surface datum, Dec. 7, 1949.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984

Date	Water Level	Date	Water Level	Date	Water Level	Date	Water Level
OCT 19	22.02	FEB 6	19.64	JUN 5	18.85	AUG 9	20.08
DEC 8	21.02						

472009119300101. Local number, 21/26-12F1.

LOCATION.--Lat 47°20'09", long 119°30'01", Hydrologic Unit 17020015, near Ephrata.

Owner: Grant County.

AQUIFER.--Basalt of Miocene to Pliocene Age.

WELL CHARACTERISTICS.--Drilled unused water-table well, diameter 12 in, depth 183 ft.

DATUM.--Altitude of land-surface datum is 1,259 ft.

PERIOD OF RECORD.--December 1949 to August 1984 (discontinued).

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 79.85 ft below land-surface datum, Apr. 13, 1978; lowest measured, 117.77 ft below land-surface datum, Mar. 13, 1950.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984

Date	Water Level	Date	Water Level	Date	Water Level	Date	Water Level
OCT 18	84.68	FEB 6	81.98	JUN 5	83.44	AUG 9	82.02
DEC 8	85.15	APR 3	81.85				

a Well being pumped.

GROUND-WATER LEVELS

413

GRANT COUNTY--Continued

473644119161101. Local number, 24/28-2C1.

LOCATION.--Lat 47°36'44", long 119°16'11", Hydrologic Unit 17020014, near Coulee City.

Owner: Amax Corporation.

AQUIFER.--Basalt of Miocene to Pliocene Age.

WELL CHARACTERISTICS.--Drilled irrigation water-table well, diameter 12 in, depth 400 ft.

DATUM.--Altitude of land-surface datum is 1,661 ft.

PERIOD OF RECORD.--October 1966 to August 1984 (discontinued).

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 52.7 ft below land-surface datum, Feb. 29, 1968; lowest measured, 123.5 ft below land-surface datum, Aug. 23, 1977.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984

Date	Water Level	Date	Water Level	Date	Water Level	Date	Water Level
OCT 19	82.2	FEB 6	67.3	JUN 5	91.5	AUG 14	85.3
DEC 12	66.0	APR 2	62.1				

473505119085701. Local number, 24/29-10R1.

LOCATION.--Lat 47°35'05", long 119°08'57", Hydrologic Unit 17020014, near Coulee City.

Owner: Harold Isaak.

AQUIFER.--Basalt of Miocene to Pliocene Age.

WELL CHARACTERISTICS.--Drilled domestic water-table well, diameter 7 in, depth 120 ft.

DATUM.--Altitude of land-surface datum is 1,771 ft.

PERIOD OF RECORD.--October 1966 to August 1984 (discontinued).

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 70.8 ft below land-surface datum, Apr. 27, 1983; lowest measured, 93.84 ft below land-surface datum, Apr. 14, 1978.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984

Date	Water Level	Date	Water Level	Date	Water Level	Date	Water Level
OCT 19	73.1	FEB 6	67.24	JUN 5	79.73	AUG 14	76.72
DEC 12	72.6	APR 2	71.50				

GRAYS HARBOR COUNTY

465123124062201. Local number, 16/12W-24J4.

LOCATION.--Lat 46°51'23", long 124°06'22", Hydrologic Unit 17100106, near Westport.

Owner: State of Washington, Department of Ecology.

AQUIFER.--Glacial sand of Pleistocene Age.

WELL CHARACTERISTICS.--Drilled observation-test, artesian well, diameter 12 to 8 in, depth 700 ft, 12-in diameter casing to 398 ft, 8-in diameter casing 378 to 678 ft, perforated 187 to 192 ft, 269 to 279 ft, 327 to 332 ft, and 516 to 521 ft.

DATUM.--Altitude of land-surface datum is 15.65 ft National Geodetic Vertical Datum of 1929.

REMARKS.--Monitored depth interval from 187 to 192 ft, water level measured in 12-in diameter casing.

PERIOD OF RECORD.--March 1972 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 7.63 ft below land-surface datum, Jan. 20, 1982; lowest measured, 11.05 ft below land-surface datum, Oct. 4, 1974, Aug. 8, 1979.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984

Date	Water Level	Date	Water Level
JAN 10	9.59	SEP 12	10.43

465123124062202. Local number, 16/12W-24J5.

LOCATION.--Lat 46°51'23", long 124°06'22", Hydrologic Unit 17100106, near Westport.

Owner: State of Washington, Department of Ecology.

AQUIFER.--Sand and gravel of Pleistocene Age.

WELL CHARACTERISTICS.--Drilled observation-test, artesian well, diameter 12 to 8 in, depth 700 ft, 12-in diameter casing to 398 ft, 8-in diameter casing 378 to 678 ft, perforated 187 to 192 ft, 269 to 279 ft, 327 to 332 ft, and 516 to 521 ft.

DATUM.--Altitude of land-surface datum is 15.65 ft National Geodetic Vertical Datum of 1929.

REMARKS.--Monitored depth interval from 269 to 279 ft, water level measured in piezometer.

PERIOD OF RECORD.--March 1972 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 8.30 ft below land-surface datum, Jan. 10, 1978; lowest measured, 14.37 ft below land-surface datum, Jan. 20, 1982.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984

Date	Water Level	Date	Water Level
JAN 10	9.60	SEP 12	9.73

b Well recently pumped.

GROUND-WATER LEVELS

GRAYS HARBOR COUNTY--Continued

465123124062203. Local number, 16/12W-24J6.

LOCATION.--Lat 46°51'23", long 124°06'22", Hydrologic Unit 17100106, near Westport.

Owner: State of Washington, Department of Ecology.

AQUIFER.--Gravel of Pleistocene Age.

WELL CHARACTERISTICS.--Drilled observation-test, artesian well, diameter 12 to 8 in, depth 700 ft, 12-in diameter casing to 398 ft, 8-in diameter casing 378 to 678 ft, perforated 187 to 192 ft, 269 to 279 ft, 327 to 332 ft, and 516 to 521 ft.

DATUM.--Altitude of land-surface datum is 15.65 ft National Geodetic Vertical Datum of 1929.

REMARKS.--Monitored depth interval from 327 to 332 ft, water level measured in piezometer.

PERIOD OF RECORD.--March 1972 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 7.36 ft below land-surface datum, Jan. 20, 1982; lowest measured, 10.37 ft below land-surface datum, Aug. 8, 1979.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984

Date	Water Level	Date	Water Level
JAN 10	9.40	SEP 12	9.67

465123124062204. Local number, 16/12W-24J7.

LOCATION.--Lat 46°51'23", long 124°06'22", Hydrologic Unit 17100106, near Westport.

Owner: State of Washington, Department of Ecology.

AQUIFER.--Sandy clay of Pleistocene Age.

WELL CHARACTERISTICS.--Drilled observation-test, artesian well, diameter 12 to 8 in, depth 700 ft, 12-in diameter casing to 398 ft, 8-in diameter casing 378 to 678 ft, perforated 187 to 192 ft, 269 to 279 ft, 327 to 332 ft, and 516 to 521 ft.

DATUM.--Altitude of land-surface datum is 15.65 ft National Geodetic Vertical Datum of 1929.

REMARKS.--Monitored depth interval from 516 to 521 ft, water level measured in piezometer.

PERIOD OF RECORD.--March 1972 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 7.68 ft below land-surface datum, Jan. 27, 1983; lowest measured, 20.28 ft below land-surface datum, Aug. 19, 1983.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984

Date	Water Level	Date	Water Level
JAN 10	9.99	SEP 12	11.05

KITITITAS COUNTY

465111120272701. Local number, 16/19-28C1.

LOCATION.--Lat 46°51'11", long 120°27'27", Hydrologic Unit 17030001, near Ellensburg.

Owner: State of Washington

AQUIFER.--Grande Ronde Basalt of Miocene Age.

WELL CHARACTERISTICS.--Drilled observation artesian well, 10- to 8-in diameter, cased to 474 ft, total depth 1,019 ft, uncased depth interval from 474 to 1,019 ft.

REMARKS.--Well 16/19-28C1 is inside well 16/19-28C2.

DATUM.--Altitude of land-surface datum is 1,425 ft.

PERIOD OF RECORD.--February 1978 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 16.79 ft below land-surface datum, Aug. 20, 1980; lowest measured, 24.33 ft below land-surface datum, Sept. 23, 1981.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984

Date	Water Level	Date	Water Level
NOV 8	21.48	JAN 11	20.79

465111120272702. Local number, 16/19-28C2.

LOCATION.--Lat 46°51'11", long 120°27'27", Hydrologic Unit 17030001, near Ellensburg.

Owner: State of Washington

AQUIFER.--Grande Ronde Basalt of Miocene Age.

WELL CHARACTERISTICS.--Drilled 12-in diameter observation artesian well, total depth 474 ft, uncased depth interval from 169 to 474 ft.

DATUM.--Altitude of land-surface datum is 1,425 ft.

REMARKS.--Well 16/19-28C1 is inside well 16/19-28C2.

PERIOD OF RECORD.--March 1978 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 37.12 ft below land-surface datum, Mar. 1, 1978; lowest measured, 51.62 ft below land-surface datum, June 3, 1981.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984

Date	Water Level	Date	Water Level
NOV 8	45.95	JAN 11	46.26

GROUND-WATER LEVELS

415

KLICKITAT COUNTY

455008120561301. Local number, 4/15-16F1.

LOCATION.--Lat 45°50'08", long 120°56'13", Hydrologic Unit 17070106, near Blockhouse.

Owner: State of Washington, Department of Ecology.

AQUIFER.--Basalt of Miocene to Pliocene Age.

WELL CHARACTERISTICS.--Drilled observation-test, water-table well, diameter 12 in, depth 595 ft, 12-in diameter casing to 331 ft, perforated 40 to 331 ft.

DATUM.--Altitude of land-surface datum is 1,590 ft.

REMARKS.--Monitored depth interval from 40 to 210 ft, water level measured in piezometer.

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

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 11.1 ft below land-surface datum, Apr. 12, 1976; lowest measured, 31.1 ft below land-surface datum, Sept. 8, 1983.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984

Date	Water Level
FEB 15	28.18

455008120561302. Local number, 4/15-16F2.

LOCATION.--Lat 45°50'08", long 120°56'13", Hydrologic Unit 17070106, near Blockhouse.

Owner: State of Washington, Department of Ecology.

AQUIFER.--Basalt of Miocene to Pliocene Age.

WELL CHARACTERISTICS.--Drilled observation-test, artesian well, diameter 12 in, depth 595 ft, 12-in diameter casing to 331 ft, perforated 40 to 331 ft.

DATUM.--Altitude of land-surface datum is 1,590 ft.

REMARKS.--Monitored depth interval from 215 to 330 ft, water level measured in piezometer.

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

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 11.0 ft below land-surface datum, Apr. 12, 1976; lowest measured, 31.0 ft below land-surface datum, Sept. 8, 1983.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984

Date	Water Level
FEB 15	28.12

455008120561303. Local number, 4/15-16F3.

LOCATION.--Lat 45°50'08", long 120°56'13", Hydrologic Unit 17070106, near Blockhouse.

Owner: State of Washington, Department of Ecology.

AQUIFER.--Basalt of Miocene to Pliocene Age.

WELL CHARACTERISTICS.--Drilled observation-test, artesian well, diameter 12 in, depth 595 ft, 12-in diameter casing to 331 ft, perforated 40 to 331 ft.

DATUM.--Altitude of land-surface datum is 1,590 ft.

REMARKS.--Monitored depth interval from 500 to 580 ft, water level measured in piezometer.

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

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 11.6 ft below land-surface datum, Apr. 12, 1976; lowest measured, 31.5 ft below land-surface datum, Sept. 8, 1983.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984

Date	Water Level
FEB 15	28.60

455008120561304. Local number, 4/15-16F4.

LOCATION.--Lat 45°50'08", long 120°56'13", Hydrologic Unit 17070106, near Blockhouse.

Owner: State of Washington, Department of Ecology.

AQUIFER.--Basalt of Miocene to Pliocene Age.

WELL CHARACTERISTICS.--Drilled observation-test, artesian well, diameter 12 in, depth 595 ft, 12-in diameter casing to 331 ft, perforated 40 to 331 ft.

DATUM.--Altitude of land-surface datum is 1,590 ft.

REMARKS.--Monitored depth interval from 335 to 440 ft, water level measured in piezometer.

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

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 195.6 ft below land-surface datum, Mar. 16, 1982; lowest measured, 223.60 ft below land-surface datum, Apr. 30, 1973.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984

Date	Water Level
FEB 15	196.68

GROUND-WATER LEVELS

KLICKITAT COUNTY--Continued

455458120112702. Local number, 5/21-16L2.

LOCATION.--Lat 45°54'58", long 120°11'27", Hydrologic Unit 17070101, near Bickleton.

Owner: State of Washington, Department of Ecology.

AQUIFER.--Basalt of Miocene to Pliocene Age.

WELL CHARACTERISTICS.--Drilled observation-test, artesian well, diameter 8 in, total depth 1,500 ft, uncased depth interval from 1,469 to 1,474 ft.

DATUM.--Altitude of land-surface datum is 2,304 ft.

REMARKS.--Water level measured in piezometer.

PERIOD OF RECORD.--August 1981 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 677.25 ft below land-surface datum, Mar. 1, 1982; lowest measured, 682.7 ft below land-surface datum, May 16, 1983.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984

Date	Water Level	Date	Water Level
NOV 10	682.1	FEB 17	682.4

455458120112704. Local number, 5/21-16L4.

LOCATION.--Lat 45°54'58", long 120°11'27", Hydrologic Unit 17070101, near Bickleton.

Owner: State of Washington, Department of Ecology.

AQUIFER.--Basalt of Miocene to Pliocene Age.

WELL CHARACTERISTICS.--Drilled observation-test, artesian well, diameter 8 in, total depth 1,500 ft, uncased depth interval from 1,092 to 1,097 ft.

DATUM.--Altitude of land-surface datum is 2,304 ft.

REMARKS.--Water level measured in piezometer.

PERIOD OF RECORD.--August 1981 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 679.0 ft below land-surface datum, Mar. 1, 1982; lowest measured, 681.7 below land-surface datum, Feb. 17, 1984.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984

Date	Water Level	Date	Water Level
NOV 10	679.9	FEB 17	681.7

455458120112705. Local number, 5/21-16L5.

LOCATION.--Lat 45°54'58", long 120°11'27", Hydrologic Unit 17070101, near Bickleton.

Owner: State of Washington, Department of Ecology.

AQUIFER.--Basalt of Miocene to Pliocene Age.

WELL CHARACTERISTICS.--Drilled observation-test, artesian well, diameter 8 in, total depth 1,500 ft, uncased depth interval from 966 to 971 ft.

DATUM.--Altitude of land-surface datum is 2,304 ft.

REMARKS.--Water level measured in piezometer.

PERIOD OF RECORD.--August 1981 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 679.05 ft below land-surface datum, Dec. 9, 1981, Mar. 1, 1982; lowest measured, 682.3 ft below land-surface datum, Feb. 17, 1984.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984

Date	Water Level	Date	Water Level
NOV 10	682.1	FEB 17	682.3

455458120112706. Local number, 5/21-16L6.

LOCATION.--Lat 45°54'58", long 120°11'27", Hydrologic Unit 17070101, near Bickleton.

Owner: State of Washington, Department of Ecology.

AQUIFER.--Basalt of Miocene to Pliocene Age.

WELL CHARACTERISTICS.--Drilled observation-test, artesian well, diameter 8 in, total depth 1,500 ft, uncased depth interval from 802 to 807 ft.

DATUM.--Altitude of land-surface datum is 2,304 ft.

REMARKS.--Water level measured in piezometer.

PERIOD OF RECORD.--August 1981 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 679.05 ft below land-surface datum, Dec. 9, 1981, Mar. 1, 1982; lowest measured, 682.4 ft below land-surface datum, Feb. 17, 1984.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984

Date	Water Level	Date	Water Level
NOV 10	682.1	FEB 17	682.4

GROUND-WATER LEVELS

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KLICKITAT COUNTY--Continued

455458120112707. Local number, 5/21-16L7.

LOCATION.--Lat 45°54'58", long 120°11'27", Hydrologic Unit 17070101, near Bickleton.

Owner: State of Washington, Department of Ecology.

AQUIFER.--Basalt of Miocene to Pliocene Age.

WELL CHARACTERISTICS.--Drilled observation-test, artesian well, diameter 8 in, total depth 1,500 ft, uncased depth interval from 423 to 598 ft.

DATUM.--Altitude of land-surface datum is 2,304 ft.

REMARKS.--Water level measured in piezometer.

PERIOD OF RECORD.--August 1981 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 580.0 ft below land-surface datum, Dec. 9, 1981, Feb. 17, 1984; lowest measured, 583.8 ft below land-surface datum, July 19, 1983.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984

Date	Water Level	Date	Water Level
NOV 10	582.2	FEB 17	580.0

LINCOLN COUNTY

471937118544402. Local number, 21/31-10M2.

LOCATION.--Lat 47°19'37", long 118°54'44", Hydrologic Unit 17020015, near Odessa.

Owner: Mrs. Robert Schell.

AQUIFER.--Basalt of Miocene to Pliocene Age.

WELL CHARACTERISTICS.--Drilled oil-test well, diameter 10 in, depth 4,682 ft, cased to 98 ft.

DATUM.--Altitude of land-surface datum is 1,610 ft.

REMARKS.--Monitored depth interval from 98 to 735 ft, water level measured in piezometer.

PERIOD OF RECORD.--November 1972 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 230.25 ft below land-surface datum, Jan. 8, 1973; lowest measured, 289.7 ft below land-surface datum, June 21, 1983.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984

Date	Water Level	Date	Water Level	Date	Water Level
OCT 18	285.8	DEC 12	284.3	MAR 7	284.2

471937118544403. Local number, 21/31-10M3.

LOCATION.--Lat 47°19'37", long 118°54'44", Hydrologic Unit 17020015, near Odessa.

Owner: Mrs. Robert Schell.

AQUIFER.--Basalt of Miocene to Pliocene Age.

WELL CHARACTERISTICS.--Drilled oil-test well, diameter 10 in, depth 4,682 ft, cased to 98 ft.

DATUM.--Altitude of land-surface datum is 1,610 ft.

REMARKS.--Monitored depth interval from 742 to 1,480 ft, water level measured in piezometer.

PERIOD OF RECORD.--November 1972 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 231.32 ft below land-surface datum, Jan. 8, 1973; lowest measured, 338.3 ft below land-surface datum, Oct. 4, 1982.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984

Date	Water Level	Date	Water Level	Date	Water Level
OCT 18	324.3	DEC 12	312.0	MAR 7	306.0
NOV 30	317.1	MAR 7	310.0	JUN 21	327.8

471937118544404. Local number, 21/31-10M4.

LOCATION.--Lat 47°19'37", long 118°54'44", Hydrologic Unit 17020015, near Odessa.

Owner: Mrs. Robert Schell.

AQUIFER.--Basalt of Miocene to Pliocene Age.

WELL CHARACTERISTICS.--Drilled oil-test well, diameter 10 in, depth 4,682 ft, cased to 98 ft.

DATUM.--Altitude of land-surface datum is 1,610 ft.

REMARKS.--Monitored depth interval from 1,488 to 2,300 ft, water level measured in piezometer.

PERIOD OF RECORD.--November 1972 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 224.56 ft below land-surface datum, May 24, 1976; lowest measured, 241.9 ft below land-surface datum, Oct. 4, 1982.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984

Date	Water Level	Date	Water Level	Date	Water Level
OCT 18	238.7	DEC 12	237.2	MAR 7	236.9

GROUND-WATER LEVELS

LINCOLN COUNTY--Continued

473433118560301. Local number, 24/31-16E1.

LOCATION.--Lat 47°34'33", long 118°56'03", Hydrologic Unit 17020013, near Almira.

Owner: State of Washington, Department of Ecology.

AQUIFER.--Basalt of Miocene to Pliocene Age.

WELL CHARACTERISTICS.--Drilled observation-test, water-table well, diameter 10 in, depth 750 ft, cased to 60 ft.

DATUM.--Altitude of land-surface datum is 1,845 ft.

REMARKS.--Monitored depth interval from 60 to 316 ft, water level measured in 10 in diameter casing.

PERIOD OF RECORD.--May 1971 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 175.20 ft below land-surface datum, Sept. 1, 1975; lowest measured, 186.4 ft below land-surface datum, Mar. 18, 1980.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984

Date	Water Level	Date	Water Level	Date	Water Level
OCT 17	176.3	DEC 12	183.2	MAR 5	175.6

473433118560302. Local number 24/31-16E2.

LOCATION.--Lat 47°34'33", long 118°56'03", Hydrologic Unit 17020013, near Almira.

Owner: State of Washington, Department of Ecology.

AQUIFER.--Basalt of Miocene to Pliocene Age.

WELL CHARACTERISTICS.--Drilled observation-test, artesian well, diameter 10 in, depth 750 ft, cased to 60 ft.

DATUM.--Altitude of land-surface datum is 1,845 ft.

REMARKS.--Monitored depth interval from 424 to 456 ft, water level measured in piezometer.

PERIOD OF RECORD.--May 1971 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 345.65 ft below land-surface datum, Jan. 31, 1977; lowest measured, 393.1 ft below land-surface datum, Feb. 14, 1978.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984

Date	Water Level	Date	Water Level	Date	Water Level
OCT 17	376.7	DEC 12	379.4	MAR 5	372.3

473433118560303. Local number, 24/31-16E3.

LOCATION.--Lat 47°34'33", long 118°56'03", Hydrologic Unit 17020013, near Almira.

Owner: State of Washington, Department of Ecology.

AQUIFER.--Basalt of Miocene to Pliocene Age.

WELL CHARACTERISTICS.--Drilled observation-test, artesian well, diameter 10 in, depth 750 ft cased to 60 ft.

DATUM.--Altitude of land-surface datum is 1,845 ft.

REMARKS.--Monitored depth interval from 494 to 556 ft, water level measured in piezometer.

PERIOD OF RECORD.--May 1971 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 345.53 ft below land-surface datum, Jan. 31, 1977; lowest measured, 393.6 ft below land-surface datum, Feb. 14, 1978.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984

Date	Water Level	Date	Water Level	Date	Water Level
OCT 17	376.6	DEC 12	379.5	MAR 5	372.6

473433118560304. Local number, 24/31-16E4.

LOCATION.--Lat 47°34'33", long 118°56'03", Hydrologic Unit 17020013, near Almira.

Owner: State of Washington, Department of Ecology.

AQUIFER.--Basalt of Miocene to Pliocene Age.

WELL CHARACTERISTICS.--Drilled observation-test, artesian well, diameter 10 in, depth 750 ft, cased to 60 ft.

DATUM.--Altitude of land-surface datum is 1,845 ft.

REMARKS.--Monitored depth interval 650 to 698 ft, water level measured in piezometer.

PERIOD OF RECORD.--May 1971 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 346.50 ft below land-surface datum, Jan. 31, 1977; lowest measured, 393.5 ft below land-surface datum, Feb. 14, 1978.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984

Date	Water Level	Date	Water Level	Date	Water Level
OCT 17	376.8	DEC 12	379.6	MAR 5	372.8

GROUND-WATER LEVELS

419

LINCOLN COUNTY--Continued

473442118162201. Local number, 24/36-16A1.

LOCATION.--Lat 47°34'42", long 118°16'22", Hydrologic Unit 17020013, near Davenport.

Owner: State of Washington, Department of Ecology.

AQUIFER.--Basalt of Miocene to Pliocene Age.

WELL CHARACTERISTICS.--Drilled observation-test, water-table well, diameter 10 in, depth 750 ft, cased to 75 ft.

DATUM.--Altitude of land-surface datum is 2,372 ft.

REMARKS.--Monitored depth interval from 75 to 116 ft, water level measured in 10 in casing.

PERIOD OF RECORD.--September 1971 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 28.52 ft below land-surface datum, May 1, 1974; lowest measured, 46.10 ft below land-surface datum, Nov. 6, 1973.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984

Date	Water Level	Date	Water Level	Date	Water Level
OCT 17	36.79	DEC 7	36.45	MAR 5	33.02

473442118162202. Local number, 24/36-16A2.

LOCATION.--Lat 47°34'42", long 118°16'22", Hydrologic Unit 17020013, near Davenport.

Owner: State of Washington, Department of Ecology.

AQUIFER.--Basalt of Miocene to Pliocene Age.

WELL CHARACTERISTICS.--Drilled observation-test, artesian well, diameter 10 in, depth 750 ft, cased to 75 ft.

DATUM.--Altitude of land-surface datum is 2,372 ft.

REMARKS.--Monitored depth interval from 123 to 160 ft, water level measured in piezometer.

PERIOD OF RECORD.--September 1971 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 28.38 ft below land-surface datum, May 1, 1974; lowest measured, 46.22 ft below land-surface datum, Nov. 6, 1973.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984

Date	Water Level	Date	Water Level	Date	Water Level
OCT 17	36.75	DEC 7	36.79	MAR 5	32.56

473442118162203. Local number, 24/36-16A3.

LOCATION.--Lat 47°34'42", long 118°16'22", Hydrologic Unit 17020013, near Davenport.

Owner: State of Washington, Department of Ecology.

AQUIFER.--Basalt of Miocene to Pliocene Age.

WELL CHARACTERISTICS.--Drilled observation-test, artesian well, diameter 10 in, depth 750 ft, cased to 75 ft.

DATUM.--Altitude of land-surface datum is 2,372 ft.

REMARKS.--Monitored depth interval from 208 to 224 ft, water level measured in piezometer.

PERIOD OF RECORD.--September 1971 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 28.24 ft below land-surface datum, May 1, 1974; lowest measured, 46.25 ft below land-surface datum, Nov. 6, 1973.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984

Date	Water Level	Date	Water Level	Date	Water Level
OCT 17	36.76	DEC 7	36.70	MAR 5	32.97

473442118162204. Local number, 24/36-16A4.

LOCATION.--Lat 47°34'42", long 118°16'22", Hydrologic Unit 17020013, near Davenport.

Owner: State of Washington, Department of Ecology.

AQUIFER.--Basalt of Miocene to Pliocene Age.

WELL CHARACTERISTICS.--Drilled observation-test, artesian well, diameter 10 in, depth 750 ft, cased to 75 ft.

DATUM.--Altitude of land-surface datum is 2,372 ft.

REMARKS.--Monitored depth interval from 242 to 261 ft, water level measured in piezometer.

PERIOD OF RECORD.--September 1971 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 27.47 ft below land-surface datum, May 1, 1974; lowest measured, 46.45 ft below land-surface datum, Nov. 6, 1973.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984

Date	Water Level	Date	Water Level	Date	Water Level
OCT 17	36.80	DEC 7	36.82	MAR 5	33.17

GROUND-WATER LEVELS

LINCOLN COUNTY--Continued

473442118162205. Local number, 24/36-16A5.

LOCATION.--47°34'42", long 188°16'22", Hydrologic Unit 17020013, near Davenport.

Owner: State of Washington, Department of Ecology.

AQUIFER.--Basalt of Miocene to Pliocene Age.

WELL CHARACTERISTICS.--Drilled observation-test, artesian well, diameter 10 in, depth 750 ft, cased to 75 ft.

DATUM.--Altitude of land-surface datum is 2,372 ft.

REMARKS.--Monitored depth interval from 315 to 365 ft, water level measured in piezometer.

PERIOD OF RECORD.--September 1971 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 27.90 ft below land-surface datum, May 1, 1974; lowest measured, 50.53 ft below land-surface datum, Sept. 6, 1973.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984

Date	Water Level	Date	Water Level	Date	Water Level
OCT 17	40.17	DEC 7	39.84	MAR 5	37.55

473442118162206. Local number, 24/36-16A6.

LOCATION.--Lat 47°34'42", long 118°16'22", Hydrologic Unit 17020013, near Davenport.

Owner: State of Washington, Department of Ecology.

AQUIFER.--Basalt of Miocene to Pliocene Age.

WELL CHARACTERISTICS.--Drilled observation-test, artesian well, diameter 10 in, depth 750 ft, cased to 75 ft.

DATUM.--Altitude of land-surface datum is 2,372 ft.

REMARKS.--Monitored depth interval from 451 to 491 ft, water level measured in piezometer.

PERIOD OF RECORD.--September 1971 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 34.93 ft below land-surface datum, Mar. 2, 1976; lowest measured, 66.34 ft below land-surface datum, Sept. 20, 1971.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984

Date	Water Level	Date	Water Level	Date	Water Level
OCT 17	42.10	DEC 7	41.01	MAR 5	40.08

473442118162207. Local number, 24/36-16A7.

LOCATION.--Lat 47°34'42", long 118°16'22", Hydrologic Unit 17020013, near Davenport.

Owner: State of Washington, Department of Ecology.

AQUIFER.--Basalt of Miocene to Pliocene Age.

WELL CHARACTERISTICS.--Drilled observation-test, artesian well, diameter 10 in, depth 750 ft, cased to 75 ft.

DATUM.--Altitude of land-surface datum is 2,372 ft.

REMARKS.--Monitored depth interval from 590 to 635 ft, water level measured in piezometer.

PERIOD OF RECORD.--September 1971 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 162.47 ft below land-surface datum, Mar. 2, 1972; lowest measured, 213.6 ft below land-surface datum, Aug. 23, 1982.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984

Date	Water Level	Date	Water Level	Date	Water Level
OCT 17	201.78	DEC 7	197.1	MAR 5	193.13

473442118162208. Local number, 24/36-16A8.

LOCATION.--Lat 47°34'42", long 118°16'22", Hydrologic Unit 17020013, near Davenport.

Owner: State of Washington, Department of Ecology.

AQUIFER.--Basalt of Miocene to Pliocene Age.

WELL CHARACTERISTICS.--Drilled observation-test, artesian well, diameter 10 in, depth 750 ft, cased to 75 ft.

DATUM.--Altitude of land-surface datum is 2,372 ft.

REMARKS.--Monitored depth interval from 728 to 750 ft, water level measured in piezometer.

PERIOD OF RECORD.--September 1971 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 162.82 ft below land-surface datum, Mar. 2, 1972; lowest measured, 214.77 ft below land-surface datum, Aug. 22, 1977.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984

Date	Water Level	Date	Water Level	Date	Water Level
OCT 17	201.50	DEC 7	197.2	MAR 5	194.1

GROUND-WATER LEVELS--Continued

421

PIERCE COUNTY

471358122302207. Local number, 20/2-11J7.

LOCATION.--Lat 47°13'58", long 122°30'22", Hydrologic Unit 17110019.

Owner: Fircrest Well No. 3.

AQUIFER.--Glacial sand and gravel of Pleistocene Age.

WELL CHARACTERISTICS.--Drilled unused water-table well, diameter 12 in, depth 152 ft, perforated 88 to 94 ft and 141 to 149 ft.

DATUM.--Altitude of land-surface datum is 285 ft.

PERIOD OF RECORD.--August 1963 to February 1964, December 1970 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 56.40 ft below land-surface datum, May 25, 1984; lowest measured, 68.21 ft below land-surface datum, Oct. 1, 1973. Water level measurements affected by nearby pumpage.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984

Date	Water Level	Date	Water Level	Date	Water Level	Date	Water Level
NOV 23	58.75	MAR 26	57.70	JUL 25	57.90	SEP 26	59.00
JAN 25	57.40	MAY 25	56.40				

471329122310501. Local number, 20/2-14F2.

LOCATION.--Lat 47°13'29", long 122°31'05", Hydrologic Unit 17110019.

Owner: Fircrest Well No. 6.

AQUIFER.--Glacial sand and gravel of Pleistocene Age.

WELL CHARACTERISTICS.--Drilled water-table well, diameter 16 in, depth 203 ft, screened 162 to 172 ft and 178 to 198 ft.

DATUM.--Altitude of land-surface datum is 365 ft.

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

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 150.80 ft below land-surface datum, Nov. 23, 1983; lowest measured, 175.84 ft below land-surface datum, May 6, 1980. Water level measurements are affected by nearby pumpage.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984

Date	Water Level	Date	Water Level	Date	Water Level	Date	Water Level
NOV 23	150.80	MAR 28	152.00	MAY 25	151.80	JUL 25	152.40
JAN 25	151.00						

471308122305501. Local number, 20/2-14L1.

LOCATION.--Lat 47°13'08", long 122°30'55", Hydrologic Unit 17110019.

Owner: Town of Fircrest, well No. 8.

AQUIFER.--Glacial sand and gravel of Pleistocene Age.

WELL CHARACTERISTICS.--Drilled public-supply water-table well, diameter 20 in, depth 141 ft, cased to 112 ft.

DATUM.--Altitude of land-surface datum is 295 ft.

PERIOD OF RECORD.--October 1970 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 79.21 ft below land-surface datum, Apr. 24, 1972; lowest measured, 98.81 ft below land-surface datum, Mar. 10, 1981. Water levels affected by nearby pumpage.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984

Date	Water Level	Date	Water Level	Date	Water Level	Date	Water Level
NOV 23	82.02	MAR 28	79.67	MAY 25	81.02	JUL 25	86.32
JAN 25	85.22						

471338122282201. Local number, 20/3-18C1.

LOCATION.--Lat 47°13'38", long 122°28'22", Hydrologic Unit 17110019.

Owner: City of Tacoma.

AQUIFER.--Glacial sand and gravel of Pleistocene Age.

WELL CHARACTERISTICS.--Drilled unused test artesian well, diameter 12 in, depth 185 ft, cased to 152 ft.

DATUM.--Altitude of land-surface datum is 310 ft.

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

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 63.85 ft below land-surface datum, Oct. 5, 1954; lowest measured, 127.38 ft below land-surface datum, Mar. 27, 1974. Water level measurements are affected by nearby pumpage.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984

Date	Water Level	Date	Water Level	Date	Water Level	Date	Water Level
OCT 25	111.18	JAN 25	100.48	APR 25	99.08	JUL 25	111.13
NOV 23	101.93	FEB 27	99.83	MAY 25	108.88	AUG 24	112.68
DEC 23	101.18	MAR 26	99.48	JUN 25	99.48	SEP 26	102.28

GROUND-WATER LEVELS

SPOKANE COUNTY

47401117072901. Local number, 25/45-16C1.

LOCATION.--Lat 47°40'11", long 117°07'29", Hydrologic Unit 17010305, near Greenacres.

Owner: Inland Empire Paper Company.

AQUIFER.--Glacial sand and gravel of Pleistocene Age.

WELL CHARACTERISTICS.--Dug unused irrigation water-table well, diameter 96 in, depth 129 ft, lined with gunite cement to 129 ft.

DATUM.--Altitude of land-surface datum is 2,060.4 ft National Geodetic Vertical Datum of 1929.

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

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 84.56 ft below land-surface datum, June 17, 1953; lowest measured, 114.53 ft below land-surface datum, Dec. 8, 1931.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984

Date	Water Level	Date	Water Level	Date	Water Level	Date	Water Level
OCT 24	103.09	FEB 23	99.66	APR 19	97.16	JUL 23	100.24
NOV 25	104.30	MAR 21	99.21	MAY 24	96.22	AUG 23	102.64
DEC 21	101.25	MAR 22	99.08	JUN 27	96.12	SEP 25	102.55
JAN 30	100.08						

WALLA WALLA COUNTY

460014118281801. Local number, 6/35-18A1.

LOCATION.--Lat 46°00'14", long 118°28'18", Hydrologic Unit 17070102, near Walla Walla.

Owner: State of Washington, Department of Ecology.

AQUIFER.--Basalt of Miocene to Pliocene Age.

WELL CHARACTERISTICS.--Drilled observation-test, water-table well, diameter 12 to 8 in, depth 1,308 ft, 12-in diameter casing from 0 to 273 ft, 10-in diameter casing from 250 to 680 ft, 8-in diameter casing from 670 to 730 ft, perforations from 90 to 230 ft and from 710 to 730 ft.

DATUM.--Altitude of land-surface datum is 670 ft.

REMARKS.--Monitored depth interval from 90 to 230 ft, water level measured in 12-in diameter casing.

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

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 14.7 ft below land-surface datum, Mar. 17, 1980; lowest measured, 45.70 ft below land-surface datum, Jan. 27, 1975.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984

Date	Water Level	Date	Water Level	Date	Water Level
OCT 5	30.05	DEC 14	23.12	FEB 8	25.07

460014118281802. Local number, 6/35-18A2.

LOCATION.--Lat 46°00'14", long 118°28'18", Hydrologic Unit 17070102, near Walla Walla.

Owner: State of Washington, Department of Ecology.

AQUIFER.--Basalt of Miocene to Pliocene Age.

WELL CHARACTERISTICS.--Drilled observation-test, water-table well, diameter 12 to 8 in, depth 1,308 ft, 12-in diameter casing from 0 to 273 ft, 10-in diameter casing from 250 to 680 ft, 8-in diameter casing from 670 to 730 ft, perforations from 90 to 230 ft and from 710 to 730 ft.

DATUM.--Altitude of land-surface datum is 670 ft.

REMARKS.--Monitored depth interval from 710 to 730 ft, water level measured in piezometer.

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

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 144.20 ft below land-surface datum, Apr. 1, 1974; lowest measured, 200.8 ft below land-surface datum, Oct. 19, 1977.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984

Date	Water Level	Date	Water Level	Date	Water Level
OCT 5	167.2	DEC 14	157.1	FEB 8	151.7

460014118281803. Local number, 6/35-18A3.

LOCATION.--Lat 46°00'14", long 118°28'18", Hydrologic Unit 17070102, near Walla Walla.

Owner: State of Washington, Department of Ecology.

AQUIFER.--Basalt of Miocene to Pliocene Age.

WELL CHARACTERISTICS.--Drilled observation-test, artesian well, diameter 12 to 8 in, depth 1,308 ft, 12-in diameter casing from 0 to 273 ft, 10-in diameter casing from 250 to 680 ft, 8-in diameter casing from 670 to 730 ft, perforations from 90 to 230 ft and from 710 to 730 ft.

DATUM.--Altitude of land-surface datum is 670 ft.

REMARKS.--Monitored depth interval from 740 to 1,204 ft, water level measured in piezometer.

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

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 145.10 ft below land-surface datum, Apr. 1, 1974; lowest measured, 201.0 ft below land-surface datum, Oct. 19, 1977.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984

Date	Water Level	Date	Water Level	Date	Water Level
OCT 5	167.6	DEC 14	157.8	FEB 8	153.4

GROUND-WATER LEVELS

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WALLA WALLA COUNTY--Continued

460014118281804. Local number, 6/35-18A4.

LOCATION.--Lat 46°00'14", long 118°28'18", Hydrologic Unit 17070102, near Walla Walla.

Owner: State of Washington, Department of Ecology.

AQUIFER.--Basalt of Miocene to Pliocene Age.

WELL CHARACTERISTICS.--Drilled observation-test, artesian well, diameter 12 to 8 in, depth 1,308 ft, 12-in diameter casing from 0 to 273 ft, 10-in diameter casing from 250 to 680 ft, 8-in diameter casing from 670 to 730 ft, perforations from 90 to 230 ft and from 710 to 730 ft.

DATUM.--Altitude of land-surface datum is 670 ft.

REMARKS.--Monitored depth interval from 1,216 to 1,308 ft, water level measured in piezometer.

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

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 145.60 ft below land-surface datum, Apr. 1, 1974; lowest measured, 201.9 ft below land-surface datum, Oct. 19, 1977.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984

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FACTORS FOR CONVERTING INCH-POUND UNITS TO INTERNATIONAL SYSTEM UNITS (SI)

The following factors may be used to convert the inch-pound units published herein to the International System of Units (SI). This report contains both the inch-pound and SI unit equivalents in the station manuscript descriptions.

Multiply inch-pound units	By	To obtain SI units
<i>Length</i>		
inches (in)	2.54×10^1 2.54×10^{-2}	millimeters (mm) meters (m)
feet (ft)	3.048×10^{-1}	meters (m)
miles (mi)	1.609×10^0	kilometers (km)
<i>Area</i>		
acres	4.047×10^3 4.047×10^{-1} 4.047×10^{-3}	square meters (m ²) square hectometers (hm ²) square kilometers (km ²)
square miles (mi ²)	2.590×10^0	square kilometers (km ²)
<i>Volume</i>		
gallons (gal)	3.785×10^0 3.785×10^0 3.785×10^{-3}	liters (L) cubic decimeters (dm ³) cubic meters (m ³)
million gallons	3.785×10^3 3.785×10^{-3}	cubic meters (m ³) cubic hectometers (hm ³)
cubic feet (ft ³)	2.832×10^1 2.832×10^{-2}	cubic decimeters (dm ³) cubic meters (m ³)
cfs-days	2.447×10^3 2.447×10^{-3}	cubic meters (m ³) cubic hectometers (hm ³)
acre-feet (acre-ft)	1.233×10^3 1.233×10^{-3} 1.233×10^{-6}	cubic meters (m ³) cubic hectometers (hm ³) cubic kilometers (km ³)
<i>Flow</i>		
cubic feet per second (ft ³ /s)	2.832×10^1 2.832×10^1 2.832×10^{-2}	liters per second (L/s) cubic decimeters per second (dm ³ /s) cubic meters per second (m ³ /s)
gallons per minute (gal/min)	6.309×10^{-2} 6.309×10^{-2} 6.309×10^{-5}	liters per second (L/s) cubic decimeters per second (dm ³ /s) cubic meters per second (m ³ /s)
million gallons per day	4.381×10^1 4.381×10^{-2}	cubic decimeters per second (dm ³ /s) cubic meters per second (m ³ /s)
<i>Mass</i>		
tons (short)	9.072×10^{-1}	megagrams (Mg) or metric tons



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