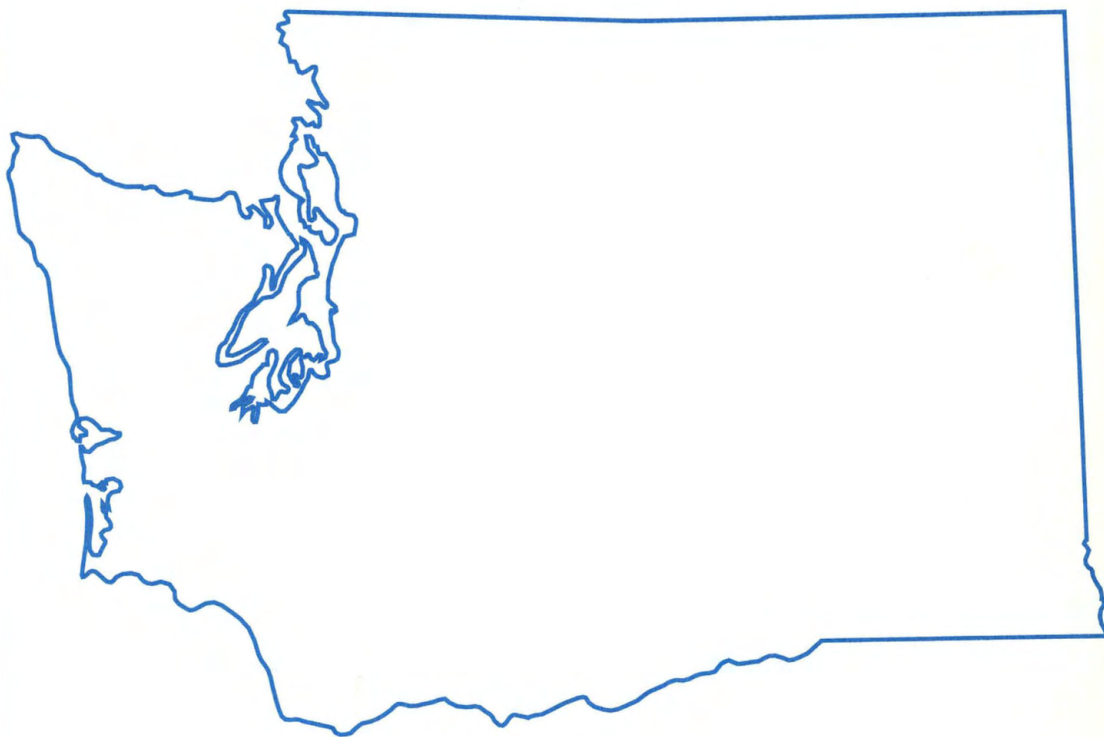
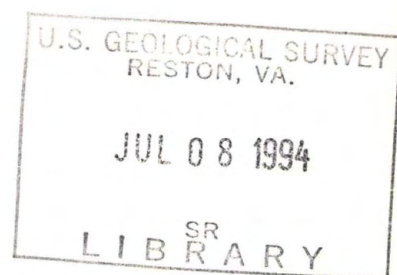


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Water Resources Data Washington Water Year 1993



U.S. GEOLOGICAL SURVEY WATER-DATA REPORT WA-93-1
Prepared in cooperation with the State of Washington
and with other agencies

CALENDAR FOR WATER YEAR 1993

1992

OCTOBER

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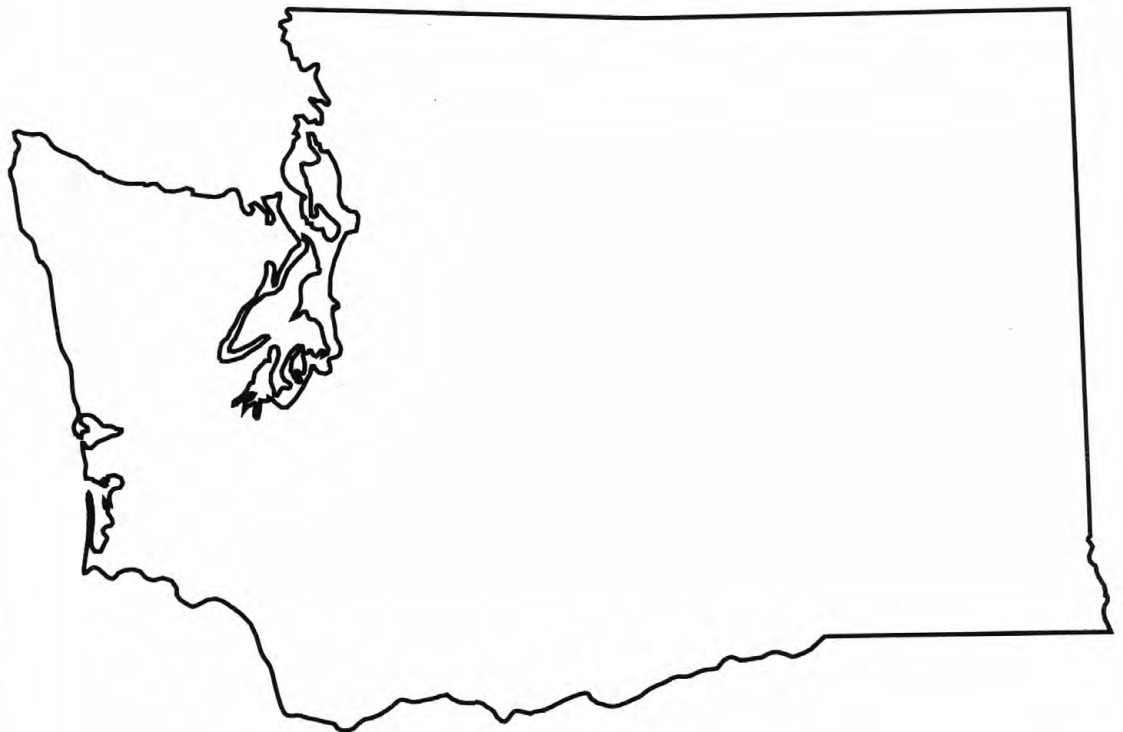
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Water Resources Data Washington Water Year 1993

by M.B. Miles, W.D. Wiggins, G.P. Ruppert, R.R. Smith, L.L. Reed,
L.E. Hubbard and M.L. Courts



U.S. GEOLOGICAL SURVEY WATER-DATA REPORT WA-93-1
Prepared in cooperation with the State of Washington
and with other agencies

U.S. DEPARTMENT OF THE INTERIOR

BRUCE BABBITT, Secretary

U.S. GEOLOGICAL SURVEY

Gordon P. Eaton, Director

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1201 Pacific Avenue - Suite 600
Tacoma, Washington, 98402

1994

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.

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

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This report was prepared in cooperation with the State of Washington and with other agencies under the general supervision of Carl R. Goodwin, District Chief, Washington District, Marvin O. Fretwell, Area Regional Hydrologist, Pacific Northwest Area, and T. John Conomos, Regional Hydrologist, Western Region.

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15. Supplementary Notes Prepared in cooperation with the State of Washington and with other agencies.				
16. Abstract (Limit: 200 words) Water resources data for the 1993 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 of wells. This report contains discharge records for 220 gaging stations; stage only records for 4 gaging stations; stage and (or) contents for 32 lakes and reservoirs; water quality for 30 streamflow-gaging stations, and 7 ungaged streamsites; water levels for 5 observation wells; streamflow for 43 partial-record or miscellaneous streamflow stations, and 1 seepage investigation. Locations of these sites are shown on figures 4a, 4b, 5, 6a, and 6b. 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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SURFACE-WATER STATIONS IN DOWNSTREAM ORDER, FOR WHICH RECORDS
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VII

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

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

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DISCONTINUED SURFACE-WATER DISCHARGE OR STAGE-ONLY STATIONS

The following continuous-record surface-water discharge or stage-only stations (gaging stations) in Washington have been discontinued. Period of record for daily streamflow or stage records collected and published as daily means, or monthly means for some periods, for the period of record, expressed in water years, are shown for each station. Those stations with an asterisk (*) after the station number are currently operated as a crest-stage station. Discontinued stations with less than 3 years of records are included. Information and data regarding any station may be obtained from the District Office at the address given on the back side of the title page of this report.

[Data listed are for discharge, except where noted with the letter: (E) elevation, (S) stage.]

Discontinued surface-water discharge or stage-only stations

Station name	Station number	Drainage Area (square miles)	Period of record (water years)
SOUTHWEST WASHINGTON RIVER BASINS			
Bear Branch (River) near Naselle, Wa.	12009500	11.7	1963-75
Salmon Creek near Naselle, Wa.	12010500	16.4	1953-65
South Fork Naselle River near Naselle, Wa.	12010700	17.9	1964-75;1977
North Nmah River near South Bend, Wa.	12011000	18.0	1946-54;1964-68;1977
Williams Creek near South Bend, Wa.	12011200	9.43	1964-74;1977
Willapa River at Lebam, Wa.	12011500	41.4	1948-71
Fork Creek near Lebam, Wa.	12012000	20.4	1953-70
Stringer Creek near Holcomb, Wa.	12012500	3.02	1953
Mill Creek near Willapa, Wa.	12013000	23.7	1953
Ward Creek near Willapa, Wa.	12014000	19.3	1953
South Fork Willapa River near Raymond, Wa.	12014500	27.8	1953-71
Elkhorn Creek near Raymond, Wa.	12015000	15.6	1953
Clearwater Creek near Raymond, Wa.	12015100	3.98	1964-75
Smith Creek near Raymond, Wa.	12015200	57.7	1963-66
North River near Brooklyn, Wa.	12015500	29.8	1953-65
Fall River at Brooklyn, Wa.	12016000	41.0	1953
Little North River near Cosmopolis, Wa.	12016500	18.6	1946-49;1953
North River near Raymond, Wa.	12017000	219	1927-77
Johns River near Markham, Wa.	12017500	18.9	1942-43
Newskah Creek near Aberdeen, Wa.	12018000	7.44	1946-49
Charley (Charles) Creek near Aberdeen, Wa.	12018500	5.93	1946-49
CHEHALIS RIVER BASIN			
Chehalis River near Pe Ell, Wa.	12019000	54.7	1944
Rock Creek near Pe Ell, Wa.	12019500	13.4	1944
Elk Creek near Doty, Wa.	12020500	46.7	1942-50;1967-70
South Fork Chehalis River near Boistfort, Wa.	12020900	44.9	1965-80
South Fork Chehalis River at Boistfort, Wa.	12021000	48.0	1942-50;1961-65
Halfway Creek near Boistfort, Wa.	12021500	13.4	1944
Bunker Creek near Adna, Wa.	12022000	20.1	1944
Stearns Creek near Napaville, Wa.	12022500	14.1	1945
Stearns Creek near Adna, Wa.	12023000	27.1	1944
Chehalis River near Chehalis, Wa.	12023500	434	1929-31
South Fork Newaukum River near Onalaska, Wa.	12024000	42.4	1944-49;1957-71
North Fork Newaukum River near Forest, Wa.	12024500	31.5	1944;1957-66
Salzer Creek near Centralia, Wa.	12025300	12.6	1968-71
Chehalis River at Centralia, Wa. (S)	12025500	---	1910-11
Skookumchuck River near Centralia, Wa.	12026000	61.7	1929-34;1940-69
Hanaford Creek near Centralia, Wa.	12026500	13.3	1944
Lincoln Creek near Rochester, Wa.	12027000	19.3	1942-50
Scatter Creek near Ground Mound, Wa.	12028000	21.0	1944
Wadell Creek near Little Rock, Wa.	12028500	15.9	1944
Black River at Little Rock, Wa.	12029000	63.7	1942-50
Garrard (Garrod) Creek near Oakville, Wa.	12029500	27.7	1944
Rock Creek near Cedarville, Wa.	12030000	24.8	1942-71
Cedar Creek near Cedarville, Wa.	12030500	38.2	1944
Porter Creek at Porter, Wa.	12030900	35.3	1942-49
Wildcat Creek near Elma, Wa.	12032000	19.8	1944
Cloquallum River (Creek) near Elma, Wa.	12032500	64.9	1942-72
Chehalis River at South Elma, Wa.	12033000	1,417	1942-45;1947-52
East Fork Satsop River near Matlock, Wa.	12033500	23.7	1946-47
Bingham Creek near Satsop, Wa.	12034000	30.0	1946-48
East Fork Satsop River near Elma, Wa.	12034200	65.9	1957-71
Middle Fork Satsop River near Satsop, Wa.	12034500	63.0	1942-43
Chehalis River near Satsop, Wa.	12035002	1,761	1977-83
Wynoochee River at Oxbow near Aberdeen, Wa.	12035500	70.7	1925-52
Wynoochee River near Montesano, Wa.	12036500	112	1923-30
Anderson Creek near Montesano, Wa.	12036650	2.72	1972-85
City Aberdeen River Intake near Montesano, Wa.	12037000	---	1942
Wynoochee River below Black Creek near Montesano, Wa.	12037500	180	1942-50
Wishkah River near Wishkah, Wa.	12038000	57.8	1942-43
WESTERN OLYMPIC MOUNTAIN RIVER BASINS			
West Fork Hoquiam River near Hoquiam, Wa.	12038500	16.0	1942-44
Humtuplups River near Humtuplups, Wa.	12039000	130	1933-35;1942-79
Moclips River at Moclips, Wa.	12039220	35.0	1975-81
North Fork Quinalt River near Amanda Park, Wa.	12039300	74.1	1964-86
Raft River below Rainy Creek near Queets, Wa.	12039520	76.0	1974-81
Clearwater River near Clearwater, Wa.	12040000	140	1932;1937-50
Hoh River below Mt. Tom Creek near Forks, Wa.	12040700	97.8	1985-89
South Fork Hoh River near Forks, Wa.	12040900	50.4	1985-89
Hoh River near Forks (Spruce), Wa.	12041000	208	1926-64
Soleduck River near Fairholm, Wa.	12041500	83.8	1918-21;1933-71;1977-80
Soleduck River at Snider Ranger Station near Beaver, Wa.	12042000	116	1922-28
Soleduck River near (at) Quillayute, Wa.	12042500	219	1898-1902;1978-80
Bogachiel River near Forks, Wa.	12042800	111	1975-80
East Fork Dickey River near La Push, Wa.	12043080	39.8	1962-68
Dickey River near La Push, Wa.	12043100	86.3	1962-73;1977-80
Ozette River near Ozette, Wa.	12043150	77.5	1976-79
Sooes River below Miller Creek near Ozette, Wa.	12043163	32.0	1976-86
EASTERN OLYMPIC MOUNTAIN RIVER BASINS			
Waatch River below Edocket Creek at Neah Bay, Wa.	12043173	9.96	1976-79
Sail River near Neah Bay, Wa.	12043190	5.42	1976-79
Clallam River near Clallam Bay, Wa.	12043350	137	1962
East Twin River near Pysht, Wa.	12043430	14.0	1962-72
Lake Crescent at Piedmont, Wa. (S)	12043500	49.1	1919-27
Lyre River at Piedmont, Wa.	12044000	49.5	1918-27
Salt Creek near Port Angeles, Wa.	12044500	8.31	1952
Elwha River near Port Angeles, Wa. (S)	12046000	315	1911-12
Elwha River below Diversion near Port Angeles, Wa.	12046500	318	1951-54
Ennis Creek near Port Angeles, Wa.	12047000	8.32	1952
Morse Creek near Port Angeles, Wa.	12047300	46.6	1966-76
Siebert Creek near Port Angeles, Wa.	12047500	15.5	1952-69
Dungeness River below Canyon Creek near Sequim, Wa.	12048500	170	1897-98

Discontinued surface-water discharge or stage-only stations

Station name	Station number	Drainage Area (square miles)	Period of record (water years)
EASTERN OLYMPIC MOUNTAIN RIVER BASIN--Continued			
Dungeness River at Dungeness (Sequim), Wa.	12049000	197	1898-1902
Jimmycomelately Creek near Blyn, Wa.	12049500	18.3	1952
Salmon Creek near Maynard, Wa.	12050000	13.0	1952
Snow Creek near Maynard, Wa.	12050500	11.2	1952-72
Andrews Creek near Maynard, Wa.	12051000	10.2	1952
Chimacum Creek near Chimacum, Wa.	12051500	13.8	1952-58
Little Quilcene River near Quilcene, Wa.	12052000	23.7	1926-27; 1951-58
Big Quilcene River near (at) Quilcene, Wa.	12052500	66.0	1971-72
Dosewallips River near Brinnon, Wa.	12053000	93.5	1931-50
Dosewallips River at Brinnon, Wa.	12053500	116	1911; 1924-25; 1928-30
Hamma Hamma River near Eldon, Wa.	12054500	51.3	1951-71
Jefferson Creek near Eldon, Wa.	12054600	21.6	1958-71
Hamma Hamma River near Hoodsport, Wa.	12055000	83.5	1926-30
Eagle Creek near Lilliwaup, Wa.	12055500	7.06	1951
Finch Creek at Hoodsport, Wa.	12056000	3.45	1951
Lake Cushman (Reservoir) near Hoodsport, Wa. (E)	12057000	93.7	1925-82
North Fork Skokomish River near Hoodsport, Wa. (S 1910-11)	12057500	93.7	1910-82
Dear Meadow Creek near Hoodsport, Wa.	12058000	1.83	1950-73
Dow Creek near Hoodsport, Wa.	12058500	1.67	1950-54
McTaggart Creek near Hoodsport, Wa.	12059000	1.30	1951-53
South Fork Skokomish River near Hoodsport, Wa.	12059800	26.0	1964-70
South Fork Skokomish River near Potlatch, Wa.	12060000	65.6	1924-32; 1946-64
South Fork Skokomish River near Union, Wa.	12060500	76.3	1931-84
Vance Creek near Potlatch, Wa.	12061000	15.6	1955-56
SOUTHWESTERN PUGET SOUND RIVER BASINS			
Purdy Creek near Union, Wa.	12062500	3.73	1954-60
Union River near Bremerton, Wa.	12063000	3.16	1946-59
Union River near Belfair, Wa.	12063500	19.8	1947-59
Mission Lake near Bremerton, Wa. (S)	12064000	1.83	1945-53
Mission Creek near Belfair, Wa.	12065000	4.43	1946-53
Gold Creek near Bremerton, Wa.	12065500	1.51	1946-70
Tahuya River (Creek) near Bremerton, Wa.	12066000	5.99	1945-56
Panther Lake near Bremerton, Wa. (S)	12066500	0.80	1945-53
Panther Creek near Bremerton, Wa.	12067000	1.00	1945-53
Tahuya River (Creek) near Belfair, Wa.	12067500	15.0	1945-56
Tahuya River near Tahuya, Wa.	12068000	42.2	1947
Dewatto River (Creek) near Dewatto, Wa.	12068500	18.4	1947-54; 1958-74
Anderson Creek near Holley, Wa.	12069000	6.30	1947
Stavis Creek near Seabeck, Wa.	12069500	5.60	1947
Dogfish Creek near Poulsbo, Wa.	12070000	5.01	1947-71
Clear Creek near Silverdale, Wa.	12070500	8.50	1947
Wildcat Lake near Bremerton, Wa. (S)	12071000	2.50	1947-50
Kitsap Lake near Bremerton, Wa. (S)	12071500	2.73	1947-50
Chico Creek near Bremerton, Wa.	12072000	15.3	1947-50; 1961-74
Blackjack Creek at Port Orchard, Wa.	12072500	14.5	1947-50
Purdy Creek at Purdy, Wa.	12072800	3.44	1960-62
Burley Creek at Burley, Wa.	12073000	10.7	1947-50; 1960-65
Shumocher Creek (Sherwood Creek) near Union, Wa.	12074000	12.2	1951
Mason Lake near Union, Wa. (S)	12074500	20.2	1951-75
Deer Creek near Shelton, Wa.	12075000	13.6	1943; 1948-51
Cranberry Creek near Shelton, Wa.	12075500	15.2	1942-43; 1948-51
Johns Creek near Shelton, Wa.	12076000	17.7	1943; 1948-51
Goldsborough Creek near Shelton, Wa.	12076500	39.3	1951-71
Goldsborough Creek at Shelton, Wa.	12077000	55.0	1943; 1951
Mill Creek at Shelton, Wa.	12077500	19.5	1943; 1951
Skookum Creek at Kamliche, Wa.	12078000	16.1	1951-59
Kennedy Creek near Kamliche, Wa.	12078400	17.4	1960-71
Kennedy Creek near New Kamliche, Wa.	12078500	18.7	1951
Snyder Creek near Olympia, Wa.	12078650	0.52	1971-74
Spurgeon Creek near Olympia, Wa.	12079500	11.0	1949-50
Deschutes River near Olympia, Wa.	12080000	160	1945-54; 1957-64
Woodward Creek near Olympia, Wa.	12080500	3.80	1949; 1988-90
Woodland Creek near Olympia, Wa.	12081000	24.6	1949-69; 1988-90
McAllister Springs near Olympia, Wa.	12081500	----	1951-64
NISQUALLY RIVER BASIN			
Nisqually River near Ashford, Wa.	12082000	68.5	1910-14
East Creek near Elbe, Wa.	12083500	11.5	1918-22; 1949-50
Nisqually River near Alder, Wa.	12084000	252	1931-45
Little Nisqually River near Alder, Wa.	12084500	28.0	1920-43
Tacoma Power Conduit near LaGrande, Wa.	12086000	----	1919-31
Ohop Lake near Eatonville, Wa. (S)	12087400	17.3	1960-75
Lynch Creek near Eatonville, Wa.	12087500	16.3	1949
Ohop Creek near Eatonville, Wa.	12088000	34.5	1927-32; 1941-71
Nisqually River above Powell Creek near McKenna, Wa.	12088400	431	1969-79
Nisqually River near McKenna, Wa.	12088500	445	1941-63
Tanwax Lake near Kapowsin, Wa. (S)	12088900	4.08	1962-75
Tanwax Creek near McKenna, Wa.	12089000	26.0	1945-50
Muck Creek near Loveland, Wa.	12090000	16.9	1949
Muck Creek at Roy, Wa.	12090200	86.8	1956-72
SOUTH CENTRAL PUGET SOUND RIVER BASINS			
American Lake near Tillicum, Wa. (E)	12090300	24.5	1956-59
Clover Creek near Tillicum, Wa.	12090500	73.8	1949-54
Chambers Creek at Steilacoom Lake near Steilacoom, Wa.	12091000	78.4	1939-40
Chambers Creek above Flett Creek near Steilacoom, Wa.	12091040	90.4	1966-71
Flett Creek at 74th Street at Tacoma, Wa.	12091050	4.23	1959-63
Flett Creek at Mountain View Memorial Park at Tacoma, Wa.	12091060	5.91	1967-79
Flett Creek below Flett Springs at Tacoma, Wa.	12091070	6.72	1959-65
Leach Creek at Holding Pond at Fircrest, Wa.	12091180	4.59	1967-90
Chambers Creek below Leach Creek near Steilacoom, Wa.	12091500	104	1937-40; 1943-65
Judd Creek near Burton, Wa.	12091700	4.41	1968-75
PUYALLUP RIVER BASIN			
Puyallup River at Electron, Wa.	12092500	131	1946
Kapowsin Creek near Kapowsin, Wa.	12093000	25.9	1927-32; 1942-57
Carbon River at Fairfax, Wa.	12093900	76.2	1911-12; 1965-78
South Prairie Creek near Enumclaw, Wa.	12094400	22.4	1963-68
Wilkeson (Gale) Creek at Wilkeson, Wa.	12094500	25.0	1949
Voight Creek near Crocker, Wa.	12095500	22.9	1949
Fennel Creek near McMillan, Wa.	12096000	12.5	1949
White River near Greenwater, Wa.	12096600	16.2	1964-70
White River at Greenwater, Wa.	12097000	216	1911-12; 1929-75
White River Flume near Buckley, Wa.	12098910	----	1972-73

Discontinued surface-water discharge or stage-only stations

Station name	Station number	Drainage Area (square miles)	Period of record (water years)
PUYALLUP RIVER BASIN--Continued			
Boise Creek above Reservoir near Enumclaw, Wa.	12099300	4.60	1963-66
Boise Creek below Millpond near Enumclaw, Wa.	12099400	8.27	1963-66
Boise Creek near Enumclaw, Wa.	12099500	12.3	1945-46; 1963-66
White River near Auburn, Wa.	12100496	464	1987-89
White (Stuck) River near Sumner, Wa.	12100500	470	1945-71
Clark Creek at Puyallup, Wa.	12102000	1.66	1946-48
SOUTH CENTRAL PUGET SOUND RIVER BASINS (Continued)			
Wapato Creek near Tacoma, Wa.	12102500	6.00	1949
Hylebos Creek at 5th Avenue at Milton, Wa.	12102900	4.77	1987-88
Joes Creek at Marine Drive near Tacoma, Wa.	12103205	----	1987-88
DUWAMISH (GREEN) RIVER BASIN			
Green River below intake Creek near Lester, Wa.	12103400	34.8	1966-77
Snow Creek near Lester, Wa.	12103500	11.5	1945-65
Friday Creek near Lester, Wa.	12104000	4.67	1945-77
Green Canyon Creek near Lester, Wa.	12104700	3.23	1960-70
Smay Creek near Lester, Wa.	12105000	8.56	1947-70
Charley Creek near Eagle Gorge, Wa.	12105500	11.3	1947-55
North Fork Green River near Palmer, Wa.	12105700	16.5	1957-65
North Fork Green River near Lemolo, Wa.	12105710	16.7	1965-87
Bear Creek near Eagle Gorge, Wa.	12106000	4.10	1947-56
Green River near Palmer, Wa.	12106500	230	1932-63
Green River at Kanaskat, Wa.	12107000	240	1911
Icy Creek near Black Diamond, Wa.	12107300	3.29	1963-68
Green River near Black Diamond, Wa.	12107500	285	1939-48
North Fork Newaukum Creek near Enumclaw, Wa.	12107950	1.93	1977-78
Newaukum Creek near Enumclaw, Wa.	12108000	13.0	1945
Clovercrest Outfall at Enumclaw, Wa.	12108050	0.26	1977-78
Newaukum Creek Tributary near Black Diamond, Wa.	12108450	1.52	1977-78
Burns Creek near Black Diamond, Wa.	12109000	3.47	1945
Little Soos Creek near Kent, Wa.	12109500	6.08	1985-86
Big Soos Creek above Jenkins Creek near Auburn, Wa.	12110000	20.9	1944-45; 1985-86
Wilderness Lake Outlet near Maple Valley, Wa.	12110003	0.66	1977
South Fork Jenkins Creek near Covington, Wa.	12110400	3.47	1985-86
Jenkins Creek near Auburn, Wa.	12110500	13.5	1985-86
Lake Sawyer near Black Diamond, Wa. (S)	12111000	13.0	1952-75
Covington Creek near Black Diamond, Wa.	12111500	13.0	1953-60
Covington Creek near Auburn, Wa.	12112000	21.6	1944-45
Big Soos Creek near Auburn, Wa.	12112500	62.9	1944-56
Soosette Creek near Auburn, Wa.	12112550	5.50	1985-86
Green River at Tukwilla, Wa.	12113350	440	1960-84
LAKE WASHINGTON - CEDAR RIVER BASIN			
North Fork Cedar River near Lester, Wa.	12113500	9.30	1944-63
South Fork Cedar River near Lester, Wa.	12114000	6.00	1944-83
Cedar River at Chester Morse (Cedar) Lake nr North Bend, Wa.	12116000	77.7	1898-99; 1902-03
Middle Fork Taylor Creek near Selleck, Wa.	12116700	5.17	1956-64
North Fork Taylor Creek near Selleck, Wa.	12116800	3.77	1956-64
Rock Creek above Walsh Lake Ditch near Landsburg, Wa.	12117700	4.91	1986-90
Walsh Lake Ditch near Landsburg, Wa.	12117820	9.42	1986-90
Rock Creek Diversion near Landsburg, Wa.	12118000	11.0	1932-48
Rock Creek near Ravensdale, Wa.	12118300	----	1956-58
Rock Creek at State Highway 5A near Ravensdale, Wa.	12118400	11.2	1956-62
Rock Creek near Maple Valley, Wa.	12118500	12.6	1945-73
LAKE WASHINGTON RIVER BASINS			
May Creek near Issaquah, Wa.	12119300	2.82	1978-79
May Creek Tributary at State Road 900 near Issaquah, Wa.	12119302	----	1978-79
May Creek at Renton, Wa.	12119375	7.57	1978-79
Honey Creek near Renton, Wa.	12119450	0.70	1978-79
May Creek near Renton, Wa.	12119500	12.5	1945-50; 1955-58; 1964
May Creek at Mouth near Renton, Wa.	12119600	12.7	1964-72; 1978-79
Coal Creek near Bellevue, Wa.	12119700	6.80	1964-68
Lake Hills Storm Sewer Outfall at Bellevue, Wa.	12119725	----	1980-82
148th Ave Storm Sewer below Lake Hills Blvd near Bellevue, Wa.	12119730	----	1980-82
148th Ave Upstream Manometer at Bellevue, Wa.	12119731	----	1980-82
148th Ave Downstream Manometer at Bellevue, Wa.	12119732	----	1980-82
Surrey Downs Storm Sewer Outfall at Bellevue, Wa.	12120005	----	1980-82
Juanita Creek near Kirkland, Wa.	12120500	6.69	1945; 1963-90
LAKE WASHINGTON - SAMMAMISH RIVER BASIN			
Issaquah Creek near Issaquah, Wa.	12121000	27.0	1945-64
East Fork Issaquah Creek near Issaquah, Wa.	12121500	8.54	1945
East Fork Issaquah Creek at Mouth at Issaquah, Wa.	12121510	9.50	1975-81
Tibbetts Creek near Issaquah, Wa.	12121700	3.90	1963-68; 1971-76
Pine Lake near Issaquah, Wa. (S)	12121800	1.06	1956-77
Pine Lake Creek near Issaquah, Wa.	12121810	1.06	1980-81
Sammamish River above Bear Creek near Redmond, Wa.	12122010	102	1975-78
Cottage Lake Creek near Redmond, Wa.	12123000	10.7	1945; 1955-65
Cottage Lake Creek above Bear Creek near Redmond, Wa.	12123100	12.2	1985-86
Bear Creek Tributary near Redmond, Wa.	12123200	1.40	1985-86
Evans Creek near Redmond, Wa.	12123500	10.9	1945
Evans Creek above Mouth near Redmond, Wa.	12124000	13.0	1955-76; 1985-86
Bear Creek at Redmond, Wa.	12124500	48.2	1945-50; 1955-58; 1984-86
Sammamish River near Redmond, Wa.	12125000	150	1939-57
Bear Creek at Woodinville, Wa.	12125500	15.3	1945; 1965-69
Penny Creek near Everett, Wa.	12125800	3.67	1985-86
North Creek below Penny Creek near Bothell, Wa.	12125900	9.12	1985-86
North Creek Tributary near Woodinville, Wa.	12125950	4.20	1985-86
North Creek near Bothell, Wa.	12126000	24.6	1945-73
North Creek near Woodinville, Wa.	12126100	27.0	1985-86
Sammamish River at Bothell, Wa.	12126500	212	1940-63; 1983-87
Swamp Creek near Alderwood Manor, Wa.	12126800	9.55	1984-86
Scriber Creek near Mountlake Terrace, Wa.	12126900	6.14	1985-86
Swamp Creek near Bothell, Wa.	12127000	21.8	1945
Swamp Creek at Kenmore, Wa.	12127100	23.1	1963-90
Lyon Creek at Lake Forest Park, Wa.	12127300	3.67	1963-68
Lake Ballinger near Edmonds, Wa. (S)	12127400	5.09	1961-77
McAleer Creek near Bothell, Wa.	12127500	7.48	1945; 1947-49
McAleer Creek at Lake Forest Park, Wa.	12127600	7.80	1963-72
Thorton Creek near Seattle, Wa.	12128000	12.1	1945-46; 1961-68

Discontinued surface-water discharge or stage-only stations

Station name	Station number	Drainage Area (square miles)	Period of record (water years)
EAST CENTRAL PUGET SOUND RIVER BASINS			
Powder Creek near Mukulteo, Wa.	12128500	2.11	1946
SNOHOMISH RIVER BASIN			
Tye River near Skykomish, Wa.	12129000	79.8	1929-31;1946
East Fork Foss River near Skykomish, Wa. (S)	12129500	21.6	1911
Foss River near Skykomish, Wa.	12130000	54.8	1911
South Fork Skykomish (Tye) River near Skykomish, Wa.	12130500	135	1930-31;1946-50
Beckler River near Skykomish, Wa.	12131000	96.5	1929-33;1946-49
West Fork Miller River near Miller River (Berlin), Wa. (S)	12131500	13.4	1911
Miller River (Creek) at (near) Miller River, Wa.	12132000	13.2	1911-19;1929-31;1946
South Fork Skykomish River near Miller River (Berlin), Wa. (S)	12132500	313	1910-11
South Fork Skykomish River near Index, Wa.	12133000	355	1903-05;1911-82
Troublesome Creek near Index, Wa.	12133500	10.6	1929-41
North Fork Skykomish River at Index, Wa.	12134000	146	1911-22;1929-38;1946-48
Olney Creek near Gold Bar, Wa.	12135500	8.31	1946-50
Olney Creek neary Startup, Wa.	12136000	10.3	1923-26;1929-34
May Creek near Gold Bar, Wa.	12136500	3.80	1928-35;1946-47
Skykomish River at Sultan, Wa.	12137000	618	1911
Elk Creek near Sultan, Wa.	12137200	11.4	1977-83
Williamson Creek near Sultan, Wa.	12137260	15.6	1977-83
Sultan River near Startup, Wa.	12137500	74.5	1934-71
Sultan River near Sultan, Wa.	12138000	86.6	1911-27;1929-31
Sultan River below Chaplain Creek near Sultan, Wa.	12138150	92.6	1975-84
McCoy Creek near Sultan, Wa.	12138500	6.17	1946-50
Elwell Creek near Sultan, Wa.	12139000	22.9	1946
Roesiger Creek near Machias, Wa.	12139500	3.80	1946-48
Woods Creek below Roesiger Creek near Monroe, Wa.	12140000	19.0	1946
Carpenter Creek near Machias, Wa.	12140500	8.89	1946
Woods Creek near Monroe, Wa.	12141000	56.4	1946-71
Middle Fork Snoqualmie River near North Bend, Wa.	12141500	169	1907-26;1929-32;1945
Calligan Creek near Snoqualmie, Wa.	12142200	7.31	1964-70
Hancock Creek near Snoqualmie, Wa.	12142300	7.67	1964-71
North Fork Snoqualmie River at Cable Br. near North Bend, Wa.	12142500	85.6	1914-15
North Fork Snoqualmie River near North Bend, Wa.	12143000	95.7	1907-26;1929-38;1961-71
South Fork Snoqualmie River near Garcia, Wa.	12143500	45.8	1910-15
Beaver Creek near Snoqualmie, Wa.	12144800	4.13	1964-67
Tokul Creek near Snoqualmie, Wa.	12145000	32.2	1907-15;1929-31;1945
Patterson Creek near Fall City, Wa.	12146000	15.5	1947-50;1955-71
Patterson Creek 0.8 miles above Mouth near Fall City, Wa.	12146500	21.3	1945
Griffin Creek near Carnation (Tolt), Wa.	12147000	17.1	1945-70
Phelps Creek near Index, Wa.	12147700	2.04	1961
South Fork Tolt River at Upper Station near Carnation, Wa.	12147800	8.82	1958-59
Stossel Creek near Carnation, Wa.	12148700	5.58	1957-63
Harris Creek near Tolt, Wa.	12149500	8.39	1945
Ames Creek near Tolt, Wa.	12150000	3.17	1945
Cherry Creek near Duvall, Wa.	12150500	19.2	1945-49;1961-64
Evans Creek near Snohomish, Wa.	12151000	2.75	1946
French Creek near Monroe, Wa.	12151500	7.09	1946
Pilchuck River below Worthy Creek near Granite Falls, Wa.	12152000	41.7	1946
Pilchuck River near Granite Falls, Wa.	12152500	54.5	1911;1943-58
Little Pilchuck River near Lake Stevens, Wa.	12153000	17.0	1946-70
Lake Stevens at Lake Stevens, Wa. (S)	12153500	6.83	1946-50
Stevens Creek at Lake Stevens, Wa.	12154000	15.3	1946-50
Dubuque Creek near Lake Stevens, Wa.	12154500	7.16	1946-50
Panther Creek near Lake Stevens, Wa.	12155000	5.93	1946
Snohomish River at Snohomish, Wa.	12155500	1720	1964-66
Wood Creek near Everett, Wa.	12156000	1.89	1946-48
Allen Creek at Marysville, Wa.	12156500	7.93	1946
Quilceda Creek near Marysville, Wa.	12157000	15.4	1946-69;1975-77
Quilceda Creek above West Fork near Marysville, Wa.	12157005	17.4	1985-86
West Fork Quilceda Creek near Marysville, Wa.	12157020	9.41	1985-86
EAST CENTRAL PUGET SOUND RIVER BASINS (Continued)			
Mission Creek near Tulalip, Wa.	12157250	7.92	1975-77
Lake Goodwin (Tulalip Creek) near Silvana, Wa. (S)	12157500	5.17	1953-75
Lake Shoecraft near Tulalip, Wa. (S)	12158000	6.02	1953-75
Tulalip Creek at Tulalip, Wa.	12158040	15.4	1975-77
STILLAGUAMISH RIVER BASIN			
South Fork Stillaguamish River at Silverton, Wa.	12158500	32.7	1929-32
South Fork Stillaguamish River blw Bender Cr nr Silverton, Wa.	12159000	40.7	1950
South Fork Stillaguamish River near Silverton, Wa.	12159500	43.7	1910-18
Boardman Creek near Silverton, Wa.	12160000	8.52	1950
Benson Creek near Granite Falls, Wa.	12160500	2.70	1950
South Fork Stillaguamish River near Granite Falls (Robe), Wa. (S 1902-03)	12161000	119	1902-03;1928-80
Canyon Creek near Granite Falls, Wa. (S 1911-13)	12161500	55.3	1911-13;1929-32;1950
South Fork Stillaguamish River at Granite Falls, Wa.	12162000	182	1911;1914-16
South Fork Stillaguamish River abv Jim Cr nr Arlington, Wa.	12162500	199	1937-58
Jim Creek near Oso, Wa.	12163000	10.9	1948-50
Cub Creek near Oso, Wa.	12163500	6.44	1949-50
Jim Creek near Arlington, Wa.	12164000	46.2	1938-57
South Fork Stillaguamish River near Arlington, Wa.	12164500	254	1929-37
Squire Creek near Darrington, Wa.	12165000	20.0	1950-69
North Fork Stillaguamish River near Darrington, Wa.	12165500	82.2	1951-57
Boulder Creek near Oso, Wa.	12166000	27.0	1950
Deer Creek near Oso, Wa.	12166500	65.9	1917-30;1950
Armstrong Creek near Arlington, Wa.	12167500	7.33	1951-58
Stillaguamish River at Silvana, Wa.	12167700	557	1975
Cavanaugh Lake (Lake Creek) near Oso, Wa. (S)	12168000	6.70	1950-51
Portage Creek near Arlington, Wa.	12169000	8.80	1950
Fish Creek near Arlington, Wa.	12169500	7.52	1950-54
Church Creek near Stanwood, Wa.	12170000	6.40	1950
SKAGIT RIVER BASIN			
Skagit River near Hope, British Columbia	12170500	357	1915-22;1935-55
Lightening Creek near Newhalem, Wa.	12171000	129	1944-48
Skagit River above Devils Creek near Newhalem, Wa.	12171500	655	1940-45
Big Beaver Creek near Newhalem, Wa.	12172000	63.2	1940-48;1963-69
Skagit River above Ruby Creek near Newhalem, Wa.	12172500	780	1929-40
Granite Creek near Newhalem, Wa.	12173000	71.0	1947-48
Ruby Creek below Panther Creek near Newhalem, Wa.	12173500	206	1948-56;1963-69
Ruby Creek near Newhalem, Wa.	12174000	210	1919-20;1928-49
Skagit River below Ruby Creek near Newhalem, Wa.	12174500	999	1919-30

Discontinued surface-water discharge or stage-only stations

Station name	Station number	Drainage Area (square miles)	Period of record (water years)
SKAGIT RIVER BASIN--Continued			
Thunder Creek below McAllister Creek near Newhalem, Wa.	12175400	91.7	1958-62
Thunder Creek near Marblemount, Wa.	12176000	114	1919-30
Skagit River at Reflector Bar near Newhalem, Wa.	12177000	1,125	1909-22
Stetattle Creek near Newhalem, Wa.	12177500	22.0	1914-15; 1933-83
Goodell Creek near Newhalem, Wa.	12178500	38.7	1943-44
Alma Creek near Marblemount, Wa.	12179500	8.37	1943
Skagit River above Bacon Creek near Marblemount, Wa.	12179800	1,289	1977-83
Bacon Creek near Marblemount, Wa.	12180000	50.9	1943-50
Diobsud Creek near Marblemount, Wa.	12180500	25.4	1943-44
Marble Creek near Marblemount, Wa.	12181500	15.9	1943-44
Cascade River near Marblemount, Wa.	12182000	140	1909-13
Cascade River at Marblemount, Wa.	12182500	172	1929-79
Clark Creek at Marblemount, Wa.	12183000	1.42	1944-46
Jordan Creek at Marblemount, Wa.	12183500	12.0	1943-48
Rocky Creek near Marblemount, Wa.	12184000	10.0	1943-44
Upper Illabot Creek near Rockport, Wa.	12184200	27.0	1982-83
Illabot Creek near Rockport, Wa.	12184500	42.4	1943-45; 1982-85
North Fork Sauk River near Barlow Pass, Wa.	12185000	76.4	1918-20
South Fork Sauk River near Barlow Pass, Wa.	12185500	33.1	1918-21; 1929-31
Whitechuck River near Darrington, Wa. (S 1910-11)	12186500	77.9	1910-11; 1919-22
Sauk River above Clear Creek near Darrington, Wa.	12187000	259	1910-11; 1913
Sauk River at Darrington, Wa.	12187500	293	1914-26; 1928-32
Sulatlle River below Lime Creek near Darrington, Wa.	12188000	213	1921-22
Sulatlle River above Big Creek near Darrington, Wa.	12188400	307	1971-80
Big Creek near Mansford, Wa.	12188500	21.0	1943-47
Sulatlle River near Mansford, Wa.	12189000	335	1938-50
Jackman Creek near Concrete, Wa.	12190000	23.9	1943-47
Baker Lake near Concrete, Wa. (S)	12190500	119	1910-15
Swift Creek near Concrete, Wa.	12190710	36.4	1982-90
Park Creek at Upper Bridge near Concrete, Wa.	12190718	10.5	1982-90
Sandy Creek near Concrete, Wa.	12191000	10.8	1953-54
Baker River below Anderson Creek near Concrete, Wa.	12191500	211	1911-25; 1928-32; 1955-59
Sulphur Creek near Concrete, Wa.	12191800	8.36	1963-74; 1981-82
Bear Creek near Concrete, Wa.	12192000	10.0	1953-55
North Fork Bear Creek near Concrete, Wa.	12192500	20.2	1953-55
Bear Creek below Tributaries near Concrete, Wa.	12192600	14.4	1982-86
Finney Creek near Concrete, Wa.	12194500	51.6	1943-48
Grandy Creek near Concrete, Wa.	12195000	18.9	1943-45
O'Toole Creek near Hamilton, Wa.	12195500	5.69	1943-45
Alder Creek near Hamilton, Wa.	12196000	10.7	1943-71
Skagit River near Hamilton, Wa.	12196150	2,870	1975-77
Day Creek below Day Lake near Lyman, Wa.	12196200	6.56	1963-71
Day Creek near Hamilton, Wa.	12196400	32.3	1962-69
Day Creek near Lyman, Wa.	12196500	34.2	1943-61
Jones Creek near Lyman, Wa.	12197000	7.80	1943-44
Childs Creek near Lyman, Wa.	12197020	2.40	1974-76
Tank Creek near Lyman, Wa.	12197040	2.50	1974-80
Minkler Creek near Lyman, Wa.	12197110	5.00	1974-80
Gilligan Creek near Lyman, Wa.	12197500	6.31	1943-44
Black Creek near Minkler, Wa.	12197680	0.50	1975-80
Black Creek near Lyman, Wa.	12197690	0.50	1974-75
Wiseman Creek near Lyman, Wa.	12197700	3.00	1974-83
Cool (Coal) Creek near Sedro Wooley, Wa.	12198000	1.88	1948-50
Hansen Creek near Sedro Wooley, Wa.	12198500	9.66	1943-45
Skagit River near Sedro Wooley, Wa.	12199000	3,015	1908-24; 1975-80
Nookachamps Creek near Mount Vernon, Wa.	12199500	22.2	1943-44
East Fork Nookachamps Creek near Big Lake, Wa.	12199800	3.56	1962-71
East Fork Nookachamps Creek near Clear Lake, Wa.	12200000	20.5	1943-50; 1962-63
NORTHEASTERN PUGET SOUND RIVER BASINS			
Friday Creek near Burlington, Wa.	12201000	37.1	1943-49
Samish River near Burlington, Wa.	12201500	87.8	1943-71
Anderson Creek near Bellingham, Wa.	12201950	4.13	1968-70; 1972
Austin Creek near Bellingham, Wa.	12202000	7.73	1948; 1954; 1968-70
Smith Creek near Bellingham, Wa.	12202050	5.12	1968-69
Olsen Creek near Bellingham, Wa.	12202300	3.78	1968-69
Whatcom Creek near Bellingham, Wa. (S 1910-14)	12203000	56.1	1911-12; 1939-46; 1974-76
Whatcom Creek below Hatchery near Bellingham, Wa.	12203500	56.1	1946-57; 1968-69
Squalicum Creek at Bellingham, Wa.	12204000	12.0	1948-49; 1954-55
NOOKSACK RIVER BASIN			
Nooksack River at Excelsior, Wa.	12204500	95.7	1920-21
Nooksack (North Fork) River near Glacier, Wa. (S 1910)	12205500	193	1911; 1934-38
Kendall Creek at Kendall, Wa.	12206000	24.0	1948-50
Kendall Creek at Mouth at Kendall, Wa.	12206500	29.2	1954-55
Coal Creek near Kendall, Wa.	12207000	4.57	1948-49; 1954-55
North Fork Nooksack River near Deming, Wa.	12207200	282	1964-75
Middle Fork Nooksack River at Ranger Stn. near Deming, Wa. (S)	12207500	----	1910
Middle Fork Nooksack River near Deming, Wa. (S 1910-11)	12208000	73.3	1910-11; 1920-21; 1934-35; 1954-55; 1965-70
Skookum Creek near Wickersham, Wa.	12209500	23.1	1948-69
South Fork Nooksack River at Saxon Bridge, Wa.	12210000	129	1920-21; 1933-34
Anderson Creek near Goshen, Wa.	12211000	12.9	1948; 1954-55
Nooksack River near Lynden, Wa.	12211500	648	1945-67
Fishtrap Creek at Lynden, Wa.	12212000	22.3	1948-71
Bertrand Creek near Lynden, Wa.	12212500	40.3	1948; 1954-55
Tenmile Creek near Laurel, Wa.	12212900	23.6	1968-72
Tenmile Creek near Ferndale, Wa.	12213000	22.7	1948; 1954-55
NORTHEASTERN PUGET SOUND RIVER BASINS (Continued)			
California Creek near Custer, Wa.	12213500	6.85	1954-55
Dakota Creek near Blaine, Wa.	12214000	18.4	1948-55
Sumas River near Sumas, Wa.	12214500	33.0	1948-51; 1954-55
Johnson Creek at Sumas, Wa.	12215000	23.0	1954-55
Sumas River near Huntington, B.C. (S 1935-52)	12215100	57.6	1960-78
Saar Creek near Sumas, Wa.	12215500	9.76	1948; 1954-55
Chilliack River (at Lake Outlet) near Vedder Crossing, B.C.	12215700	131	1961-78
Slesse Creek near Vedder Crossing, B.C.	12215900	62.7	1961-78
UPPER COLUMBIA RIVER BASIN			
Calispell Creek near Dalkena, Wa.	12396000	68.3	1950-73
Winchester Creek near Cusick, Wa.	12396100	16.8	1957
Smalle Creek near Cusick, Wa.	12396200	25.1	1957

Discontinued surface-water discharge or stage-only stations

Station name	Station number	Drainage Area (square miles)	Period of record (water years)
UPPER COLUMBIA RIVER BASIN--Continued			
Trimble Creek near Cusick, Wa.	12396300	3.50	1957
Sullivan Creek above Outlet Creek near Metaline Falls, Wa.	12396900	70.2	1959-72
Sullivan Creek near Metaline Falls, Wa.	12397500	122	1912-25
Sullivan Creek at Metaline Falls, Wa.	12398000	142	1954-68
Pend Oreille River below Z Canyon near Metaline Falls, Wa. (S 1908-10)	12398500	25,200	1909-10;1913-64
Salmo River near Salmo, B.C.	12398900	476	1961-78
Salmo (Salmon) River near Waneta, B.C.	12399000	500	1936-46
Deep Creek near Northport, Wa.	12399600	191	1972-75
Big Sheep Creek (HD Sheep Cr.) near Rossland, B.C.	12399900	134	1961-78
Sheep Creek near Velvet, Wa.	12400000	171	1929-32
Sheep Creek near Northport, Wa.	12400500	225	1929-42
KETTLE RIVER BASIN			
Myers Creek near Myncaster, B.C.	12401000	85.7	1926-50
Curlew Lake near Malo, Wa. (S)	12402000	65.9	1953-54
Curlew Creek near Malo, Wa.	12402500	66.8	1951-54
Curlew Creek near Curlew, Wa.	12403000	89.8	1917-21
Kettle River at Curlew, Wa. (S)	12403500	----	1911-12
Kettle River at Cascade, B.C.	12404000	3,550	1916-34
Kettle River at Boyds, Wa.	12405000	4,070	1914-16
UPPER COLUMBIA RIVER BASIN (Continued)			
Columbia River at Kettle Falls, Wa.	12405500	64,500	1913-41
COLVILLE RIVER BASIN			
Deer Lake near Loon Lake, Wa. (S)	12406000	18.2	1953-78
Loon Lake near Loon Lake, Wa. (E)	12406500	14.1	1950-89
Sheep Creek at Loon Lake, Wa.	12407000	37.9	1950-59
Sheep Creek at Springdale, Wa.	12407500	48.2	1953-72
Deer Creek near Valley, Wa.	12407520	36.0	1959-72
Jumpoff Joe Lake near Valley, Wa. (S)	12407530	2.35	1961-75
Waitts Lake near Valley, Wa. (S)	12407550	14.2	1961-75
Chewelah Creek at Chewelah, Wa.	12407700	94.1	1957-74
Colville River at Blue Creek, Wa.	12408000	428	1923-24;1960-66;1979
Lake Thomas near Tiger, Wa. (S)	12408210	12.7	1961-66
Little Pend Oreille River near Colville, Wa.	12408300	132	1958-75
Haller Creek near Arden, Wa.	12408420	37.0	1959-70
White Mud Lake near Colville, Wa. (S)	12408440	15.3	1961-66
Mill Creek below Forks near Colville, Wa.	12408450	67.9	1959
Mill Creek near Colville, Wa.	12408500	83.0	1939-72;1977-86
Mill Creek at Mouth near Colville, Wa.	12408700	146	1959-65
UPPER COLUMBIA RIVER BASIN (Franklin D. Roosevelt Lake)			
Hall Creek at (near) Inchellium, Wa.	12409500	161	1913-29;1972-73
Stranger Creek at Meteor, Wa.	12410000	50.9	1916-29
Stranger Creek at Inchellium, Wa.	12410500	80.2	1914-17
Harvey Creek near Cedonia, Wa.	12410700	29.9	1958
SPOKANE RIVER BASIN			
Spokane River above Liberty Bridge near Otis Orchards, Wa.	12419500	3,880	1929-83
Newman Lake near Newman Lake, Wa. (S)	12419800	28.6	1958-80
Liberty Lake at Liberty, Wa. (E)	12420000	13.3	1950-89
Spokane River at Greenacres, Wa.	12420500	4,150	1948-52
Spokane River at Trent, Wa.	12421000	4,200	1912-13
Spokane River below Trent Bridge near Spokane, Wa.	12421500	4,200	1948-54
Spokane River below Green Street at Spokane, Wa.	12422000	4,220	1949-52
Hangman (Latah) Creek at Tekoa, Wa.	12423000	130	1904-05
North Fork Hangman (NF Latah) Creek at Tekoa, Wa.	12423500	60.0	1904-05
Spokane River above 7 Mile Bridge near Spokane, Wa.	12424500	5,020	1949-52
Medical Lake at Medical Lake, Wa. (E)	12425000	1,35	1953-58
Deep Creek near Spokane, Wa.	12425500	76.6	1949-50
Spokane River below Nine-Mile Dam near Spokane, Wa.	12426000	5,200	1948-50
Little Spokane River at Scotia, Wa.	12426500	74.2	1948
Little Spokane River at Elk, Wa.	12427000	115	1948-71
Diamond Lake (W. Branch Little Spokane) near Newport, Wa. (S)	12427500	17.4	1953-78
Sacheen Lake near Newport, Wa. (S)	12428000	33.5	1954-75
Eloika Lake near Elk, Wa. (S)	12428500	101	1953-75
Little Spokane River at Milan, Wa.	12429000	274	1948
Little Spokane River at Chattaroy, Wa.	12429500	301	1948
Wetthey Creek near Deer Park, Wa.	12430000	12.0	1948
Deep Creek at Colbert, Wa.	12430500	32.8	1948
Little Spokane River near Dartford, Wa. (S 1903-05)	12431500	698	1948-52
Little Spokane River at Norman's Ranch near Spokane, Wa. (S)	12431900	700	1911-12
Little Spokane River near Spokane, Wa.	12432000	701	1913
Chamokane Creek near Springdale, Wa.	12433100	99.9	1973-78
Spokane River below Little Falls near Long Lake, Wa.	12433500	6,220	1913-40
UPPER COLUMBIA RIVER BASIN 9(Franklin D. Roosevelt Lake)			
Sanpoil River above Thirteen Mile Creek near Republic, Wa.	12433890	263	1972-74
Lost Creek near Aeneas, Wa.	12434000	84.0	1921
West Fork Sanpoil River near Republic, Wa.	12434110	308	1972-74
Sanpoil River near Keller, Wa.	12434500	880	1952-55;1972-74
Sanpoil River at Keller, Wa.	12435000	928	1911-18
Nespelem Canal at Nespelem, Wa.	12437000	----	1921-29
Nespelem River at (near) Nespelem, Wa.	12437500	122	1911-29
Nespelem River below Millpond at Nespelem, Wa.	12437505	123	1972-74
Rufus Woods Lake at Bridgeport, Wa.	12437900	75,400	1955-62
OKANOGAN RIVER BASIN			
Okanagan River at Okanagan Falls, B.C.	12438500	2,650	1915-65
Okanagan River at Bridge Street at Oroville, Wa. (S,E)	12439150	3,133	1965-91
Tonasket River at Oroville, Wa.	12439300	60.1	1967-91
Okanagan River at Zosel Millpond at Oroville, Wa. (S,E)	12439400	3,195	1965-86
Sinlahekin Creek above Blue Lake near Loomis, Wa.	12440000	41.7	1924-30
Sinlahekin Creek at Blue Lake near Loomis, Wa.	12440500	42.9	1920
Sinlahekin Creek at Twin Bridge near Loomis, Wa.	12441000	75.5	1921-23
Sinlahekin Creek near Loomis, Wa.	12441500	86.0	1903-05

Discontinued surface-water discharge or stage-only stations

Station name	Station number	Drainage Area (square miles)	Period of record (water years)
OKANOGAN RIVER BASIN--Continued			
Toats Cculee Creek near Loomis, Wa.	12442000	130	1920-26;1957-80
Whitestone Irrigation Canal near Loomis, Wa.	12442200	----	1957-70
Sinlehekin Creek above Chopaka Creek near Loomis, Wa.	12442300	256	1957-66
Palmer Lake near Nighthawk, Wa. (E)	12442400	293	1956-68
Oroville-Tonasket Irrigation District Canal nr Oroville, Wa.	12443000	----	1916-28
Similkameen River near Oroville, Wa.	12443500	3,580	1911-28
Spectacle Lake near Loomis, Wa. (S)	12443800	17.2	1956-71
Whitestone Lake near Tonasket, Wa. (S)	12444000	52.3	1958-71
Whitestone Creek near Tonasket, Wa.	12444100	55.4	1959-72
Bonaparte Creek near Wauconda, Wa.	12444490	96.6	1968-73
Bonaparte Creek near Anglin, Wa.	12444550	110	1921
Aeneas Lake near Tonasket, Wa. (S)	12444700	32.4	1964-83
Johnson Creek near Riverside, Wa.	12445500	68.2	1903-08
Omak Creek near Omak, Wa.	12445900	119	1972-74;1976-79
No Name Creek near Source near Omak, Wa.	12445939	----	1976-78;1981-88
No Name Creek Diversion near Omak, Wa.	12445940	----	1976-88
No Name Creek below Diversion near Omak, Wa.	12445941	----	1976-88
No Name Creek Diversion Return near Omak, Wa.	12445942	----	1976-79
No Name Creek at Granite Lip near Omak, Wa.	12445944	----	1976-78;1981-88
Okanogan River at Okanogan, Wa.	12446000	7,900	1911-25
Salmon Creek near Concully (Okanogan), Wa.	12446500	121	1910-22
Salmon Creek near Okanogan (Malott), Wa. (S 1911-12)	12447000	150	1903-10
Okanogan River near Malott, Wa.	12447300	8,220	1958-67
METHOW RIVER BASIN			
Chewack Creek below Boulder Creek near Winthrop, Wa.	12447500	465	1920-21
Twisp River at Twisp, Wa. (S)	12449000	250	1911-13
Beaver Creek below South Fork near Twisp, Wa.	12449600	62.0	1960-78
Beaver Creek near Twisp, Wa.	12449700	68.1	1956-61
Alta Lake near Pateros, Wa. (S)	12450000	5.01	1954-75
Methow River at Pateros, Wa.	12450500	1,810	1903-20
LAKE CHELAN AND CHELAN RIVER BASIN			
Railroad Creek at Lucerne, Wa.	12451500	64.8	1911-13;1927-57
Safety Harbor Creek near Manson, Wa.	12451600	7.85	1961-69
Grade Creek near Manson, Wa.	12451620	8.45	1961-69
Gold Creek near Manson, Wa.	12451650	6.30	1961-69
Antilon Creek Feeder System Canal near Manson, Wa.	12451700	----	1958-69
ENTIAT RIVER BASIN			
Entiat River at Entiat, Wa.	12453000	419	1911-25;1951-58
MID-COLUMBIA RIVER BASIN			
Pine Canyon Creek near Waterville, Wa.	12453500	11.1	1945-47
WENATCHEE RIVER BASIN			
White (HD) Wenatchee) River near Plain, Wa.	12454000	150	1911-14;1954-83
Wenatchee Lake near Plain, Wa. (E)	12454500	273	1932-71
Wenatchee River below Wenatchee Lake, Wa.	12455000	273	1932-58
Nason Creek near Nason, Wa.	12455500	88.7	1911
Phelps Creek near Plain, Wa.	12456000	16.4	1927-31
Wenatchee River at Plain (Leavenworth), Wa.	12457000	591	1910-1979
Chiawukum Creek near Chiawukum, Wa.	12457500	49.6	1911
Icicle Creek above Snow Creek near Leavenworth, Wa.	12458000	193	1936-71
Icicle Creek near Leavenworth, Wa.	12458500	211	1911-15
Peshastir Creek at Blewett, Wa.	12459500	40.0	1911-12
Peshastir Creek below Ingall Creek near Leavenworth, Wa.	12460000	101	1911-12
Wenatchee Valley Canal at Dryden, Wa.	12460500	----	1911-17
Wenatchee River at Dryden (Cashmere), Wa.	12461000	1,155	1904-17
Mission Creek above Sand Creek near Cashmere, Wa.	12461400	39.8	1958-71
Sand Creek near Cashmere, Wa.	12461500	18.6	1954-56
Mission Creek at (near) Cashmere, Wa.	12462000	81.2	1954-59
Douglas Creek near Alstow, Wa.	12463000	99.9	1949-55;1963-68
Douglas Creek near Palisades, Wa.	12463500	206	1951-52
Douglas Creek at Palisades, Wa.	12464000	844	1954-55
MID-COLUMBIA RIVER BASIN--Continued			
Columbia River at Trinidad (Wenatchee) (Vernita), Wa. (S 1910)	12464500	90,500	1911,1913-63
West Medical Lake near Medical Lake, Wa. (S)	12464669	1.84	1964-75
Clear Lake near Medical Lake, Wa. (S)	12464670	9.51	1958-80
Crab Creek above Sylvan Lake near Lamona, Wa.	12464780	542	1972-74
Coal Creek at Mohler, Wa.	12464800	64.7	1963-74
Sylvan Lake near Lamona, Wa.	12464809	675	1973-74
Crab Creek below Sylvan Lake near Odessa, Wa.	12464810	686	1972-74
Wilson Creek below Corbett Draw near Almira, Wa.	12465400	327	1969-71
Wilson Creek at Wilson Creek, Wa.	12465500	427	1951-73
Crab Creek at Wilson Creek, Wa. (S)	12466000	1,765	1904
Crab Creek (Upper Crab) Creek at Adrain, Wa.	12466500	1,950	1910-12
Park Creek (Continuation of Grand Coulee) near Coulee City, Wa.	12467500	400	1942-45
Park Lake near Coulee City, Wa. (E)	12468000	317	1938-68
Park Creek below Park Lake near Coulee City, Wa.	12468500	317	1945-68
Blue Lake near Coulee City, Wa. (E)	12469000	334	1938-68
Rocky Ford Creek near Ephrata, Wa.	12470500	458	1909-12;1942-91
Farrier Coulee near Schrag, Wa.	12471270	42.0	1963-74
Crab Creek (Lower Crab Creek) near Warden, Wa.	12471500	4,470	1909-12;1943-66
DW 272A1 Drain near Royal Camp, Wa.	12472300	0.88	1977-81
DW 272A Drain near Royal Camp, Wa.	12472350	3.36	1977-81
Crab Creek near Smyrna, Wa.	12472500	4,500	1942-60
Columbia River near Julia, Wa. (S)	12473000	----	1905
Columbia River at Hanford, Wa. (S)	12473500	----	1910
Columbia River at Ringold, Wa. (E)	12473510	----	1980-81
YAKIMA RIVER BASIN			
Keechelus Lake near Martin, Wa.	12474000	55.8	1906-88
Yakima River near Martin, Wa.	12474500	54.7	1903-78
Cabin Creek near Easton, Wa.	12475000	31.7	1909-11
Kachess Lake near Easton, Wa.	12475500	63.6	1905-88
Kachess River near Easton, Wa.	12476000	63.6	1904-78
Yakima River at Easton, Wa.	12477000	188	1904-05;1910-15;1941-50;1950-55
Big Creek near Cle Elum, Wa. (S)	12477500	----	1909
North Fork Cle Elum River at Galena, Wa. (S 1911)	12478000	----	1907;1911
Cle Elum River near Roslyn, Wa.	12479000	203	1904-78

Discontinued surface-water discharge or stage-only stations

Station name	Station number	Drainage Area (square miles)	Period of record (water years)
YAKIMA RIVER BASIN--Continued			
Yakima River at Cle Elum, Wa.	12479500	495	1906-78;1987-90
Teanaway River below Forks near Cle Elum, Wa.	12480000	172	1911-12;1968-73
Teanaway River near Cle Elum, Wa.	12480500	200	1909-14;1947-52
Swauk Creek near Cle Elum, Wa.	12481000	87.8	1909-14
Cascade Canal near Ellensburg, Wa. (S 1905)	12481500	---	1905;1909-11
Taneum Creek near Thorp, Wa.	12482000	74.3	1909-12
West Kittitas Canal near Thorp, Wa.	12482500	---	1904-05;1909-11
Ellensburg Water Co Canal near Ellensburg, Wa.	12483000	---	1904-05;1909-11
Manastash Creek near Ellensburg, Wa.	12483500	74.5	1909-14
Wilson Creek near Ellensburg, Wa.	12483600	13.6	1956-78
Naneum Creek near Ellensburg, Wa.	12483800	69.5	1957-78
Cooke Creek near Ellensburg, Wa.	12484300	18.6	1957-60
Wilson Creek at Thrall, Wa. (S)	12484490	382	1911
Roza Canal near Moxee City, Wa.	12485000	---	1942-78
Selah-Moxee Canal near Selah, Wa.	12485500	---	1904-05;1909-12
Wenas Creek near Selah, Wa. (S 1910-12)	12486000	192	1909-12
Taylor Canal near Selah, Wa. (S 1905)	12486500	---	1905;1909-12
Yakima River at Selah Gap near North Yakima, Wa. (S 1905)	12487000	2,130	1897-98;1904-05;1911-12
Bumping Lake near Nile, Wa.	12487500	117	1906;1909-88
Bumping River near Nile, Wa.	12488000	70.7	1906;1909-78
Naches River at Anderson Ranch near Nile, Wa.	12489000	392	1909-14
Naches River at Oak Flat near Nile, Wa.	12489500	641	1904-18
North Fork Tieton River below Clear Creek near Naches, Wa.	12490500	61.5	1914-15
Rimrock Lake at Tieton Dam near Naches, Wa.	12491000	187	1925-88
Tieton River at Tieton Dam near Naches, Wa.	12491500	187	1908-14;1918-21;1925-78
Tieton Canal near Naches, Wa.	12492000	---	1910-60
Tieton River at Headworks T Canal near Naches, Wa.	12492500	239	1906-78
Tieton River above and below Oak Creek near Naches, Wa.	12493000	296	1902-13
Naches River below Tieton River near Naches, Wa.	12494000	941	1905;1908-79
Naches Canal Co (Gleed) Canal near Naches, Wa. (S 1905)	12494500	---	1904-05;1909-13
Yakima Valley Canal near Naches, Wa. (S 1905)	12495000	---	1904-05;1909-11
Naches-Cowiche Canal near North Yakima, Wa. (S 1905)	12495500	---	1904-05;1909-11
North Yakima Power Canal near North Yakima, Wa. (S 1905)	12496000	---	1904-05;1910
Schanno Canal near North Yakima, Wa. (S 1905)	12496500	---	1904-05;1909-11
North Yakima Power Waste at North Yakima, Wa.	12497000	---	1909-12
North Yakima Milling Co Waste at North Yakima, Wa.	12497500	---	1909-12
Old Union Canal near North Yakima, Wa. (S 1905)	12498000	---	1904-05;1909-11
Naches Avenue Union Canal at North Yakima, Wa.	12498500	---	1910
Naches River near North Yakima, Wa. (S 1893-95)	12499000	1,106	1893-1915;1987-90
Moxee Co Canals near North Yakima, Wa. (S 1905)	12499500	---	1904-05;1909-11
Fowler Canal near North Yakima, Wa. (S 1905;1909-11)	12500000	---	1904-04;1909-11
North Fork Ahtanum Creek near Tampico, Wa.	12500500	68.9	1907-78
South Fork Ahtanum Creek at Conrad Ranch near Tampico, Wa.	12501000	24.8	1915-78
South Fork Ahtanum Creek near Tampico, Wa. (S 1907)	12501500	28.5	1908-15
Ahtanum Creek at Narrows near Tampico, Wa.	12502000	119	1908-13;1960-68
Yakima River at Union Gap near Yakima, Wa.	12503000	3,652	1898-1914;1963-66
New Reservation Canal near Parker, Wa.	12503500	---	1904-78
Old Reservation Canal near Parker, Wa. (S 1905)	12504000	---	1904-78
Sunnyside Canal near Parker, Wa.	12504500	---	1904-78
Yakima River near Parker, Wa.	12505000	3,660	1908-78
Reservation Drain at Alfalfa, Wa.	12505500	---	1913-23
Toppenish Creek near Ft. Simcoe, Wa.	12506000	122	1909-24
Simcoe Creek below Spring Creek near Fort Simcoe, Wa.	12506500	81.5	1909-23
Toppenish Creek near White Swan, Wa. (S 1912)	12507000	409	1909-12
Toppenish Creek at Alfalfa, Wa.	12507500	625	1909-12
Satus Creek near Toppenish, Wa.	12508000	271	1909-13
Satus Creek below Dry Creek near Toppenish, Wa.	12508500	234	1913-24
Drain 61.0 above Drain 61.4 near Sunnyside, Wa.	12508755	3.27	1979-82
Drain 60.7 near Sunnyside, Wa.	12508769	0.92	1979-82
Drain 59.6 below 60.2 near Sunnyside, Wa.	12508775	0.68	1979-82
Drain 59.4 near Sunnyside, Wa.	12508779	---	1979-82
Sulphur Creek Wasteway near Sunnyside, Wa.	12508850	155	1976-77;1987-90
Yakima River near Mabton, Wa.	12509000	5,359	1911-14
Yakima River at Euclid Bridge near Grandview, Wa.	12509050	5,400	1987-90
Yakima River near Prosser, Wa.	12509500	5,453	1904-06;1913-33
Kiona Canal near Kiona, Wa. (S 1908-09)	12501000	---	1904-05;1908-11
Kennewick Canal near Kiona, Wa. (S 1905)	12511000	---	1904-05;1910-11
Lower Yakima Canal near Kiona, Wa. (S 1905)	12511500	---	1905;1910-11
Yakima River near Richland, Wa. (S 1907-08)	12512000	6,120	1906-11
Providence Coulee at Cunningham, Wa.	12512500	27.8	1953-77
Esquatzel Coulee at Eltopia, Wa.	12513500	551	1953-79
MID-COLUMBIA RIVER BASIN (Continued)			
Columbia River at Pasco, Wa. (S 1904-10;1979-80)	12514000	104,000	1904-10;1964-66;1980-88
GRANDE RONDE RIVER BASIN			
Grande Ronde River at Zindel, Wa.	13334000	3,950	1904-12
SNAKE RIVER BASIN			
Asotin Creek (at Shelmans Ranch) near Asotin, Wa.	13334500	156	1904-07;1910-12;1928-60
Asotin Creek above Asotin, Wa. (S)	13335000	---	1904-06
Snake River near Clarkstown (at Riparia), Wa. (S 1935-48)	13343500	1,032	1900-72
Snake River below Lower Granite Dam, Wa.	13343600	103,000	1979-85
Meadow Creek near Central Ferry, Wa.	13343800	66.2	1963-74
Tucannon River near Pomeroy, Wa.	13344000	160	1913-15;1924-30
Tucannon River near Starbuck, Wa.	13344500	431	1915-17;1928-31;1958-90
PALOUSE RIVER BASIN			
Palouse River at Palouse, Wa.	13345300	360	1973-80
Palouse River at Elberton, Wa. (S 1905)	13345500	406	1904;1905
Palouse River near Colfax, Wa.	13346000	491	1955-64
Palouse River at Colfax, Wa.	13346100	497	1955-73;1976-79
South Fork Palouse River above Paradise C near Pullman, Wa.	13346500	84.4	1934-40
Paradise Creek near Pullman, Wa.	13347000	34.5	1934-38
Dry Fork of South Fork Palouse River at Pullman, Wa.	13347500	7.28	1935-38
South Fork Palouse River at Pullman, Wa.	13348000	132	1934-42;1960-81
Missouri Flat Creek at Pullman, Wa.	13348500	27.1	1934-40;1960-79
Fourmile Creek at Shawnee, Wa.	13349000	71.6	1934-40
Pine Creek at Pine City, Wa.	13349400	302	1961-75
Rock Creek near Ewan (St. John), Wa.	13349500	523	1904-05;1914-17
Palouse River near Winona, Wa.	13350000	2,056	1915-17

Discontinued surface-water discharge or stage-only stations

Station name	Station number	Drainage Area (square miles)	Period of record (water years)
PALOUSE RIVER BASIN--Continued			
Union Flat Creek near Colfax, Wa.	13350500	189	1953-71
Silver Lake at Medical Lake, Wa. (E)	13351300	19	1958-75
Williams Lake near Amber, Wa. (S)	13351500	23.4	1955-75
Sprague (Colville) Lake near Sprague, Wa. (E)	13351800	289	1958-80
Cow Creek near Keystone, Wa. (S)	13352000	117	1904-05
Cow Creek at Hooper, Wa.	13352500	679	1951-54; 1962-70
WALLA WALLA RIVER BASIN			
Blue Creek near Walla Walla, Wa.	14013500	17	1940-71
Yellowhawk Creek at Walla Walla, Wa.	14014000	---	1941-52
Garrison Creek at Walla Walla, Wa.	14014500	---	1941-52
Walla Walla River at Whitman, Wa. (S)	14015500	---	1897-1899
Dry Creek near Walla Walla, Wa.	14016000	48.4	1949-67
East Fork Touchet River near Dayton, Wa.	14016500	102	1941-51; 1956-64; 1966-68
East Fork Touchet River below Hatley Creek near Dayton, Wa.	14016610	106	1964-66
Touchet River at Bolles, Wa.	14017000	361	1924-29; 1951-89
Touchet River near Touchet, Wa.	14017500	733	1941-55
Attalia Irrigation District Canal near Wallula, Wa.	14018000	---	1924-25
Walla Walla River near Wallula, Wa.	14019000	1,760	1924-25
LOWER COLUMBIA RIVER BASIN			
Alder Creek at Alderdale, Wa.	14034350	197	1962-68; 1980-82
Rock Creek near Goldendale, Wa.	14036500	120	1912-13
Rock Creek near Roosevelt, Wa.	14036600	213	1962-68
Klickitat River Basin			
Klickitat River above Pearl Creek near Glenwood, Wa.	14106000	131	1910; 1916-17
Pearl Creek near Glenwood, Wa.	14106500	4	1916-17
Klickitat River Above West Fork near Glenwood, Wa.	14107000	151	1945-77
Swamp Creek near Glenwood, Wa.	14107500	11.2	1916-17
West Fork Klickitat River near Glenwood, Wa.	14108000	87	1910-11; 1916-17; 1945-49; 1953-55
Cunningham Creek near Glenwood, Wa.	14108500	16	1916-17
Big Muddy Creek near Glenwood, Wa.	14109000	22.5	1916-18; 1945-49
Cougar Creek near Glenwood, Wa.	14109500	3.8	1916-17
Klickitat River (above, below Big Muddy R) near Glenwood, Wa. (S 1905-08)	14110000	360	1905-09; 1910-71;
Indian Ford Springs No 1 near Glenwood, Wa.	14110500	---	1947-48
Klickitat River at Hanson Cable near Klickitat, Wa. (S)	14111000	---	1908-09
Klickitat River below Glenwood, Wa.	14111500	747	1914-15
Buttler Creek near Goldendale, Wa.	14111700	11.6	1964-68
Little Klickitat River near Goldendale, Wa.	14112000	83.5	1911-12; 1947-51; 1958-70
Spring Creek near Blockhouse, Wa.	14112300	2.75	1964-68
Mill Creek near Blockhouse, Wa.	14112400	26.90	1964-72
Little Klickitat River near Wahkiacus, Wa.	14112500	280	1945-81
Klickitat River near Pitt, Wa.	14113000	1,297	1909-12; 1929-89
WHITE SALMON RIVER BASIN			
White Salmon River below Cascades Creek near Trout Lake, Wa.	14121300	32.4	1957-78
White Salmon River above Trout Lake Creek near Trout Lake, Wa.	14121400	64.9	1959-69
Trout Lake Creek near Trout Lake, Wa.	14121500	69.3	1909-12; 1959-69
White Salmon River near Trout Lake, Wa.	14122000	185	1918; 1929-31; 1957-67
White Salmon River at Splash Dam near Trout Lake, Wa.	14122500	240	1912-17
White Salmon River at B-2 Corner, Wa.	14122900	269	1958-65
White Salmon River at Husum, Wa.	14123000	294	1909-20; 1930-41; 1957-62
Little White Salmon River near Willard, Wa.	14124000	39.2	1945-49
Little White Salmon River at Willard, Wa.	14124500	114	1904-06; 1945-61
Little White Salmon River above Lapham Creek near Willard, Wa.	14125000	117	1949-64
Little White Salmon River near Cook, Wa.	14125500	134	1957-78
LOWER COLUMBIA RIVER BASIN (Continued)			
Falls Creek near Carson, Wa.	14126500	24.3	1945-49
Wind River above Trout Creek near Carson, Wa.	14127000	108	1945-69
Trout Creek near Carson, Wa.	14127500	30.3	1945-49
Panther Creek near Carson, Wa.	14128000	30.1	1945-53
Wind River near Carson, Wa.	14128500	225	1935-77
Columbia River at Washougal, Wa. (S 1990)	14129400	240,000	1972-81; 1990
West Fork Washougal River near Washougal, Wa.	14143000	30.3	1951
Washougal River near Washougal, Wa.	14143500	108	1944-81
Little Washougal River near Washougal, Wa.	14144000	23.3	1951-56
Lacamas Creek at Proebstel, Wa.	14144500	22.5	1951
Columbia River at Vancouver, Wa.	14144700	241,000	1963-70
Salmon Creek near Battleground, Wa.	14122000	18.3	1944-75; 1988-89
Salmon Creek near Brush Prairie, Wa.	14122500	63.5	1941-42
Salmon Creek near Vancouver, Wa.	14123000	80.7	1951
LEWIS RIVER BASIN			
Lewis River near Trout Lake, Wa.	14213200	127	1959-72
Big Creek below Skookum Meadow near Trout Lake, Wa.	14213500	13.2	1927-31; 1955-70
Rush Creek above Meadow Creek near Trout Lake, Wa.	14214000	5.87	1955-65
Rush Creek above Meadow Creek near Guler, Wa.	14214200	10.1	1929-30
Meadow Creek below Lone Butte Meadow near Trout Lake, Wa.	14214500	11.7	1927-31; 1955-65
Rush Creek above Falls near Cougar, Wa.	14215000	26	1928-31; 1956-74
Curly Creek near Cougar, Wa.	14215500	11.6	1955-70
Lewis River above Muddy River near Cougar, Wa.	14216000	227	1927-34; 1955-70
Clearwater Creek near Mouth near Cougar, Wa.	14216300	33	1981-89
Muddy River above Clear Creek near Cougar, Wa.	14216350	84.1	1981-82
Pine Creek near Cougar, Wa.	14216800	22.4	1957-70
Pine Creek at Mouth near Cougar, Wa.	14216900	26	1982
Lewis River at Peterson Ranch near Cougar, Wa. (S 1910)	14217000	454	1909-10
Swift Creek near Cougar, Wa.	14217500	27.5	1924-34; 1954-56
Swift Reservoir near Cougar, Wa.	14217600	481	1958-82
Lewis River near Cougar, Wa. (S 1910-12)	14218000	481	1910-12; 1924-58
Canyon Creek near Amboy, Wa.	14219000	64.9	1922-34
Lewis River near Amboy, Wa.	14219500	665	1911-31
Chelatchie Creek at Amboy, Wa.	14221000	12.8	1951
Cedar Creek near Arlet, Wa.	14221500	40.8	1951-55; 1961-69
East Fork Lewis River near Yacolt, Wa.	14222000	31.4	1951

WATER RESOURCES DATA FOR WASHINGTON, 1993

Discontinued surface-water discharge or stage-only stations

Station name	Station number	Drainage Area (square miles)	Period of record (water years)
KALAMA RIVER BASIN			
Kalama River near Cougar, Wa.	14222920	12.3	1969-70
Fossil Creek near Cougar, Wa.	14222930	8.21	1969-70
Dry Creek near Cougar, Wa.	14222950	3.29	1969-71
Merrill Lake near Cougar, Wa.	14222960	9.08	1969-71
Spring Creek near Cougar, Wa.	14222970	---	1969-71
Kalama River below Falls near Cougar, Wa.	14222980	37.4	1969-71; 1980-82
Kalama River near Kalama, Wa.	14223000	179	1911-13; 1916-33
Kalama River below Italian Creek near Kalama, Wa.	14223500	198	1947-75
COWLITZ RIVER BASIN			
Ohanapecosh River near Lewis, Wa.	14224000	101	1907-13
Clear Fork Cowlitz River near Packwood (Lewis), Wa.	14224500	56.5	1907-13; 1930-43; 1950
Coal Creek at Mouth near Lewis, Wa. (S 1915)	14225000	10.5	1911-15
Packwood Lake near Packwood, Wa. (E)	14225400	19.2	1959-80
Lake Creek near Packwood, Wa.	14225500	19.2	1912-24; 1930-43; 1950-54; 1959-80
Lake Creek at Mouth near Packwood (Lewis), Wa.	14226000	26.5	1907-15; 1962-77
Skate Creek near Packwood, Wa.	14227000	33.9	1950
Hager Creek near Lewis, Wa.	14227500	3.81	1912-14
North Fork Hager Creek near Lewis, Wa.	14228000	1.45	1912-14
Hall Creek near Packwood, Wa.	14228500	10.9	1947-50
Johnson Creek below West Fork near Lewis, Wa.	14229000	33.3	1912-14
Johnson Creek below Glacier Creek near Packwood	14229500	42.8	1951-54
Johnson Creek near Packwood, Wa.	14230000	50	1907-14; 1919-24; 1947-50
Silver Creek near Randle, Wa.	14230500	51.1	1950
Cowlitz River at Randle, Wa. (S 1912)	14231000	541	1911-12
Siler Creek near Randle, Wa.	14231500	10.1	1950
Niggerhead Creek near Randle, Wa.	14232000	66.3	1950
Tower Rock Spring near Randle, Wa.	14233000	---	1950-51
Cowlitz River near Kosmos, Wa.	14233500	1,040	1948-68
Rainy Creek near Kosmos, Wa.	14234000	17.9	1950-54
Landers Creek near Kosmos, Wa.	14234500	9.61	1950
Cowlitz River near (at) Mossyrock, Wa.	14235000	1,162	1912-17; 1926-35; 1946-60
West Fork Tilton River near Morton, Wa.	14235500	16.4	1950-71
Tilton River at Morton, Wa.	14236000	70.2	1950
Cinnabar Creek near Clinebar, Wa.	14236400	4.55	1957-66
Tilton River near Clinebar, Wa.	14236500	156	1941-58
Klickitat Creek at Mossyrock, Wa.	14237000	3.29	1948-72
Winston Creek near Silver Creek, Wa.	14237500	37.8	1950-70
Mill Creek near Salkum, Wa.	14238500	20.9	1955-59
Cowlitz River at Toledo, Wa.	14238800	1,461	1977-78; 1980-82
Salmon Creek near Toledo, Wa.	14239000	77.6	1949; 1961-71
Olequa Creek at Winlock, Wa.	14239500	33.7	1949-50
Stillwater Creek near Vader, Wa.	14240000	25.9	1949-50
Coldwater Lake Canal near Spirit Lake, Wa.	14240352	36.2	1985-86
North Fork Toutle River at St. Helens, Wa.	14240500	124	1930-33
Green River near Toutle, Wa.	14241000	131	1947-50
Coldspring Creek near Cougar, Wa.	14241200	5.47	1969-71
South Fork Toutle River above Herrington Creek nr Cougar, Wa.	14241465	34.4	1981
South Fork Toutle River at Toutle, Wa.	14241500	120	1940-58
Silver Lake At Silver Lake, Wa.	14242000	41.5	1949-50; 1953-75;
Toutle River near Silver Lake, Wa.	14242500	474	1909-12; 1920-24; 1929-80
Toutle River at Highway 99 Bridge near Castle Rock, Wa.	14242690	511	1980-82
Delameter Creek near Castle Rock, Wa.	14243500	19.6	1949-69
Ostrander Creek near Kelso, Wa.	14244000	25.3	1949
Coweman River above Mulholland Creek near Kelso, Wa.	14244500	50.5	1951
Coweman River near Kelso, Wa.	14245000	119	1950-84
Cowlitz River at Longview, Wa. (S)	14245150	2,480	1984-90
LOWER COLUMBIA RIVER BASIN (Continued)			
Columbia River at Mile 66.2 at Longview, Wa. (S)	14245300	256,700	1983-90
Germany Creek near Longview, Wa.	14245500	22.9	1949
Abernathy Creek near Longview, Wa.	14246000	20.3	1949-58
Mill Creek near Cathlamet, Wa.	14246500	28.3	1949-56
Elochoman River near Cathlamet, Wa.	14247500	65.8	1941-71
Skamokawa Creek near Skamokawa, Wa.	14248000	17.4	1949-50
Jim Crow Creek near Grays Harbor, Wa.	14248200	5.48	1964-74
Grays River above South Fork Grays River, Wa.	14249000	39.9	1956-75
Grays River below South Fork Grays River, Wa.	14249500	60.3	1956-60
Grays River near Grays River, Wa.	14250000	60.6	1949-51
West Fork Grays River near Grays River, Wa.	14250500	15.2	1949-69
Hull Creek At Grays River, Wa.	14251000	11.9	1949

DISCONTINUED SURFACE-WATER QUALITY STATIONS

The following continuous-record surface-water water-quality stations (gaging stations) in Washington have been discontinued. Period of record for daily water-quality records collected and published as daily means, or monthly means for some periods, for the period of record, expressed in water years, are shown for each station. Information and data regarding any station may be obtained from the District Office at the address given on the back side of the title page of this report.

[Type of record: do (dissolved oxygen), ph (pH), sc (specific conductance), sed (sediment), t (temperature).]

Discontinued surface-water water quality stations

Station name	Station number	Drainage Area (square miles)	Type of Record	Period of record (water years)
SOUTHWEST WASHINGTON RIVER BASIN				
Bear Branch (River) near Naselle, Wa.	12009500	11.7	t	1963-66
Naselle River near Naselle, Wa.	12010000	54.8	t	1963-73
North Nemah River near South Bend, Wa.	12011000	18.0	t	1970-71
Willapa River at Lebam, Wa.	12011500	41.4	t	1952-71
North River above Joe Creek, near Raymond, Wa.	12016600	188	t, sed	1965
North River near Raymond, Wa.	12017000	210	t	1963-73
CHEHALIS RIVER BASIN				
Skookumcuck River near Bucoda, Wa.	12026400	112	t, sed	1968-71
Chehalis River near Grand Mound, Wa.	12027500	895	t	1952-74
Chehalis River near Porter, Wa.	12031000	1,294	t, sed	1959-72
Cloquallum River (Creek) near Elma, Wa.	12032500	64.9	t	1972-73
Middle Fork Satsop River near Satsop, Wa.	12034500	56.7	t	1972-73
Wynoochee River near Grisdale, Wa.	12035400	41.3	t, sed	1966-67
Wynoochee River above Black Creek, near Montesano, Wa.	12037400	155	t	1970-86
WESTERN OLYMPIC MOUNTAIN RIVER BASIN				
Humtulpis River near Humtulpis, Wa.	12039000	130	t	1970-71
North Fork Quinault River near Amanda Park, Wa.	12039300	74.1	t	1965-79
Hoh River at U.S. Highway 101, near Forks, Wa.	12041200	253	t, sed	1971;1978-80
EASTERN OLYMPIC MOUNTAIN RIVER BASIN				
Elwha River at McDonald Bridge, near Port Angeles, Wa.	12045500	269	t	1976-77
Dungeness River near Sequim, Wa.	12048000	156	t	1968-70
Dosewallips River near Brinnon, Wa.	12053000	93.5	t	1970-71
North Fork Skokomish River near Potlatch, Wa.	12059500	117	t	1965-82
South Fork Skokomish River near Hoodspout, Wa.	12059800	26.0	t	1965-71
South Fork Skokomish River near Potlatch, Wa.	12060000	63.4	t	1955-64
South Fork Skokomish River near Union, Wa.	12060500	76.3	t	1980-82
Vance Creek near Potlatch, Wa.	12061000	15.6	t	1955-57
Skokomish River near Potlatch, Wa.	12061500	227	t	1955-62;1964-82
SOUTH WESTERN PUGET SOUND RIVER BASINS				
Purdy Creek near Union, Wa.	12062500	1.43	t	1955-60
Dewatto River near Dewatto, Wa.	12068500	18.4	t	1968-70
Deschutes River near Rainier, Wa.	12079000	89.8	t	1968-70
NISQUALLY RIVER BASIN				
Nisqually Rivnear National, Wa.	12082500	133	t	1952-82
Nisqually River at La Grande, Wa.	12086500	292	t	1966-82
PUYALLUP RIVER BASIN				
Puyallup River near Orting, Wa.	12093500	172	sed	1955
South Prairie Creek at South Prairie, Wa.	12095000	79.5	t	1971
White River near Greenwater, Wa.	12096600	16.2	t	1965-68
White River Below Clearwater River near Buckley, Wa.	12097850	375	sed	1974-76
White River near Buckley, Wa.	12098500	401	t, sed	1955;1971-73
Puyallup River at Puyallup, Wa.	12101500	948	t	1959-60;1965-67
DUWAMISH (GREEN) RIVER BASIN				
Green River near Auburn, Wa.	12113000	399	t	1952-86
Green River at Tukwilla, Wa.	12113350	440	t, sed	1964-66
LAKE WASHINGTON (CEDAR) BASIN				
Cedar River near Landsburg, Wa.	12117500	121	t	1953-85
Issaquah Creek near Mouth, near Issaquah, Wa.	12121600	54.7	t	1971
Sammamish River near Woodinville, Wa.	12125200	157	t	1965-67
Bear Creek at Woodinville, Wa.	12125500	15.3	t	1971
Wallace River at Gold Bar, Wa.	12135000	19.0	t	1955-57;1959-72
SNOHOMISH RIVER BASIN				
Skykomish Rivat Monroe, Wa.	12141100	834	t, sed	1967-69
Middle Fork Snoqualmie River near Tanner, Wa.	12141300	154	t	1979-80
North Fork Snoqualmie River near Snoqualmie Falls, Wa.	12142000	64.0	t	1979-80
South Fork Snoqualmie River abv Alice Creek, nr Garcia, Wa.	12143400	41.6	t	1979-80
Snoqualmie River near Carnation, Wa.	12149000	603	t, sed	1967-70
Snohomish River at Snohomish, Wa.	12155500	1,714	t	1961
EAST CENTRAL PUGET SOUND RIVER BASINS--Continued				
Mission Creek near Tulalip, Wa.	12157250	7.92	t	1975-76
Tulalip Creek at Tulalip, Wa.	12158040	15.4	t	1975-76
STILLAGUAMISH RIVER BASIN				
North Fork Stillaguamish River near Darrington, Wa.	12165500	82.2	t	1952-57
Pilchuck River near Bryant, Wa.	12168500	52.0	t	1952-72
SKAGIT RIVER BASIN				
Skagit River above Alma Creek, near Marblemount, Wa.	12179000	1,274	t	1953-83
Skagit River at Marblemount, Wa.	12181000	1,381	t	1986-93
Cascade River at Marblemount, Wa.	12182500	168	t	1952-64;1966-73
Sauk River near Sauk, Wa.	12189500	714	t	1970-71
Skagit River near Hamilton, Wa.	12196150	2,870	t	1975-77
Childs Creek near Lyman, Wa.	12197020	2.4	t	1974-76
Tank Creek near Lyman, Wa.	12197040	2.50	t	1974-80
Minkler Creek near Lyman, Wa.	12197110	5.0	t	1974-80
Black Creek near Minkler, Wa.	12197680	0.5	t	1975-80
Black Creek near Lyman, Wa.	12197690	0.5	t	1974-75
Skagit River near Sedro Wooley, Wa.	12199000	3,015	t, do, ph, sc	1975-79
Skagit River near Mount Vernon, Wa.	12200500	3,093	t, sp	1962-70;1974-82

WATER RESOURCES DATA FOR WASHINGTON, 1993
DISCONTINUED SURFACE-WATER QUALITY STATIONS

Station name	Station number	Drainage Area (square mile)	Type of Record	Period of record (water years)
NORTHEASTERN PUGET SOUND RIVER BASIN				
Samish River near Burlington, Wa.	12201500	87.8	t	1973-74
NOOKSACK RIVER BASIN				
Nooksack River at Deming, Wa.	12210500	584	sc,ph	1959-60
PEND OREILLE RIVER BASIN				
Pend Oreille River at Metaline Falls, Wa.	12398090	----	t	1949-50
Pend Oreille River at International Boundary	12398600	25,200	t,sp	1974-81
UPPER COLUMBIA RIVER BASIN				
Columbia River at International Boundary	12399500	59,700	t	1952-73
Columbia River at Northport, Wa.	12400520	----	t,sp	1974-81
COLVILLE RIVER BASIN				
Chewelah Creek at Chewelah, Wa.	12407700	94.1	t	1973-74
Mill Creek near Colville, Wa.	12408500	83.0	t	1973-74
Colville River at Kettle Falls, Wa.	12409000	1,007	t	1970-71
SPOKANE RIVER BASIN				
Spokane River above Liberty Bridge near Otis Orchards, Wa.	12419500	3,880	t,sp	1964-65
Little Spokane River at Dartford, Wa.	12431000	665	t	1968-70
Spokane River at Long Lake, Wa.	12433000	6,020	t,sc	1959-62;1967-70;
				1973-82
Chamokane Creek below Falls, near Longlake, Wa.	12433200	179	t	1984-90
UPPER COLUMBIA RIVER BASIN				
Sanpoil River near Keller, Wa.	12434500	880	t	1968-70
Columbia River at Grand Coulee Dam, Wa.	12436500	74,700	t,sc,ph	1951-58;1974-79
OKANOGAN RIVER BASIN				
Okanogan River at Oroville, Wa.	12439500	3,210	t	1960;1986-88
Similkameen River near Nighthawk, Wa.	12442500	3,550	t	1967-71;1986-88
Okanogan River near Tonasket, Wa.	12445000	7,280	t	1986-88
Okanogan River at Malott, Wa.	12447200	8,100	t	1970-71
METHOW RIVER BASIN				
Methow River near Pateros, Wa.	12449950	1,772	t	1969-70
ENTIAT RIVER BASIN				
Entiat River near Ardenvoir, Wa.	12452800	203	t	1968-71
WENATCHEE RIVER BASIN				
White (HD Wenatchee) River near Plain, Wa.	12454000	150	t	1971
Nason Creek near Plain, Wa.	12455550	108	t	1973-74
MID-COLUMBIA RIVER BASIN				
DW 272A1 Drain near Royal Camp, Wa.	12472300	0.88	t, sed	1977-82
DW 272A Drain near Royal Camp, Wa.	12472350	3.36	t, sed	1977-82
Crab Creek near Beverly, Wa.	12472600	4,842	t	1959-62;1968-69
Columbia River at Vernita Bridge, near Priest Rapids, Wa.	12472900	96,000	t	1974-81
EL 68 Wasteway near Othello, Wa.	12473740	----	t	1978-80
YAKIMA RIVER BASIN				
Yakima River near Martin, Wa.	12474500	54.7	t	1981-82
Kachess River near Easton, Wa.	12476000	63.6	t	1981-82
Yakima River at Cle Elum, Wa.	12479500	495	t	1981-82
Yakima River at Roza Dam, Wa.	12484900	1,802	t,sp	1966-71
Roza Canal below Sulphur Creek Wasteway nr Sunnyside, Wa.	12485012	----	t, sed, sc	1976-77
Bumping River near Nile, Wa.	12488000	70.7	t	1971;1981-82
American River near Nile, Wa.	12488500	78.9	t	1969-71
Tieton River at Tieton Dam near Naches, Wa.	12491500	187	t	1981-82
Yakima River above Ahtanum Creek, at Union Gap, Wa.	12500450	3,479	t	1981-82
Ahtanum Creek at Union Gap, Wa.	12502500	173	t	1981-82
Sunnyside Canal blw Sulphur Creek Wstwy nr Sunnyside, Wa.	12504512	----	t, sed, sc	1976-77
Yakima River near Parker, Wa.	12505000	3,660	t,sp	1959-70
Toppenish Creek at Indian Church Road, near Granger, Wa.	12507508	----	t	1981-82
Satus Creek at Satus, Wa.	12508621	----	t	1981-82
Drain 61.0 above Drain 61.4 near Sunnyside, Wa.	12508755	3.27	t, sed	1979-82
Drain 60.7 near Sunnyside, Wa.	12508769	0.92	t, sed	1979-82
Drain 59.6 below 60.2 near Sunnyside, Wa.	12508775	0.68	t, sed	1979-82
Drain 59.4 near Sunnyside, Wa.	12508779	0.68	t, sed	1978-81
DID 18 Drain at Sunnyside, Wa.	12508790	14.7	t, sed, sc	1976-77
Black Canyon Creek at Waneta Road nr Sunnyside, Wa.	12500820	35.8	t, sed, sc	1976-77
DID 9 Drain near Sunnyside, Wa.	12508830	27.1	t, sed, sc	1976-77
DID 3 Drain near Sunnyside, Wa.	12508840	18.8	t, sed, sc	1976-77
Sulphur Creek Wasteway near Sunnyside, Wa.	12508850	155	t, sed, sp	1981-82;1976-77;
				1987-90
Yakima River at Mabton, Wa.	12508990	5,359	t	1981-82
Yakima River at Klona, Wa.	12510500	5,615	t, sed, sp	1953-82
SNAKE RIVER BASIN				
Snake River neanatone, Wa.	13334300	92,960	t	1959-84;1986-91
Snake River near Clarkstown (at Riparia), Wa.	13343500	103,200	t	1952-55;1959-64
Tucannon River near Starbuck, Wa.	13344500	431	t, sed	1963-70
PALOUSE RIVER BASIN				
Pine Creek at Pine City, Wa.	13349400	302	t	1970-71
Palouse River at Hooper, Wa.	13351000	2,500	t, sed	1962-71
SNAKE RIVER BASIN--Continued				
Snake River below Ice Harbor Dam, Wa.	13353000	108,500	t	1980
Snake River at Burbank, Wa.	13353200	108,800	t,sp	1973-81

WATER RESOURCES DATA FOR WASHINGTON, 1993
DISCONTINUED SURFACE-WATER QUALITY STATIONS

XXVII

Station name	Station number	Drainage Area (square mile)	Type of Record	Period of record (water years)
WALLA WALLA RIVER BASIN				
Mill Creek bw Blue Creek near Walla Walla, Wa.	14013600	91	t, sed	1963-70
Touchet River at Bolles, Wa.	14017000	361	t	1970-71
LOWER COLUMBIA RIVER BASIN				
Alder Creek at Alderdale, Wa.	14034350	196	t, sed	1963-68
Rock Creek near Roosevelt, Wa.	14036600	213	t, sed	1963-68
Klickitat River Basin				
Klickitat River near Pitt, Wa.	14113000	1,297	t	1950-70
WHITE SALMON RIVER BASIN				
White Salmon River near Underwood, Wa.	14123500	386	t	1968-69
LOWER COLUMBIA RIVER BASIN--Continued				
Wind River below Dry Creek near Carson, Wa.	14126600	79.0	t	1973-74
Columbia River at Vancouver, Wa.	14144700	241,000	t, sed	1964-70; 1972-80
LEWIS RIVER BASIN				
Clearwater Creek near Mouth near Cougar, Wa.	14216300	33	sed	1982-88
Muddy River below Clear Creek, near Cougar, Wa.	14216500	135	sed	1984-88
Yale Reservoir near Yale, Wa.	14218500	596	t, sed	1969-70
Lewis River at Ariel, Wa.	14220500	731	t	1961-63
East Fork Lewis River near Heisson, Wa.	14222500	125	t	1950-72
KALAMA RIVER BASIN				
Kalama River near Cougar, Wa.	14222920	12.3	t	1969-70
Fossil Creek near Cougar, Wa.	14222930	8.21	t	1969
Dry Creek near Cougar, Wa.	14222950	3.29	t, sed	1969-70
Merrill Lake near Cougar, Wa.	14222960	9.08	t, sed	1969-70
Kalama River below Falls near Cougar, Wa.	14222980	37.4	t	1970-71
Kalama River below Italian Creek near Kalama, Wa.	14223500	198	t	1955-72
Kalama River Above Spencer Creek, near Kalama, Wa.	14223600	202	t	1970-79
COWLITZ RIVER BASIN				
Cowlitz River at Packwood, Wa.	14226500	287	t	1971
Cispus River near Randle, Wa.	14232500	321	t	1950-72;
Cowlitz River near Randle, Wa.	14233400	1,030	t	1953-82
Cowlitz River near Kosmos, Wa.	14233500	1,042	t	1953-68
Rainy Creek near Kosmos, Wa.	14234000	17.9	t	1951-53
Cowlitz River below Mosseyrock Dam, Wa.	14234810	1,154	t	1970-82
West Fork Tilton River near Morton, Wa.	14235500	16.4	t	1951-59; 1961-71
Tilton River above Bear Canyon, near Cinebar, Wa.	14236200	141	t	1965-82
Winston Creek near Silver Creek, Wa.	14237500	37.8	t	1965-71
Cowlitz River below Mayfield Dam, Wa.	14238000	1,400	t	1950-82
North Fork Toutle River above Alder Cr nr Kid Valley, Wa.	14240490	---	t, sc	1990
North Fork Toutle River below Sed. Ret. near Kid Valley, Wa.	14240525	175	t, sc	1990-91
North Fork Toutle River at Kid Valley, Wa.	14241100	284	t, sc	1990-91
Cold Spring Creek near Cougar, Wa.	14241200	5.47	t	1969-71
South Fork Toutle at Camp 12 near Toutle, Wa.	14241490	117	t, sed, sp	1981
South Fork Toutle River at Toutle, Wa.	14241500	120	sed	1981
Toutle River at Tower Road near Silver Lake, Wa.	14242580	496	t, sc	1990-91
Toutle River near Silver Lake, Wa.	14242500	474	t	1951-62; 1964-72
Toutle River at Highway 99 Bridge near Castle Rock, Wa.	14242690	512	t, sed, ph, sc	1980-82
Cowlitz River at Castle Rock, Wa.	14243000	2,238	t, sed	1950-73; 1980-85
Coweman River near Kelso, Wa.	14245000	125	t	1950-72
LOWER COLUMBIA RIVER BASIN--Continued				
Abernathy Creek near Longview, Wa.	14246000	20.3	t	1950; 1953-57
Mill Creek near Cathlamet, Wa.	14246500	28.3	t	1954
Elochoman River near Cathlamet, Wa.	14247500	65.8	t	195

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WATER RESOURCES DATA FOR WASHINGTON 1993

INTRODUCTION

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

This report includes records on both surface and ground water in the State. Specifically, it contains: (1) Discharge records for 220 stream-gaging stations, 41 partial-record or miscellaneous streamflow stations, and 2 crest-stage partial-record streamflow stations; (2) stage only records for 4 gaging stations; (3) stage and (or) content records for 32 lakes and reservoirs; (4) water-quality records for 30 streamflow-gaging stations, and 7 ungaged streamsites; (5) water-level records for 5 observation wells; (6) water quality record for observation well; and (7) seepage investigation. Records included for stream stages and for ground-water levels are only a small fraction of those obtained during the water year.

This series of annual reports for Washington began with the 1961 water year with a report that contained only data relating to the quantities of surface water. For the 1964 water year, a similar report was introduced that contained only data relating to water quality. Beginning with the 1975 water year, the report format was changed to present, in one volume, data on quantities of surface water, quality of surface and ground water, and ground-water levels.

Prior to introduction of this series and for several water years concurrent with it, water-resources data for Washington were published in U.S. Geological Survey Water-Supply Papers. Data on stream discharge and stage and on lake or reservoir contents and stage, through September 1960, were published annually under the title "Surface-Water Supply of the United States, Parts 12, 13, and 14." For the 1961 through 1970 water years, the data were published in two 5-year reports. Data on chemical quality, temperature, and suspended sediment for the 1941 through 1970 water years were published annually under the title "Quality of Surface Waters of the United States," and water levels for the 1935 through 1974 water years were published under the title "Ground-Water Levels in the United States." These Water-Supply Papers may be consulted in the libraries of the principal cities of the United States, or if not out of print, may be purchased from the U.S. Geological Survey, Books and Open-File Reports, Federal Center, Building 41, Box 25425, Denver, Co 80225. For further ordering information, telephone (303) 236-7476.

Publications similar to this report are published annually by the Geological Survey for all states. These official Survey reports have an identification number consisting of the two-letter State abbreviation, the last two digits of the water year, and the volume number. For example, this report is identified as "U.S. Geological Survey Water-Data Report WA-93-1." For archiving and general distribution, the reports for 1971-74 water years also are identified as water-data reports. These water-data reports are for sale in paper copy or in microfiche by the National Technical Information Service, U.S. Department of Commerce, Springfield, VA 22161. For further ordering information, the Customer Inquiries telephone number is (703) 487-4650. Beginning with the 1990 water year, all water-data reports are available on Compact Disc - Read Only Memory (CD-ROM). All data reports published for the current water year for the entire Nation, including Puerto Rico and the Trust Territories, will be reproduced on a single CD-ROM disc.

Additional information, including current prices, for ordering specific reports may be obtained from the Office Chief at the address given on back of title page or by telephone (206) 593-6510. A limited number of CD-ROM discs will be available for sale by the Books and Open-File Reports Section, U.S. Geological Survey, Federal Center, Box 25425, Denver, Colorado 80225.

COOPERATION

The U.S. Geological Survey, in cooperation with State and local agencies within the State of Washington, have had joint-funding agreements for the systematic collection of surface-water, ground-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, Mary Rivelin, director
 Washington State Department of Community Development, Division of Emergency Management, Kate Heimbach, assistant director
 Washington State Department of Fisheries, Robert Turner, acting director
 Washington State Department of Natural Resources, Brian Boyle, commissioner of public lands
 Chelan County, P.U.D. No. 1, W. D. Fields, director of power operations
 Cowlitz County Board of Commissioners, Van Youngquist, commissioner
 Douglas County, P.U.D. No. 1, Eldon Landin, manager
 King County, Department of Public Works, Paul Tanaka, director
 Lewis County, Department of Public Works, Robert Berg, director
 Pacific County Health and Human Services, Bryan Harrison, administrator
 Pierce County, Department of Public Works, J. D. Trent, director
 Skagit Conservation District, Vickie Mesman, manager
 Skagit County Public Works Department, M. D. Spahr, director
 Snohomish County Department of Public Works, G. E. Weed, director
 Snohomish County, P.U.D. No. 1, Charles Earl, district manager
 Thurston County Department of Public Works, Daniel Durig, director
 Thurston County Department of Water and Waste Management, Daniel F. Durig, director
 Whatcom County, Shirley Van Zanten, county executive
 City of Aberdeen, R. A. Salmon, public works director
 City of Bellevue, Department of Public Works, Storm and Surface Water Utility, Damon Diessner, director
 City of Kent, William Wolinski, supervisor environmental engineering
 City of Seattle, City Light Department, Roberta Palm Bradley, superintendent
 City of Seattle, Seattle Water Department, Robert P. Groncznack, superintendent
 City of Tacoma, Department of Public Utilities, S.J. Klein, superintendent
 City of Tacoma, Department of Public Works, Sewer Utility Division, F. A. Thompson, director of public works
 Hoh Tribal Council, Eugene Sampson, chairman
 Jamestown S'Klallam Tribe, Linda Newberry, project director
 Makah Indian Tribe, Ned Currence, fishery management
 Nisqually Indian Tribe, Richard A. Wells, tribal administrator
 Quileute Tribal Council, Steve Meadows, tribal council
 Quinault Business Committee, J. B. DeLaCruz, tribal chairman
 Yakima Tribal Council, Wilferd Yallup, tribal council chairman

Assistance in the form of funds or services in collecting records was given by the Corps of Engineers, U.S. Army; the Bureau of Reclamation, U.S. Department of Interior; the U.S. Department of State; the Bonneville Power Administration, U.S. Department of Energy; and the Bureau of Indian Affairs, U.S. Department of Interior.

The following organizations aided in collecting records for stations under Federal Energy Regulatory Commission licenses:

City of Seattle; Daishowa America Co., Ltd.; P.U.D. No. 1 of Chelan County; City of Tacoma Department of Public Utilities; P.U.D. No. 1 of Pend Oreille County; P.U.D. No. 1 of Grant County; P.U.D. No. 1 of Douglas County; Puget Sound Power and Light; Snohomish County P.U.D. No. 1; Cowlitz County P.U.D.; South Fork II, Inc.; Washington Water Power Co.; and Idaho Power Company.

SUMMARY OF HYDROLOGIC CONDITIONS

Surface Water

Washington has a distinctly varied climate resulting from two features: (1) the Cascade Mountain Range and (2) the prevailing westerly winds from the Pacific Ocean. The north-south trending Cascades divide the State into the western part, which has a marine climate characterized by cool, wet winters and warm, relatively dry summers and into the eastern part, which has a more continental climate of cold winters and hot, dry summers.

Although the average annual precipitation in Washington is about 40 inches, the western part receives about 70 inches and the eastern about 20 inches. Locally, average annual precipitation ranges from only 7 inches in the driest part of eastern Washington to about 150 inches in the Olympic Mountains in western Washington. About two-thirds of the precipitation in Washington occurs in the fall and winter (October through March), either as rain at the lower elevations or as snow at the higher elevations. Heavy snowpack and glaciers in the Olympic Mountains and Cascade Range are major sources of water for many rivers in Washington.

The runoff in Washington is greatly influenced by the varied topography and rainfall and falls into two general categories: (1) the snowmelt-runoff regime of the eastern part of the State; and (2) the rainfall-runoff regime that predominates in western Washington. The Naselle River is typical of the coastal streams whose major runoff occurs during the 4 months November through February; only about 10 percent runs off during the 5 months May through September. The runoff is closely related to precipitation and because of the relatively low elevations, the heavy winter precipitation falls as rain and runs off quickly. Thunder Creek (Skagit River basin) is a glacier-fed stream in western Washington draining a high elevation where almost all winter precipitation falls as snow. The distribution of runoff for Thunder Creek is opposite to that of the Naselle River, with the maximum runoff occurring in July and the high-runoff period extending from May through September. The period of low flow lasts all winter. The Colville River exhibits a typical runoff pattern for a stream in eastern Washington. Much of the winter precipitation falls as snow which does not melt until the warmer temperatures of spring cause the high-runoff period to occur from April through June. By July the snow has melted and the streamflow becomes low.

Surface-water Conditions

Total precipitation during the 1993 water year was about 81 percent of normal in western Washington and about 96 percent of normal in eastern Washington. The total precipitation for the water year ranged between about 70 and 130 percent of normal throughout the State. Precipitation during February was the farthest below normal for a month when the monthly total was about 6 percent of normal in western Washington and about 23 percent of normal in eastern Washington. Monthly precipitation was the farthest above normal during June in western Washington, and during July in eastern Washington, when monthly totals were about 170 and 360 percent of normal, respectively.

Rainfall in western Washington was less than 75 percent of normal during the months of October, December, January, February, August, and September. It was near normal during November and March, and was more than 140 percent of normal during April, May, June, and July.

In eastern Washington, precipitation was less than 75 percent of normal during the months of October, January, and September. It was near normal during November, December, March, and August and was more than 125 percent of normal during April, May, June, and July.

The annual mean runoff was below normal throughout Washington during the 1993 water year. The Chehalis River near Grand Mound and the Skykomish River near Gold Bar are typical of western Washington streams. The annual mean flows for those two streams were 69 percent and 77 percent of normal, respectively, during 1993. In eastern Washington, the Spokane River at Spokane and the Klickitat River near Pitt had flows for 1993 that were 80 percent and 71 percent of normal, respectively. The monthly mean discharges are compared with long-term medians at those four gaging stations in figures 3a and 3b. In the Chehalis River, monthly mean flow was far below normal during October through March but far above normal during April through August and below normal during October. In the Skykomish River, monthly mean flow was far below normal during October through February and June through September and above or near normal during March through May. The monthly mean flow was far below normal in the Spokane River during the months of November through February and also June, and near normal during the other months. In the Klickitat River, monthly mean flow was far below normal during October through February, near normal during March through May, and far below normal during June to October.

During the 1993 water year, no significant flood events occurred in Washington. In western Washington some minor flooding occurred in the Snohomish River basin on January 25. Peak flows in both western and eastern Washington had recurrence intervals of 2 years or less. (A peak flow that has a recurrence interval of five years can be expected to be exceeded once in five years on the average.) Peak discharges for some representative gaging stations are shown in Table 1.

Table 1.--Comparison of peak discharge for the 1993 water year with the peak discharge for the period of record at long-term stations

Station number	Station name	Drainage area (mi ²)	Date	Peak discharge 1993 Water year		Recurrence interval (years)	Peak discharge Period of record	
				ft ³ /s			Date	ft ³ /s
12010000	Naselle River near Naselle	54.8	3-22	2,560		<2	11-24-90	11,300
12027500	Chehalis River near Grand Mound	895	4-12	10,400		<2	1-10-90	68,700
12039500	Quinault River at Quinault Lake	264	1-25	10,100		<2	11-4-55	50,200
12048000	Dungeness River near Sequim	156	1-25	1,610		<2	11-24-90	7,120
12082500	Nisqually River near National	133	3-23	3,440		<2	12-2-77	17,100
12134500	Skykomish River near Gold Bar	535	1-25	33,700		<2	11-24-90	102,000
12205000	North Fork Nooksack River below Cascade Creek, near Glacier	105	6-9	3,890		<2	11-10-89	11,200
12409000	Colville River at Kettle Falls	1,007	5-5	804		<2	1-21-74	3,440
12449950	Methow River near Pateros	1,772	5-15	11,400		<2	5-31-72	28,800
12510500	Yakima River at Kiona	5,615	3-25	6,550		<2	12-23-33	67,000
13351000	Palouse River at Hooper	2,500	3-25	4,790		<2	2-4-63	33,500
14113000	Klickitat River near Pitt	1,297	3-23	4,150		<2	1-15-74	47,400
14232500	Cispus River near Randle	321	3-23	6,560		<2	1-15-74	21,700

Storage in Lake Merwin on the Lewis River in western Washington began the water year at 97.2 percent of total capacity, dropped to 93 percent by the end of February, and rose to 106 percent by the end of the water year in September. The usable storage in Ross Reservoir, in the mountains of western Washington, began the water year at 83 percent of the usable normal maximum, fell between October and February to 22 percent, rose again to 100 percent by the end of July, and was 93 percent at the end of the water year in September. In eastern Washington, the usable storage in Lake Chelan began the water year at 93 percent of the usable normal maximum, fell steadily to 21 percent by the end of March, rose to 99 percent by June, and ended the year at 93 percent in September. At Franklin D. Roosevelt Lake, on the Columbia River in eastern Washington, storage began the 1993 water year at 86 percent of the usable normal maximum, fell to 54 percent by the end of February, rose again to 98 percent by the end of May, and was at 92 percent at the end of the water year in September.

Surface-Water Quality

The National Stream Quality Accounting Network (NASQAN) and Hydrologic Bench-Mark (HBM) Programs were established to assess the quality of the nation's water through systematic continuing measurements at specific key locations. Washington operates 14 surface-water-quality stations throughout the state. These include 10 NASQAN stations in the Pacific Slope, Snake River, and upper and lower Columbia River basins, one Bench-Mark station on Andrews Creek near Mazama. One surface-water-quality station is operated in the middle Columbia Basin on the main stem at Richland, Washington, as adjunct to one of the NASQAN stations. The outlet to Goat Lake near Monte Cristo on the west side of the north Cascade Mountains is sampled monthly and the inlet is sampled quarterly except during some winter months when access is limited. Results of analyses from these stations reveal that the rivers east of the Cascade Mountains are generally more mineralized than those west of the Cascade Mountains.

Specific conductance has an inverse relation to streamflow. Specific conductance at the surface-water NASQAN and HBM stations sampled east of the Cascades ranged from an annual mean of about 50 microsiemens on Andrews Creek, the least mineralized of streams sampled, to an annual mean of 235, 208, and 256 microsiemens at the Okanogan, Snake, and lower Yakima River stations, respectively. The annual mean conductance at the Columbia River stations was about 145 microsiemens. The annual mean conductance for all NASQAN and HBM stations sampled east of the Cascades was 167 microsiemens. By comparison, at the surface-water NASQAN stations sampled west of the Cascades, specific conductance was less than 100 microsiemens most of the year and exceeded 100 microsiemens only at one station, the Chehalis River at Porter. The annual mean conductance for NASQAN stations sampled west of the Cascades was 68 microsiemens.

Like specific conductance, dissolved-solids concentration and streamflow generally have an inverse relation. The smallest concentrations of dissolved solids occur during the high flows of late fall, winter, and early spring runoff when rainfall and snowmelt are the major sources of water. Dissolved solids are usually most concentrated in Washington during late summer and early fall when base flow from ground-water sources is the dominant component of flow. The largest concentration of dissolved solids at the NASQAN stations east of the Cascades was 209 mg/L in the Snake River at Burbank, Washington during December. The HBM station, Andrews Creek near Mazama, had the lowest concentration of dissolved solids (ranging from 18 to 41 mg/L) sampled east of the Cascade Mountains. In contrast, dissolved solid concentrations in NASQAN streams sampled west of the Cascades were largest in the Chehalis River (ranging from 47 to 84 mg/L) and smallest in the Queets River (ranging from 19 to 49 mg/L).

Bacteria carried by NASQAN and HBM streams both east and west of the Cascades are usually in moderate concentrations ranging from below ideal counts (<20 colonies/100 mL) at most stations to within the ideal range (20 to 60 colonies/100 mL for fecal coliform and 20 to 100 colonies/100 mL for fecal streptococci). However, east of the Cascades, samples from the Yakima River at Union Gap had counts of fecal coliform ranging from 20 to 87 colonies/100 mL and counts of 16 to 440 colonies/100 mL for fecal streptococci. Samples from the Yakima River at Kiona had fecal coliform counts that ranged from 17 to 58 colonies/100 mL and fecal streptococci counts that ranged from 20 to 2700 colonies/100 mL. West of the Cascades, samples from the Puyallup River station had counts ranging from 23 to 300 colonies/100 mL for fecal coliform and from 5 to 320 colonies/100 mL for fecal streptococci. Samples from the Chehalis River at Porter had counts of fecal coliform that ranged from 6 to 660 colonies/100 mL and counts of 10 to 200 colonies/100 mL for fecal streptococci.

Surface waters in Washington are generally classified as clear and carry only small amounts of sediment except where influenced by glaciers, unconsolidated volcanic deposits, or disturbed soils. Water flowing in the Columbia River and streams draining the Olympic Mountains are very low in sediment, usually less than 10 mg/L, and at times, there is no measurable sediment. The Skagit River is a major stream west of the Cascades that includes glacial runoff and carries relatively large concentrations of sediment. During the 1993 water year, measured concentrations ranged from 24 to 198 mg/L. The Puyallup River also includes glacial runoff and carries large concentrations of sediment ranging from 42 to 105 mg/L. The Queets River generally carries sediment concentrations less than 5 mg/L, but in March the measured concentration was 164 mg/L due to seasonally high runoff. The streams east of the Cascades that characteristically carry sediment concentrations greater than 10 mg/L are those that carry return flow from heavily irrigated and farmed lands in the semi-arid region. During the 1993 water year, the Yakima River carried sediment loads that characteristically exceeded 10 mg/L with a maximum concentration of 82 mg/L. Sediment concentration at the Okanogan River near Malott ranged from 2 to 54 mg/L.

Ground Water

In eastern Washington, water levels in an observation well near Spokane are generally representative of those in the Spokane River valley. Measured water levels in the Spokane well were above average from October to November and February to March, but were below average the rest of the year. Maximum departure of water levels above average was 2.19 feet in March and maximum departure below average was 6.66 feet in June. The ground-water levels in western Washington are generally not well defined by the existing network of observation wells.

SPECIAL NETWORKS AND PROGRAMS

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

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

The National Water-Quality Assessment (NAWQA) Program is being conducted by the U.S. Geological Survey to provide a nationally consistent description of current water-quality conditions and to define long-term trends (or lack of trends) in water quality. It was funded by Congress in 1986. A fully implemented national program is now underway to assess a large number of river basins and aquifer systems--each treated as a separate study unit. The national perspective is obtained by aggregating results from the study units to answer regional- and national-scale questions about current conditions, trends, and factors that affect water quality. The Yakima River and Central Columbia Plateau study units are active studies and the Puget Sound study unit is scheduled to begin in 1994. These studies will have a cycle of three years of intensive sampling followed by six years with minimal sampling; the nine-year cycle is then repeated. Issues and concerns of the NAWQA Program include: salinity, sedimentation and erosion, eutrophication, toxicity from trace elements and organic compounds, sanitary quality, and health of aquatic biota.

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

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

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

EXPLANATION OF THE RECORDS

The surface-water and ground-water records published in this report are for the 1992 water year that began October 1, 1992, and ended September 30, 1993. A calendar of the water year is provided on the inside of the front cover. The records contain streamflow data, stage and content data for lakes and reservoirs, water-quality data for surface water, and ground-water-level data. The locations of the stations and wells where the data were collected are shown in figures 4a, 4b, 5, 6a and 6b. The following sections of the introductory text are presented to provide users with a more detailed explanation of how the hydrologic data published in this report were collected, analyzed, computed, and arranged for presentation.

Station Identification Numbers

Each data station, whether streamsite or well, in this report is assigned a unique identification number. This number is unique in that it applies specifically to a given station and to no other. The number usually is assigned when a station is first established and is retained for that station indefinitely. The systems used by the U.S. Geological Survey to assign identification numbers for surface-water stations and for ground-water well sites differ, but both are based on geographic location. The "downstream order" system is used for regular surface-water stations and the "latitude-longitude" system is used for wells and, in Washington, for surface-water stations where only miscellaneous measurements are made.

Downstream Order System

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

The station-identification number is assigned according to downstream order. In assigning station numbers, no distinction is made between partial-record stations and other stations; therefore, the station number for a partial-record station indicates downstream-order position in a list made up of both types of stations. Gaps are left in the series of numbers to allow for new stations that may be established; hence, the numbers are not consecutive. The complete eight-digit number for each station, such as 12020000, which appears just to the left of the station name, includes the two-digit Part number "12" plus the six-digit downstream-order number "020000." The Part number designates the major river basin; for example, part "12" refers to the Pacific slope basins in Washington and upper Columbia River basin.

Latitude-Longitude System

The identification numbers for wells and miscellaneous surface-water sites are assigned according to the grid system of latitude and longitude. The number consists of 15 digits. The first six digits denote the degrees, minutes, and seconds of latitude, the next seven digits denote degrees, minutes, and seconds of longitude, and the last two digits (assigned sequentially) identify the wells or other sites within a one-second grid. This site-identification number, once assigned, is a pure number, and has no locational significance. In the rare instance where the initial determination of latitude and longitude are found to be in error, the station will retain its initial identification number; however, its true latitude and longitude will be listed in the LOCATION paragraph of the station description.

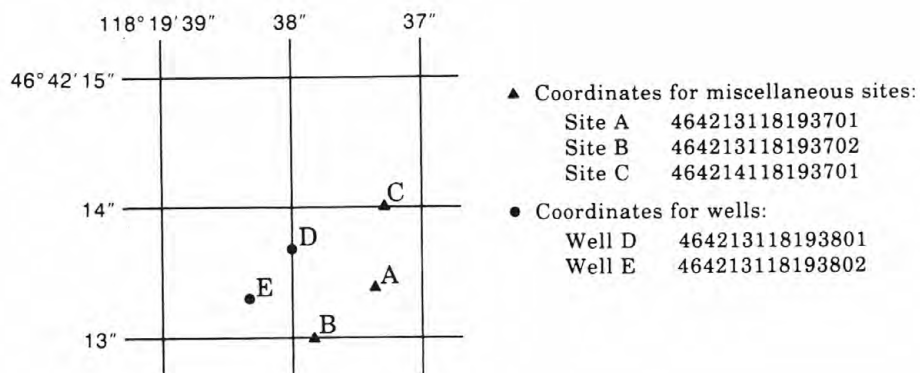


Figure 1. System for numbering wells and miscellaneous sites (latitude and longitude).

Local Identifier Well-Numbering System

In addition to the latitude-longitude based site identification number, wells in the State of Washington are assigned local well numbers. These numbers 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 NW 1/4 SW 1/4 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.

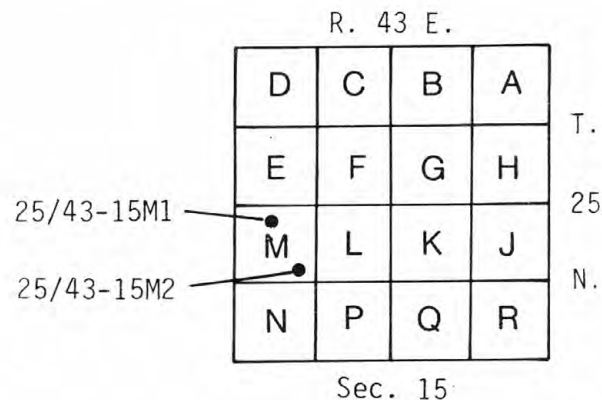


Figure 2. Local identifier well numbering system.

Records of Stage and Water Discharge

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

By contrast, partial records are obtained through discrete measurements without using a continuous stage-recording device and pertain only to a few flow characteristics, or perhaps only one. The nature of the partial record is indicated by table titles such as "Crest-stage partial records," or "Low-flow partial records." Records of miscellaneous discharge measurements or of measurements from special studies, such as low-flow seepage studies, may be considered as partial records, but they are presented separately in this report. Location of all complete-record and crest-stage partial-record stations for which data are given in this report are shown in figures 4a and 4b.

Data Collection and Computation

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

Continuous records of stage are obtained with satellite telemetry data collection platforms that transmit data at selected time intervals via satellite to a direct readout ground station, with digital recorders that punch stage values on paper tapes at selected time intervals, or with analog recorders that trace continuous graphs of stage. Measurements of discharge are made with current meters using methods adapted by the Geological Survey as a result of experience accumulated since 1880. These methods are described in standard textbooks, in Water-Supply Paper 2175, and in U.S. Geological Survey Techniques of Water-Resources Investigations (TWRI), Book 3, Chapter A6.

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

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

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

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

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

Data Presentation

Streamflow data in this report are presented in a new format that is considerably different from the format in data reports prior to the 1991 water year. The major changes are that statistical characteristics of discharge now appear in tabular summaries following the water-year data table and less information is provided in the text or station manuscript above the table. These changes represent the results of a pilot program to reformat the annual water-data report to meet current user needs and data preferences.

The records published for each continuous-record surface-water discharge station (gaging station) now consist of four parts, the manuscript or station description; the data table of daily mean values of discharge for the current water year with summary data; a tabular statistical summary of monthly mean flow data for a designated period, by water year; and a summary statistics table that includes statistical data of annual and daily flows as well as data pertaining to annual runoff, 7-day low-flow minimums, and flow duration. Summary statistics were not included for certain sites where these data would be misleading. Contact the District Office for information concerning summary statistics for these sites.

Station manuscript

The manuscript provides, under various headings, descriptive information, such as station location; period of record; historical extremes outside the period of record; record accuracy; and other remarks pertinent to station operation and regulation. The following information, as appropriate, is provided with each continuous record of discharge or lake content. Comments to follow clarify information presented under the various headings of the station description.

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

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

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

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

GAGE.--The type of gage in current use, the datum of the current gage referred to sea level (see "DEFINITION OF TERMS"), and a condensed history of the types, location, and datums of previous gages are given under this heading.

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

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

AVERAGE DISCHARGE.--The discharge value given is the arithmetic average of the water-year mean discharges. Average discharge is computed only for stations having at least 5 water years of complete record; water years with incomplete record are not included in the computation. The mean-discharge value that uses all published data may differ from that given in the summary statistics data, which is based only on computer-stored data. The summary data does not include values of monthly or yearly data that were determined by various methods for the series of Water-Supply Papers entitled "Compilation of Records of Surface Water of the United States". The average-discharge value is not computed for stations where diversions, storage or other water-use practices cause the value to be meaningless. If water projects that significantly alter flow at a station are put into use after the station has been in operation for a period of years, the new average is computed as soon as 5 water years of record have accumulated after the project began.

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

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

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

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

Although rare, occasionally the records of a discontinued gaging station may need revision. Because, for these stations, there would be no current or, possibly, future station manuscript published to document the revision in a "Revised Records" entry, users of data for these stations who obtained the record from previously published data reports may wish to contact the Washington office (address given on the back of the title page of this report) to determine if the published records were ever revised after the station was discontinued. Of course, if the data were obtained by computer retrieval, the data would be current and there would be no need to check because any published revision of data is always accompanied by revision of the corresponding data in computer storage.

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

Data table of daily mean values

The daily table of discharge records for stream-gaging stations gives mean discharge for each day of the water year. In the monthly summary for the table, the line headed "TOTAL" gives the sum of the daily figures for each month. 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 mean discharges, respectively, for the month. Discharge for the month also is usually expressed in cubic feet per second per square mile (line headed "CFSM"), or in inches (line headed "IN."), or in acre-feet (line headed "AC-FT"). Figures for cubic feet per second per square mile and runoff in inches are omitted if there is extensive regulation or diversion or if the drainage area includes large noncontributing areas. At some stations monthly and (or) yearly observed discharges are adjusted for reservoir storage or diversion, or diversion data or reservoir contents are given. These figures are identified by a symbol and corresponding footnote.

Statistics of monthly mean data

A tabular summary of the mean (line headed "MEAN"), maximum (line headed "MAX"), and minimum (line headed "MIN") of monthly mean flows for each month for a designated period is provided below the mean values table. The water years of the first occurrence of the maximum and minimum monthly flows are provided immediately below those figures. The designated period will be expressed as "FOR WATER YEAR _____ - _____, BY WATER YEAR (WY)", and will list the first and last water years of the range of years selected from the PERIOD OF RECORD paragraph in the station manuscript. It will consist of all of the station record within the specified water years, inclusive, including complete months of record for partial water years, if any, and may coincide with the period of record for the station. The water years for which the statistics are computed will be consecutive, unless a break in the station record is indicated in the manuscript.

Summary statistics

A table titled "SUMMARY STATISTICS" follows the statistics of monthly mean data tabulation. This table consists of four columns, with the first column containing the line headings of the statistics being reported. The table provides a statistical summary of yearly and daily flows, not only for the current water year but also for the previous calendar year and for a designated period, as appropriate. The designated period selected, "WATER YEARS _____ - _____", will consist of all of the station record within the specified water years, inclusive, including complete months of record for partial water years, if any, and may coincide with the period of record for the station. The water years for which the statistics are computed will be consecutive, unless a break in the station record is indicated in the manuscript. All of the calculations for the statistical characteristics designated ANNUAL (See line headings below), except for the "ANNUAL 7-DAY MINIMUM" statistic, are calculated for the designated period using complete water years. The other statistical characteristics may be calculated using partial water years.

The date or water year, as appropriate, of the first occurrence of each statistic reporting extreme values of discharge is provided adjacent to the statistic. Repeated occurrences may be noted in the REMARKS paragraph of the manuscript or in footnotes. Because the designated period may not be the same as the station period of record published in the manuscript, occasionally the dates of occurrence listed for the daily extremes in the designated-period column may not be within the selected water years listed in the heading. When this occurs, it will be noted in the REMARKS paragraph or in footnotes. Selected streamflow duration curve statistics and runoff data are also given. Runoff data may be omitted if there is extensive regulation or diversion of flow in the drainage basin.

The following summary statistics data, as appropriate, are provided with each continuous record of discharge. Comments to follow clarify information presented under the various line headings of the summary statistics table.

ANNUAL TOTAL.--The sum of the daily mean values of discharge for the year. At some stations the annual total discharge is adjusted for reservoir storage or diversion. The adjusted figures are identified by a symbol and corresponding footnotes.

ANNUAL MEAN.--The arithmetic mean of the individual daily mean discharges for the year noted or for the designated period. At some stations the yearly mean discharge is adjusted for reservoir storage or diversion. The adjusted figures are identified by a symbol and corresponding footnotes. At least 5 complete years of record must be available before this statistic is published for the designated period.

HIGHEST ANNUAL MEAN.--The maximum annual mean discharge occurring for the designated period.

LOWEST ANNUAL MEAN.--The minimum annual mean discharge occurring for the designated period.

HIGHEST DAILY MEAN.--The maximum daily mean discharge for the year or for the designated period.

LOWEST DAILY MEAN.--The minimum daily mean discharge for the year or for the designated period.

ANNUAL 7-DAY MINIMUM.--The lowest mean discharge for 7 consecutive days for a calendar year or a water year. Note that most low-flow frequency analyses of annual 7-day minimum flows use a climatic year (April 1 - March 31). The date shown in the summary statistics table is the initial date of the 7-day period. (This value should not be confused with the 7-day 10-year low-flow statistic.)

ANNUAL RUNOFF.--Indicates the total quantity of water in runoff for a drainage area for the year. Data reports may use any of the following units of measurement in presenting annual runoff data:

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

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

Inches (INCHES) indicates the depth to which the drainage area would be covered if all of the runoff for a given time period were uniformly distributed on it.

10 PERCENT EXCEEDS.--The discharge that is exceeded by 10 percent of the flow for the designated period.

50 PERCENT EXCEEDS.--The discharge that is exceeded by 50 percent of the flow for the designated period.

90 PERCENT EXCEEDS.--The discharge that is exceeded by 90 percent of the flow for the designated period.

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

Identifying Estimated Daily Discharge

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

Accuracy of the Records

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

The accuracy attributed to the records is indicated under the "REMARKS" paragraph. "Excellent" means that about 95 percent of the daily discharges are within 5 percent of the true; "good," within 10 percent; and "fair," within 15 percent. Records that do not meet the criteria mentioned, are rated "poor." Different accuracies may be attributed to different parts of a given record.

Daily mean discharges in this report are given to the nearest hundredth of a cubic foot per second for values less than 1 ft³/s; the nearest tenth between 1.0 and 10 ft³/s; whole numbers between 10 and 1,000 ft³/s; and 3 significant figures for more than 1,000 ft³/s. The number of significant figures used is based solely on the magnitude of the discharge value. The same rounding rules apply to discharges listed for partial-record stations and miscellaneous sites.

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

Other Records Available

Monthly records for several ungaged sites are given in a separate section following the gaged sites. The accuracy of records for ungaged sites is generally lower than that for gaged sites, depending on the precision of the computation method and the accuracy of data used in the computations.

For most gaging stations, unpublished, detailed information, on file in the Washington office, includes discharge measurements, gage-height records, and rating tables. Many gaging-station records in Washington through 1979 have been analyzed to determine several statistical summaries: (1) The number of days in each year that the daily discharge was between selected limits (duration tables); (2) the lowest mean discharge for selected numbers of consecutive days in each year; and (3) the highest mean discharge for selected numbers of consecutive days in each year.

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

Records of Surface-Water Quality

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

Classification of Records

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

A careful distinction needs to be made between "continuing records" as used in this report and "continuous recordings," which refers to a continuous graph or a series of discrete values punched at short intervals on a paper tape or obtained via data collection platform. Some records of water quality, such as temperature and specific conductance, may be obtained through continuous recordings; however, because of costs, most data are obtained only monthly or less frequently. Locations of stations for which records on the quality of surface water appear in this report are shown in figures 6a and 6b.

Arrangement of Records

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

On-site Measurement and Sample Collection

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

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

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

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

Water Temperature

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

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

Sediment

Suspended-sediment concentrations are determined from samples collected by one of the standard sampling techniques discussed in TWRI, Book 3, Chapter C2, "Field methods for measurement of fluvial sediment," 1985 revision. Samples are obtained using standard depth- or point-integrating samplers, or by means of an approved pumping sampler. Mean concentrations for the sampled cross section are in turn determined from these samples.

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

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

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

Laboratory Measurements

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

In March 1989, the National Water-Quality Laboratory discovered a bias in the turbidimetric method for sulfate analysis, indicating that values below 75 mg/L have a median positive bias of 2 mg/L above the true value for the period between 1982 and 1989. Sulfate values in this report have not been corrected for this bias.

Data Presentation

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

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

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

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

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

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

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

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

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

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

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

Remark Codes

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

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

Records of Ground-Water Levels

Water-level data from only a few of the many observation wells in Washington are given in this report.

Ground-water records obtained through cooperative efforts of many Federal, State, and local agencies for several thousand observation wells throughout Washington are not included in this report. These records may be placed in computer storage, published in reports, or kept in files. Information about the availability of ground-water data may be obtained from the District Chief, Washington District, U.S. Geological Survey, 1201 Pacific Avenue, Suite 600, Tacoma, Washington 98402.

Data Collection and Computation

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

Tables of water-level data are presented by counties arranged in alphabetical order. The prime identification number for a given well is the 15-digit number that appears in the upper left corner of the table. The secondary identification number is the local well number, an alphanumeric number, derived from the township-range location of the well.

Water-level records are obtained from direct measurements with a steel or electrical tape or from the graph or punched tape of a water-stage recorder. The water-level measurements in this report are given in feet with reference to land-surface datum (lsd). Land-surface datum is a datum plane that is approximately at land surface at each well. If known, the elevation of the land-surface datum is given in the well description.

Water levels are reported to as many significant figures as can be justified by the local conditions. For example, in a measurement of a depth to water of several hundred feet, the error of determining the absolute value of the total depth to water may be a few tenths of a foot, whereas the error in determining the net change of water level between successive measurements may be only a hundredth or a few hundredths of a foot. For lesser depths to water, the accuracy is greater. Accordingly, most measurements are reported to a hundredth of a foot, but some are given to a tenth of a foot or a larger unit.

Data Presentation

Each well record consists of two parts, the station description and the data table of water levels observed during the water year. The description of the well is presented first through use of descriptive headings preceding the tabular data. The comments to follow clarify information presented under the various headings.

LOCATION.--This paragraph follows the well-identification number and reports the latitude and longitude (given in degrees, minutes, and seconds); a landline location designation; the hydrologic unit number; the distance and direction from a geographic point of reference; and the owner's name.

AQUIFER.--This entry designates by name (if a name exists) and geologic age the aquifer(s) open to the well.

WELL CHARACTERISTICS.--This entry describes the well in terms of depth, diameter, casing depth and (or) screened interval, method of construction, use, and additional information such as casing breaks, collapsed screen, and other changes since construction.

INSTRUMENTATION.--This paragraph provides information on both the frequency of measurement and the collection method used, allowing the user to better evaluate the reported water-level extremes by knowing whether they are based on weekly, monthly, or some other frequency of measurement.

DATUM.--This entry describes the land-surface elevation at the well. The elevation of the land-surface datum is described in feet above (or below) sea level; it is reported with a precision depending on the method of determination.

REMARKS.--This entry describes factors that may influence the water level in a well or the measurement of the water level. It should identify wells that also are water-quality observation wells, and may be used to acknowledge the assistance of local (non-Survey) observers.

PERIOD OF RECORD.--This entry indicates the period for which there are published records for the well. It reports the month and year of the start of publication of water-level records by the U.S. Geological Survey and the words "to current year" if the records are to be continued into the following year. Periods for which water-level records are available, but are not published by the Geological Survey, may be noted.

EXTREMES FOR PERIOD OF RECORD.--This entry contains the highest and lowest water levels of the period of published record, with respect to land-surface datum, and the dates of their occurrence.

A table of water levels follows the station description for each well. Water levels are reported in feet below land-surface datum and all taped measurements of water level are listed. For wells equipped with a recorder, only abbreviated tables are published; generally, only water-level lows are listed for every fifth day and at the end of the month (eom). The highest and lowest water levels of the water year and their dates of occurrence are shown on a line below the abbreviated table. Because all values are not published for wells with recorders, the extremes may be values that are not listed in the table. Missing records are indicated by dashes in place of the water level.

ACCESS TO WATSTORE DATA

The U.S. Geological Survey is the principal Federal water-data agency and, as such, collects and disseminates about 70 percent of the water data currently being used by numerous State, local, private, and other federal agencies to develop and manage our water resources. As part of the Geological Survey's program of releasing water data to the public, a large-scale computerized system has been developed for the storage and retrieval of water data collected through its activities. The National WATER Data STORage and RETrieval System (WATSTORE) was established in 1972 to provide an effective and efficient means for the processing and maintenance of water data collected through the activities of the U.S. Geological Survey and to facilitate release of the data to the public. A variety of useful products, ranging from data tables to complex statistical analyses such as Log Pearson Type III, can be produced using WATSTORE. The system resides on the central computer facilities of the U.S. Geological Survey at its National Center in Reston, Virginia, and consists of related files and data bases.

- * Station Header File - Contains descriptive information on more than 440,000 sites throughout the United States and its territories where the U.S. Geological Survey collects or has collected data.
- * Daily Values File - Contains more than 220 million daily values of stream flows, stages, reservoir contents, water temperatures, specific conductances, sediment concentrations, sediment discharges, and ground-water levels.
- * Peak Flow File - Contains approximately 500,000 maximum (peak) streamflow and gage-height values at surface-water sites.
- * Water Quality File - Contains approximately 2 million analyses of water samples that describe the chemical, physical, biological, and radio-chemical characteristics of both surface and ground water.
- * Ground-Water Site Inventory Data Base - Contains inventory data for more than 900,000 wells, springs, and other sources of ground water. The data includes site location, geohydrologic characteristics, well-construction history, and one-time field measurements such as water temperature.

In 1976, the U.S. Geological Survey opened WATSTORE to the public for direct access. The signing of a Memorandum of Agreement with the Survey is required to obtain direct access to WATSTORE. The system can be accessed either synchronously or asynchronously. The requestor will be expected to pay all computer costs he/she incurs. Direct access may be obtained by contacting:

U.S. Geological Survey
National Water Data Exchange
421 USGS National Center
Reston, Virginia 22092

In addition to providing direct access to WATSTORE, data can be provided in various machine-readable formats on magnetic tape or 5-1/4 inch floppy disk and, as noted in the introduction, on CD-ROM discs. Beginning with the 1990 water year, all water-data reports will also be available on Compact Disc - Read Only Memory (CD-ROM). All data reports published for the current water year for the entire Nation, including Puerto Rico and the Trust Territories, will be reproduced on a single CD-ROM disc. Information about the availability of specific types of data or products, and user charges, can be obtained locally from each of the Water Resources Division's District offices. (See address on the back of the title page.) A limited number of CD-ROM discs will be available for sale by the Books and Open-File Reports Section, U.S. Geological Survey, Federal Center, Box 25425, Denver, Colorado 80225.

DEFINITION OF TERMS

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

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

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

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

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

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

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

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

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

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

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

Base flow. See Base runoff.

Base runoff refers to sustained or fair weather runoff. In most streams, base runoff is composed largely of ground-water effluent. (Langbein and others, 1947, p. 6.) The term base flow is often used in the same sense as base runoff. However, the distinction is the same as that between streamflow and runoff. When the concept in the terms base flow and base runoff is that of the natural flow in a stream, base runoff is the logical term.

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

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

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

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

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

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

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

Bottom material: See Bed material.

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

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

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

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

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

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

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

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

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

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

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

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

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

Annual 7-day minimum is the lowest mean discharge for 7 consecutive days for a calendar year or a water year. Note that most low-flow frequency analyses of annual 7-day minimum flows use a climatic year (April 1 - March 31). The date shown in the summary statistics table is the initial date of the 7-day period. (This value should not be confused with the 7-day 10-year low-flow statistic.)

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

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

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

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

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

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

Hardness of water is a physical-chemical characteristic that is commonly recognized by the increased quantity of soap required to produce lather. It is computed as the sum of equivalents of polyvalent cations and is expressed as the equivalent concentration of calcium carbonate (CaCO_3).

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

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

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

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

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

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

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

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

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

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

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

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

National Water-Quality Assessment (NAWQA) Program is being conducted by the U.S. Geological Survey to provide a nationally consistent description of current water-quality conditions and to define long-term trends (or lack of trends) in water quality. It was funded by Congress in 1986. The Yakima River basin was selected as one of seven pilot project areas in the Nation. A fully implemented national program is now underway to assess a large number of river basins and aquifer systems--each treated as a separate study unit. The national perspective is obtained by aggregating results from the study units to answer regional- and national-scale questions about current conditions, trends, and factors that affect water quality. The Yakima River NAWQA Program includes three years of intensive sampling: (1) monthly and high-flow samplings (April 1987 to March 1990) from seven fixed-location stations, and (2) several synoptic samplings--as many as 110 sites sampled within a short time period during selected hydrologic conditions. The three years of intensive sampling will be followed by six years with minimal sampling; the nine-year cycle is then repeated. Issues and concerns of the NAWQA Program include: salinity, sedimentation and erosion, eutrophication, toxicity from trace elements and organic compounds, sanitary quality, and health of aquatic biota.

Organism is any living entity.

Organism count/area refers to the number of organisms collected and enumerated in a sample and adjusted to the number per unit area habitat, usually square meter (m²), acre, or hectare. Periphyton, benthic organisms, and macrophytes are expressed in these terms.

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

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

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

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

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

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

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

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

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

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

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

Picocurie (PC, pCi) is one trillionth (1×10^{-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 2.22 disintegrations per minute (dpm).

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

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

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

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

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

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

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

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

Milligrams of oxygen per area or volume per unit time [$\text{mg O}_2/(\text{m}^2 \cdot \text{time})$] periphyton and macrophytes and [$\text{mg O}_2/(\text{m}^3 \cdot \text{time})$] for phytoplankton are the units for expressing primary productivity. They define production and respiration rates as estimated from changes in the measured dissolved-oxygen concentration. The oxygen light and dark bottle method is preferred if the rate of primary production is sufficient for accurate measurements to be made within 24 hours. Unit time may be either the hour or day, depending on the incubation period.

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

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

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

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

Sea level, in this report, refers to the National Geodetic Vertical Datum of 1929 (NGVD of 1929)--a geodetic datum derived from a general adjustment of the first-order level nets of both the United States and Canada, formerly called Sea Level Datum of 1929.

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

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

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

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

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

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

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

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

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

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

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

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

Solute is any substance that is dissolved in water.

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

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

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

Substrate is the physical surface upon which an organism lives.

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

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

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

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

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

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

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

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

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

Taxonomy is the division of biology concerned with the classification and naming of organisms. The 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.....	Ephemeroptera
Family.....	Ephemeridae
Genus.....	<u>Hexagenia</u>
Species.....	<u>Hexagenia limbata</u>

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

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

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

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

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

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

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

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

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

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

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

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

PUBLICATIONS ON TECHNIQUES OF WATER-RESOURCES INVESTIGATIONS

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

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

- 1-D1. *Water temperature--influential factors, field measurement, and data presentation*, by H. H. Stevens, Jr., J. F. Ficken, and G. F. Smoot: USGS--TWRI Book 1, Chapter D1. 1975. 65 pages.
- 1-D2. *Guidelines for collection and field analysis of ground-water samples for selected unstable constituents*, by W. W. Wood: USGS--TWRI Book 1, Chapter D2. 1976. 24 pages.
- 2-D1. *Application of surface geophysics to ground-water investigations*, by A. A. R. Zohdy, G. P. Eaton, and D. R. Mabey: USGS--TWRI Book 2, Chapter D1. 1974. 116 pages.
- 2-D2. *Application of seismic-refraction techniques to hydrologic studies*, by F. P. Haeni: USGS--TWRI Book 2, Chapter D2. 1988. 86 pages.
- 2-E1. *Application of borehole geophysics to water-resources investigations*, by W. S. Keys and L.M. McCary: USGS--TWRI Book 2, Chapter E1. 1971. 126 pages.
- 2-E2. *Borehole geophysics applied to ground-water investigations*, by W. S. Keys: USGS--TWRI Book 2, Chapter E2. 1990. 150 pages.
- 2-F1. *Application of drilling, coring, and sampling techniques to test holes and wells*, by Eugene Shuter and W. E. Teasdale: USGS--TWRI Book 2, Chapter F1. 1989. 97 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.
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- 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--Continued

- 3-A9. *Measurement of time of travel in streams by dye tracing*, by F. A. Kilpatrick and J. F. Wilson, Jr.: USGS--TWRI Book 3, Chapter A9. 1989. 27 pages.
- 3-A10. *Discharge ratings at gaging stations*, by E. J. Kennedy: USGS--TWRI Book 3, Chapter A10. 1984. 59 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., E. D. Cobb, and F. A. Kilpatrick: USGS--TWRI Book 3, Chapter A12. 1986. 41 pages.
- 3-A13. *Computation of continuous records of streamflow*, by E. J. Kennedy: USGS--TWRI Book 3, Chapter A13. 1983. 53 pages.
- 3-A14. *Use of flumes in measuring discharge*, by F. A. Kilpatrick and V. R. Schneider: USGS--TWRI Book 3, Chapter A14. 1983. 46 pages.
- 3-A15. *Computation of water-surface profiles in open channels*, by Jacob Davidian: USGS--TWRI Book 3, Chapter A15. 1984. 48 pages.
- 3-A16. *Measurement of discharge using tracers*, by F. A. Kilpatrick and E. D. Cobb: USGS--TWRI Book 3, Chapter A16. 1985. 52 pages.
- 3-A17. *Acoustic velocity meter systems*, by Antonius Laenen: USGS--TWRI Book 3, Chapter A17. 1985. 38 pages.
- 3-A18. *Determination of stream reaeration coefficients by use of tracers*, by F. A. Kilpatrick, R. E. Rathburn, Nobuhiro Yotsukura, G. W. Parker, and L. L. DeLong: USGS--TWRI Book 3, Chapter A18. 1989. 52 pages.
- 3-A19. *Levels of streamflow gaging stations*, by E.J. Kennedy: USGS--TWRI Book 3, Chapter A19. 1990. 27 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 programmed 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-B4. *Regression modeling of ground-water flow*, by R. L. Cooley and R. L. Naff: USGS--TWRI Book 3, Chapter B4. 1990. 232 pages.
- 3-B4. *Supplement 1. Regression modeling of ground-water flow - Modifications to the computer code for nonlinear regression solution of steady-state ground-water flow problems*, by R. L. Cooley: USGS--TWRI Book 3, Chapter B4. 1993. 8 pages.
- 3-B5. *Definition of boundary and initial conditions in the analysis of saturated ground-water flow systems--An introduction*, by O. L. Franke, T. E. Reilly, and G. D. Bennett: USGS--TWRI Book 3, Chapter B5. 1987. 15 pages.
- 3-B6. *The principle of superposition and its application in ground-water hydraulics*, by T. E. Reilly, O. L. Franke, and G. D. Bennett: USGS--TWRI Book 3, Chapter B6. 1987. 28 pages.
- 3-B7. *Analytical solutions for one-, two-, and three-dimensional solute transport in ground-water systems with uniform flow*, by E. J. Wexler: USGS--TWRI Book 3, Chapter B7. 1992. 90 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.

PUBLICATIONS ON TECHNIQUES OF WATER-RESOURCES INVESTIGATIONS--Continued

- 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. J. Fishman and L. C. Friedman: USGS--TWRI Book 5, Chapter A1. 1989. 545 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 the determination of organic substances in water and fluvial sediments*, edited by R. L. Wershaw, M. J. Fishman, R. R. Grabbe, and L. E. Lowe: USGS--TWRI Book 5, Chapter A3. 1987. 80 pages.
- 5-A4. *Methods for collection and analysis of aquatic biological and microbiological samples*, by L. J. Britton and P. E. Greeson, editors: USGS--TWRI Book 5, Chapter A4. 1989. 363 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: USGS--TWRI Book 5, Chapter A6. 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.
- 6-A1. *A modular three-dimensional finite-difference ground-water flow model*, by M. G. McDonald and A. W. Harbaugh: USGS--TWRI Book 6, Chapter A1. 1988. 586 pages.
- 6-A2. *Documentation of a computer program to simulate aquifer-system compaction using the modular finite-difference ground-water flow model*, by S. A. Leake and D. E. Prudic: USGS--TWRI Book 6, Chapter A2. 1991. 68 pages.
- 6-A3. *A modular finite-element model (MODFE) for areal and axisymmetric ground-water-flow problems, Part 1: Model Description and User's Manual*, by L. J. Torak: USGS--TWRI Book 6, Chapter A3. 1993. 136 pages.
- 6-A4. *A modular finite-element model (MODFE) for areal and axisymmetric ground-water-flow problems, Part 2: Derivation of finite-element equations and comparisons with analytical solutions*, by R. L. Cooley: USGS--TWRI Book 6, Chapter A4. 1992. 108 pages.
- 6-A5. *A modular finite-element model (MODFE) for areal and axisymmetric ground-water problems, Part 3: Design philosophy and programming details*, by L. J. Torak: USGS--TWRI Book 6, Chapter A5. 1993. 243 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.

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- 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: USGS--TWRI Book 8, Chapter A2. 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.

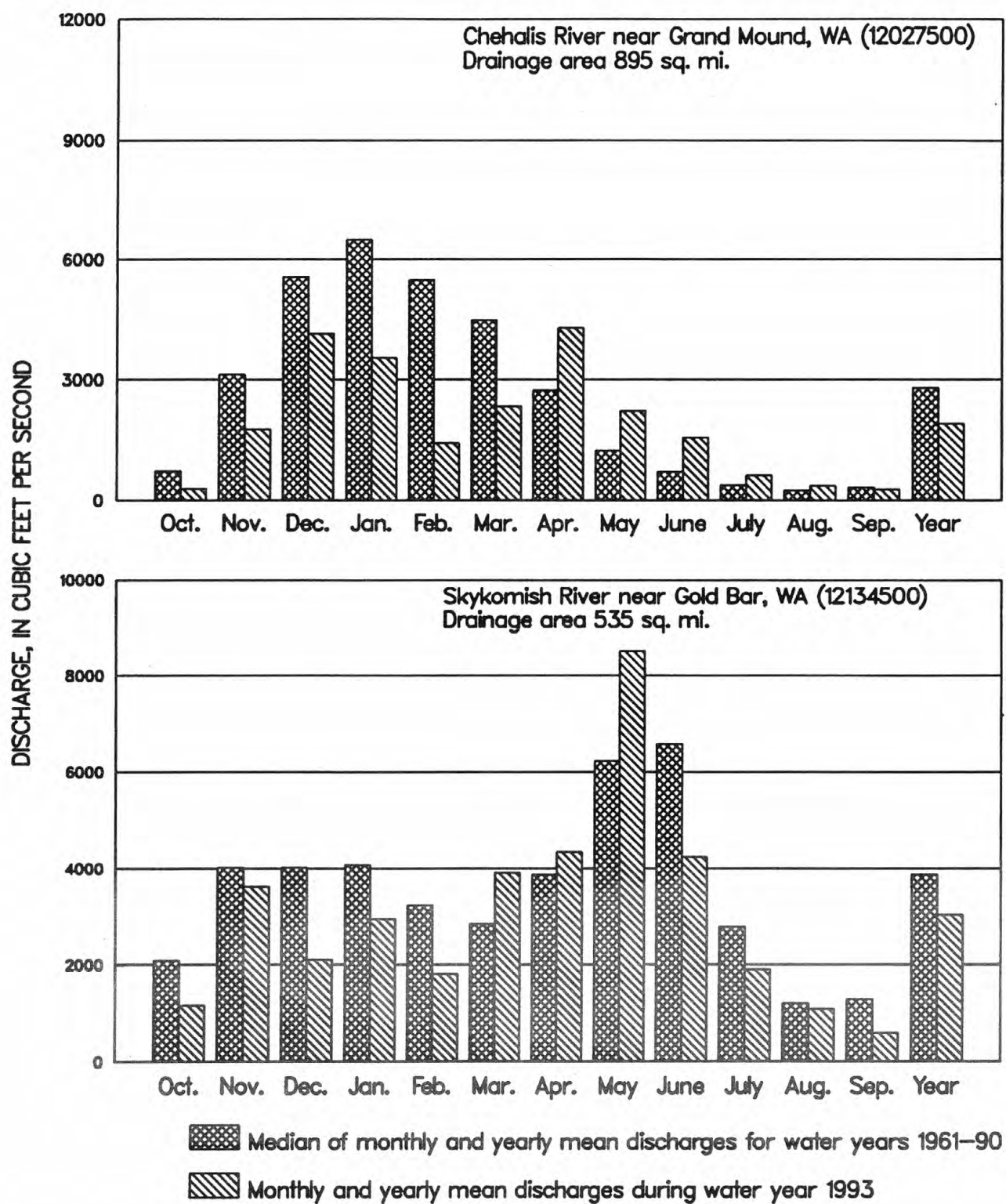


Figure 3a. Discharge during 1993 water year compared with median discharge for period 1961-90 for two representative gaging stations in Western Washington.

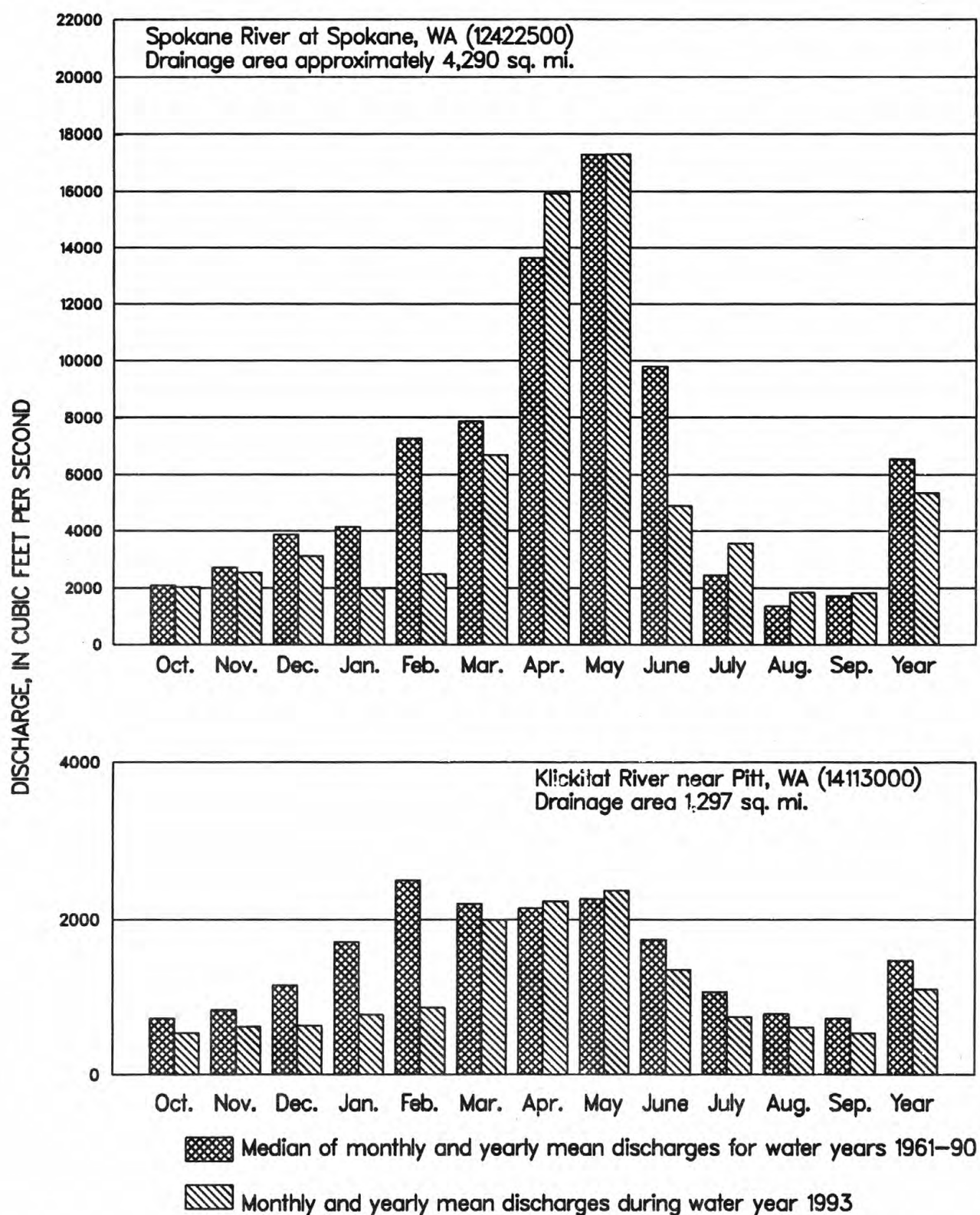


Figure 3b. Discharge during 1993 water year compared with median discharge for period 1961-90 for two representative gaging stations in Eastern Washington.

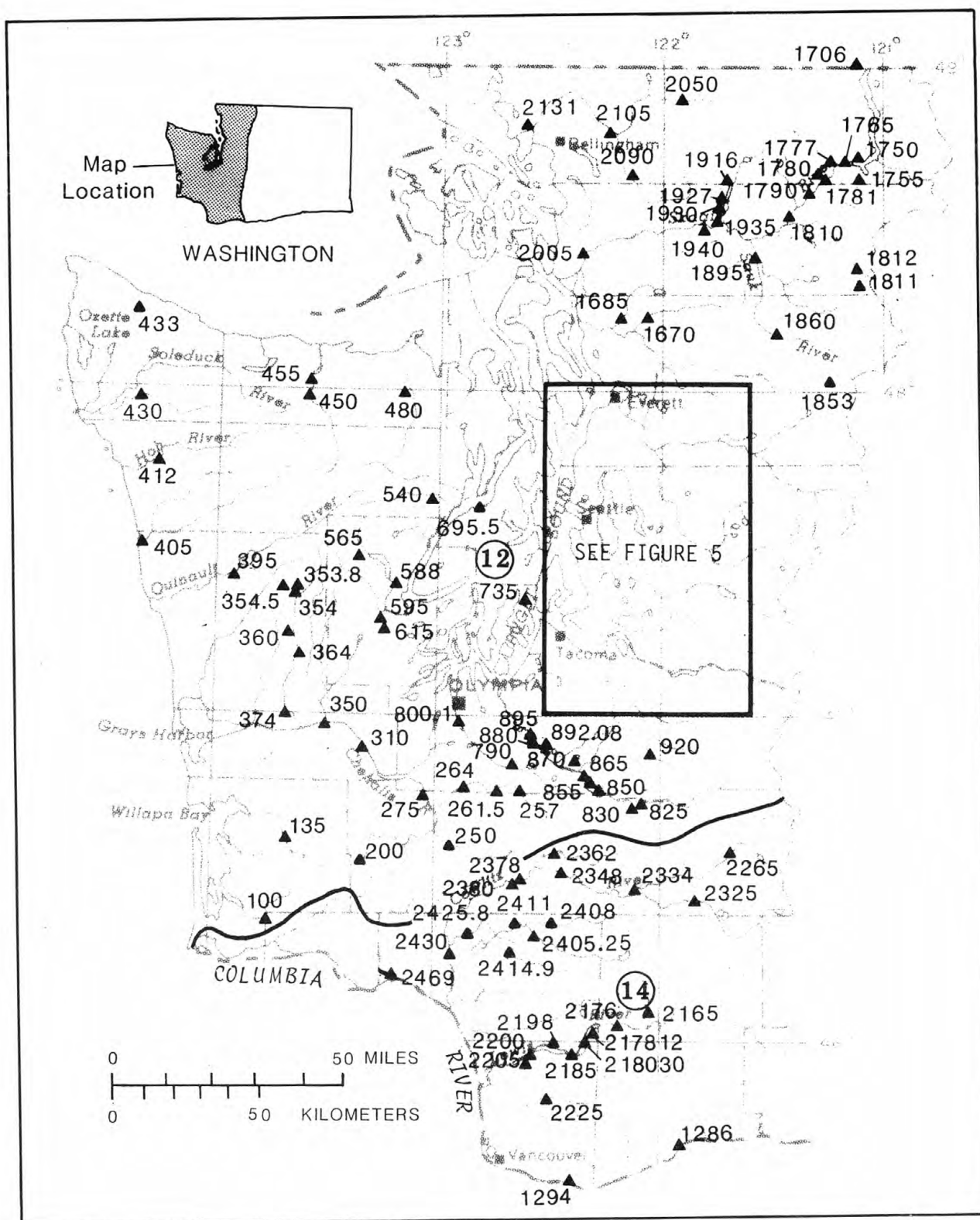


Figure 4a. Map of Western Washington showing locations of gaging stations. Numbers shown are abbreviated versions of complete station numbers used on text. Part numbers are the large circled numbers.

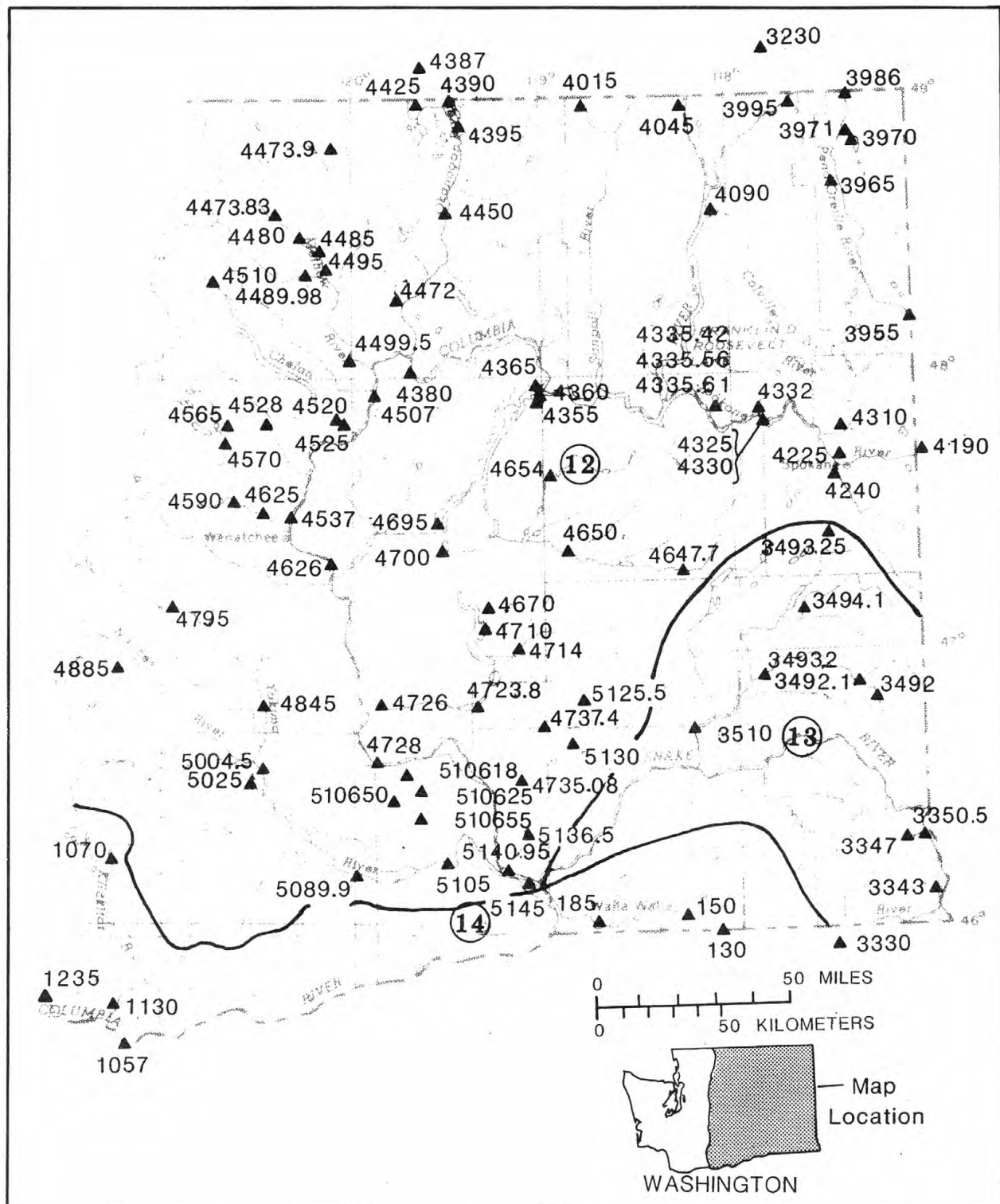


Figure 4b. Map of Eastern Washington showing locations of gaging stations. Numbers shown are abbreviated versions of complete station numbers used on text. Part numbers are the large circled numbers.

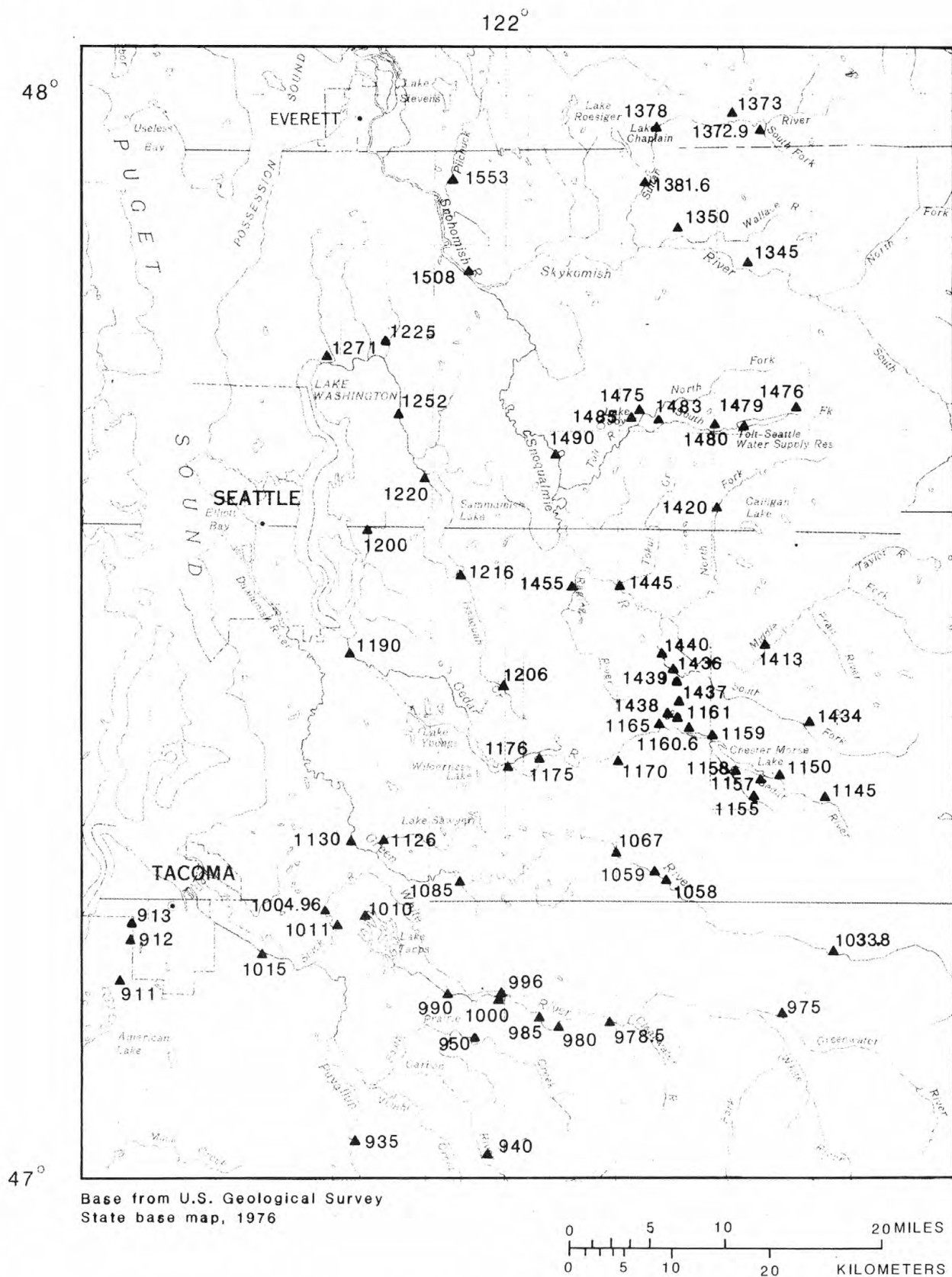


Figure 5. Map showing locations of gaging stations in the insert of Figure 4a.

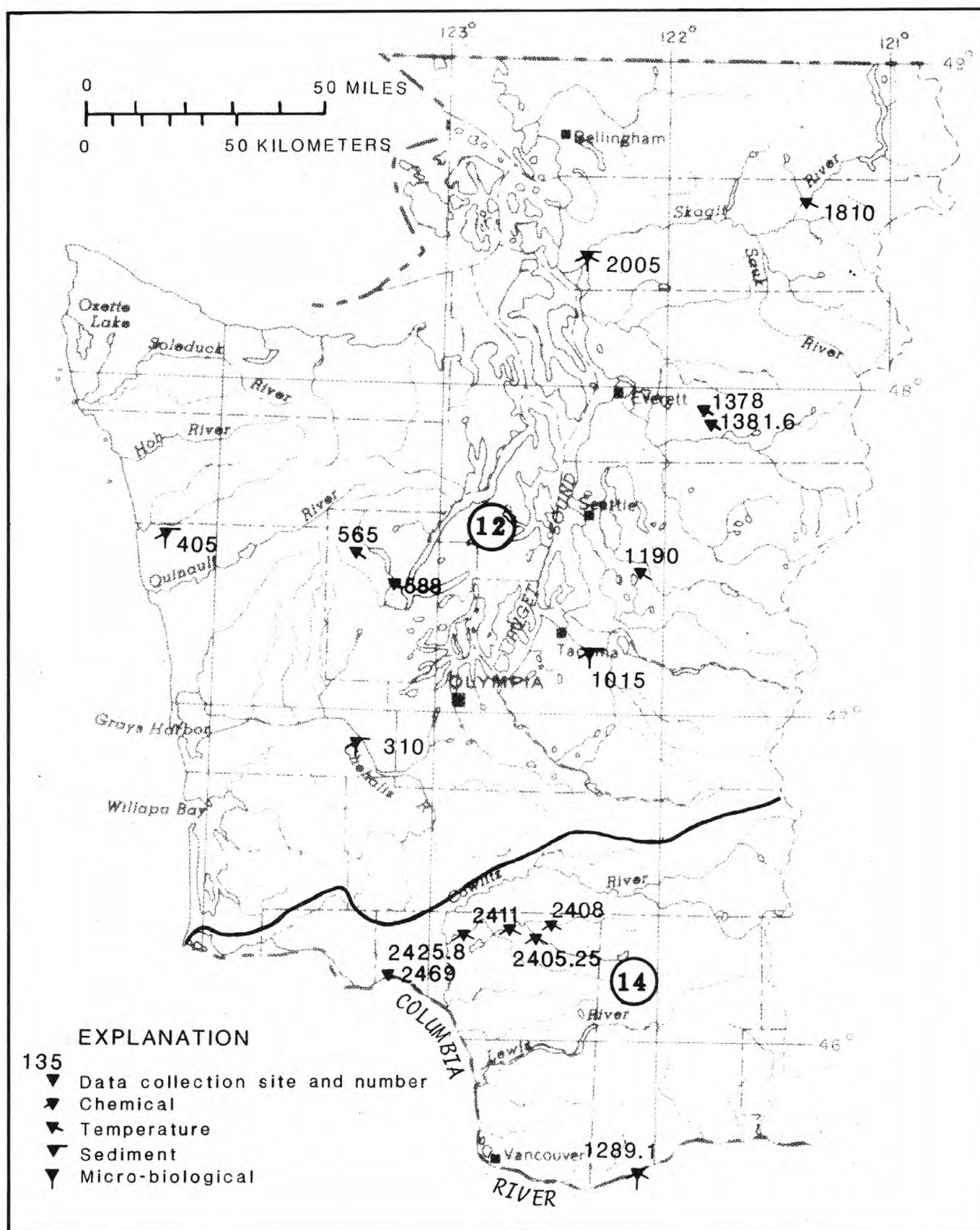


Figure 6a. Map of Western Washington showing locations of surface-water-quality stations. Numbers shown are abbreviated versions of complete station numbers used on text. Part numbers are the large circled numbers.

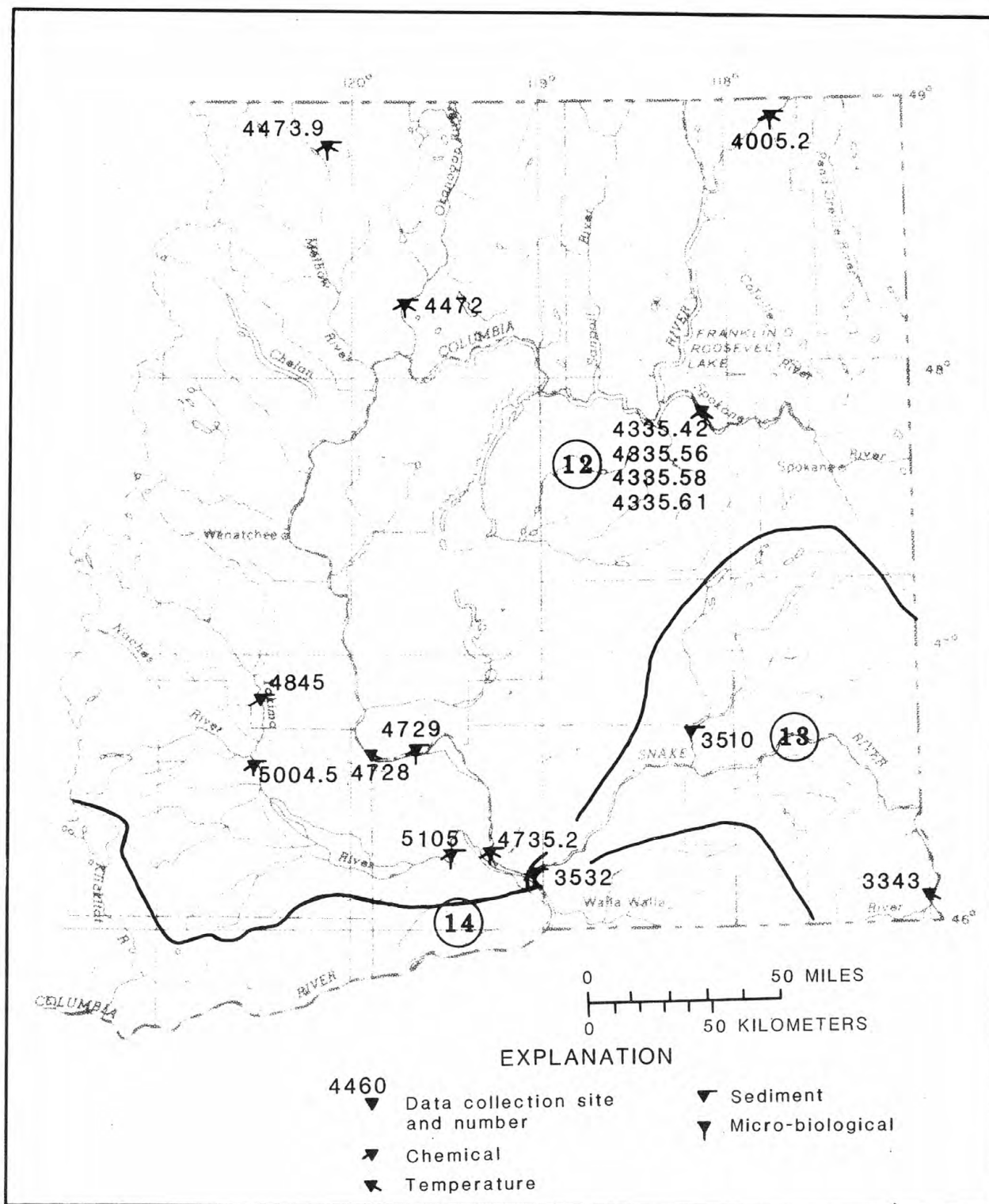


Figure 6b. Map of Eastern Washington showing locations of surface-water-quality stations. Numbers shown are abbreviated versions of complete station numbers used on text. Part numbers are the large circled numbers.

SURFACE-WATER RECORDS

Remark Codes

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

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

NOTE: In March 1989 the National Water-Quality Laboratory discovered a bias in the turbidimetric method for sulfate analysis, indicating that values below 75 mg/L have a median positive bias of 2 mg/L above the true value for the period between 1982 and 1989.

Dissolved Trace-Element Concentrations

NOTE: Historical and current dissolved trace-element concentrations are reported herein for water that was collected, processed, and analyzed by using either ultraclean or other than ultraclean techniques. If ultraclean techniques were used, then those concentrations are reported in nanograms per liter. If other than ultraclean techniques were used, then those concentrations are reported in micrograms per liter and could reflect contamination introduced during some phase of the procedure.

NASELLE RIVER BASIN

12010000 NASELLE RIVER NEAR NASELLE, WA

LOCATION.--Lat 46°22'27", long 123°44'32", in SW 1/4 SW 1/4 sec.1, T.10 N., R.9 W., Pacific County, Hydrologic Unit 17100106, on right bank 0.2 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 good. No regulation or diversion upstream from station. Chemical analyses October 1965 to September 1970, January to September 1973, November 1975 to June 1980. Water temperatures August 1963 to September 1973. U.S. Geological Survey satellite telemeter at station.

AVERAGE DISCHARGE.--64 years, 424 ft³/s, 105.07 in/yr, 307,200 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 11,300 ft³/s Nov. 24, 1990, gage height, 18.45 ft, from rating curve extended above 5,500 ft³/s; 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)
Mar. 22	2300	*2,560	*9.24				
Minimum discharge, 27 ft ³ /s Sept. 28-30.							

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	46	647	531	390	521	103	326	529	244	139	78	37
2	44	540	483	346	439	109	384	489	250	135	70	38
3	44	397	409	359	378	179	499	514	222	126	66	37
4	41	358	358	347	332	1010	448	496	201	121	62	37
5	36	294	321	304	299	930	388	450	184	117	59	37
6	34	264	288	277	267	640	359	450	175	112	58	36
7	32	848	262	258	242	492	327	485	196	109	57	35
8	32	651	406	245	221	397	581	596	177	103	58	34
9	33	533	527	223	208	334	1060	551	348	100	69	34
10	30	429	510	208	e195	290	1070	492	399	99	68	33
11	29	376	602	193	e183	256	1260	429	494	96	58	33
12	28	326	541	182	e171	230	961	378	490	94	54	34
13	35	280	470	174	e159	211	756	335	426	92	54	33
14	31	248	483	167	e148	259	612	300	381	89	53	32
15	29	222	447	160	e139	453	622	270	362	89	56	32
16	29	213	407	152	130	354	579	244	315	92	54	31
17	33	205	473	145	123	465	602	222	280	89	51	30
18	54	209	432	138	119	478	581	203	250	82	48	30
19	248	446	459	237	117	426	517	192	226	79	46	31
20	334	369	739	866	116	412	466	200	205	81	44	31
21	298	1340	1120	794	125	356	460	281	193	81	44	30
22	230	1570	1060	564	115	1170	430	242	275	94	43	30
23	169	991	909	461	112	2050	497	214	241	91	61	29
24	136	683	758	689	105	1270	837	189	202	81	57	28
25	115	514	616	1930	101	852	988	173	184	78	48	29
26	102	414	581	1680	98	642	1060	164	173	72	44	28
27	93	491	519	1110	95	522	957	160	173	69	42	28
28	87	429	551	1060	93	437	763	159	166	73	42	27
29	115	372	590	1050	---	386	686	173	156	119	41	27
30	306	576	510	808	---	342	583	201	146	111	39	27
31	856	---	443	639	---	309	---	248	---	86	38	---
TOTAL	3729	15235	16805	16156	5351	16364	19659	10029	7734	2999	1662	958
MEAN	120	508	542	521	191	528	655	324	258	96.7	53.6	31.9
MAX	856	1570	1120	1930	521	2050	1260	596	494	139	78	38
MIN	28	205	262	138	93	103	326	159	146	69	38	27
AC-FT	7400	30220	33330	32050	10610	32460	38990	19890	15340	5950	3300	1900
CSM	2.20	9.27	9.89	9.51	3.49	9.63	12.0	5.90	4.70	1.77	.98	.58
IN.	2.53	10.34	11.41	10.97	3.63	11.11	13.35	6.81	5.25	2.04	1.13	.68

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1929 - 1993, BY WATER YEAR (WY)

MEAN	275	708	899	856	798	612	401	208	138	77.6	51.4	84.6
MAX	796	1539	2530	1969	1587	1217	858	448	343	250	123	455
(WY)	1948	1984	1934	1953	1961	1950	1937	1948	1968	1983	1968	1978
MIN	20.9	37.3	245	215	191	153	120	82.0	54.9	33.8	22.3	28.7
(WY)	1988	1937	1977	1985	1993	1992	1939	1956	1982	1970	1970	1967

SUMMARY STATISTICS	FOR 1992 CALENDAR YEAR	FOR 1993 WATER YEAR	WATER YEARS 1929 - 1993
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ANNUAL TOTAL	105701		116681			
ANNUAL MEAN	289		320		424	
HIGHEST ANNUAL MEAN					611	1974
LOWEST ANNUAL MEAN					226	1977
HIGHEST DAILY MEAN	4090	Jan 29	2050	Mar 23	10400	Jan 22 1935
LOWEST DAILY MEAN	22	Sep 19	27	Sep 28	18	Aug 31 1970
ANNUAL SEVEN-DAY MINIMUM	23	Aug 15	28	Sep 24	19	Oct 16 1987
ANNUAL RUNOFF (AC-FT)	209700		231400		307100	
ANNUAL RUNOFF (CFSM)	5.27		5.83		7.74	
ANNUAL RUNOFF (INCHES)	71.75		79.21		105.12	
10 PERCENT EXCEEDS	634		684		1040	
50 PERCENT EXCEEDS	134		223		216	
90 PERCENT EXCEEDS	26		36		40	

e Estimated

WILLAPA RIVER BASIN

45

12013500 WILLAPA RIVER NEAR WILLAPA, WA

LOCATION.--Lat 46°39'04", long 123°39'05", in SW 1/4 SW 1/4 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.

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 and crest-stage gage. Datum of gage is 3.57 ft above sea level. 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.--Records good except for estimated daily discharges, which are fair. Some diversion for domestic use and irrigation upstream from station. No regulation. U.S. Geological Survey satellite telemeter at station. Chemical analyses October 1965 to September 1986.

AVERAGE DISCHARGE.--38 years (water years 1949-1954, 1962-1993), 624 ft³/s, 65.18 in/yr, 452,100 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 11,800 ft³/s Nov. 24, 1990, from rating curve extended above 8,000 ft³/s, gage height, 24.21 ft; 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)
Mar. 23	0300	*3,350	*12.22				
Minimum discharge, 25 ft ³ /s Sept. 30, gage height, 3.14 ft.							

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	42	622	750	572	e660	154	493	660	416	176	87	37
2	39	572	701	511	e580	163	519	619	442	175	79	37
3	39	396	600	532	e510	212	670	638	383	162	73	36
4	38	335	535	616	e470	887	608	608	343	154	67	36
5	35	275	483	543	e420	987	542	538	306	145	64	38
6	33	224	438	494	e390	669	492	536	292	140	62	38
7	31	620	403	463	e360	537	458	570	290	133	61	37
8	30	587	601	440	e340	459	684	719	263	123	62	34
9	29	527	949	394	e320	399	1520	656	342	118	63	34
10	29	411	912	360	e300	356	1680	601	455	113	68	32
11	29	347	1280	329	e285	320	1860	533	476	112	62	32
12	28	306	1090	319	264	296	1460	477	482	107	58	33
13	29	262	880	289	251	277	1150	426	422	101	57	33
14	29	231	816	276	236	305	918	383	376	98	57	32
15	27	208	748	265	224	612	880	347	373	100	61	31
16	27	201	653	249	212	474	811	317	330	102	62	30
17	28	214	927	238	200	599	789	289	293	107	59	30
18	35	222	847	225	194	585	745	267	267	96	54	29
19	128	531	761	316	190	526	656	261	245	88	49	30
20	215	476	1060	e1150	188	536	598	297	228	92	46	30
21	195	1210	1460	e1000	198	480	593	405	219	96	46	30
22	152	1830	1350	e780	196	1060	578	337	300	100	45	29
23	107	1140	1160	e640	181	2770	580	299	323	103	50	30
24	84	847	967	e900	172	1770	807	263	244	94	66	29
25	70	659	800	e2000	163	1240	976	239	219	89	55	30
26	62	544	728	e1800	157	941	1280	227	206	82	50	30
27	57	567	674	e1500	153	755	1330	213	208	77	46	30
28	51	567	775	e1450	151	631	1070	224	203	87	45	30
29	59	478	881	e1350	---	569	902	280	194	122	43	29
30	268	758	742	e1000	---	508	760	269	178	137	40	27
31	793	---	645	e780	---	459	---	402	---	101	39	---
TOTAL	2818	16167	25616	21781	7965	20536	26409	12900	9318	3530	1776	963
MEAN	90.9	539	826	703	284	662	880	416	311	114	57.3	32.1
MAX	793	1830	1460	2000	660	2770	1860	719	482	176	87	38
MIN	27	201	403	225	151	154	458	213	178	77	39	27
AC-FT	5590	32070	50810	43200	15800	40730	52380	25590	18480	7000	3520	1910
CFSM	.70	4.15	6.36	5.40	2.19	5.10	6.77	3.20	2.39	.88	.44	.25
IN.	.81	4.63	7.33	6.23	2.28	5.88	7.56	3.69	2.67	1.01	.51	.28

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1947 - 1993, BY WATER YEAR (WY)

	MEAN	266	964	1416	1406	1247	958	609	297	163	76.2	47.5	76.2
MAX	793	2270	2402	3115	2523	1847	1312	600	486	203	117	378	
(WY)	1976	1984	1971	1953	1954	1950	1991	1984	1968	1983	1968	1978	
MIN	25.6	92.8	240	213	284	253	284	144	59.8	34.5	20.4	24.9	
(WY)	1988	1953	1977	1977	1993	1992	1949	1989	1992	1992	1992	1967	

SUMMARY STATISTICS	FOR 1992 CALENDAR YEAR	FOR 1993 WATER YEAR	WATER YEARS 1947 - 1993
ANNUAL TOTAL	150586	149779	
ANNUAL MEAN	411	410	624
HIGHEST ANNUAL MEAN			963
LOWEST ANNUAL MEAN			294
HIGHEST DAILY MEAN	7410	2770	10100
LOWEST DAILY MEAN	15	27	14
ANNUAL SEVEN-DAY MINIMUM	16	28	16
ANNUAL RUNOFF (AC-FT)	298700	297100	452100
ANNUAL RUNOFF (CFSM)	3.16	3.16	4.80
ANNUAL RUNOFF (INCHES)	43.09	42.86	65.22
10 PERCENT EXCEEDS	950	914	1570
50 PERCENT EXCEEDS	189	293	290
90 PERCENT EXCEEDS	20	35	37

e Estimated

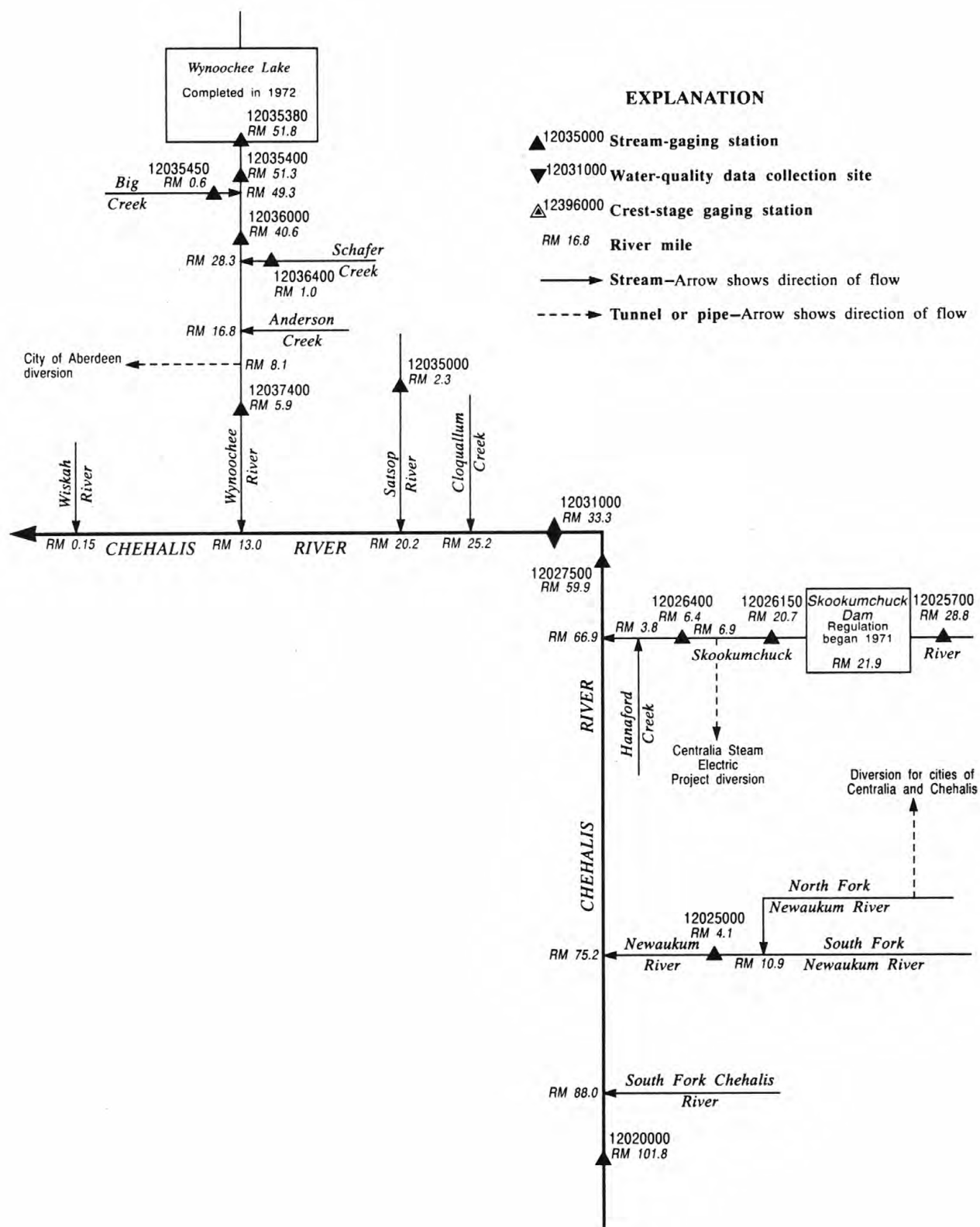


Figure 7. Gaging stations in Chehalis River Basin.

CHEHALIS RIVER BASIN

47

12020000 CHEHALIS RIVER NEAR DOTY, WA

LOCATION.--Lat 46°37'03", long 123°16'35", in NE 1/4 NW 1/4 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 sea level (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. Chemical analyses July 1959 to September 1970, sediment records October 1961 to December 1964 (partial-record station).

AVERAGE DISCHARGE.--54 years, 564 ft³/s, 67.78 in/yr, 408,600 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 27,500 ft³/s Jan. 9, 1990, gage height, 19.96 ft, from rating curve extended above 8,000 ft³/s on basis of slope-area measurement of peak flow; minimum discharge, 16 ft³/s Aug. 31, Sept. 3, 4, 7, 8, 1992, gage height, 0.45 ft.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 6,800 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Jan. 25	1000	*3,880	*6.66				
Minimum discharge, 24 ft ³ /s Oct. 15, 16, gage height, 0.53 ft.							

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	41	623	653	489	695	138	392	634	365	145	81	36
2	39	611	612	425	591	148	431	604	407	141	75	36
3	39	376	489	443	521	193	577	694	365	133	72	35
4	38	298	406	451	462	961	533	716	321	127	68	35
5	34	240	351	384	418	1240	474	612	288	122	65	35
6	32	193	310	344	387	777	423	576	275	119	63	35
7	30	499	276	318	365	556	385	585	259	114	61	34
8	28	513	397	300	345	432	551	753	234	108	60	33
9	28	464	732	271	326	356	1420	687	274	103	60	32
10	27	350	770	254	315	306	1580	605	341	103	61	30
11	27	289	1090	e240	289	268	1800	506	339	101	60	30
12	26	253	903	e229	266	242	1380	440	319	99	58	31
13	25	213	741	e210	247	225	1050	384	286	96	56	30
14	27	187	837	199	230	257	828	344	264	95	58	30
15	24	167	850	192	215	620	832	311	264	96	64	30
16	24	158	699	184	200	520	803	282	237	97	62	30
17	26	155	718	176	186	652	759	260	215	96	60	29
18	36	165	587	168	179	674	715	240	199	89	55	28
19	86	429	541	311	176	576	631	234	186	88	51	29
20	117	389	999	1980	173	572	553	262	174	97	48	30
21	155	1310	1600	2110	174	498	516	383	167	92	45	29
22	120	1810	1480	1370	166	947	479	348	241	96	43	28
23	92	1050	1410	971	159	2160	531	320	262	103	59	28
24	76	670	1180	989	151	1360	889	279	209	95	67	28
25	66	474	957	3170	143	950	1070	252	188	89	55	28
26	58	365	822	2340	139	723	1600	236	174	83	48	27
27	53	478	744	1590	135	577	1650	223	173	77	44	27
28	50	534	839	1420	133	479	1150	217	165	80	42	27
29	61	431	808	1380	---	419	896	224	155	89	41	26
30	222	648	679	1070	---	382	739	228	146	106	39	25
31	566	---	572	850	---	344	---	330	---	91	38	---
TOTAL	2273	14342	24052	24828	7786	18552	25637	12769	7492	3170	1759	911
MEAN	73.3	478	776	801	278	598	855	412	250	102	56.7	30.4
MAX	566	1810	1600	3170	695	2160	1800	753	407	145	81	36
MIN	24	155	276	168	133	138	385	217	146	77	38	25
AC-FT	4510	28450	47710	49250	15440	36800	50850	25330	14860	6290	3490	1810
CFSM	.65	4.23	6.87	7.09	2.46	5.30	7.56	3.65	2.21	.90	.50	.27
IN.	.75	4.72	7.92	8.17	2.56	6.11	8.44	4.20	2.47	1.04	.58	.30

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1940 - 1993, BY WATER YEAR (WY)

	MEAN	275	900	1202	1213	1145	876	581	272	144	71.4	47.0	77.9
MAX	891	2131	2289	2888	2354	1870	1264	700	390	183	124	357	
(WY)	1948	1956	1956	1953	1954	1956	1991	1948	1968	1983	1968	1959	
MIN	20.5	76.9	217	176	278	216	207	127	62.8	33.9	23.6	25.3	
(WY)	1988	1953	1977	1977	1993	1992	1941	1954	1992	1951	1951	1952	

SUMMARY STATISTICS FOR 1992 CALENDAR YEAR FOR 1993 WATER YEAR WATER YEARS 1940 - 1993

	ANNUAL TOTAL	136797	143571	564	1956
ANNUAL MEAN		374	393	911	1977
HIGHEST ANNUAL MEAN				259	
LOWEST ANNUAL MEAN				16400	Jan 9 1990
HIGHEST DAILY MEAN	6300	Jan 28	3170	16	Sep 3 1992
LOWEST DAILY MEAN	16	Sep 3	24	17	Aug 29 1992
ANNUAL SEVEN-DAY MINIMUM	17	Aug 29	26	17	
ANNUAL RUNOFF (AC-FT)	271300		284800	408800	
ANNUAL RUNOFF (CFSM)	3.31		3.48	4.99	
ANNUAL RUNOFF (INCHES)	45.03		47.26	67.84	
10 PERCENT EXCEEDS	875		921	1430	
50 PERCENT EXCEEDS	159		253	259	
90 PERCENT EXCEEDS	23		34	37	

e Estimated

CHEHALIS RIVER BASIN

12025000 NEWAUKUM RIVER NEAR CHEHALIS. WA

LOCATION.--Lat 46°37'13", long 122°56'38", in SW 1/4 SW 1/4 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.--No estimated daily discharges. Records good. Cities of Chehalis and Centralia divert about 5 ft³/s from North Fork Newaukum River for municipal use. No regulation upstream from station.

AVERAGE DISCHARGE.--52 years (water years, 1930-31, 1943-81, 1983-93), 491 ft³/s, 43.02 in/yr, 355,700 acre-ft/yr, unadjusted.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 10,700 ft³/s Nov. 24, 1986, gage height, 12.76 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)
Apr. 11	1300	*3,730	*7.31				
Minimum discharge, 37 ft ³ /s Oct. 11, 12.							

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	45	198	914	503	601	145	505	705	1020	174	165	66
2	46	228	722	436	523	171	553	681	643	170	149	66
3	53	177	529	424	464	207	1050	825	486	161	137	66
4	59	155	418	551	418	284	1090	943	416	155	127	65
5	48	155	354	502	381	483	778	767	376	150	119	64
6	44	120	318	395	351	383	613	769	386	145	115	64
7	43	156	291	344	330	316	553	722	331	139	114	63
8	41	235	373	317	313	277	592	893	296	130	112	60
9	39	247	779	278	300	248	985	805	297	126	108	58
10	38	182	1480	283	288	222	1230	803	439	123	104	57
11	38	159	1820	270	272	204	2950	656	446	122	101	56
12	37	194	977	216	256	188	2150	561	532	122	98	59
13	39	163	676	211	241	179	1380	482	438	120	98	59
14	47	140	718	193	229	196	1110	423	370	167	97	57
15	39	124	749	185	216	440	967	377	403	158	97	57
16	38	113	598	178	202	402	977	340	365	178	97	56
17	41	113	769	169	186	520	884	310	302	314	103	54
18	46	156	729	161	182	630	885	286	264	224	94	53
19	65	403	623	223	184	517	765	267	237	174	88	54
20	86	447	1420	1220	184	479	661	315	216	201	84	56
21	68	789	1470	1390	184	414	617	326	203	251	83	57
22	71	1550	1300	999	180	432	752	357	311	235	81	54
23	65	830	1210	729	167	1900	744	305	398	292	84	53
24	57	543	1030	758	160	1120	944	263	278	270	91	52
25	51	398	857	1230	152	768	1070	232	232	236	83	52
26	48	313	832	2040	146	595	1270	224	209	208	78	53
27	46	541	880	1470	141	486	1130	207	202	182	75	52
28	45	834	970	1100	139	407	925	207	211	187	74	51
29	48	553	838	1060	---	356	934	275	205	226	73	48
30	64	970	708	846	---	332	815	277	186	232	70	44
31	104	---	581	709	---	321	---	1120	---	188	68	---
TOTAL	1599	11186	25933	19390	7390	13622	29879	15723	10698	5760	3067	1710
MEAN	51.6	373	837	625	264	439	996	507	357	186	98.9	57.0
MAX	104	1550	1820	2040	601	1900	2950	1120	1020	314	165	66
MIN	37	113	291	161	139	145	505	207	186	120	68	48
AC-FT	3170	22190	51440	38460	14660	27020	59260	31190	21220	11420	6080	3390
CFSM	.33	2.41	5.40	4.04	1.70	2.83	6.43	3.27	2.30	1.20	.64	.37
IN.	.38	2.68	6.22	4.65	1.77	3.27	7.17	3.77	2.57	1.38	.74	.41

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1929 - 1993, BY WATER YEAR (WY)

MEAN	177	709	1011	1064	977	757	547	288	183	89.9	54.3	69.9
MAX	613	1717	2081	2169	1875	1609	1052	680	464	307	159	243
(WY)	1956	1956	1976	1953	1961	1972	1991	1960	1981	1983	1968	1968
MIN	25.5	47.6	194	192	262	280	281	130	66.3	36.1	21.5	27.9
(WY)	1988	1930	1977	1977	2677	1992	1973	1947	1992	1951	1951	198.9

SUMMARY STATISTICS	FOR 1992 CALENDAR YEAR	FOR 1993 WATER YEAR	WATER YEARS 1929 - 1993
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ANNUAL TOTAL	120721		145957						
ANNUAL MEAN	330		400						
HIGHEST ANNUAL MEAN						491			
LOWEST ANNUAL MEAN						748			1956
HIGHEST DAILY MEAN	3470	Jan 28	2950	Apr 11	9720	244			1977
LOWEST DAILY MEAN	25	Aug 29	37	Oct 12	14				1986
ANNUAL SEVEN-DAY MINIMUM	26	Aug 26	39	Oct 7	15			Sep 13	1949
ANNUAL RUNOFF (AC-FT)	239500		289500			356000		Aug 20	1951
ANNUAL RUNOFF (CFSM)	2.13		2.58			3.17			
ANNUAL RUNOFF (INCHES)	28.97		35.03			43.08			
10 PERCENT EXCEEDS	831		953			1180			
50 PERCENT EXCEEDS	156		248			253			
90 PERCENT EXCEEDS	34		56			44			

CHEHALIS RIVER BASIN

49

12025700 SKOOKUMCHUCK RIVER NEAR VAIL, WA

LOCATION.--Lat 46°46'22", long 122°35'34", in SW 1/4 NW 1/4 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 good. No regulation or diversion upstream from station. U.S. Geological Survey satellite telemeter at station.

AVERAGE DISCHARGE.--26 years, 195 ft³/s, 66.20 in/yr, 141,300 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 6,900 ft³/s Jan. 20, 1972, gage height, 10.93 ft; minimum discharge, 13 ft³/s Oct. 29, 1987.

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)
Mar. 23	0100	*912	*6.13				
Minimum discharge, 19 ft ³ /s Oct. 10-12, 14-16.							

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	24	157	244	140	219	69	141	244	291	70	58	29
2	e25	185	192	127	193	64	182	227	220	68	55	28
3	e24	116	156	124	175	84	284	256	180	65	53	28
4	e23	101	136	116	162	253	270	270	158	64	50	28
5	e22	82	121	105	157	317	210	242	142	61	48	28
6	e21	70	106	98	151	220	185	238	129	59	47	28
7	e21	139	97	93	147	173	166	238	120	57	46	27
8	20	154	137	e88	144	148	271	274	110	55	45	26
9	20	124	184	84	143	131	472	255	166	54	43	26
10	20	97	224	81	136	116	474	251	194	53	43	25
11	19	88	273	80	125	104	648	217	192	52	42	25
12	19	80	197	78	114	96	505	192	178	51	41	26
13	22	71	165	76	106	90	384	169	159	53	40	25
14	20	64	272	75	99	121	318	154	145	54	39	25
15	19	59	260	69	93	264	312	140	136	51	39	25
16	20	55	209	65	87	201	312	129	120	68	41	24
17	21	57	180	62	82	195	308	120	110	69	39	24
18	26	76	148	60	79	209	330	112	103	56	37	24
19	42	192	158	116	78	179	291	107	96	56	36	24
20	39	151	318	455	76	196	249	113	90	71	35	24
21	47	397	368	424	73	178	225	135	88	70	34	24
22	47	482	344	285	69	343	231	145	118	76	33	23
23	39	292	350	212	67	737	243	129	109	84	38	23
24	34	204	306	267	64	435	334	116	96	77	35	23
25	31	155	255	723	61	300	475	107	89	72	34	22
26	29	126	253	769	59	233	553	100	85	66	32	22
27	27	206	237	533	58	193	500	95	85	62	32	22
28	26	207	225	441	58	165	388	110	82	65	31	22
29	32	167	199	379	---	147	330	121	76	72	31	21
30	50	282	174	304	---	137	276	128	72	69	30	21
31	109	---	155	256	---	125	---	332	---	62	29	---
TOTAL	938	4636	6643	6785	3075	6223	9867	5466	3939	1962	1236	742
MEAN	30.3	155	214	219	110	201	329	176	131	63.3	39.9	24.7
MAX	109	482	368	769	219	737	648	332	291	84	58	29
MIN	19	55	97	60	58	64	141	95	72	51	29	21
AC-FT	1860	9200	13180	13460	6100	12340	19570	10840	7810	3890	2450	1470
CFSM	.76	3.86	5.36	5.47	2.75	5.02	8.22	4.41	3.28	1.58	1.00	.62
IN.	.87	4.31	6.18	6.31	2.86	5.79	9.18	5.08	3.66	1.82	1.15	.69

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1968 - 1993, BY WATER YEAR (WY)

	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993
MEAN	83.5	276	372	387	345	296	237	135	93.7	48.9	32.7	41.3														
MAX	209	622	697	756	653	621	454	261	187	122	71.2	95.7														
(WY)	1976	1984	1976	1971	1972	1972	1991	1984	1981	1983	1968	1968														
MIN	14.6	51.5	78.4	68.6	92.5	90.9	112	71.2	33.3	27.1	19.3	18.6														
(WY)	1988	1977	1977	1977	1977	1977	1973	1980	1992	1992	1992	1987														

SUMMARY STATISTICS	FOR 1992 CALENDAR YEAR	FOR 1993 WATER YEAR	WATER YEARS 1968 - 1993
ANNUAL TOTAL	43094	51512	195
ANNUAL MEAN	118	141	286
HIGHEST ANNUAL MEAN			103
LOWEST ANNUAL MEAN			4340
HIGHEST DAILY MEAN	1500	769	Jan 20 1972
LOWEST DAILY MEAN	16	19	Oct 11 1987
ANNUAL SEVEN-DAY MINIMUM	16	20	Oct 17 1987
ANNUAL RUNOFF (AC-FT)	85480	102200	141100
ANNUAL RUNOFF (CFSM)	2.94	3.53	4.87
ANNUAL RUNOFF (INCHES)	40.08	47.91	66.17
10 PERCENT EXCEEDS	260	302	445
50 PERCENT EXCEEDS	66	105	114
90 PERCENT EXCEEDS	19	25	27

e Estimated

CHEHALIS RIVER BASIN

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

LOCATION.--Lat 46°47'25", long 122°44'03", in NW 1/4 NW 1/4 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 sea level. 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 sea level.

REMARKS.--No estimated daily discharges. Records good. Flow regulated by Skookumchuck Dam since January 1971. No diversions upstream from station. U.S. Geological Survey satellite telemeter at station.

AVERAGE DISCHARGE.--58 years (water years 1930-33, 1940-93), 250 ft³/s, 181,100 acre-ft/yr, unadjusted.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 7,800 ft³/s Jan. 9, 1990, gage height, 12.56 ft, result of slope-area measurement; minimum discharge, 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)
Jan. 26	1600	*1,060	*8.19				
Minimum discharge, 55 ft ³ /s Nov. 25.							

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	120	103	98	113	310	108	182	307	563	104	95	107
2	121	103	97	112	261	119	198	282	378	106	96	129
3	121	101	105	112	233	126	282	287	274	104	98	149
4	121	102	102	116	213	128	358	319	227	103	97	160
5	121	107	101	118	200	123	311	296	196	102	96	160
6	120	106	100	117	191	121	268	292	175	102	96	160
7	121	108	100	114	183	148	231	285	169	102	96	162
8	122	108	103	113	179	164	246	320	167	102	96	158
9	123	106	130	111	176	145	487	319	170	102	96	162
10	123	106	119	110	172	125	599	322	203	102	96	166
11	123	104	142	108	164	119	923	287	216	102	96	166
12	121	104	129	106	154	114	826	251	219	102	96	166
13	117	98	120	106	152	113	579	216	203	102	96	165
14	112	96	117	106	150	118	454	178	184	102	96	165
15	115	94	113	106	153	217	382	173	206	102	96	171
16	116	99	110	106	156	247	386	165	189	102	96	164
17	115	102	110	106	127	258	370	152	167	102	96	162
18	117	102	109	106	114	256	386	141	150	102	96	162
19	118	114	108	106	114	229	366	137	137	102	96	162
20	108	108	117	120	114	223	316	142	128	103	96	162
21	98	125	124	128	114	216	282	146	121	104	96	159
22	102	127	123	126	114	250	276	162	130	101	96	171
23	98	111	121	123	114	904	272	158	140	97	98	161
24	98	82	118	122	114	707	317	161	133	96	98	159
25	98	70	115	206	110	471	449	146	125	96	97	158
26	96	80	114	929	108	335	639	132	118	96	96	157
27	94	90	114	853	108	274	654	133	114	96	96	160
28	94	96	117	636	108	235	532	141	114	97	96	168
29	94	90	118	548	---	203	439	171	109	98	95	167
30	96	104	117	439	---	172	360	186	104	97	94	160
31	102	---	114	364	---	167	---	504	---	96	95	---
TOTAL	3445	3046	3525	6686	4406	7135	12370	6911	5529	3124	2979	4778
MEAN	111	102	114	216	157	230	412	223	184	101	96.1	159
MAX	123	127	142	929	310	904	923	504	563	106	98	171
MIN	94	70	97	106	108	108	182	132	104	96	94	107
AC-FT	6830	6040	6990	13260	8740	14150	24540	13710	10970	6200	5910	9480

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1972 - 1993, BY WATER YEAR (WY)

	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	
MEAN	142	232	430	480	433	356	298	176	135	102	94.8	136											
MAX	192	552	1100	910	915	829	590	365	254	127	114	167											
(WY)	1979	1984	1978	1974	1990	1972	1991	1984	1990	1983	1972	1983											
MIN	111	87.6	95.8	92.6	62.5	88.0	145	109	85.4	81.7	78.9	115											
(WY)	1993	1988	1977	1977	1977	1977	1973	1989	1989	1992	1985	1975											

SUMMARY STATISTICS

FOR 1992 CALENDAR YEAR

FOR 1993 WATER YEAR

WATER YEARS 1972 - 1993

	1992	1993	1972-1993
ANNUAL TOTAL	56836	63934	
ANNUAL MEAN	155	175	
HIGHEST ANNUAL MEAN			251
LOWEST ANNUAL MEAN			386
HIGHEST DAILY MEAN	1690	929	119
LOWEST DAILY MEAN	70	87	119
ANNUAL SEVEN-DAY MINIMUM	78	70	119
ANNUAL RUNOFF (AC-FT)	112700	126800	181500
10 PERCENT EXCEEDS	216	316	480
50 PERCENT EXCEEDS	115	121	146
90 PERCENT EXCEEDS	83	96	93

CHEHALIS RIVER BASIN

51

12026400 SKOOKUMCHUCK RIVER NEAR BUCODA, WA

LOCATION.--Lat 46°46'20", long 122°55'23", in SW 1/4 NW 1/4 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 198.19 ft (revised) above sea level.

REMARKS.--No estimated daily discharges. Records good. 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. Water temperatures October 1968 to September 1971; sediment records July 1968 to September 1971. U.S. Geological Survey satellite telemeter at station.

AVERAGE DISCHARGE.--22 years (water years 1972-93), 341 ft³/s, 247,000 acre-ft/yr, unadjusted.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 8,540 ft³/s Jan. 10, 1990, gage height, 17.33 ft; minimum discharge, 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)
Apr. 11	1900	*1,760	*9.05				
Minimum discharge, 74 ft ³ /s Aug. 31.							

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	101	108	256	193	422	106	186	442	1090	106	92	79
2	101	111	189	177	365	111	204	402	699	111	91	101
3	102	100	162	172	314	128	325	421	471	106	94	122
4	105	96	142	217	276	133	489	500	363	103	92	139
5	102	103	132	238	248	138	430	457	302	101	92	142
6	97	98	126	212	229	135	349	448	252	100	91	142
7	99	101	121	190	212	158	292	423	226	95	91	145
8	96	111	135	175	200	181	267	489	206	96	91	136
9	98	105	304	161	194	159	672	482	200	96	90	134
10	98	101	351	150	185	137	964	484	254	96	87	139
11	98	105	645	142	180	125	1480	428	269	96	81	139
12	97	101	448	138	166	111	1420	365	291	95	80	138
13	98	96	324	135	158	110	946	302	259	95	79	138
14	94	93	272	132	154	117	695	230	228	96	79	138
15	93	94	238	129	155	204	560	209	295	96	84	144
16	96	94	200	127	157	300	542	206	258	98	89	138
17	96	93	201	126	143	343	520	186	213	101	89	137
18	99	94	197	125	117	356	535	162	186	97	89	137
19	100	134	190	128	116	313	508	149	156	97	88	136
20	99	143	289	242	115	290	438	176	142	98	84	136
21	83	197	365	371	115	280	384	185	131	100	79	134
22	83	392	341	325	114	288	388	202	137	102	78	142
23	83	243	296	255	112	1150	374	204	151	95	80	141
24	79	160	254	248	111	1130	402	182	142	92	77	134
25	79	101	220	400	109	704	519	175	132	91	82	132
26	77	105	206	1240	106	478	812	150	124	89	93	131
27	77	123	211	1350	105	356	904	144	119	89	93	133
28	77	196	249	958	105	283	756	162	118	90	87	140
29	79	146	271	794	---	236	626	200	117	91	77	141
30	81	235	249	634	---	184	517	195	112	93	76	135
31	94	---	216	509	---	167	---	718	---	95	74	---
TOTAL	2861	3979	7800	10393	4983	8911	17504	9478	7643	3006	2649	4023
MEAN	92.3	133	252	335	178	287	583	306	255	97.0	85.5	134
MAX	105	392	645	1350	422	1150	1480	718	1090	111	94	145
MIN	77	93	121	125	105	106	186	144	112	89	74	79
AC-FT	5670	7890	15470	20610	9880	17670	34720	18800	15160	5960	5250	7980

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1972 - 1993, BY WATER YEAR (WY)

	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993
MEAN	143	346	641	702	641	525	418	220	161	101	83.1	128										
MAX	205	846	1539	1351	1399	1446	970	461	331	156	121	180										
(WY)	1982	1984	1978	1972	1990	1972	1991	1984	1990	1983	1972	1978										
MIN	92.3	66.4	105	95.0	85.7	154	180	121	78.5	62.7	56.3	94.9										
(WY)	1993	1988	1977	1977	1977	1992	1973	1989	1979	1992	1985	1992										

SUMMARY STATISTICS	FOR 1992 CALENDAR YEAR	FOR 1993 WATER YEAR	WATER YEARS 1972 - 1993
ANNUAL TOTAL	72164	83230	
ANNUAL MEAN	197	228	
HIGHEST ANNUAL MEAN			341
LOWEST ANNUAL MEAN			571
HIGHEST DAILY MEAN	2360	1480	148
LOWEST DAILY MEAN	53	74	1972
ANNUAL SEVEN-DAY MINIMUM	55	78	1977
ANNUAL RUNOFF (AC-FT)	143100	165100	7190
10 PERCENT EXCEEDS	337	474	Nov 25 1990
50 PERCENT EXCEEDS	108	142	Sep 3 1973
90 PERCENT EXCEEDS	60	91	Aug 24 1989

CHEHALIS RIVER BASIN

12027500 CHEHALIS RIVER NEAR GRAND MOUND, WA

LOCATION.--Lat 46°46'34", long 123°02'04", in NE 1/4 NE 1/4 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 sea level. Prior to Oct. 3, 1934, nonrecording gage at present site at datum 3.0 ft higher.

REMARKS.--No estimated daily discharges. Records 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 5 ft³/s for municipal water supply for Centralia and Chehalis. Water temperatures March 1952 to September 1974. Miscellaneous suspended sediment data published for water years 1962-64. U.S. Geological Survey satellite telemeter at station.

AVERAGE DISCHARGE.--65 years, 2,773 ft³/s, 42.08 in/yr, 2,009,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 68,700 ft³/s Jan. 10, 1990, gage height, 19.34 ft. from inside high-water mark; minimum discharge, 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)
Apr. 12	0100	*10,400	*11.02				
Minimum discharge, 218 ft ³ /s Oct. 16.							

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	269	1510	3930	2950	3600	712	1930	3420	4550	742	550	250
2	262	1590	3370	2530	3070	762	2180	3140	3800	725	495	254
3	260	1490	2850	2270	2680	814	2900	3190	3020	701	460	278
4	272	1100	2230	2950	2380	1010	3710	4150	2350	663	434	294
5	269	1010	1850	3020	2120	2880	3170	3670	1960	645	413	306
6	244	849	1620	2620	1940	2470	2640	3410	1720	627	392	309
7	233	767	1460	2270	1780	1890	2340	3260	1520	598	385	306
8	231	1300	1510	2050	1680	1610	2200	3790	1390	576	382	300
9	229	1440	3340	1840	1590	1390	4330	3870	1270	551	379	286
10	229	1230	4370	1600	1510	1220	7000	3640	1640	529	379	283
11	226	1020	7050	1390	1410	1090	8780	3210	1680	528	370	281
12	222	979	6630	1370	1320	993	9550	2710	1860	528	355	281
13	222	922	5230	1270	1240	941	7120	2310	1670	516	342	283
14	224	820	4410	1220	1170	938	5670	1960	1460	556	339	284
15	222	751	4380	1160	1110	1460	4710	1740	1510	603	352	284
16	220	698	3640	1110	1060	2080	4510	1590	1510	580	396	290
17	222	682	3620	1050	994	2390	4070	1440	1300	743	391	280
18	231	725	4190	1010	922	3030	3940	1310	1150	729	377	274
19	261	1090	3500	1020	906	2820	3570	1200	1020	610	350	273
20	360	2070	4510	3200	901	2520	3100	1350	935	587	328	272
21	408	2030	6570	8120	892	2360	2790	1510	878	661	305	275
22	431	6500	7120	7000	889	2150	2850	1670	915	660	300	275
23	404	5320	6430	5290	848	6490	2840	1490	1390	694	297	284
24	350	3490	5570	4480	817	7490	3230	1300	1190	697	310	274
25	306	2390	4700	6220	780	5370	3870	1180	993	634	330	268
26	286	1790	4030	9620	747	4060	4840	1100	897	590	320	265
27	268	1640	3930	8770	724	3200	6410	1030	841	545	315	261
28	257	2950	4180	6720	709	2590	5550	1000	850	516	298	261
29	276	2520	4630	6100	---	2190	4680	1070	839	574	284	268
30	332	2620	4150	5110	---	1910	4090	1110	791	618	270	261
31	807	---	3470	4270	---	1760	---	2260	---	624	261	---
TOTAL	9033	53293	128470	109600	39789	72590	128570	69080	46899	19150	11159	8360
MEAN	291	1776	4144	3535	1421	2342	4286	2228	1563	618	360	279
MAX	807	6500	7120	9620	3600	7490	9550	4150	4550	743	550	309
MIN	220	682	1460	1010	709	712	1930	1000	791	516	261	250
AC-FT	17920	105700	254800	217400	78920	144000	255000	137000	93020	37980	22130	16580
CFSM	.33	1.98	4.63	3.95	1.59	2.62	4.79	2.49	1.75	.69	.40	.31
IN.	.38	2.22	5.34	4.56	1.65	3.02	5.34	2.87	1.95	.80	.46	.35

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1929 - 1993, BY WATER YEAR (WY)

	MEAN	907	3781	6102	6331	5779	4459	2976	1354	803	376	237	336
MAX	2635	9697	19280	13900	11490	9477	6787	3496	2482	934	570	1289	
(WY)	1956	1956	1934	1971	1961	1972	1937	1948	1936	1983	1968	1978	
MIN	125	221	884	860	1201	1354	1086	549	352	174	118	117	
(WY)	1953	1937	1977	1977	1977	1992	1939	1939	1992	1970	1967	1967	

SUMMARY STATISTICS

FOR 1992 CALENDAR YEAR

FOR 1993 WATER YEAR

WATER YEARS 1929 - 1993

ANNUAL TOTAL	644408	695993	2773	
ANNUAL MEAN	1761	1907	4444	1956
HIGHEST ANNUAL MEAN			1122	1977
LOWEST ANNUAL MEAN			58500	Jan 10 1990
HIGHEST DAILY MEAN	19300	Jan 30	220	Oct 16
LOWEST DAILY MEAN	117	Aug 30	223	Oct 11
ANNUAL SEVEN-DAY MINIMUM	124	Aug 26	223	Oct 11
ANNUAL RUNOFF (AC-FT)	1278000	1381000	2009000	
ANNUAL RUNOFF (CFSM)	1.97	2.13	3.10	
ANNUAL RUNOFF (INCHES)	26.78	28.93	42.10	
10 PERCENT EXCEEDS	4440	4490	7350	
50 PERCENT EXCEEDS	809	1200	1230	
90 PERCENT EXCEEDS	172	275	218	

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 NE 1/4 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 September 1985, October 1985 to September 1986 (monthly means only), October 1986 to current year. Daily routed values for October 1985 to September 1986 are available in the files of the U.S. Geological Survey.

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

GAGE.--Water-stage recorder. Datum of gage is 23.64 ft above sea level.

REMARKS.--No estimated daily discharges. Water-discharge records 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 5 ft³/s for municipal water supply for Centralia and Chehalis. U.S. Geological Survey satellite telemeter at station.

AVERAGE DISCHARGE.--38 years (water years 1953-72, 1976-93), 4,013 ft³/s, 42.11 in/yr, 2,907,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 60,400 ft³/s Jan. 11, 1990, gage height, 24.52 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)
Jan. 27	0800	*12,300	*16.42				
Minimum discharge, 323 ft ³ /s Oct. 14-16.							

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	394	1480	4520	4330	5380	1180	2890	5020	4770	1070	834	439
2	379	1910	4400	3840	4740	1220	3230	4650	4970	1030	758	433
3	378	1850	3930	3530	4220	1310	3520	4560	4290	1000	707	444
4	373	1580	3250	3860	3820	1670	4340	5230	3580	962	666	458
5	376	1320	2730	4220	3470	2870	4260	5180	3070	926	636	482
6	365	1190	2380	3910	3200	3590	3760	4800	2680	901	609	493
7	348	1290	2150	3510	2960	2920	3380	4670	2390	880	599	493
8	339	1460	2070	3230	2780	2490	3270	4870	2180	842	595	490
9	333	1780	3130	2940	2630	2200	4440	5180	2090	806	594	476
10	333	1660	4880	2620	2480	1970	7700	4910	2230	781	601	464
11	334	1490	6970	2310	2350	1770	9650	4600	2460	776	587	462
12	329	1410	8150	2170	2210	1620	11700	4040	2510	770	564	469
13	330	1340	6830	2070	2090	1520	10200	3580	2450	762	553	470
14	328	1200	5710	1970	1990	1520	7980	3160	2200	780	541	470
15	327	1070	5320	1870	1900	1990	6640	2840	2110	830	559	469
16	325	1050	4830	1790	1800	2830	6030	2600	2170	853	592	466
17	334	1110	4420	1700	1700	3220	5570	2370	1970	924	608	466
18	347	1230	4920	1630	1610	3830	5230	2190	1760	1020	595	456
19	401	1700	4590	1670	1550	3900	4900	2040	1580	923	564	456
20	423	2510	4740	2990	1530	3630	4420	2110	1450	881	538	451
21	508	3260	6980	8120	1520	3480	4040	2390	1350	904	522	450
22	532	6300	8460	9310	1490	3610	3890	2510	1410	1010	502	449
23	528	7470	8140	7430	1450	6990	3960	2360	1650	1000	510	444
24	490	5360	7310	6220	1380	10000	4110	2130	1780	986	508	448
25	441	3940	6310	7840	1320	8020	4680	1920	1500	938	517	440
26	414	3030	5490	11200	1260	6110	5450	1790	1340	876	519	427
27	393	2500	5130	12000	1220	4940	7100	1690	1250	822	510	419
28	377	3080	5220	10000	1190	4150	7250	1640	1220	812	503	412
29	385	3420	5840	8420	---	3580	6370	1730	1200	826	486	408
30	493	3260	5570	7380	---	3190	5720	1840	1140	907	467	406
31	736	---	4930	6240	---	2900	---	2340	---	893	450	---
TOTAL	12393	71250	159300	150320	65240	104220	165680	100940	66750	27691	17794	13610
MEAN	400	2375	5139	4849	2330	3362	5523	3256	2225	893	574	454
MAX	736	7470	8460	12000	5380	10000	11700	5230	4970	1070	834	493
MIN	325	1050	2070	1630	1190	1180	2890	1640	1140	762	450	406
AC-FT	24580	141300	316000	298200	129400	206700	328600	200200	132400	54930	35290	27000
CFSM	.31	1.84	3.97	3.75	1.80	2.60	4.27	2.52	1.72	.69	.44	.35
IN.	.36	2.05	4.58	4.32	1.88	3.00	4.76	2.90	1.92	.80	.51	.39

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1952 - 1993, BY WATER YEAR (WY)

	MEAN	1241	5183	8461	9342	8322	6407	4499	2083	1181	604	403	540
MAX	3117	12770	17710	19050	16380	12920	9130	4202	2456	1295	838	1879	
(WY)	1956	1956	1978	1971	1961	1972	1991	1984	1968	1968	1968	1978	
MIN	196	376	1273	1360	1711	2314	2025	1131	528	350	223	199	
(WY)	1953	1953	1977	1977	1977	1992	1977	1989	1992	1992	1967	1952	

SUMMARY STATISTICS

	FOR 1992 CALENDAR YEAR	FOR 1993 WATER YEAR	WATER YEARS 1952 - 1993
ANNUAL TOTAL	904231	955188	
ANNUAL MEAN	2471	2617	4013
HIGHEST ANNUAL MEAN			6064
LOWEST ANNUAL MEAN			1646
HIGHEST DAILY MEAN	24600	Jan 31	52200
LOWEST DAILY MEAN	182	Aug 31	166
ANNUAL SEVEN-DAY MINIMUM	187	Aug 27	169
ANNUAL RUNOFF (AC-FT)	1794000	1895000	2907000
ANNUAL RUNOFF (CFSM)	1.91	2.02	3.10
ANNUAL RUNOFF (INCHES)	25.99	27.46	42.14
10 PERCENT EXCEEDS	5980	5770	10300
50 PERCENT EXCEEDS	1270	1840	1940
90 PERCENT EXCEEDS	245	449	367

CHEHALIS RIVER BASIN
12031000 CHEHALIS RIVER AT PORTER, WA
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 TEMPERATURE: July 1959 to September 1960, October 1961 to July 1972.

SUSPENDED SEDIMENT: October 1961 to September 1971.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DATE	TIME	DIS-CHARGE, INST. (CUBIC FEET PER SECOND)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH (STAND- ARD UNITS)	TEMPER- ATURE WATER (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)
NOV 19...	0930	1750	100	7.5	9.0	3.9	10.8	93	K660	140
JAN 29...	1025	8440	67	7.2	7.0	6.1	12.1	98	67	46
MAR 24...	0915	10400	64	7.3	8.0	32	10.9	92	160	200
MAY 26...	0930	1800	89	7.4	14.5	1.0	9.1	89	K16	K10
JUL 21...	1020	897	98	7.9	14.5	0.6	9.4	92	38	K19
SEP 20...	1330	453	110	7.9	14.0	0.5	10.4	101	K6	K15

DATE	HARD- NESS AS CACO3	HARD NESS, NONCAR- BONATE (MG/L AS CACO3)	CALCIUM, DIS- SOLVED (MG/L AS CA)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG)	SODIUM, DIS- SOLVED (MG/L AS NA)	SODIUM PERCENT	SODIUM AD- SORP- TION RATIO	POTAS- SIUM, DIS- SOLVED (MG/L AS K)	ALKA- LINITY, DIS IT, FIELD (MG/L AS CACO3)	BICAR- BONATE, DIS IT, FIELD (MG/L AS HCO3)
NOV 19...	28	4	7.0	2.5	7.2	35	0.6	0.8	24	29
JAN 29...	20	1	5.1	1.7	4.7	33	0.5	0.5	19 *	23 *
MAR 24...	18	2	4.6	1.6	4.5	34	0.5	0.6	16 *	20 *
MAY 26...	30	0	7.6	2.6	5.5	28	0.4	0.6	30	36
JUL 21...	34	0	8.9	2.9	6.1	27	0.5	0.8	35	43
SEP 20...	38	0	9.5	3.4	6.2	26	0.4	0.9	38	47

DATE	CAR- BONATE, DIS IT, FIELD (MG/L AS CO3)	SULFATE, DIS- SOLVED (MG/L AS SO4)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	FLUO- RIDE, DIS- SOLVED (MG/L AS F)	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, NITRITE DIS- SOLVED (MG/L AS N)
NOV 19...	0	9.2	5.7	<0.1	15	84	68	0.11	397	--
JAN 29...	0 *	5.5	3.9	<0.1	16	47	53	0.06	1070	0.02
MAR 24...	0 *	4.4	3.3	<0.1	13	51	46	0.07	1430	<0.01
MAY 26...	0	4.0	4.4	<0.1	17	64	62	0.09	311	<0.01
JUL 21...	0	3.2	5.0	<0.1	17	75	68	0.10	182	0.01
SEP 20...	0	3.4	7.0	0.1	18	75	74	0.10	91.7	<0.01

CHEHALIS RIVER BASIN

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12031000 CHEHALIS RIVER AT PORTER, WA--Continued

WATER-QUALITY RECORDS

WATER-QUALITY DATA, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DATE	NITRO- GEN, NO ₂ +NO ₃ , 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)	BARIUM, DIS- SOLVED (UG/L AS BA)	COBALT, DIS- SOLVED (UG/L AS CO)	IRON, DIS- SOLVED (UG/L AS FE)
NOV 19...	--	0.01	0.3	0.04	0.03	0.02	40	4	<3	180
JAN 29...	0.94	0.03	<0.2	<0.01	0.04	0.02	--	--	--	--
MAR 24 ..	0.82	0.02	0.4	0.10	<0.01	0.01	--	4	<3	190
MAY 26...	0.58	0.04	<0.2	0.03	0.02	0.02	20	5	<3	290
JUL 21...	0.62	0.02	<0.2	0.04	0.04	0.03	<10	5	<3	230
SEP 20...	0.58	0.03	0.2	0.05	0.03	0.03	--	--	--	--

DATE	LITHIUM, DIS- SOLVED (UG/L AS LI)	MANGA- NESE, DIS- SOLVED (UG/L AS MN)	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)	SEDI- MENT, SUS- PENDE (MG/L)	SEDI- MENT, DIS- CHARGE, SUS- PENDE (T/DAY)
NOV 19...	<4	7	<10	<1	<1	<1	42	<6	14	66
JAN 29...	--	--	--	--	--	--	--	--	24	547
MAR 24...	<4	12	<10	<1	<1	<1	31	<6	79	2220
MAY 26...	<4	12	<10	<1	<1	<1	46	<6	6	29
JUL 21...	<4	9	<10	<1	<1	<1	50	<6	4	9.7
SEP 20...	--	--	--	--	--	--	--	--	3	3.7

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

* - Whole water sample rather than filtered

CHEHALIS RIVER BASIN

12035000 SATSOP RIVER NEAR SATSOP, WA

LOCATION.--Lat 47°00'03", long 123°29'37", in NE 1/4 SE 1/4 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 sea level. Prior to Mar. 19, 1938, nonrecording gage at site 60 ft upstream at datum 20.9 ft higher.

REMARKS.--Records good. No regulation or diversion upstream from station. Chemical analyses July 1960 to September 1971, October 1974 to September 1975, October 1976 to June 1980; sediment records November 1961 to June 1965 (partial-record station). U.S. Geological Survey satellite telemeter at station.

AVERAGE DISCHARGE.--64 years, 2,002 ft³/s, 90.93 in/yr, 1,450,000 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 discharge, 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)
Jan. 25	1300	*23,500	*32.81	No other peak greater than base discharge.			
Minimum discharge, 226 ft ³ /s Sept. 29, 30.							

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	308	2340	2420	1690	2370	659	1610	2850	1060	622	448	311
2	300	2450	2000	1550	2070	669	1580	2710	1090	607	427	309
3	294	1580	1700	1530	1860	738	1760	2690	1030	592	411	304
4	281	1380	1510	1580	1700	3870	1820	2720	980	579	397	304
5	273	1200	1380	1440	1600	4520	1680	2350	938	568	388	307
6	266	1020	1310	1330	1520	3050	1650	2240	886	555	383	298
7	259	2740	1250	1270	1450	2170	1700	2130	851	545	383	296
8	257	2170	1520	1220	1380	1710	2110	2490	810	533	380	290
9	254	1500	2440	1160	1320	1450	3150	2220	1060	525	381	289
10	250	1150	2360	1100	1280	1280	4080	2030	1500	519	386	284
11	244	1500	2540	1050	1210	1150	3580	1800	1240	510	373	279
12	244	1670	2510	1010	1130	1060	2890	1610	1130	505	366	277
13	250	1360	2190	988	1070	1000	2570	1470	1040	495	361	277
14	247	1140	2570	962	1010	1010	2330	1350	1010	501	361	277
15	240	1000	2510	932	982	1190	2230	1260	1180	483	367	276
16	241	1090	2140	910	936	1080	2260	1180	1090	479	368	268
17	252	1200	2000	883	894	1520	2520	1100	1000	487	362	264
18	264	1190	1780	864	865	2200	2850	1040	937	461	354	264
19	534	1950	1690	950	846	1720	2500	1010	882	448	351	264
20	1200	1920	2290	1910	828	1740	2190	1120	836	468	343	264
21	1220	3070	2880	3420	810	1900	2030	1230	800	467	339	260
22	1070	5030	2990	2890	793	3970	1940	1340	895	489	333	251
23	856	3380	3250	2300	762	9930	2380	1220	849	474	353	251
24	683	2550	2990	2700	736	5470	3980	1100	778	445	369	251
25	575	2030	2640	17500	712	3680	4770	1010	744	431	345	251
26	498	1700	2450	9670	686	2870	5560	971	712	419	336	248
27	452	1860	2230	5880	668	2400	5280	922	698	414	330	238
28	425	2020	2290	4650	657	2070	3770	897	694	431	325	238
29	445	1700	2300	4670	---	1850	3690	959	662	474	323	234
30	1030	2290	2090	3470	---	1730	3300	946	639	556	318	231
31	1780	---	1870	2820	---	1610	---	1020	---	488	315	---
TOTAL	15492	57180	68090	84299	32145	71266	83760	48985	28021	15570	11276	8155
MEAN	500	1906	2196	2719	1148	2299	2792	1580	934	502	364	272
MAX	1780	5030	3250	17500	2370	9930	5560	2850	1500	622	448	311
MIN	240	1000	1250	864	657	659	1580	897	639	414	315	231
AC-FT	30730	113400	135100	167200	63760	141400	166100	97160	55580	30880	22370	16180
CFSM	1.67	6.37	7.35	9.09	3.84	7.69	9.34	5.28	3.12	1.68	1.22	.91
IN.	1.93	7.11	8.47	10.49	4.00	8.87	10.42	6.09	3.49	1.94	1.40	1.01

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1929 - 1993, BY WATER YEAR (WY)

	1126	2949	4095	4080	3781	2954	2095	1141	693	452	328	434
MEAN	1126	2949	4095	4080	3781	2954	2095	1141	693	452	328	434
MAX	3814	6887	9296	9598	8050	6229	4038	2696	1393	1133	574	1791
(WY)	1976	1991	1934	1953	1961	1972	1937	1948	1931	1983	1964	1978
MIN	201	268	1361	1127	1148	1155	898	674	407	287	225	208
(WY)	1988	1937	1986	1949	1993	1992	1942	1931	1992	1951	1944	1938

SUMMARY STATISTICS	FOR 1992 CALENDAR YEAR	FOR 1993 WATER YEAR	WATER YEARS 1929 - 1993
ANNUAL TOTAL	553947	524239	
ANNUAL MEAN	1514	1436	2002
HIGHEST ANNUAL MEAN			2908
LOWEST ANNUAL MEAN			1199
HIGHEST DAILY MEAN	16900	Jan 29	45900
LOWEST DAILY MEAN	214	Sep 5	182
ANNUAL SEVEN-DAY MINIMUM	218	Sep 1	190
ANNUAL RUNOFF (AC-FT)	1099000	1040000	1451000
ANNUAL RUNOFF (CFSM)	5.06	4.80	6.70
ANNUAL RUNOFF (INCHES)	68.92	65.22	91.00
10 PERCENT EXCEEDS	2910	2830	4680
50 PERCENT EXCEEDS	808	1060	1140
90 PERCENT EXCEEDS	240	287	284

e Estimated

CHEHALIS RIVER BASIN

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12035380 WYNOOCHEE LAKE NEAR GRIDDALE, WA

LOCATION.--Lat 47°23'08", long 123°36'16", in NE 1/4 NW 1/4 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 Grisdale, 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 sea level (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. City of Aberdeen satellite telemeter at station.

COOPERATION.--Daily elevations at 2400 hours, and capacity table furnished by Corps of Engineers, and by the City of Aberdeen..

EXTREMES FOR PERIOD OF RECORD.--Maximum contents observed, 70,078 acre-ft July 13, 1983, elevation, 800.60 ft; minimum contents observed, 4,227 acre-ft Oct. 19, 1992, elevation, 701.04 ft.

EXTREMES FOR CURRENT YEAR.--Maximum contents, 69,405 acre-ft May 6, elevation, 800.00 ft; minimum contents, 4,227 acre-ft Oct. 19, elevation, 701.04 ft.

MONTHEND ELEVATION AND CONTENTS AT 2400, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

Date	Elevation (feet)	Contents (acre-feet)	Change in contents (acre-feet)
Sept. 30.....	713.32	7,621	--
Oct. 31.....	724.06	11,533	+3,912
Nov. 30.....	734.45	16,276	+4,743
Dec. 31.....	745.66	22,629	+6,353
CAL YR 1992.....	--	--	-11,246
Jan. 31.....	757.07	30,306	+7,677
Feb. 28.....	762.57	34,392	+4,086
Mar. 31.....	785.28	53,952	+19,560
Apr. 30.....	797.89	67,054	+13,102
May 31.....	799.51	68,855	+1,801
June 30.....	796.99	66,065	-2,790
July 31.....	787.24	55,882	-10,183
Aug. 31.....	780.99	49,866	-6,016
Sep. 30.....	771.30	41,340	-8,526
WTR YR 1993.....	--	--	+33,719

CHEHALIS RIVER BASIN

12035400 WYNOOCHEE RIVER NEAR GRIDDALE, WA

LOCATION.--Lat 47°22'50", long 123°36'31", in NW 1/4 SW 1/4 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 Griddale, 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.--No estimated daily discharges. Records good except for those below 100 ft³/s, which are poor. 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 1969 to August 1972 due to dam construction. No diversion upstream from station. City of Aberdeen satellite telemeter at station.

AVERAGE DISCHARGE.--28 years, 513 ft³/s, 168.68 in/yr, 371,700 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 discharge, 0.9 ft³/s Sept. 10, 12, 1974, gage height, 0.06 ft.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 3,470 ft³/s Mar. 22, gage height, 4.63 ft; minimum discharge, 26 ft³/s Sept. 16; minimum daily discharge, 168 ft³/s Oct. 15, 18, July 30 to Aug. 2.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	200	1310	223	234	399	213	216	511	399	333	168	194
2	200	504	221	226	362	213	216	639	432	334	168	194
3	195	517	216	210	260	216	216	764	287	334	171	198
4	192	554	243	210	258	221	219	455	259	340	176	200
5	189	463	305	210	240	223	220	219	258	348	184	200
6	186	404	305	210	213	223	220	416	255	350	188	200
7	184	1020	305	210	216	223	220	842	247	350	203	198
8	178	602	309	210	216	223	643	800	264	351	203	197
9	173	461	309	210	218	225	929	503	553	361	203	197
10	173	374	309	210	213	226	863	670	435	346	203	206
11	172	630	283	209	213	226	751	484	313	335	203	213
12	169	461	252	207	213	224	375	557	313	335	203	213
13	169	391	218	207	213	211	221	571	313	335	200	213
14	169	389	221	207	213	212	221	497	310	335	200	211
15	168	333	223	207	214	213	220	443	430	335	200	210
16	171	301	223	207	215	212	220	359	429	342	200	211
17	172	317	223	206	215	212	557	284	281	348	200	213
18	168	376	223	204	214	213	762	266	304	348	200	213
19	174	612	226	206	213	213	306	372	322	348	200	213
20	189	492	226	209	213	215	226	671	322	348	200	210
21	194	756	226	210	214	332	227	913	318	348	200	207
22	189	1000	227	210	213	1760	303	666	301	348	199	206
23	190	562	230	210	213	1620	624	496	301	308	199	203
24	194	451	230	216	213	695	1280	316	305	223	199	203
25	196	359	231	750	213	394	2120	322	321	223	200	203
26	194	206	233	661	213	215	1960	423	335	203	199	203
27	191	213	233	665	213	213	1350	345	321	180	196	203
28	190	221	233	669	213	213	1050	290	305	172	194	203
29	192	224	233	586	---	213	931	370	321	175	194	203
30	290	222	233	459	---	213	892	386	334	168	194	203
31	1500	---	233	399	---	214	---	420	---	168	194	---
TOTAL	7111	14725	7605	9244	6436	10439	18560	15270	9888	9372	6041	6141
MEAN	229	491	245	298	230	337	619	493	330	302	195	205
MAX	1500	1310	309	750	399	1760	2120	913	553	361	203	213
MIN	168	206	216	204	213	211	216	219	247	168	168	194
AC-FT	14100	29210	15080	18340	12770	20710	36810	30290	19610	18590	11980	12180
MEAN†	293	571	348	423	304	655	839	522	283	137	97	61
CFSM†	7.09	13.8	8.44	10.2	7.35	15.9	20.3	12.6	6.85	3.31	2.35	1.49
IN.†	8.18	15.41	9.73	11.81	7.65	18.28	22.66	14.57	7.64	3.82	2.71	1.66
AC-FT†	18010	33950	21430	26020	16860	40270	49910	32090	16820	8410	5960	3650

CAL YR 1992 TOTAL 154229 MEAN 421 MAX 5110 MIN 162 AC-FT 305900 MEAN† 406 CFSM† 9.83 IN.† 133.79 AC-FT† 294700
WTR YR 1993 TOTAL 120832 MEAN 331 MAX 2120 MIN 168 AC-FT 239700 MEAN† 378 CFSM† 9.14 IN.† 124.12 AC-FT† 273400

† Adjusted for change in contents in Wynoochee Lake.

CHEHALIS RIVER BASIN

59

12035450 BIG CREEK NEAR GRIDDALE, WA

LOCATION.--Lat 47°22'28", long 123°38'08", in SE 1/4 SE 1/4 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. Prior to Oct. 1, 1990, at a site 300 ft upstream, at different datum.

REMARKS.--No estimated daily discharges. Records good except those above 1,000 ft³/s, which are fair. No regulation or diversion upstream from station. City of Aberdeen satellite telemeter at station.

AVERAGE DISCHARGE.--21 years, 111 ft³/s, 157.51 in/yr, 80,420 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 3,680 ft³/s Nov. 24, 1990, gage height, 7.44 ft, from rating curve extended above 1,000 ft³/s; minimum discharge, 7.2 ft³/s Oct. 14, 18-25, 27-29, 1987, Oct. 9, 1989.

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)
Jan. 24	2330	*2,580	*6.94	Mar. 4	0945	1,340	6.13

Minimum discharge, 9.7 ft³/s Sept. 30.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	21	239	130	71	124	28	65	148	60	29	22	13
2	20	176	102	65	109	28	68	151	68	28	20	13
3	18	118	85	63	98	69	80	148	60	26	19	12
4	17	125	75	58	91	620	75	135	55	25	19	12
5	16	99	69	54	91	231	67	115	51	25	18	12
6	16	97	64	51	90	147	72	117	47	24	17	12
7	15	263	62	48	84	104	72	142	44	23	17	12
8	14	140	89	46	78	82	168	167	42	23	17	12
9	14	107	107	44	74	71	214	131	109	22	17	12
10	14	89	88	41	72	64	181	129	106	22	16	11
11	13	177	84	39	66	57	162	109	79	21	16	11
12	13	133	81	37	61	52	128	95	68	21	15	11
13	13	102	81	35	56	49	111	85	60	21	15	11
14	12	84	192	34	52	52	98	77	63	20	15	11
15	12	75	124	33	48	57	119	71	75	20	15	11
16	12	86	97	32	45	51	131	65	66	19	15	11
17	12	88	83	31	43	128	200	61	59	20	14	11
18	17	82	72	30	41	134	187	57	54	19	14	11
19	144	168	74	40	40	88	143	56	50	19	14	11
20	139	127	100	168	38	123	115	61	46	19	14	10
21	132	255	105	143	36	185	119	119	44	18	13	10
22	121	224	144	93	34	528	165	105	45	18	14	10
23	98	142	151	75	33	427	262	84	42	18	22	10
24	70	110	137	422	31	200	379	71	39	17	15	10
25	56	90	114	1200	30	142	444	64	37	17	15	10
26	46	81	115	325	29	113	397	58	35	17	15	10
27	40	145	109	214	28	94	287	54	34	17	14	10
28	39	121	103	311	27	81	201	52	33	18	14	10
29	85	97	100	230	---	73	202	50	31	32	13	10
30	233	179	89	170	---	68	165	53	30	35	13	9.8
31	298	---	79	144	---	62	---	55	---	24	13	---
TOTAL	1770	4019	3105	4347	1649	4208	5077	2885	1632	677	491	329.8
MEAN	57.1	134	100	140	58.9	136	169	93.1	54.4	21.8	15.8	11.0
MAX	298	263	192	1200	528	620	444	167	109	35	22	13
MIN	12	75	62	30	27	28	65	50	30	17	13	9.8
AC-FT	3510	7970	6160	8620	3270	8350	10070	5720	3240	1340	974	654
CFSM	5.97	14.0	10.5	14.7	6.15	14.2	17.7	9.72	5.68	2.28	1.66	1.15
IN.	6.88	15.62	12.07	16.90	6.41	16.36	19.74	11.21	6.34	2.63	1.91	1.28

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1972 - 1993, BY WATER YEAR (WY)

	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993
MEAN	76.1	211	221	190	200	151	108	65.8	41.0	27.8	19.9	32.1										
MAX	240	458	445	353	379	313	171	120	80.7	85.7	76.2	104										
(WY)	1976	1991	1980	1992	1982	1974	1981	1984	1990	1983	1991	1978										
MIN	8.43	62.6	76.8	51.7	58.9	46.1	50.2	29.8	17.4	13.8	10.3	9.30										
(WY)	1988	1977	1986	1985	1993	1992	1973	1980	1980	1975	1985	1987										

SUMMARY STATISTICS	FOR 1992 CALENDAR YEAR	FOR 1993 WATER YEAR	WATER YEARS 1972 - 1993
ANNUAL TOTAL	33844.5	30189.8	
ANNUAL MEAN	92.5	82.7	111
HIGHEST ANNUAL MEAN			174
LOWEST ANNUAL MEAN			73.7
HIGHEST DAILY MEAN	1330	1200	2080
LOWEST DAILY MEAN	9.1	9.8	7.2
ANNUAL SEVEN-DAY MINIMUM	9.4	10	7.3
ANNUAL RUNOFF (AC-FT)	67130	59880	80650
ANNUAL RUNOFF (CFSM)	9.66	8.64	11.6
ANNUAL RUNOFF (INCHES)	131.56	117.35	158.06
10 PERCENT EXCEEDS	178	168	258
50 PERCENT EXCEEDS	40	60	57
90 PERCENT EXCEEDS	11	13	14

CHEHALIS RIVER BASIN

12036000 WYNOOCHEE RIVER ABOVE SAVE CREEK, NEAR ABERDEEN, WA

LOCATION.--Lat 47°17'57", long 123°39'07", in NE 1/4 NE 1/4 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 sea level (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 sea level (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.--No estimated daily discharges. 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. City of Aberdeen satellite telemeter at station.

AVERAGE DISCHARGE.--68 years, 820 ft³/s, 150.28 in/yr, 594,100 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 discharge, 57 ft³/s Sept. 3-5, 1972, gage height, 4.43 ft.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 5,350 ft³/s Mar. 22, gage height, 9.48 ft; minimum discharge, 219 ft³/s Oct. 12-18; minimum daily discharge, 219 ft³/s Oct. 15.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	277	1890	616	481	778	337	458	996	583	425	244	251
2	272	1000	537	458	717	337	474	1090	627	422	242	251
3	264	845	483	442	575	402	509	1190	487	420	242	253
4	259	870	468	425	544	1430	490	929	430	421	242	256
5	251	746	523	406	527	905	466	599	413	432	250	255
6	246	644	512	394	480	670	484	715	402	430	253	255
7	243	1630	509	387	466	556	474	1240	388	425	270	255
8	235	1030	633	380	451	497	990	1270	389	424	271	255
9	228	763	687	371	444	461	1520	908	751	432	271	254
10	226	628	623	363	432	436	1430	993	730	421	269	260
11	225	1090	601	357	416	418	1260	827	541	404	267	267
12	222	861	555	352	403	406	838	818	499	400	266	267
13	222	680	503	348	393	384	605	825	480	401	263	267
14	221	634	756	343	386	406	551	725	487	399	264	267
15	219	564	606	341	378	410	590	664	630	396	264	267
16	221	556	542	336	372	397	608	572	606	403	264	266
17	224	560	511	333	366	577	994	489	474	412	262	268
18	237	600	472	329	362	604	1360	451	455	408	259	267
19	495	1040	504	368	361	504	773	502	467	406	259	267
20	501	865	610	661	357	566	608	864	458	413	259	265
21	531	1350	645	659	354	789	602	1180	452	405	258	259
22	464	1670	718	523	348	2560	712	942	445	408	263	259
23	416	1030	736	468	344	2940	1230	734	426	387	284	258
24	362	786	688	1040	340	1390	2120	531	423	295	266	258
25	333	673	617	3460	338	884	2910	498	434	291	262	257
26	314	468	611	1700	334	623	2760	594	443	277	259	255
27	298	612	589	1370	334	543	2160	517	435	259	257	255
28	295	562	585	1490	329	503	1610	451	410	249	255	255
29	354	515	575	1310	---	476	1560	521	415	272	254	255
30	645	740	539	997	---	465	1400	545	430	269	253	255
31	1930	---	507	840	---	444	---	588	---	250	251	---
TOTAL	11230	25902	18061	21732	11929	22320	32546	23768	14610	11656	8043	7779
MEAN	362	863	583	701	426	720	1085	767	487	376	259	259
MAX	1930	1890	756	3460	778	2940	2910	1270	751	432	284	268
MIN	219	468	468	329	329	337	458	451	388	249	242	251
AC-FT	22270	51380	35820	43110	23660	44270	64550	47140	28980	23120	15950	15430
MEAN†	426	943	686	826	500	1038	1305	796	440	210	161	116
CFSM†	5.74	12.7	9.25	11.1	6.74	14.0	17.6	10.7	5.94	2.84	2.18	1.57
IN.†	6.62	14.20	10.67	12.85	7.02	16.15	19.65	12.38	6.63	3.27	2.51	1.75
AC-FT†	26180	56120	42170	50790	27750	63830	77650	48940	26190	12940	9930	6900

CAL YR 1992 TOTAL 249294 MEAN 681 MAX 7970 MIN 215 AC-FT 494500 MEAN† 666 CFSM† 8.99 IN.† 122.29 AC-FT† 483300
WTR YR 1993 TOTAL 209576 MEAN 574 MAX 3460 MIN 219 AC-FT 415700 MEAN† 621 CFSM† 8.38 IN.† 113.71 AC-FT† 449400

† Adjusted for change in contents in Wynoochee Lake.

CHEHALIS RIVER BASIN

61

12036400 SCHAFER CREEK NEAR GRIDDALE, WA

LOCATION.--47°12'16", long 123°36'50", in NE 1/4 SW 1/4 sec.24, T.20 N., R.8 W., Grays Harbor County, Hydrologic Unit 17100104, Olympic National Forest, on left bank, 9.1 mi south of Grisdale, and 1.0 mi upstream from mouth.

DRAINAGE AREA.--12.1 mi².

PERIOD OF RECORD.--October 1986 to current year.

GAGE.--Water-stage recorder and crest-stage gage. Elevation of gage is 280 ft, from topographic map.

REMARKS.--No estimated daily discharges. Records good except for the periods Dec. 7-31, Jan. 25 to Feb. 10, which are fair. No regulation or diversion upstream from station.

AVERAGE DISCHARGE.--7 years, 71.5 ft³/s, 80.25 in/yr, 51,800 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 2,340 ft³/s Nov. 24, 1990, gage height, 10.08 ft, from rating curve extended above 550 ft³/s; minimum discharge, 2.9 ft³/s Sept. 28, 30, Oct. 15, 20, 28, 29, 1987, gage height, 3.23 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)
Jan. 25	0530	*2,120	9.75	No other peak greater than base discharge.			
Jan. 25	0530	(a)	*9.85				

Minimum discharge, 4.5 ft³/s Oct. 9-12.

(a) From crest-stage gage.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	5.1	135	107	67	60	17	49	122	38	19	11	6.1
2	5.3	153	87	59	50	18	47	109	39	18	10	6.1
3	5.4	91	70	63	44	23	58	117	35	18	9.2	5.8
4	5.2	104	61	59	40	195	53	97	33	17	8.8	5.8
5	4.9	72	55	51	37	191	51	84	31	17	8.0	5.8
6	4.8	65	54	46	35	130	61	88	29	16	8.0	5.8
7	4.8	255	54	43	33	90	56	91	27	16	8.0	5.8
8	4.8	150	126	41	32	68	89	96	25	16	8.0	5.8
9	4.5	92	145	38	32	55	108	83	67	15	8.6	5.8
10	4.5	67	129	36	31	46	117	77	54	15	9.3	5.8
11	4.5	134	148	34	29	40	105	64	48	15	8.9	5.8
12	4.5	105	132	33	27	36	85	56	43	14	8.1	5.8
13	5.3	82	111	33	26	33	88	48	38	13	8.0	5.1
14	5.0	66	158	31	25	42	74	43	45	14	8.5	5.1
15	4.8	57	117	31	24	45	80	38	50	13	10	5.1
16	4.9	82	98	29	22	39	75	35	40	14	9.3	5.1
17	6.0	73	93	28	21	66	99	33	36	14	8.8	5.1
18	8.5	68	82	27	21	70	100	30	34	12	8.0	5.1
19	53	134	112	47	21	61	85	31	32	12	7.2	5.1
20	48	103	174	132	21	82	74	36	29	15	7.2	5.1
21	51	256	185	160	20	89	72	48	27	13	7.2	5.1
22	42	270	193	123	19	351	67	44	37	15	7.0	5.1
23	33	161	178	94	19	417	95	35	29	13	11	5.1
24	26	114	148	329	18	209	168	32	25	12	8.6	5.1
25	22	86	116	1120	18	132	195	30	24	11	7.2	5.1
26	19	72	110	325	17	95	227	29	22	10	7.2	5.1
27	17	98	94	180	17	74	198	27	23	10	6.8	4.8
28	16	78	110	154	16	60	154	27	22	12	6.8	4.8
29	26	70	103	125	---	52	165	30	20	17	6.8	4.8
30	57	132	88	97	---	50	128	33	19	16	6.1	4.8
31	79	---	76	77	---	45	---	37	---	13	6.1	---
TOTAL	581.8	3425	3514	3712	775	2921	3023	1750	1021	445	253.7	160.8
MEAN	18.8	114	113	120	27.7	94.2	101	56.5	34.0	14.4	8.18	5.36
MAX	79	270	193	1120	60	417	227	122	67	19	11	6.1
MIN	4.5	57	54	27	16	17	47	27	19	10	6.1	4.8
AC-FT	1150	6790	6970	7360	1540	5790	6000	3470	2030	883	503	319
CFSM	1.55	9.44	9.37	9.90	2.29	7.79	8.33	4.67	2.81	1.19	.68	.44
IN.	1.79	10.53	10.80	11.41	2.38	8.98	9.29	5.38	3.14	1.37	.78	.49

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1987 - 1993, BY WATER YEAR (WY)

	1987	1988	1989	1990	1991	1992	1993
MEAN	24.3	164	129	160	128	91.7	78.6
MAX	45.6	285	178	230	227	125	110
(WY)	1989	1991	1991	1992	1991	1987	1991
MIN	4.16	26.4	91.0	83.6	27.7	28.5	30.7
(WY)	1988	1988	1989	1988	1993	1992	1990

SUMMARY STATISTICS

FOR 1992 CALENDAR YEAR

FOR 1993 WATER YEAR

WATER YEARS 1987 - 1993

ANNUAL TOTAL	22825.5	21582.3	71.5
ANNUAL MEAN	62.4	59.1	97.8
HIGHEST ANNUAL MEAN			54.8
LOWEST ANNUAL MEAN			1840
HIGHEST DAILY MEAN	892	Jan 29	Nov 24 1990
LOWEST DAILY MEAN	3.6	Aug 27	Oct 28 1987
ANNUAL SEVEN-DAY MINIMUM	3.7	Aug 24	Sep 24 1987
ANNUAL RUNOFF (AC-FT)	45270	42810	51790
ANNUAL RUNOFF (CFSM)	5.15	4.89	5.91
ANNUAL RUNOFF (INCHES)	70.17	66.35	80.27
10 PERCENT EXCEEDS	151	132	176
50 PERCENT EXCEEDS	22	36	32
90 PERCENT EXCEEDS	4.5	5.8	5.8

CHEHALIS RIVER BASIN

12037400 WYNOOCHEE RIVER ABOVE BLACK CREEK, NEAR MONTESANO, WA

LOCATION.--Lat 47°00'42", long 123°39'15", in SE 1/4 SE 1/4 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.

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.--No estimated daily discharges. Records good. 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. Sediment records October 1961 to June 1965. Water temperatures October 1969 to September 1986. City of Aberdeen satellite telemeter at station.

AVERAGE DISCHARGE.--37 years, 1,250 ft³/s, 905,600 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, 11,000 ft³/s Jan. 25, gage height, 12.18 ft; minimum discharge, 110 ft³/s Oct. 15.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	168	2650	1270	890	1360	324	749	1850	736	424	184	152
2	170	2050	1050	809	1230	331	725	1690	826	418	174	152
3	168	1390	893	789	1040	378	793	1730	745	408	168	150
4	159	1260	783	802	909	1500	812	1710	591	401	167	150
5	152	1210	761	722	848	1950	754	1220	536	401	167	152
6	147	975	756	649	777	1360	754	1110	502	402	167	152
7	142	2260	727	614	705	1030	773	1500	499	401	173	151
8	139	2020	925	592	659	841	995	1840	474	392	184	149
9	132	1410	1340	555	634	725	2100	1550	665	389	186	148
10	125	1090	1270	525	608	646	2210	1320	1160	391	189	146
11	121	1340	1360	500	568	586	2060	1330	876	380	182	150
12	116	1590	1330	475	529	543	1700	1100	735	370	178	155
13	124	1170	1140	459	506	509	1260	1100	664	364	177	154
14	117	1020	1360	445	483	517	1110	998	647	359	175	152
15	113	920	1300	432	465	618	1080	913	797	353	182	152
16	117	932	1100	417	443	549	1110	806	791	355	180	151
17	131	995	1070	401	423	752	1280	689	716	363	176	150
18	145	1010	953	389	410	1000	2010	596	569	359	171	152
19	438	1560	922	450	403	859	1570	580	564	353	168	152
20	878	1650	1300	889	396	896	1170	831	547	372	167	151
21	822	2100	1620	1510	388	1020	1050	1220	524	367	167	148
22	666	3310	1610	1270	379	2470	1030	1260	584	384	166	146
23	564	2210	1720	1010	365	6590	1400	990	538	373	188	145
24	464	1550	1530	1360	353	3240	2550	775	489	318	185	143
25	392	1280	1320	8030	343	2040	3540	613	473	259	170	143
26	335	982	1250	4670	334	1440	4030	629	473	241	167	142
27	298	988	1170	3030	327	1110	3720	631	474	222	167	140
28	274	1020	1190	2580	320	942	2570	561	449	208	164	140
29	300	893	1210	2570	---	840	2560	568	422	221	160	137
30	675	1210	1100	1950	---	779	2220	635	424	243	157	137
31	1660	---	996	1570	---	732	---	723	---	206	155	---
TOTAL	10252	44045	36326	41354	16205	37117	49685	33068	18490	10697	5361	4442
MEAN	331	1468	1172	1334	579	1197	1656	1067	616	345	173	148
MAX	1660	3310	1720	8030	1360	6590	4030	1850	1160	424	189	155
MIN	113	893	727	389	320	324	725	561	422	206	155	137
AC-FT	20330	87360	72050	82030	32140	73620	98550	65590	36670	21220	10630	8810

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1957 - 1993, BY WATER YEAR (WY)

	MEAN	853	2111	2593	2428	2250	1646	1150	742	483	293	190	317
MAX	2967	4951	4984	4024	4632	3925	2011	1322	1030	766	399	1287	
(WY)	1976	1991	1967	1968	1961	1972	1959	1984	1974	1974	1991	1978	
MIN	143	416	788	602	579	539	497	346	193	78.9	17.0	25.5	
(WY)	1988	1988	1986	1985	1993	1992	1973	1980	1963	1970	1967	1965	

SUMMARY STATISTICS

FOR 1992 CALENDAR YEAR

FOR 1993 WATER YEAR

WATER YEARS 1957 - 1993

ANNUAL TOTAL	350715	307042	1250	
ANNUAL MEAN	958	841	1871	1974
HIGHEST ANNUAL MEAN			749	1977
LOWEST ANNUAL MEAN			20600	Jan 19 1968
HIGHEST DAILY MEAN	11500	Jan 31		
LOWEST DAILY MEAN	108	Sep 22		
ANNUAL SEVEN-DAY MINIMUM	119	Oct 10	3.0	Aug 28 1967
ANNUAL RUNOFF (AC-FT)	695600	609000	3.2	Aug 25 1967
10 PERCENT EXCEEDS	1790	1670	905400	
50 PERCENT EXCEEDS	518	629	2960	
90 PERCENT EXCEEDS	178	152	700	
			167	

LOCATION.--Lat 47°27'28", long 123°53'17", in SW 1/4 NE 1/4 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.

PERIOD OF RECORD.--October 1911 to current year. Monthly discharge for some months during the 1923-25, 1933 water years, published in WSP 1316.

GAGE.--Water-stage recorder. Datum of gage is 184.60 ft above sea level (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.

AVERAGE DISCHARGE.--82 years (1912-93 water years), 2,830 ft³/s, 145.57 in/yr, 2,050,000 acre-ft/yr.

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

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Jan. 25	1700	*10,100	*8.56				
Minimum daily discharge, 350 ft ³ /s Sept. 25.							

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	975	4600	3450	1730	2870	854	2020	4450	3620	1400	1140	523
2	896	4720	3040	1590	2590	851	2010	4350	3500	1340	1070	513
3	824	3970	2650	1520	2380	919	2060	4190	3200	1290	1000	499
4	760	3480	2340	1470	2240	2560	2080	4040	2940	1250	948	492
5	705	3160	2110	1360	2210	4600	1990	3670	2740	1200	895	486
6	660	2750	1930	1270	2230	4300	1890	3510	2620	1170	853	471
7	625	3940	1800	1200	2220	3590	1850	3480	2530	1130	816	472
8	585	4050	1880	1140	2200	3030	2370	3770	2410	1090	781	464
9	554	3460	2130	1080	2160	2620	3970	3700	2620	1070	755	458
10	528	2930	2120	1030	2190	2310	4490	3640	3660	1040	738	451
11	508	3090	2070	979	2140	2060	4260	4120	3460	1000	709	440
12	493	3180	1970	934	2000	1860	3730	4310	3080	975	680	433
13	490	2860	1870	897	1860	1700	3250	4650	2770	942	656	428
14	480	2540	2310	868	1730	1630	2900	4230	2570	927	640	419
15	463	2290	2600	841	1610	1800	2700	3790	2710	917	621	414
16	447	2270	2450	815	1500	1820	2840	3400	2720	916	614	405
17	438	2230	2290	792	1400	2090	3370	3200	2600	922	601	401
18	445	2100	2060	767	1320	3220	4200	3200	2490	904	591	397
19	742	2470	1960	785	1250	3180	4020	3360	2390	880	581	387
20	1620	2720	2190	1000	1190	3070	3500	3630	2240	921	569	381
21	2340	2980	2340	1540	1150	3370	3250	4500	2110	983	560	e370
22	2390	4080	2410	1650	1100	4640	3600	5210	2040	980	560	e365
23	2500	3940	2560	1560	1050	9180	3870	4740	1960	966	625	e360
24	2260	3340	2550	1820	1010	7560	4470	4160	1840	940	693	e355
25	1950	2830	2400	8370	962	5500	5840	3830	1740	899	685	e350
26	1690	2460	2280	8560	924	4200	7620	3520	1700	864	656	e352
27	1480	3090	2180	6580	893	3400	8270	3330	1680	833	625	e353
28	1340	3770	2070	5190	864	2870	6750	3230	1630	830	599	e354
29	1320	3320	2070	4510	---	2510	5790	3350	1540	927	578	e355
30	2050	3420	2010	3760	---	2260	5080	3360	1460	1180	556	e355
31	3430	---	1860	3240	---	2080	---	3480	---	1210	540	---
TOTAL	35988	96040	69950	68848	47243	95634	114040	119400	74570	31896	21935	12511
MEAN	1161	3201	2256	2221	1687	3085	3801	3852	2486	1029	708	417
MAX	3430	4720	3450	8560	2870	9180	8270	5210	3660	1400	1140	523
MIN	438	2100	1800	767	864	851	1850	3200	1460	830	540	

MEAN	2304	4136	4800	4191	3779	2881	2656	2841	2753	1804	932	1013
MAX	6703	11220	10390	11390	8244	7752	4484	4575	5116	3658	1975	3573
(WY)	1922	1991	1980	1953	1961	1972	1943	1948	1956	1974	1971	1920
MIN	266	410	1676	1177	673	1162	1182	1635	982	585	422	368
(WY)	1988	1937	1986	1937	1929	1912	1912	1920	1992	1926	1944	1987

ANNUAL TOTAL	848173		788055				
ANNUAL MEAN	2317		2159			2834	
HIGHEST ANNUAL MEAN						3981	1974
LOWEST ANNUAL MEAN						1785	1930
HIGHEST DAILY MEAN	23800	Jan 31	9180	Mar 23	41200		Nov 4 1955
LOWEST DAILY MEAN	321	Aug 28	350	Sep 25	250		Oct 29 1987
ANNUAL SEVEN-DAY MINIMUM	327	Sep 1	353	Sep 24	254		Oct 24 1987
ANNUAL RUNOFF (AC-FT)	1682000		1563000		2053000		
ANNUAL RUNOFF (CFSM)	8.78		8.18		10.7		
ANNUAL RUNOFF (INCHES)	119.52		111.04		145.83		
10 PERCENT EXCEEDS	4060		4060		5400		
50 PERCENT EXCEEDS	1580		1990		2160		
90 PERCENT EXCEEDS	437		511		660		

e Estimated

LOCATION.--Lat 47°32'17", long 124°18'52", in NE 1/4 SW 1/4 sec.36, T.24 N., R.13 W., Jefferson County, Hydrologic Unit 17100102, Quinault Indian Reservation, on right bank 2.4 mi downstream from mouth of Clearwater River, 0.8 mi east of Queets, and at mile 4.6.

WATER-DISCHARGE RECORDS

REVISED RECORDS.--WSP 1316: 1931-49 (m).

REMARKS.--No estimated daily discharges. Water-discharge records good. No regulation or diversion upstream from station. U.S. Geological Survey satellite telemeter at station.

AVERAGE DISCHARGE.--38 years (water years 1931-49, 1975-93), 4,241 ft³/s, 129.42 in/yr, 3,070,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 130,400 ft³/s Jan. 22, 1935, gage height, 27.0 ft, from floodmarks, present datum; minimum discharge, 300 ft³/s Oct. 21-25, 29, 1987.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 42,000 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Jan. 25	0600	*88,200	*23.10	No other peak greater than base discharge.			
Minimum discharge, 363 ft ³ /s Sept. 24, 27.							

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1150	8200	5420	2670	3510	919	2570	5750	4410	1350	1000	539
2	1090	7230	4070	2380	3120	1010	2530	6540	4230	1280	941	534
3	1020	4690	3330	2460	2850	1670	2760	5750	3300	1220	920	535
4	931	5270	2870	2420	2710	20700	2540	5200	2870	1190	879	531
5	846	4040	2550	2070	2890	10700	2190	4290	2600	1160	849	530
6	791	3470	2320	1870	2800	6050	2060	5190	2480	1120	831	525
7	751	13600	2170	1740	2550	4100	2100	5610	2480	1070	795	518
8	717	7320	3790	1650	2370	3240	7650	7730	2280	1050	755	510
9	692	5170	4980	1540	2250	2710	9210	5930	4880	1050	756	497
10	667	3980	3720	1440	2450	2340	7530	5420	5880	998	816	483
11	656	9350	3640	1350	2090	2060	9970	5100	4030	983	736	475
12	658	6030	3360	1260	1870	1870	6220	4630	3260	957	696	459
13	771	4360	3030	1230	1730	1720	5100	4470	2790	914	673	442
14	705	3560	9150	1190	1620	1800	4420	3560	2850	936	653	431
15	637	3060	5440	1150	1520	2800	4510	3120	3880	895	645	423
16	609	3760	4110	1110	1420	2000	4950	2780	3130	899	625	414
17	602	3250	3900	1060	1340	4570	6850	2670	2690	955	617	407
18	897	2900	3220	1020	1270	6580	6510	2700	2490	899	605	400
19	4050	8220	5660	1230	1230	3650	5040	2770	2310	851	602	392
20	7310	6000	8690	3250	1200	4650	4000	3030	2070	1010	601	387
21	5320	6760	6660	4290	1160	7370	4770	5940	1950	1090	601	380
22	5000	8230	7300	2910	1120	18900	5950	5840	2040	965	599	374
23	5040	5510	7200	2260	1070	19700	6540	4000	1910	1070	1410	369
24	4050	4200	6110	10400	1020	9640	8560	3310	1670	994	1090	370
25	2820	3430	4730	52200	981	6120	13300	3040	1590	912	817	376
26	2240	2950	4600	14200	947	4540	15800	2710	1630	874	703	374
27	1890	7390	4240	8660	923	3630	13500	2610	1640	855	645	372
28	1750	5720	3870	7730	902	3070	9210	2560	1550	864	611	374
29	2400	4010	4230	6340	---	2690	8520	3210	1430	1140	583	374
30	7300	7700	3550	4780	---	2470	6570	3300	1350	1630	569	375
31	9760	---	3030	4070	---	2270	---	3910	---	1140	553	---
TOTAL	73120	169360	140940	151930	50913	165539	191430	132670	81670	32321	23176	13170
MEAN	2359	5645	4546	4901	1818	5340	6381	4280	2722	1043	748	439
MAX	9760	13600	9150	52200	3510	20700	15800	7730	5880	1630	1410	539
MIN	602	2900	2170	1020	902	919	2060	2560	1350	851	553	369
AC-FT	145000	335900	279600	301400	101000	328300	379700	263200	162000	64110	459700	26120
CFSM	5.30	12.7	10.2	11.0	4.09	12.0	14.3	9.62	6.12	2.34	1.68	.99
IN.	6.11	14.16	11.78	12.70	4.26	13.84	16.00	11.09	6.83	2.70	1.94	1.11

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1931 - 1993, BY WATER YEAR (WY)

MEAN	3378	7281	7909	7215	6734	5106	4109	3201	2393	1589	1025	1386
MAX	10050	20100	18140	23500	12770	8349	7093	6263	4509	4327	4396	4330
(WY)	1976	1991	1980	1935	1982	1932	1937	1948	1936	1983	1991	1978
MIN	348	754	2435	1787	1818	1876	2082	1765	980	682	469	439
(WY)	1988	1937	1986	1937	1993	1992	1975	1931	1992	1992	1938	1993

SUMMARY STATISTICS

FOR 1992 CALENDAR YEAR

FOR 1993 WATER YEAR

WATER YEARS 1931 - 1993

ANNUAL TOTAL	1335443		1226239				
ANNUAL MEAN	3649		3360			4242	
HIGHEST ANNUAL MEAN						6196	1935
LOWEST ANNUAL MEAN						2872	1944
HIGHEST DAILY MEAN	46900	Jan 23	52200	Jan 25	79100		Nov 10 1990
LOWEST DAILY MEAN	407	Sep 18	369	Sep 23	300		Oct 22 1987
ANNUAL SEVEN-DAY MINIMUM	432	Sep 14	373	Sep 22	303		Oct 19 1987
ANNUAL RUNOFF (AC-FT)	2649000		2432000		3073000		
ANNUAL RUNOFF (CF5M)	8.20		7.55		9.53		
ANNUAL RUNOFF (INCHES)	111.64		102.51		129.51		
10 PERCENT EXCEEDS	7730		7260		9080		
50 PERCENT EXCEEDS	1770		2470		2510		
90 PERCENT EXCEEDS	523		602		720		

QUEETS RIVER BASIN

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12040500 QUEETS RIVER NEAR CLEARWATER, WA--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--October 1977 to September 1993 (discontinued).

WATER-QUALITY DATA, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DATE	TIME	DIS-CHARGE, INST. (CUBIC FEET PER SECOND)	SPE-CIFIC CON-DUCT-ANCE (US/CM)	PH (STAND-ARD UNITS)	TEMPER-ATURE WATER (DEG C)	TUR-BID-ITY (NTU)	OXYGEN, DIS-SOLVED (MG/L)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION)	COLI-FORM, FECA, 0.7 UM-MF (COLS./ 100 ML)	STREP-TOCOC CI, KF AGAR (COLS. PER 100 ML)
NOV 18...	1420	2810	67	7.6	9.0	2.6	12.2	105	K2	25
MAR 23...	1430	17500	40	7.1	8.0	66	12.4	105	270	<1
MAY 25...	1345	3050	61	7.5	12.0	4.8	10.9	102	K10	K6
JUL 20...	1530	1100	78	7.4	14.5	1.1	10.6	104	44	K3
DATE	HARD-NESS (MG/L AS CaCO3)	HARD-NESS, NONCAR-BONATE (MG/L AS CaCO3)	CALCIUM, DIS-SOLVED (MG/L AS Ca)	MAGNE-SIUM, DIS-SOLVED (MG/L AS Mg)	SODIUM, DIS-SOLVED (MG/L AS Na)	SODIUM PERCENT	SODIUM AD-SORP-TION RATIO	POTAS-SIUM, DIS-SOLVED (MG/L AS K)	ALKA-LINITY, DIS IT, FIELD (MG/L AS CaCO3)	BICAR-BONATE, DIS IT, FIELD (MG/L AS HCO3)
NOV 18...	24	5	7.9	1.0	2.6	19	0.2	0.3	19	23
MAR 23...	14	2	4.4	0.6	2.1	25	0.2	0.3	12 *	15 *
MAY 25...	23	4	7.9	0.8	2.2	17	0.2	0.2	19	23
JUL 20...	29	5	10	1.0	2.6	16	0.2	0.3	25	30
DATE	CAR-BONATE, DIS IT, FIELD (MG/L AS CO3)	SULFATE, DIS-SOLVED (MG/L AS SO4)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)	FLUO-RIDE, DIS-SOLVED (MG/L AS F)	SILICA, DIS-SOLVED (MG/L AS SiO2)	SOLIDS, RESIDUE AT 180 DEG. C (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, NITRITE DIS-SOLVED (MG/L AS N)
NOV 18...	0	6.4	2.2	<0.1	5.5	44	39	0.06	334	<0.01
MAR 23...	0 *	3.4	1.9	<0.1	4.6	19	26	0.03	898	<0.01
MAY 25...	0	5.9	1.5	<0.1	5.0	33	35	0.05	272	<0.01
JUL 20...	0	8.2	2.1	<0.1	4.9	49	44	0.07	146	<0.01
DATE	NITRO-GEN, NO2+NO3, DIS-SOLVED (MG/L AS N)	NITRO-GEN, AM-MONIA, 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)	BARIUM, DIS-SOLVED (UG/L AS BA)	COBALT, DIS-SOLVED (UG/L AS CO)	IRON, DIS-SOLVED (UG/L AS FE)
NOV 18...	--	0.02	<0.2	<0.01	<0.01	0.01	30	9	<3	49
MAR 23...	0.14	0.02	0.2	0.09	<0.01	<0.01	--	9	<3	91
MAY 25...	<0.05	0.04	<0.2	<0.01	<0.01	<0.01	20	8	<3	26
JUL 20...	<0.05	0.02	<0.2	<0.01	<0.01	<0.01	<10	10	<3	25
DATE	LITHIUM, DIS-SOLVED (UG/L AS LI)	MANGA-NESE, DIS-SOLVED (UG/L AS MN)	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)	SEDI-MENT, SUS-PENDED (MG/L)	SEDI-MENT, DIS-CHARGE, SUS-PENDED (T/DAY)
NOV 18...	<4	4	<10	<1	<1	<1	66	<6	8	61
MAR 23...	<4	8	<10	<1	<1	<1	40	<6	164	7750
MAY 25...	<4	3	<10	<1	<1	<1	64	<6	14	115
JUL 20...	5	5	<10	<1	<1	<1	81	<6	6	18

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

* - Whole water samples rather than filtered

HOH RIVER BASIN

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

LOCATION.--Lat 47°48'25", long 124°14'59", in NE 1/4 NE 1/4 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 sea level.

REMARKS.--No estimated daily discharges. Records good. No regulation or diversion upstream from station. Chemical analyses July 1960 to September 1961, November 1961 to September 1970 (partial-record station), October 1971 to September 1974. Prior to November 1961, published as Hoh River near Forks (Spruce). Water temperatures November 1970 to April 1971.

AVERAGE DISCHARGE.--33 years, 2,505 ft³/s, 134.46 in/yr, 1,815,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 54,500 ft³/s Nov. 24, 1990, gage height, 19.61 ft from rating curve extended above 34,000 ft³/s on basis of slope-area measurement at gage height 17.74 ft; minimum discharge, 249 ft³/s Oct. 23, 1987, gage height, 2.13 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)
Jan. 25	0400	*25,700	*13.24	No other peak greater than base discharge.			
Minimum discharge, 374 ft ³ /s Sept. 24.							

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1250	3350	2800	1360	1790	632	1540	2720	2930	1320	1240	709
2	1160	2940	2300	1260	1650	650	1540	3270	2490	1270	1260	770
3	1050	2170	1980	1310	1550	912	1520	2820	2200	1230	1310	860
4	918	2630	1760	1240	1530	5530	1440	2520	2040	1210	1340	857
5	774	2160	1600	1110	1680	3310	1330	2230	1950	1200	1330	842
6	706	1870	1470	1030	1660	2240	1270	2500	2000	1180	1290	837
7	653	5200	1390	978	1570	1700	1300	2510	2050	1120	1130	885
8	616	3380	1930	938	1460	1450	3000	2960	1910	1120	1020	882
9	612	2590	2240	888	1400	1300	3830	2530	3450	1170	1010	811
10	575	2150	1800	844	1460	1180	3180	3020	3970	1100	1020	766
11	623	3500	1710	804	1300	1090	3360	3450	2690	1100	922	735
12	665	2640	1560	765	1190	1030	2430	3510	2200	1040	889	631
13	811	2150	1500	740	1120	969	2220	3710	1970	982	869	561
14	657	1900	3320	719	1070	997	2020	2870	2010	1020	838	531
15	568	1730	2460	697	1010	1290	2080	2480	2660	981	792	524
16	526	2000	2050	677	954	1090	2240	2220	2240	961	796	496
17	517	1790	1870	655	905	1840	2500	2180	2050	1040	826	492
18	983	1700	1610	638	868	2660	2560	2380	2010	1020	842	473
19	2290	3200	2090	811	840	1740	2200	2640	1920	999	880	452
20	4360	2450	2890	1430	814	1970	1910	2990	1710	1300	968	439
21	3260	3090	2510	1780	789	2530	2240	4100	1630	1250	927	413
22	2900	3750	2920	1340	759	5920	2690	3550	1570	1160	940	396
23	2750	2730	2870	1110	727	7680	2390	2690	1470	1310	2080	387
24	2450	2240	2570	4030	700	4150	2520	2410	1340	1210	1480	393
25	1740	1920	2170	16400	673	2940	4010	2390	1380	1120	1060	397
26	1380	1720	2120	5800	651	2370	6010	2150	1530	1120	867	417
27	1190	4850	1980	3950	634	2030	5330	2210	1580	1110	802	466
28	1090	3360	1850	3140	621	1800	3870	2300	1440	1220	764	529
29	1290	2480	1860	2600	---	1650	3400	2690	1320	1490	714	553
30	2230	3690	1660	2180	---	1550	2990	2570	1270	1610	707	576
31	3020	---	1490	1970	---	1450	---	3010	---	1250	717	---
TOTAL	43614	81330	64330	63194	31375	67650	78920	85580	60980	36213	31630	18080
MEAN	1407	2711	2075	2039	1121	2182	2631	2761	2033	1168	1020	603
MAX	4360	5200	3320	16400	1790	7680	6010	4100	3970	1610	2080	885
MIN	517	1700	1390	638	621	632	1270	2150	1270	961	707	387
AC-FT	86510	161300	127600	125300	62230	134200	156500	169700	121000	71830	62740	35860
CFSM	5.56	10.7	8.20	8.06	4.43	8.63	10.4	10.9	8.03	4.62	4.03	2.38
IN.	6.41	11.96	9.46	9.29	4.61	9.95	11.60	12.58	8.97	5.32	4.65	2.66

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1961 - 1993, BY WATER YEAR (WY)

MEAN	2106	3873	4041	3725	3386	2600	2109	2034	2091	1691	1252	1205
MAX	5602	10690	8701	6780	6214	5697	3248	2891	3117	2806	2557	2266
(WY)	1968	1991	1980	1974	1982	1972	1981	1986	1964	1983	1991	1969
MIN	381	1246	1282	992	1121	1261	925	1562	1285	1012	827	603
(WY)	1988	1980	1986	1979	1993	1992	1975	1978	1992	1992	1987	1993

SUMMARY STATISTICS

	FOR 1992 CALENDAR YEAR	FOR 1993 WATER YEAR	WATER YEARS 1961 - 1993
ANNUAL TOTAL	759004	662896	
ANNUAL MEAN	2074	1816	2505
HIGHEST ANNUAL MEAN			3429
LOWEST ANNUAL MEAN			1645
HIGHEST DAILY MEAN	21000	16400	39000
LOWEST DAILY MEAN	443	387	252
ANNUAL SEVEN-DAY MINIMUM	494	406	259
ANNUAL RUNOFF (AC-FT)	1505000	1315000	1815000
ANNUAL RUNOFF (CFSM)	8.20	7.18	9.90
ANNUAL RUNOFF (INCHES)	111.60	97.47	134.52
10 PERCENT EXCEEDS	3420	3190	4590
50 PERCENT EXCEEDS	1430	1520	1790
90 PERCENT EXCEEDS	763	670	891

QUILLAYUTE RIVER BASIN

67

12043000 CALAWAH RIVER NEAR FORKS, WA

LOCATION.--Lat 47°57'37", long 124°23'30", in NW 1/4 SW 1/4 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 1984 to current year. 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 sea level. 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.--No estimated daily discharges. Records good. No regulation or diversion upstream from station. Chemical analyses October 1976 to September 1978.

AVERAGE DISCHARGE.--16 years (water years 1899-1901, 1977-80, 1985-93), 998 ft³/s, 105.06 in/yr, 723,100 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 34,500 ft³/s Nov. 23, 1990, gage height, 20.58 ft, from rating curve extended above 10,000 ft³/s on basis of step-backwater analysis; minimum discharge, 15 ft³/s Sept. 28, 1899.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 10,000 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Jan. 25	0400	*21,700	*16.76	No other peak greater than base discharge.			
Minimum discharge, 63 ft ³ /s Sept. 28, 29.							

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	176	1540	1480	628	837	217	568	1330	965	251	159	97
2	163	1480	1090	569	738	226	552	1490	842	240	145	95
3	160	1000	860	590	676	384	545	1330	797	229	134	93
4	151	1000	721	543	637	4360	506	1110	699	225	126	92
5	133	815	628	477	655	2340	482	962	619	216	120	91
6	125	744	557	442	604	1380	465	1040	560	203	115	87
7	117	2130	506	430	544	980	471	1140	549	195	110	86
8	113	1490	841	412	505	768	1540	1620	501	188	107	85
9	109	1120	1200	385	475	637	2640	1480	1060	178	107	83
10	105	875	912	355	493	550	2060	1270	1480	176	113	80
11	101	1570	784	332	431	489	2270	1070	1140	178	103	80
12	99	1190	683	314	399	446	1680	909	881	176	95	80
13	131	909	635	319	375	409	1340	789	726	163	91	77
14	109	744	1980	314	352	412	1110	705	671	155	90	76
15	99	646	1300	306	331	466	1160	626	679	152	90	75
16	95	648	1040	279	312	390	1320	568	580	156	85	73
17	93	580	881	266	299	1050	1420	519	524	183	81	71
18	248	613	732	256	285	1370	1420	479	479	157	78	71
19	399	1930	1090	394	280	906	1250	451	440	146	75	69
20	1680	1480	2260	907	272	980	1030	475	405	149	73	67
21	1340	2260	1890	1110	265	1450	1060	799	382	159	73	67
22	1250	2690	2170	827	252	4110	1310	975	380	154	79	67
23	1240	1610	2310	666	241	4260	1240	788	354	188	303	67
24	1070	1140	1920	3080	229	2430	1350	652	327	182	186	65
25	760	889	1460	12200	220	1560	2510	571	311	172	147	67
26	577	748	1270	3390	214	1150	4460	514	296	158	128	67
27	467	1650	1110	2200	212	918	3960	470	315	147	121	66
28	421	1450	983	1660	205	766	2500	483	297	147	115	64
29	451	1080	925	1310	---	663	2050	678	278	187	108	65
30	917	1960	804	1080	---	598	1590	643	261	220	104	67
31	1430	---	708	956	---	539	---	894	---	178	99	---
TOTAL	14329	37981	35730	36997	11338	37204	45859	26830	17798	5608	3560	2290
MEAN	462	1266	1153	1193	405	1200	1529	865	593	181	115	76.3
MAX	1680	2690	2310	12200	837	4360	4460	1620	1480	251	303	97
MIN	93	580	506	256	205	217	465	451	261	146	73	64
AC-FT	28420	75340	70870	73380	22490	73790	90960	53220	35300	11120	7060	4540
CFSM	3.58	9.81	8.93	9.25	3.14	9.30	11.8	6.71	4.60	1.40	.89	.59
IN.	4.13	10.95	10.30	10.67	3.27	10.73	13.22	7.74	5.13	1.62	1.03	.66

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1898 - 1993, BY WATER YEAR (WY)

	1898	1946	2035	1754	1787	1333	1006	669	427	200	164	218
MEAN	661	4706	4395	3100	3294	2400	1529	1161	1128	460	766	812
MAX (WY)	1901	1991	1980	1992	1991	1900	1993	1984	1900	1900	1991	1978
MIN (WY)	49.3	483	585	476	405	419	554	283	160	96.9	63.9	65.3
(WY)	1988	1988	1986	1979	1993	1992	1990	1989	1992	1992	1992	1899

SUMMARY STATISTICS

FOR 1992 CALENDAR YEAR

FOR 1993 WATER YEAR

WATER YEARS 1898 - 1993

ANNUAL TOTAL	310454	275524	998
ANNUAL MEAN	848	755	1466
HIGHEST ANNUAL MEAN			1466
LOWEST ANNUAL MEAN			665
HIGHEST DAILY MEAN	13000	12200	22900
LOWEST DAILY MEAN	45	64	15
ANNUAL SEVEN-DAY MINIMUM	47	66	26
ANNUAL RUNOFF (AC-FT)	615800	546500	722800
ANNUAL RUNOFF (CFSM)	6.58	5.85	7.73
ANNUAL RUNOFF (INCHES)	89.53	79.45	105.09
10 PERCENT EXCEEDS	1900	1560	2290
50 PERCENT EXCEEDS	385	506	533
90 PERCENT EXCEEDS	65	92	98

HOKO RIVER BASIN

12043300 HOKO RIVER NEAR SEKIU, WA

LOCATION.--Lat 48°14'30", long 124°22'57", in NE 1/4 SW 1/4 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), June 1983 to current year (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 discharge, 11 ft³/s Oct. 1-13, 21-24, 1987, Aug. 29, 30, 1992.

EXTREMES FOR PERIOD MAY TO OCTOBER.--Maximum discharge, 1,060 ft³/s Oct. 23, gage height, 4.19 ft; minimum discharge, 14 ft³/s several days in September and October.

DISCHARGE, CUBIC FEET PER SECOND, MAY TO DECEMBER 1993
DAILY MEAN VALUES

DAY	MAY	JUN	JUL	AUG	SEP	OCT
1	535	286	79	41	e20	14
2	480	233	76	37	e20	14
3	435	200	69	33	e19	14
4	378	176	65	31	e19	14
5	327	155	63	29	e19	14
6	376	140	59	29	e18	17
7	396	144	56	29	e18	20
8	527	127	52	28	e17	16
9	445	279	49	32	e17	15
10	396	363	49	39	e17	14
11	348	288	49	32	e17	14
12	291	230	48	29	e16	18
13	248	195	45	28	e16	29
14	218	197	43	28	e16	26
15	191	239	43	28	e15	22
16	171	188	47	27	e15	19
17	151	166	51	25	e15	17
18	137	149	44	24	e15	17
19	129	134	40	23	e14	22
20	167	120	38	22	e14	24
21	398	110	40	23	e14	20
22	349	122	45	26	e14	132
23	263	106	62	52	e14	542
24	213	96	53	38	e14	398
25	181	91	48	30	e15	164
26	161	85	43	26	e15	104
27	143	94	40	24	e14	81
28	158	86	41	23	e14	69
29	166	81	40	22	e14	60
30	178	77	40	21	15	54
31	275	---	49	20	---	50
TOTAL	8831	4957	1566	899	480	2034
MEAN	285	165	50.5	29.0	16.0	65.6
MAX	535	363	79	52	20	542
MIN	129	77	38	20	14	14
AC-FT	17520	9830	3110	1780	952	4030
CFSM	5.56	3.23	1.99	.57	.31	1.28
IN.	6.42	3.60	1.14	.65	.35	1.48

e Estimated

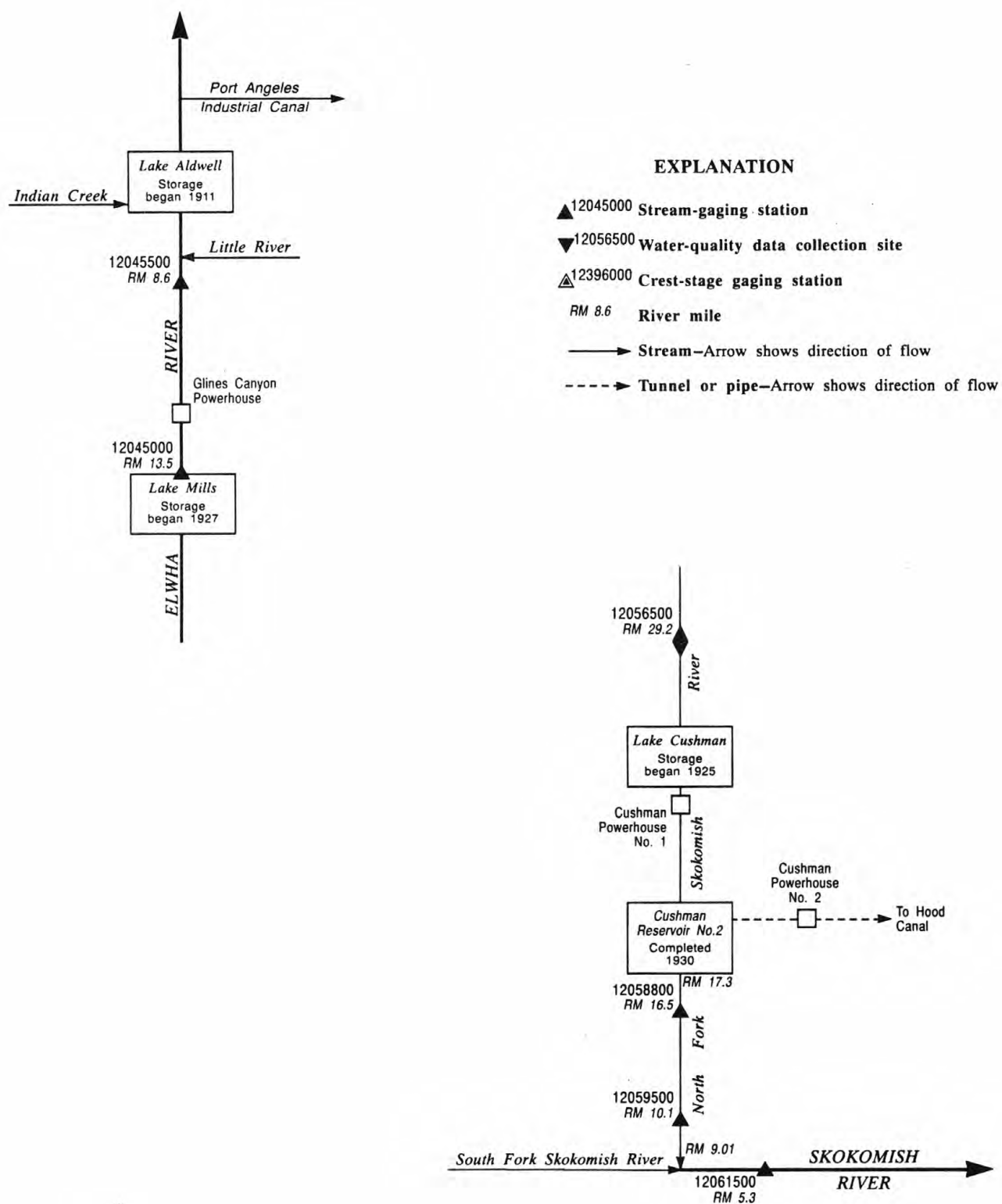


Figure 8. Gaging stations in Elwha and Skokomish River Basins.

ELWHA RIVER BASIN

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

LOCATION.--Lat 48°00'08", long 123°35'55", in SW 1/4 SE 1/4 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 sea level.

REMARKS.--Reservoir is formed by concrete dam, completed in 1927; storage began Apr. 1, 1927. Usable capacity, 6,150 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, 25,240 acre-ft. Figures given herein represent total contents. Water is used for power production by Daishowa America Co., Ltd.

COOPERATION.--Gage-height record furnished by Daishowa America Co., Ltd. Capacity table, revised Oct. 1, 1989, was furnished by Hosey and Associates to be used starting in the 1990 water year.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents observed, 39,940 acre-ft Dec. 22, 1936, gage height, 613.0 ft; minimum contents 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, 31,522 acre-ft Mar. 6, Apr. 26, 27, July 30, gage height, 610.4 ft; minimum contents observed, 28,072 acre-ft Jan. 19, gage height, 600.3 ft.

MONTHEND GAGE HEIGHT AND CONTENTS AT 2400, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

Date	Gage height (feet)	Contents (acre-feet)	Change in contents (acre-feet)
Sept. 30.....	a608.5	30,873	--
Oct. 31.....	a608.2	30,770	-103
Nov. 30.....	a609.2	31,112	+342
Dec. 31.....	a605.1	29,712	-1,400
CAL YR 1992.....	--	--	-1,502
Jan. 31.....	a610.0	31,385	+1,673
Feb. 28.....	a604.2	29,404	-1,981
Mar. 31.....	a609.8	31,317	+1,913
Apr. 30.....	a610.0	31,385	+68
May 31.....	a609.8	31,317	-68
June 30.....	a608.4	30,839	-478
July 31.....	a609.9	31,351	+512
Aug. 31.....	a609.1	31,078	-273
Sept. 30.....	a602.1	28,687	-2,391
WTR YR 1993.....	--	--	-2,186

a Interpolated

ELWHA RIVER BASIN

71

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

LOCATION.--Lat 48°03'18", long 123°34'55", in NE 1/4 NW 1/4 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.

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 sea level. 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.--No estimated daily discharges. 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 (station 12045000). Chemical analyses July 1959 to June 1960, July 1960 to September 1970 (partial-record station), October 1971 to September 1986. Water temperatures April 1976 to August 1977. 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.

AVERAGE DISCHARGE.--79 years (water years 1898-1901, 1919-93), 1,499 ft³/s, 75.67 in/yr, 1,086,000 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, 6,780 ft³/s Jan. 25, gage height, 15.01 ft; minimum discharge, 95 ft³/s Sept. 20, due to regulation; minimum daily discharge, 313 ft³/s Sept. 29.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	370	1300	1230	509	1250	502	1060	1670	2680	991	636	386
2	368	924	1080	509	1180	482	1050	1870	2160	868	623	380
3	368	549	969	510	1130	475	1020	1690	2090	893	645	380
4	368	862	990	492	1140	608	917	1550	2100	875	635	380
5	368	838	858	517	1260	768	995	1560	1970	850	626	380
6	368	746	616	502	1280	1110	883	1630	2060	850	647	378
7	368	1700	814	499	1280	951	858	1420	2010	844	598	374
8	366	1220	889	484	1230	850	1220	1390	1790	819	554	374
9	362	949	820	475	1190	883	1720	1320	2390	851	515	374
10	362	702	849	475	1190	784	1490	2210	2460	802	524	374
11	362	1060	670	458	1110	705	1340	3080	1880	785	519	374
12	362	875	655	437	1010	690	1200	3470	1660	780	508	374
13	362	697	539	436	951	690	1110	3750	1600	714	486	374
14	362	631	643	436	833	705	1020	2850	1660	710	493	374
15	359	623	692	436	866	850	1050	2530	1930	759	489	374
16	357	848	674	436	800	729	1030	2330	1730	722	481	374
17	357	861	719	436	776	1090	1050	2520	1670	713	482	374
18	361	739	714	434	729	784	1110	2790	1830	708	482	374
19	415	869	795	431	752	1200	1110	3260	1650	686	462	374
20	701	784	703	443	690	1100	1020	3350	1460	1140	458	360
21	679	944	725	455	615	1180	1040	3550	1450	725	464	344
22	388	1350	684	446	675	2470	1290	3040	1300	731	501	320
23	487	935	792	442	752	3960	1150	2620	1270	868	696	327
24	570	794	672	562	690	2440	1140	2590	1180	672	623	321
25	483	693	678	4600	784	1980	1260	2750	1210	534	497	326
26	416	683	668	2820	784	1690	2080	2290	1240	581	463	329
27	416	2080	532	2250	752	1670	2110	2670	1300	622	454	328
28	439	1570	626	1650	557	1280	1680	2720	1220	686	418	327
29	462	1190	671	1400	---	1140	1680	2840	1150	761	420	313
30	462	1340	619	1260	---	1100	1750	2470	1100	937	416	329
31	831	---	535	1230	---	1040	---	2930	---	684	416	---
TOTAL	13299	29356	23121	26470	26256	35906	37433	76710	51200	24161	16231	10770
MEAN	429	979	746	854	938	1158	1248	2475	1707	779	524	359
MAX	831	2080	1230	4600	1280	3960	2110	3750	2680	1140	696	386
MIN	357	549	532	431	557	475	858	1320	1100	534	416	313
AC-FT	26380	58230	45860	52500	52080	71220	74250	152200	101600	47920	32190	21360
MEAN†	427	985	723	881	902	1189	1249	2473	1699	787	519	319
CFSM†	1.59	3.66	2.69	3.28	3.35	4.42	4.64	9.19	6.32	2.93	1.93	1.19
IN.†	1.83	4.08	3.10	3.78	3.49	5.10	5.18	10.60	7.05	3.38	2.22	1.32
AC-FT†	26280	58570	44460	54170	50100	73130	74320	152100	101100	48430	31920	18970

CAL YR 1992 TOTAL 459657 MEAN 1256 MAX 14600 MIN 245 AC-FT 911700 MEAN† 1254 CFSM† 4.66 IN.† 63.44 AC-FT† 910200
WTR YR 1993 TOTAL 370913 MEAN 1016 MAX 4600 MIN 313 AC-FT 735700 MEAN† 1013 CFSM† 3.77 IN.† 51.13 AC-FT† 733500

† Adjusted for change in contents in Lake Mills.

12048000 DUNGENESS RIVER NEAR SEQUIM, WA

LOCATION.--Lat 48°00'52", long 123°07'53", in NW 1/4 NE 1/4 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 sea level (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 except for estimated daily discharges, which are fair. No regulation or diversion upstream from station. Water temperatures July 1968 to December 1969. U.S. Geological Survey satellite telemeter at station.

AVERAGE DISCHARGE.--63 years (water years 1924-30, 1938-93), 377 ft³/s, 32.82 in/yr, 273,100 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 7,120 ft³/s Nov. 24, 1990, gage height, 8.35 ft; maximum gage height, 8.58 ft Nov. 27, 1949; minimum discharge, 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)
Jan. 25	0700	*1,610	*5.15				
Minimum discharge, 94 ft ³ /s Sept. 29, 30.							

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	e117	134	176	e104	257	120	e220	247	885	313	287	139
2	e115	140	161	e102	243	119	e212	289	709	337	279	139
3	e115	122	143	e101	236	119	e210	297	640	312	278	139
4	e115	153	139	e102	247	118	e200	307	663	305	273	137
5	e115	152	135	e103	278	118	e185	299	614	296	264	136
6	e114	140	132	122	273	116	e172	332	680	291	252	13
7	e113	372	129	155	265	116	e170	319	675	269	242	132
8	e112	271	129	193	254	116	e230	288	586	265	230	131
9	e111	206	127	157	243	116	e240	270	658	273	225	128
10	e110	163	124	172	e232	116	e230	651	712	258	221	126
11	e110	192	e119	220	e220	116	e210	1040	608	259	209	123
12	e110	174	e112	240	e200	116	e183	1060	553	237	201	119
13	e110	152	e160	264	e190	116	e160	1170	513	225	195	114
14	e110	144	e148	233	e178	117	e140	944	514	248	193	112
15	e110	138	e136	170	e168	118	e160	762	587	245	198	113
16	e110	154	e125	133	e160	118	e162	692	539	240	211	111
17	e110	155	e115	126	e152	116	e270	701	535	280	198	107
18	123	142	e108	125	e150	e230	e250	788	547	284	189	107
19	151	164	e104	134	146	e300	e205	914	536	261	184	107
20	172	140	e103	207	138	e380	e170	952	478	509	181	107
21	167	179	e101	160	128	e500	e185	854	454	464	184	105
22	138	204	e100	123	127	e660	e195	706	400	411	182	103
23	e106	160	e103	119	126	e780	189	609	359	382	210	100
24	e118	140	e106	133	125	e520	183	622	339	347	193	98
25	e112	130	e103	1230	123	e380	192	656	361	325	172	98
26	e97	126	e101	703	122	e310	204	601	400	311	162	97
27	e98	351	e99	504	122	e260	196	645	398	295	157	95
28	e100	290	e108	415	121	e230	190	734	357	343	153	95
29	e102	223	e118	344	---	e205	197	720	322	355	148	95
30	e106	204	e112	290	---	e185	226	684	309	337	143	95
31	122	---	e105	272	---	e175	---	923	---	297	142	---
TOTAL	3619	5415	3781	7456	5224	7106	5936	20076	15931	9574	6356	3442
MEAN	117	180	122	241	187	229	198	648	531	309	205	115
MAX	172	372	176	1230	278	780	270	1170	885	509	287	139
MIN	97	122	99	101	121	116	140	247	309	225	142	95
AC-FT	7180	10740	7500	14790	10360	14090	11770	39820	31600	18990	12610	6830
IN.	.75	1.16	.78	1.54	1.20	1.47	1.27	4.15	3.40	1.98	1.31	.74
CFM	.86	1.29	.90	1.78	1.25	1.69	1.42	4.79	3.80	2.28	1.52	.80

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1923 - 1993, BY WATER YEAR (WY)

MEAN	211	342	418	387	382	283	322	565	700	490	263	173
MAX	561	1099	1034	1075	1042	819	519	893	1196	840	521	364
(WY)	1968	1991	1980	1968	1924	1972	1925	1956	1948	1954	1954	1954
MIN	80.6	84.9	117	74.3	106	133	171	292	289	179	129	93.8
(WY)	1988	1988	1977	1979	1929	1962	1975	1977	1926	1926	1944	1928

SUMMARY STATISTICS	FOR 1992 CALENDAR YEAR	FOR 1993 WATER YEAR	WATER YEARS 1923 - 1993
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ANNUAL TOTAL	123274		93916						
ANNUAL MEAN	337		257				377		
HIGHEST ANNUAL MEAN							545		1954
LOWEST ANNUAL MEAN							197		1977
HIGHEST DAILY MEAN	3900	Jan 31	1230	Jan 25		5280		Nov 24	1990
LOWEST DAILY MEAN	97	Oct 26	95	Sep 27		65		Jan 31	1979
ANNUAL SEVEN-DAY MINIMUM	102	Dec 21	96	Sep 24		65		Jan 29	1979
ANNUAL RUNOFF (AC-FT)	244500		186300			273400			
ANNUAL RUNOFF (CFSM)	2.16		1.65				2.42		
ANNUAL RUNOFF (INCHES)	29.40		22.40				32.87		
10 PERCENT EXCEEDS	589		593				721		
50 PERCENT EXCEEDS	258		184				290		
90 PERCENT EXCEEDS	113		108				134		

e Estimated

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LOCATION.--Lat 47°41'03", long 123°00'37", in NW 1/4 SW 1/4 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.

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.

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

REMARKS.--Records good except for estimated daily discharges, which are fair. No regulation or diversion upstream from station. Chemical analyses April 1972 to September 1974.

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 daily discharge, 41 ft³/s Oct. 23-30, 1987, Oct. 15-17, 1992.

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Mar. 22	2300	*1,990	*4.91				
Minimum daily discharge, 41 ft ³ /s Oct. 15-17.							

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	e72	570	312	148	372	104	303	496	693	248	215	e86
2	e60	451	260	139	353	104	294	490	568	278	196	e84
3	e55	298	224	135	334	220	293	573	515	249	183	e82
4	e51	298	201	131	332	699	285	542	523	241	173	e78
5	e49	250	186	127	342	530	256	479	514	233	164	e79
6	e47	214	175	125	369	442	237	492	528	224	158	e76
7	e45	539	169	125	381	375	232	460	502	206	150	e76
8	e44	336	195	119	357	347	694	418	456	201	144	e75
9	e43	248	201	114	339	313	729	387	627	202	138	e74
10	e42	203	186	111	332	274	648	645	664	190	136	e72
11	e42	217	177	108	299	238	529	882	506	187	132	e71
12	e42	202	168	107	268	216	456	1130	459	176	127	e69
13	e45	180	160	106	237	198	403	1080	424	175	124	e69
14	e43	168	265	104	217	193	349	772	427	187	123	e69
15	e41	158	241	e96	200	248	417	664	495	190	128	e69
16	e41	189	205	e93	182	213	429	603	486	187	124	e67
17	e41	198	192	e91	168	336	820	651	459	221	120	e68
18	e80	176	172	e90	161	450	730	762	474	209	116	e65
19	159	292	166	102	156	349	491	828	449	193	114	e64
20	325	223	164	281	148	422	400	884	402	277	112	e63
21	252	376	158	280	142	352	429	972	375	233	111	e60
22	205	420	154	198	134	847	474	745	330	208	109	e58
23	188	299	161	164	126	1340	465	630	302	195	128	e55
24	149	236	167	192	120	724	657	666	287	182	115	e53
25	128	202	164	1370	116	505	797	677	307	173	107	e53
26	111	188	158	947	111	411	938	623	327	166	104	e53
27	101	711	152	720	107	350	774	651	310	161	96	e51
28	100	483	163	645	105	307	585	645	277	198	94	e51
29	252	348	187	530	---	277	530	683	256	295	e92	e50
30	544	378	176	427	---	259	530	663	247	351	e90	e50
31	568	---	157	400	---	242	---	766	---	251	e88	---
TOTAL	3965	9051	5816	8325	6508	11885	15174	20959	13189	6687	4011	1992
MEAN	128	302	188	269	232	383	506	676	440	216	129	66.4
MAX	568	711	312	1370	381	1340	938	1130	693	351	215	86
MIN	41	158	152	90	105	104	232	387	247	161	88	50
AC-FT	7860	17950	11540	16510	12910	23570	30100	41570	26160	13260	7960	3950
CSFM	1.92	4.54	2.82	4.04	3.50	5.77	7.61	10.2	6.61	3.24	1.95	1.00
IN.	2.22	5.06	3.25	4.66	3.64	6.65	8.49	11.72	7.38</			

MEAN	282	523	586	494	498	373	391	556	571	357	170	135
MAX	817	1446	1470	1180	1050	883	656	1043	1088	766	376	523
(WY)	1976	1984	1967	1953	1991	1972	1943	1956	1956	1956	1971	1978
MIN	44.4	120	167	116	133	138	214	314	242	136	75.1	57.6
(WY)	1988	1977	1977	1979	1985	1985	1973	1977	1992	1977	1944	1942

ANNUAL TOTAL	121982		107562			
ANNUAL MEAN	333		295		411	
HIGHEST ANNUAL MEAN					599	1983
LOWEST ANNUAL MEAN					204	1977
HIGHEST DAILY MEAN	3940	Jan 31	1370	Jan 25	5100	Nov 15 1983
LOWEST DAILY MEAN	41	Oct 15	41	Oct 15	41	Oct 23 1987
ANNUAL SEVEN-DAY MINIMUM	42	Oct 11	42	Oct 11	41	Oct 23 1987
ANNUAL RUNOFF (AC-FT)	242000		213300		297800	
ANNUAL RUNOFF (CFSM)	5.01		4.43		6.18	
ANNUAL RUNOFF (INCHES)	68.24		60.17		83.98	
10 PERCENT EXCEEDS	613		646		790	
50 PERCENT EXCEEDS	233		214		309	
90 PERCENT EXCEEDS	70		72		98	

e Estimated

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

LOCATION.--Lat 47°30'52", long 123°19'43", in NW 1/4 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 sea level. 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.--No estimated daily discharges. Records good. No regulation or diversion upstream from station. U.S. Geological Survey satellite telemeter at station. Chemical analyses December 1973 to September 1985.

AVERAGE DISCHARGE.--69 years, 502 ft³/s, 119.18 in/yr, 363,700 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 discharge 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)
Mar. 22	2000	*3,030	*5.44				
Minimum discharge, 38 ft ³ /s Oct. 15-18.							

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	75	991	481	202	418	146	460	748	724	237	165	73
2	70	740	411	192	395	146	447	746	645	229	158	71
3	64	489	361	189	380	360	484	828	590	226	151	70
4	57	511	327	181	378	1190	448	757	572	221	142	69
5	53	404	303	172	399	853	398	671	549	213	135	69
6	50	360	289	164	434	641	398	694	541	203	128	68
7	47	813	279	160	454	528	385	671	510	196	122	67
8	45	471	288	157	442	478	1080	635	459	194	117	67
9	43	374	289	150	460	425	1140	583	774	191	114	65
10	43	318	275	145	484	381	927	893	670	182	111	64
11	41	381	262	141	419	341	724	1000	531	178	107	62
12	41	335	242	138	374	312	591	1260	477	173	103	61
13	46	297	242	135	335	291	524	1130	437	175	101	60
14	41	274	383	133	308	315	471	877	470	181	98	60
15	38	257	327	131	284	395	576	771	525	179	106	60
16	38	296	296	127	259	322	627	718	483	173	98	59
17	39	288	276	125	237	629	1220	755	447	179	95	60
18	112	270	250	123	225	694	983	850	442	171	91	57
19	512	410	251	127	216	484	698	879	418	170	89	57
20	733	347	252	249	206	582	591	982	389	208	87	56
21	487	509	247	248	196	530	746	1310	369	176	86	54
22	473	637	259	199	183	1610	791	980	348	170	84	52
23	389	464	276	180	175	1720	832	782	322	164	149	50
24	273	380	274	407	165	945	1260	770	304	152	111	48
25	217	330	262	1850	158	695	1680	757	307	145	92	47
26	182	337	254	950	151	575	1640	723	312	140	85	47
27	161	1050	243	731	147	501	1250	716	297	137	82	45
28	155	639	246	703	143	450	974	712	270	162	80	45
29	492	481	246	604	---	418	904	765	254	245	78	44
30	1050	607	228	501	---	406	813	735	244	231	76	44
31	1360	---	213	453	---	391	---	775	---	174	75	---
TOTAL	7427	14060	8832	9967	8425	17754	24062	25473	13680	5775	3316	1751
MEAN	240	469	285	322	301	573	802	822	456	186	107	58.4
MAX	1360	1050	481	1850	484	1720	1680	1310	774	245	165	73
MIN	38	257	213	123	143	146	385	583	244	137	75	44
AC-FT	14730	27890	17520	19770	16710	35220	47730	50530	27130	11450	6580	3470
CFSM	4.19	8.19	4.98	5.62	5.26	10.0	14.0	14.4	7.97	3.26	1.87	1.02
IN.	4.83	9.14	5.74	6.48	5.48	11.55	15.65	16.57	8.90	3.76	2.16	1.14

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1924 - 1993, BY WATER YEAR (WY)

	371	697	774	665	628	484	512	662	603	340	153	145
MEAN	371	697	774	665	628	484	512	662	603	340	153	145
MAX	1136	1762	1778	1915	1465	1325	901	1304	1332	915	384	624
(WY)	1968	1984	1934	1953	1991	1972	1943	1956	1956	1974	1978	
MIN	42.3	40.0	244	124	111	190	268	333	180	88.5	54.9	50.2
(WY)	1988	1937	1979	1937	1929	1955	1975	1930	1992	1926	1926	

SUMMARY STATISTICS

FOR 1992 CALENDAR YEAR

FOR 1993 WATER YEAR

WATER YEARS 1924 - 1993

ANNUAL TOTAL	157827	140522	
ANNUAL MEAN	431	385	
HIGHEST ANNUAL MEAN			502
LOWEST ANNUAL MEAN			755
HIGHEST DAILY MEAN	6160	Jan 31	1974
LOWEST DAILY MEAN	38	Oct 15	1930
ANNUAL SEVEN-DAY MINIMUM	41	Oct 11	9980
ANNUAL RUNOFF (AC-FT)	313000	278700	363900
ANNUAL RUNOFF (CFSM)	7.54	6.73	8.78
ANNUAL RUNOFF (INCHES)	102.64	91.39	119.30
10 PERCENT EXCEEDS	794	800	998
50 PERCENT EXCEEDS	274	289	369
90 PERCENT EXCEEDS	54	65	91

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

WATER-QUALITY RECORDS

PERIOD OF DAILY RECORD.--

WATER TEMPERATURES: April 1965 to September 1982, June 1989 to December 1989, December 1990 to April 1991, June 1992 to current year.

INSTRUMENTATION.--Temperature recorder April 1965 to September 1982, June 1989 to current year.

EXTREMES FOR PERIOD OF DAILY RECORD.--

WATER TEMPERATURES: Maximum recorded, 16.5°C Aug. 14, 15, 1992; minimum, 0.0°C Mar. 24, 1976.

EXTREMES FOR CURRENT YEAR.--

WATER TEMPERATURES: Maximum, 14.0°C Aug. 4, 5; minimum recorded, 1.0°C Jan. 11, 12, but probably lower during periods of no record.

WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
OCTOBER			NOVEMBER			DECEMBER			JANUARY			
1	12.0	10.5	11.5	7.5	7.0	7.5	5.0	5.0	5.0	3.5	3.0	3.0
2	11.5	11.0	11.5	7.5	7.0	7.5	5.0	4.5	5.0	3.0	3.0	3.0
3	12.0	10.5	11.5	7.5	7.0	7.5	4.5	4.0	4.0	3.0	2.5	3.0
4	11.5	10.0	10.5	8.0	7.5	7.5	4.0	3.5	4.0	3.0	2.5	3.0
5	10.5	9.5	10.0	8.0	7.5	7.5	4.0	3.5	4.0	3.0	2.0	2.5
6	10.0	9.0	9.5	8.0	7.5	8.0	4.5	4.0	4.5	2.0	2.0	2.0
7	10.5	9.0	9.5	8.0	7.5	7.5	4.5	3.5	4.5	2.5	1.5	2.0
8	11.0	9.5	10.0	7.5	6.5	7.0	---	---	---	---	---	---
9	10.5	9.5	10.0	6.5	6.0	6.0	4.0	3.0	3.5	2.5	2.0	2.0
10	10.5	9.5	10.0	6.5	5.5	6.0	4.0	3.0	4.0	2.0	1.5	1.5
11	10.5	9.0	10.0	7.0	6.5	6.5	4.0	3.5	3.5	2.0	1.0	1.5
12	11.0	9.5	10.0	7.5	7.0	7.0	4.0	3.5	4.0	2.0	1.0	1.5
13	10.5	9.5	10.0	7.5	6.5	7.0	4.5	4.0	4.0	2.0	1.5	2.0
14	10.0	9.0	9.5	7.0	6.5	7.0	4.0	4.0	4.0	---	---	---
15	9.0	8.0	8.5	7.5	7.0	7.0	4.0	4.0	4.0	---	---	---
16	9.0	8.5	8.5	7.5	7.5	7.5	4.0	2.5	3.5	---	---	---
17	10.0	8.5	9.0	7.5	7.0	7.0	3.5	3.0	3.5	---	---	---
18	10.0	9.0	9.5	7.0	6.5	7.0	3.5	3.0	3.0	---	---	---
19	9.5	9.0	9.5	6.5	5.5	6.0	3.5	2.0	3.0	---	---	---
20	10.0	9.5	9.5	6.0	5.5	5.5	3.5	2.0	3.0	---	---	---
21	10.0	9.5	9.5	6.0	4.5	5.0	4.0	3.5	4.0	---	---	---
22	9.5	9.0	9.5	6.0	5.5	5.5	4.5	4.0	4.0	---	---	---
23	10.0	9.5	9.5	5.5	5.0	5.0	4.5	4.0	4.0	---	---	---
24	10.0	10.0	10.0	5.0	4.5	5.0	4.0	4.0	4.0	---	---	---
25	10.0	8.5	9.0	5.0	4.5	5.0	4.5	4.0	4.0	---	---	---
26	8.5	8.0	8.5	5.5	5.0	5.0	4.5	4.0	4.0	---	---	---
27	8.0	7.5	8.0	5.5	5.0	5.0	---	---	---	---	---	---
28	8.5	7.5	8.0	6.0	5.0	5.5	---	---	---	---	---	---
29	8.5	8.0	8.0	5.5	5.0	5.5	3.5	2.5	3.0	---	---	---
30	8.0	7.5	8.0	5.5	5.0	5.5	4.0	3.5	3.5	---	---	---
31	8.0	7.5	7.5	---	---	---	3.5	3.0	3.5	---	---	---
MONTH	12.0	7.5	9.5	8.0	4.5	6.4	---	---	---	---	---	---

SKOKOMISH RIVER BASIN

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

WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
FEBRUARY			MARCH			APRIL			MAY			
1	---	---	---	4.0	3.5	3.5	6.0	5.0	5.5	6.5	6.0	6.0
2	---	---	---	4.5	3.5	4.0	6.0	5.0	5.5	7.0	5.5	6.0
3	4.5	4.0	4.0	4.0	3.5	4.0	6.0	5.0	5.5	6.5	6.0	6.0
4	4.5	4.0	4.0	4.0	3.5	3.5	5.5	4.5	5.0	7.0	5.5	6.0
5	4.5	4.0	4.5	4.5	4.0	4.5	6.0	4.5	5.5	7.0	6.0	6.5
6	5.0	4.5	4.5	5.0	4.0	4.5	6.0	5.0	5.5	7.0	6.0	6.5
7	4.5	4.0	4.5	5.0	4.0	5.0	5.5	4.5	5.5	6.0	5.5	5.5
8	4.5	4.0	4.0	5.0	4.5	5.0	5.5	5.0	5.0	7.0	5.5	6.0
9	4.5	4.5	4.5	5.0	4.0	4.5	5.0	4.5	5.0	7.0	5.5	6.5
10	5.0	4.5	4.5	4.5	4.0	4.5	6.0	4.5	5.0	8.0	6.5	7.0
11	5.0	4.5	4.5	4.5	4.0	4.5	6.5	5.0	5.5	8.0	6.0	7.0
12	4.5	4.0	4.5	5.0	4.0	4.5	6.0	5.0	5.5	9.0	6.5	7.5
13	5.0	4.0	4.5	5.0	4.0	4.5	6.0	5.0	5.5	8.0	6.5	7.0
14	4.5	4.0	4.5	5.0	4.5	5.0	6.5	4.5	5.5	8.0	6.0	7.0
15	4.0	3.0	3.5	5.0	4.0	4.5	6.5	5.5	6.0	7.5	6.5	7.0
16	3.0	2.5	2.5	4.5	3.0	4.0	5.5	5.5	5.5	9.0	6.5	7.5
17	2.5	2.0	2.0	4.5	3.0	4.0	5.5	5.0	5.5	9.0	6.5	8.0
18	2.5	2.0	2.0	5.0	4.0	4.5	6.5	5.0	5.5	9.0	7.0	8.0
19	3.0	2.0	2.5	5.0	4.0	4.5	6.5	4.5	5.5	8.5	7.0	7.5
20	3.5	3.0	3.0	5.5	4.5	5.0	6.5	5.5	6.0	7.5	6.5	7.0
21	3.5	3.0	3.5	5.5	4.5	5.0	6.0	5.5	6.0	7.0	6.5	6.5
22	3.5	2.5	3.0	5.0	4.5	5.0	6.0	5.5	6.0	7.5	6.5	7.0
23	3.5	3.0	3.0	5.0	4.5	5.0	6.0	5.5	5.5	9.0	6.5	7.5
24	3.0	2.5	2.5	5.0	4.5	5.0	6.0	5.0	5.5	9.5	7.0	8.0
25	3.0	2.0	2.5	5.5	4.5	5.0	5.5	5.0	5.5	8.0	7.5	8.0
26	3.0	2.0	2.5	5.5	4.5	5.0	5.5	5.0	5.5	9.5	7.5	8.5
27	3.5	2.5	3.0	5.5	4.5	5.0	6.5	5.5	6.0	9.0	7.5	8.5
28	4.0	3.0	3.5	5.5	4.5	5.0	6.5	6.0	6.0	9.0	7.5	8.5
29	---	---	---	6.0	5.0	5.5	7.0	6.0	6.5	8.5	7.5	8.0
30	---	---	---	6.0	5.0	5.5	7.0	6.0	6.5	9.0	8.0	8.5
31	---	---	---	5.5	4.5	5.0	---	---	---	8.5	8.0	8.0
MONTH	---	---	---	6.0	3.0	4.6	7.0	4.5	5.6	9.5	5.5	7.2

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
JUNE			JULY			AUGUST			SEPTEMBER			
1	8.0	7.5	8.0	10.0	9.0	9.5	12.5	10.0	11.0	12.5	10.0	11.0
2	8.5	7.0	8.0	10.0	9.0	9.5	13.0	10.5	12.0	12.5	10.5	11.0
3	8.5	7.5	8.0	10.5	9.0	9.5	13.5	11.0	12.0	13.0	10.5	11.5
4	8.5	7.5	8.0	10.5	9.0	9.5	14.0	11.5	12.5	12.5	10.5	11.5
5	9.5	8.0	8.5	11.0	9.0	10.0	14.0	11.5	13.0	12.5	10.5	11.5
6	9.5	8.5	9.0	10.0	9.0	9.5	13.5	12.0	12.5	12.5	10.5	11.5
7	9.0	8.0	8.5	11.0	8.5	9.5	13.5	11.5	12.5	13.0	11.0	11.5
8	8.5	7.5	8.0	11.5	9.0	10.5	12.0	11.5	12.0	13.0	11.0	12.0
9	8.5	7.5	8.0	11.0	9.5	10.0	11.5	11.0	11.5	13.0	11.0	12.0
10	8.5	7.0	7.5	11.5	9.0	10.0	12.0	11.0	11.5	13.0	11.0	11.5
11	8.5	7.0	8.0	11.0	10.0	10.5	13.0	10.5	11.5	12.0	10.5	11.5
12	9.0	7.0	8.0	10.0	9.0	9.5	13.0	10.5	11.5	12.0	10.0	10.5
13	9.0	7.0	8.0	10.0	9.0	9.5	11.5	11.0	11.5	11.5	9.5	10.0
14	8.5	8.0	8.5	10.0	9.0	9.5	11.0	10.5	11.0	11.0	9.5	10.0
15	9.0	8.0	8.5	10.5	9.0	9.5	11.5	10.0	11.0	11.5	9.5	10.5
16	9.5	7.5	8.5	10.0	9.0	9.5	11.0	10.5	11.0	11.5	9.5	10.5
17	11.0	8.5	9.5	10.5	9.0	10.0	13.0	10.0	11.5	11.5	9.5	10.5
18	10.5	9.0	10.0	12.0	9.0	10.5	13.0	10.5	11.5	11.0	9.0	10.0
19	10.5	9.0	10.0	11.0	9.5	10.5	13.5	11.0	12.0	11.0	9.5	10.0
20	11.0	9.0	10.0	10.0	9.5	10.0	13.5	11.0	12.0	10.5	9.0	9.5
21	9.5	8.5	9.0	11.0	9.5	10.0	12.5	11.5	12.0	10.0	8.5	9.0
22	9.0	8.0	8.5	11.0	9.5	10.0	12.5	11.0	11.5	10.0	8.5	9.0
23	9.5	7.5	8.5	11.0	9.5	10.0	12.0	10.5	11.5	10.0	8.5	9.0
24	10.0	8.0	9.0	10.5	9.5	10.0	11.5	10.0	10.5	9.5	8.5	9.0
25	11.0	8.5	10.0	12.0	9.5	10.5	11.5	9.5	10.5	10.5	8.5	9.0
26	10.5	9.5	10.0	12.5	9.5	11.0	11.5	9.5	10.5	10.5	8.5	9.0
27	10.0	9.0	9.5	11.5	10.5	11.0	12.0	10.0	10.5	10.5	8.5	9.5
28	9.5	8.0	9.0	11.5	10.5	11.0	11.5	10.0	11.0	10.5	9.0	9.5
29	10.0	8.0	9.0	10.5	9.5	10.0	12.0	9.5	10.5	11.0	9.0	10.0
30	9.5	8.5	9.0	10.0	9.0	9.5	12.0	10.0	11.0	11.0	9.5	10.0
31	---	---	---	12.0	9.5	10.5	12.0	10.0	11.0	---	---	---
MONTH	11.0	7.0	8.7	12.5	8.5	10.0	14.0	9.5	11.5	13.0	8.5	10.4

SKOKOMISH RIVER BASIN

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12058800 NORTH FORK SKOKOMISH RIVER BELOW LOWER CUSHMAN DAM, NEAR POTLATCH, WA

LOCATION.--Lat 47°23'27", long 123°12'30", in SE 1/4 SE 1/4 sec.17, T.22 N., R.4 W., Mason County, Hydrologic Unit 17110017, on left bank 1.2 mi downstream from Lower Cushman Dam (Cushman Dam No. 2), 2.8 mi northwest of Potlatch, and at mile 16.5.

DRAINAGE AREA.--102 mi², approximately, includes 99 mi² upstream from Cushman Dam No. 2 which is noncontributing except during spillage.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--June 1988 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 230 ft, from topographic map.

REMARKS.--Records good except for estimated daily discharges, which are fair. Flow regulated by Lower Cushman Dam (Cushman Dam No. 2) 1.2 mi upstream from station. U.S. Geological Survey satellite telemeter at station.

AVERAGE DISCHARGE.--5 years (water years 1989-93), 42.0 ft³/s, 30,430 acre-ft/yr, unadjusted.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 2,470 ft³/s, (due to unscheduled release from Lower Cushman Dam) Sept. 5, 1990, from slope-area measurement, gage height, not determined; minimum discharge, 4.7 ft³/s, June 13-15, 1988.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 222 ft³/s, June 16, gage height, 5.76 ft; minimum discharge, 29 ft³/s, Feb. 14 to Mar. 4.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	32	35	36	36	34	29	30	31	33	38	38	38
2	32	36	35	36	34	29	30	31	34	38	39	38
3	33	35	33	36	34	29	30	31	39	37	39	38
4	33	34	34	36	34	32	30	31	39	38	38	38
5	33	34	34	36	33	31	30	31	38	38	e38	38
6	33	34	34	36	33	30	30	31	38	38	e38	38
7	33	36	33	35	33	30	30	31	38	38	e38	38
8	33	35	35	35	33	30	31	31	38	38	e38	38
9	33	35	36	35	33	30	32	30	39	38	e38	39
10	33	34	36	35	33	30	33	30	38	38	38	39
11	33	34	37	35	30	30	32	30	38	38	38	39
12	33	34	37	35	30	30	31	30	38	38	38	39
13	33	34	36	35	30	30	31	30	38	38	38	39
14	33	34	37	34	30	30	31	30	38	38	37	39
15	33	34	37	35	29	30	31	30	38	39	38	39
16	33	34	36	35	29	30	31	30	77	38	38	39
17	33	34	36	35	29	31	31	30	203	39	38	39
18	34	34	36	35	29	30	31	30	189	39	38	39
19	35	36	34	35	29	30	31	30	46	38	38	39
20	35	36	35	38	29	30	30	30	38	39	38	39
21	34	36	36	37	29	30	30	30	70	38	38	39
22	33	36	36	35	29	33	30	30	71	38	38	38
23	34	36	36	35	29	35	31	32	39	39	38	38
24	34	36	36	36	29	32	32	33	39	38	38	39
25	34	36	36	42	29	31	34	33	39	38	38	39
26	34	36	36	38	29	31	35	33	39	38	38	39
27	34	36	36	37	29	30	34	33	38	38	38	39
28	34	36	36	36	29	30	33	33	39	38	38	38
29	34	36	36	36	---	30	32	33	39	38	38	38
30	33	36	36	35	---	30	32	33	38	38	39	39
31	34	---	36	35	---	30	---	33	---	39	38	---
TOTAL	1035	1052	1103	1110	860	943	939	964	1568	1183	1180	1158
MEAN	33.4	35.1	35.6	35.8	30.7	30.4	31.3	31.1	52.3	38.2	38.1	38.6
MAX	35	36	37	42	34	35	35	33	203	39	39	39
MIN	32	34	33	34	29	29	30	30	33	37	37	38
AC-FT	2050	2090	2190	2200	1710	1870	1860	1910	3110	2350	2340	2300

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1988 - 1993, BY WATER YEAR (WY)

	1988	1989	1990	1991	1992	1993
MEAN	34.5	47.7	44.8	39.1	65.4	33.5
MAX	37.5	95.4	84.5	52.8	183	36.0
(WY)	1992	1991	1992	1992	1990	1991
MIN	33.0	33.6	32.4	33.9	30.7	30.4
(WY)	1990	1990	1989	1991	1993	1993

SUMMARY STATISTICS

FOR 1992 CALENDAR YEAR

FOR 1993 WATER YEAR

WATER YEARS 1988 - 1993

ANNUAL TOTAL	17034	13095	42.0	
ANNUAL MEAN	46.5	35.9	51.4	1992
HIGHEST ANNUAL MEAN			33.1	1989
LOWEST ANNUAL MEAN				
HIGHEST DAILY MEAN	493	203	1800	Aug 31 1991
LOWEST DAILY MEAN	29	29	4.9	Jun 14 1988
ANNUAL SEVEN-DAY MINIMUM	30	29	5.1	Jun 8 1988
ANNUAL RUNOFF (AC-FT)	33790	25970	30400	
10 PERCENT EXCEEDS	36	39	38	
50 PERCENT EXCEEDS	33	35	33	
90 PERCENT EXCEEDS	31	30	30	

e Estimated

SKOKOMISH RIVER BASIN

12058800 NORTH FORK SKOKOMISH RIVER BELOW LOWER CUSHMAN DAM, NEAR POTLATCH, WA--Continued

WATER-QUALITY RECORDS

PERIOD OF DAILY RECORD.--

WATER TEMPERATURE: May 1989 to August 1990, December 1990 to April 1991, August 1993 to September 1993.

INSTRUMENTATION.--Temperature recorder.

EXTREMES FOR PERIOD OF DAILY RECORD.--

WATER TEMPERATURE: Maximum recorded, 13.0°C July 4, 5, Oct. 6, 8-10, 1989; minimum, 4.0°C Feb. 14, 15, 18-20, 1990.

EXTREMES FOR PERIOD AUGUST TO SEPTEMBER 1993.--

WATER TEMPERATURE: Maximum recorded 10.0°C several days in August and September; minimum recorded, 8.0°C Sept. 21.

WATER TEMPERATURE, DEGREES CELSIUS, AUGUST TO SEPTEMBER 1993

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN
AUGUST			SEPTEMBER			
1	---	---	---	9.5	8.5	9.0
2	---	---	---	10.0	8.5	9.0
3	---	---	---	10.0	9.0	9.0
4	---	---	---	10.0	9.0	9.0
5	---	---	---	10.0	9.0	9.0
6	---	---	---	10.0	9.0	9.5
7	---	---	---	10.0	9.0	9.5
8	---	---	---	10.0	9.0	9.5
9	---	---	---	10.0	9.0	9.5
10	---	---	---	10.0	9.0	9.5
11	10.0	9.0	9.5	10.0	9.0	9.5
12	9.5	9.0	9.5	10.0	9.0	9.0
13	9.5	9.0	9.0	9.5	8.5	9.0
14	9.5	9.0	9.5	9.0	8.5	9.0
15	9.5	9.0	9.5	9.5	8.5	9.0
16	9.5	9.0	9.5	9.5	8.5	8.5
17	10.0	9.0	9.5	9.5	8.5	9.0
18	10.0	9.0	9.5	9.0	8.5	8.5
19	10.0	9.0	9.5	9.5	8.5	8.5
20	10.0	9.0	9.5	9.0	8.5	8.5
21	10.0	9.0	9.5	9.5	8.0	8.5
22	10.0	9.0	9.5	9.5	8.5	8.5
23	10.0	9.0	9.5	9.5	8.5	9.0
24	9.5	8.5	9.0	9.0	8.5	9.0
25	9.5	8.5	9.0	9.5	8.5	9.0
26	9.5	8.5	8.5	9.5	8.5	9.0
27	9.0	8.5	8.5	9.5	8.5	9.0
28	9.0	8.5	8.5	10.0	9.0	9.0
29	9.5	8.5	8.5	10.0	9.0	9.0
30	9.5	8.5	9.0	9.5	9.0	9.0
31	9.5	8.5	9.0	---	---	---
MONTH	---	---	---	10.0	8.0	9.0

12059500 NORTH FORK SKOKOMISH RIVER NEAR POTLATCH, WA

LOCATION.--Lat 47°19'42", long 123°14'33", in NE 1/4 NW 1/4 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 upstream from 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 sea level (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 except for estimated daily discharges, which are poor. 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. Water temperatures March 1965 to September 1982.

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

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 600 ft³/s Jan. 25; minimum discharge, 30 ft³/s Oct. 1, 2, 7, 8, 27.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	30	93	e115	68	e132	e43	88	142	67	56	49	42
2	30	89	e94	65	e118	e43	88	129	67	54	49	42
3	32	69	e80	65	e93	e70	91	134	68	55	48	42
4	33	67	e71	63	e88	e200	86	122	68	54	47	42
5	33	59	e64	59	e84	e190	79	113	66	52	47	42
6	33	57	e59	54	e88	e145	82	111	65	52	47	42
7	30	106	e66	54	e90	e116	78	117	64	52	47	42
8	30	80	e90	51	e86	e97	102	113	62	52	47	43
9	33	68	e108	51	e82	e86	147	107	89	51	47	42
10	33	59	e98	50	e84	76	199	104	81	51	46	42
11	33	63	e92	49	e78	72	170	98	75	51	43	42
12	33	58	e87	46	e72	69	144	93	73	51	43	42
13	33	55	e86	45	e70	67	129	87	69	53	43	42
14	33	52	e100	44	e66	67	117	82	70	55	43	42
15	33	49	e99	43	e63	66	117	79	73	53	43	42
16	33	51	e92	43	e60	67	111	75	80	53	43	42
17	33	53	e85	43	e57	116	119	72	222	52	43	42
18	39	52	e84	43	e56	113	119	70	228	51	43	42
19	71	82	e87	59	e54	98	110	69	100	51	43	42
20	73	68	96	119	e52	102	104	73	65	53	43	42
21	59	e105	97	91	e50	96	100	81	83	52	42	42
22	46	e180	85	72	e49	219	99	72	106	51	42	42
23	37	e122	80	66	e47	339	114	69	65	51	43	42
24	35	e92	78	e90	e47	227	165	68	60	51	42	42
25	34	e79	73	e600	e47	171	235	67	58	50	42	42
26	33	e70	72	e450	e45	143	317	66	58	49	42	42
27	30	e118	68	e230	e44	122	282	64	58	49	42	41
28	32	e120	75	e225	e43	109	219	63	56	52	42	40
29	37	e94	77	e220	---	100	185	64	56	54	42	40
30	52	e118	75	e170	---	95	156	63	56	53	42	40
31	74	---	71	e150	---	90	---	68	---	50	42	---
TOTAL	1200	2428	2604	3478	1945	3614	4152	2735	2408	1614	1367	1254
MEAN	38.7	80.9	84.0	112	69.5	117	138	88.2	80.3	52.1	44.1	41.8
MAX	74	180	115	600	132	339	317	142	228	56	49	43
MIN	30	49	59	43	43	43	78	63	56	49	42	40
AC-FT	2380	4820	5170	6900	3860	7170	8240	5420	4780	3200	2710	2490

CAL YR 1992 TOTAL 36150 MEAN 98.8 MAX 1320 MIN 30 AC-FT 71700
WTR YR 1993 TOTAL 28799 MEAN 78.9 MAX 600 MIN 30 AC-FT 57120

e Estimated

LOCATION.--Lat 47°18'36", long 123°10'33", in SE 1/4 NW 1/4 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.

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 sea level. 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 sea level used Nov. 16 to Dec. 10, 1964, June 11 to July 7, and Nov. 2-24, 1965.

REMARKS.--No estimated daily discharges. 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. Chemical analyses August 1960 to September 1961, October 1961 to September 1970 (partial-record station), October 1971 to September 1974. Water temperatures May 1955 to September 1962, October 1963 to September 1982. U.S. Geological Survey satellite telemeter at station.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 36,600 ft³/s, Nov. 23, 1990, gage height, 16.80 ft (floodmark), from rating curve extended above 14,000 ft³/s; minimum discharge, 99 ft³/s, Oct. 27, 28, Nov. 6-9, 1987.

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

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 12,200 ft³/s, Jan. 25, gage height, 15.82 ft; minimum discharge, 152 ft³/s, Oct. 16, 18.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	191	1920	1190	684	1260	389	867	1430	668	381	308	196
2	190	1540	987	641	1130	387	892	1340	658	371	290	195
3	185	1050	851	642	1040	515	965	1390	625	370	277	193
4	181	916	762	616	978	2850	965	1400	605	370	267	192
5	177	790	701	579	956	2460	884	1210	580	356	262	191
6	173	689	656	550	974	1650	874	1130	554	345	257	190
7	170	1410	626	528	978	1240	868	1130	533	335	256	188
8	168	1090	786	512	947	1040	1380	1180	515	328	249	185
9	165	836	1020	492	919	900	2220	1080	692	323	246	184
10	164	698	981	473	945	799	2480	1040	857	317	245	178
11	159	770	950	455	877	726	1920	1010	724	314	240	178
12	159	761	898	442	803	671	1490	948	659	311	236	177
13	159	674	812	432	742	628	1280	927	606	311	236	175
14	159	609	997	420	695	621	1120	845	597	316	236	175
15	159	555	1020	410	656	745	1170	787	662	313	237	174
16	158	570	900	402	619	680	1240	740	638	309	238	173
17	159	591	841	393	586	1140	1850	711	693	303	234	170
18	165	562	748	382	559	1500	1910	695	680	294	229	170
19	408	985	759	438	537	1100	1460	687	588	288	221	170
20	833	926	856	1040	517	1090	1220	740	526	303	218	170
21	856	1410	909	1440	504	1180	1150	934	512	298	218	170
22	787	2130	892	1080	479	2470	1230	989	531	296	214	168
23	728	1440	972	879	462	4810	1670	846	486	288	239	165
24	567	1110	1010	1110	445	2550	3150	757	457	283	243	165
25	464	915	951	7950	429	1780	3920	713	439	278	229	165
26	398	795	891	3310	414	1420	4540	673	428	273	222	166
27	353	1260	841	2350	402	1210	3410	641	415	269	216	166
28	329	1270	854	2270	392	1060	2210	617	404	281	212	160
29	379	1010	838	2210	---	965	1930	659	393	309	210	159
30	1130	1260	791	1690	---	916	1640	631	386	395	201	159
31	1910	---	732	1420	---	864	---	653	---	341	197	---
TOTAL	12183	30542	27022	36240	20245	40356	51905	28533	17111	9869	7383	5267
MEAN	393	1018	872	1169	723	1302	1730	920	570	318	238	176
MAX	1910	2130	1190	7950	1260	4810	4540	1430	857	395	308	196
MIN	158	555	626	382	392	387	867	617	386	269	197	159
AC-FT	24160	60580	53600	71880	40160	80050	103000	56600	33940	19580	14640	10450
CAL YR 1992	TOTAL 365448		MEAN 998	MAX 19800	MIN 146	AC-FT 724900						
WTR YR 1993	TOTAL 286656		MEAN 785	MAX 7950	MIN 158	AC-FT 568600						

BIG BEEF CREEK BASIN

81

12069550 BIG BEEF CREEK NEAR SEABECK, WA

LOCATION.--Lat 47°38'27", long 122°47'02", in NW 1/4 SE 1/4 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, June 1983 to current year (seasonal records).

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

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

REMARKS.--No estimated daily discharges. Records good. 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 discharge, 2.2 ft³/s Aug. 12-17, 1990.

EXTREMES FOR CURRENT YEAR.--Maximum discharge during period May to December 1993, 561 ft³/s Dec. 10, gage height, 5.31 ft; minimum discharge, 2.8 ft³/s several days in September and October.

DISCHARGE, CUBIC FEET PER SECOND, MAY TO DECEMBER 1993
DAILY MEAN VALUES

DAY	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	---	19	7.3	6.7	3.8	2.8	4.0	17
2	---	17	9.6	6.5	3.8	2.8	4.0	14
3	---	15	7.8	6.4	3.8	2.8	4.2	15
4	---	15	7.3	6.1	3.8	2.8	4.0	26
5	---	13	7.1	5.9	3.8	3.0	4.0	18
6	---	13	6.9	5.8	3.8	5.4	4.0	13
7	---	13	6.8	5.6	3.6	4.5	4.0	29
8	---	12	6.6	5.4	3.6	3.4	3.8	52
9	---	17	6.5	5.1	3.6	3.2	3.8	150
10	---	21	6.3	5.1	3.6	3.0	3.8	469
11	---	19	6.2	5.0	3.5	3.0	3.8	274
12	29	18	6.0	4.9	3.5	3.0	3.8	170
13	26	15	5.7	4.9	3.4	3.3	3.8	---
14	23	14	5.7	4.8	3.5	4.2	3.6	---
15	21	13	5.9	4.7	3.2	3.6	4.0	---
16	20	13	6.0	4.9	2.9	3.5	4.0	---
17	18	12	5.9	4.7	2.8	3.4	4.0	---
18	17	11	5.8	4.6	2.9	3.4	3.8	---
19	16	10	5.9	4.4	3.0	3.4	3.8	---
20	17	9.7	7.0	4.4	2.9	3.4	3.9	---
21	24	9.3	6.8	4.5	2.9	3.4	4.6	---
22	21	8.9	7.2	4.5	2.9	3.6	4.5	---
23	19	8.4	6.8	4.6	2.9	5.4	4.0	---
24	17	8.3	6.6	4.4	2.9	5.5	3.9	---
25	15	9.8	6.5	4.4	3.0	4.7	3.9	---
26	14	9.9	6.2	4.3	2.9	4.7	4.0	---
27	13	8.9	6.0	4.3	2.9	4.7	4.0	---
28	12	8.9	6.3	4.2	2.8	4.5	4.2	---
29	12	7.6	7.3	4.1	2.8	4.4	7.7	---
30	13	7.3	7.5	4.0	2.8	4.3	8.0	---
31	18	---	7.1	3.9	---	4.2	---	---
TOTAL	---	377.0	206.6	153.1	97.6	117.3	126.9	---
MEAN	---	12.6	6.66	4.94	3.25	3.78	4.23	---
MAX	---	21	9.6	6.7	3.8	5.5	8.0	---
MIN	---	7.3	5.7	3.9	2.8	2.8	3.6	---
AC-FT	---	748	410	304	194	233	252	---
CFSM	---	.91	.48	.36	.24	.27	.31	---
IN.	---	1.02	.56	.41	.26	.32	.34	---

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.--No estimated daily discharges. Records good. No regulation or diversion upstream from station.

AVERAGE DISCHARGE.--38 years (water years 1948-69, 1978-93), 10.9 ft³/s, 22.88 in/yr, 7,900 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 547 ft³/s, Nov. 24, 1990, gage height, 5.13 ft, from rating curve extended above 185 ft³/s; minimum discharge, 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)
Jan. 25	0500	*40	*2.09				
Minimum discharge, 2.9 ft ³ /s, Sept. 10, 15.							

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3.5	6.6	4.6	4.8	8.0	4.6	7.2	10	7.7	4.9	4.2	3.7
2	3.5	5.3	4.1	4.7	6.9	4.7	7.2	10	6.3	5.3	4.1	3.5
3	3.7	4.3	3.9	5.4	6.4	6.0	8.4	11	5.8	5.2	4.2	3.5
4	3.6	6.1	3.9	5.6	6.3	9.9	7.2	9.6	5.8	4.9	4.1	3.6
5	3.5	4.0	3.9	5.0	5.9	7.2	6.4	8.3	5.8	5.0	4.2	3.5
6	3.5	3.6	3.9	4.7	5.9	6.0	6.4	8.0	5.7	5.0	4.1	3.5
7	3.5	5.6	4.0	4.7	5.9	5.5	6.2	7.6	5.6	5.0	3.8	3.4
8	3.6	4.4	6.9	4.6	5.7	5.1	9.4	7.4	5.6	4.6	3.8	3.3
9	3.5	4.0	7.6	4.5	5.9	5.0	12	6.7	9.0	4.6	3.7	3.2
10	3.5	3.9	9.0	4.5	5.9	4.9	16	7.0	6.7	4.9	3.8	3.1
11	3.5	4.6	10	4.5	5.7	4.8	13	6.7	6.3	4.6	3.8	3.1
12	3.5	4.7	7.4	4.3	5.4	4.8	11	6.1	6.6	5.0	3.8	3.2
13	3.5	4.3	5.9	4.3	8.8	4.8	9.9	5.8	5.9	4.8	3.9	3.2
14	3.5	4.0	5.8	4.5	6.4	4.9	8.9	5.8	5.8	5.0	3.9	3.2
15	3.5	4.0	5.6	4.5	5.3	5.4	11	5.5	7.5	4.9	4.0	3.1
16	3.5	4.7	5.4	4.5	5.0	5.0	11	5.3	7.3	5.1	4.1	3.1
17	3.5	5.1	5.9	4.5	5.0	7.2	11	5.2	5.9	4.7	3.9	3.2
18	3.7	4.6	5.5	4.4	5.1	5.5	11	5.2	5.8	4.9	3.9	3.2
19	4.9	5.7	6.0	7.2	5.2	5.0	8.5	5.3	5.7	4.7	3.8	3.2
20	4.3	4.5	9.4	11	5.2	5.9	7.4	6.6	5.6	5.8	3.9	3.2
21	4.0	9.2	7.1	9.4	5.6	5.4	7.9	7.3	5.5	4.9	3.8	3.2
22	3.8	6.9	6.1	7.3	5.4	15	9.4	5.8	5.1	4.7	3.7	3.2
23	3.6	4.8	5.4	6.4	5.1	24	9.1	6.0	5.1	4.4	3.6	3.2
24	3.5	4.5	5.0	14	5.0	17	9.2	6.0	5.2	4.5	3.7	3.3
25	3.7	4.3	5.2	33	4.9	13	12	5.8	5.3	4.4	3.6	3.3
26	3.5	4.3	5.2	27	4.8	10	17	5.5	5.2	4.3	3.6	3.3
27	3.5	5.8	4.9	18	4.8	8.9	16	5.7	5.0	4.2	3.6	3.2
28	3.5	5.0	5.8	14	4.8	7.7	13	5.5	5.3	4.5	3.6	3.4
29	3.7	4.3	5.3	12	---	6.8	12	5.6	5.0	4.8	3.6	4.5
30	4.4	5.2	5.2	11	---	6.5	10	7.9	5.1	4.8	3.6	4.4
31	6.6	---	4.9	9.0	---	6.2	---	8.7	---	4.4	3.6	---
TOTAL	116.6	148.3	178.8	263.3	160.3	232.7	304.7	212.9	178.2	148.8	119.0	101.0
MEAN	3.76	4.94	5.77	8.49	5.72	7.51	10.2	6.87	5.94	4.80	3.84	3.37
MAX	6.6	9.2	10	33	8.8	24	17	11	9.0	5.8	4.2	4.5
MIN	3.5	3.6	3.9	4.3	4.8	4.6	6.2	5.2	5.0	4.2	3.6	3.1
AC-FT	231	294	355	522	318	462	604	422	353	295	236	200
CFSM	.58	.76	.89	1.31	.88	1.16	1.57	1.06	.92	.74	.59	.52
IN.	.67	.85	1.03	1.51	.92	1.34	1.75	1.22	1.02	.86	.68	.58

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1947 - 1993, BY WATER YEAR (WY)

	5.47	10.2	17.0	23.0	22.0	15.6	10.5	7.42	5.99	5.01	4.56	4.67
MEAN	5.47	10.2	17.0	23.0	22.0	15.6	10.5	7.42	5.99	5.01	4.56	4.67
MAX	8.83	29.2	36.8	47.1	54.6	38.8	24.6	12.3	8.60	7.31	6.18	6.68
(WY)	1957	1991	1956	1966	1961	1950	1991	1959	1984	1961	1968	1978
MIN	3.45	4.13	4.97	5.37	5.72	7.23	6.17	4.77	4.47	4.00	3.44	3.23
(WY)	1988	1953	1953	1979	1993	1992	1952	1952	1989	1989	1980	1989

SUMMARY STATISTICS

FOR 1992 CALENDAR YEAR

FOR 1993 WATER YEAR

WATER YEARS 1947 - 1993

ANNUAL TOTAL	3022.5	2164.6	
ANNUAL MEAN	8.26	5.93	
HIGHEST ANNUAL MEAN			10.9
LOWEST ANNUAL MEAN			17.1
HIGHEST DAILY MEAN	136	33	355
LOWEST DAILY MEAN	3.5	3.1	3.0
ANNUAL SEVEN-DAY MINIMUM	3.5	3.1	3.1
ANNUAL RUNOFF (AC-FT)	6000	4290	7900
ANNUAL RUNOFF (CFSM)	1.28	.92	1.68
ANNUAL RUNOFF (INCHES)	17.38	12.45	22.89
10 PERCENT EXCEEDS	12	9.4	21
50 PERCENT EXCEEDS	5.0	5.0	6.7
90 PERCENT EXCEEDS	3.6	3.5	4.2

CASE INLET BASIN

83

12073550 UNNAMED TRIBUTARY TO BEAVER CREEK, NEAR HERRRON, WA

LOCATION.--Lat 47°16'48", long 122°48'01", in SW 1/4 NW 1/4 sec.27, T.21 N. R.1 W., Pierce County, Hydrologic Unit 17110019, 1.7 mi west of Home, and 0.5 mi upstream from mouth.

DRAINAGE AREA.--0.21 mi².

PERIOD OF RECORD.--November 1991 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 155 ft, from topographic map.

REMARKS.--Records good except for estimated daily discharges, which are fair. No regulation or diversion upstream from station.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 5.1 ft³/s Jan. 25, 1993, gage height, 1.84 ft; minimum discharge, no flow many days each year.

EXTREMES FOR PERIOD.--

Water year 1992: Maximum discharge, 4.7 ft³/s Jan. 28, gage height, 1.74 ft; minimum discharge, no flow all or parts of the months May to September.

Water year 1993: Maximum discharge, 5.1 ft³/s Jan. 25, gage height, 1.84 ft; minimum discharge, no flow all or parts of the months October, August and September.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1991 TO SEPTEMBER 1992
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	---	e.06	.17	1.9	.20	.05	.13	.00	.00	.00	.00
2	---	---	e.05	.65	1.3	.18	.05	.10	.00	.00	.00	.00
3	---	---	e.05	.56	1.1	.18	.04	.08	.00	.00	.00	.00
4	---	---	e.20	.59	.75	.18	.05	.07	.00	.00	.00	.00
5	---	e.01	e.40	.46	.54	.21	.16	.06	.00	.00	.00	.00
6	---	e.00	e.55	.32	.41	.22	.13	.06	.00	.00	.00	.00
7	---	e.00	e.35	.23	.35	.21	.10	.04	.00	.00	.00	.00
8	---	e.00	e.28	.18	.40	.19	.08	.04	.00	.00	.00	.00
9	---	e.00	e.25	.15	.35	.17	.08	.04	.00	.00	.00	.00
10	---	e.00	e.23	.23	.30	.16	.08	.04	.00	.00	.00	.00
11	---	e.03	.21	.27	.26	.13	.07	.03	.00	.00	.00	.00
12	---	e.03	.25	.22	.23	.12	.09	.03	.00	.00	.00	.00
13	---	e.03	.20	.18	.24	.12	.10	.03	.00	.00	.00	.00
14	---	e.03	.16	.15	.27	.11	.11	.02	.00	.00	.00	.00
15	---	e.02	.13	.14	.38	.11	.10	.02	.00	.00	.00	.00
16	---	e.03	.11	.19	.31	.11	.17	.02	.00	.00	.00	.00
17	---	e.06	.10	.18	.29	.11	1.0	.02	.00	.00	.00	.00
18	---	e.05	.15	.15	.48	.11	.73	.02	.00	.00	.00	.00
19	---	e.15	.15	.14	.49	.10	.41	.01	.00	.00	.00	.00
20	---	e.20	.13	.12	.60	.14	.25	.01	.00	.00	.00	.00
21	---	e.10	.17	.14	1.1	.19	.17	.00	.00	.00	.00	.00
22	---	e.08	.15	.14	1.6	.17	.16	.00	.00	.00	.00	.00
23	---	e.05	.12	1.3	.97	.14	.12	.00	.00	.00	.00	.00
24	---	e.06	.11	1.9	.73	.11	.11	.00	.00	.00	.00	.00
25	---	e.12	.11	1.1	.53	.09	.09	.00	.00	.00	.00	.00
26	---	e.10	.11	.80	.39	.08	.07	.00	.00	.00	.00	.00
27	---	e.10	.13	1.8	.31	.08	.07	.00	.00	.00	.00	.00
28	---	e.09	.13	4.1	.26	.07	.07	.00	.00	.00	.00	.00
29	---	e.08	.13	3.0	.22	.06	.24	.00	.00	.00	.00	.00
30	---	e.07	.13	2.5	---	.05	.21	.00	.00	.00	.00	.00
31	---	---	.12	2.9	---	.05	---	.00	---	.00	.00	---
TOTAL	---	---	5.42	24.96	17.06	4.15	5.16	0.87	0.00	0.00	0.00	0.00
MEAN	---	---	.17	.81	.59	.13	.17	.028	.000	.000	.000	.000
MAX	---	---	.55	4.1	1.9	.22	1.0	.13	.00	.00	.00	.00
MIN	---	---	.05	.12	.22	.05	.04	.00	.00	.00	.00	.00
AC-FT	---	---	11	50	34	8.2	10	1.7	.00	.00	.00	.00

e Estimated

CASE INLET BASIN

12073550 UNNAMED TRIBUTARY TO BEAVER CREEK, NEAR HERRON, WA--Continued

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.05	.03	.08	.31	.03	.15	.36	.11	.03	.02	.00
2	.00	.05	.03	.07	.24	.03	.18	.33	.08	.03	.01	.00
3	.00	.03	.02	.09	.20	.05	.26	.36	.06	.02	.01	.00
4	.00	.03	.02	.10	.17	.11	.25	.37	.05	.05	.01	.00
5	.00	.03	.02	.08	.14	.10	.21	.31	.04	.07	.01	.00
6	.00	.01	.02	.07	.12	.10	.21	.26	.04	.08	.00	.00
7	.00	.04	.02	.06	.10	.09	.21	.23	.03	.10	.00	.00
8	.00	.02	.05	.05	.09	.08	.32	.24	.03	.06	.00	.00
9	.00	.01	.12	.04	.08	.07	.48	.20	.09	.04	.00	.00
10	.00	.01	.11	.04	.08	.06	.79	.19	.08	.03	.00	.00
11	.00	.01	.27	.03	.07	.05	.67	.15	.08	.02	.00	.00
12	.00	.02	.46	.03	.06	.05	.50	.12	.08	.02	.00	.00
13	.00	.01	.36	.03	.06	.04	.43	.11	.06	.02	.00	.00
14	.00	.01	.27	.03	.05	.05	.37	.12	.06	.02	.00	.00
15	.00	.01	.19	.02	.05	.07	.43	.09	.08	.02	.00	.00
16	.00	.01	.15	.02	.04	.08	.44	.07	.07	.02	.00	.00
17	.00	.02	.16	.02	.04	.13	.49	.06	.05	.02	.00	.00
18	.00	.02	.15	.03	.04	.13	.54	.04	.04	.02	.00	.00
19	.00	.04	.17	.10	.03	.11	.44	.04	.03	.01	.00	.00
20	.00	.02	.36	.54	.03	.12	.36	.05	.03	.02	.00	.00
21	.00	.25	.35	.77	.04	.12	.34	.07	.02	.02	.00	.00
22	.00	.10	.28	.65	.04	.73	.44	.06	.02	.02	.00	.00
23	.00	.04	.21	.46	.04	1.9	.27	.04	.02	.02	.00	.00
24	.00	.03	.17	.91	.03	.90	.50	.03	.02	.01	.00	.00
25	.00	.03	.13	4.1	.03	.54	.71	.03	.02	.01	.00	.00
26	.00	.03	.12	2.1	.03	.39	.75	.02	.04	.02	.00	.00
27	.00	.03	.11	1.1	.02	.30	.68	.02	.09	.02	.00	.00
28	.00	.02	.13	.72	.03	.22	.51	.02	.07	.02	.00	.00
29	.00	.02	.12	.55	---	.17	.47	.02	.02	.03	.00	.00
30	.00	.05	.11	.43	---	.15	.42	.04	.03	.03	.00	.00
31	.01	---	.09	.37	---	.13	---	.08	---	.02	.00	---
TOTAL	0.01	1.05	4.80	13.69	2.26	7.10	12.82	4.13	1.54	0.92	0.06	0.00
MEAN	.000	.035	.15	.44	.081	.23	.43	.13	.051	.030	.002	.000
MAX	.01	.25	.46	4.1	.31	1.9	.79	.37	.11	.10	.02	.00
MIN	.00	.01	.02	.02	.02	.03	.15	.02	.02	.01	.00	.00
AC-FT	.02	2.1	9.5	27	4.5	14	25	8.2	3.1	1.8	.1	.00
CAL YR 1992	TOTAL 58.06	MEAN .16	MAX 4.1	MIN .00	AC-FT 115							
WTR YR 1993	TOTAL 48.38	MEAN .13	MAX 4.1	MIN .00	AC-FT 96							

VAUGHN BAY BASIN

85

12073600 UNNAMED CREEK NEAR KEY CENTER, WA

LOCATION.--Lat 47°21'13", long 122°44'36", in NW 1/4 SE 1/4 sec.36, T.22 N., R.1 W., Pierce County, Hydrologic Unit 17110019, 0.8 mi north of Key Center.

DRAINAGE AREA.--0.20 mi².

PERIOD OF RECORD.--October 1991 to current year.

GAGE.--Water-stage recorder. Datum of gage is 160 ft, from topographic map.

REMARKS.--Records good, except for estimated daily discharges, which are fair. No regulation or diversion upstream from station.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 9.2 ft³/s Jan. 28, 1992, gage height, 2.31 ft; minimum discharge, no flow most days each year.

EXTREMES FOR PERIOD.--

Water year 1992: Maximum discharge, 9.2 ft³/s Jan. 28, gage height, 2.31 ft; minimum discharge, no flow all or parts of the months October to December and March to September.

Water year 1993: Maximum discharge, 6.2 ft³/s Jan. 25, gage height, 1.87 ft; minimum discharge, no flow all or parts of the months October to March and May to September.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1991 TO SEPTEMBER 1992
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.00	.00	e.00	2.2	.05	.00	.00	.00	.00	.00	.00
2	.00	.00	.00	e.00	1.5	.04	.00	.00	.00	.00	.00	.00
3	.00	.00	e.00	e.01	1.3	.03	.00	.00	.00	.00	.00	.00
4	.00	.00	e.10	.03	.77	.03	.00	.00	.00	.00	.00	.00
5	.00	.00	e.60	.02	.48	.03	.00	.00	.00	.00	.00	.00
6	.00	.00	e.50	.02	.31	.03	.00	.00	.00	.00	.00	.00
7	.00	.00	e.35	.02	.21	.02	.00	.00	.00	.00	.00	.00
8	.00	.00	e.20	e.01	.19	.02	.00	.00	.00	.00	.00	.00
9	.00	.00	e.30	e.01	.16	.02	.00	.00	.00	.00	.00	.00
10	.00	.00	e.20	.02	.12	.02	.00	.00	.00	.00	.00	.00
11	.00	.00	.15	.02	.08	.01	.00	.00	.00	.00	.00	.00
12	.00	.00	.13	e.02	.06	.01	.00	.00	.00	.00	.00	.00
13	.00	.00	.08	e.02	.05	.01	.00	.00	.00	.00	.00	.00
14	.00	.00	.05	e.01	.05	.01	.00	.00	.00	.00	.00	.00
15	.00	.00	.03	e.01	.07	.01	.00	.00	.00	.00	.00	.00
16	.00	.00	.02	e.01	.05	.01	.00	.00	.00	.00	.00	.00
17	.00	.00	.02	.01	.04	.01	.01	.00	.00	.00	.00	.00
18	.00	.00	.02	e.01	.08	.01	.01	.00	.00	.00	.00	.00
19	.00	.00	e.02	e.01	.07	.00	.00	.00	.00	.00	.00	.00
20	.00	.00	.01	e.01	.13	.00	.00	.00	.00	.00	.00	.00
21	.00	.00	e.00	e.01	.54	.01	.00	.00	.00	.00	.00	.00
22	.00	.00	e.00	.01	1.5	.01	.00	.00	.00	.00	.00	.00
23	.00	.00	e.00	.08	.78	.00	.00	.00	.00	.00	.00	.00
24	.00	.00	e.00	1.0	.50	.00	.00	.00	.00	.00	.00	.00
25	.00	.00	e.00	.65	.30	.00	.00	.00	.00	.00	.00	.00
26	.00	.00	e.00	.34	.19	.00	.00	.00	.00	.00	.00	.00
27	.00	.00	e.00	1.7	.14	.00	.00	.00	.00	.00	.00	.00
28	.00	.00	e.00	6.3	.09	.00	.00	.00	.00	.00	.00	.00
29	.00	.00	e.00	4.6	.07	.00	.00	.00	.00	.00	.00	.00
30	.00	.00	e.00	3.3	---	.00	.00	.00	.00	.00	.00	.00
31	.00	---	.00	4.2	---	.00	---	.00	---	.00	.00	---
TOTAL	0.00	0.00	2.78	22.46	12.03	0.39	0.02	0.00	0.00	0.00	0.00	0.00
MEAN	.000	.000	.090	.72	.41	.013	.001	.000	.000	.000	.000	.000
MAX	.00	.00	.60	6.3	2.2	.05	.01	.00	.00	.00	.00	.00
MIN	.00	.00	.00	.00	.04	.00	.00	.00	.00	.00	.00	.00
AC-FT	.00	.00	5.5	45	24	.8	.04	.00	.00	.00	.00	.00

WTR YR 1992 TOTAL 37.68 MEAN .10 MAX 6.3 MIN .00 AC-FT 75

e Estimated

VAUGHN BAY BASIN

12073600 UNNAMED CREEK NEAR KEY CENTER, WA--Continued

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.00	.00	.00	.07	.00	.01	.02	.00	.00	.00	.00
2	.00	.00	.00	.00	.05	.00	.01	.02	.00	.00	.00	.00
3	.00	.00	.00	.00	.03	.00	.02	.03	.00	.00	.00	.00
4	.00	.00	.00	.00	.02	.00	.02	.03	.00	.00	.00	.00
5	.00	.00	.00	.00	.02	.00	.01	.02	.00	.00	.00	.00
6	.00	.00	.00	.00	.01	.00	.01	.02	.00	.00	.00	.00
7	.00	.00	.00	.00	.01	.00	.01	.02	.00	.00	.00	.00
8	.00	.00	.00	.00	.01	.00	.01	.01	.00	.00	.00	.00
9	.00	.00	.00	.00	.01	.00	.03	.01	.00	.00	.00	.00
10	.00	.00	.00	.00	.01	.00	.07	.01	.00	.00	.00	.00
11	.00	.00	.00	.00	.00	.00	.20	.01	.00	.00	.00	.00
12	.00	.00	.00	.00	.00	.00	.12	.01	.00	.00	.00	.00
13	.00	.00	.00	.00	.00	.00	.08	.01	.00	.00	.00	.00
14	.00	.00	.00	.00	.00	.00	.06	.01	.00	.00	.00	.00
15	.00	.00	.00	.00	.00	.00	.07	.01	.00	.00	.00	.00
16	.00	.00	.00	.00	.00	.00	.06	.00	.00	.00	.00	.00
17	.00	.00	.00	.00	.00	.00	.07	.00	.00	.00	.00	.00
18	.00	.00	.00	.00	.00	.00	.04	.04	.00	.00	.00	.00
19	.00	.00	.00	.00	.00	.00	.03	.00	.00	.00	.00	.00
20	.00	.00	.00	.00	.00	.00	.02	.00	.00	.00	.00	.00
21	.00	.00	.00	.00	.00	.00	.02	.00	.00	.00	.00	.00
22	.00	.00	.01	.00	.00	.00	.02	.00	.00	.00	.00	.00
23	.00	.00	.00	.01	.00	.20	.02	.00	.00	.00	.00	.00
24	.00	.00	.00	.26	.00	.42	.02	.00	.00	.00	.00	.00
25	.00	.00	.00	4.6	.00	.21	.04	.00	.00	.00	.00	.00
26	.00	.00	.00	2.1	.00	.11	.10	.02	.00	.00	.00	.00
27	.00	.00	.00	1.0	.00	.06	.13	.00	.00	.00	.00	.00
28	.00	.00	.00	.55	.00	.03	.08	.00	.00	.00	.00	.00
29	.00	.00	.00	.32	---	.02	.06	.00	.00	.00	.00	.00
30	.00	.00	.00	.19	---	.02	.04	.00	.00	.00	.00	.00
31	.00	---	.00	.12	---	.01	---	.00	---	.00	.00	---
TOTAL	0.00	0.00	0.01	9.15	0.24	1.08	1.48	0.30	0.00	0.00	0.00	0.00
MEAN	.000	.000	.000	.30	.009	.035	.049	.010	.000	.000	.000	.000
MAX	.00	.00	.01	4.6	.07	.42	.20	.04	.00	.00	.00	.00
MIN	.00	.00	.00	.00	.00	.00	.01	.00	.00	.00	.00	.00
AC-FT	.00	.00	.02	18	.5	2.1	2.9	.6	.00	.00	.00	.00
CAL YR 1992	TOTAL 34.91	MEAN .095	MAX 6.3	MIN .00	AC-FT 69							
WTR YR 1993	TOTAL 12.26	MEAN .034	MAX 4.6	MIN .00	AC-FT 24							

87

LOCATION.--Lat 46°51'08", long 122°40'03", in SE 1/4 SW 1/4 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.

PERIOD OF RECORD.--June 1949 to September 1975; water years 1976-79 (annual maximum); June 1980 to July 1982; June 1983 to October 1987 (seasonal records); October 1987 to current year.

GAGE.--Water-stage recorder and crest-stage gage. Datum of gage is 348.77 ft above sea level.

REMARKS.--No estimated daily discharges. Records good. Probably some small diversions for irrigation and domestic use upstream from station. No regulation. U.S. Geological Survey satellite telemeter at station. Chemical analyses July 1959 to July 1960, October 1971 to September 1972. Water temperatures August 1968 to September 1970.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 9,600 ft³/s Jan. 9, 1990, gage height, 17.01 ft, from outside high-water mark, from rating curve extended above 3,900 ft³/s; minimum discharge, 16 ft³/s Sept. 7, 1963, gage height, 2.60 ft.

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Mar. 23	0700	*1.660	*7.36				

Minimum discharge, 27 ft³/s Oct. 11, 12.

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	33	152	239	115	255	70	153	240	566	71	63	37
2	34	209	180	103	222	74	158	225	339	71	60	36
3	35	150	142	104	201	79	234	232	245	68	58	35
4	36	124	118	124	184	142	313	272	202	69	56	35
5	33	106	102	110	175	338	248	252	180	66	54	35
6	31	89	91	95	168	262	207	233	161	63	52	35
7	30	124	84	86	163	204	186	216	151	61	52	38
8	28	156	95	82	159	171	255	239	136	58	51	34
9	28	139	227	75	159	153	723	227	145	57	50	34
10	28	114	300	69	157	138	691	247	227	56	48	32
11	28	100	545	62	149	124	895	224	218	55	48	32
12	27	94	302	58	134	113	745	201	196	58	48	32
13	28	85	200	58	122	105	500	177	169	57	47	33
14	29	77	278	58	115	106	378	161	152	69	46	32
15	28	70	329	56	108	234	316	148	151	64	48	32
16	28	66	224	53	101	228	305	136	136	65	48	31
17	31	63	187	51	93	225	294	126	123	75	49	30
18	31	69	149	49	90	236	331	118	112	66	46	30
19	35	149	133	54	89	213	318	111	104	61	44	30
20	46	162	403	589	88	219	275	118	97	83	42	31
21	48	351	492	852	86	217	237	120	92	105	42	31
22	53	710	383	502	82	272	225	156	103	88	41	30
23	49	376	340	304	79	1370	219	146	104	85	42	29
24	45	220	288	279	76	802	256	132	93	81	44	29
25	42	154	225	1020	73	473	403	121	87	76	42	29
26	40	122	193	1050	71	328	622	114	82	72	40	29
27	39	139	185	750	70	252	597	107	81	68	39	29
28	37	195	177	550	69	207	451	106	80	67	39	29
29	40	156	165	471	---	180	352	140	77	73	39	28
30	51	220	146	370	---	161	286	132	73	76	38	28
31	91	---	128	303	---	149	---	501	---	68	37	---
TOTAL	1162	4941	7050	8502	3538	7845	11173	5678	4682	2152	1453	955
MEAN	37.5	165	227	274	126	253	372	183	156	69.4	46.9	31.8
MAX	91	710	545	1050	255	1370	895	501	566	105	63	38
MIN	27	63	84	49	69	70	153	106	73	55	37	28
AC-FT	2300	9800	13980	16860	7020	15560	22160	11260	9290	4270	2880	1890
CFSM	.42	1.83	2.53	3.05	1.41	2.82	4.15	2.04	1.74	.77	.52	.35
IN.	.48	2.05	2.92	3.52	1.47	3.25	4.63	2.35	1.94	.89	.60	.44

MEAN	100	333	497	589	518	409	317	164	104	55.6	40.6	42.8
MAX	274	725	1063	1071	943	839	659	287	233	110	74.1	89.7
(WY)	1956	1961	1956	1953	1954	1972	1991	1960	1990	1974	1968	1968
MIN	23.1	35.9	189	162	126	116	118	89.3	42.8	37.6	24.0	25.1
(WY)	1988	1953	1953	1957	1993	1992	1973	1992	1992	1970	1992	1952

ANNUAL TOTAL	57077		59131			
ANNUAL MEAN	156		162		261	
HIGHEST ANNUAL MEAN					389	1974
LOWEST ANNUAL MEAN					162	1993
HIGHEST DAILY MEAN	2990	Jan 28	1370	Mar 23	6000	Jan 9 1990
LOWEST DAILY MEAN	20	Sep 2	27	Oct 12	20	Sep 2 1992
ANNUAL SEVEN-DAY MINIMUM	21	Aug 28	28	Oct 8	21	Aug 28 1992
ANNUAL RUNOFF (AC-FT)	113200		117300		189300	
ANNUAL RUNOFF (CFSM)	1.74		1.80		2.91	
ANNUAL RUNOFF (INCHES)	23.64		24.50		39.54	
10 PERCENT EXCEEDS	301		330		594	
50 PERCENT EXCEEDS	81		106		128	
90 PERCENT EXCEEDS	25		34		35	

DESCHUTES RIVER BASIN

12080010 DESCHUTES RIVER AT E STREET BRIDGE, AT TUMWATER, WA

LOCATION.--Lat 47°00'43", long 122°54'07", in NW 1/4 Land Grant parcel 60, T.18 N., R.2 W., Thurston County, Hydrologic Unit 17110016, 0.2 mi upstream from Capitol Boulevard, and at mile 2.4.

DRAINAGE AREA.--162 mi².

PERIOD OF RECORD.--October 1990 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 75 ft, from topographic map.

REMARKS.--Records good except for estimated daily discharges, which are poor. Some small diversions for irrigation and domestic use upstream from station. No regulation. Miscellaneous discharge measurement site 1971-72, 1975, 1977-90.

AVERAGE DISCHARGE.--3 years, 330 ft³/s, 27.66 in/yr, 239,100 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 8,850 ft³/s Apr. 6, 1991, gage height, 32.32 ft; minimum daily discharge, 58 ft³/s Oct. 13, 1992.

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)
Mar. 23	unknown	a*1,700	unknown				

Minimum daily discharge, 58 ft³/s Oct. 13.

a Maximum daily discharge.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	78	e300	e490	222	435	163	e240	417	805	151	119	90
2	78	e430	e380	204	387	164	e270	386	538	149	115	87
3	79	e350	e300	204	355	169	e350	386	408	146	113	85
4	80	e270	e250	238	331	192	e470	423	347	144	111	83
5	80	e230	e200	229	313	358	e380	415	312	142	108	82
6	80	e200	e170	203	302	366	e320	397	286	137	107	82
7	78	e250	e145	189	293	312	318	377	267	133	106	82
8	e72	e330	e130	179	284	275	322	387	248	131	106	83
9	e66	e300	e400	168	280	251	709	384	246	135	105	80
10	e60	e250	e640	156	274	233	897	390	314	127	108	79
11	e60	e220	e760	146	265	e220	948	380	342	125	107	77
12	e60	e200	e560	138	253	e200	1010	351	331	124	106	77
13	e58	e180	e450	134	239	e190	733	325	296	124	107	78
14	e62	e170	e520	131	228	e200	583	298	269	126	107	79
15	e60	e155	e600	128	218	e370	496	280	267	131	107	77
16	e60	e145	e450	124	209	e360	471	263	251	130	110	77
17	e64	e135	e370	119	200	e355	455	248	234	136	110	76
18	e66	e150	e320	116	194	e380	470	232	218	134	111	75
19	e76	e300	e270	122	191	e340	480	224	205	126	108	75
20	e96	e350	e600	297	189	e345	441	230	195	132	110	75
21	e100	e700	e660	1010	187	e355	410	230	188	159	e105	77
22	e110	e1000	532	688	183	e700	395	253	192	160	e101	73
23	e108	e700	457	468	178	e1700	377	261	197	149	e101	74
24	e100	e450	422	404	173	e1200	382	242	187	146	e101	74
25	e90	e300	367	858	169	e700	476	225	178	140	e105	75
26	e78	e250	323	1330	166	e500	735	217	172	134	e104	75
27	e72	e300	312	1020	162	e380	776	207	167	128	98	74
28	e68	e410	306	756	160	e330	669	205	165	127	97	74
29	e74	e320	293	661	---	e280	554	235	162	128	95	73
30	e100	e450	271	562	---	e250	471	235	158	134	95	74
31	e180	---	243	485	---	e230	---	369	---	128	93	---
TOTAL	2493	9795	12191	11689	6818	12068	15608	9472	8145	4216	3276	2342
MEAN	80.4	326	393	377	243	389	520	306	271	136	106	78.1
MAX	180	1000	760	1330	435	1700	1010	423	805	160	119	90
MIN	58	135	130	116	160	163	240	205	158	124	93	73
AC-FT	4940	19430	24180	23190	13520	23940	30960	18790	16160	8360	6500	4650
CFSM	.50	2.02	2.43	2.33	1.50	2.40	3.21	1.89	1.68	.84	.65	.48
IN.	.57	2.25	2.80	2.68	1.57	2.77	3.58	2.18	1.87	.97	.75	.54

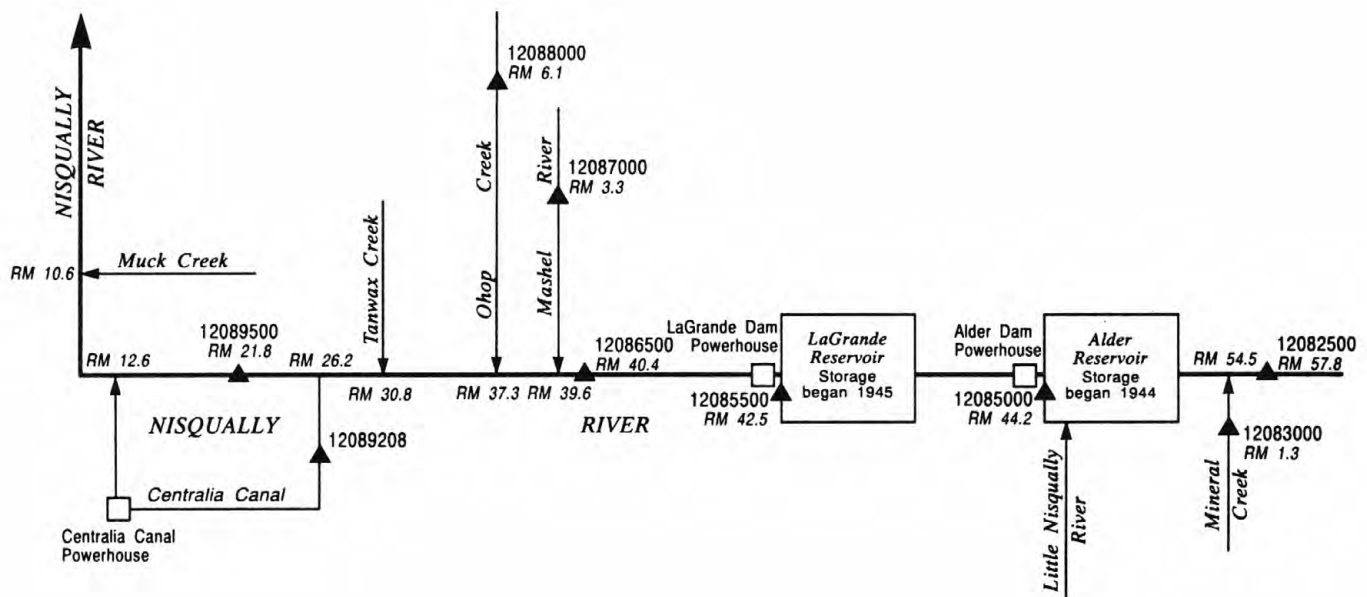
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1990 - 1993, BY WATER YEAR (WY)

	1990	1991	1992	1993
MEAN	104	483	464	542
MAX	142	812	641	631
(WY)	1991	1991	1991	1992
MIN	80.4	310	358	377
(WY)	1993	1992	1992	1993

SUMMARY STATISTICS FOR 1992 CALENDAR YEAR FOR 1993 WATER YEAR WATER YEARS 1990 - 1993

ANNUAL TOTAL	95939	98113	330
ANNUAL MEAN	262	269	463
HIGHEST ANNUAL MEAN			259
LOWEST ANNUAL MEAN			6010
HIGHEST DAILY MEAN	3560	1700	Mar 23
LOWEST DAILY MEAN	58	58	Oct 13
ANNUAL SEVEN-DAY MINIMUM	60	60	Oct 10
ANNUAL RUNOFF (AC-FT)	190300	194600	239100
ANNUAL RUNOFF (CFSM)	1.62	1.66	2.04
ANNUAL RUNOFF (INCHES)	22.03	22.53	27.68
10 PERCENT EXCEEDS	520	498	640
50 PERCENT EXCEEDS	177	205	219
90 PERCENT EXCEEDS	66	78	78

e Estimated



EXPLANATION

- ▲ 12085000 Stream-gaging station
- ▼ 14142500 Water-quality data collection site
- ▲ 12396000 Crest-stage gaging station
- RM 37.3 River mile
- Stream—Arrow shows direction of flow
- Tunnel or pipe—Arrow shows direction of flow

Figure 9. Gaging stations in Nisqually River Basin.

NISQUALLY RIVER BASIN

12082500 NISQUALLY RIVER NEAR NATIONAL, WA

LOCATION.--Lat 46°45'10", long 122°04'57", in SW 1/4 SW 1/4 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 except for estimated daily discharges, which are fair. Small diversions for domestic use. Water temperatures published October 1951 to September 1982. U.S. Geological Survey satellite telemeter at station.

AVERAGE DISCHARGE.--51 years, 764 ft³/s, 78.01 in/yr, 553,500 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 discharge, 100 ft³/s, Nov. 10, 17, 1987.

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)
Mar. 23	0630	*3,440	*6.37	No other peak greater than base discharge.			
Minimum discharge, 181 ft ³ /s Oct. 16.							

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	380	418	596	398	583	240	614	1060	1090	549	e675	374
2	395	514	531	379	545	236	684	1090	913	550	e710	407
3	356	418	480	362	518	287	833	1020	828	554	e700	440
4	326	578	442	353	494	375	822	983	776	518	e660	453
5	e297	506	423	350	490	465	719	914	835	509	e630	443
6	e289	428	401	345	496	495	669	1020	862	511	e580	443
7	284	823	382	335	505	494	636	987	874	514	e560	440
8	258	673	384	e325	518	513	733	965	806	529	e540	431
9	e250	571	393	e320	534	514	979	919	929	540	e520	418
10	e270	488	385	e315	544	489	941	1030	1010	521	e500	418
11	e270	581	386	e305	521	459	e940	1490	904	526	488	418
12	e260	734	355	e295	483	429	e880	2170	877	487	497	401
13	e350	648	350	e285	451	406	e820	2020	804	452	496	368
14	e238	603	377	275	423	484	e740	1650	855	467	477	351
15	200	542	442	256	403	1010	696	1400	1040	479	418	328
16	191	485	458	251	363	893	e710	1220	977	501	444	305
17	237	452	463	244	333	776	e740	1190	924	519	445	292
18	219	454	461	238	e332	890	778	1370	933	493	469	279
19	361	528	445	232	e327	799	738	1500	931	558	465	268
20	354	489	452	270	322	816	687	1510	844	710	498	255
21	313	652	468	320	304	742	e750	1410	790	683	486	241
22	274	896	477	326	290	1090	749	1240	742	736	443	228
23	292	900	487	325	279	2980	e720	1060	678	788	463	223
24	302	668	490	318	268	1980	e800	1050	600	759	443	231
25	275	556	486	799	254	1370	e1000	1040	609	731	365	234
26	239	490	481	1400	244	1060	e1100	944	697	691	321	244
27	221	515	481	1180	239	873	e1060	976	764	683	313	267
28	205	578	470	932	237	745	950	964	672	723	321	313
29	204	544	454	789	---	676	1000	964	658	813	317	360
30	216	660	436	687	---	609	1100	922	571	810	334	351
31	266	---	420	627	---	561	---	1220	---	684	364	---
TOTAL	8592	17392	13756	13836	11300	23756	24588	37298	24793	18588	14942	10224
MEAN	277	580	444	446	404	766	820	1203	826	600	482	341
MAX	395	900	596	1400	583	2980	1100	2170	1090	813	710	453
MIN	191	418	350	232	237	236	614	914	571	452	313	223
AC-FT	17040	34500	27290	27440	22410	47120	48770	73980	49180	36870	29640	20280
CFSM	2.08	4.36	3.34	3.36	3.03	5.76	6.16	9.05	6.21	4.51	3.62	2.56
IN.	2.40	4.86	3.85	3.87	3.16	6.64	6.88	10.43	6.93	5.20	4.18	2.86

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1942 - 1993, BY WATER YEAR (WY)

	MEAN	MAX	MIN	(WY)	MEAN	MAX	MIN	(WY)	MEAN	MAX	MIN	(WY)	MEAN	MAX	MIN	(WY)	MEAN	MAX	MIN	(WY)
1942	457	1333	1948	205	802	1813	1991	140	938	2344	1976	246	846	1805	1974	285	799	1818	1982	
1943	457	1333	1948	205	802	1813	1991	140	938	2344	1976	246	846	1805	1974	285	799	1818	1982	
1944	457	1333	1948	205	802	1813	1991	140	938	2344	1976	246	846	1805	1974	285	799	1818	1982	
1945	457	1333	1948	205	802	1813	1991	140	938	2344	1976	246	846	1805	1974	285	799	1818	1982	
1946	457	1333	1948	205	802	1813	1991	140	938	2344	1976	246	846	1805	1974	285	799	1818	1982	
1947	457	1333	1948	205	802	1813	1991	140	938	2344	1976	246	846	1805	1974	285	799	1818	1982	
1948	457	1333	1948	205	802	1813	1991	140	938	2344	1976	246	846	1805	1974	285	799	1818	1982	
1949	457	1333	1948	205	802	1813	1991	140	938	2344	1976	246	846	1805	1974	285	799	1818	1982	
1950	457	1333	1948	205	802	1813	1991	140	938	2344	1976	246	846	1805	1974	285	799	1818	1982	
1951	457	1333	1948	205	802	1813	1991	140	938	2344	1976	246	846	1805	1974	285	799	1818	1982	
1952	457	1333	1948	205	802	1813	1991	140	938	2344	1976	246	846	1805	1974	285	799	1818	1982	
1953	457	1333	1948	205	802	1813	1991	140	938	2344	1976	246	846	1805	1974	285	799	1818	1982	
1954	457	1333	1948	205	802	1813	1991	140	938	2344	1976	246	846	1805	1974	285	799	1818	1982	
1955	457	1333	1948	205	802	1813	1991	140	938	2344	1976	246	846	1805	1974	285	799	1818	1982	
1956	457	1333	1948	205	802	1813	1991	140	938	2344	1976	246	846	1805	1974	285	799	1818	1982	
1957	457	1333	1948	205	802	1813	1991	140	938	2344	1976	246	846	1805	1974	285	799	1818	1982	
1958	457	1333	1948	205	802	1813	1991	140	938	2344	1976	246	846	1805	1974	285	799	1818	1982	
1959	457	1333	1948	205	802	1813	1991	140	938	2344	1976	246	846	1805	1974	285	799	1818	1982	
1960	457	1333	1948	205	802	1813	1991	140	938	2344	1976	246	846	1805	1974	285	799	1818	1982	
1961	457	1333	1948	205	802	1813	1991	140	938	2344	1976	246	846	1805	1974	285	799	1818	1982	
1962	457	1333	1948	205	802	1813	1991	140	938	2344	1976	246	846	1805	1974	285	799	1818	1982	
1963	457	1333	1948	205	802	1813	1991	140	938	2344	1976	246	846	1805	1974	285	799	1818	1982	
1964	457	1333	1948	205	802	1813	1991	140	938	2344	1976	246	846	1805	1974	285	799	1818	1982	
1965	457	1333	1948	205	802	1813	1991	140	938	2344	1976	246	846	1805	1974	285	799	1818	1982	
1966	457	1333	1948	205	802	1813	1991	140	938	2344	1976	246	846	1805	1974	285	799	1818	1982	
1967	457	1333	1948	205	802	1813	1991	140	938	2344	1976	246	846	1805	1974	285	799	1818	1982	
1968	457	1333	1948	205	802	1813	1991	140	938	2344	1976	246	846	1805	1974	285	799	1818	1982	
1969	457	1333	1948	205	802	1813	1991	140	938	2344	1976	246	846	1805	1974	285	799	1818	1982	
1970	457	1333	1948	205	802	1813	1991	140	938	2344	1976	246	846	1805	1974	285	799	1818	1982	
1971	457	1333	1948	205	802	1813	1991	140	938	2344	1976	246	846	1805	1974	285	799	1818	1982	
1972	457	1333	1948	205	802	1813	1991	140	938	2344	1976	246	846	1805	1974	285	799	1818	1982	
1973	457	1333	1948	205	802	1813	1991	140	938	2344	1976	246	846	1805	1974	285	799	1818	1982	
1974	457	1333	1948	205	802	1813	1991	140	938	2344	1976	246	846	1805	1974	285	799	1818		

NISQUALLY RIVER BASIN

91

12083000 MINERAL CREEK NEAR MINERAL, WA

LOCATION.--Lat 46°44'40", long 122°08'36", in SE 1/4 SW 1/4 sec.35, T.15 N., R.5 E., Lewis County, Hydrologic Unit 17110015, on right bank 0.3 mi downstream from railroad bridge, 2.3 mi northeast of Mineral, and at mile 1.3. Prior to May 14, 1987, at site 0.25 mi downstream.

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. Prior to May 14, 1987, at site 0.25 mi downstream at datum 1.90 ft lower.

REMARKS.--Records good. No regulation or diversion upstream from station. U.S. Geological Survey satellite telemeter at station.

AVERAGE DISCHARGE.--51 years, 364 ft³/s, 65.73 in/yr, 263,700 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 13,800 ft³/s Jan. 9, 1990, gage height, 13.56 ft, from rating curve extended above 3,000 ft³/s; minimum discharge, 13 ft³/s Sept. 23-25, 1989, gage height, 6.93 ft.

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)
Mar. 23	0545	*3,240	*11.16	No other peak greater than base discharge.			
Minimum discharge, 29 ft ³ /s Oct. 10-13, 15-17.							

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	35	296	374	162	379	127	355	498	275	144	169	53
2	35	307	318	152	350	129	457	496	236	143	158	52
3	40	186	270	150	331	189	620	488	227	141	147	49
4	39	187	237	148	317	439	602	491	211	141	135	47
5	34	149	215	136	321	584	483	442	211	131	127	47
6	32	118	197	131	323	e500	432	445	209	123	123	47
7	31	302	184	131	333	438	412	454	202	119	118	46
8	31	300	226	127	348	410	471	531	191	113	109	44
9	31	241	279	122	357	382	743	483	252	106	108	43
10	30	180	333	122	351	349	759	464	299	104	109	42
11	29	168	324	122	326	315	793	427	319	103	103	42
12	29	165	251	122	300	286	678	394	299	108	96	42
13	32	142	215	119	277	263	574	369	270	99	93	42
14	32	126	297	107	253	358	500	328	253	96	90	42
15	30	110	300	102	235	892	484	298	303	114	87	40
16	29	98	255	99	211	673	459	270	423	115	96	40
17	31	94	235	99	193	566	502	250	350	124	96	40
18	33	135	204	96	188	572	532	233	307	118	84	39
19	61	252	201	130	183	502	485	219	274	139	77	39
20	63	211	310	359	177	546	438	224	246	226	73	40
21	73	607	327	336	167	491	439	235	227	218	71	40
22	69	808	303	247	157	1010	433	222	257	194	70	39
23	55	522	306	199	151	2630	433	193	256	200	76	38
24	48	383	294	271	143	1480	506	175	221	202	79	38
25	44	306	266	1280	136	949	726	163	201	198	70	36
26	42	256	256	1090	131	690	907	157	187	183	65	36
27	41	316	241	786	127	544	861	150	188	169	62	36
28	41	331	222	634	124	452	694	159	172	163	59	34
29	57	288	203	551	---	398	609	183	162	174	58	34
30	127	400	185	468	---	357	541	169	150	234	56	34
31	232	---	172	417	---	326	---	304	---	186	53	---
TOTAL	1536	7984	8000	9015	6889	17847	16928	9914	7378	4628	2917	1241
MEAN	49.5	266	258	291	246	576	564	320	246	149	94.1	41.4
MAX	232	808	374	1280	379	2630	907	531	423	234	169	53
MIN	29	94	172	96	124	127	355	150	150	96	53	34
AC-FT	3050	15840	15870	17880	13660	35400	33580	19660	14630	9180	5790	2460
CFSM	.66	3.54	3.43	3.87	3.27	7.66	7.50	4.25	3.27	1.99	1.25	.55
IN.	.76	3.95	3.96	4.46	3.41	8.83	8.37	4.90	3.65	2.29	1.44	.61

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1942 - 1993, BY WATER YEAR (WY)

	1942	1943	1944	1945	1946	1947	1948	1949	1950	1951	1952	1953
MEAN	155	513	667	659	617	478	505	395	213	84.4	47.6	57.4
MAX	527	1219	1463	1568	1443	1358	873	745	552	195	94.5	192
(WY)	1956	1956	1976	1953	1982	1972	1991	1949	1955	1983	1968	1959
MIN	23.1	35.9	128	138	146	155	226	142	50.9	38.9	23.6	18.3
(WY)	1953	1953	1977	1977	1977	1992	1973	1992	1992	1970	1970	1989

SUMMARY STATISTICS	FOR 1992 CALENDAR YEAR	FOR 1993 WATER YEAR	WATER YEARS 1942 - 1993
ANNUAL TOTAL	70422	94277	364
ANNUAL MEAN	192	258	527
HIGHEST ANNUAL MEAN			181
HIGHEST ANNUAL MEAN			1977
HIGHEST DAILY MEAN	2320	2630	7600
LOWEST DAILY MEAN	20	29	13
ANNUAL SEVEN-DAY MINIMUM	20	30	15
ANNUAL RUNOFF (AC-FT)	139700	187000	263900
ANNUAL RUNOFF (CFSM)	2.56	3.43	4.84
ANNUAL RUNOFF (INCHES)	34.84	46.64	65.82
10 PERCENT EXCEEDS	369	504	791
50 PERCENT EXCEEDS	114	199	234
90 PERCENT EXCEEDS	24	42	38

e Estimated

NISQUALLY RIVER BASIN

12085000 ALDER RESERVOIR AT ALDER, WA

LOCATION.--Lat 46°48'09", long 122°18'37", in SE 1/4 NW 1/4 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 sea level (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, 161,457 acre-ft (based on 1985 resurvey) 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. Chemical analyses December 1973 to September 1983 (samples were taken near the dam).

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

EXTREMES FOR CURRENT YEAR.--Maximum contents, 213,408 acre-ft June 19, gage height, 1,206.95 ft; minimum contents, 90,498 acre-ft Oct. 30, 31, gage height, 1,151.22 ft.

Capacity table (gage height, in feet, and total contents, in acre-feet)
(Based on project resurvey and maps provided by city of Tacoma in 1985)

1,143	80,474	1,170	120,739	1,200	192,542
1,150	89,003	1,180	141,566	1,207	213,567
1,160	103,086	1,190	164,971		

RESERVOIR STORAGE (ACRE-FEET), WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY OBSERVATION AT 24:00 VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	103578	92095	130895	128455	123040	111454	165899	203580	205960	208013	201349	186096
2	103451	93401	131787	127701	123794	110223	166905	203699	206644	207626	201616	185679
3	103134	94165	131728	126947	124369	109386	169148	203848	207091	207150	201825	185179
4	102753	95025	131450	126154	124527	110044	171044	203818	207358	206585	202211	184790
5	102325	95605	131033	125162	124726	111663	172350	203401	207715	205900	202211	184318
6	101912	95979	130593	124131	124944	112773	173405	203193	208162	205305	202063	183902
7	101373	97854	130069	122861	125261	113470	174349	203044	208310	204502	201795	183513
8	100722	99468	129742	120660	125698	114041	176210	203074	208132	203848	201438	182902
9	99881	100674	129808	118557	126293	114291	179931	203253	208578	203223	200932	182458
10	99183	101468	130484	116486	126808	114434	183430	203372	209441	202449	200188	181958
11	98707	102372	130875	114362	127106	114237	187095	204145	210244	201825	199712	181375
12	98187	103467	130659	112234	127146	113845	189775	206020	210647	201140	199385	180625
13	97840	104403	130288	110080	126967	113291	191531	206912	210837	200902	198820	179820
14	97201	105030	130375	107868	126709	113202	192780	207001	211123	199742	198373	179125
15	96549	105690	130811	105387	126213	116308	193792	206555	211789	198760	197808	178237
16	95785	106172	130895	103181	125480	118736	194476	205543	212646	198165	197451	177431
17	95240	106440	130811	100897	124646	120719	195220	204472	213059	197689	196975	176571
18	94740	106940	130375	98564	123714	122861	196291	204145	213313	197154	196559	175737
19	94514	108064	130135	96896	122683	124587	197392	203996	213376	197035	196053	174793
20	94407	108925	130724	97340	121810	126471	196886	203937	213186	197511	195547	173877
21	94262	112345	130914	97937	120739	127860	196440	203788	212964	197927	194892	172905
22	93873	116911	131113	97715	119589	132402	196291	203223	212615	198373	194208	172016
23	93540	119628	131351	97090	118379	146191	196440	202182	212297	199028	193673	171072
24	93220	121473	131430	96826	116950	153697	196678	201289	211377	199415	192929	170183
25	92790	122703	131331	103023	115683	157973	198552	201140	210552	199772	191888	169303
26	92234	123397	131291	109163	114469	160448	200932	201081	210006	199950	190846	168581
27	91804	124785	131152	113273	113452	162138	202509	201170	209798	200158	189924	167910
28	91193	126273	130914	116891	112535	163281	202985	201587	209292	200486	189067	167214
29	90721	127423	130506	119331	---	164328	203223	202092	208786	200813	188234	166570
30	90498	129284	129829	120798	---	164828	203431	202628	208400	201230	187512	165873
31	90943	---	129131	122088	---	165229	---	204681	---	201349	186734	---
MAX	103578	129284	131787	128455	127146	165229	203431	207001	213376	208013	202211	186096
MIN	90498	92095	129131	96826	112535	109386	165899	201081	205960	197035	186734	165873
†	1151.54	1174.28	1174.21	1170.68	1165.58	1190.10	1203.66	1204.08	1205.33	1202.96	1197.98	1190.35
‡	a-12762	+38341	-153	-7043	-9553	+52694	+38202	+1250	+3719	-7052	-14614	-20861

CAL YR 1992.....‡ a-28413

WTR YR 1993.....‡ +62168

† Gage height, in feet at end of month.

‡ Change in contents, in acre-feet.

a Computed on basis of revised capacity table put into use October 1, 1992.

NISQUALLY RIVER BASIN

93

12085500 LA GRANDE RESERVOIR AT LA GRANDE, WA

LOCATION.--Lat 46°49'23", long 122°18'13", in SW 1/4 SE 1/4 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 sea level (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 contents observed since reservoir first filled, 1,370 acre-ft Aug. 24, 1956, gage height, 900.0 ft.

EXTREMES FOR CURRENT YEAR.--Maximum contents, 2,672 acre-ft Mar. 19, gage height, 934.81 ft; minimum contents, 1,694 acre-ft July 13, gage height, 912.20 ft.

MONTHEND GAGE HEIGHT AND CONTENTS AT 2400, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

Date	Gage height (feet)	Contents (acre-feet)	Change in contents (acre-feet)
Sept. 30.....	931.35	2,486	--
Oct. 31.....	929.92	2,413	-73
Nov. 30.....	928.57	2,346	-67
Dec. 31.....	929.66	2,400	+54
CAL YR 1992.....	--	--	-62
Jan. 31.....	928.65	2,350	-50
Feb. 28.....	925.43	2,197	-153
Mar. 31.....	928.52	2,343	+146
Apr. 30.....	930.85	2,374	+117
May 31.....	929.14	2,423	-86
June 30.....	930.11	2,386	+49
July 31.....	929.39	2,451	-37
Aug. 31.....	930.66	2,451	+65
Sept. 30.....	930.06	2,420	-31
WTR YR 1993.....	--	--	-66

NISQUALLY RIVER BASIN

12086500 NISQUALLY RIVER AT LA GRANDE, WA

LOCATION.--Lat 46°50'25", long 122°19'38", in NW 1/4 SE 1/4 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.

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.--Records fair. Flow regulated by city of Tacoma powerplant at La Grande since December 1943, by Alder Reservoir (station 12085000) since November 1944, and by La Grande Reservoir (station 12085500) since February 1945. All diversions returned to river upstream from gage. U.S. Geological Survey satellite telemeter at station. Chemical analyses October 1972 to September 1985. Water temperatures October 1965 to September 1982.

AVERAGE DISCHARGE.--67 years (water years 1907-11, 1920-31, 1944-93), 1,422 ft³/s, 66.13 in/yr, 1,030,000 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, 2,220 ft³/s, May 16, gage height, 5.03 ft; minimum discharge, 410 ft³/s, Aug. 23, gage height, 3.42 ft; minimum daily discharge, 578 ft³/s, Oct. 3, 4.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	600	e627	627	1040	911	1020	1030	1980	1010	921	832	771
2	596	e627	681	1040	933	1060	1030	1980	994	975	776	728
3	578	e627	1020	1040	997	1080	1030	1980	989	989	792	733
4	578	627	1030	1040	1050	1080	1040	2000	989	989	774	731
5	587	627	1030	1040	1050	1080	1030	1980	989	989	863	734
6	588	627	1030	1050	1050	e1080	1030	1990	989	1000	906	740
7	586	627	1030	1150	1050	e1080	1030	1980	1050	1010	871	740
8	601	627	1030	e1350	1040	1070	1030	1950	1160	992	873	736
9	675	627	1030	1400	1010	1090	1030	1830	1160	989	871	732
10	665	627	1040	1410	1020	1120	1040	1800	1160	989	967	740
11	629	627	1050	1430	1030	1130	1050	1820	1160	989	817	740
12	636	627	1050	1430	1060	1160	1050	1900	1160	983	812	740
13	636	627	1040	1430	1070	1170	1110	2210	1170	992	853	743
14	640	627	1050	1430	1090	1170	1210	2210	1170	990	798	740
15	640	627	1050	1430	1100	1100	1220	2210	1170	965	795	741
16	624	627	1040	1430	1120	1040	1370	2190	1170	917	787	741
17	611	627	1040	1430	1160	1000	1380	2100	1140	918	790	740
18	611	627	1040	1430	1160	953	1380	1920	1150	890	785	746
19	611	627	1040	1430	1140	950	1450	1890	1250	904	796	749
20	610	627	1040	1350	1140	971	1720	1890	1250	901	833	749
21	619	627	e1040	1130	1150	973	1700	1880	1250	842	844	749
22	619	627	e1040	1120	1150	987	1680	1880	1250	816	861	752
23	619	627	e1040	1110	1170	1010	1680	1880	1210	814	844	758
24	619	627	1040	1110	1170	990	1680	1690	1220	819	847	758
25	619	627	1040	1120	1160	979	1680	1370	1270	814	906	758
26	612	627	1040	1090	1140	972	1790	1160	1190	814	852	757
27	611	627	1030	917	1000	971	1990	1110	1130	814	816	760
28	611	627	1040	910	999	969	2030	1030	1130	835	814	758
29	e622	627	1040	927	---	972	2040	995	1100	859	814	758
30	e627	627	1040	915	---	998	1990	990	995	845	806	765
31	e627	---	1040	909	---	1000	---	1010	---	834	796	---
TOTAL	19107	18810	31418	37038	30120	32225	41520	54805	34025	28398	25791	22387
MEAN	616	627	1013	1195	1076	1040	1384	1768	1134	916	832	746
MAX	675	627	1050	1430	1170	1170	2040	2210	1270	1010	967	771
MIN	578	627	627	909	911	950	1030	990	989	814	774	728
AC-FT	37900	37310	62320	73460	59740	63920	82350	108700	67490	56330	51160	44400
MEAN†	407	1270	1012	1079	901	1899	2029	1787	1198	801	595	395
CFSM†	1.40	4.35	3.46	3.70	3.09	6.50	6.95	6.12	4.10	2.74	2.04	1.35
IN.†	1.61	4.85	4.00	4.26	3.21	7.50	7.75	7.06	4.58	3.16	2.35	1.51
AC-FT†	25060	75580	62220	66370	50030	116800	120700	109900	71260	49240	36610	23510

CAL YR 1992 TOTAL 368215 MEAN 1006 MAX 3980 MIN 571 AC-FT 730400 MEAN† 967 CFSM† 3.31 IN.† 45.07 AC-FT† 701900
WTR YR 1993 TOTAL 375644 MEAN 1029 MAX 2210 MIN 578 AC-FT 745100 MEAN† 1115 CFSM† 3.82 IN.† 51.83 AC-FT† 807200

e Estimated

† Adjusted for change in contents in Alder and La Grande Reservoirs.

95

LOCATION.--Lat 46°51'25", long 122°18'05", in NW 1/4 SE 1/4 sec.21, T.16 N., R.4 E., Pierce County, Hydrologic Unit 17110015, on left bank, 50 ft downstream from State Highway 7 bridge, 1.8 mi northeast of La Grande, and at mile 3.3.

PERIOD OF RECORD.--October 1940 to September 1957, October 1991 to current year.

GAGE.--Water-stage recorder. Datum of gage is 619.53 ft above sea level. Prior to Oct. 1, 1957, on right bank at same datum.

REMARKS.--No estimated daily discharges. Small diversion for municipal supply for Eatonville. Some regulation at low water by millpond in Eatonville.

AVERAGE DISCHARGE.--19 years (1940-56, 1992-93), 225 ft³/s, 37.86 in/yr, 163,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 7,980 ft³/s Dec. 11, 1946, gage height, 9.30 ft, from rating curve extended above 3,200 ft³/s, present datum; minimum discharge, 2.3 ft³/s Aug. 27, 1992.

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)
Mar. 23	0245	*2,620	*6.38	No other peak greater than base discharge.			
Minimum discharge, 6.9 ft ³ /s Sept. 30.							

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	41	184	363	115	219	56	209	285	631	113	122	34
2	40	248	253	103	194	64	218	316	382	110	106	36
3	60	166	191	102	182	125	383	304	314	113	93	37
4	56	187	158	102	178	164	408	325	263	115	80	31
5	43	166	135	88	206	167	297	273	244	97	74	32
6	36	120	119	74	191	151	241	270	259	84	62	31
7	32	147	108	83	181	132	223	247	271	78	58	28
8	29	216	134	78	176	121	341	285	232	68	56	22
9	27	220	208	64	171	110	630	287	289	58	52	19
10	24	161	382	58	161	98	497	322	418	55	49	17
11	24	253	341	69	140	86	720	266	555	52	47	15
12	22	327	224	67	121	78	641	228	593	55	42	17
13	52	236	175	57	109	73	490	197	411	52	43	19
14	43	178	509	60	99	102	422	166	323	69	43	20
15	32	145	445	59	90	302	398	143	407	113	42	22
16	29	120	297	54	76	234	363	126	515	117	61	19
17	38	112	241	54	63	231	338	114	371	180	82	17
18	34	142	190	52	69	231	375	104	281	145	59	14
19	37	281	174	86	75	195	317	97	221	173	49	13
20	42	228	453	461	71	214	264	141	178	610	44	14
21	45	630	320	354	67	186	263	167	152	583	41	13
22	66	766	287	220	63	325	261	216	192	368	38	12
23	53	438	304	162	60	1860	234	183	187	304	46	11
24	43	283	265	198	55	758	218	143	150	350	51	10
25	39	203	224	794	51	451	287	116	132	312	53	9.9
26	37	162	234	855	51	322	356	106	115	243	45	9.4
27	35	242	221	571	50	245	360	92	112	194	40	9.1
28	32	286	195	423	50	197	296	94	138	171	38	8.1
29	38	208	168	348	---	182	332	169	161	191	37	7.6
30	72	442	146	277	---	160	329	158	128	191	36	7.3
31	93	---	125	242	---	141	---	747	---	147	35	---
TOTAL	1294	7497	7589	6330	3219	7761	10711	6687	8625	5511	1724	554.4
MEAN	41.7	250	245	204	115	250	357	216	287	178	55.6	18.5
MAX	93	766	509	855	219	1860	720	747	631	610	122	37
MIN	22	112	108	52	50	56	209	92	112	52	35	7.3
AC=FT	2570	14870	15050	12560	6380	15390	21250	13260	17110	10930	3420	1100
CFSM	.52	3.10	3.03	2.53	1.42	3.10	4.42	2.67	3.56	2.20	.69	.23
IN.	.60	3.46	3.50	2.92	1.48	3.58	4.94	3.08	3.98	2.54	.79	.22

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1941 - 1993, BY WATER YEAR (WY)

MEAN	119	319	422	347	388	298	295	218	167	66.9	28.3	41.8
MAX	307	688	890	694	703	567	475	441	329	178	70.6	115
(WY)	1956	1956	1947	1953	1954	1950	1955	1945	1946	1993	1954	1954
MIN	9.97	12.8	83.2	113	98.7	88.2	132	67.2	25.2	14.4	12.6	11.2
(WY)	1953	1953	1953	1957	1941	1941	1942	1947	1992	1951	1951	1952

SUMMARY STATISTICS	FOR 1992 CALENDAR YEAR	FOR 1993 WATER YEAR	WATER YEARS 1941 - 1993
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ANNUAL TOTAL	51700.7		67502.4						
ANNUAL MEAN	141		185			225			
HIGHEST ANNUAL MEAN						337			1956
LOWEST ANNUAL MEAN						125			1941
HIGHEST DAILY MEAN	1670	Jan 28	1860	Mar 23	5570				Dec 11 1946
LOWEST DAILY MEAN	6.4	Aug 28	7.3	Sep 30	4.6				Oct 12 1991
ANNUAL SEVEN-DAY MINIMUM	8.0	Aug 27	8.8	Sep 24	5.1				Oct 7 1991
ANNUAL RUNOFF (AC-FT)	102500		133900		162900				
ANNUAL RUNOFF (CFSM)	1.75		2.29		2.79				
ANNUAL RUNOFF (INCHES)	23.83		31.12		37.86				
10 PERCENT EXCEEDS	304		378		506				
50 PERCENT EXCEEDS	88		145		141				
90 PERCENT EXCEEDS	14		33		18				

NISQUALLY RIVER BASIN

12088000 OHOP CREEK NEAR EATONVILLE, WA

LOCATION.--Lat 46°52'52", long 122°16'42", in SE 1/4 SE 1/4 sec.10, T.16 N., R.4 E., Pierce County, Hydrologic Unit 17110015, on left bank, 150 ft downstream from Lynch Creek, 0.2 mi downstream from outlet of Ohop Lake, 0.8 mi northwest of Eatonville, and at mile 6.1.

DRAINAGE AREA.--34.5 mi².

PERIOD OF RECORD.--June 1927 to September 1932, September 1941 to September 1971, June 1993 to September 1993.

REVISED RECORDS.--WSP 1286: 1946. WSP 1932: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 517.76 ft above sea level (stadia traverse). June 1, 1927 to Sept. 30, 1932, water-stage recorder at datum 4.83 ft higher; Sept. 6, 1941 to Mar. 17, 1942, nonrecording gage and Mar. 18, 1942 to June 15, 1964, water-stage recorder at datum 2.04 ft higher; all at site 250 ft downstream. June 15, 1964 to Aug. 26, 1966, water-stage recorder at site on left bank across stream at datum 2.04 ft higher. Aug. 27, 1966 to Sept. 30, 1972, water-stage recorder at site on right bank at same datum.

REMARKS.--No estimated daily discharges. Records good. Flow affected by natural storage in Ohop Lake.

AVERAGE DISCHARGE.--35 years (water years 1928-32, 1942-71), 67.0 ft³/s, 26.37 in/yr, 48,540 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,740 ft³/s Dec. 9, 1953; maximum gage height, 9.46 ft, present datum, Jan. 29, 1965; minimum discharge, 2.3 ft³/s Aug. 22, 23, 1944.

EXTREMES FOR PERIOD JUNE TO SEPTEMBER 1993.--Maximum discharge, 330 ft³/s July 20, gage height, 3.84 ft; minimum discharge, 7.6 ft³/s Sept. 30.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR JUNE TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	JUN	JUL	AUG	SEP
1	---	48	43	12
2	---	44	36	12
3	---	42	32	11
4	---	40	29	11
5	---	35	25	11
6	---	31	24	11
7	---	28	23	11
8	---	26	21	10
9	---	23	20	9.7
10	---	22	19	9.9
11	---	21	18	9.4
12	---	22	17	9.4
13	---	21	17	9.4
14	---	23	17	9.1
15	---	32	17	9.1
16	---	40	22	9.2
17	---	67	25	9.1
18	---	46	21	8.9
19	---	52	18	8.9
20	---	210	20	9.4
21	---	200	18	9.3
22	---	141	16	8.8
23	---	143	19	8.4
24	---	135	20	8.4
25	---	111	18	8.8
26	35	84	17	8.7
27	33	66	15	8.9
28	52	58	15	8.8
29	86	67	14	8.7
30	60	67	13	8.4
31	---	53	13	---
TOTAL	---	1998	642	287.7
MEAN	---	64.5	20.7	9.59
MAX	---	210	43	12
MIN	---	21	13	8.4
AC-FT	---	3960	1270	571
CFSM	---	1.87	.60	.28
IN.	---	2.15	.69	.31

NISQUALLY RIVER BASIN

97

12089208 CENTRALIA POWER CANAL NEAR MCKENNA, WA

LOCATION.--Lat 46°54'01", long 122°29'50", in NE 1/4 SW 1/4 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 fair except those below 200 ft³/s, which are poor. Flow regulated by headworks 500 ft upstream from station. U.S. Geological Survey satellite telemeter at station.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 900 ft³/s Nov. 11, 1990, gage height, 7.72 ft; minimum discharge, no flow on many days during 1990, 1992 and 1993 water years.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 738 ft³/s Apr. 19, gage height, 6.68 ft; minimum discharge, no flow on many days.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.00	.00	.00	234	438	602	.00	.00	594	416	442
2	.00	.00	.00	.00	418	478	600	.00	175	593	420	390
3	.00	.00	.00	.00	549	525	604	.00	270	602	421	387
4	.00	.00	.00	.00	593	554	598	.00	425	592	421	380
5	.00	.00	.00	.00	506	557	601	.00	450	584	416	382
6	.00	.00	.00	.00	505	556	633	.00	449	614	420	383
7	.00	.00	.00	.00	505	554	650	.00	539	634	418	380
8	.00	.00	.00	86	504	552	667	.00	594	529	416	378
9	.00	.00	.00	.00	501	552	675	.00	644	614	418	372
10	.00	.00	.00	.00	501	554	673	.00	667	626	421	373
11	.00	.00	.00	.00	500	554	673	11	654	610	411	368
12	.00	.00	.00	.00	501	555	694	70	650	606	412	368
13	.00	.00	.00	.00	502	554	699	.00	648	613	419	370
14	.00	.00	.00	.00	502	554	701	.00	652	645	414	364
15	.00	.00	.00	.00	502	556	714	.00	651	660	411	362
16	.00	.00	.00	.00	502	555	726	.00	657	620	412	361
17	.00	.00	.00	.00	503	554	724	.00	651	655	416	361
18	.00	.00	.00	.00	502	555	726	.00	650	651	411	358
19	.00	.00	.00	.00	502	555	728	.00	650	625	419	359
20	.00	.00	.00	.00	502	558	727	.00	652	693	503	358
21	.00	.00	.00	.00	501	552	727	.00	653	696	530	357
22	.00	.00	.00	.00	500	572	727	.00	653	699	547	359
23	.00	.00	.00	.00	502	513	318	.00	651	703	506	359
24	.00	.00	.00	.00	501	603	.00	.00	653	703	549	356
25	.00	.00	185	.00	500	599	.00	.00	651	699	617	353
26	.00	.00	261	.00	500	598	.00	.00	650	701	560	354
27	.00	.00	270	.00	438	598	.00	.00	649	643	493	352
28	.00	.00	311	.00	413	599	.00	.00	653	606	487	350
29	.00	.00	88	.00	---	603	.00	.00	653	638	482	349
30	.00	.00	.00	.00	---	595	.00	.00	652	441	467	348
31	.00	---	.00	.00	---	590	---	.00	---	425	459	---
TOTAL	0.00	0.00	1115.00	86.00	13689	17292	15187.00	81.00	17246.00	19314	14112	11033
MEAN	.000	.000	36.0	2.77	489	558	506	2.61	575	623	455	368
MAX	.00	.00	311	86	593	603	728	70	667	703	617	442
MIN	.00	.00	.00	.00	234	438	.00	.00	.00	425	411	348
AC-FT	.00	.00	2210	171	27150	34300	30120	161	34210	38310	27990	21880
CAL YR 1992	TOTAL	140761.00	MEAN	385	MAX	780	MIN	.00	AC-FT	279200		
WTR YR 1993	TOTAL	109155.00	MEAN	299	MAX	728	MIN	.00	AC-FT	216500		

NISQUALLY RIVER BASIN

12089500 NISQUALLY RIVER AT MCKENNA, WA

LOCATION.--Lat 46°56'01", long 122°33'35", in SE 1/4 NW 1/4 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 sea level. Prior to Sept. 30, 1968, water-stage recorder at site 80 ft downstream at present datum. Prior to Oct. 11, 1985, water-stage recorder at site 20 ft upstream at present datum.

REMARKS.--Records good. Flow regulated by Alder Reservoir (station 12085000) at mile 44.2 and La Grande Reservoir (station 12085500) at mile 42.5. Centralia Power Canal (station 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.--37 years (water years 1948-68, 1978-93), 1,290 ft³/s, 934,600 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 discharge, 20 ft³/s Sept. 10, 11, 1965, Aug. 31, 1966.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 3,180 ft³/s Mar. 23, gage height, 4.51 ft; minimum discharge, 366 ft³/s Aug. 26.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	610	763	1320	1280	1060	621	697	2470	2360	505	677	376
2	611	877	1120	1260	821	627	747	2490	1770	521	570	371
3	604	818	1370	1260	688	653	946	2480	1450	541	586	377
4	623	803	1350	1280	674	679	1240	2540	1150	554	524	377
5	607	816	1310	1260	798	708	1000	2470	1040	540	556	376
6	596	754	1280	1220	788	685	845	2440	1030	532	657	373
7	583	761	1260	1290	768	662	786	2430	1020	533	609	371
8	580	841	1270	1520	755	642	807	2430	1050	612	589	369
9	654	912	1390	1600	721	639	1330	2350	974	512	575	374
10	676	832	1560	1590	719	651	1230	2360	1210	505	660	370
11	614	844	1730	1580	707	651	1490	2310	1340	503	531	373
12	623	1040	1550	1530	711	662	1750	2210	1530	506	481	377
13	641	940	1440	1510	710	662	1470	2550	1300	511	519	375
14	665	858	1700	1510	705	672	1390	2540	1110	507	485	373
15	643	803	1930	1510	714	864	1250	2500	1160	517	464	372
16	628	769	1660	1490	708	806	1310	2480	1340	512	467	373
17	608	752	1550	1500	720	749	1260	2440	1150	593	517	374
18	612	786	1450	1490	733	714	1280	2250	1010	505	485	374
19	611	938	1390	1510	718	659	1240	2200	1030	514	466	374
20	618	987	1690	1830	716	665	1460	2250	979	957	395	375
21	620	1140	1660	1660	710	656	1410	2280	950	1230	388	377
22	643	1830	1580	1480	709	636	1380	2340	974	779	380	375
23	643	1390	1590	1430	726	2460	1770	2330	952	660	413	372
24	679	1110	1540	1410	718	1770	2120	2100	888	660	376	373
25	621	976	1280	2020	702	1220	2130	1750	901	646	379	376
26	615	894	1160	2460	694	967	2350	1490	804	534	366	377
27	616	916	1170	1970	593	812	2570	1380	713	500	374	375
28	619	1090	1080	1690	624	700	2550	1310	724	509	375	377
29	621	988	1260	1580	---	643	2560	1350	778	546	369	373
30	638	1170	1340	1440	---	649	2550	1320	625	783	373	374
31	670	---	1310	1360	---	608	---	2030	---	717	372	---
TOTAL	19342	28398	44290	47520	20410	24792	44918	67870	33312	18544	14978	11223
MEAN	624	947	1429	1533	729	800	1497	2189	1110	598	483	374
MAX	676	1830	1930	2460	1060	2460	2570	2550	2360	1230	677	377
MIN	580	752	1080	1220	593	608	697	1310	625	500	366	369
AC-FT	38360	56330	87850	94260	40480	49170	89090	134600	66070	36780	29710	22260

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1948 - 1993, BY WATER YEAR (WY)

	MEAN	843	1666	2235	2110	2191	1581	1369	1185	913	538	410	505
MAX	1693	4071	5516	4264	5087	3398	2714	2659	1894	1308	743	1167	
(WY)	1956	1956	1978	1965	1982	1950	1991	1949	1950	1955	1954	1977	
MIN	298	272	655	705	668	405	553	499	254	85.5	137	148	
(WY)	1962	1953	1953	1979	1985	1962	1978	1978	1965	1965	1963	1965	

SUMMARY STATISTICS

FOR 1992 CALENDAR YEAR

FOR 1993 WATER YEAR

WATER YEARS 1948 - 1993

ANNUAL TOTAL	306840					375597						
ANNUAL MEAN	838					1029				1290		
HIGHEST ANNUAL MEAN										2063		1956
LOWEST ANNUAL MEAN										781		1979
HIGHEST DAILY MEAN	4850					2570		Apr 27		21800		Jan 30 1965
LOWEST DAILY MEAN	343					366		Aug 26		22		Sep 11 1965
ANNUAL SEVEN-DAY MINIMUM	355					372		Aug 26		27		Sep 1 1965
ANNUAL RUNOFF (AC-FT)	608600					745000				934500		
10 PERCENT EXCEEDS	1550					1990				2280		
50 PERCENT EXCEEDS	611					788				958		
90 PERCENT EXCEEDS	375					377				373		

EXPLANATION

▲ 12091200 Stream-gaging station

▼ 14142500 Water-quality data collection site

▲ 12396000 Crest-stage gaging station

RM 18.4 River mile

—→ Stream—Arrow shows direction of flow

- - - - -→ Tunnel or pipe—Arrow shows direction of flow

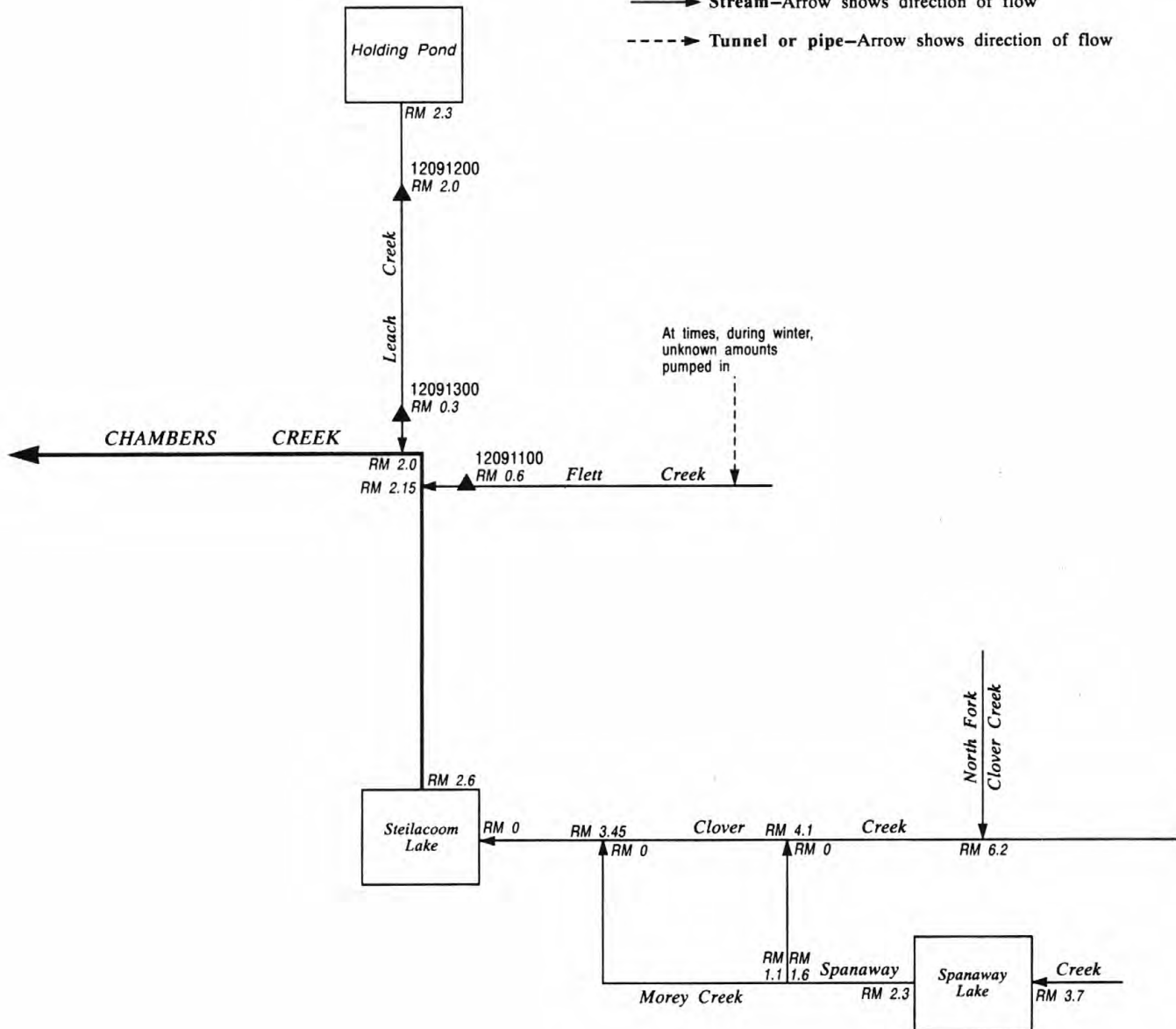


Figure 10. Gaging stations in Chambers Creek Basin.

CHAMBERS CREEK BASIN

12090365 UNNAMED TRIBUTARY TO NORTH FORK CLOVER CREEK AT WALLER ROAD EAST, NEAR PARKLAND, WA

LOCATION.--Lat 47°08'02", long 122°23'16", in SE 1/4 NW 1/4 sec.14, T.19 N., R.3 E., Pierce County, Hydrologic Unit 17110019, at Bingham Avenue. East crossing, 3.2 mi southeast of Parkland.

DRAINAGE AREA.--0.14 mi².

PERIOD OF RECORD.--October 1990 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 397 ft, from topographic map.

REMARKS.--Records fair except for estimated daily discharges, which are poor. No regulation or diversion upstream from station.

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 6.8 ft³/s Nov. 24, 1990; maximum gage height, 4.83 ft Nov. 24, 1990 (overflow from North Fork Clover Creek); no flow for many days each year.EXTREMES FOR CURRENT YEAR.--Maximum discharge, 4.9 ft³/s Mar. 23, gage height, 1.62 ft; no flow for many days.DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.00	.01	.04	.13	.03	.28	.15	.07	.00	.00	.00
2	.00	.00	.01	.03	.11	.06	.40	.18	.03	.00	.00	.00
3	.00	.00	.01	e.08	.09	.09	.58	.25	.02	.00	.00	.00
4	.00	.00	.00	e.17	.08	.14	.28	.17	.02	.00	.00	.00
5	.00	.00	.00	e.11	.07	.08	.18	.11	.01	.00	.00	.00
6	.00	.00	.00	e.03	.06	.07	.17	.12	.01	.00	.00	.00
7	.00	.00	.01	e.03	.06	.06	.18	.18	.01	.00	.00	.00
8	.00	.00	.03	e.03	.05	.05	.60	.24	.01	.00	.00	.00
9	.00	.00	.04	e.03	.04	.05	.99	.14	.10	.00	.00	.00
10	.00	.00	.38	e.03	.04	.04	.73	.22	.07	.00	.00	.00
11	.00	.00	.34	e.02	.04	.03	.86	.10	.05	.00	.00	.00
12	.00	.00	.20	e.02	.03	.03	.39	.07	.02	.00	.00	.00
13	.00	.00	.10	e.02	.03	.02	.28	.05	.01	.00	.00	.00
14	.00	.00	.09	e.02	.03	.08	.20	.04	.01	.00	.00	.00
15	.00	.00	.06	e.02	.03	.10	.23	.03	.03	.00	.00	.00
16	.00	.00	.06	.01	.02	.16	.33	.02	.01	.00	.00	.00
17	.00	.00	.06	.01	.02	.23	.37	.02	.00	.00	.00	.00
18	.00	.00	.07	.01	.02	.14	.26	.02	.00	.00	.00	.00
19	.00	.00	.22	.06	.02	.10	.14	.02	.00	.00	.00	.00
20	.00	.00	.53	.46	.03	.13	.10	.03	.00	.00	.00	.00
21	.00	.00	.37	.32	.03	.09	.09	.03	.00	.00	.00	.00
22	.00	.00	.16	.17	.03	e1.1	.16	.02	.00	.00	.00	.00
23	.00	.00	.10	.10	.02	e1.8	.14	.02	.00	.00	.00	.00
24	.00	.00	.08	.61	.02	.51	.16	.01	.00	.00	.00	.00
25	.00	.00	.07	1.9	.02	.30	.32	.01	.00	.00	.00	.00
26	.00	.00	.07	.99	.01	.19	.23	.01	.00	.00	.00	.00
27	.00	.00	.06	.47	.01	.13	.19	.01	.00	.00	.00	.00
28	.00	.00	.07	.40	.01	.10	.14	.01	.00	.00	.00	.00
29	.00	.00	.06	.26	---	.09	.35	.01	.00	.00	.00	.00
30	.00	.02	.05	.20	---	.09	.18	.01	.00	.00	.00	.00
31	.00	---	.05	.16	---	.09	---	.09	---	.00	.00	---
TOTAL	0.00	0.02	3.36	6.81	1.15	6.18	9.51	2.39	0.48	0.00	0.00	0.00
MEAN	.000	.001	.11	.22	.041	.20	.32	.077	.016	.000	.000	.000
MAX	.00	.02	.53	1.9	.13	1.8	.99	.25	.10	.00	.00	.00
MIN	.00	.00	.00	.01	.01	.02	.09	.01	.00	.00	.00	.00
AC-FT	.00	.04	6.7	14	2.3	12	19	4.7	1.0	.00	.00	.00
CFSM	.00	.00	.77	1.57	.29	1.42	2.26	.55	.11	.00	.00	.00
IN.	.00	.01	.89	1.81	.31	1.64	2.53	.64	.13	.00	.00	.00

CAL YR 1992 TOTAL 35.66 MEAN .097 MAX 2.6 MIN .00 AC-FT 71 CFSM .70 IN. 9.48
WTR YR 1993 TOTAL 29.90 MEAN .082 MAX 1.9 MIN .00 AC-FT 59 CFSM .59 IN. 7.94

e Estimated

CHAMBERS CREEK BASIN

101

12091100 FLETT CREEK AT TACOMA, WA

LOCATION.--Lat 47°11'23", long 122°31'08", in NE 1/4 SW 1/4 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 September 1985, October 1985 to current year (seasonal records).

REVISED RECORDS.--WSP 1932: Drainage area.

GAGE.--Water-stage recorder and concrete control. Datum of gage is 195.05 ft above sea level (levels by USGS National Mapping Division).

REMARKS.--Records fair except for estimated daily discharges, which are 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. Chemical analyses October 1964 to September 1965.

AVERAGE DISCHARGE.--26 years (water years 1960-85), 10.0 ft³/s, 7,240 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 discharge, 0.09 ft³/s Oct. 23-25, Nov. 11, 12, 1987.

EXTREMES FOR THE PERIOD OCTOBER TO MAY.--Maximum discharge, 68 ft³/s Jan. 26, gage height, 2.58 ft; minimum discharge, 1.0 ft³/s Oct. 1, 4-7, 10, 11.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO MAY 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY
1	1.5	17	e7.0	6.8	21	8.3	14	19
2	1.5	15	e5.4	7.0	14	8.1	14	20
3	1.5	22	e4.6	8.3	11	11	20	20
4	1.5	22	e4.0	12	10	14	23	21
5	1.4	18	e4.8	10	8.8	12	19	16
6	1.5	14	e4.2	9.0	9.0	10	17	16
7	1.4	13	e4.7	8.4	8.2	9.1	16	16
8	1.6	14	5.6	8.2	7.7	8.5	20	20
9	1.7	13	9.2	8.0	8.2	7.4	29	17
10	1.5	9.8	13	7.5	7.6	7.5	25	16
11	1.6	9.9	18	6.5	7.5	7.0	23	17
12	1.7	15	19	7.2	7.2	6.3	21	15
13	2.3	15	18	7.0	7.5	5.5	22	11
14	2.0	12	16	5.6	7.3	8.3	23	10
15	1.9	8.9	13	5.2	7.2	16	23	10
16	2.7	8.4	9.4	5.0	7.1	10	21	9.7
17	5.2	12	7.6	5.1	7.5	17	20	9.7
18	4.7	14	8.4	4.7	7.5	15	19	9.5
19	5.7	e16	8.8	8.5	7.9	12	17	11
20	6.9	e15	13	20	8.1	13	13	26
21	6.0	e27	21	31	7.6	10	12	28
22	5.2	e25	22	33	7.6	16	18	29
23	4.6	e18	16	21	7.5	36	16	20
24	3.9	e14	11	25	7.0	40	16	15
25	2.5	e9.0	7.9	44	7.3	33	18	13
26	2.4	e8.0	7.3	62	6.6	24	23	12
27	2.4	e9.0	7.0	52	7.1	21	21	11
28	2.5	e8.0	8.3	32	6.7	18	21	11
29	5.1	e9.6	7.6	26	---	12	23	17
30	11	e8.0	8.3	38	---	9.1	21	18
31	14	---	7.2	24	---	9.5	---	25
TOTAL	109.4	419.6	317.3	548.0	237.7	434.6	588	508.9
MEAN	3.53	14.0	10.2	17.7	8.49	14.0	19.6	16.4
MAX	14	27	22	62	21	40	29	29
MIN	1.4	8.0	4.0	4.7	6.6	5.5	12	9.5
AC-FT	217	832	629	1090	471	862	1170	1010

e Estimated

CHAMBERS CREEK BASIN

12091200 LEACH CREEK NEAR FIRCREST, WA

LOCATION.--Lat 47°13'18", long 122°30'29", in lot 24, block 14, SE 1/4 NE 1/4 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.

DRAINAGE AREA.--4.73 mi² includes 0.68 mi² storm drainage from Flett Creek basin.

PERIOD OF RECORD.--March 1957 to September 1985, October 1985 to April 1988 (seasonal records), October 1988 to current year.

REVISED RECORDS.--WSP 1932: Drainage area.

GAGE.--Water-stage recorder and metal weir 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. Low flows supplemented from well in basin beginning June 30, 1993. Storage is not retained and observed annual runoff closely represents natural runoff of basin. Drainage into basin influenced by urbanizing of area. No known diversion upstream from station. U.S. Geological Survey satellite telemeter at station.

AVERAGE DISCHARGE.--33 years (water years 1958-85, 1989-93), 4.44 ft³/s, 12.75 in/yr, 3,217 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 309 ft³/s Nov. 24, 1990, gage height, 5.76 ft, from rating curve extended above 200 ft³/s; minimum discharge, 0.1 ft³/s Sept. 22, 1965.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 79 ft³/s Jan. 20, gage height, 2.16 ft; minimum discharge, 1.0 ft³/s Jan. 10-12.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.5	19	1.9	1.3	1.8	4.9	7.6	5.8	12	2.9	2.1	2.0
2	2.2	7.1	1.5	1.3	1.7	2.6	6.1	7.8	3.4	2.5	2.2	2.1
3	3.1	1.6	1.4	6.0	1.7	8.8	6.9	11	1.9	1.3	2.2	2.1
4	1.8	9.3	1.4	4.4	1.6	14	6.3	5.7	1.8	1.3	2.1	2.0
5	1.6	1.5	1.8	1.6	1.6	2.3	e2.0	2.6	1.4	1.4	2.1	2.0
6	1.6	3.1	1.5	1.4	1.5	1.6	3.2	4.7	1.3	2.3	2.0	2.2
7	1.6	11	3.6	1.4	1.5	1.5	2.8	6.5	2.4	2.9	2.0	2.0
8	1.6	3.9	9.2	1.3	1.6	1.6	5.7	7.1	2.7	2.8	2.0	2.0
9	1.5	1.5	8.0	1.1	2.0	1.5	6.2	2.8	11	2.5	2.3	2.1
10	1.5	1.2	21	1.1	1.6	1.4	5.8	6.4	e5.1	2.8	2.1	2.0
11	1.6	13	23	1.0	1.6	1.5	5.0	2.4	e1.9	2.9	2.1	1.9
12	2.0	4.4	3.8	1.0	1.5	1.5	4.1	2.2	e1.9	2.8	2.1	2.1
13	3.6	1.7	1.9	1.1	1.5	1.8	3.7	1.9	e1.8	2.8	2.1	2.2
14	1.6	1.3	2.5	1.1	1.8	8.7	2.8	2.0	7.2	3.1	2.1	2.0
15	1.5	3.0	1.5	1.1	1.6	13	2.1	1.9	7.3	2.6	2.0	1.9
16	6.4	11	1.8	1.1	1.4	7.5	2.9	1.8	2.9	4.1	2.8	1.9
17	2.3	8.4	8.0	1.1	1.5	9.0	3.6	1.9	1.5	2.2	2.2	1.9
18	3.5	6.3	1.9	1.1	1.6	2.0	3.7	1.7	1.6	2.1	2.3	1.9
19	9.8	15	9.1	14	1.6	2.0	6.3	4.2	1.5	3.5	2.1	1.9
20	2.7	1.7	12	30	2.8	5.3	e2.0	9.5	1.5	3.3	2.1	2.1
21	7.0	31	7.5	22	3.1	2.5	4.8	6.0	1.6	1.4	2.1	2.0
22	2.1	4.0	1.9	2.7	2.2	13	8.2	e2.2	e1.4	3.7	2.3	2.0
23	1.5	1.8	1.6	3.2	1.6	15	6.1	e1.8	e1.3	1.4	2.3	2.0
24	2.1	1.6	1.4	23	1.6	4.6	2.5	e2.0	1.3	1.3	1.9	2.0
25	1.4	1.5	1.4	35	1.5	e3.2	14	e1.7	1.3	1.2	1.9	2.0
26	1.5	1.4	2.4	12	1.6	e1.9	17	e1.8	1.3	1.6	1.9	2.0
27	1.3	8.8	3.3	3.2	1.5	e1.6	7.8	e1.8	1.3	2.3	2.0	2.2
28	3.9	1.6	3.5	4.5	1.6	e1.6	5.0	e3.5	2.1	4.4	2.0	2.1
29	7.5	3.5	2.3	2.6	---	e1.9	12	5.5	1.3	8.8	1.7	2.1
30	9.5	11	3.3	2.1	---	e3.0	2.8	6.6	2.2	3.7	1.5	2.0
31	12	---	1.5	1.9	---	e1.7	---	12	---	2.2	2.0	---
TOTAL	102.8	191.2	146.9	185.7	48.2	142.5	169.0	134.8	87.2	84.1	64.6	60.7
MEAN	3.32	6.37	4.74	5.99	1.72	4.60	5.63	4.35	2.91	2.71	2.08	2.02
MAX	12	31	23	35	3.1	15	17	12	12	8.8	2.8	2.2
MIN	1.3	1.2	1.4	1.0	1.4	1.4	2.0	1.7	1.3	1.2	1.5	1.9
AC-FT	204	379	291	368	96	283	335	267	173	167	128	120
CFSM	.70	1.35	1.00	1.27	.36	.97	1.19	.92	.61	.57	.44	.43
IN.	.81	1.50	1.16	1.46	.38	1.12	1.33	1.06	.69	.66	.51	.48

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1957 - 1993, BY WATER YEAR (WY)

	MEAN	3.85	6.78	7.20	7.51	6.32	5.22	4.06	2.93	2.78	2.24	2.40	2.79
MAX	8.38	16.8	14.6	16.3	14.4	12.4	10.3	5.52	5.22	4.58	3.87	6.92	
(WY)	1986	1991	1980	1990	1982	1972	1991	1984	1981	1983	1975	1978	
MIN	1.57	2.53	3.54	2.80	1.72	2.22	2.09	1.72	1.40	1.33	1.12	1.24	
(WY)	1973	1977	1977	1962	1993	1992	1977	1965	1969	1969	1969	1989	

SUMMARY STATISTICS

FOR 1992 CALENDAR YEAR

FOR 1993 WATER YEAR

WATER YEARS 1957 - 1993

ANNUAL TOTAL	1377.0	1417.7	4.44
ANNUAL MEAN	3.76	3.88	6.43
HIGHEST ANNUAL MEAN			2.60
LOWEST ANNUAL MEAN			166
HIGHEST DAILY MEAN	44	35	Jan 9 1990
LOWEST DAILY MEAN	1.2	1.0	Jan 11
ANNUAL SEVEN-DAY MINIMUM	1.5	1.1	Jan 9
ANNUAL RUNOFF (AC-FT)	2730	2810	3220
ANNUAL RUNOFF (CFSM)	.80	.82	.94
ANNUAL RUNOFF (INCHES)	10.83	11.15	12.75
10 PERCENT EXCEEDS	9.0	8.8	9.5
50 PERCENT EXCEEDS	1.8	2.1	2.5
90 PERCENT EXCEEDS	1.5	1.4	1.5

e Estimated

LOCATION.--Lat 47°11'54", long 122°31'17", in NW 1/4 NW 1/4 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.

PERIOD OF RECORD.--February 1957 to September 1985, October 1985 to September 1992 (seasonal records), October 1992 to September 1993.

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.

AVERAGE DISCHARGE.--29 years (water years 1958-85, 1993), 10.4 ft³/s, 7,530 acre-ft/yr.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 76 ft³/s, Jan. 25, gage height, 3.25 ft; minimum daily discharge, 5.5 ft³/s, Oct. 26, Nov. 10, June 6.

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	6.2	24	e8.2	e6.2	7.3	8.8	12	28	15	7.4	7.0	6.2
2	6.7	e11	e7.3	e6.2	7.3	7.6	12	35	8.8	7.5	7.0	6.3
3	8.0	e17.0	e6.6	e18	7.3	12	13	35	6.1	6.2	7.0	6.5
4	7.1	e16	e6.6	e12	7.3	14	12	35	5.8	6.2	7.0	6.5
5	6.1	e6.5	e6.4	e7.6	7.1	8.4	9.0	25	5.7	6.2	7.0	6.5
6	5.7	e9.0	e7.2	e7.0	7.0	7.0	9.3	25	5.5	6.7	6.8	6.5
7	5.9	e19	e10	e6.8	7.0	6.5	10	27	5.7	7.3	6.5	6.5
8	6.2	e10	e16	e6.7	7.0	6.5	13	30	6.2	7.3	6.5	6.5
9	6.5	e6.2	e14	e6.2	7.2	6.5	15	24	14	7.0	6.8	6.5
10	6.5	e5.5	e34	e6.2	7.3	6.5	13	27	13	7.3	7.0	6.5
11	6.5	e23	e35	e5.8	7.3	6.3	12	23	6.5	7.3	6.5	6.2
12	6.6	e10	e13	e5.8	7.3	6.2	10	e7.5	6.4	7.4	6.9	6.2
13	8.5	e6.6	e8.5	e6.0	7.3	6.2	10	e6.5	6.2	7.3	6.5	6.2
14	6.7	e5.7	e9.8	e6.0	7.3	9.4	10	6.5	8.5	7.5	6.5	6.2
15	6.8	e9.0	e7.2	6.0	7.3	16	9.2	6.5	15	7.2	6.5	6.2
16	9.9	e19	e8.0	6.0	7.3	9.5	9.5	6.5	7.8	8.4	7.4	6.2
17	11	e15	e14	6.0	7.3	13	10	6.5	6.3	7.1	7.0	6.2
18	9.1	e12	e9.0	5.8	7.3	7.3	11	6.5	6.3	7.0	6.7	6.2
19	17	e26	e14	17	7.3	6.6	12	7.7	6.2	7.8	7.0	6.2
20	7.3	e7.2	e19	39	7.7	8.9	8.9	17	6.2	8.9	6.5	6.2
21	9.5	e48	e14	37	8.0	7.5	9.9	14	6.2	6.2	6.5	6.2
22	10	e12	e9.0	10	8.4	e17	13	7.2	6.9	8.4	6.6	6.2
23	6.2	e8.7	e7.7	8.5	7.9	e25	12	6.5	6.3	6.3	7.2	6.2
24	6.6	e7.7	e6.6	27	7.5	e12	9.8	6.3	6.2	5.7	6.5	6.2
25	5.6	e7.1	e6.6	56	7.3	8.5	24	6.1	6.2	5.7	6.5	6.2
26	5.5	e6.6	e8.0	e25	7.3	7.9	36	5.7	6.2	6.0	6.5	6.2
27	5.7	e13	e10	e9.0	7.3	7.4	29	5.7	6.2	6.8	6.5	6.3
28	7.6	e7.8	e11	e12	7.3	7.3	24	7.1	6.6	9.0	6.5	6.5
29	12	e10	e8.6	8.0	---	7.8	32	13	6.3	11	6.4	6.3
30	16	e17	e9.5	7.9	---	8.4	23	14	6.9	13	5.8	6.5
31	18	---	e7.0	7.4	---	8.0	---	24	---	7.1	6.2	---
TOTAL	257.0	385.6	353.8	394.1	206.2	290.0	433.6	492.8	225.2	230.2	207.3	189.3
MEAN	8.29	12.9	11.4	12.7	7.36	9.35	14.5	15.9	7.51	7.43	6.69	6.31
MAX	18	48	35	56	8.4	25	36	35	15	13	7.4	6.5
MIN	5.5	5.5	6.6	5.8	7.0	6.2	8.9	5.7	5.5	5.7	5.8	6.2
AC-FT	510	765	702	782	409	575	860	977	447	457	411	378

MEAN	9.31	13.7	14.3	16.1	14.5	12.2	10.7	8.86	7.95	6.90	6.98	7.66
MAX	17.4	28.9	23.7	34.4	28.1	25.2	23.0	18.3	14.5	10.6	9.88	10.6
(WY)	1986	1991	1983	1990	1974	1972	1991	1984	1984	1983	1987	1978
MIN	5.96	7.30	8.64	6.87	6.66	5.12	6.36	5.78	5.23	5.04	4.40	5.19
(WY)	1988	1970	1977	1985	1973	1973	1973	1971	1969	1973	1969	1974

WATER YEARS 1957 - 1993

e Estimated

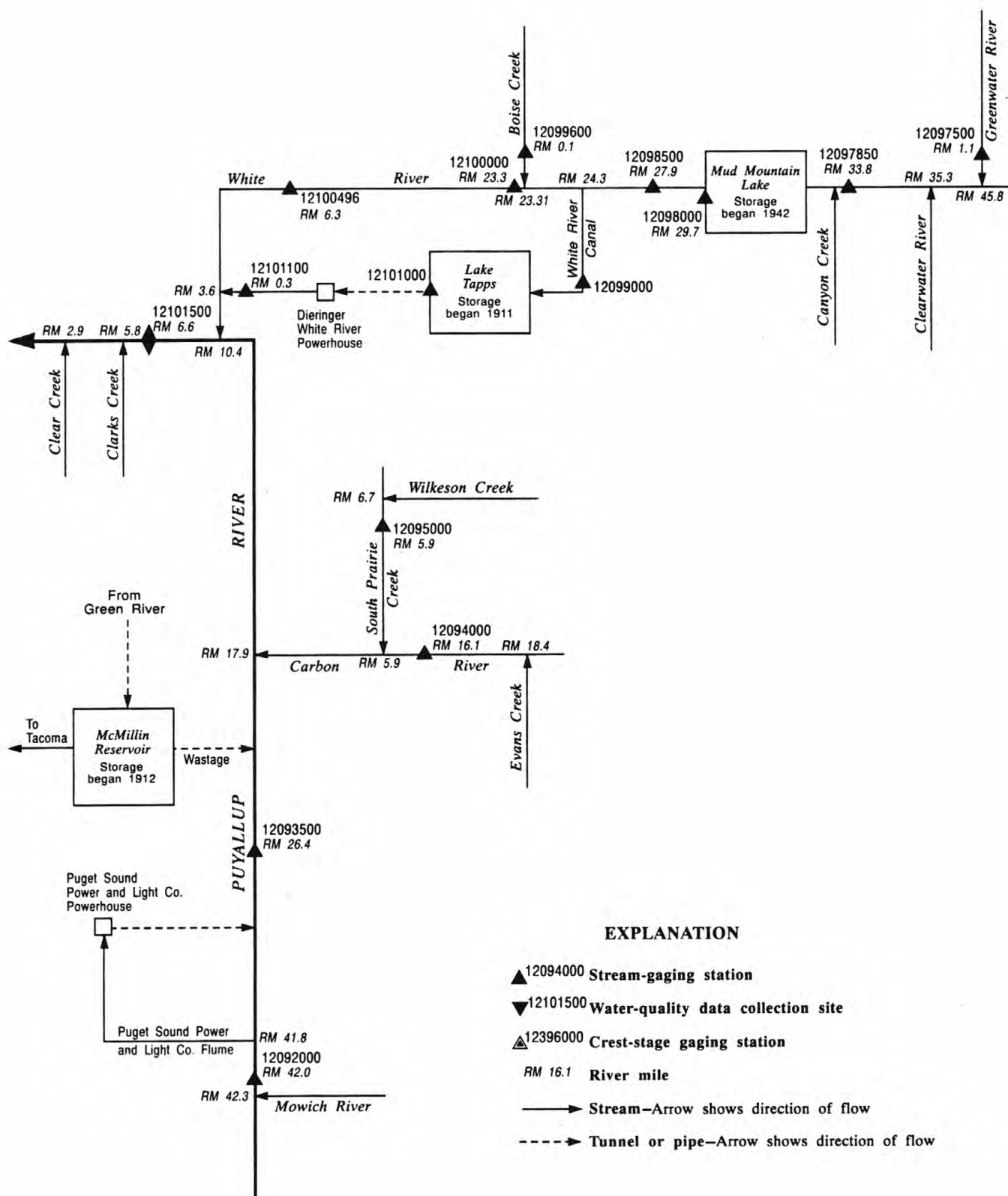


Figure 11. Gaging stations in Puyallup River Basin.

12092000 PUYALLUP RIVER NEAR ELECTRON, WA

LOCATION.--Lat 46°54'14", long 122°02'02", in SE 1/4 NW 1/4 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 December 1933, October 1944 to September 1949, October 1957 to current year.

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 above sea level. 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 160 ft downstream at different datum. Dec. 24, 1980, to Dec. 24, 1987, at site 60 ft downstream at different datum. U.S. Geological Survey satellite telemetry at station.

REMARKS.--Records fair except for flows above 2,500 ft³/s, which are poor. No regulation or diversion upstream from station.

AVERAGE DISCHARGE.--66 years (water years 1909-33, 1945-49, 1958-93), 524 ft³/s, 76.68 in/yr, 379,600 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 discharge, 93 ft³/s Nov. 23, 24, 1929.

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)
Mar. 23	0445	*2,560	*6.02	No other peak greater than base discharge.			
Minimum daily discharge, 110 ft ³ /s Jan. 18 due to freezeup.							

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	400	326	417	e220	459	e160	439	682	945	510	569	368
2	392	352	368	e205	440	e190	432	758	749	520	632	424
3	360	269	313	e190	425	e230	516	665	699	498	693	476
4	295	429	292	e175	440	e280	485	655	645	490	708	457
5	259	348	278	e160	462	e340	434	612	620	488	697	433
6	240	283	269	e145	456	e345	411	684	670	479	665	439
7	220	603	260	e135	451	e325	406	643	807	458	585	438
8	220	458	271	e130	450	e320	517	661	727	469	512	438
9	218	380	257	e125	442	e310	637	628	855	489	469	413
10	257	311	294	e125	442	e295	566	922	916	463	444	418
11	268	536	268	e125	419	e275	565	1090	914	471	437	390
12	253	601	248	e120	395	e255	507	1370	884	446	466	e245
13	375	469	244	e120	e360	e240	465	1260	723	404	472	e240
14	232	430	505	e120	e330	e300	449	1030	757	472	447	e245
15	209	371	420	e115	e300	753	450	891	978	466	390	e200
16	213	323	351	e115	e270	552	441	815	966	478	444	e195
17	247	306	315	e115	e240	521	469	813	806	518	440	e190
18	247	323	285	e110	e225	680	516	912	759	484	455	e185
19	324	348	277	242	e210	576	471	975	734	554	473	e175
20	318	296	311	302	e200	540	452	1110	665	822	527	e172
21	262	760	291	248	e195	475	494	970	639	738	507	e166
22	267	726	299	225	e190	758	492	839	614	723	484	e164
23	326	495	313	208	e180	1810	464	708	561	734	621	e170
24	328	398	288	278	e175	1030	457	665	515	716	440	e175
25	270	345	272	1450	e170	755	520	660	518	657	e350	e172
26	228	318	293	1270	e170	618	543	643	556	638	e292	e203
27	215	511	272	896	e165	529	516	659	629	607	e290	e240
28	205	473	265	732	e165	469	448	711	623	689	e280	e285
29	210	400	252	615	---	435	570	723	692	810	e290	302
30	216	508	243	537	---	406	744	711	548	612	e320	306
31	233	---	e235	493	---	388	---	994	---	541	348	---
TOTAL	8307	12696	9266	10046	8826	15160	14876	25459	21714	17444	14747	8724
MEAN	268	423	299	324	315	489	496	821	724	563	476	291
MAX	400	760	505	1450	462	1810	744	1370	978	822	708	476
MIN	205	269	235	110	165	160	406	612	515	404	280	164
AC-FT	16480	25180	18380	19930	17510	30070	29510	50500	43070	34600	29250	17300
CFSM	2.89	4.56	3.22	3.49	3.40	5.27	5.34	8.85	7.80	6.06	5.13	3.13
IN.	3.33	5.09	3.71	4.03	3.54	6.08	5.96	10.21	8.70	6.99	5.91	3.50

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1909 - 1993, BY WATER YEAR (WY)

	394	560	586	530	442	363	427	618	770	677	546	407
MEAN	394	560	586	530	442	363	427	618	770	677	546	407
MAX	1015	1467	2214	1071	984	944	657	1019	1248	1256	746	727
(WY)	1960	1933	1934	1918	1982	1972	1988	1929	1974	1917	1917	1927
MIN	185	134	174	193	154	146	200	380	413	453	368	291
(WY)	1981	1930	1915	1979	1922	1922	1975	1909	1910	1987	1969	1993

SUMMARY STATISTICS	FOR 1992 CALENDAR YEAR	FOR 1993 WATER YEAR	WATER YEARS 1909 - 1993
ANNUAL TOTAL	153245	167265	
ANNUAL MEAN	419	458	526
HIGHEST ANNUAL MEAN			664
LOWEST ANNUAL MEAN			383
HIGHEST DAILY MEAN	1940	1810	6610
LOWEST DAILY MEAN	205	110	93
ANNUAL SEVEN-DAY MINIMUM	225	116	104
ANNUAL RUNOFF (AC-FT)	304000	331800	381000
ANNUAL RUNOFF (CFSM)	4.51	4.94	5.67
ANNUAL RUNOFF (INCHES)	61.43	67.05	77.00
10 PERCENT EXCEEDS	624	754	898
50 PERCENT EXCEEDS	361	439	439
90 PERCENT EXCEEDS	260	198	220

e Estimated

12093500 PUYALLUP RIVER NEAR ORTING, WA

LOCATION.--Lat 47°02'22", long 122°12'24", in SW 1/4 SW 1/4 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 OR 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 sea level. 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. U.S. Corps of Engineers satellite telemeter at station.

REMARKS.--Records good except for estimated daily discharges, which are fair. 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. U.S. Army Corps of Engineers satellite telemeter at station.

AVERAGE DISCHARGE.--62 years, 709 ft³/s, 55.98 in/yr, 513,700 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 discharge, 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)
Mar. 23	0415	*3,570	*7.89				
Minimum daily discharge, 130 ft ³ /s Jan. 18 due to freezeup.							

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	591	466	835	340	686	e185	521	905	1440	681	733	423
2	588	564	691	310	626	238	535	1030	1110	675	818	519
3	544	424	575	e280	592	339	703	919	1020	662	895	607
4	462	599	506	e260	570	368	714	897	923	603	899	612
5	e400	546	458	e230	615	454	591	790	873	571	868	589
6	e340	441	426	e215	603	458	532	876	937	568	821	590
7	e280	846	396	e200	591	420	527	825	1090	529	718	590
8	e280	770	391	e185	581	417	633	819	971	534	611	596
9	e222	646	436	e170	583	400	960	834	1090	548	538	525
10	326	520	489	e160	567	371	847	1150	1280	514	501	544
11	360	767	512	e155	524	346	1030	1380	1280	517	480	507
12	374	1050	450	e150	487	319	1030	1660	1290	507	513	296
13	549	797	413	e145	448	300	866	1570	1070	466	516	287
14	337	705	953	e140	405	408	770	1280	1030	541	507	298
15	248	616	882	e140	380	1030	709	1050	1340	564	424	227
16	238	549	692	e135	328	764	665	948	1380	547	521	222
17	340	505	613	e135	e290	713	662	931	1160	671	533	217
18	319	573	524	e130	e270	896	733	1040	1060	600	553	207
19	473	641	485	e180	e250	765	653	1140	1000	654	545	197
20	488	572	633	e460	e235	708	577	1360	886	1120	643	195
21	430	1080	628	394	e220	622	628	1200	847	1090	598	192
22	378	1340	640	297	e210	897	637	1080	843	1010	542	192
23	484	940	648	249	e205	2600	602	898	780	1060	806	197
24	494	723	573	327	e200	1510	576	806	661	1010	614	209
25	407	594	513	2320	e195	1060	649	790	654	944	489	202
26	314	520	551	2270	e190	835	716	733	718	881	357	241
27	256	804	518	1600	e190	696	738	766	821	831	358	310
28	245	832	477	1220	e185	582	643	799	832	891	348	337
29	235	673	435	994	---	526	781	927	985	1080	312	363
30	248	983	400	844	---	470	997	884	762	890	351	367
31	271	---	365	751	---	419	---	1410	---	711	405	---
TOTAL	11481	21086	17108	15386	11226	20116	21225	31727	30133	22470	17817	10867
MEAN	370	703	552	496	401	649	707	1023	1004	725	575	362
MAX	591	1340	953	2320	686	2600	1030	1660	1440	1120	899	612
MIN	222	424	365	130	185	185	521	733	654	466	312	192
AC-FT	22770	41820	33930	30520	22270	39900	42100	62930	59770	44570	35340	21550
CFSM	2.15	4.09	3.21	2.89	2.33	3.77	4.11	5.95	5.84	4.21	3.34	2.11
IN.	2.48	4.56	3.70	3.33	2.43	4.35	4.59	6.86	6.52	4.86	3.85	2.33

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1932 - 1993, BY WATER YEAR (WY)

MEAN	475	807	930	873	753	607	650	783	884	731	565	449
MAX	1291	1997	3015	2314	1688	1619	1038	1282	1470	1239	881	748
(WY)	1960	1991	1934	1934	1982	1972	1991	1936	1974	1933	1983	1968
MIN	210	92.8	205	205	280	266	303	494	311	483	373	283
(WY)	1953	1953	1953	1937	1977	1941	1975	1941	1934	1977	1957	1936

SUMMARY STATISTICS	FOR 1992 CALENDAR YEAR	FOR 1993 WATER YEAR	WATER YEARS 1932 - 1993
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ANNUAL TOTAL	212488		230642			
ANNUAL MEAN	581		632		709	
HIGHEST ANNUAL MEAN					985	1934
LOWEST ANNUAL MEAN					465	1941
HIGHEST DAILY MEAN	2820	Jan 28	2600	Mar 23	12000	Dec 10 1933
LOWEST DAILY MEAN	222	Oct 9	130	Jan 18	59	Nov 29 1952
ANNUAL SEVEN-DAY MINIMUM	282	Oct 25	139	Jan 12	66	Nov 25 1952
ANNUAL RUNOFF (AC-FT)	421500		457500		513500	
ANNUAL RUNOFF (CFSM)	3.38		3.67		4.12	
ANNUAL RUNOFF (INCHES)	45.96		49.88		55.99	
10 PERCENT EXCEEDS	882		1050		1180	
50 PERCENT EXCEEDS	507		577		582	
90 PERCENT EXCEEDS	337		233		310	

e Estimated

PUYALLUP RIVER BASIN

107

12094000 CARBON RIVER NEAR FAIRFAX, WA

LOCATION.--Lat 47°01'41", long 122°01'53", in SW 1/4 SW 1/4 sec.22, T.18 N., R.6 E., Pierce County, Hydrologic Unit 17110014, on left bank, 1.1 mi upstream from State highway 165 (Fairfax) bridge, 1.2 mi northwest of Fairfax, 2.3 mi downstream from Evans Creek, 4 mi south of Carbonado, and at mile 16.1.

DRAINAGE AREA.--78.9 mi².

PERIOD OF RECORD.--December 1910 to June 1912, April 1929 to September 1965, October 1965 to May 1978, October 1991 to September 1992. Published as "at Fairfax" 1910-12, 1966-78.

GAGE.--Water-stage recorder. Datum of gage is 1,201.7 ft above sea level. Prior to July 12, 1912, nonrecording gage at railroad crossing 1.7 mi upstream at different datum. March 1929 to September 1965, recording gage 350 ft upstream at datum 1,212.6 ft above sea level. October 1965 to May 1978, recording gage 1.7 mi upstream at datum then in use.

REMARKS.--Records fair. No regulation or diversion upstream from station. U.S. Army Corps of Engineers satellite telemeter at station.

AVERAGE DISCHARGE.--50 years (1929-56, 1966-77, 1992-93), 426 ft³/s, 73.32 in/yr, 308,600 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 11,000 ft³/s Dec. 9, 1933, gage height, 10.2 ft, at site and datum then in use, from rating curve extended above 4,200 ft³/s; minimum discharge, 36 ft³/s Nov. 28, 29, 1952.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of Nov. 24, 1990 reached a stage of 8.68 ft, from floodmark at former site and datum 350 ft upstream, discharge, 13,000 ft³/s, from rating extended above 6,200 ft³/s.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 1,800 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Jan. 25	1400	*3,280	*11.16	No other peak greater than base discharge.			
Minimum discharge, 61 ft ³ /s, Sept. 21.							

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	311	e365	473	199	423	e130	283	625	910	520	400	227
2	317	e330	392	186	385	138	291	872	749	491	427	258
3	300	e280	318	e170	368	174	367	649	673	460	447	288
4	255	357	280	e150	365	208	357	557	639	420	444	282
5	200	340	253	e140	374	301	304	489	655	398	433	269
6	176	284	254	e130	383	347	296	577	670	388	410	278
7	169	559	240	e123	369	320	325	534	799	397	361	279
8	164	515	252	e117	366	317	359	551	786	387	325	276
9	146	410	244	e110	375	289	480	548	897	360	309	257
10	147	332	242	e108	347	266	419	747	1080	341	294	258
11	155	547	225	e108	322	245	409	1000	1000	338	273	222
12	148	759	208	e110	298	230	388	1300	910	343	266	154
13	220	547	207	122	288	223	357	1280	743	304	280	139
14	200	470	618	133	259	352	338	963	712	353	258	138
15	196	415	531	126	234	829	339	790	914	343	236	128
16	186	369	388	114	190	549	311	745	1030	356	253	118
17	242	349	347	117	163	484	324	778	884	378	257	120
18	240	371	e340	105	e150	714	358	879	807	365	294	118
19	289	361	e360	125	e140	589	308	932	756	372	308	108
20	313	317	e430	e250	e130	483	303	1110	661	581	341	88
21	298	718	e430	e300	e125	418	334	972	580	657	324	77
22	268	950	343	e230	e121	530	350	942	578	639	302	79
23	267	611	378	e190	e118	1500	329	776	535	698	355	82
24	255	452	352	e180	e115	879	320	727	476	595	297	86
25	236	376	307	2330	e111	548	344	697	485	506	257	91
26	202	349	341	1870	e110	420	353	668	503	472	199	93
27	167	532	299	1110	e107	355	369	661	562	448	209	110
28	164	522	283	785	e106	303	327	685	631	433	216	131
29	168	418	259	617	---	273	498	744	750	492	205	142
30	165	594	236	514	---	246	747	686	587	469	206	148
31	e255	---	210	450	---	230	---	876	---	407	209	---
TOTAL	6819	13799	10040	11319	6842	12890	10867	24360	21962	13711	9395	5044
MEAN	220	460	324	365	244	416	362	786	732	442	303	168
MAX	317	950	618	2330	423	1500	747	1300	1080	698	447	288
MIN	146	280	207	105	106	130	283	489	476	304	199	77
AC-FT	13530	27370	19910	22450	13570	25570	21550	48320	43560	27200	18630	10000
CFSM	2.79	5.83	4.10	4.63	3.10	5.27	4.59	9.96	9.28	5.61	3.84	2.13
IN.	3.22	6.51	4.73	5.34	3.23	6.08	5.12	11.49	10.35	6.46	4.43	2.38

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1911 - 1993, BY WATER YEAR (WY)

	301	479	530	462	365	302	378	561	660	492	323	248
MEAN	301	479	530	462	365	302	378	561	660	492	323	248
MAX	830	1138	1952	948	781	879	577	854	1083	828	500	538
(WY)	1960	1933	1934	1934	1951	1972	1938	1936	1964	1972	1964	1959
MIN	109	59.0	110	110	120	143	134	346	306	264	220	158
(WY)	1975	1930	1953	1937	1911	1941	1975	1941	1992	1940	1947	1930

SUMMARY STATISTICS	FOR 1992 CALENDAR YEAR		FOR 1993 WATER YEAR		WATER YEARS 1911 - 1993	
ANNUAL TOTAL	120568		147048			
ANNUAL MEAN	329		403			
HIGHEST ANNUAL MEAN					425	
LOWEST ANNUAL MEAN					601	
HIGHEST DAILY MEAN					276	
LOWEST DAILY MEAN					6790	
ANNUAL SEVEN-DAY MINIMUM					40	
ANNUAL RUNOFF (AC-FT)	239100		291700		42	
ANNUAL RUNOFF (CFSM)	4.18		5.11		308000	
ANNUAL RUNOFF (INCHES)	56.85		69.33		5.39	
10 PERCENT EXCEEDS	508		749		73.22	
50 PERCENT EXCEEDS	290		340		770	
90 PERCENT EXCEEDS	170		131		338	
					155	

e Estimated

PUYALLUP RIVER BASIN

109

12097500 GREENWATER RIVER AT GREENWATER, WA

LOCATION.--Lat 47°09'13", long 121°38'10", in NE 1/4 NE 1/4 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, June 1980 to current year (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 good. 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 discharge, 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 PERIOD MAY TO OCTOBER.--Maximum discharge, 624 ft³/s May 13, gage height, 4.80 ft; minimum discharge, 38 ft³/s Oct. 31.

DISCHARGE, CUBIC FEET PER SECOND, MAY TO OCTOBER 1993
DAILY MEAN VALUES

DAY	MAY	JUN	JUL	AUG	SEP	OCT
1	---	317	148	180	64	41
2	---	298	148	171	63	41
3	---	287	146	161	61	40
4	---	276	140	150	60	40
5	---	274	135	142	59	40
6	---	264	130	135	57	43
7	---	268	127	130	56	65
8	---	273	122	125	55	50
9	---	275	118	119	54	44
10	---	283	113	114	53	42
11	---	313	113	111	53	41
12	---	326	126	106	54	41
13	e610	309	117	103	52	47
14	556	288	126	100	52	46
15	513	284	119	97	51	47
16	485	275	120	98	50	51
17	472	258	139	95	49	45
18	475	242	137	91	48	42
19	490	225	141	87	48	41
20	502	210	172	84	48	40
21	494	200	172	81	47	40
22	472	194	180	80	47	40
23	431	184	187	79	46	55
24	399	173	189	94	45	49
25	377	164	197	84	44	44
26	352	157	194	77	43	41
27	335	154	185	74	43	40
28	331	157	181	72	42	40
29	328	174	196	69	42	40
30	298	151	202	67	41	39
31	316	---	188	66	---	86
TOTAL	---	7253	4708	3242	1527	1401
MEAN	---	242	152	105	50.9	45.2
MAX	---	326	202	180	64	86
MIN	---	151	113	66	41	39
AC-FT	---	14390	9340	6430	3030	2780
CFSM	---	3.29	2.07	1.42	.69	.61
IN.	---	3.67	2.38	1.64	.77	.71

e Estimated

PUYALLUP RIVER BASIN

12097850 WHITE RIVER BELOW CLEARWATER RIVER, NEAR BUCKLEY, WA

LOCATION.--Lat 47°08'49", long 121°51'32", in NE 1/4 SW 1/4 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 sea level (Corps of Engineers bench mark). Prior to March 1982, at datum 47.16 ft higher.

REMARKS.--No estimated daily discharges. Records fair. No regulation or diversion upstream from station. Sediment records June 1974 to June 1976. U.S. Army Corps of Engineers satellite telemeter at station.

AVERAGE DISCHARGE.--13 years (water years 1975-76, 1983-93), 1,307 ft³/s, 47.33 in/yr, 946,900 acre-ft/yr.

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 discharge, 252 ft³/s Nov. 8-11, 1987.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 4,100 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Jan. 25	1515	*3,880	*49.76				
Minimum discharge, 318 ft ³ /s Jan. 19.							

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	546	501	1290	610	1140	478	1180	1910	2640	1130	1190	543
2	583	747	1080	563	1060	493	1230	2030	2260	1100	1210	573
3	572	692	913	543	994	502	1440	1930	2020	1080	1230	614
4	544	683	816	538	938	553	1510	1890	1840	1030	1220	613
5	477	774	785	505	922	808	1380	1770	1890	978	1200	598
6	436	671	760	456	908	924	1330	1880	1860	962	1160	605
7	409	795	718	422	933	941	1330	1850	1910	925	1070	599
8	393	1020	683	417	985	993	1390	1840	1910	927	993	605
9	381	997	675	404	1010	1000	1770	1770	1950	938	943	644
10	369	835	649	389	1010	944	1740	1850	2320	922	902	645
11	376	1130	653	362	976	874	1640	2310	2390	916	871	631
12	379	1660	648	339	915	811	1520	3000	2230	951	865	554
13	494	1390	623	344	861	777	1420	3640	1980	856	869	505
14	476	1290	1230	379	812	909	1320	3220	1950	880	842	494
15	410	1140	1180	396	775	1910	1260	2830	2180	882	796	455
16	373	996	935	357	694	1640	1210	2560	2150	917	814	453
17	400	952	863	354	614	1380	1190	2540	2020	1050	806	442
18	391	1020	800	334	612	1490	1230	2790	1950	995	850	433
19	447	1050	776	333	624	1380	1170	3030	1930	1040	854	426
20	543	979	838	419	616	1300	1110	3260	1800	1310	892	395
21	528	1580	829	498	593	1210	1120	2950	1690	1320	859	360
22	482	2550	849	447	567	1420	1180	2790	1520	1380	809	356
23	460	1850	985	409	545	3470	1160	2440	1350	1450	840	352
24	458	1380	946	481	524	2850	1180	2240	1220	1410	757	352
25	441	1100	879	3120	504	2190	1260	2220	1200	1350	671	350
26	404	942	897	3500	485	1800	1340	2100	1280	1290	613	363
27	368	1010	842	2590	480	1560	1360	2160	1330	1240	585	406
28	345	1070	795	1920	475	1390	1300	2160	1240	1240	582	431
29	339	938	771	1580	---	1280	1510	2190	1300	1470	559	444
30	350	1300	719	1370	---	1180	1940	2040	1160	1350	558	446
31	358	---	659	1240	---	1090	---	2450	---	1200	553	---
TOTAL	13532	33042	26086	25619	21572	39547	40720	73640	54470	34489	26963	14687
MEAN	437	1101	841	826	770	1276	1357	2375	1816	1113	870	490
MAX	583	2550	1290	3500	1140	3470	1940	3640	2640	1470	1230	645
MIN	339	501	623	333	475	478	1110	1770	1160	856	553	350
AC-FT	26840	65540	51740	50820	42790	78440	80770	146100	108000	68410	53480	29130
CFSM	1.16	2.94	2.24	2.20	2.05	3.40	3.62	6.33	4.84	2.97	2.32	1.31
IN.	1.34	3.28	2.59	2.54	2.14	3.92	4.04	7.31	5.40	3.42	2.67	1.46

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1974 - 1993, BY WATER YEAR (WY)

	588	1351	1383	1606	1337	1231	1470	1969	2161	1451	870	597
MEAN	588	1351	1383	1606	1337	1231	1470	1969	2161	1451	870	597
MAX	1167	3096	4095	3177	3083	1663	2236	2653	4317	2520	1287	843
(WY)	1991	1991	1976	1984	1991	1987	1990	1975	1974	1974	1974	1976
MIN	318	341	586	640	675	743	895	1395	1036	758	621	466
(WY)	1988	1988	1986	1985	1985	1985	1975	1991	1992	1987	1987	1989

SUMMARY STATISTICS	FOR 1992 CALENDAR YEAR	FOR 1993 WATER YEAR	WATER YEARS 1974 - 1993
ANNUAL TOTAL	358429	404367	
ANNUAL MEAN	979	1108	1307
HIGHEST ANNUAL MEAN			1751
LOWEST ANNUAL MEAN			1030
HIGHEST DAILY MEAN	3600	Jan 29	15600
LOWEST DAILY MEAN	339	Oct 29	254
ANNUAL SEVEN-DAY MINIMUM	372	Oct 25	263
ANNUAL RUNOFF (AC-FT)	710900	802100	946600
ANNUAL RUNOFF (CFSM)	2.61	2.95	3.48
ANNUAL RUNOFF (INCHES)	35.56	40.11	47.34
10 PERCENT EXCEEDS	1570	2020	2480
50 PERCENT EXCEEDS	877	942	1070
90 PERCENT EXCEEDS	482	414	493

PUYALLUP RIVER BASIN

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12098000 MUD MOUNTAIN LAKE NEAR BUCKLEY, WA

LOCATION.--Lat 47°08'27", long 121°55'48", in NE 1/4 NE 1/4 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. Daily contents at 0800 hours only October 1944 to September 1987. 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 sea level (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 (revised by U.S.G.S. below 917 ft). Table uncertain below about 970 ft, due to siltation. Mud Mountain Lake is considered to have no appreciable storage below 917 ft.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents observed since dam was completed, 55,865 acre-ft Aug. 23, 1974, elevation, 1,150.0 ft; no contents at times in some years.

EXTREMES FOR CURRENT YEAR.--Maximum contents, 250 acre-ft Mar. 14, elevation, 934.08 ft; no contents many days during the year.

RESERVOIR STORAGE (ACRE-Feet), WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY OBSERVATION AT 08:00 VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	67	---	52	---	62	39	57	---	99	95	96	85
2	68	57	52	---	60	43	57	---	91	95	96	85
3	67	57	47	---	57	43	---	68	84	95	96	85
4	66	47	47	43	57	43	---	70	74	94	97	85
5	65	47	---	43	52	47	60	66	76	---	96	85
6	64	47	---	43	---	---	60	68	76	93.0	96	87
7	64	---	47	43	---	---	62	67	76	92	94	85
8	64	---	47	43	60	47	60	---	79	92	91	85
9	64	47	47	---	62	47	62	---	111	92	91	85
10	63	43	43	---	60	47	---	67	101	91	91	85
11	63	---	35	43	60	47	---	74	94	91	90	85
12	---	62	---	43	60	45	62	89	91	93	90	85
13	68	47	---	43	---	---	62	126	94	90	91	84
14	65	---	47	43	---	---	60	120	74	91	90	83
15	63	---	52	43	---	123	62	114	88	91	88	82
16	62	43	47	---	52	60	57	103	88	90	89	82
17	64	43	47	---	52	54	---	204	84	94	89	82
18	63	43	47	---	47	57	---	108	82	92	90	82
19	65	43	---	43	43	52	60	116	76	91	90	82
20	54	43	---	43	---	---	57	128	75	97	90	81
21	52	---	47	43	---	---	57	122	74	99	90	80
22	52	---	47	43	43	50	57	118	72	98	89	80
23	47	89	52	---	43	109	57	---	72	100	91	80
24	47	54	43	---	43	108	---	97	69	100	88	80
25	47	54	---	99	43	81	---	90	70	99	87	80
26	47	---	---	167	39	64	60	90	72	98	85	80
27	47	62	---	149	---	---	60	90	72	97	85	81
28	47	---	43	107	---	---	60	88	72	96	85	81
29	47	---	43	77	---	58	60	86	95	102	84	82
30	47	47	43	---	---	57	68	79	95	100	85	82
31	47	---	43	---	---	57	---	86	---	96	85	---
MAX	---	---	---	---	---	---	---	---	111	---	97	87
MIN	---	---	---	---	---	---	---	---	69	---	84	80
††	910.0	909.5	908.0	913.0	907.0	911.0	913.2	917.6	918.0	918.1	916.3	915.8
†	0	0	0	0	0	0	0	93	95	96	0	0
‡	0	0	0	0	0	0	0	+93	+2	+1	-96	0

CAL YR 1992 AC-FT‡ 0
WTR YR 1993 AC-FT‡ 0

†† Monthend elevation, in feet, at 2400 hours.
† Monthend contents, in acre-feet.
‡ Change in contents, in acre-feet.

PUYALLUP RIVER BASIN

12098500 WHITE RIVER NEAR BUCKLEY, WA

LOCATION.--Lat 47°09'05", long 121°56'55", in SW 1/4 NW 1/4 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 sea level (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 for estimated daily discharges, which are fair. 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 upstream from station. Chemical analyses July 1981; water temperatures March 1971 to September 1972; sediment records November 1971 to November 1972. U.S. Army Corps of Engineers satellite telemeter at station.

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

AVERAGE DISCHARGE.--60 years (water years 1929-33, 1939-93), 1,425 ft³/s, 48.26 in/yr, 1,032,000 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 discharge, 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, 4,120 ft³/s May 13, elevation, 804.23 ft; minimum discharge, 314 ft³/s Feb. 25, due to regulation; minimum daily, 350 ft³/s Jan. 12, 13, 18, 19.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	578	551	1340	605	1240	503	1240	2110	2700	1330	1250	679
2	577	720	1130	559	1140	516	1310	2200	2330	1310	1260	717
3	558	558	958	e550	1070	542	1580	2100	2110	1300	1280	736
4	525	684	852	e540	1010	602	1630	2080	1950	1260	1270	719
5	458	692	778	520	987	817	1460	1940	2010	1210	1240	690
6	420	572	745	461	959	936	1410	2050	1970	1200	1180	694
7	398	853	709	e435	977	950	1410	1990	2030	1150	1110	675
8	389	1030	686	e425	1020	1000	1520	1990	2020	1140	1030	641
9	382	975	688	e410	1050	1010	1970	1880	2070	1140	969	625
10	383	772	664	e395	1040	948	1890	2000	2420	1110	932	619
11	387	1120	633	e370	1010	872	1780	2420	2530	1100	892	603
12	390	1770	607	e350	938	810	1630	3150	2380	1150	880	543
13	512	1350	578	e350	885	765	1510	3710	2130	1030	874	508
14	449	1220	1260	e390	829	912	1390	3040	2070	1070	838	498
15	381	1070	1260	e410	789	2050	1330	2760	2300	1070	789	468
16	374	926	978	e370	691	1740	1260	2600	2250	1080	804	467
17	440	853	890	e360	621	1420	1260	2630	2130	1190	795	462
18	394	972	783	e350	634	1550	1320	2860	2070	1130	817	458
19	477	1010	736	e350	653	1420	1230	3070	2040	1150	810	454
20	593	924	916	e445	641	1320	1150	3380	1910	1440	827	410
21	572	1610	902	523	616	1220	1170	3060	1820	1450	796	403
22	528	2800	909	470	586	1460	1230	2820	1660	1490	747	402
23	506	1980	1040	429	568	3700	1200	2470	1490	1570	774	406
24	511	1460	992	514	545	3080	1230	2270	1370	1530	766	401
25	495	1170	925	3210	522	2390	1340	2280	1350	1480	778	398
26	460	996	936	3720	508	1970	1420	2180	1430	1390	723	402
27	430	1070	883	2850	503	1670	1460	2230	1490	1330	718	418
28	414	1140	817	2120	498	1460	1370	2220	1420	1320	710	431
29	416	990	750	1720	---	1340	1710	2270	1500	1570	683	441
30	428	1350	693	1490	---	1210	2140	2120	1340	1480	689	454
31	436	---	632	1350	---	1120	---	2520	---	1270	684	---
TOTAL	14261	33188	26670	27041	22530	41303	43550	76400	58290	39440	27915	15822
MEAN	460	1106	860	872	805	1332	1452	2465	1943	1272	900	527
MAX	593	2800	1340	3720	1240	3700	2140	3710	2700	1570	1280	736
MIN	374	551	578	350	498	503	1150	1880	1340	1030	683	398
AC-FT	28290	65830	52900	53640	44690	81920	86380	151500	115600	78230	55370	31380
MEAN†	460	1107	860	872	805	1332	1452	2465	1943	1272	899	527
CFSM†	1.15	2.76	2.15	2.18	2.01	3.32	3.62	6.15	4.85	3.17	2.24	1.32
IN.†	1.32	3.08	2.47	2.51	2.09	3.83	4.04	7.09	5.41	3.66	2.58	1.47
AC-FT†	28290	65830	52900	53640	44690	81920	86380	151600	115600	78230	55270	31380

CAL YR 1992 TOTAL 346415 MEAN 946 MAX 3800 MIN 347 AC-FT 687100 MEAN† 947 CFSM† 2.36 IN.† 32.13 AC-FT† 687100
WTR YR 1993 TOTAL 426410 MEAN 1168 MAX 3720 MIN 350 AC-FT 845800 MEAN† 1168 CFSM† 2.91 IN.† 39.55 AC-FT† 845800

e Estimated

† Adjusted for change in contents in Mud Mountain Lake.

PUYALLUP RIVER BASIN

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12099000 WHITE RIVER CANAL AT BUCKLEY, WA

LOCATION (Revised).--Lat 47°10'19", long 122°01'13", in SE 1/4 SE 1/4 sec.34, T.20 N., R.6 E., Pierce County, Hydrologic Unit 17110014, on right bank 0.8 mi downstream from diversion dam, and 0.8 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 0.5 mi downstream from White River diversion dam. September 1959 to September 1992 station at site 4.0 mi downstream from diversion dam. October 1992 to current year, gage at site 0.8 mi downstream from diversion dam.

GAGE.--Water-stage recorder. Elevation of gage is 650 ft, from topographic map.

REMARKS.--Records good except for estimated daily discharges, which are fair. Flow completely regulated at White River diversion dam about 0.8 mi upstream from gage. U.S. Geological Survey satellite telemeter at station.

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 2,040 ft³/s May 11, 12, 15, 1993; no flow on many days during most years.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	521	513	1390	624	e865	465	1240	1950	1450	1230	1150	529
2	540	755	1220	568	e816	488	1290	1990	1500	1220	1160	610
3	537	604	1050	575	768	530	1520	1940	1640	1200	1170	652
4	507	694	918	570	e726	604	1590	1950	1660	1150	1160	652
5	403	713	840	524	687	848	1430	1850	1680	1100	1120	629
6	342	579	785	455	668	972	1370	1920	1320	1110	1050	646
7	309	839	741	e444	e639	984	1400	1890	1340	1090	1000	329
8	292	1090	716	e444	372	1030	1430	1890	1440	1080	914	.00
9	277	1120	725	e40.0	.00	1050	1760	1820	1380	1080	872	.00
10	281	917	715	.00	.00	992	1750	1900	1300	1050	829	.00
11	290	1160	660	.00	.00	e928	1670	2040	1310	1010	761	.00
12	303	1640	619	.00	40.0	e850	1580	2040	1090	1040	762	.00
13	535	1530	581	.00	724	813	1450	2020	1370	911	787	.00
14	408	1440	1280	.00	819	948	1350	2020	1330	971	751	.00
15	315	1300	1340	.00	778	1430	1290	2040	1310	1000	693	.00
16	288	1150	1060	.00	677	1450	313	2000	1350	1010	715	.00
17	357	1050	967	e115	621	1400	1240	1990	1620	1140	715	.00
18	334	1150	852	229	644	1490	1300	1990	1630	1060	726	118
19	449	1190	797	e289	618	1400	1240	2000	1560	1060	736	346
20	515	1100	997	459	610	1330	1180	2000	1490	1380	861	317
21	477	1330	1030	498	589	1240	1190	2000	1570	1390	738	288
22	422	1730	1030	453	553	1350	1300	1670	1570	1440	686	304
23	397	1810	1130	e395	525	1790	1210	1580	1410	1510	742	294
24	400	1610	1080	498	495	1810	1240	1540	1280	1450	662	295
25	381	1350	1010	1700	464	1910	1320	1550	1300	1400	570	281
26	328	1160	1010	1680	450	1810	1400	1570	1320	1320	497	242
27	287	1180	953	1730	447	1580	1460	1600	1390	1260	480	.00
28	270	1220	896	1470	439	1380	1450	1610	1340	1260	475	.00
29	269	1080	810	1220	---	1300	1590	1580	1440	1400	460	105
30	300	1380	742	1040	---	1200	1980	1580	1280	1380	466	392
31	309	---	659	e934	---	1120	---	1510	---	1200	451	---
TOTAL	11643	34384	28603	16954.00	15034.00	36492	41533	57030	42670	36902	24159	7029.00
MEAN	376	1146	923	547	537	1177	1384	1840	1422	1190	779	234
MAX	540	1810	1390	1730	865	1910	1980	2040	1680	1510	1170	652
MIN	269	513	581	.00	.00	465	313	1510	1090	911	451	.00
AC-FT	23090	68200	56730	33630	29820	72380	82380	113100	84640	73200	47920	13940

CAL YR 1992 TOTAL 300711.50 MEAN 822 MAX 1940 MIN .00 AC-FT 596500
WTR YR 1993 TOTAL 352433.00 MEAN 966 MAX 2040 MIN .00 AC-FT 699100

e Estimated

PUYALLUP RIVER BASIN

12099600 BOISE CREEK AT BUCKLEY, WA

LOCATION.--Lat 47°10'34", long 122°01'02", in NE 1/4 SE 1/4 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.--No estimated daily discharges. Records good. Flow partly regulated by millpond at mile 5.6. Diversions upstream from station for domestic and industrial use. Interbasin diversion from Scatter Creek of about 2 ft³/s during low-flow periods enters Boise Creek upstream from millpond. U.S. Geological Survey satellite telemeter at station. Chemical analyses November 1961 to July 1964.

AVERAGE DISCHARGE.--15 years (1978-81, 1983-93), 32.9 ft³/s, 23,840 acre-ft/yr.

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

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

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Jan. 25	1345	*376	*2.65	Mar. 23	0115	319	2.52

Minimum discharge, 6.9 ft³/s Sept. 29, 30.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	9.4	21	49	22	33	14	35	65	56	27	31	10
2	9.0	18	42	21	29	13	37	65	54	34	28	10
3	17	14	36	23	27	20	61	61	48	32	25	9.9
4	14	21	32	22	25	16	49	65	43	29	22	9.5
5	11	16	29	20	23	16	40	55	39	26	21	9.5
6	10	15	27	19	22	15	38	60	38	23	20	9.5
7	10	27	25	18	22	15	39	52	49	21	19	9.4
8	9.2	46	26	18	21	15	44	54	42	19	18	8.9
9	8.9	58	30	15	20	15	76	48	68	18	17	8.7
10	8.7	38	43	15	19	14	58	54	60	17	16	8.7
11	8.3	54	33	15	18	13	67	42	77	19	16	8.7
12	8.4	49	30	14	17	12	61	38	68	22	15	9.0
13	18	40	26	14	17	12	52	34	53	20	15	8.7
14	12	32	75	14	17	19	45	31	47	31	15	8.7
15	10	26	62	13	18	40	41	29	52	33	15	8.7
16	11	23	47	13	18	29	37	27	45	39	20	8.4
17	14	32	42	13	18	28	47	25	37	40	18	8.0
18	13	42	35	13	16	30	51	24	33	37	15	8.0
19	16	57	40	17	17	24	39	23	30	33	14	8.1
20	13	39	89	19	17	23	35	28	29	56	13	8.1
21	16	84	71	18	18	22	38	33	27	50	13	8.0
22	18	92	54	20	17	82	38	35	32	61	12	8.0
23	14	77	50	17	17	210	35	27	26	51	13	8.0
24	13	55	45	30	17	103	39	24	24	49	14	7.4
25	12	44	40	252	16	65	51	22	22	49	13	7.5
26	11	37	38	222	16	47	60	21	20	42	12	7.4
27	10	46	34	123	15	38	69	20	20	37	12	7.3
28	10	44	30	84	13	32	53	23	26	36	11	7.3
29	11	36	27	59	---	32	72	26	32	45	11	7.0
30	12	66	25	46	---	28	70	24	24	48	11	7.0
31	15	---	23	39	---	25	---	60	---	36	10	---
TOTAL	372.9	1249	1255	1248	543	1067	1477	1195	1221	1080	505	253.4
MEAN	12.0	41.6	40.5	40.3	19.4	34.4	49.2	38.5	40.7	34.8	16.3	8.45
MAX	18	92	89	252	33	210	76	65	77	61	31	10
MIN	8.3	14	23	13	13	12	35	20	20	17	10	7.0
AC-FT	740	2480	2490	2480	1080	2120	2930	2370	2420	2140	1000	503

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1977 - 1993, BY WATER YEAR (WY)

	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993
MEAN	13.0	47.9	50.9	56.9	55.8	44.5	41.4	31.4	22.8	14.8	9.51	10.2					
MAX	29.8	124	96.2	162	128	67.1	69.3	57.5	55.1	35.5	16.3	29.5					
(WY)	1986	1991	1978	1984	1982	1989	1991	1984	1990	1983	1993	1978					
MIN	4.65	7.85	23.2	25.5	19.4	25.1	24.8	15.6	8.45	6.20	4.72	3.37					
(WY)	1990	1980	1988	1979	1993	1978	1983	1982	1982	1987	1987	1989					

SUMMARY STATISTICS FOR 1992 CALENDAR YEAR FOR 1993 WATER YEAR WATER YEARS 1977 - 1993

	1992 CALENDAR YEAR	1993 WATER YEAR	WATER YEARS 1977 - 1993
ANNUAL TOTAL	8857.1	11466.3	
ANNUAL MEAN	24.2	31.4	
HIGHEST ANNUAL MEAN			32.9
LOWEST ANNUAL MEAN			50.4
HIGHEST DAILY MEAN	119	252	22.9
LOWEST DAILY MEAN	6.9	7.0	620
ANNUAL SEVEN-DAY MINIMUM	7.2	7.3	2.0
ANNUAL RUNOFF (AC-FT)	17570	22740	2.4
10 PERCENT EXCEEDS	47	58	23850
50 PERCENT EXCEEDS	19	25	66
90 PERCENT EXCEEDS	8.4	10	23
			6.6

12100000 WHITE RIVER AT BUCKLEY, WA

LOCATION (Revised).--Lat 47°10'28", long 122°01'09", in NE 1/4 SE 1/4 sec.34, T.20 N., R.6 E., Pierce County, Hydrologic Unit 17110014, on left bank 500 ft upstream from state highway 410 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 sea level (levels by Puget Sound Power and Light Co.).

REMARKS.--No estimated daily discharges. 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. U.S. Geological Survey satellite telemeter at station.

AVERAGE DISCHARGE.--16 years (water years 1978-93), 515 ft³/s, 373,100 acre-ft/yr.

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, 14,900 ft³/s Nov. 24, 1986, gage height, 8.48 ft; minimum discharge, 25 ft³/s Nov. 19, 1979, gage height, 2.41 ft; minimum daily discharge, 31 ft³/s July 30, 1978.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 3,170 ft³/s Jan. 25, gage height, 5.70 ft; minimum discharge, 92 ft³/s Feb. 18; minimum daily discharge, 127 ft³/s Mar. 7, 21.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	141	149	153	132	488	135	136	160	1470	191	213	161
2	141	150	141	130	427	131	137	259	1040	204	216	135
3	147	136	134	133	392	140	156	159	657	203	215	136
4	141	147	133	130	371	134	141	165	430	198	215	133
5	134	138	129	129	370	129	130	142	462	198	215	133
6	138	139	130	134	367	133	133	148	845	200	237	139
7	139	157	131	146	410	127	130	138	916	188	212	396
8	139	190	133	130	606	133	136	140	758	185	229	640
9	140	208	133	449	1120	131	244	133	913	193	213	634
10	141	162	146	502	1110	128	160	141	1370	190	212	643
11	142	225	140	377	1080	128	153	363	1480	202	227	643
12	142	338	137	320	919	130	145	1160	1550	197	225	582
13	151	166	133	479	274	129	136	1780	971	195	212	527
14	139	156	189	529	132	142	130	1310	889	205	212	515
15	139	146	159	539	131	770	132	879	1170	201	212	482
16	140	144	140	483	129	394	1070	655	1060	204	216	479
17	142	153	137	322	133	172	164	601	597	208	210	467
18	135	165	129	210	136	155	136	827	503	193	222	350
19	145	182	139	156	141	137	135	1100	527	200	218	157
20	136	166	214	170	138	128	129	1370	471	216	218	149
21	143	554	158	163	131	127	130	1120	303	200	221	145
22	144	1300	129	136	131	232	131	1310	175	205	220	145
23	139	446	133	134	133	2190	131	1000	141	194	215	141
24	143	172	129	143	133	1450	139	837	148	190	211	139
25	138	157	128	2020	133	518	142	806	141	192	216	142
26	134	149	129	2680	137	159	143	661	148	191	213	180
27	134	159	128	1420	134	137	151	701	147	197	217	438
28	134	153	128	890	138	140	131	702	146	195	220	459
29	137	139	128	700	---	132	153	800	149	276	215	370
30	142	178	129	588	---	134	193	634	147	226	218	147
31	142	---	131	539	---	129	---	1180	---	193	219	---
TOTAL	4342	6824	4330	15013	9944	8954	5277	21381	19724	6230	6734	9807
MEAN	140	227	140	484	355	289	176	690	657	201	217	327
MAX	151	1300	214	2680	1120	2190	1070	1780	1550	276	237	643
MIN	134	136	128	129	129	127	129	133	141	185	210	133
AC-FT	8610	13540	8590	29780	19720	17760	10470	42410	39120	12360	13360	19450

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1977 - 1993, BY WATER YEAR (WY)

	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993
MEAN	157	548	798	670	827	457	443	502	657	508	368	165					
MAX	510	1713	4014	2888	3209	990	1171	919	1898	1473	825	511					
(WY)	1986	1991	1978	1984	1982	1989	1980	1984	1988	1982	1978	1988					
MIN	48.4	40.9	137	69.8	130	122	89.9	67.6	172	58.2	57.4	45.2					
(WY)	1980	1980	1985	1979	1985	1985	1982	1977	1992	1978	1977	1979					

SUMMARY STATISTICS

FOR 1992 CALENDAR YEAR

FOR 1993 WATER YEAR

WATER YEARS 1977 - 1993

ANNUAL TOTAL	81383	118560	515
ANNUAL MEAN	222	325	804
HIGHEST ANNUAL MEAN			268
LOWEST ANNUAL MEAN			1990
HIGHEST DAILY MEAN	2140	2680	13500
LOWEST DAILY MEAN	110	127	31
ANNUAL SEVEN-DAY MINIMUM	114	128	37
ANNUAL RUNOFF (AC-FT)	161400	235200	372800
10 PERCENT EXCEEDS	307	814	1280
50 PERCENT EXCEEDS	143	161	150
90 PERCENT EXCEEDS	130	131	63

PUYALLUP RIVER BASIN

12100496 WHITE RIVER NEAR AUBURN, WA

LOCATION.--Lat 47°15'58", long 122°13'43", in SE 1/4 NE 1/4 sec.36, T.21 N., R.4 E., King County, Hydrologic Unit 17110014, on left bank 100 ft downstream from railroad bridge, 2.7 mi upstream from the White River Power Plant tailrace, 2.9 mi south of Auburn, and at mile 6.3.

DRAINAGE AREA.--464 mi².

PERIOD OF RECORD.--October 1987 to September 1989, October 1990 to current year.

GAGE.--Water-stage recorder. Datum of gage is sea level.

REMARKS.--Records fair. Since November 1911, White River Canal (station 12099000) has diverted from left bank 18.0 mi upstream for storage in Lake Tapps (station 12101000). Water is returned to White River 2.7 mi downstream via the Lake Tapps Diversion (station 12101100) after power development at White River Power Plant at Dieringer. Since 1942, flow regulated by Mud Mountain Lake (station 12098000) for flood control. U.S. Geological Survey satellite telemeter at station.

AVERAGE DISCHARGE.--5 years (water years 1988-89, 1991-93), 618 ft³/s, 18.09 in/yr, 447,700 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 10,800 ft³/s Nov. 24, 1990, gage height, 80.71 ft; minimum discharge, 89 ft³/s Feb. 17, 18, 1993.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 3,850 ft³/s Jan. 25, gage height, 78.60 ft; minimum discharge, 89 ft³/s Feb. 17, 18.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	174	199	220	177	550	149	221	304	1830	251	267	212
2	176	192	195	172	484	137	223	394	1320	272	266	162
3	184	163	173	181	440	188	301	303	807	264	263	162
4	177	182	167	180	417	186	275	310	530	259	249	154
5	159	172	159	178	410	168	218	247	519	251	251	155
6	161	176	160	192	408	169	215	248	857	253	284	162
7	170	211	160	231	450	150	217	253	1050	251	269	407
8	170	217	170	e195	556	160	248	253	899	244	270	752
9	166	268	172	369	1190	154	445	223	930	245	256	709
10	170	206	208	502	1190	137	330	258	1640	245	243	731
11	171	228	212	464	1160	134	335	394	1750	258	279	733
12	172	407	194	469	1070	138	292	1190	1860	249	257	651
13	178	214	182	411	438	144	255	2210	1140	256	243	574
14	162	197	235	536	181	179	235	1760	974	280	245	557
15	150	182	225	547	170	716	236	1170	1350	264	248	527
16	155	182	191	502	155	587	1150	839	1300	259	262	524
17	163	189	189	425	153	304	436	749	728	268	249	520
18	160	229	181	287	152	219	259	949	589	243	263	457
19	173	246	189	259	159	191	228	1340	594	251	256	213
20	168	215	362	251	157	170	223	1710	602	284	257	201
21	171	394	287	302	145	159	226	1420	424	261	256	173
22	172	1490	231	239	140	244	225	1580	282	268	254	171
23	172	631	216	216	148	2650	219	1270	206	276	256	165
24	179	243	199	238	138	2050	232	999	212	252	242	169
25	163	203	185	2090	134	879	254	937	204	246	243	174
26	164	198	193	3200	142	298	258	783	205	242	239	174
27	158	218	186	1890	137	216	294	782	201	245	247	501
28	160	214	181	1070	144	214	235	785	217	248	251	480
29	166	184	176	817	---	203	283	947	220	358	251	454
30	176	242	183	654	---	194	335	736	206	295	255	194
31	178	---	177	603	---	187	---	1270	---	241	248	---
TOTAL	5218	8292	6158	17847	11018	11674	8903	26613	23646	8079	7919	11218
MEAN	168	276	199	576	393	377	297	858	788	261	255	374
MAX	184	1490	362	3200	1190	2650	1150	2210	1860	358	284	752
MIN	150	163	159	172	134	134	215	223	201	241	239	154
AC-FT	10350	16450	12210	35400	21850	23160	17660	52790	46900	16020	15710	22250

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1988 - 1993, BY WATER YEAR (WY)

	1988	1989	1990	1991	1992	1993
MEAN	295	887	775	659	927	519
MAX	501	2500	2030	1150	2364	1280
(WY)	1991	1991	1991	1989	1991	1989
MIN	165	172	199	234	342	193
(WY)	1992	1988	1993	1988	1992	1992

SUMMARY STATISTICS

FOR 1992 CALENDAR YEAR

FOR 1993 WATER YEAR

WATER YEARS 1988 - 1993

ANNUAL TOTAL	98311	146585	
ANNUAL MEAN	269	402	
HIGHEST ANNUAL MEAN			618
LOWEST ANNUAL MEAN			1033
HIGHEST DAILY MEAN	2320	Jan 29	3200
LOWEST DAILY MEAN	150	Oct 15	134
ANNUAL SEVEN-DAY MINIMUM	155	May 11	140
ANNUAL RUNOFF (AC-FT)	195000	290800	447800
10 PERCENT EXCEEDS	389	933	1480
50 PERCENT EXCEEDS	192	245	259
90 PERCENT EXCEEDS	164	162	162

e Estimated

PUYALLUP RIVER BASIN

117

12101000 LAKE TAPPS NEAR SUMNER, WA

LOCATION.--Lat 47°14'28", long 122°11'26", in NE 1/4 NE 1/4 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.--Water-stage recorder. Datum of gage is 0.7 ft above sea level (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. U. S. Geological Survey satellite telemeter at station.

COOPERATION.--Prior to October 1, 1990 gage-height record furnished by Puget Sound Power & Light Co. 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, 543.07 ft July 8, 1990; 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, 46,579 acre-ft Sept. 7, 9, gage height, 542.97 ft; minimum contents, 13,107 acre-ft Apr. 19, gage height, 526.52 ft.

MONTHEND GAGE HEIGHT AND CONTENTS AT 2400, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

	Gage height (feet)	Contents (acre-feet)	Change in contents (acre-feet)
Sept. 30.....	541.68	43,355	--
Oct. 31.....	534.76	27,585	-15,770
Nov. 30.....	540.62	40,787	+13,202
Dec. 31.....	536.08	30,391	-10,396
CAL YR 1992.....	--	--	-44
Jan. 31.....	536.67	31,688	+1,297
Feb. 28.....	529.12	17,121	-14,567
Mar. 31.....	531.56	21,320	+4,199
Apr. 30.....	533.06	24,144	+2,824
May 31.....	542.56	45,547	+21,403
June 30.....	542.40	45,144	-403
July 31.....	542.55	45,522	+378
Aug. 31.....	542.64	45,749	+227
Sept. 30.....	542.54	45,497	-252
WTR YR 1993.....	--	--	+2,142

12101100 LAKE TAPPS DIVERSION AT DIERINGER, WA

LOCATION.--Lat 47°14'18", long 122°13'37", in SW 1/4 NW 1/4 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. Datum of gage is 42.36 ft above sea level (levels by Puget Sound Power and Light Co.). Prior to September 30, 1990, at same site at datum 5.00 ft higher.

REMARKS.--Records good except for discharges below 60 ft³/s and estimated daily discharges, which are poor. Flow regulated by White River powerplant. U.S. Geological Survey satellite telemeter at station.

AVERAGE DISCHARGE.--35 years, 937 ft³/s, 678,900 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 2,530 ft³/s Jan. 29, 1965, gage height, 6.23 ft, datum then in use; maximum gage height, 7.67 ft Nov. 24, 1986 (backwater from White River), datum then in use; no flow many days in July and August 1990, Sept. 29, 1993.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 1,760 ft³/s Apr. 7, gage height, 8.64 ft; minimum discharge, no flow Sept. 29.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	638	326	1450	839	835	514	1590	1200	1550	1140	1210	420
2	734	296	1460	759	834	568	1450	1200	1510	1120	1140	420
3	942	650	1450	e240	835	577	1600	1370	1510	1100	1030	413
4	738	952	1450	828	e275	574	1600	1460	1510	1080	1000	490
5	397	924	1460	795	821	e130	1620	512	1510	1050	969	513
6	385	994	1460	860	e175	474	1590	1450	1320	907	1070	382
7	386	843	1450	881	e44	563	1540	1450	1240	821	551	e125
8	646	849	1460	942	e285	706	1510	1540	1250	902	990	e28
9	859	897	1460	394	864	537	1640	1540	1240	824	920	e28
10	858	926	1460	374	831	532	1640	1350	1240	858	917	e24
11	856	924	1460	352	824	573	1640	1540	1260	763	584	e22
12	854	907	1470	523	1060	533	1640	1540	1030	1030	e28	e20
13	855	961	1470	355	834	568	1640	1540	1240	955	858	e17
14	851	955	1460	356	787	521	1640	1540	1240	859	e420	e14
15	584	957	1420	329	747	984	1610	1540	1230	808	e380	e11
16	844	920	1370	290	853	977	1640	1350	1350	840	637	11
17	881	1030	1050	e44	809	1110	1650	1540	1540	952	557	11
18	856	926	1050	e44	1110	1340	1650	1510	1520	1360	574	111
19	859	e44	e44	298	1050	1480	852	1510	1530	945	712	291
20	798	e44	773	294	517	1480	e360	1510	1530	1380	681	505
21	767	e44	873	e44	576	1030	e405	1510	1520	1380	e380	455
22	769	e44	863	98	1070	977	e430	1530	1550	1380	738	300
23	752	e44	886	380	1080	1450	e455	1530	1470	1410	649	12
24	e44	1160	e180	390	1070	1450	908	1510	1260	1420	685	10
25	e44	1500	694	170	1060	1450	851	1510	1240	1420	419	10
26	588	1510	703	849	1050	1580	830	1510	1330	1420	331	10
27	579	1500	e44	919	e44	1710	891	1510	1370	1380	264	12
28	624	1470	e44	834	e44	1670	925	1510	1370	1340	252	13
29	655	1470	825	842	---	1640	1230	1510	1380	656	285	9.8
30	647	1460	916	505	---	1620	1230	1510	1300	1520	420	308
31	586	---	1190	e44	---	1600	---	1550	---	1200	420	---
TOTAL	20876	25527	33345	14872	20384	30918	38257	44882	41140	34220	20071	4995.8
MEAN	673	851	1076	480	728	997	1275	1448	1371	1104	647	167
MAX	942	1510	1470	942	1110	1710	1650	1550	1550	1520	1210	513
MIN	44	44	44	44	44	130	360	512	1030	656	28	9.8
AC-FT	41410	50630	66140	29500	40430	61330	75880	89020	81600	67880	39810	9910

CAL YR 1992 TOTAL 313300 MEAN 856 MAX 1950 MIN 10 AC-FT 621400
WTR YR 1993 TOTAL 329487.8 MEAN 903 MAX 1710 MIN 9.8 AC-FT 653500

e Estimated

PUYALLUP RIVER BASIN

119

12101500 PUYALLUP RIVER AT PUYALLUP, WA
(National stream quality accounting network station)

LOCATION.--Lat 47°12'31", long 122°19'33", in SE 1/4 NW 1/4 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 sea level. 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.--No estimated daily discharges. Water-discharge records good. All diverted water returned to river upstream from 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 upstream from station. U.S. Geological Survey satellite telemeter at 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 16 ft³/s per month into Puyallup River 0.5 mi east of McMillin. Monthly mean diversions, in cubic feet per second, for the year are as follows:

October	2.46	January	1.36	April	0	July	0
November	0.77	February	0.89	May	3.56	August	0
December	0	March	0	June	0	September	0

AVERAGE DISCHARGE.--79 years, 3,330 ft³/s, 2,413,000 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 discharge, 306 ft³/s Sept. 25, 1955, elevation, 8.23 ft; minimum daily discharge, 400 ft³/s Nov. 30, 1952.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 12,700 ft³/s Mar. 23, elevation, 16.79 ft; minimum discharge, 530 ft³/s Jan. 18, 19, elevation, 9.21 ft; minimum daily discharge, 564 ft³/s Jan. 18.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1750	1420	4000	1760	2950	1200	3290	3660	6660	2640	3200	1480
2	1730	1620	3630	1550	2800	1330	3210	4140	5230	2580	3270	1490
3	1970	1740	3260	1080	2660	1500	3830	3870	4340	2580	3100	1580
4	1780	2070	3010	1650	2180	1580	4070	3880	3840	2420	3110	1710
5	1230	2300	2840	1490	2570	1280	3660	2580	3620	2310	2950	1710
6	1110	1990	2730	1450	1870	1670	3430	3580	3720	2160	3060	1630
7	1070	2560	2620	1500	1750	1720	3440	3610	4120	1980	2450	1430
8	1200	2740	2550	1620	2170	1810	3430	3670	4130	2050	2530	1730
9	1460	2740	2690	1100	3240	1640	4600	3670	3980	2010	2480	1600
10	1490	2280	2900	1250	3270	1540	4290	3830	5790	1840	2370	1630
11	1530	2580	2960	1160	3170	1530	4470	4780	5770	1860	2050	1610
12	1570	3830	2760	1290	3300	1450	4570	5940	5690	2020	1360	1360
13	1900	3030	2610	1130	2430	1440	4040	7250	4600	2020	1220	1220
14	1800	2680	3490	1220	1990	1490	3790	5940	4030	2110	2000	1200
15	1370	2430	4070	1240	1860	4010	3590	4810	4930	2160	1800	1120
16	1440	2240	3370	1080	1850	3580	4190	4010	5590	2090	1980	1070
17	1650	2230	2860	754	1670	2990	3820	4000	4750	2410	2030	1060
18	1640	2480	2320	564	2030	3590	3680	4250	4170	2780	2020	1130
19	1830	1890	1310	836	2000	3560	2730	4780	3960	2220	2120	982
20	1910	1660	2660	1120	1460	3260	2150	5790	3750	3740	2200	1210
21	1800	2220	2810	1060	1410	2720	2230	5270	3390	4680	2050	1120
22	1680	5120	2560	776	1990	2520	2400	5460	3280	4210	2080	950
23	1760	3420	2650	1050	1980	10800	2380	4770	3090	4450	2290	632
24	1020	3150	1830	1200	1850	8230	2570	4100	2620	4260	2180	633
25	904	3200	2050	8290	1850	5240	2550	3920	2460	4000	1790	617
26	1270	3020	2060	11300	1830	3960	2720	3660	2580	3780	1490	657
27	1240	3340	1290	7430	684	3670	2840	3640	2820	3570	1320	1000
28	1240	3680	1150	4760	625	3390	2670	3640	2990	3490	1310	1080
29	1300	3380	1870	3860	---	3250	3250	4200	3490	3230	1260	1110
30	1340	4040	1830	3090	---	3170	4010	3780	3010	4190	1470	1170
31	1280	---	2140	2390	---	3080	---	5200	---	3280	1480	---
TOTAL	46264	81080	80880	70050	59439	92200	101900	135680	122400	89120	67010	36921
MEAN	1492	2703	2609	2260	2123	2974	3397	4377	4080	2875	2162	1231
MAX	1970	5120	4070	11300	3300	10800	4600	7250	6660	4680	3270	1730
MIN	904	1420	1150	564	625	1200	2150	2580	2460	1840	1260	617
AC-FT	91760	160800	160400	138900	117900	182900	202100	269100	242800	176800	132900	73230
MEAN†	1236	2925	2439	2280	1860	3042	3444	4724	4075	2881	2164	1227
AC-FT†	75990	174000	150000	140200	103300	187100	204900	290500	242400	177200	133100	72980

CAL YR 1992 TOTAL 852744 MEAN 2330 MAX 9600 MIN 683 AC-FT 1691000 MEAN† 2.46 AC-FT† 1691000
WTR YR 1993 TOTAL 982944 MEAN 2693 MAX 11300 MIN 564 AC-FT 1950000 MEAN† 2.84 AC-FT† 1952000

† Adjusted for change in contents in 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 TEMPERATURE: July 1959 to September 1961, August 1965 to September 1966.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DATE	TIME	DIS-CHARGE, INST. (CUBIC FEET PER SECOND)	SPE-CIFIC CON-DUCT-ANCE (US/CM)	PH (STAND-ARD UNITS)	TEMPER-ATURE WATER (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)
NOV 16...	1115	2550	74	7.4	8.5	5.3	11.2	95	--	320	24
MAR 22...	1005	1880	80	7.5	8.0	3.3	11.8	101	140	190	28
MAY 24...	1430	4100	55	7.6	15.0	1.2	10.0	100	23	K5	19
JUL 19...	1115	2580	79	7.2	14.5	16	9.9	97	300	81	28
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)	SODIUM PERCENT	SODIUM AD-SORP-TION RATIO	POTAS-SIUM, DIS-SOLVED (MG/L AS K)	ALKA-LINITY, DIS IT, FIELD (MG/L AS CACO3)	BICAR-BONATE, DIS IT, FIELD (MG/L AS HCO3)	CAR-BONATE, DIS IT, FIELD (MG/L AS CO3)	
NOV 16...	0	6.8	1.7	3.9	25	0.3	0.9	24	29	0	
MAR 22...	1	7.4	2.2	4.4	25	0.4	0.9	27 *	33 *	0 *	
MAY 24...	0	5.5	1.3	2.9	24	0.3	0.6	19	23	0	
JUL 19...	1	7.9	2.1	4.1	23	0.3	0.9	27	33	0	
DATE	SULFATE, DIS-SOLVED (MG/L AS SO4)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)	FLUO-RIDE, DIS-SOLVED (MG/L AS F)	SILICA, DIS-SOLVED (MG/L AS SIO2)	SOLIDS RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L)	SOLIDS, DIS-SOLVED (TONS PER AC-FT)	SOLIDS, DIS-SOLVED (TONS PER DAY)	NITRO-GEN, NITRITE DIS-SOLVED (MG/L AS N)	NITRO-GEN, NO2+NO3, DIS-SOLVED (MG/L AS N)	
NOV 16...	7.1	2.1	<0.1	14	49	52	0.07	337	<0.01	0.21	
MAR 22...	4.8	2.6	<0.1	15	49	55	0.07	249	<0.01	0.31	
MAY 24...	4.4	1.3	<0.1	13	43	41	0.06	476	<0.01	0.18	
JUL 19...	6.0	1.9	<0.1	13	61	53	0.08	425	<0.01	0.15	
DATE	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)	BARIUM, DIS-SOLVED (UG/L AS BA)	COBALT, DIS-SOLVED (UG/L AS CO)	IRON, DIS-SOLVED (UG/L AS FE)	LITHIUM, DIS-SOLVED (UG/L AS LI)	
NOV 16...	0.05	<0.2	0.06	0.05	0.02	--	5	<3	100	<4	
MAR 22...	0.11	0.3	0.04	0.02	0.03	50	7	<3	160	<4	
MAY 24...	0.05	<0.2	0.03	0.01	0.01	20	4	<3	44	<4	
JUL 19...	0.06	0.4	0.09	0.02	0.02	20	6	<3	91	5	
DATE	MANGA-NESE, DIS-SOLVED (UG/L AS MN)	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)	SEDI-MENT, SUS-PENDED (MG/L)	SEDI-MENT, DIS-CHARGE, SUS-PENDED (T/DAY)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM	
NOV 16...	12	<10	<1	<1	<1	37	<6	105	723	16	
MAR 22...	26	<10	<1	<1	<1	48	<6	92	467	28	
MAY 24...	11	<10	<1	<1	<1	28	<6	64	708	55	
JUL 19...	24	<10	<1	<1	<1	45	<6	42	293	78	

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

* - Whole water sample rather than filtered

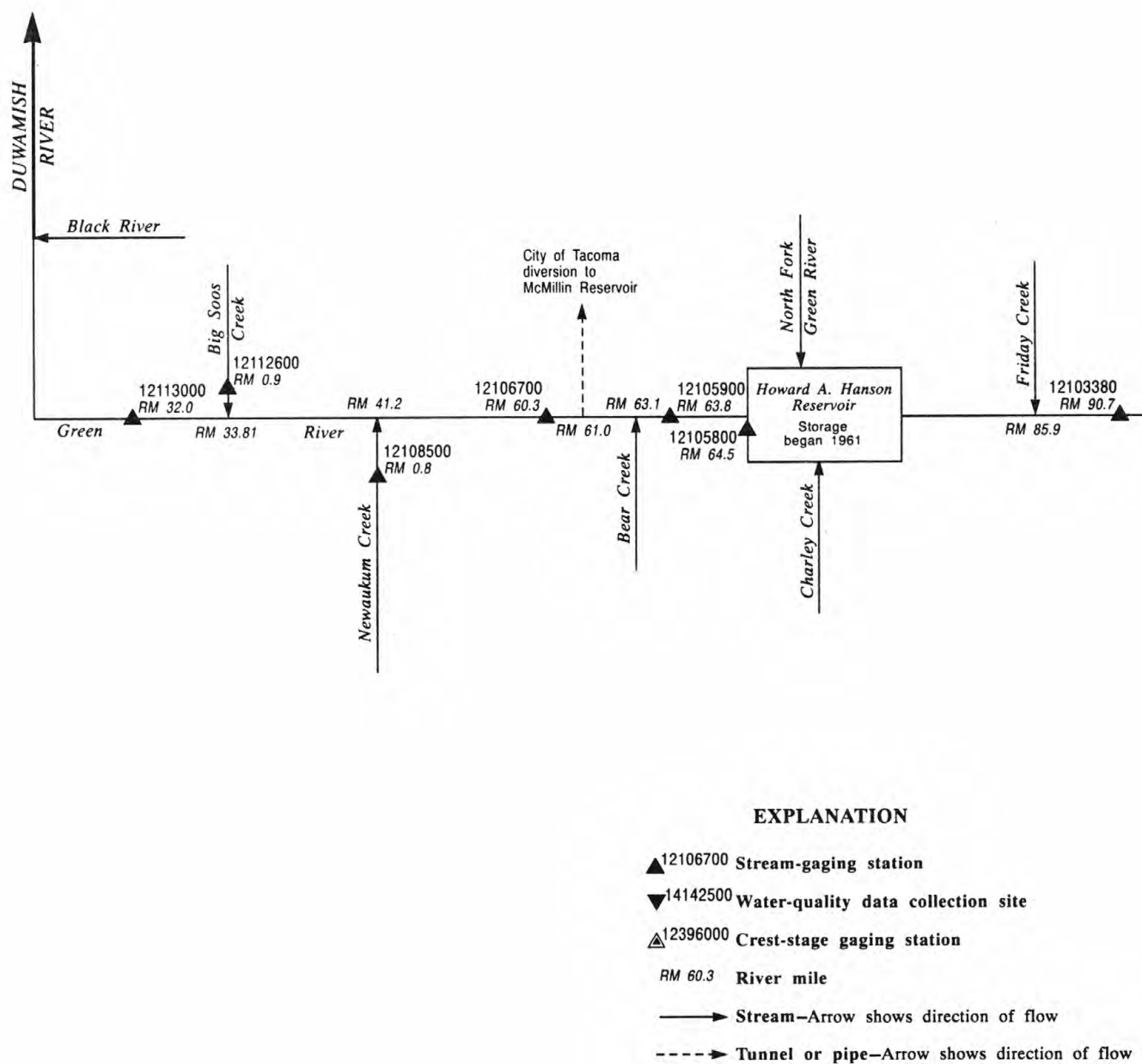


Figure 12. Gaging stations in Duwamish River Basin.

DUWAMISH RIVER BASIN

12103380 GREEN RIVER ABOVE TWIN CAMP CREEK, NEAR LESTER, WA

LOCATION.--Lat. 47°10'55", long 121°23'15", in NW 1/4 NE 1/4 sec.34, T.20 N., R.11 E., Pierce County, Hydrologic Unit 17110013, Snoqualmie National Forest, on left bank, 0.1 mi upstream from Twin Camp Creek, 5.2 mi southeast of Lester, and at mile 90.7.

DRAINAGE AREA.--16.5 mi².

PERIOD OF RECORD.--September 1992 to September 1993.

GAGE.--Water-stage recorder. Elevation of gage is 2,040 ft, from topographic map.

REMARKS.--Records good except for estimated daily discharges, which are fair. No regulation or diversion upstream from station. U.S. Geological Survey satellite telemeter at station.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 278 ft³/s May 12, gage height, 4.98 ft; minimum discharge, 6.6 ft³/s Sept. 30, result of discharge measurement.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	15	16	27	e30	61	e16	69	185	56	29	32	11
2	14	32	24	e29	55	e16	88	176	53	29	31	10
3	14	25	22	e28	50	e16	102	167	49	28	29	10
4	14	28	20	e27	46	19	104	158	47	27	28	9.9
5	13	28	18	e26	42	34	95	149	45	26	26	9.7
6	13	26	18	e25	39	53	85	155	43	26	25	9.4
7	12	38	17	e23	38	65	78	154	45	25	23	9.3
8	12	45	17	e24	38	82	90	143	48	24	22	9.1
9	11	42	16	e23	38	88	121	132	50	23	21	9.0
10	11	37	15	e22	39	81	120	139	55	22	20	8.8
11	11	41	14	e21	40	73	106	189	60	22	19	9.0
12	10	51	14	e20	38	66	92	247	69	22	18	9.4
13	12	53	13	e19	35	59	83	252	67	22	17	8.8
14	11	e51	43	e18	33	63	76	200	65	21	17	8.6
15	10	e47	46	e17	31	118	74	161	62	20	16	8.5
16	10	e44	40	e16	28	103	73	138	57	20	16	8.3
17	12	e42	38	e16	26	85	75	133	53	21	16	8.2
18	10	e45	35	e15	e24	77	85	136	50	20	15	8.1
19	11	49	e34	e15	e23	71	86	137	47	21	14	8.1
20	11	44	e33	e15	e21	69	83	132	44	24	14	8.1
21	11	42	e32	e14	e20	69	84	117	41	24	14	8.0
22	10	41	e38	e14	e20	84	89	105	40	26	13	7.7
23	e10	37	e48	e14	e19	144	91	91	40	28	13	7.5
24	e9.9	32	e50	24	e18	144	95	81	36	30	15	7.4
25	9.9	28	e48	157	e18	115	101	77	33	33	13	7.3
26	9.8	26	e46	188	e17	96	104	72	31	33	13	7.2
27	9.6	24	e43	151	e17	85	103	67	30	33	12	7.1
28	9.7	23	e40	115	e17	76	96	63	31	32	12	7.0
29	9.8	21	e37	93	---	71	103	59	33	34	11	6.9
30	9.7	29	e34	79	---	64	173	54	29	35	11	6.9
31	11	---	e32	69	---	59	---	56	---	33	11	---
TOTAL	347.4	1087	952	1347	891	2261	2824	4125	1409	813	557	254.3
MEAN	11.2	36.2	30.7	43.5	31.8	72.9	94.1	133	47.0	26.2	18.0	8.48
MAX	15	53	50	188	61	144	173	252	69	35	32	11
MIN	9.6	16	13	14	17	16	69	54	29	20	11	6.9
AC-FT	689	2160	1890	2670	1770	4480	5600	8180	2790	1610	1100	504
CFSM	.68	2.20	1.86	2.63	1.93	4.42	5.71	8.06	2.85	1.59	1.09	.51
IN.	.78	2.45	2.15	3.04	2.01	5.10	6.37	9.30	3.18	1.83	1.26	.57

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1993 - 1993, BY WATER YEAR (WY)

	1993	1993	1993	1993	1993	1993	1993	1993	1993	1993	1993	1993
MEAN	11.2	36.2	30.7	43.5	31.8	72.9	94.1	133	47.0	26.2	18.0	8.48
MAX	11.2	36.2	30.7	43.5	31.8	72.9	94.1	133	47.0	26.2	18.0	8.48
(WY)	1993	1993	1993	1993	1993	1993	1993	1993	1993	1993	1993	1993
MIN	11.2	36.2	30.7	43.5	31.8	72.9	94.1	133	47.0	26.2	18.0	8.48
(WY)	1993	1993	1993	1993	1993	1993	1993	1993	1993	1993	1993	1993

SUMMARY STATISTICS

FOR 1993 WATER YEAR

ANNUAL TOTAL	16867.7
ANNUAL MEAN	46.2
HIGHEST DAILY MEAN	252
LOWEST DAILY MEAN	6.9
ANNUAL SEVEN-DAY MINIMUM	7.1
ANNUAL RUNOFF (AC-FT)	33460
ANNUAL RUNOFF (CFSM)	2.80
ANNUAL RUNOFF (INCHES)	38.03
10 PERCENT EXCEEDS	103
50 PERCENT EXCEEDS	31
90 PERCENT EXCEEDS	10

e Estimated

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LOCATION.--Lat 47°12'28", long 121°33'07", in NE 1/4 SE 1/4 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.

PERIOD OF RECORD.--October 1945 to September 1990, October 1992 to September 1993 (discontinued).

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.

AVERAGE DISCHARGE.--46 years (water years 1946-1990, 1993), 381 ft³/s, 53.78 in/yr, 276,000 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 discharge, 20 ft³/s Oct. 23-26, 1987.

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. 25	1700	*1,610	*4.14				
Minimum daily discharge, 43 ft ³ /s Sept. 30.							

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	129	122	368	258	386	124	429	1020	290	195	169	66
2	118	239	316	241	346	124	520	913	282	190	159	64
3	112	218	278	235	311	122	608	847	265	182	154	62
4	110	228	254	225	285	156	641	798	255	177	149	61
5	102	242	235	210	266	283	576	754	244	169	142	60
6	96	226	223	196	249	420	514	767	234	161	135	59
7	91	320	214	186	248	479	477	737	248	155	130	57
8	89	378	208	188	261	533	509	718	281	150	124	56
9	86	367	202	184	282	546	698	713	291	149	120	55
10	83	308	195	176	301	488	701	737	336	140	114	54
11	80	339	184	165	303	424	623	902	376	132	111	55
12	78	446	177	164	288	373	555	1040	474	131	107	62
13	92	433	170	162	263	334	497	1050	447	126	103	57
14	83	418	355	157	246	362	452	836	392	137	102	55
15	78	377	431	153	230	945	445	692	371	129	100	55
16	76	343	356	150	207	807	453	603	343	134	99	54
17	85	323	323	148	191	610	460	568	317	144	98	52
18	81	372	288	145	186	535	506	552	291	142	94	50
19	97	392	272	143	183	482	501	540	268	141	91	50
20	103	376	270	143	177	465	481	517	246	168	87	52
21	96	381	263	141	168	450	484	478	229	177	85	52
22	95	447	291	137	161	580	518	445	237	185	83	49
23	92	450	440	133	152	1180	526	393	304	197	84	48
24	90	363	454	168	141	1040	534	359	283	203	99	48
25	87	310	443	1220	136	788	575	337	264	205	89	47
26	83	277	420	1540	129	635	601	312	241	203	82	45
27	82	259	398	1190	126	547	638	296	211	195	78	45
28	79	250	364	836	125	486	599	290	208	187	74	44
29	79	235	329	619	---	450	627	292	222	191	73	44
30	80	340	298	511	---	408	1000	261	202	196	70	e43
31	82	---	272	442	---	376	---	282	---	178	68	---
TOTAL	2814	9779	9291	10566	6347	15552	16748	19049	8652	5169	3273	1601
MEAN	90.8	326	300	341	227	502	558	614	288	167	106	53.4
MAX	129	450	454	1540	386	1180	1000	1050	474	205	169	66
MIN	76	122	170	133	125	122	429	261	202	126	68	43
AC-FT	5580	19400	18430	20960	12590	30850	33220	37780	17160	10250	6490	3180
CFSM	.94	3.39	3.12	3.54	2.36	5.21	5.80	6.39	3.00	1.73	1.10	.55
IN.	1.09	3.78	3.59	4.09	2.45	6.01	6.48	7.37	3.35	2.00	1.27	.62

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1946 - 1993, BY WATER YEAR (WY)

MEAN	153	421	532	480	449	393	623	771	471	155	64.9	71.4
MAX	750	1683	1521	1324	1060	1272	1169	1596	1401	458	122	412
(WY)	1960	1960	1976	1984	1982	1972	1956	1956	1974	1955	1955	1959
MIN	22.0	27.9	44.9	124	116	178	251	315	141	58.6	35.6	28.6
(WY)	1988	1953	1953	1988	1969	1955	1967	1977	1987	1987	1987	1987

SUMMARY STATISTICS

FOR 1993 WATER YEAR

WATER YEARS 1946 - 1993

ANNUAL TOTAL	108841				
ANNUAL MEAN	298			381	
HIGHEST ANNUAL MEAN				588	1972
LOWEST ANNUAL MEAN				219	1977
HIGHEST DAILY MEAN	1540	Jan 26	15000		Nov 22 1959
LOWEST DAILY MEAN	43	Sep 30	20		Oct 24 1987
ANNUAL SEVEN-DAY MINIMUM	45	Sep 24	21		Oct 19 1987
ANNUAL RUNOFF (AC-FM)	215900		276200		
ANNUAL RUNOFF (CFM)	3.10			3.96	
ANNUAL RUNOFF (INCHES)	42.09			53.84	
10 PERCENT EXCEEDS	602		854		
50 PERCENT EXCEEDS	235		240		
90 PERCENT EXCEEDS	78		49		

e Estimated

DUWAMISH RIVER BASIN

12105800 HOWARD A. HANSON RESERVOIR NEAR PALMER, WA

LOCATION.--Lat 47°16'38", long 121°47'03", in NE 1/4 SE 1/4 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 sea level, supplementary adjustment of 1947.

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.--Elevations 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 contents observed, 34 acre-ft Nov. 2, 1962, elevation, 1,037.6 ft.

EXTREMES FOR CURRENT YEAR.--Maximum contents observed, 27,816 acre-ft June 14, 15, elevation, 1,143.7 ft; minimum contents observed, 1,277 acre-ft Jan. 7, elevation, 1,066.7 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 (ACRE-Feet), WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY OBSERVATION AT 09:00 VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	19240	6149	2227	1660	1820	1691	1865	22343	26756	25382	25649	24813
2	18250	6493	1920	1766	1712	1723	2340	25963	26356	25497	25573	24740
3	17474	7175	1712	1777	1499	1755	2976	25963	25806	25649	25649	24666
4	16521	7678	1385	1744	1670	1831	4012	25963	25497	25649	25728	24518
5	15707	7896	1640	1538	1744	2444	4682	25806	25497	25573	25806	24445
6	15166	7896	1734	1394	1820	2786	4855	25728	25420	25497	25806	24297
7	14642	8007	1755	1277	1887	3354	4876	25728	25420	25420	25728	24150
8	14046	8836	1578	1385	1990	4012	4746	25649	25806	25344	25728	24007
9	13430	10130	1489	1558	2048	3917	4746	25806	25963	25268	25649	23865
10	12800	9937	1348	1670	1990	2800	4942	25806	25884	25192	25573	23651
11	12120	8925	1509	1723	1909	2264	4942	25806	26042	25039	25497	23368
12	11295	8806	1660	1798	1787	2577	4660	25649	26676	24963	25420	23092
13	10905	8344	1755	1831	1842	2673	4070	25806	27405	24887	25420	22884
14	10595	8007	2107	1854	1854	2659	3488	27079	27816	24963	25344	22612
15	10196	7464	2470	1831	1777	4031	3114	26998	27816	25116	25344	22410
16	9715	6543	1876	1854	1609	4942	3240	25963	27652	25192	25268	22141
17	9376	5554	1385	1854	1588	2659	3387	24592	27240	25420	25268	21878
18	8984	4942	1451	1831	1650	1702	3608	23936	26756	25573	25268	21550
19	8631	4227	1744	1798	1712	1538	3954	24007	26756	25728	25192	21291
20	8458	3643	2036	1798	1820	2048	4267	24518	26756	26042	25192	21098
21	8287	3130	2264	1865	1898	2417	4682	24963	26676	26042	25116	20778
22	8174	3898	1809	1898	1920	2659	5438	25497	26356	25963	25039	20527
23	8007	4618	1777	1909	1898	2118	6518	25806	26042	25963	24963	20214
24	7787	2470	1619	1887	1831	2618	7464	25884	25649	25963	25039	19906
25	7544	1734	2059	3643	1723	2107	8287	25806	25573	26042	25116	19420
26	7254	1660	2179	5932	1598	2315	9715	25649	25728	26042	25192	18884
27	7047	1609	2227	3161	1650	2744	11477	25573	25728	25728	25116	18362
28	6818	1809	2036	2378	1681	2744	13473	25649	25963	25649	25192	17856
29	6592	1865	1670	2001	---	2510	15362	25963	25963	25649	25039	17311
30	6394	1909	1339	2264	---	2118	18420	26198	25497	25649	25039	16940
31	6198	---	1394	2191	---	1787	---	26356	---	25649	24963	---
MEAN	10892	5712	1779	2035	1783	2566	5987	25563	26283	25540	25352	21856
MAX	19240	10130	2470	5932	2048	4942	18420	27079	27816	26042	25806	24813
MIN	6198	1609	1339	1277	1499	1538	1865	22343	25420	24887	24963	16940
††	1096.9	1075.3	1070.0	1073.5	1071.0	1070.7	1134.4	1142.3	1140.7	1141.0	1140.0	1126.8
†	6125	2179	1588	1966	1691	1660	21034	26676	25420	25649	24887	16625
‡	-13842	-3946	-591	+378	-275	-31	+19374	+5642	-1256	+229	-762	-8262

CAL YR 1992 MEAN 13472 MAX 30359 MIN 1083 AC-FT† -321
WTR YR 1993 MEAN 13015 MAX 27816 MIN 1277 AC-FT† -3342

†† Monthend elevation, in feet at 2400 hours.

† Monthend contents, in acre-feet.

‡ Change in contents, in acre-feet.

DUWAMISH RIVER BASIN

125

12105900 GREEN RIVER BELOW HOWARD A. HANSON RESERVOIR, WA

LOCATION.--Lat 47°17'02", long 121°47'48", in NE 1/4 NW 1/4 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 good. Flow regulated by Howard A. Hanson Reservoir (station 12105800) for flood control and during summer months to augment the natural river flow. U.S. Army Corps of Engineers satellite telemeter at station.

AVERAGE DISCHARGE.--33 years, 1,002 ft³/s, 61.57 in/yr, 725,900 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 discharge, 87 ft³/s Dec. 29, 1961, gage height, 3.49 ft.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 6,380 ft³/s Jan. 26, gage height, 11.70 ft; minimum discharge, 256 ft³/s Aug. 27, gage height, 4.31 ft.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	817	386	1420	660	1330	388	998	631	766	e580	596	259
2	833	391	1250	667	1150	391	1050	1720	981	591	508	258
3	825	399	1030	666	973	392	1110	2230	857	616	427	264
4	818	562	786	705	843	399	1180	2100	677	616	429	268
5	686	705	654	661	820	657	1270	1970	615	616	446	267
6	554	729	662	569	779	914	1340	1850	615	570	430	266
7	585	751	704	488	786	953	1330	1850	593	542	406	266
8	607	768	703	428	831	1240	1450	1850	676	517	407	270
9	602	1130	665	409	932	1760	1720	1850	926	488	412	280
10	596	1580	565	415	992	1610	1820	1850	1070	488	402	309
11	590	1620	468	397	984	1040	1810	2080	1070	488	387	325
12	583	1800	453	381	897	862	1790	2120	1070	437	359	325
13	507	1780	458	398	798	867	1690	1540	1080	369	336	318
14	455	1600	1170	399	798	873	1500	1420	1140	357	336	314
15	488	1570	1660	380	791	1880	1240	1930	1180	357	336	314
16	483	1530	1440	369	699	2940	1120	1920	1180	357	339	314
17	479	1390	1070	369	593	2480	1130	1700	1170	358	322	316
18	474	1400	752	369	556	1730	1150	1190	955	358	302	320
19	471	1500	672	367	533	1330	1130	892	749	357	302	319
20	468	1420	696	356	501	1130	1030	804	749	529	297	319
21	467	1350	924	337	505	1170	897	808	794	679	292	319
22	465	1690	1120	339	505	2110	756	808	867	736	290	320
23	462	2430	1380	339	504	4080	706	804	929	801	270	327
24	460	2050	1320	355	499	3400	906	804	800	775	258	396
25	457	1260	1270	2450	493	2430	744	804	613	775	258	443
26	419	937	1290	5450	424	1700	695	774	546	831	258	440
27	395	888	1290	4350	387	1480	617	685	547	749	258	428
28	393	844	1260	2590	387	1480	573	588	634	653	261	423
29	390	848	1150	1820	---	1440	529	524	847	654	261	399
30	388	1140	924	1540	---	1340	562	524	e785	629	260	376
31	386	---	705	1520	---	1110	---	526	---	596	260	---
TOTAL	16603	36448	29911	30543	20290	45576	33843	41146	25481	17469	10705	9762
MEAN	536	1215	965	985	725	1470	1128	1327	849	564	345	325
MAX	833	2430	1660	5450	1330	4080	1820	2230	1180	831	596	443
MIN	386	386	453	337	387	388	529	524	546	357	258	258
AC-FT	32930	72290	59330	60580	40250	90400	67130	81610	50540	34650	21230	19360
MEAN†	310	1149	955	991	720	1469	1454	1419	828	567	333	187
CFSM†	1.40	5.20	4.32	4.49	3.26	6.65	6.58	6.42	3.75	2.57	1.51	0.84
IN.†	1.62	5.80	4.98	5.17	3.39	7.67	7.34	7.40	4.18	2.96	1.74	0.94
AC-FT†	19090	68340	58740	60960	39980	90370	86500	87250	49280	34880	20470	11100

CAL YR 1992 TOTAL 248142 MEAN 678 MAX 5320 MIN 209 AC-FT 492200 MEAN† 678 CFSM† 3.07 IN.† 41.73 AC-FT† 491900
WTR YR 1993 TOTAL 317777 MEAN 871 MAX 5450 MIN 258 AC-FT 630300 MEAN† 866 CFSM† 3.92 IN.† 53.20 AC-FT† 627000

e Estimated

† Adjusted for change in contents in Howard A. Hanson Reservoir.

DUWAMISH RIVER BASIN

12106700 GREEN RIVER AT PURIFICATION PLANT, NEAR PALMER, WA

LOCATION.--Lat 47°18'19", long 121°50'58", in NE 1/4 SE 1/4 sec.13, T.21 N., R.7 E., King County, Hydrologic Unit 17110013, on left bank at city of Tacoma purification plant, 0.7 mi downstream from diversion dam, 2 mi southeast of Palmer, and at mile 60.3.

DRAINAGE AREA.--231 mi².

PERIOD OF RECORD.--July 1963 to current year.

GAGE.--Water-stage recorder and crest-stage gage. Datum of gage is 859.53 ft above sea level. Prior to Oct. 1, 1987, water-stage recorder at site 0.1 mi upstream at same datum.

REMARKS.--No estimated daily discharges. Records good. 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 94 ft³/s upstream from station for municipal supply, of which a small amount is returned to the river 300 ft upstream from station. U.S. Geological Survey satellite telemeter at station.

AVERAGE DISCHARGE.--30 years, 963 ft³/s, 697,700 acre-ft/yr, unadjusted.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 12,500 ft³/s Feb. 12, 1981, gage height, 12.05 ft, at site then in use; minimum discharge, 20 ft³/s part or all of each day Oct. 26, 27, Nov. 3, 4, 6, 1974, gage height, 3.90 ft, at site then in use.

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 0.5 mi downstream from present gage.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 6,740 ft³/s Jan. 26, gage height, 10.00 ft; maximum gage height, 10.13 ft (from crest-stage gage); minimum discharge, 158 ft³/s Aug. 25-27.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	771	365	1640	657	1370	324	882	628	664	506	493	161
2	786	389	1450	662	1160	325	933	1640	886	497	420	162
3	780	383	1160	664	992	329	1010	2310	777	539	333	168
4	771	555	849	701	836	336	1080	2150	596	537	333	171
5	659	717	667	662	806	594	1160	2020	535	535	347	171
6	490	726	646	540	757	890	1230	1870	536	494	333	171
7	526	793	672	454	764	915	1240	1860	529	463	307	171
8	555	841	690	386	808	1180	1330	1870	598	440	306	173
9	549	1230	666	362	917	1710	1640	1860	861	411	308	181
10	544	1700	564	365	974	1600	1750	1840	1030	410	299	206
11	532	1760	458	361	962	1010	1760	2030	1030	411	283	223
12	523	1950	436	352	875	810	1720	2100	1030	366	259	223
13	465	1930	441	369	761	806	1620	1540	1020	301	234	232
14	389	1700	1370	369	764	828	1430	1330	1080	288	234	214
15	426	1650	1860	354	749	1950	1160	1870	1120	287	234	214
16	425	1600	1570	341	660	3010	1020	1860	1120	291	236	212
17	431	1460	1180	341	545	2590	1040	1670	1110	305	224	214
18	427	1450	803	339	495	1790	1050	1150	912	302	202	219
19	429	1590	684	338	477	1360	1040	819	683	310	211	217
20	436	1500	712	332	441	1110	931	718	678	478	203	219
21	458	1540	966	311	443	1150	802	729	711	648	189	216
22	453	2070	1210	311	443	2080	660	734	783	714	189	218
23	435	2880	1500	311	442	4390	594	728	834	767	173	224
24	427	2340	1460	337	439	3560	799	723	725	704	162	280
25	421	1420	1380	3000	430	2460	650	720	525	696	160	328
26	386	1010	1400	5830	367	1640	640	691	455	743	158	327
27	357	962	1390	4690	322	1380	580	596	454	670	159	317
28	351	911	1340	2850	322	1370	526	501	537	557	162	312
29	347	896	1220	1960	---	1330	492	436	755	560	162	290
30	348	1270	974	1610	---	1230	574	436	683	537	160	268
31	348	---	721	1580	---	1010	---	445	---	497	160	---
TOTAL	15245	39588	32079	31739	19321	45067	31343	39874	23257	15264	7633	6702
MEAN	492	1320	1035	1024	690	1454	1045	1286	775	492	246	223
MAX	786	2880	1860	5830	1370	4390	1760	2310	1120	767	493	328
MIN	347	365	436	311	322	324	492	436	454	287	158	161
AC-FT	30240	78520	63630	62950	38320	89390	62170	79090	46130	30280	15140	13290

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1963 - 1993, BY WATER YEAR (WY)

	MEAN	MAX	(WY)	MIN	(WY)
1963	457	1174	1991	66.2	1975
1964	1227	4074	1991	82.7	1988
1965	1570	4591	1976	371	1986
1966	1626	3225	1984	399	1979
1967	1452	3481	1982	367	1969
1968	1177	3801	1972	432	1981
1969	1367	2376	1985	286	1992
1970	1280	2605	1972	394	1983
1971	699	2514	1974	129	1987
1972	319	809	1972	118	1965
1973	167	306	1974	98.6	1969
1974	245	757	1968	109	1979

SUMMARY STATISTICS FOR 1992 CALENDAR YEAR FOR 1993 WATER YEAR WATER YEARS 1963 - 1993

ANNUAL TOTAL	229269		307112																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							
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12108500 NEWAUKUM CREEK NEAR BLACK DIAMOND, WA

LOCATION.--Lat 47°16'33", long 122°03'30", in NW 1/4 SW 1/4 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 good except for estimated daily discharges, which are fair. Many small diversions upstream from station for irrigation and domestic use. No regulation. U.S. Army Corps of Engineers furnished partial gage-height record intermittently throughout the year, which was used to compute or estimate the discharge.

AVERAGE DISCHARGE.--47 years (water years 1945-50, 1953-93), 60.1 ft³/s, 29.79 in/yr, 43,542 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 discharge, 8.0 ft³/s Oct. 13, 14, 1952.

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)
Mar. 23	0400	*414	*2.28				
Minimum daily discharge, 12 ft ³ /s Oct. 11, 12.							

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	e13	35	80	28	58	33	61	92	e85	e45	34	19
2	e13	35	63	27	54	33	65	89	e90	e49	31	19
3	e15	24	e50	28	52	46	120	e95	e75	e52	29	18
4	e20	30	e45	34	49	45	101	e97	e65	e47	27	18
5	e16	27	38	32	47	40	70	78	e60	e36	26	19
6	15	22	36	29	47	38	62	79	e55	e34	26	19
7	e14	35	35	28	45	36	68	73	e145	e33	26	18
8	e14	48	37	26	43	37	70	79	e135	e32	25	18
9	e13	77	51	25	42	36	134	e72	e160	e30	24	17
10	e13	51	75	24	42	33	106	e79	e165	28	24	17
11	e12	64	81	23	41	32	117	64	e145	29	23	17
12	e12	72	65	22	40	31	93	57	e115	30	23	18
13	e14	50	51	21	38	31	76	51	e90	28	23	17
14	e16	39	85	20	38	37	71	47	e79	31	23	17
15	e15	33	80	20	37	57	64	44	e74	34	23	17
16	e15	30	61	20	36	46	60	43	e70	36	26	16
17	e16	31	57	20	34	50	72	42	e60	44	26	16
18	e17	76	56	19	34	49	83	40	e54	40	23	16
19	e18	82	58	23	35	42	64	39	e50	36	22	16
20	19	61	187	32	36	42	e56	e42	e45	56	21	16
21	27	96	129	33	35	40	53	e48	e42	49	21	16
22	21	128	82	35	34	99	58	e54	e41	53	21	16
23	18	83	65	39	33	341	54	e42	e94	46	21	16
24	16	59	54	51	32	184	56	38	e70	42	21	15
25	15	46	46	301	32	97	73	36	e53	44	22	15
26	15	40	41	304	31	72	87	35	e47	41	20	15
27	14	51	38	178	31	61	110	e35	e42	37	20	15
28	14	59	35	109	31	53	77	e37	e41	37	20	14
29	14	48	33	87	---	54	e100	e39	e45	42	20	14
30	16	87	31	71	---	52	107	e38	e52	51	19	14
31	19	---	30	64	---	48	---	e75	---	39	19	---
TOTAL	489	1619	1875	1773	1107	1895	2388	1779	2344	1231	729	498
MEAN	15.8	54.0	60.5	57.2	39.5	61.1	79.6	57.4	78.1	39.7	23.5	16.6
MAX	27	128	187	304	58	341	134	97	165	56	34	19
MIN	12	22	30	19	31	31	53	35	41	28	19	14
AC-FT	970	3210	3720	3520	2200	3760	4740	3530	4650	2440	1450	988
CFSM	.58	1.97	2.21	2.09	1.44	2.23	2.91	2.09	2.85	1.45	.86	.61
IN.	.66	2.20	2.55	2.41	1.50	2.57	3.24	2.42	3.18	1.67	.99	.68

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1944 - 1993, BY WATER YEAR (WY)

	MEAN	25.0	65.2	97.3	117	104	88.9	70.7	48.9	39.9	26.3	20.4	20.5
MAX	58.9	215	225	252	222	215	134	97.0	98.1	40.1	32.2	39.2	
(WY)	1956	1991	1956	1975	1961	1950	1991	1984	1990	1948	1976	1959	
MIN	9.35	9.99	11.1	37.4	34.4	40.7	40.0	31.0	20.7	17.2	12.5	11.4	
(WY)	1953	1953	1953	1977	1977	1992	1977	1992	1992	1985	1958	1989	

SUMMARY STATISTICS

FOR 1992 CALENDAR YEAR

FOR 1993 WATER YEAR

WATER YEARS 1944 - 1993

ANNUAL TOTAL	13743	17727	
ANNUAL MEAN	37.5	48.6	
HIGHEST ANNUAL MEAN			60.1
LOWEST ANNUAL MEAN			85.9
HIGHEST DAILY MEAN	242	341	1100
LOWEST DAILY MEAN	12	12	8.3
ANNUAL SEVEN-DAY MINIMUM	12	13	8.3
ANNUAL RUNOFF (AC-FT)	27260	35160	43560
ANNUAL RUNOFF (CFSM)	1.37	1.77	2.19
ANNUAL RUNOFF (INCHES)	18.66	24.07	29.81
10 PERCENT EXCEEDS	73	87	118
50 PERCENT EXCEEDS	31	39	41
90 PERCENT EXCEEDS	14	16	17

e Estimated

DUWAMISH RIVER BASIN

12112600 BIG SOOS CREEK ABOVE HATCHERY, NEAR AUBURN, WA

LOCATION.--Lat 47°18'45", long 122°09'51", on west line NW 1/4 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 sea level.

REMARKS.--Records good except for estimated daily discharges, which are fair. 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. Chemical analyses October 1962 to September 1971, at site 1.0 mi upstream.

AVERAGE DISCHARGE.--27 years (water years 1967-93), 124 ft³/s, 25.25 in/yr, 89,840 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,750 ft³/s Jan. 9, 1990, gage height, 7.55 ft; minimum discharge, 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. 25	1900	*419	*4.80				
Minimum daily discharge, 21 ft ³ /s Oct. 1, 7, 12, 16.							

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	e21	47	73	84	179	e68	e135	180	182	88	60	32
2	e22	53	64	80	166	e68	e150	180	166	85	56	32
3	e28	44	58	82	153	e102	e260	182	147	87	51	32
4	e27	43	53	94	142	e100	e220	192	127	83	49	34
5	e23	40	52	89	131	e92	e160	176	116	78	47	35
6	e22	36	50	78	125	e85	e142	170	109	72	46	34
7	e21	51	50	72	119	e78	e157	164	148	67	44	33
8	e23	54	52	70	113	e78	177	160	149	64	46	32
9	e24	63	61	68	108	e74	284	150	164	61	46	30
10	e23	52	93	64	107	e66	269	163	185	61	43	29
11	e22	59	122	61	101	e63	261	146	168	61	41	28
12	e21	65	104	59	98	e61	237	135	165	60	40	30
13	e25	59	84	59	94	e60	212	126	141	60	40	31
14	e24	51	93	60	90	e82	194	116	130	71	41	29
15	e23	48	109	60	88	e120	181	110	128	78	39	31
16	e21	46	98	59	83	e98	172	103	120	65	43	30
17	e24	45	92	59	79	e105	180	98	111	62	45	29
18	e25	56	85	58	e79	e103	182	94	103	60	42	29
19	e27	79	91	66	e80	e91	166	91	97	60	40	30
20	e30	74	173	103	e81	e91	147	104	93	79	39	30
21	35	95	188	154	e79	e87	140	107	89	73	38	28
22	34	115	169	155	e76	e200	142	114	85	71	38	28
23	30	93	147	140	e72	e355	141	101	83	66	38	28
24	29	74	132	144	e69	e270	144	90	81	62	36	26
25	29	64	121	362	e67	e200	179	82	76	61	35	28
26	28	58	115	396	e64	e178	193	79	73	59	35	28
27	26	62	108	331	e61	e140	194	74	71	55	34	26
28	25	65	106	278	e60	e120	177	75	86	58	33	26
29	27	60	97	244	---	e120	173	87	128	66	33	25
30	30	76	94	215	---	e115	178	89	101	74	32	24
31	36	---	90	193	---	e110	---	148	---	66	34	---
TOTAL	805	1827	3024	4037	2764	3580	5547	3886	3622	2113	1284	887
MEAN	26.0	60.9	97.5	130	98.7	115	185	125	121	68.2	41.4	29.6
MAX	36	115	188	396	179	355	284	192	185	88	60	35
MIN	21	36	50	58	60	60	135	74	71	55	32	24
AC-FT	1600	3620	6000	8010	5480	7100	11000	7710	7180	4190	2550	1760
CFSM	.39	.91	1.46	1.95	1.48	1.73	2.77	1.88	1.81	1.02	.62	.44
IN.	.45	1.02	1.69	2.25	1.54	2.00	3.09	2.17	2.02	1.18	.72	.49

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1967 - 1993, BY WATER YEAR (WY)

	MEAN	42.7	109	210	251	240	208	156	95.2	73.0	45.0	33.6	34.8
MAX	77.2	433	401	407	485	453	343	174	150	71.3	46.8	57.9	
(WY)	1982	1991	1976	1967	1982	1972	1991	1984	1990	1981	1976	1978	
MIN	25.9	37.0	58.0	84.3	73.6	103	80.5	57.0	34.7	26.4	23.7	23.4	
(WY)	1988	1980	1977	1977	1977	1985	1977	1985	1992	1985	1985	1992	

SUMMARY STATISTICS

FOR 1992 CALENDAR YEAR

FOR 1993 WATER YEAR

WATER YEARS 1967 - 1993

ANNUAL TOTAL	29794	33376	124
ANNUAL MEAN	81.4	91.4	195
HIGHEST ANNUAL MEAN			63.5
LOWEST ANNUAL MEAN			1470
HIGHEST DAILY MEAN	489	396	19
LOWEST DAILY MEAN	19	21	19
ANNUAL SEVEN-DAY MINIMUM	19	22	19
ANNUAL RUNOFF (AC-FT)	59100	66200	90120
ANNUAL RUNOFF (CFSM)	1.22	1.37	1.87
ANNUAL RUNOFF (INCHES)	16.62	18.61	25.34
10 PERCENT EXCEEDS	174	177	275
50 PERCENT EXCEEDS	53	76	82
90 PERCENT EXCEEDS	24	29	31

e Estimated

DUWAMISH RIVER BASIN

129

12113000 GREEN RIVER NEAR AUBURN, WA

LOCATION.--Lat 47°18'45", long 122°12'10", in NW 1/4 NW 1/4 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.

PERIOD OF RECORD.--August 1936 to current year.

REVISED RECORDS.--WSP 1932: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is sea level. Prior to Oct. 19, 1936, nonrecording gage at same site and datum.

REMARKS.--No estimated daily discharges. 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 94 ft³/s from river at headworks near Palmer, 29 mi upstream from station, for municipal use. Minor diversions on upstream tributaries for domestic use. U.S. Geological Survey satellite telemeter at station. Water temperatures March 1952 to September 1986.

AVERAGE DISCHARGE.--57 years, 1,336 ft³/s, 967,900 acre-ft/yr, unadjusted.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 28,100 ft³/s Nov. 23, 1959, elevation, 69.75 ft; minimum discharge, 81 ft³/s Sept. 23, 1952; minimum elevation, 52.76 ft Oct. 22, 29-31, 1987.

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

Date	Time	Discharge (ft ³ /s)	Elevation (ft)	Date	Time	Discharge (ft ³ /s)	Elevation (ft)
Jan. 27	0015	*7,280	*60.28	No other peak greater than base discharge.			
Minimum discharge, 297 ft ³ /s Sept. 9, elevation, 53.14 ft.							

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	861	515	1910	1000	1980	578	1410	1270	1080	943	811	308
2	890	552	1840	990	1670	576	1450	1720	1420	864	784	304
3	905	518	1490	995	1560	635	1630	2900	1360	926	627	303
4	902	556	1250	1020	1300	651	1710	2740	1110	909	599	310
5	872	841	959	1030	1260	702	1690	2640	994	896	590	314
6	623	838	916	876	1170	1140	1770	2420	970	870	609	313
7	605	954	906	801	1160	1190	1790	2390	1050	801	560	308
8	655	1010	952	697	1160	1270	1850	2400	1020	787	553	303
9	651	1240	962	640	1240	1830	2370	2380	1280	728	548	304
10	645	1830	1000	627	1340	1970	2520	2400	1600	718	545	309
11	635	1980	886	621	1320	1450	2550	2430	1580	720	520	349
12	615	2100	799	585	1290	1080	2460	2610	1580	711	501	360
13	636	2210	753	601	1120	1060	2340	2210	1520	631	457	367
14	478	1900	1210	600	1100	1090	2160	1730	1520	602	445	353
15	506	1840	2190	594	1080	1750	1880	2170	1630	603	444	351
16	514	1780	1980	565	1040	3110	1630	2270	1600	586	460	346
17	531	1730	1670	558	896	3190	1660	2220	1570	596	458	340
18	529	1640	1240	553	814	2210	1690	1710	1490	591	414	345
19	554	1900	1060	577	809	1840	1650	1290	1130	592	394	349
20	545	1810	1330	642	758	1420	1520	1170	1100	703	398	354
21	596	1840	1420	689	746	1440	1390	1160	1090	982	383	354
22	583	2260	1680	677	740	1910	1250	1170	1200	1030	370	343
23	551	2740	1820	651	733	5170	1120	1130	1210	1130	368	345
24	532	2960	1930	671	716	4570	1280	1100	1220	1050	337	352
25	521	1910	1760	2700	701	3500	1280	1080	957	1040	331	462
26	510	1320	1770	6150	678	2450	1300	1070	835	1040	325	470
27	446	1300	1750	6210	583	1990	1260	984	820	1070	318	464
28	440	1220	1710	3750	574	1940	1160	900	859	896	317	447
29	436	1180	1620	2800	---	1900	1100	831	1150	910	317	444
30	442	1420	1420	2200	---	1820	1190	805	1180	934	313	401
31	461	---	1140	2120	---	1610	---	957	---	838	311	---
TOTAL	18670	45894	43323	43190	29538	57042	50060	54257	37125	25697	14407	10672
MEAN	602	1530	1398	1393	1055	1840	1669	1750	1237	829	465	356
MAX	905	2960	2190	6210	1980	5170	2550	2900	1630	1130	811	470
MIN	436	515	753	553	574	576	1100	805	820	586	311	303
AC-FT	37030	91030	85930	85670	58590	113100	99290	107600	73640	50970	28580	21170

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1962 - 1993, BY WATER YEAR (WY)

	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993
MEAN	613	1520	2114	2298	2094	1711	1844	1595	975	524	321	389																				
MAX	1358	5045	5654	3908	4861	4994	3023	2896	2849	1069	514	955																				
(WY)	1991	1991	1976	1975	1982	1972	1989	1972	1974	1972	1974	1968																				
MIN	173	194	765	703	720	891	601	659	330	262	227	210																				
(WY)	1988	1988	1986	1988	1977	1963	1992	1983	1987	1987	1989	1989																				

SUMMARY STATISTICS

FOR 1992 CALENDAR YEAR

FOR 1993 WATER YEAR

WATER YEARS 1962 - 1993

	1992	1993	1962-1993
ANNUAL TOTAL	325116	429875	
ANNUAL MEAN	888	1178	1329
HIGHEST ANNUAL MEAN			2071
LOWEST ANNUAL MEAN			785
HIGHEST DAILY MEAN	6280	Jan 30	11600
LOWEST DAILY MEAN	218	Jul 31	152
ANNUAL SEVEN-DAY MINIMUM	224	Jul 30	157
ANNUAL RUNOFF (AC-FT)	644900	852700	962800
10 PERCENT EXCEEDS	1820	2180	2700
50 PERCENT EXCEEDS	642	1000	957
90 PERCENT EXCEEDS	249	396	272

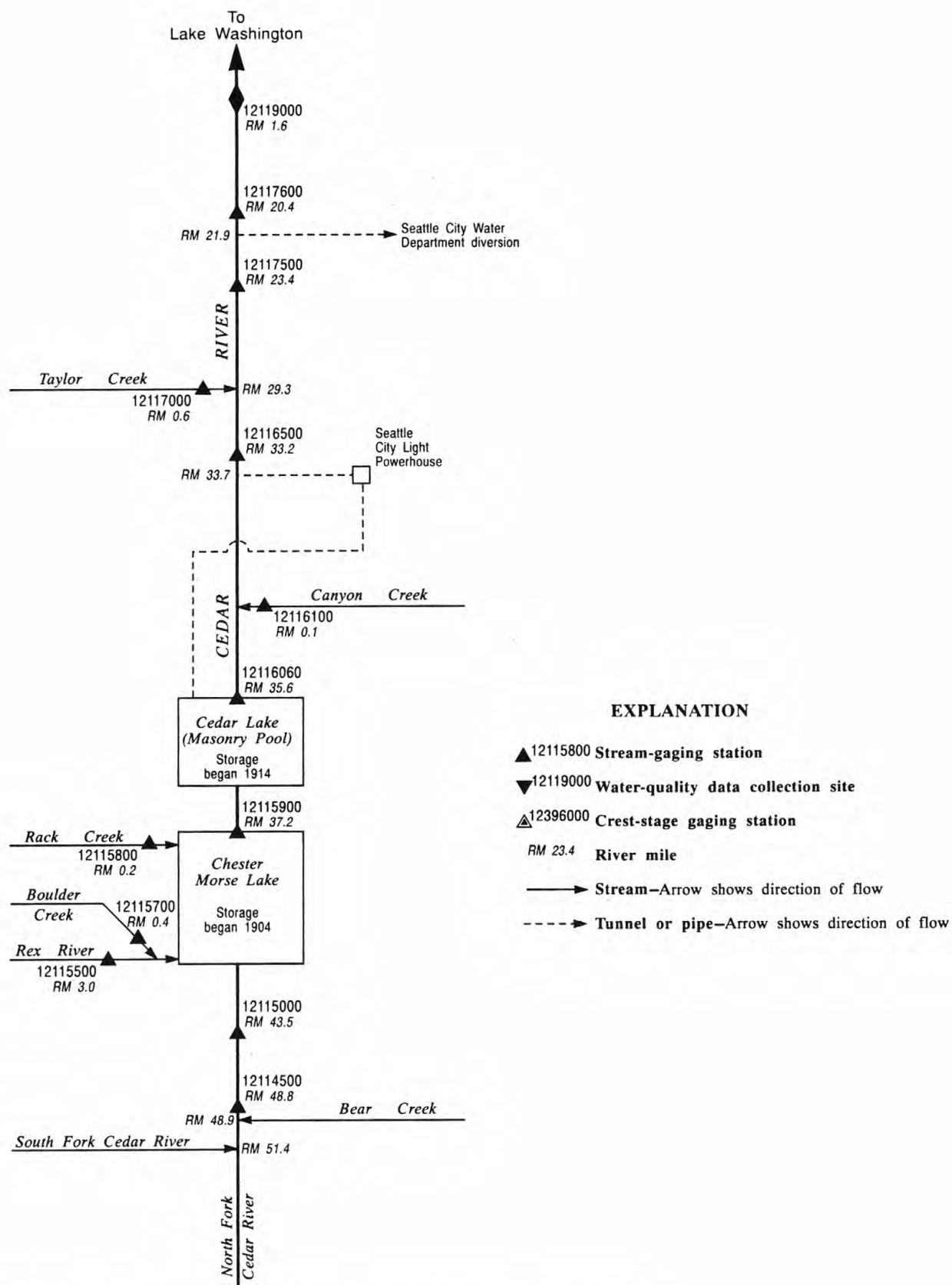


Figure 13. Gaging stations in Lake Washington Basin (Cedar River).

12114500 CEDAR RIVER BELOW BEAR CREEK, NEAR CEDAR FALLS, WA

LOCATION.--Lat 47°20'32", long 121°32'52", in SE 1/4 SE 1/4 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.--No estimated daily discharges. Records good. No regulation or diversion upstream from station. U.S. Geological Survey satellite telemeter at station.

AVERAGE DISCHARGE.--36 years (water years 1946-63, 1976-93), 166 ft³/s, 88.75 in/yr, 120,300 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 discharge, 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. 25	1300	*839	*4.01	May 12	2000	701	3.78
Mar. 23	0900	701	3.78				

Minimum discharge, 21 ft³/s Sept. 30.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	70	74	120	89	152	52	181	472	180	122	91	31
2	64	126	109	83	136	52	198	471	158	124	86	31
3	61	104	100	81	122	51	242	405	143	114	80	30
4	56	131	93	76	112	79	251	388	134	109	74	29
5	52	139	87	71	104	135	227	358	129	104	69	29
6	48	125	82	65	101	178	212	382	124	101	65	28
7	46	247	78	61	99	181	203	357	157	99	62	28
8	44	231	77	62	101	197	218	363	183	97	59	27
9	43	197	73	61	103	202	281	352	184	93	57	27
10	41	166	70	58	104	187	275	423	191	87	55	26
11	39	184	66	55	102	167	255	537	219	82	52	27
12	38	211	62	54	99	151	230	623	278	80	50	28
13	45	200	60	53	95	138	209	545	238	78	48	26
14	38	194	136	51	91	172	195	417	212	85	47	26
15	36	179	118	50	86	423	191	359	194	78	46	26
16	35	162	106	49	79	302	188	322	176	79	45	25
17	39	153	101	48	74	242	199	329	158	83	45	25
18	39	162	95	47	74	227	223	363	146	80	43	25
19	52	167	92	47	72	201	218	350	134	82	41	25
20	50	157	92	47	69	197	208	332	121	98	40	27
21	51	155	86	46	66	188	213	290	113	105	38	25
22	52	182	111	45	63	320	227	287	125	111	38	24
23	49	160	147	43	61	665	233	239	224	119	38	24
24	47	137	142	83	58	503	242	230	195	121	50	24
25	46	120	136	675	56	360	269	217	180	117	40	23
26	44	108	142	641	54	288	297	199	162	111	37	23
27	42	102	130	446	53	239	329	192	152	104	36	22
28	41	99	120	303	52	207	300	188	143	100	35	23
29	41	91	110	240	---	187	361	184	143	99	34	22
30	41	135	102	201	---	168	562	158	128	101	33	22
31	49	---	95	172	---	157	---	195	---	95	32	---
TOTAL	1439	4598	3138	4103	2438	6816	7437	10527	5024	3058	1566	778
MEAN	46.4	153	101	132	87.1	220	248	340	167	98.6	50.5	25.9
MAX	70	247	147	675	152	665	562	623	278	124	91	31
MIN	35	74	60	43	52	51	181	158	113	78	32	22
AC-FT	2850	9120	6220	8140	4840	13520	14750	20880	9970	6070	3110	1540
CFSM	1.83	6.03	3.99	5.21	3.43	8.66	9.76	13.4	6.59	3.88	1.99	1.02
IN.	2.11	6.73	4.60	6.01	3.57	9.98	10.89	15.42	7.36	4.48	2.29	1.14

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1946 - 1993, BY WATER YEAR (WY)

	MEAN	MAX	(WY)	MIN	(WY)
1946	96.3	221	210	164	167
1947	262	697	496	459	378
1948	1991	1976	1953	1982	1986
1949	15.3	16.5	27.9	49.9	43.9
1950	1988	1953	1953	1952	1956
1951					1955
1952					1955
1953					1955
1954					1955
1955					1955
1956					1955
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1982					1955
1983					1955
1984					1955
1985					1955
1986					1955
1987					1955
1988					1955
1989					1955
1990					1955
1991					1955
1992					1955
1993					1955

SUMMARY STATISTICS

FOR 1992 CALENDAR YEAR

FOR 1993 WATER YEAR

WATER YEARS 1946 - 1993

ANNUAL TOTAL	38316	50922	166
ANNUAL MEAN	105	140	234
HIGHEST ANNUAL MEAN			104
LOWEST ANNUAL MEAN			3880
HIGHEST DAILY MEAN	772	675	Jan 25
LOWEST DAILY MEAN	19	22	Sep 27
ANNUAL SEVEN-DAY MINIMUM	19	23	Sep 24
ANNUAL RUNOFF (AC-FT)	76000	101000	119900
ANNUAL RUNOFF (CFSM)	4.12	5.49	6.52
ANNUAL RUNOFF (INCHES)	56.12	74.58	88.57
10 PERCENT EXCEEDS	195	289	365
50 PERCENT EXCEEDS	82	103	110
90 PERCENT EXCEEDS	24	36	28

LOCATION.--Lat 47°21'03", long 121°39'43", in NE 1/4 NW 1/4 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.

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 good. No regulation or diversion upstream from station. U.S. Geological Survey satellite
telemeter at station.

AVERAGE DISCHARGE.--48 years, 102 ft³/s, 103.37 in/yr, 73,900 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, 3.0 ft³/s Sept. 6-8, 1986, gage height, 3.23 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. 25	1000	*902	*5.68	Mar. 15	0500	723	5.44
Minimum discharge, 10.0 ft ³ /s Sept. 29, 30.							

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	58	88	158	67	99	33	143	246	62	87	56	17
2	53	147	122	63	85	33	163	255	56	108	51	17
3	55	102	102	57	75	35	198	215	56	89	47	16
4	50	133	77	51	67	111	175	218	53	79	44	16
5	44	112	68	e46	65	187	147	180	50	71	41	15
6	41	100	61	e43	63	189	141	187	49	63	39	15
7	38	197	55	e41	70	166	152	166	108	58	37	15
8	39	183	53	e39	81	161	189	213	102	53	35	14
9	37	159	49	e36	93	149	236	178	120	49	34	14
10	34	131	46	e34	96	129	202	202	131	46	32	14
11	33	170	44	e33	83	107	185	180	153	44	31	15
12	33	196	41	e32	73	91	166	171	171	42	29	17
13	55	172	42	e31	66	79	148	152	129	41	28	14
14	37	162	222	e30	61	179	138	127	111	49	27	13
15	34	144	145	e29	58	428	144	111	115	42	27	13
16	34	128	115	e29	e54	233	136	99	101	46	28	13
17	42	125	94	e28	e50	176	154	92	86	55	27	13
18	41	144	80	28	e47	206	171	88	75	47	25	12
19	61	139	71	28	e45	163	152	81	66	50	23	13
20	53	122	67	31	42	164	147	81	59	86	22	16
21	62	158	62	29	40	154	155	90	55	82	21	13
22	63	231	123	28	38	309	160	99	80	94	21	13
23	55	175	167	26	37	492	161	73	181	96	22	12
24	51	130	167	115	36	303	166	64	134	95	32	12
25	48	100	141	640	36	208	202	59	110	90	23	11
26	45	79	154	505	34	163	214	54	92	79	21	11
27	42	91	125	300	32	137	249	52	92	70	20	11
28	40	87	104	209	31	116	200	58	98	66	19	11
29	39	72	86	166	---	103	288	60	107	72	19	11
30	42	197	74	139	---	89	298	49	88	74	18	10
31	55	---	69	117	---	90	---	65	---	60	17	---
TOTAL	1414	4174	2984	3050	1657	5183	5380	3965	2890	2083	916	407
MEAN	45.6	139	96.3	98.4	59.2	167	179	128	96.3	67.2	29.5	13.6
MAX	63	231	222	640	99	492	298	255	181	108	56	17
MIN	33	72	41	26	31	33	136	49	49	41	17	10
AC-FT	2800	8280	5920	6050	3290	10280	10670	7860	5730	4130	1820	807
CFM	3.40	10.4	7.18	7.34	4.42	12.5	13.4	9.55	7.19	5.01	2.21	1.01
IN.	3.93	11.59	8.28	8.47	4.60	14.39	14.94	11.01	8.02	5.78	2.54	1.11

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1946 - 1993, BY WATER YEAR (WY)

MEAN	70.6	147	151	132	118	90.2	138	164	120	47.1	18.8	31.9
MAX	171	489	357	326	281	250	248	280	354	174	62.4	189
(WY)	1948	1991	1976	1953	1982	1972	1989	1971	1974	1955	1964	1959
MIN	6.26	7.90	28.9	32.6	20.6	28.7	50.7	41.7	17.1	12.2	6.73	6.54
(WY)	1953	1953	1986	1957	1969	1955	1967	1992	1992	1958	1986	1967

SUMMARY STATISTICS	FOR 1992 CALENDAR YEAR	FOR 1993 WATER YEAR	WATER YEARS 1946 - 1993
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ANNUAL TOTAL	24240.6		34103				
ANNUAL MEAN	66.2		93.4			102	
HIGHEST ANNUAL MEAN						146	1974
LOWEST ANNUAL MEAN						63.6	1977
HIGHEST DAILY MEAN	674	Jan 29	640	Jan 25	2750		Nov 24 1990
LOWEST DAILY MEAN	9.1	Sep 3	10	Sep 30	3.1		Sep 7 1986
ANNUAL SEVEN-DAY MINIMUM	9.4	Aug 28	11	Sep 24	3.8		Sep 2 1986
ANNUAL RUNOFF (AC-FT)	48080		67640		74070		
ANNUAL RUNOFF (CFSM)	4.94		6.97			7.63	
ANNUAL RUNOFF (INCHES)	67.29		94.67			103.67	
10 PERCENT EXCEEDS	146		184		222		
50 PERCENT EXCEEDS	45		70		66		
90 PERCENT EXCEEDS	13		21		13		

e Estimated

LAKE WASHINGTON BASIN

12115700 BOULDER CREEK NEAR CEDAR FALLS, WA

LOCATION.--Lat 47°21'59", long 121°41'30", in NW 1/4 NW 1/4 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 fair except for estimated daily discharges, which are poor. No regulation or diversion upstream from station.

AVERAGE DISCHARGE.--10 years, 23.0 ft³/s, 67.31 in/yr, 16,660 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,800 ft³/s Nov. 23, 1986, gage height, 4.16 ft; minimum discharge, no flow for many days during August through October most years.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 310 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Jan. 25	1000	*547	*5.38	No other peak greater than base discharge.			
No flow on many days during September.							

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	e5.5	e30	60	16	26	5.0	26	75	17	19	12	1.8
2	e6.0	e50	44	14	22	5.2	33	81	16	25	11	e1.6
3	e6.0	e35	33	13	19	5.6	51	68	15	22	9.9	e1.3
4	e5.5	e45	27	12	17	16	44	76	15	20	8.7	e1.0
5	e5.5	e40	22	10	15	38	32	63	13	19	7.9	e.60
6	e5.0	e35	20	e9.5	14	47	31	62	13	17	7.4	e.20
7	e5.0	e70	17	e9.0	14	39	32	55	38	15	7.1	.00
8	e4.5	e60	16	e8.5	15	39	44	62	36	14	6.6	.00
9	e4.0	e55	14	e8.0	19	35	69	54	44	12	6.1	.00
10	e4.0	e45	13	e7.5	21	29	61	63	45	11	5.7	.00
11	e4.5	e55	11	e7.0	19	24	56	52	55	11	5.4	e.50
12	e4.5	e65	9.8	e6.5	17	20	47	47	60	10	5.1	e1.5
13	e7.0	e60	10	e6.3	15	18	38	40	44	9.1	4.9	e.50
14	e6.0	e55	85	e6.0	14	35	31	32	35	10	4.7	.00
15	e5.0	e50	49	e5.7	e12	149	30	27	33	9.2	4.6	.00
16	e6.0	e45	34	e5.5	e10	69	27	24	29	11	4.7	.00
17	e7.0	e40	28	e5.2	e9.5	47	31	20	24	12	4.6	.00
18	e9.0	e50	22	e5.0	e9.0	55	36	19	21	9.6	3.9	.00
19	e14	e45	20	e4.8	e8.5	42	30	17	18	9.3	3.6	e.20
20	e12	41	18	e4.6	e8.0	42	27	18	16	20	3.3	e.80
21	e13	60	17	e4.5	e7.5	39	28	22	15	20	3.1	e.20
22	e15	107	29	4.3	7.1	116	30	23	20	24	2.9	.00
23	e13	79	43	4.2	6.5	251	31	18	50	25	3.4	.00
24	e12	50	53	20	6.1	128	33	15	31	24	6.3	.00
25	e11	36	46	406	5.6	66	51	14	25	22	3.8	.00
26	e10	28	49	272	5.6	43	63	12	21	19	3.2	.00
27	e10	34	39	129	5.6	31	78	12	21	17	2.8	.00
28	e9.5	34	32	72	5.4	25	55	14	22	16	2.6	.00
29	e9.5	28	26	50	---	22	79	15	23	17	2.4	.00
30	e10	73	22	39	---	18	87	12	18	17	2.2	.00
31	e20	---	18	31	---	17	---	16	---	14	2.0	---
TOTAL	259.0	1500	926.8	1196.1	353.4	1515.8	1311	1128	833	500.2	161.9	10.20
MEAN	8.35	50.0	29.9	38.6	12.6	48.9	43.7	36.4	27.8	16.1	5.22	.34
MAX	20	107	85	406	26	251	87	81	60	25	12	1.8
MIN	4.0	28	9.8	4.2	5.4	5.0	26	12	13	9.1	2.0	.00
AC-FT	514	2980	1840	2370	701	3010	2600	2240	1650	992	321	.20
CFSM	1.80	10.8	6.44	8.32	2.72	10.5	9.42	7.84	5.98	3.48	1.13	.07
IN.	2.08	12.03	7.43	9.59	2.83	12.15	10.51	9.04	6.68	4.01	1.30	.08

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1983 - 1993, BY WATER YEAR (WY)

	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	
MEAN	12.4	50.3	28.8	33.0	28.4	29.3	37.6	30.2	15.2	6.49	1.47	3.21
MAX	42.0	90.1	46.0	73.2	48.8	48.9	70.7	47.7	32.8	27.8	5.22	12.2
(WY)	1986	1987	1992	1984	1986	1993	1985	1984	1990	1983	1993	1983
MIN	.000	2.07	5.92	9.96	11.2	9.34	16.5	9.21	2.03	.22	.000	.000
(WY)	1988	1988	1986	1985	1989	1992	1983	1992	1992	1987	1987	1987

SUMMARY STATISTICS

FOR 1992 CALENDAR YEAR

FOR 1993 WATER YEAR

WATER YEARS 1983 - 1993

ANNUAL TOTAL	6182.33	9695.40	23.0
ANNUAL MEAN	16.9	26.6	26.6
HIGHEST ANNUAL MEAN			15.6
LOWEST ANNUAL MEAN			15.6
HIGHEST DAILY MEAN	169	406	530
LOWEST DAILY MEAN	.00	.00	.00
ANNUAL SEVEN-DAY MINIMUM	.03	.00	.00
ANNUAL RUNOFF (AC-FT)	12260	19230	16680
ANNUAL RUNOFF (CFSM)	3.64	5.72	4.96
ANNUAL RUNOFF (INCHES)	49.57	77.73	67.42
10 PERCENT EXCEEDS	48	55	53
50 PERCENT EXCEEDS	8.6	17	12
90 PERCENT EXCEEDS	.70	3.0	.01

e Estimated

LAKE WASHINGTON BASIN

135

12115800 RACK CREEK NEAR CEDAR FALLS, WA

LOCATION.--Lat 47°23'29", long 121°43'17", in NW 1/4 SE 1/4 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 September 1993 (discontinued).

GAGE.--Water-stage recorder. Elevation of gage is 1,590 ft, from topographic map. March 1983, to September 1989, recording gage at same site at datum 10.00 ft higher.

REMARKS.--Records fair except those above 60 ft³/s, which are poor. No regulation or diversion upstream from station. U.S. Geological Survey satellite telemeter at station.

AVERAGE DISCHARGE.--10 years, 10.2 ft³/s, 64.73 in/yr, 7,390 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 525 ft³/s Nov. 24, 1990, gage height, 12.47 ft, from maximum stage indicator, from rating curve extended above 42 ft³/s; minimum discharge, no flow for many days each year.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 85 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Jan. 25	1100	*246	*11.57	June 23	0130	137	11.11
Mar. 23	0600	172	11.23				

No flow for many days during October, August and September.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.02	9.1	21	7.6	12	2.4	12	52	9.4	17	6.4	.00
2	.00	17	16	6.7	10	2.5	15	53	9.4	20	5.9	.00
3	.00	14	13	6.2	9.3	3.1	22	44	9.3	19	5.4	.00
4	.00	21	11	5.7	8.3	8.4	24	40	8.5	16	4.7	.00
5	.00	23	9.6	5.1	7.7	17	19	37	7.8	14	4.2	.00
6	.00	20	8.5	4.5	7.6	21	17	35	8.4	12	3.6	.00
7	.00	23	7.5	4.2	8.3	17	18	37	23	10	3.2	.00
8	.00	27	7.2	3.9	9.3	15	20	40	25	9.3	2.8	.00
9	.00	25	6.3	3.6	10	14	33	37	28	8.2	2.5	.00
10	.00	17	5.7	3.2	11	11	34	33	27	7.4	2.2	.00
11	.00	24	5.1	2.9	9.8	9.8	38	26	26	6.6	1.9	.00
12	.00	32	4.3	2.7	8.5	8.8	32	18	27	6.0	1.7	.00
13	1.8	25	4.5	2.6	7.6	7.9	24	15	22	5.7	1.6	.00
14	.28	18	30	2.4	7.0	11	19	13	17	6.0	1.6	.00
15	.00	14	19	2.2	6.3	63	17	11	15	5.3	1.5	.00
16	.00	11	14	2.0	5.4	34	15	10	13	5.7	1.5	.00
17	.08	10	11	1.8	4.8	21	16	9.2	11	6.3	1.5	.00
18	.21	10	9.5	1.5	4.6	26	19	8.1	9.9	5.5	1.2	.00
19	1.8	12	8.8	1.3	4.4	21	18	8.1	8.9	5.6	1.1	.00
20	1.8	11	7.9	e1.2	4.2	18	16	7.7	7.9	11	.85	.00
21	11	21	8.2	e1.0	3.8	16	15	8.3	7.4	14	.67	.00
22	11	43	11	e.90	3.6	47	15	8.0	9.4	14	.53	.00
23	7.0	28	16	.79	3.2	160	15	7.2	67	14	.54	.00
24	4.1	20	25	7.1	2.9	84	15	6.8	33	13	1.9	.00
25	2.5	16	22	177	2.7	40	19	6.3	23	12	.99	.00
26	1.8	13	19	176	2.5	24	27	6.1	17	11	.50	.00
27	1.2	15	16	89	2.4	18	43	6.3	15	9.9	.31	.00
28	.75	16	13	42	2.3	15	38	7.7	19	9.2	.17	.00
29	.50	14	11	26	---	12	30	7.4	23	8.9	.05	.00
30	.26	23	9.7	18	---	11	33	6.8	20	8.1	.00	.00
31	2.0	---	8.6	14	---	10	---	8.8	---	7.1	.00	---
TOTAL	48.10	572.1	379.4	623.09	179.5	768.9	678	613.8	547.3	317.8	61.01	0.00
MEAN	1.55	19.1	12.2	20.1	6.41	24.8	22.6	19.8	18.2	10.3	1.97	.000
MAX	11	43	30	177	12	160	43	53	67	20	6.4	.00
MIN	.00	9.1	4.3	.79	2.3	2.4	12	6.1	7.4	5.3	.00	.00
AC-FT	95	1130	753	1240	356	1530	1340	1220	1090	630	121	.00
CFSM	.73	8.91	5.72	9.39	3.00	11.6	10.6	9.25	8.52	4.79	.92	.00
IN.	.84	9.94	6.60	10.83	3.12	13.37	11.79	10.67	9.51	5.52	1.06	.00

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1983 - 1993, BY WATER YEAR (WY)

	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	
MEAN	4.25	22.2	13.5	16.9	13.8	12.5	15.5	11.9	6.84	3.21	.36	1.25
MAX	16.0	43.7	32.5	35.7	34.1	24.8	26.6	19.8	18.2	12.6	1.97	4.12
(WY)	1986	1991	1990	1984	1991	1993	1989	1993	1983	1993	1983	1983
MIN	.000	.44	3.52	5.49	6.08	3.29	5.94	4.57	.80	.023	.000	.000
(WY)	1988	1988	1986	1988	1988	1992	1983	1992	1992	1987	1987	1987

SUMMARY STATISTICS	FOR 1992 CALENDAR YEAR	FOR 1993 WATER YEAR	WATER YEARS 1983 - 1993
ANNUAL TOTAL	2493.58	4789.00	
ANNUAL MEAN	6.81	13.1	
HIGHEST ANNUAL MEAN			10.2
LOWEST ANNUAL MEAN			13.8
HIGHEST DAILY MEAN	76	177	192
LOWEST DAILY MEAN	.00	.00	.00
ANNUAL SEVEN-DAY MINIMUM	.00	.00	.00
ANNUAL RUNOFF (AC-FT)	4950	9500	7400
ANNUAL RUNOFF (CFSM)	3.18	6.13	4.77
ANNUAL RUNOFF (INCHES)	43.35	83.25	64.84
10 PERCENT EXCEEDS	19	27	24
50 PERCENT EXCEEDS	3.1	8.8	6.0
90 PERCENT EXCEEDS	.00	.00	.00

e Estimated

LAKE WASHINGTON BASIN

12115900 CHESTER MORSE LAKE AT CEDAR FALLS, WA

LOCATION.--Lat 47°24'34", long 121°43'22", in SW 1/4 NE 1/4 sec.12, T.22 N., R.8 E., King County, Hydrologic Unit 17110012, at the overflow dike, 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 sea level (levels by city of Seattle).

REMARKS.--Reservoir is formed by concrete overflow dike (wooden crib dam prior to 1989). 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 the overflow dike 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. U.S. Geological Survey satellite telemeter at station.

COOPERATION.--Gage-height record furnished by city of Seattle Water Department.

EXTREMES FOR PERIOD OF RECORD.--Maximum gage height observed, 1,568.59 ft Nov. 25, 1990; minimum observed, 1,533.24 ft Nov. 8, 1987.

EXTREMES FOR CURRENT YEAR.--Maximum gage height observed, 1,563.27 ft June 25; minimum observed, 1,542.83 ft Jan. 24.

GAGE HEIGHT, FEET, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY OBSERVATION AT 08:00 VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1550.43	1544.75	1548.90	1548.98	1549.34	1544.95	1557.30	1561.65	1562.10	1563.15	1561.21	1555.30
2	1550.30	1544.75	1548.85	1548.80	1548.92	1544.75	1557.59	1561.88	1562.10	1563.15	1560.95	1555.07
3	1550.23	1544.90	1548.75	1548.65	1548.60	1544.50	1557.88	1562.00	1562.10	1563.14	1560.78	1554.90
4	1550.10	1545.00	1548.70	1548.50	1548.06	1544.40	1558.22	1562.00	1562.08	1563.05	1560.56	1554.84
5	1550.00	1545.01	1548.25	1548.30	1548.20	1544.58	1558.55	1561.99	1562.00	1562.98	1560.33	1554.44
6	1549.85	1545.31	1547.90	1548.08	1548.20	1545.02	1558.75	1561.90	1561.85	1562.86	1560.05	1554.42
7	1549.75	1545.58	1547.60	1547.77	1548.06	1545.45	1558.90	1561.80	1561.92	1562.81	1559.90	1554.20
8	1549.45	1546.20	1547.35	1547.60	1548.00	1545.68	1559.15	1561.70	1562.15	1562.70	1559.72	1554.38
9	1549.40	1546.94	1547.16	1547.27	1547.95	1545.95	1559.67	1561.60	1562.20	1562.65	1559.62	1553.78
10	1549.08	1547.28	1547.05	1546.95	1548.00	1546.30	1559.95	1561.52	1562.48	1562.50	1559.40	1553.71
11	1548.79	1547.58	1546.80	1546.65	1548.04	1546.40	1560.15	1561.50	1562.70	1562.35	1559.25	1553.30
12	1548.50	1548.15	1546.51	1546.45	1548.03	1546.50	1560.15	1561.50	1562.95	1562.20	1559.08	1553.05
13	1548.38	1548.31	1546.34	1546.10	1547.98	1546.50	1559.90	1561.65	1562.99	1562.05	1558.90	1552.80
14	1548.03	1548.42	1546.38	1545.70	1547.90	1546.50	1559.75	1561.52	1562.71	1562.00	1558.68	1552.60
15	1547.76	1548.42	1546.92	1545.48	1547.82	1547.65	1559.80	1561.51	1562.65	1561.85	1558.43	1552.35
16	1547.48	1548.35	1547.18	1545.11	1547.68	1548.80	1559.82	1561.55	1562.71	1561.75	1558.28	1552.10
17	1547.19	1548.15	1547.30	1544.80	1547.50	1549.60	1559.80	1561.67	1562.80	1561.65	1558.08	1551.92
18	1546.95	1548.10	1547.37	1544.45	1547.50	1549.60	1559.80	1561.86	1562.82	1561.55	1558.05	1551.60
19	1546.74	1548.10	1547.38	1544.00	1547.10	1550.57	1559.90	1562.10	1562.80	1561.35	1557.71	1551.30
20	1546.60	1548.33	1547.45	1543.90	1546.99	1550.90	1560.00	1562.34	1562.80	1561.32	1557.50	1551.15
21	1546.48	1548.45	1547.51	1543.67	1546.79	1551.15	1560.15	1562.52	1562.70	1561.38	1557.28	1550.85
22	1546.38	1548.85	1547.52	1543.30	1546.60	1551.55	1560.25	1562.58	1562.65	1561.40	1557.08	1550.62
23	1546.27	1549.42	1547.90	1543.10	1546.40	1553.30	1560.35	1562.60	1563.09	1561.45	1556.85	1550.38
24	1546.05	1549.58	1548.22	1542.83	1546.22	1555.00	1560.50	1562.50	1562.31	1561.50	1556.76	1550.10
25	1545.89	1549.55	1548.60	1544.00	1545.95	1555.80	1560.60	1562.52	1563.27	1561.52	1556.67	1549.95
26	1545.68	1549.45	1548.90	1547.50	1545.75	1556.35	1560.95	1562.52	1563.18	1561.55	1556.50	1

LAKE WASHINGTON BASIN

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12116060 CEDAR LAKE (MASONRY POOL) NEAR CEDAR FALLS, WA

LOCATION.--Lat 47°24'43", long 121°45'04", in NE 1/4 NW 1/4 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 sea level (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 Water Department.

EXTREMES FOR PERIOD OF RECORD.--Maximum gage height observed, 1,568.53 ft Nov. 25, 1990; 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, 1,563.22 ft June 25; minimum observed, 1,525.31 ft Oct. 9.

GAGE HEIGHT, FEET, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY OBSERVATION AT 08:00 VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1530.00	1528.72	1545.50	1546.83	1541.58	1543.05	1557.25	1561.65	1562.05	1563.10	1561.20	1555.25
2	1528.89	1528.58	1545.50	1546.71	1541.25	1542.70	1557.53	1561.83	1562.10	1563.10	1560.92	1555.05
3	1528.58	1529.72	1545.35	1546.51	1544.00	1542.75	1557.81	1561.95	1562.02	1563.09	1560.75	1554.90
4	1527.92	1529.68	1545.20	1546.42	1545.90	1542.58	1558.18	1561.98	1561.98	1563.05	1560.55	1554.58
5	1527.34	1530.69	1545.11	1546.20	1546.32	1542.58	1558.52	1561.98	1561.95	1562.95	1560.30	1554.35
6	1526.55	1531.45	1544.80	---	1545.87	1542.97	1558.75	1561.90	1561.85	1562.82	1560.01	1554.12
7	1526.00	1531.84	1544.56	---	1545.74	1543.24	1558.90	1561.75	1561.88	1562.80	1559.85	1553.98
8	1525.62	1532.60	1544.60	---	1545.75	1543.52	1559.15	1561.60	1562.15	1562.73	1559.72	1553.75
9	1525.31	1533.81	1544.70	---	1545.75	1543.90	1559.60	1561.54	1562.20	1562.55	1559.60	1553.48
10	1527.52	1534.54	1544.55	---	1546.14	1544.10	1559.95	1561.50	1562.48	1562.45	1559.35	1553.14
11	1527.82	1535.35	1544.35	---	1546.25	1544.20	1560.10	1561.42	1562.69	1562.30	1559.22	1553.00
12	1527.31	1535.97	1544.60	---	1546.40	1544.20	1560.15	1561.50	1562.91	1562.15	1558.98	1552.75
13	1526.85	1539.43	1544.42	---	1546.07	1544.40	1559.85	1561.60	1562.98	1562.00	1558.80	1552.58
14	1526.36	1540.15	1544.55	---	1545.95	1544.52	1559.75	1561.52	1562.70	1561.95	1558.61	1552.30
15	1525.95	1540.52	1545.35	---	1545.74	1545.12	1559.80	1561.48	1562.61	1561.82	1558.41	1552.10
16	1526.47	1541.04	1545.65	1542.84	1545.70	1546.95	1559.82	1561.51	1562.71	1561.70	1558.23	1551.77
17	1526.83	1542.72	1545.80	1542.52	1545.50	1548.00	1559.75	1561.62	1562.77	1561.60	1558.04	1551.57
18	1526.92	1545.00	1545.91	1542.20	1544.80	1548.70	1559.80	1561.84	1562.80	1561.50	1557.98	1551.32
19	1526.95	1546.15	1545.83	1541.80	1544.95	1549.60	1559.90	1562.05	1562.78	1561.35	1557.65	1550.90
20	1526.82	1546.40	1545.98	1541.80	1545.05	1550.33	1560.00	1562.34	1562.80	1561.35	1557.45	1550.70
21	1528.75	1546.05	1546.00	1542.20	1545.16	1550.82	1560.15	1562.52	1562.70	1561.32	1557.23	1550.40
22	1529.38	1546.32	1546.02	1541.60	1544.68	1551.20	1560.25	1562.58	1562.65	1561.35	1557.02	1550.18
23	1530.10	1546.62	1546.25	1541.35	1544.70	1552.95	1560.34	1562.54	1563.07	1561.42	1556.80	1549.70
24	1530.62	1546.15	1546.57	1541.15	1544.70	1554.85	1560.50	1562.45	1562.28	1561.45	1556.72	1549.32
25	1530.97	1546.10	1546.90	1541.80	1544.10	1555.80	1560.55	1562.45	1563.22	1561.55	1556.62	1549.00
26	1531.12	1546.10	1547.12	1544.10	1544.10	1556.35	1560.95	1562.49	1563.14	1561.52	1556.40	1548.72
27	1531.00	1545.83	1547.42	1544.20	1543.63	1556.65	1561.30	1562.50	1563.15	1561.55	1556.28	1548.48
28	1530.40	1546.19	1547.10	1542.70	1543.48	1556.92	1561.10	1562.41	1563.17	1561.50	1556.05	1548.30
29	1529.85	1545.45	1547.02	1542.40	---	1557.05	1561.00	1562.40	1563.15	1561.45	1555.78	1548.10
30	1529.36	1546.20	1547.10	1542.15	---	1557.10	1561.30	1562.22	1563.15	1561.45	1555.62	1547.80
31	1529.02	---	1546.98	1542.05	---	1557.20	---	1562.10	---	1561.35	1555.38	---
MAX	1531.12	1546.62	1547.42	---	1546.40	1557.20	1561.30	1562.58	1563.22	1563.10	1561.20	1555.25
MIN	1525.31	1528.58	1544.35	---	1541.25	1542.58	1557.25	1561.42	1561.85	1561.32	1555.38	1547.80

CAL YR 1992 MAX 1555.52 MIN 1511.52

LAKE WASHINGTON BASIN

12116100 CANYON CREEK NEAR CEDAR FALLS, WA

LOCATION.--Lat 47°25'11", long 121°45'55", in NW 1/4 SE 1/4 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 except for estimated daily discharges, which are fair. No regulation or diversion upstream from station. Flow is mostly seepage from Chester Morse Lake.

AVERAGE DISCHARGE.--48 years, 15.4 ft³/s, 11,160 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 131 ft³/s Dec. 7, 1975, gage height, 2.22 ft; minimum daily discharge, 0.22 ft³/s Nov. 6-11, 17-22, 1987.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 49 ft³/s July 5, gage height, 1.51 ft; minimum discharge, 0.73 ft³/s Oct. 1, 2.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.73	2.9	e8.2	12	8.4	8.4	23	43	44	46	38	e22
2	.79	3.0	e8.5	12	8.3	8.3	25	43	44	47	37	e22
3	.84	3.0	e9.0	12	8.0	8.0	27	44	43	46	37	e21
4	.89	3.0	e9.5	12	8.0	8.0	28	45	43	45	37	e21
5	.96	3.0	e10	12	8.0	8.0	29	45	44	47	36	e21
6	.98	3.0	e10	12	8.0	8.0	31	45	43	46	35	e20
7	.98	3.0	e10	12	8.0	8.0	32	45	43	46	35	e20
8	1.1	3.1	e11	12	8.0	7.7	33	45	43	46	34	e20
9	1.1	3.3	11	12	8.0	7.6	35	45	43	46	33	e19
10	1.1	3.3	11	12	8.0	7.6	37	44	43	46	32	e19
11	1.2	3.3	11	12	8.0	7.6	39	45	43	45	32	e19
12	1.2	3.3	11	12	8.0	7.6	41	45	43	44	31	e18
13	1.3	3.3	11	12	8.0	7.6	41	45	43	43	31	e18
14	1.3	3.4	11	12	8.0	7.6	43	45	44	42	30	e18
15	1.4	3.5	11	11	8.2	7.6	43	45	44	41	30	e18
16	1.4	3.6	11	11	8.4	7.6	42	44	44	41	30	e17
17	1.4	3.8	11	11	8.4	7.6	42	45	44	41	29	e17
18	1.5	4.0	11	11	8.4	7.3	42	44	44	40	28	e17
19	1.6	4.3	11	10	8.4	7.2	43	44	45	40	28	e16
20	1.7	4.6	11	10	8.4	7.2	42	44	45	40	27	e16
21	1.8	e5.1	11	10	8.4	7.3	42	44	46	40	27	e16
22	1.8	e5.4	11	9.9	8.4	7.7	42	44	46	39	26	e15
23	1.9	e5.7	11	9.6	8.4	9.1	43	45	47	39	26	e15
24	2.0	e6.0	11	9.3	8.4	8.9	43	45	46	39	26	e15
25	2.1	e6.3	11	10	8.4	9.1	43	46	46	39	25	e14
26	2.3	e6.6	11	9.9	8.4	10	42	46	46	39	25	e14
27	2.4	e6.9	11	9.3	8.4	11	42	45	46	39	24	e14
28	2.6	e7.3	11	8.8	8.4	13	43	45	47	39	23	e14
29	2.7	e7.6	11	8.7	---	15	43	45	46	39	23	e13
30	2.7	e7.9	12	8.4	---	18	43	45	46	38	23	e13
31	2.8	---	12	8.4	---	20	---	44	---	38	e22	---
TOTAL	48.57	132.5	331.2	334.3	230.1	283.6	1144	1384	1334	1306	920	522
MEAN	1.57	4.42	10.7	10.8	8.22	9.15	38.1	44.6	44.5	42.1	29.7	17.4
MAX	2.8	7.9	12	12	8.4	20	43	46	47	47	38	22
MIN	.73	2.9	8.2	8.4	8.0	7.2	23	43	43	38	22	13
AC-FT	96	263	657	663	456	563	2270	2750	2650	2590	1820	1040

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1945 - 1993, BY WATER YEAR (WY)

	MEAN	2.85	8.10	17.4	16.7	16.0	13.0	13.2	23.3	32.4	23.8	13.0	5.14
MAX	22.5	67.3	58.6	51.5	65.6	47.7	53.8	51.6	73.1	63.9	39.8	18.3	18.3
(WY)	1960	1948	1976	1954	1953	1950	1988	1988	1946	1955	1955	1955	1955
MIN	.32	.23	.46	1.68	3.12	1.88	4.31	4.82	9.53	5.74	1.55	.53	.53
(WY)	1988	1988	1953	1988	1985	1962	1956	1963	1963	1978	1987	1978	1978

SUMMARY STATISTICS

FOR 1992 CALENDAR YEAR

FOR 1993 WATER YEAR

WATER YEARS 1945 - 1993

ANNUAL TOTAL	3017.24	7970.27											
ANNUAL MEAN	8.24	21.8											
HIGHEST ANNUAL MEAN										15.4			
LOWEST ANNUAL MEAN										29.3			1950
HIGHEST DAILY MEAN	18	May 24	47	Jun 23						6.25			1977
LOWEST DAILY MEAN	.73	Oct 1	.73	Oct 1						120	Dec 7	1975	
ANNUAL SEVEN-DAY MINIMUM	.80	Sep 26	.88	Oct 1						.22	Nov 6	1987	
ANNUAL RUNOFF (AC-FT)	5980		15810							.22	Nov 5	1987	
10 PERCENT EXCEEDS	15		45							36			
50 PERCENT EXCEEDS	9.0		14							11			
90 PERCENT EXCEEDS	1.2		3.0							1.5			

e Estimated

LAKE WASHINGTON BASIN

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12116500 CEDAR RIVER AT CEDAR FALLS, WA

LOCATION.--Lat 47°25'02", long 121°47'27", in SW 1/4 SE 1/4 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 sea level.

REMARKS.--No estimated daily discharges. Records good. All diversions are returned to river upstream from station. Flow regulated by Chester Morse Lake (station 12115900) and Cedar Lake (station 12116060). U.S. Geological Survey satellite telemeter at station.

AVERAGE DISCHARGE.--79 years, 319 ft³/s, 231,100 acre-ft/yr, unadjusted.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 12,300 ft³/s Nov. 24, 1990, gage height, 14.00 ft, from flood mark, from rating curve extended above 3,300 ft³/s; no flow part or all of each day Nov. 25, 1917, Aug. 18, 1923, Sept. 30 to Oct. 5, 1987.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 811 ft³/s May 1, gage height, 7.15 ft; minimum discharge, 19 ft³/s Sept. 20.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	154	204	371	237	755	220	60	804	180	149	169	60
2	159	165	377	236	539	211	65	801	125	151	171	66
3	157	165	386	231	231	196	75	797	94	151	175	63
4	157	152	376	230	189	198	78	797	94	151	172	68
5	162	124	371	233	212	198	77	795	85	148	171	73
6	163	140	363	237	243	200	77	798	85	113	115	73
7	163	136	322	230	237	200	77	795	94	91	73	68
8	163	118	266	233	223	200	78	788	101	88	72	67
9	166	111	264	236	189	202	191	784	106	88	71	69
10	192	101	264	239	169	201	370	781	106	87	70	85
11	253	91	234	245	170	201	420	792	148	86	70	84
12	258	149	191	264	189	200	594	792	391	88	70	89
13	261	281	191	229	194	200	607	791	528	88	69	88
14	261	325	168	226	198	201	339	663	410	86	69	80
15	231	320	137	252	204	135	276	368	247	86	69	80
16	217	244	134	269	206	69	278	254	139	84	77	80
17	219	146	131	266	201	60	277	165	94	84	72	108
18	219	142	141	265	195	59	278	101	91	82	69	128
19	193	106	151	272	189	57	225	84	92	81	72	128
20	172	167	154	164	190	54	192	121	93	89	65	109
21	166	247	153	251	190	64	210	176	95	92	65	105
22	153	258	149	204	191	78	218	225	101	88	62	105
23	142	301	149	183	191	117	219	226	232	88	54	105
24	140	366	151	185	194	89	220	199	344	87	52	105
25	140	364	157	265	195	73	248	105	358	85	49	104
26	141	358	152	434	214	61	350	90	256	82	48	102
27	177	360	190	689	221	55	629	145	196	82	51	102
28	198	361	237	779	219	51	788	204	197	84	58	102
29	199	363	225	767	---	55	793	217	199	85	58	102
30	199	374	229	762	---	63	804	215	182	143	55	102
31	202	---	232	757	---	59	---	217	---	173	60	---
TOTAL	5777	6739	7016	10070	6538	4027	9113	14090	5463	3160	2573	2700
MEAN	186	225	226	325	233	130	304	455	182	102	83.0	90.0
MAX	261	374	386	779	755	220	804	804	528	173	175	128
MIN	140	91	131	164	169	51	60	84	85	81	48	60
AC-FT	11460	13370	13920	19970	12970	7990	18080	27950	10840	6270	5100	5360

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1914 - 1993, BY WATER YEAR (WY)

	MEAN	159	334	512	487	420	357	359	398	399	192	118	105
MAX	547	1779	2197	1393	1256	1324	716	811	1419	814	424	324	
(WY)	1960	1991	1918	1918	1982	1972	1932	1917	1917	1917	1954	1959	
MIN	34.7	24.9	47.7	133	95.0	89.0	77.1	59.5	46.3	24.5	22.4	28.3	
(WY)	1953	1953	1953	1952	1988	1941	1941	1992	1963	1926	1992	1957	

SUMMARY STATISTICS	FOR 1992 CALENDAR YEAR	FOR 1993 WATER YEAR	WATER YEARS 1914 - 1993
ANNUAL TOTAL	60618	77266	
ANNUAL MEAN	166	212	319
HIGHEST ANNUAL MEAN			567
LOWEST ANNUAL MEAN			93.0
HIGHEST DAILY MEAN	989	804	7440
LOWEST DAILY MEAN	16	48	.00
ANNUAL SEVEN-DAY MINIMUM	20	53	.04
ANNUAL RUNOFF (AC-FT)	120200	153300	231100
10 PERCENT EXCEEDS	360	372	688
50 PERCENT EXCEEDS	124	171	230
90 PERCENT EXCEEDS	26	69	61

LAKE WASHINGTON BASIN

12117000 TAYLOR CREEK NEAR SELLECK, WA

LOCATION.--Lat 47°23'12", long 121°50'42", in NW 1/4 NW 1/4 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. No regulation or diversion upstream from station.

AVERAGE DISCHARGE.--37 years, 97.8 ft³/s, 77.22 in/yr, 70,860 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 discharge, 15 ft³/s Oct. 3, 4, 7-14, 1979, Oct. 28-31, Nov. 3-10, 1987.

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. 25	0230	*501	*3.61	No other peak greater than base discharge.			
Minimum discharge, 21 ft ³ /s Oct. 1, 9-12.							

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	26	53	122	88	114	54	83	157	97	102	74	36
2	26	59	106	83	105	53	85	169	92	118	71	35
3	30	43	91	82	99	62	102	156	87	112	66	35
4	29	63	82	78	95	80	93	171	81	102	63	34
5	25	57	75	73	92	87	e85	149	76	94	62	34
6	24	51	71	71	89	82	e87	152	77	87	60	34
7	23	116	67	69	89	76	e89	139	135	82	58	33
8	24	127	70	66	89	76	e107	137	124	78	57	32
9	23	122	73	64	90	73	141	125	152	74	56	31
10	22	91	72	62	90	69	136	128	144	71	53	31
11	21	154	72	60	85	65	156	112	151	70	51	31
12	22	167	64	60	81	62	144	104	145	68	50	31
13	33	132	63	59	78	60	130	97	124	66	50	31
14	25	107	257	57	76	80	119	93	111	69	49	30
15	24	89	173	56	73	203	113	87	123	71	48	30
16	23	76	127	55	69	125	105	83	118	75	53	30
17	25	72	109	53	65	105	110	79	102	83	51	29
18	26	82	92	53	65	119	110	75	93	73	47	28
19	36	97	102	54	65	99	99	74	87	73	45	29
20	31	82	138	63	63	96	91	77	82	126	43	31
21	68	169	140	63	62	89	88	85	78	123	42	29
22	48	259	157	56	61	185	88	81	86	122	42	28
23	39	196	168	53	59	392	87	72	154	115	43	28
24	35	137	190	114	58	253	93	67	114	113	51	27
25	32	107	171	486	56	168	118	64	102	114	43	27
26	30	89	160	437	55	130	131	62	92	103	42	27
27	28	104	137	297	54	109	142	63	90	94	40	27
28	28	99	123	208	53	96	122	85	103	91	39	27
29	28	84	111	163	---	87	155	91	112	94	39	26
30	31	154	100	139	---	82	161	72	99	89	37	26
31	41	---	93	125	---	76	---	92	---	79	36	---
TOTAL	926	3238	3576	3447	2130	3393	3370	3198	3231	2831	1561	907
MEAN	29.9	108	115	111	76.1	109	112	103	108	91.3	50.4	30.2
MAX	68	259	257	486	114	392	161	171	154	126	74	36
MIN	21	43	63	53	53	53	83	62	76	66	36	26
AC-FT	1840	6420	7090	6840	4220	6730	6680	6340	6410	5620	3100	1800
CFSM	1.74	6.28	6.71	6.46	4.42	6.36	6.53	6.00	6.26	5.31	2.93	1.76
IN.	2.00	7.00	7.73	7.46	4.61	7.34	7.29	6.92	6.99	6.12	3.38	1.96

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1956 - 1993, BY WATER YEAR (WY)

	MEAN	47.6	113	150	169	151	126	125	104	75.6	47.9	32.5	35.3
MAX	132	317	291	277	293	313	174	158	171	91.3	56.3	128	
(WY)	1960	1991	1976	1971	1972	1972	1991	1971	1964	1993	1968	1959	
MIN	16.5	21.0	63.5	62.3	55.2	68.5	73.4	52.5	34.4	25.6	19.6	18.9	
(WY)	1988	1988	1986	1988	1977	1992	1983	1992	1992	1958	1958	1989	

SUMMARY STATISTICS	FOR 1992 CALENDAR YEAR	FOR 1993 WATER YEAR	WATER YEARS 1956 - 1993
ANNUAL TOTAL	25896	31808	
ANNUAL MEAN	70.8	87.1	97.8
HIGHEST ANNUAL MEAN			141
LOWEST ANNUAL MEAN			59.5
HIGHEST DAILY MEAN	550	486	1370
LOWEST DAILY MEAN	18	21	15
ANNUAL SEVEN-DAY MINIMUM	19	23	15
ANNUAL RUNOFF (AC-FT)	51360	63090	70880
ANNUAL RUNOFF (CFSM)	4.11	5.07	5.69
ANNUAL RUNOFF (INCHES)	56.01	68.79	77.29
10 PERCENT EXCEEDS	140	144	184
50 PERCENT EXCEEDS	55	80	78
90 PERCENT EXCEEDS	23	30	26

e Estimated

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LOCATION.--Lat 47°23'38", long 121°57'12", on west line NW 1/4 SW 1/4 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.

PERIOD OF RECORD.--August 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.

GAGE.--Water-stage recorder. Datum of gage is 565.9 ft above sea level. 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 sea level (levels by city of Seattle). Apr. 30, 1914, to Oct. 22, 1928, water-stage recorder 0.2 mi downstream at different datum.

AVERAGE DISCHARGE.--98 years, 690 ft³/s, 499,900 acre-ft/yr, unadjusted.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 1,490 ft³/s Jan. 25, gage height, 3.02 ft; minimum discharge, 297 ft³/s Sept. 20.

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	315	402	628	509	1100	473	377	1210	559	521	500	333
2	320	390	606	504	953	467	382	1230	501	547	496	337
3	326	345	602	503	608	466	419	1220	458	534	496	333
4	324	376	584	497	540	488	410	1230	446	519	486	336
5	322	333	569	494	542	494	391	1210	430	505	481	339
6	320	331	560	494	571	487	391	1220	428	472	444	340
7	319	421	534	486	564	476	402	1200	538	433	383	336
8	322	429	488	486	551	475	404	1190	524	431	380	331
9	322	430	496	487	517	472	535	1180	566	414	378	328
10	335	372	497	486	493	464	710	1180	564	412	375	347
11	395	424	482	487	483	460	847	1170	572	410	371	343
12	404	463	417	507	490	454	949	1160	783	409	371	352
13	421	538	411	477	492	451	1020	1150	931	401	368	349
14	411	566	671	474	491	475	732	1050	833	404	367	341
15	392	543	558	490	493	606	651	744	663	410	363	337
16	372	491	469	511	490	430	637	623	556	414	385	338
17	376	381	434	510	479	393	642	531	475	425	378	354
18	377	400	414	507	475	400	641	452	457	406	361	380
19	379	388	438	520	469	375	585	423	447	400	365	380
20	350	396	520	455	465	366	532	465	438	486	354	372
21	377	561	524	503	462	358	539	507	431	486	353	359
22	356	678	517	471	459	484	552	565	442	480	349	358
23	324	646	523	438	457	845	554	547	696	474	344	355
24	315	664	544	482	455	627	566	533	721	465	363	354
25	310	624	527	1170	454	510	622	429	743	463	342	354
26	305	603	511	1240	464	451	713	407	632	447	338	354
27	328	626	507	1250	474	414	962	436	552	433	334	351
28	351	637	547	1240	470	389	1140	521	569	435	338	349
29	356	607	526	1180	---	380	1190	571	584	443	339	347
30	362	682	516	1140	---	380	1210	532	554	486	332	347
31	380	---	514	1120	---	367	---	573	---	512	335	---
TOTAL	10866	14747	16134	20118	14961	14377	19705	25459	17093	14067	11869	10434
MEAN	351	492	520	649	534	464	657	821	570	454	383	348
MAX	421	682	671	1250	1100	845	1210	1230	931	547	500	380
MIN	305	331	411	438	454	358	377	407	428	400	332	328
AC-FT	21550	29250	32000	39900	29680	28520	39080	50500	33900	27900	23540	20700

MEAN	386	715	944	974	899	796	783	803	757	487	350	322
MAX	1015	2371	3126	2198	2009	2233	1498	1412	1795	1077	735	716
(WY)	1960	1991	1934	1918	1982	1972	1897	1897	1917	1917	1954	1959
MIN	141	141	179	369	368	360	335	306	320	262	124	127
(WY)	1905	1896	1953	1988	1988	1941	1941	1915	1992	1898	1898	1898

ANNUAL TOTAL	162364		189830				
ANNUAL MEAN	444		520			683	
HIGHEST ANNUAL MEAN						1066	1897
LOWEST ANNUAL MEAN						340	1941
HIGHEST DAILY MEAN	1490	Jan 29	1250	Jan 27	13600		Nov 19 1911
LOWEST DAILY MEAN	193	Sep 1	305	Oct 26		83	Sep 19 1898
ANNUAL SEVEN-DAY MINIMUM	195	Aug 28	321	Oct 1		87	Sep 13 1898
ANNUAL RUNOFF (AC-FT)	322000		376500			494900	
10 PERCENT EXCEEDS	639		736			1160	
50 PERCENT EXCEEDS	382		472			575	
90 PERCENT EXCEEDS	230		343			283	

LAKE WASHINGTON BASIN

12117600 CEDAR RIVER BELOW DIVERSION, NEAR LANDSBURG, WA

LOCATION.--Lat 47°22'47", long 121°58'56", in SE 1/4 NW 1/4 sec.24, T.22 N., R.6 E., King County, Hydrologic Unit 17110012, on right bank 0.8 mi northeast of the Issaquah-Ravensdale road bridge, 0.9 mi northwest of Landsburg, and at mile 20.4.

DRAINAGE AREA.--124 mi², excludes Walsh Lake diversion, which enters Cedar River at mile 19.5, and excludes 1.9 mi of Walsh Lake drainage in Cedar River basin, which is normally diverted into Issaquah Creek.

PERIOD OF RECORD.--December 1991 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 490 ft, from topographic map.

REMARKS.--Records good except for those above 850 ft³/s, which are fair. Flow is regulated by Chester Morse Lake (station 12115900) and Cedar Lake (station 12116060) 15 mi upstream for operation of powerplant at Cedar Falls 13.1 mi upstream from station. Seattle City Water diversion 1.5 mi upstream from the gage diverted an average discharge of about 133 ft³/s during the water year. U.S. Geological Survey telemeter at station.

AVERAGE DISCHARGE.--1 year (water year 1993), 383 ft³/s, 277,400 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,530 ft³/s Jan. 31, 1992, gage height, 5.78 ft; minimum discharge, 45 ft³/s Sept. 9, 1993.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 1,460 ft³/s Jan 25, gage height, 5.67 ft; minimum discharge, 45 ft³/s Sept. 9.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	242	339	544	391	796	316	300	1050	351	405	354	147
2	253	335	520	389	694	317	289	1070	325	428	349	151
3	252	287	515	390	380	285	294	1050	325	416	294	148
4	249	319	497	383	302	272	290	1070	313	400	247	149
5	249	279	487	374	295	283	289	1050	298	388	243	153
6	249	276	478	379	306	295	292	1060	317	355	221	157
7	250	363	457	377	307	302	290	1050	403	315	175	151
8	249	373	382	375	312	314	292	1040	391	301	170	147
9	250	398	385	371	303	319	393	1020	435	276	164	149
10	261	311	408	370	290	320	573	1020	450	257	173	154
11	303	355	412	372	292	320	706	991	448	252	190	160
12	305	392	348	405	300	318	785	969	644	249	187	168
13	301	464	346	376	309	322	873	918	789	243	183	176
14	301	494	646	370	312	325	611	837	706	241	183	192
15	296	473	468	367	311	454	523	592	551	244	183	205
16	281	426	366	375	311	290	512	474	448	247	203	209
17	280	316	301	373	310	282	516	391	368	259	198	214
18	268	335	297	369	310	300	515	318	347	240	182	224
19	250	309	316	370	310	310	467	335	335	233	185	226
20	238	297	338	413	312	313	412	336	327	325	173	225
21	248	455	340	455	306	318	419	366	322	331	174	173
22	279	574	332	380	308	366	425	357	319	305	169	171
23	264	535	343	343	308	856	421	353	661	302	166	173
24	255	544	360	377	309	443	430	367	589	293	183	171
25	249	495	346	1120	310	308	483	490	601	293	158	171
26	244	480	343	1210	312	300	576	450	478	275	150	174
27	263	505	347	1090	317	303	808	451	397	278	147	172
28	290	518	396	962	313	299	974	360	413	277	153	176
29	295	488	409	872	---	303	1020	421	455	298	154	174
30	302	566	397	825	---	303	1050	336	444	334	145	175
31	318	---	393	803	---	305	---	366	---	363	149	---
TOTAL	8334	12301	12517	16026	9545	10361	15828	20958	13250	9423	6005	5235
MEAN	269	410	404	517	341	334	528	676	442	304	194	174
MAX	318	574	646	1210	796	856	1050	1070	789	428	354	226
MIN	238	276	297	343	290	272	289	318	298	233	145	147
AC-FT	16530	24400	24830	31790	18930	20550	31390	41570	26280	18690	11910	10380

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1992 - 1993, BY WATER YEAR (WY)

	1992	1993	1993	1992	1993	1993	1992	1993	1993	1992	1993	1993
MEAN	269	410	404	533	583	319	418	457	319	206	145	159
MAX	269	410	404	549	816	334	528	676	442	304	194	174
(WY)	1993	1993	1993	1992	1992	1993	1993	1993	1993	1993	1993	1993
MIN	269	410	404	517	341	303	308	237	196	107	96.5	143
(WY)	1993	1993	1993	1993	1993	1992	1992	1992	1992	1992	1992	1992

SUMMARY STATISTICS FOR 1992 CALENDAR YEAR FOR 1993 WATER YEAR WATER YEARS 1992 - 1993

ANNUAL TOTAL	116298	139783	
ANNUAL MEAN	318	383	
HIGHEST ANNUAL MEAN		383	1993
LOWEST ANNUAL MEAN		383	1993
HIGHEST DAILY MEAN	1390	1210	Jan 28 1992
LOWEST DAILY MEAN	78	145	Aug 30 1992
ANNUAL SEVEN-DAY MINIMUM	90	149	Aug 30 1992
ANNUAL RUNOFF (AC-FT)	230700	277300	
10 PERCENT EXCEEDS	524	624	
50 PERCENT EXCEEDS	278	319	
90 PERCENT EXCEEDS	97	176	

LAKE WASHINGTON BASIN

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12119000 CEDAR RIVER AT RENTON, WA

LOCATION.--Lat 47°28'58", long 122°12'08", in SW 1/4 NW 1/4 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 sea level. Prior to Jan. 1, 1908, nonrecording gages within 1 mi of present site, at datum 10.67 ft above sea level. Aug. 7, 1945, to Aug. 15, 1947, water-stage recorder at site 700 ft upstream at datum 20.13 ft above sea level, and Aug. 16, 1947, to Dec. 7, 1950, at datum 19.13 ft above sea level.

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 162 ft³/s was diverted during the year at Landsburg by the city of Seattle for municipal use, computed from data furnished by Seattle Water Department. U.S. Geological Survey satellite telemeter at station. Chemical analyses July 1959 to August 1964, December 1965 to September 1971.

AVERAGE DISCHARGE.--48 years (water years 1946-93), 666 ft³/s, 482,500 acre-ft/yr, unadjusted.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 10,600 ft³/s Nov. 24, 1990, gage height, 17.13 ft from outside high-water mark; minimum daily discharge, 30 ft³/s July 1, 1962.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 1,850 ft³/s Jan. 25, gage height, 10.86 ft; minimum discharge, 133 ft³/s Aug 6, 7, Sept. 9.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	229	494	589	431	983	376	417	1300	495	475	414	e163
2	243	503	546	423	943	375	401	1350	425	482	404	157
3	252	413	530	421	559	384	451	1320	420	484	377	155
4	250	459	506	423	423	363	439	1350	395	463	292	155
5	249	419	491	406	384	355	414	1330	376	447	e280	165
6	251	403	477	400	398	369	409	1330	403	428	e265	169
7	249	527	476	399	386	365	409	1310	582	378	e205	162
8	257	521	403	384	394	375	460	1290	544	355	e195	157
9	263	618	402	384	381	382	598	1260	592	330	e193	159
10	272	e460	471	378	373	379	784	1290	649	297	e200	165
11	324	e500	526	377	362	379	971	1220	573	287	e220	166
12	331	e560	420	410	365	372	1000	1180	709	286	e215	172
13	341	e600	388	373	375	375	1190	1140	928	275	215	178
14	334	e640	680	364	380	394	837	1050	889	280	214	189
15	343	609	681	359	384	598	693	775	705	288	215	210
16	324	589	468	366	383	412	671	611	585	281	243	222
17	337	454	369	372	375	386	671	507	474	303	250	226
18	348	459	306	370	375	387	672	401	434	284	222	242
19	353	484	352	388	375	393	616	391	409	264	220	249
20	341	407	469	459	382	404	532	428	394	353	206	256
21	341	564	450	554	378	398	522	425	387	421	199	214
22	386	707	408	477	374	494	537	461	382	368	195	186
23	370	618	400	397	374	1240	538	423	663	372	193	183
24	366	607	402	401	371	832	555	412	686	352	e205	180
25	358	539	407	1240	369	535	650	529	705	349	e180	188
26	352	513	394	1570	370	458	750	506	566	331	e170	189
27	356	531	393	1480	374	442	973	484	468	317	e165	188
28	402	560	429	1260	371	423	1200	448	479	327	e175	188
29	414	528	463	1150	---	423	1260	490	513	357	e175	188
30	426	596	451	1050	---	414	1320	395	516	388	e160	189
31	457	---	442	1010	---	402	---	473	---	427	e165	---
TOTAL	10119	15882	14189	18476	11961	13884	20940	25879	16346	11049	7027	5610
MEAN	326	529	458	596	427	448	698	835	545	356	227	187
MAX	457	707	681	1570	983	1240	1320	1350	928	484	414	256
MIN	229	403	306	359	362	355	401	391	376	264	160	155
AC-FT	20070	31500	28140	36650	23720	27540	41530	51330	32420	21920	13940	11130

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1946 - 1993, BY WATER YEAR (WY)

	343	719	1044	1082	1059	874	787	725	654	302	198	231
MEAN	343	719	1044	1082	1059	874	787	725	654	302	198	231
MAX	864	2673	2845	1821	2374	2577	1203	1008	1757	785	582	601
(WY)	1960	1991	1976	1975	1982	1972	1960	1956	1964	1955	1954	1964
MIN	76.4	61.2	91.2	283	299	389	335	274	168	44.9	41.1	52.9
(WY)	1953	1953	1953	1988	1988	1992	1973	1992	1958	1958	1958	1958

SUMMARY STATISTICS

FOR 1992 CALENDAR YEAR

FOR 1993 WATER YEAR

WATER YEARS 1946 - 1993

ANNUAL TOTAL	146646	171362	666
ANNUAL MEAN	401	469	1016
HIGHEST ANNUAL MEAN			374
LOWEST ANNUAL MEAN			8900
HIGHEST DAILY MEAN	2060	Jan 28	1570
LOWEST DAILY MEAN	118	Aug 29	155
ANNUAL SEVEN-DAY MINIMUM	121	Aug 24	160
ANNUAL RUNOFF (AC-FT)	290900	339900	482400
10 PERCENT EXCEEDS	649	779	1270
50 PERCENT EXCEEDS	341	402	525
90 PERCENT EXCEEDS	133	203	147

e Estimated

LAKE WASHINGTON BASIN

12119000 CEDAR RIVER AT RENTON, WA--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1959-71, March 1978 to current year.

PERIOD OF DAILY RECORD.--

WATER TEMPERATURE: August 1965 to February 1967, March 1978 to current year.

INSTRUMENTATION.--Temperature recorder for period of daily record.

EXTREMES FOR PERIOD OF DAILY RECORD.--

WATER TEMPERATURE: Maximum, 24.0°C Aug. 8, 1978; minimum, 0.0°C Dec. 30, 1978 to Jan. 1, 1979, Jan. 29, 1980.

EXTREMES FOR CURRENT YEAR.--

WATER TEMPERATURE: Maximum recorded, 19.0°C Aug. 5; minimum, 2.0°C Jan. 11, 12.

WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
OCTOBER			NOVEMBER			DECEMBER			JANUARY			
1	13.5	13.0	13.5	9.5	9.5	9.5	6.5	6.0	6.5	4.5	3.5	4.0
2	13.5	13.0	13.0	9.5	9.5	9.5	6.5	5.5	6.0	5.0	4.0	4.5
3	13.0	12.5	12.5	9.5	8.5	9.0	5.5	4.5	5.0	5.5	4.5	5.0
4	12.5	12.0	12.5	9.0	8.5	8.5	5.5	4.5	5.0	5.5	5.0	5.0
5	12.5	11.0	11.5	9.0	9.0	9.0	5.5	4.0	5.0	5.0	3.0	4.0
6	11.5	10.5	11.0	9.0	9.0	9.0	5.5	5.0	5.0	3.5	2.5	3.0
7	11.0	10.5	11.0	9.5	9.0	9.0	5.5	5.0	5.0	4.0	2.5	3.0
8	11.5	11.0	11.5	9.0	9.0	9.0	6.0	5.0	5.5	4.0	3.0	3.5
9	11.5	11.0	11.0	9.0	8.0	8.0	6.0	5.5	6.0	4.0	3.0	3.5
10	11.0	10.5	11.0	---	---	---	5.5	5.0	5.0	3.5	2.5	3.0
11	11.5	10.5	11.0	---	---	---	6.0	5.0	5.5	3.0	2.0	2.5
12	11.5	11.0	11.0	---	---	---	6.5	5.5	6.0	4.0	2.0	3.0
13	11.5	11.5	11.5	---	---	---	7.0	5.5	6.0	4.0	2.5	3.5
14	11.5	10.0	10.5	---	---	---	7.5	6.0	7.0	4.5	3.5	4.0
15	10.5	9.5	10.0	9.0	8.0	8.5	6.0	5.5	6.0	5.5	4.0	4.5
16	9.5	9.5	9.5	9.5	9.0	9.0	5.5	5.0	5.5	4.0	3.0	3.5
17	10.5	9.5	10.0	10.0	9.0	9.5	5.5	5.0	5.5	5.0	3.5	4.0
18	11.0	10.5	10.5	10.0	9.0	9.5	5.5	4.5	5.0	5.0	3.0	4.0
19	11.5	11.0	11.0	9.0	8.0	8.5	5.5	5.0	5.0	5.0	4.0	4.5
20	11.5	11.0	11.0	9.0	7.5	8.5	6.0	5.5	6.0	5.5	4.0	5.0
21	11.5	11.0	11.5	8.5	8.0	8.0	7.0	6.0	6.0	6.0	5.0	5.5
22	11.5	11.0	11.0	8.0	7.5	8.0	7.0	6.5	6.5	5.5	4.5	5.0
23	11.5	11.0	11.0	7.5	6.5	7.0	7.5	7.0	7.5	5.0	4.0	4.5
24	11.5	11.0	11.5	6.5	5.5	6.0	7.5	6.5	7.0	6.5	5.0	5.5
25	11.0	10.0	10.5	6.5	5.5	6.0	6.5	5.5	6.0	6.5	5.5	6.0
26	10.0	10.0	10.0	7.0	5.5	6.5	7.0	6.0	6.5	6.0	5.5	6.0
27	10.0	9.5	10.0	7.5	7.0	7.0	7.0	5.5	6.0	6.0	5.0	5.5
28	9.5	9.0	9.0	7.5	7.0	7.5	6.5	5.5	6.0	5.5	5.0	5.5
29	9.5	9.0	9.0	7.0	5.5	6.5	5.5	5.0	5.5	5.5	5.0	5.0
30	9.5	9.5	9.5	7.5	6.5	7.0	5.5	5.0	5.0	5.5	4.0	4.5
31	9.5	9.5	9.5	---	---	---	5.0	4.0	4.5	5.5	4.0	4.5
MONTH	13.5	9.0	10.9	---	---	---	7.5	4.0	5.7	6.5	2.0	4.3

LAKE WASHINGTON BASIN

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12119000 CEDAR RIVER AT RENTON, WA--Continued

WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
FEBRUARY			MARCH			APRIL			MAY			
1	5.5	4.0	4.5	6.5	5.0	6.0	11.5	9.0	10.0	9.5	8.5	9.0
2	5.5	4.0	4.5	7.5	5.5	6.5	10.0	9.0	9.5	10.5	8.5	9.5
3	6.0	4.5	5.5	8.0	6.5	7.5	9.5	8.5	9.0	10.0	8.5	9.5
4	7.5	5.5	6.0	8.0	7.0	7.5	10.5	7.5	9.0	10.0	9.0	9.5
5	7.5	6.0	7.0	9.0	7.5	8.0	10.0	7.5	9.0	11.5	9.0	10.0
6	8.0	7.0	7.5	9.0	7.5	8.0	9.5	7.5	8.5	11.5	9.5	10.0
7	8.0	6.0	7.0	9.5	7.0	8.0	11.0	7.5	9.0	10.5	8.5	9.5
8	8.0	6.5	7.0	8.5	7.0	7.5	10.5	9.5	10.0	11.0	9.0	9.5
9	8.5	7.5	8.0	8.5	6.0	7.0	11.0	9.0	9.5	11.5	8.5	10.0
10	8.0	7.0	7.5	8.5	5.0	7.0	9.5	8.0	9.0	13.0	9.5	11.5
11	7.5	6.0	7.0	8.5	5.0	6.5	8.5	7.5	8.0	12.0	10.5	11.0
12	7.0	5.5	6.5	8.0	5.5	6.5	9.5	7.5	8.0	13.5	10.0	11.5
13	8.0	6.0	6.5	8.5	5.5	7.0	8.0	7.0	7.5	13.5	10.5	12.0
14	6.5	5.5	6.0	8.5	7.0	8.0	10.5	7.0	8.5	12.5	10.0	11.5
15	6.5	4.5	5.5	8.0	6.5	7.5	10.5	9.0	9.5	13.5	10.5	12.0
16	5.0	3.5	4.0	7.5	5.5	6.5	9.5	8.5	9.0	15.0	10.5	12.5
17	4.5	2.5	3.5	9.5	6.5	8.0	10.5	9.0	9.5	16.0	11.5	13.5
18	5.0	2.5	3.5	9.0	8.0	8.5	11.0	9.0	10.0	16.0	12.5	14.0
19	5.5	4.0	4.5	9.5	7.5	8.5	11.5	8.5	9.5	15.5	12.5	14.0
20	6.5	4.5	5.5	9.5	8.0	8.5	12.0	9.0	10.5	16.0	12.5	14.0
21	6.0	4.5	5.5	11.0	8.0	9.0	12.0	9.5	10.5	14.0	12.0	12.5
22	7.0	5.0	5.5	9.5	8.5	9.0	10.5	9.5	10.0	15.0	11.5	13.0
23	5.5	4.0	5.0	9.0	7.5	8.5	11.0	9.0	10.0	16.0	10.5	13.0
24	5.5	3.5	4.5	8.5	6.5	7.5	11.0	9.0	10.0	17.0	12.0	14.0
25	5.5	3.0	4.0	9.5	6.0	7.5	10.5	9.5	10.0	14.5	12.5	13.0
26	5.5	3.0	4.5	10.0	6.5	8.5	10.0	9.0	9.5	15.5	11.5	13.5
27	6.5	3.5	5.0	10.0	6.5	8.5	10.0	8.5	9.5	14.0	12.0	13.0
28	7.5	4.0	5.5	10.0	6.5	8.5	9.5	8.0	9.0	15.0	11.5	13.0
29	---	---	---	9.5	8.0	8.5	10.0	9.0	9.5	15.5	11.5	13.5
30	---	---	---	9.0	6.5	8.0	10.5	9.0	9.5	14.5	12.5	13.5
31	---	---	---	10.5	6.5	8.5	---	---	---	13.5	12.5	13.0
MONTH	8.5	2.5	5.6	11.0	5.0	7.8	12.0	7.0	9.3	17.0	8.5	11.9

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
JUNE			JULY			AUGUST			SEPTEMBER			
1	15.0	11.5	13.0	13.5	12.0	12.5	17.0	12.5	14.5	---	---	---
2	13.0	12.0	12.5	12.5	11.0	11.5	17.5	13.0	15.0	17.0	13.0	15.0
3	13.0	11.5	12.0	12.5	11.0	11.5	18.0	13.5	15.5	17.5	13.5	15.5
4	13.0	11.5	12.0	13.0	11.0	12.0	18.5	14.0	16.5	16.0	13.5	14.5
5	16.0	11.5	13.5	13.5	11.5	12.0	19.0	14.5	16.5	14.5	13.0	14.0
6	14.0	12.0	12.5	14.0	11.0	12.5	---	---	---	16.5	12.5	14.5
7	12.5	11.5	11.5	15.0	11.0	13.0	---	---	---	17.0	13.5	15.0
8	12.5	11.0	11.5	16.5	11.5	13.5	---	---	---	17.0	13.5	15.5
9	12.5	11.0	11.5	14.0	12.0	12.5	---	---	---	16.5	13.0	15.0
10	12.5	10.5	11.5	14.0	11.0	12.5	---	---	---	16.5	13.0	15.0
11	12.0	10.5	11.5	13.5	11.5	12.5	---	---	---	15.0	13.0	13.5
12	12.5	10.0	11.0	14.5	11.0	12.5	15.5	13.0	14.0	15.0	11.5	13.0
13	14.0	10.5	12.0	14.0	11.5	13.0	14.5	13.0	14.0	14.5	11.0	13.0
14	13.0	12.0	12.5	14.0	11.5	12.5	14.0	12.5	13.5	13.5	11.5	12.5
15	13.0	11.5	12.0	12.5	11.5	12.0	15.0	12.5	13.5	14.0	12.0	13.0
16	14.5	11.0	12.5	14.5	11.0	12.0	14.0	13.0	13.5	14.5	11.0	12.5
17	15.5	11.0	13.0	14.5	11.5	12.5	16.5	12.5	14.0	14.0	11.0	12.5
18	16.5	12.0	14.0	16.0	11.0	13.5	18.0	13.0	15.5	13.5	11.0	12.0
19	14.5	12.5	13.0	14.5	12.5	13.0	18.0	14.0	16.0	13.0	11.5	12.0
20	15.5	11.0	13.0	12.5	11.5	12.0	17.0	14.5	16.0	12.0	11.0	11.5
21	13.5	11.5	12.0	13.0	11.0	12.0	16.5	14.0	15.5	12.5	9.5	11.0
22	12.5	10.0	11.0	13.5	12.0	12.5	16.5	13.5	15.0	13.0	9.5	11.5
23	12.0	10.0	11.0	13.0	11.5	12.5	16.5	14.0	15.0	13.0	10.0	11.5
24	14.0	10.0	11.5	12.5	11.5	12.0	15.5	13.0	14.0	12.5	10.0	11.5
25	15.5	11.0	13.0	13.5	11.0	12.0	14.5	12.0	13.5	13.5	10.5	12.0
26	15.0	12.0	13.5	15.5	11.0	13.0	---	---	---	13.5	10.5	12.0
27	14.0	11.5	13.0	15.0	12.0	13.5	---	---	---	13.5	10.5	12.5
28	13.0	11.5	12.0	13.5	12.0	12.5	---	---	---	14.0	11.0	12.5
29	13.5	11.0	12.0	13.5	11.0	12.0	---	---	---	14.0	11.0	12.5
30	15.0	11.0	13.0	15.0	10.5	12.5	---	---	---	13.5	11.0	12.5
31	---	---	---	16.5	12.0	14.0	---	---	---	---	---	---
MONTH	16.5	10.0	12.3	16.5	10.5	12.5	---	---	---	---	---	---

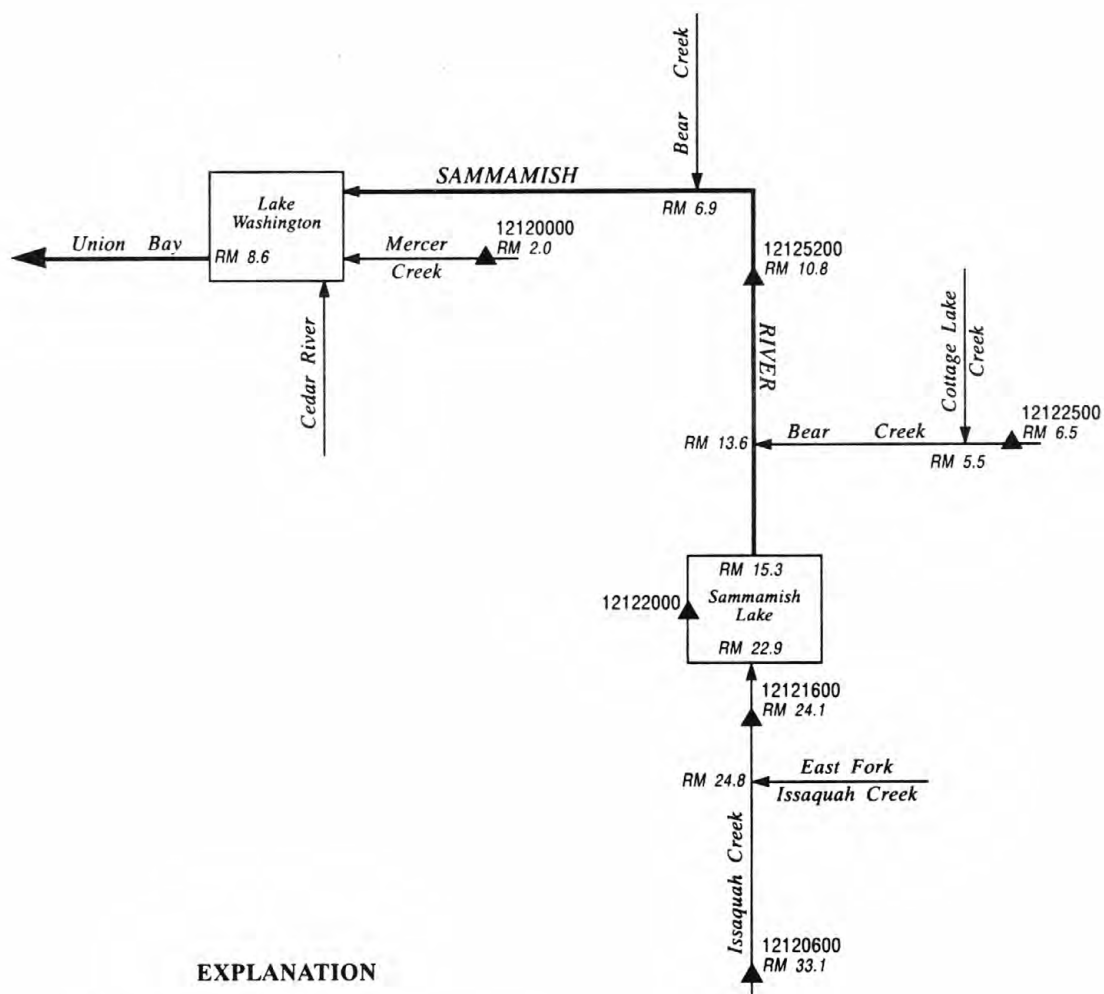


Figure 14. Gaging stations in Sammamish River Basin.

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LOCATION.--Lat 47°36'11", long 122°10'47", in NW 1/4 NW 1/4 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.

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 sea level (levels by Municipality of Metropolitan Seattle engineers). Prior to June 5, 1959, at site 600 ft downstream at different datums.

REMARKS.--No estimated daily discharges. Records good. Natural flow affected by urbanization and construction of flood-control catchments.

AVERAGE DISCHARGE.--38 years, 22.2 ft³/s, 25.12 in/yr, 16,080 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 832 ft³/s Jan. 18, 1986, gage height, 6.50 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)
Mar. 23	0145	*282	*3.59	July 14	0230	251	3.36
Minimum discharge, 5.4 ft ³ /s Aug. 9.							

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	7.7	51	19	10	11	11	19	22	27	10	6.7	7.1
2	7.8	27	14	10	11	9.5	15	16	16	20	6.6	7.0
3	12	12	12	20	11	34	43	18	11	12	6.3	7.1
4	8.3	30	11	15	11	42	16	29	10	9.6	6.2	6.8
5	7.6	11	11	11	10	15	12	14	9.7	8.8	6.0	6.8
6	7.5	11	11	9.9	10	12	12	26	27	8.3	6.1	6.9
7	7.6	72	14	9.7	9.9	11	10	17	77	8.5	6.1	6.9
8	8.1	42	39	9.7	9.9	11	55	19	20	8.4	5.9	6.8
9	7.5	31	24	9.2	12	10	45	15	62	7.7	5.8	6.7
10	7.3	13	70	8.9	10	10	50	28	26	7.8	6.2	6.8
11	7.3	72	107	8.6	9.8	9.3	43	13	19	8.0	6.3	6.7
12	7.5	30	34	8.6	9.5	9.2	27	10	13	8.3	6.3	6.8
13	11	15	21	8.7	9.2	9.2	19	10	12	16	6.5	6.6
14	7.8	12	74	8.8	9.2	14	44	9.7	13	103	6.6	6.9
15	7.7	11	33	8.8	9.1	30	19	9.6	20	11	6.5	7.0
16	7.8	42	21	8.7	8.9	20	15	9.0	11	9.5	10	6.8
17	8.1	28	22	8.7	8.7	29	24	8.8	11	7.6	7.2	6.7
18	14	20	15	8.6	8.9	18	17	8.8	9.8	6.8	6.9	6.7
19	25	65	29	41	9.3	11	15	8.3	9.2	8.4	6.5	6.6
20	18	20	55	83	14	21	12	22	8.8	43	6.5	12
21	11	64	23	45	13	13	17	28	8.5	11	6.3	8.1
22	8.9	45	16	19	15	84	24	10	12	10	6.2	7.2
23	8.3	19	14	15	9.9	132	16	9.0	21	15	20	7.1
24	8.6	14	13	19	9.3	28	22	8.5	9.2	9.0	32	7.0
25	8.3	12	13	54	9.0	18	45	8.2	8.5	8.1	9.2	6.8
26	8.0	11	19	35	8.9	15	36	7.9	8.3	7.3	8.0	6.6
27	8.0	28	17	18	9.0	13	19	9.0	8.2	7.5	7.7	6.6
28	8.7	43	14	20	9.0	11	16	12	22	23	7.2	6.9
29	11	15	11	15	---	19	45	20	22	18	6.9	7.0
30	20	51	17	13	---	14	56	18	9.8	12	6.6	7.0
31	33	---	12	12	---	11	---	73	---	7.6	7.0	---
TOTAL	329.4	917	805	571.9	285.5	694.2	808	516.8	542.0	451.2	248.3	212.0
MEAN	10.6	30.6	26.0	18.4	10.2	22.4	26.9	16.7	18.1	14.6	8.01	7.07
MAX	33	72	107	83	15	132	56	73	77	103	32	12
MIN	7.3	11	11	8.6	8.7	9.2	10	7.9	8.2	6.8	5.8	6.6
AC-FT	653	1820	1600	1130	566	1380	1600	1030	1080	895	493	421
CFSM	.89	2.55	2.16	1.54	.85	1.87	2.24	1.39	1.51	1.21	.67	.59
IN.	1.02	2.84	2.50	1.77	.89	2.15	2.50	1.60	1.68	1.40	.77	.69

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1945 - 1993, BY WATER YEAR (WY)

MEAN	15.6	30.6	39.4	39.9	34.2	30.1	22.0	14.2	12.3	8.74	8.42	11.0
MAX	44.4	60.5	69.9	61.6	59.0	67.5	39.9	20.2	23.8	15.4	18.7	22.3
(WY)	1982	1984	1974	1959	1969	1972	1991	1961	1985	1981	1976	1978
MIN	7.47	11.0	16.5	15.9	10.2	15.4	12.5	8.42	5.34	3.22	3.25	5.05
(WY)	1988	1977	1977	1977	1993	1965	1962	1958	1958	1958	1945	1955

SUMMARY STATISTICS	FOR 1992 CALENDAR YEAR	FOR 1993 WATER YEAR	WATER YEARS 1945 - 1993
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ANNUAL TOTAL	7163.5		6381.3				
ANNUAL MEAN	19.6		17.5			22.2	
HIGHEST ANNUAL MEAN						29.8	1972
LOWEST ANNUAL MEAN						15.2	1977
HIGHEST DAILY MEAN	181	Jan 28	132	Mar 23	407		Jan 18 1986
LOWEST DAILY MEAN	5.7	Jul 29	5.8	Aug 9	2.5		Jul 16 1958
ANNUAL SEVEN-DAY MINIMUM	5.8	Jul 28	6.0	Aug 4	2.8		Jul 23 1958
ANNUAL RUNOFF (AC-FT)	14210		12660		16100		
ANNUAL RUNOFF (CFSM)	1.63		1.46		1.85		
ANNUAL RUNOFF (INCHES)	22.21		19.78		25.16		
10 PERCENT EXCEEDS	44		37		46		
50 PERCENT EXCEEDS	11		11		14		
90 PERCENT EXCEEDS	6.4		6.9		6.5		

LAKE WASHINGTON BASIN

12120600 ISSAQUAH CREEK NEAR HOBART, WA

LOCATION.--Lat 47°27'27", long 122°00'14", in NE 1/4 NW 1/4 sec.26, T.23 N., R.6 E., King County, Hydrologic Unit 17110012, on left bank 20 ft downstream from highway bridge, 2.9 mi northwest of Hobart, and 10.2 mi upstream from mouth, 1.6 mi northwest of Issaquah, and at mile 33.1 (continuation of Sammamish River).

DRAINAGE AREA.--17.6 mi².

PERIOD OF RECORD.--October 1986 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 300 ft, from topographic map.

REMARKS.--No estimated daily discharges. Records good. No known regulation or diversion upstream from station. U.S. Geological Survey satellite telemeter at station.

AVERAGE DISCHARGE.--7 years, 47.1 ft³/s, 36.34 in/yr, 34,120 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,360 ft³/s Nov. 24, 1990, gage height, 9.90 ft; minimum discharge, 5.3 ft³/s, Sept. 17-20, 1992.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 280 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Jan. 25	1230	*353	*6.39	Mar. 23	0115	331	6.30

Minimum discharge, 6.2 ft³/s several days in October.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	7.2	26	62	33	47	18	54	55	48	35	27	14
2	7.4	27	50	30	43	18	53	64	40	36	26	13
3	8.9	19	42	31	38	26	69	58	38	34	24	13
4	8.3	23	38	33	35	28	55	67	36	32	22	13
5	7.3	20	34	28	33	25	43	56	34	29	21	14
6	6.6	17	32	23	30	22	46	58	40	28	20	14
7	6.2	44	29	22	29	20	47	53	121	27	20	13
8	7.2	65	38	21	29	20	54	49	85	26	19	13
9	8.3	68	45	21	31	18	84	44	109	25	18	13
10	7.2	39	62	20	32	17	78	51	92	24	18	12
11	6.2	69	66	19	27	17	112	40	71	24	18	12
12	6.3	61	50	18	26	17	96	38	60	24	17	14
13	9.1	44	43	18	24	17	70	34	48	24	17	14
14	7.6	37	172	18	23	21	57	33	44	26	17	14
15	6.7	32	140	18	23	55	50	31	43	26	16	13
16	6.3	29	97	18	21	30	45	29	40	27	24	13
17	7.6	28	77	17	20	31	46	28	36	25	22	13
18	8.8	36	62	17	21	28	46	27	33	23	19	13
19	13	56	70	23	20	23	39	25	31	23	17	13
20	13	42	140	37	20	23	36	30	29	37	16	15
21	21	85	128	45	20	21	34	36	28	34	16	14
22	17	108	105	37	19	88	33	42	31	33	15	13
23	13	79	90	31	18	225	34	32	82	34	16	13
24	11	58	85	40	18	121	43	28	42	32	16	13
25	10	46	71	238	17	83	68	27	36	31	16	13
26	9.6	39	64	227	17	69	64	26	34	28	15	12
27	9.4	47	55	133	17	61	60	25	33	27	15	12
28	9.1	64	48	93	17	55	49	27	39	29	15	12
29	10	47	44	71	---	54	61	33	38	37	15	12
30	12	74	40	62	---	52	65	28	33	37	14	11
31	20	---	35	55	---	49	---	48	---	30	14	---
TOTAL	301.3	1429	2114	1497	715	1352	1691	1222	1474	907	565	391
MEAN	9.72	47.6	68.2	48.3	25.5	43.6	56.4	39.4	49.1	29.3	18.2	13.0
MAX	21	108	172	238	47	225	112	67	121	37	27	15
MIN	6.2	17	29	17	17	17	33	25	28	23	14	11
AC-FT	598	2830	4190	2970	1420	2680	3350	2420	2920	1800	1120	776
CFSM	.55	2.71	3.87	2.74	1.45	2.48	3.20	2.24	2.79	1.66	1.04	.74
IN.	.64	3.02	4.47	3.16	1.51	2.86	3.57	2.58	3.12	1.92	1.19	.83

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1987 - 1993, BY WATER YEAR (WY)

	1987	1988	1989	1990	1991	1992	1993
MEAN	16.7	86.8	67.5	84.1	70.4	72.6	60.5
MAX	35.0	245	125	130	133	118	98.4
(WY)	1991	1991	1991	1991	1991	1989	1991
MIN	8.55	12.6	36.3	44.4	25.5	35.6	31.9
(WY)	1988	1988	1988	1988	1993	1992	1990

SUMMARY STATISTICS

FOR 1992 CALENDAR YEAR

FOR 1993 WATER YEAR

WATER YEARS 1987 - 1993

ANNUAL TOTAL	11986.2	13658.3	47.0
ANNUAL MEAN	32.7	37.4	80.9
HIGHEST ANNUAL MEAN			32.2
LOWEST ANNUAL MEAN			904
HIGHEST DAILY MEAN	277	Jan 29	Nov 24 1990
LOWEST DAILY MEAN	5.4	Sep 18	Sep 18 1992
ANNUAL SEVEN-DAY MINIMUM	5.7	Sep 16	Sep 16 1992
ANNUAL RUNOFF (AC-FT)	23770	27090	34080
ANNUAL RUNOFF (CFSM)	1.86	2.13	2.67
ANNUAL RUNOFF (INCHES)	25.33	28.87	36.32
10 PERCENT EXCEEDS	65	69	101
50 PERCENT EXCEEDS	25	29	29
90 PERCENT EXCEEDS	8.1	13	9.8

12121600 ISSAQUAH CREEK NEAR MOUTH, NEAR ISSAQUAH, WA

LOCATION.--Lat 47°33'09", long 122°02'48", in SE 1/4 NW 1/4 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, 1.6 mi northwest of Issaquah, and at mile 24.1 (continuation of Sammamish River).

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.

REVISED RECORDS.--WDR WA-77-1: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 35.99 ft above sea level.

REMARKS.--Records fair. Many minor diversions for irrigation and domestic use upstream from station. Chemical analyses November 1964 to September 1971, October 1973 to September 1974. Water temperatures September 1970 to September 1971. U.S. Geological Survey satellite telemeter at station.

AVERAGE DISCHARGE.--30 years, 134 ft³/s, 32.15 in/yr, 97,080 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 3,200 ft³/s Jan. 9, 1990, gage height, 13.50 ft; minimum discharge, 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)
Mar. 23	0430	*739	*7.44				
Minimum discharge, 16 ft ³ /s Oct. 12.							

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	19	75	151	77	129	51	113	215	144	80	60	28
2	20	75	121	71	117	51	112	225	117	92	55	28
3	24	56	101	79	107	79	171	198	102	87	52	27
4	23	59	89	80	98	91	159	207	93	80	49	27
5	21	54	81	70	92	81	133	178	85	74	46	26
6	20	49	73	63	86	70	123	184	87	67	45	27
7	20	116	68	59	82	64	125	171	268	62	44	26
8	20	131	93	56	79	60	204	156	241	58	43	25
9	22	152	114	52	75	58	360	138	291	55	41	24
10	21	95	176	49	79	55	300	156	295	54	40	24
11	21	157	212	46	73	52	330	124	223	54	39	24
12	20	145	146	44	69	50	288	111	183	53	39	24
13	24	109	119	44	66	48	229	100	150	50	38	24
14	23	89	375	43	64	59	187	91	131	56	38	24
15	22	76	341	42	63	135	168	83	132	55	38	23
16	21	71	231	41	59	100	149	77	116	56	48	23
17	23	70	186	40	57	108	152	71	102	56	e47	22
18	24	84	146	38	56	98	147	65	90	56	e44	22
19	38	159	169	57	57	87	125	62	82	51	38	22
20	41	126	348	118	58	91	112	77	77	87	35	25
21	55	192	311	175	58	84	108	87	73	86	34	24
22	48	245	252	120	57	186	106	113	81	76	34	23
23	38	178	211	94	55	574	109	80	169	81	36	23
24	36	131	192	104	52	320	132	69	103	75	43	23
25	34	102	167	478	50	218	206	61	86	71	36	22
26	32	86	149	549	48	171	212	58	78	65	34	22
27	33	101	130	362	48	142	199	56	73	61	32	21
28	32	139	116	271	47	122	166	63	93	65	32	21
29	35	107	102	208	---	116	189	83	93	80	31	20
30	44	172	95	171	---	107	241	66	80	86	30	20
31	64	---	85	147	---	99	---	121	---	68	29	---
TOTAL	918	3401	5150	3848	1981	3627	5355	3546	3938	2097	1250	714
MEAN	29.6	113	166	124	70.7	117	178	114	131	67.6	40.3	23.8
MAX	64	245	375	549	129	574	360	225	295	92	60	28
MIN	19	49	68	38	47	48	106	56	73	50	29	20
AC-FT	1820	6750	10220	7630	3930	7190	10620	7030	7810	4160	2480	1420
CFSM	.52	2.00	2.94	2.19	1.25	2.07	3.15	2.02	2.32	1.20	.71	.42
IN.	.60	2.24	3.38	2.53	1.30	2.38	3.52	2.33	2.59	1.38	.82	.47

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1964 - 1993, BY WATER YEAR (WY)

	MEAN	53.4	155	246	282	228	196	156	93.5	79.3	45.9	34.1	39.4
MAX	151	440	520	472	546	420	280	146	179	77.0	56.4	85.5	85.5
(WY)	1976	1991	1964	1982	1972	1991	1981	1964	1972	1976	1976	1976	1976
MIN	19.6	24.6	96.2	11.0	70.7	86.2	81.5	56.0	29.8	26.6	19.9	19.1	19.1
(WY)	1988	1980	1988	1985	1993	1992	1977	1992	1992	1987	1992	1992	1987

SUMMARY STATISTICS FOR 1992 CALENDAR YEAR FOR 1993 WATER YEAR WATER YEARS 1964 - 1993

	ANNUAL TOTAL	31136	ANNUAL MEAN	85.1	ANNUAL MEAN	35825	ANNUAL MEAN	98.2	ANNUAL MEAN	134	ANNUAL MEAN	1972
HIGHEST ANNUAL MEAN										197		1972
LOWEST ANNUAL MEAN										76.2		1977
HIGHEST DAILY MEAN										2350		Nov 24 1986
LOWEST DAILY MEAN										15		Aug 28 1992
ANNUAL SEVEN-DAY MINIMUM										16		Aug 27 1992
ANNUAL RUNOFF (AC-FT)		61760				71060				96810		
ANNUAL RUNOFF (CFSM)		1.50				1.73				2.36		
ANNUAL RUNOFF (INCHES)		20.46				23.55				32.08		
10 PERCENT EXCEEDS		172				194				281		
50 PERCENT EXCEEDS		61				77				87		
90 PERCENT EXCEEDS		20				24				28		

e Estimated

LAKE WASHINGTON BASIN

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12122500 BEAR CREEK NEAR REDMOND, WA

LOCATION.--Lat 47°43'04", long 122°04'34", in NW 1/4 NW 1/4 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 September 1984 (seasonal records), October 1984 to September 1986, October 1986 to September 1989 (seasonal records), October 1989 to September 1991, October 1991 to current year (seasonal records).

REVISED RECORD.--WDR WA-79-1: Drainage area. WDR WA-84: Datum.

GAGE.--Water-stage recorder. Datum of gage is 111.0 ft above sea level. June 1945 to October 1949 at different datum.

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

AVERAGE DISCHARGE.--10 years (water years 1946-49, 1980-81, 1985-86, 1990-91), 27.1 ft³/s, 26.48 in/yr, 19,630 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 420 ft³/s Jan. 18, 1986, gage height, 4.54 ft; minimum discharge, 3.1 ft³/s Aug. 22, 1946, gage height, 1.34 ft at datum then is use.

EXTREMES FOR PERIOD MAY TO DECEMBER.--Maximum discharge, 125 ft³/s Dec. 11, gage height, 2.28 ft; minimum discharge, 5.4 ft³/s Sept. 2, 3, Oct. 14, 15.

DISCHARGE, CUBIC FEET PER SECOND, MAY TO DECEMBER 1993
DAILY MEAN VALUES

DAY	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	---	38	10	13	7.4	7.0	9.3	57
2	---	27	18	10	6.5	6.9	9.2	61
3	---	21	17	9.0	6.0	6.8	12	49
4	---	17	14	8.3	6.0	6.8	12	60
5	---	14	12	8.3	6.5	7.4	11	45
6	---	15	10	8.7	9.8	8.5	11	36
7	---	54	9.4	9.9	8.4	9.1	10	41
8	---	47	9.2	9.7	7.7	8.1	10	47
9	---	53	8.4	9.0	7.4	7.5	11	71
10	---	56	8.3	8.7	7.0	6.8	12	101
11	---	69	8.2	8.6	8.6	6.6	12	98
12	---	62	8.4	8.6	8.6	6.9	11	104
13	---	46	12	8.4	7.9	7.3	11	86
14	---	36	35	8.4	8.2	6.7	11	74
15	---	32	18	8.3	8.4	6.9	14	58
16	---	28	15	9.5	7.7	9.3	17	47
17	---	23	13	9.2	7.7	8.8	16	39
18	---	18	12	8.4	7.3	10	15	34
19	---	16	12	8.1	7.7	11	14	30
20	13	14	27	7.9	9.6	11	13	26
21	17	12	23	7.5	8.8	8.8	32	24
22	16	17	20	7.2	8.5	9.4	37	24
23	13	23	21	9.4	8.4	17	27	22
24	11	16	18	17	8.0	17	22	20
25	10	13	15	12	7.8	12	19	19
26	9.3	11	14	8.9	7.5	10	16	18
27	8.7	11	12	8.4	7.7	9.0	16	17
28	12	17	19	8.0	7.5	11	20	17
29	15	15	22	7.5	7.3	11	24	17
30	13	13	20	7.4	7.2	9.6	28	21
31	33	---	17	7.7	---	9.4	---	29
TOTAL	---	834	477.9	281.0	233.1	283.6	482.5	1392
MEAN	---	27.8	15.4	9.06	7.77	9.15	16.1	44.9
MAX	---	69	35	17	9.8	17	37	104
MIN	---	11	8.2	7.2	6.0	6.6	9.2	17
AC-FT	---	1650	948	557	462	563	957	2760
CFSM	---	2.00	1.11	.65	.56	.66	1.16	3.23
IN.	---	2.23	1.28	.75	.62	.76	1.29	3.73

LAKE WASHINGTON BASIN

12125200 SAMMAMISH RIVER NEAR WOODINVILLE, WA

LOCATION.--Lat 47°42'15", long 122°08'29", in SW 1/4 SW 1/4 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.

DRAINAGE AREA.--159 mi², includes 1.9 mi² of Cedar River drainage from upper Rock Creek which is normally diverted into Issaquah Creek.

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

GAGE.--Water-stage recorder. Datum of gage is sea level (Corps of Engineers bench mark). Prior to July 7, 1970, auxiliary water-stage recorder 2 mi downstream from base gage at same datum.

REMARKS.--No estimated daily discharges. Records fair. Some regulation at Sammamish Lake. Many small diversions for irrigation and domestic use. Water temperatures August 1965 to February 1967.

AVERAGE DISCHARGE.--28 years, 309 ft³/s, 26.39 in/yr, 223,900 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 2,390 ft³/s Mar. 6, 1972, elevation, 25.83 ft; minimum daily discharge, 25 ft³/s Aug. 2, 1977.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 688 ft³/s Apr. 14, elevation, 19.14 ft; minimum discharge, 55 ft³/s Oct. 12.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	71	120	271	292	337	183	302	532	376	232	138	94
2	69	113	250	272	324	184	295	493	359	261	132	92
3	74	90	228	271	310	186	325	453	347	242	127	92
4	72	102	208	275	299	217	330	446	340	225	122	91
5	71	92	191	258	284	205	311	419	333	212	120	89
6	65	84	180	235	276	191	301	440	340	196	117	90
7	63	191	172	218	269	187	296	423	449	179	117	86
8	62	187	193	210	260	187	344	405	453	163	114	83
9	61	189	206	200	251	186	404	378	492	151	113	81
10	59	139	247	190	243	185	492	392	525	146	110	80
11	59	217	422	178	238	183	577	358	542	136	107	80
12	56	199	378	171	229	181	598	334	535	128	106	80
13	58	174	342	166	221	162	537	316	477	145	106	76
14	59	152	407	162	215	160	656	299	448	291	105	74
15	56	138	429	161	211	185	563	288	434	200	105	76
16	58	173	414	150	206	189	502	271	411	173	113	73
17	59	195	411	137	198	210	484	259	390	153	115	71
18	62	168	383	137	190	210	461	253	367	134	110	70
19	78	226	379	163	184	195	470	249	345	119	106	70
20	73	206	488	257	185	202	427	262	328	182	105	75
21	73	237	492	273	186	192	404	277	312	174	105	74
22	71	291	478	253	192	265	397	270	317	155	106	70
23	68	269	450	236	186	533	370	261	338	155	123	68
24	65	240	420	228	181	455	372	254	307	151	149	67
25	62	216	396	294	177	414	405	250	291	146	131	66
26	60	197	406	359	176	378	433	249	275	138	118	64
27	58	213	414	371	180	351	424	252	264	132	113	64
28	59	274	391	386	184	329	406	265	276	151	108	63
29	61	239	362	385	---	321	471	277	269	167	103	66
30	66	289	341	370	---	308	624	283	249	162	98	64
31	85	---	316	354	---	294	---	352	---	147	95	---
TOTAL	2013	5620	10665	7612	6392	7628	12981	10260	11189	5346	3537	2289
MEAN	64.9	187	344	246	228	246	433	331	373	172	114	76.3
MAX	85	291	492	386	337	533	656	532	542	291	149	94
MIN	56	84	172	137	176	160	295	249	249	119	95	63
AC-FT	3990	11150	21150	15100	12680	15130	25750	20350	22190	10600	7020	4540
CFSM	.41	1.18	2.16	1.54	1.44	1.55	2.72	2.08	2.35	1.08	.72	.48
IN.	.47	1.31	2.50	1.78	1.50	1.78	3.04	2.40	2.62	1.25	.83	.54

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1965 - 1993, BY WATER YEAR (WY)

	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993
MEAN	120	312	576	631	549	482	367	232	185	109	73.0	88.7																	
MAX	338	681	1078	946	1066	1214	675	331	373	175	124	189																	
(WY)	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993
MIN	49.8	70.1	186	246	200	246	199	154	84.7	68.9	46.2	48.5																	
(WY)	1988	1988	1977	1993	1977	1993	1992	1989	1992	1987	1967	1987																	

SUMMARY STATISTICS

FOR 1992 CALENDAR YEAR

FOR 1993 WATER YEAR

WATER YEARS 1965 - 1993

ANNUAL TOTAL	76427	85532	309	
ANNUAL MEAN	209	234	442	1972
HIGHEST ANNUAL MEAN			186	1977
LOWEST ANNUAL MEAN				
HIGHEST DAILY MEAN	1350	656	2330	Mar 6 1972
LOWEST DAILY MEAN	42	56	25	Aug 2 1977
ANNUAL SEVEN-DAY MINIMUM	43	58	32	Aug 1 1977
ANNUAL RUNOFF (AC-FT)	151600	169700	224200	
ANNUAL RUNOFF (CFSM)	1.31	1.47	1.95	
ANNUAL RUNOFF (INCHES)	17.88	20.01	26.44	
10 PERCENT EXCEEDS	430	423	670	
50 PERCENT EXCEEDS	153	206	220	
90 PERCENT EXCEEDS	57	71	67	

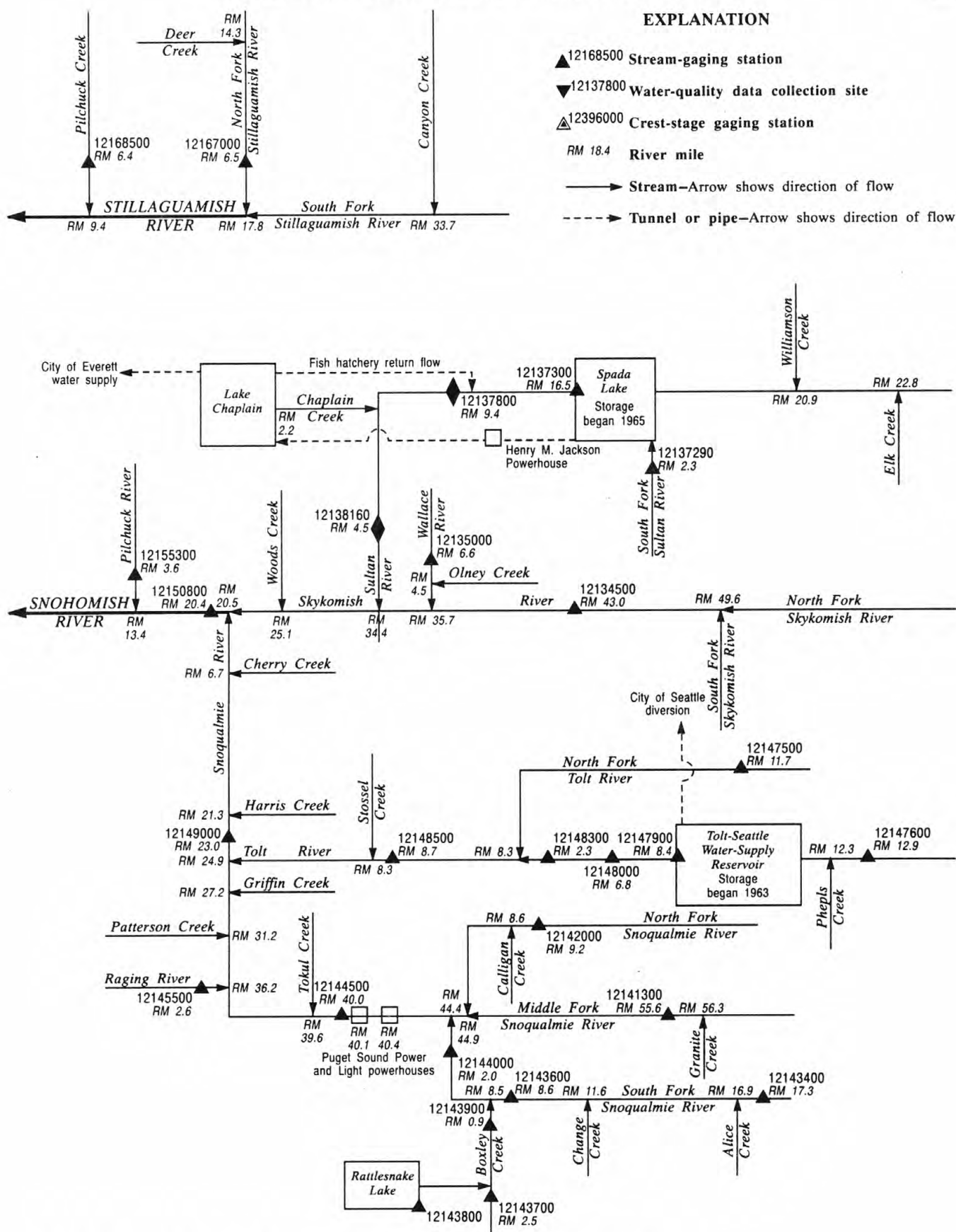


Figure 15. Gaging stations in Stillaguamish and Snohomish River Basins.

12135000 WALLACE RIVER AT GOLD BAR, WA

LOCATION.--Lat 47°51'51", long 121°40'53", in NE 1/4 NW 1/4 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 September 1988 (seasonal records), October 1988 to September 1991, October 1991 to current year (seasonal records). 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 sea level. 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.--No estimated daily discharges. Records good. Flow affected by natural storage in Wallace Lake. No diversions upstream from station. Water temperatures July 1955 to September 1972.

AVERAGE DISCHARGE.--38 years (water years 1929-33, 1947-76, 1989-91), 167 ft³/s, 119.36 in/yr, 121,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 4,210 ft³/s Feb. 19, 1991, gage height, 7.20 ft; minimum discharge, 5.8 ft³/s Aug. 25, 29, 30, 1961.

EXTREMES FOR PERIOD MAY TO NOVEMBER.--Maximum discharge, 902 ft³/s Oct. 23, gage height, 4.17 ft; minimum discharge, 16 ft³/s Oct. 5, 6, 12, 13.

DISCHARGE, CUBIC FEET PER SECOND, MAY TO NOVEMBER 1993
DAILY MEAN VALUES

DAY	MAY	JUN	JUL	AUG	SEP	OCT	NOV
1	440	189	74	85	35	18	45
2	421	163	83	76	33	18	39
3	302	143	93	68	31	17	250
4	384	140	86	61	30	17	77
5	305	137	75	56	29	17	57
6	454	139	69	51	28	20	48
7	349	270	65	48	27	28	43
8	526	188	60	45	26	22	39
9	342	260	56	42	25	19	36
10	466	226	52	40	24	18	34
11	474	246	50	39	24	17	32
12	559	396	52	36	29	17	30
13	393	248	48	35	25	18	31
14	289	203	49	35	24	30	30
15	232	238	57	35	24	87	58
16	219	187	61	37	23	90	58
17	243	145	124	45	22	48	48
18	298	127	100	38	21	35	47
19	265	110	85	34	21	57	42
20	279	95	393	32	37	39	49
21	305	90	535	30	32	31	426
22	315	212	272	29	25	83	142
23	178	194	205	157	23	564	89
24	175	124	161	157	22	183	72
25	164	100	138	82	21	86	64
26	141	91	113	61	20	63	57
27	140	126	96	51	20	53	57
28	136	117	93	46	19	65	112
29	229	106	139	43	19	57	166
30	140	84	159	40	19	46	224
31	198	---	101	37	---	48	---
TOTAL	9361	5094	3744	1671	758	1911	2502
MEAN	302	170	121	53.9	25.3	61.6	83.4
MAX	559	396	535	157	37	564	426
MIN	136	84	48	29	19	17	30
AC-FT	18570	10100	7430	3310	1500	3790	4960
CFSM	15.9	8.94	6.36	2.84	1.33	3.24	4.39
IN.	18.33	9.97	7.33	3.27	1.48	3.74	4.90

SNOHOMISH RIVER BASIN

12137290 SOUTH FORK SULTAN RIVER NEAR SULTAN, WA

LOCATION.--Lat 47°56'51", long 121°37'32", in NE 1/4 NE 1/4 sec.3, T.28 N., R.9 E., Snohomish County, Hydrologic Unit 17110009, on left bank, 0.3 mi downstream from bridge, 14 mi northeast of Sultan, and 2 mi upstream from mouth.

DRAINAGE AREA.--11.6 mi².

PERIOD OF RECORD.--October 1991 to current year.

GAGE.--Water-stage recorder. Datum of gage is 1,450.53 ft above sea level.

REMARKS.--Records good except those above 1,000 ft³/s, which are fair. No regulation or diversion upstream from station. U.S. Geological Survey satellite telemeter at station.

AVERAGE DISCHARGE.--2 years, 98.9 ft³/s, 115.78 in/yr, 71,650 acre-ft/yr.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of Nov. 24, 1990, reached a stage of 13.60 ft, discharge, 8,200 ft³/s, from slope-area measurement of peak flow.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,770 ft³/s Nov. 24, 1991, gage height, 11.00 ft; maximum gage height, 12.5 ft (from outside highwater mark) Jan. 25, 1993; minimum discharge, 4.6 ft³/s Oct. 9, 1991.

EXTREMES FOR CURENT YEAR.--Maximum daily discharge, 1,400 ft³/s Jan. 25; maximum gage height, 12.5 ft Jan. 25 (from outside highwater mark); minimum discharge, 7.7 ft³/s Sept. 30.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	39	204	130	31	e130	e18	87	274	137	57	45	14
2	35	200	91	29	e115	e28	133	284	113	60	40	13
3	41	114	72	28	e100	40	179	203	105	62	36	13
4	36	143	60	26	e88	114	141	200	109	58	32	12
5	30	103	51	23	e82	244	98	169	110	51	29	12
6	27	149	45	21	e80	188	92	258	109	46	27	11
7	24	750	40	21	e90	135	108	190	163	43	25	11
8	22	309	39	20	e105	117	224	248	101	40	23	10
9	20	169	39	19	e115	104	261	177	214	37	22	10
10	19	116	34	18	e130	85	175	303	154	34	21	9.7
11	18	127	32	e18	e110	72	133	313	150	34	20	11
12	19	139	28	18	e90	62	111	383	183	34	19	13
13	56	134	27	17	e70	55	102	265	123	31	18	10
14	27	126	155	16	e60	202	118	202	123	32	18	10
15	23	97	81	16	e50	460	136	159	157	35	19	11
16	21	136	56	16	e42	155	116	153	119	36	21	9.5
17	35	119	48	15	e37	115	148	177	98	68	23	9.1
18	28	127	40	15	e32	258	212	240	94	47	20	8.7
19	154	142	40	16	e30	133	157	207	84	41	18	10
20	153	112	44	38	e27	134	120	203	73	207	16	24
21	180	113	42	32	e26	128	129	232	69	170	15	16
22	101	164	131	23	e24	470	151	220	127	86	15	12
23	70	102	155	21	e23	605	168	139	129	68	120	11
24	55	77	139	262	e22	244	201	153	85	59	87	9.9
25	46	62	87	e1400	e21	148	295	142	76	54	41	9.4
26	39	54	75	e800	e20	112	305	126	72	48	28	8.9
27	34	177	60	e550	e19	93	282	132	92	43	23	8.5
28	32	158	49	e400	e18	81	193	142	82	48	20	8.2
29	36	100	42	e270	---	76	474	176	83	93	18	8.0
30	47	282	38	e200	---	66	428	132	64	82	16	7.8
31	134	---	34	e160	---	62	---	175	---	54	15	---
TOTAL	1601	4805	2004	4539	1756	4804	5477	6377	3398	1858	890	331.7
MEAN	51.6	160	64.6	146	62.7	155	183	206	113	59.9	28.7	11.1
MAX	180	750	155	1400	130	605	474	383	214	207	120	24
MIN	18	54	27	15	18	18	87	126	64	31	15	7.8
AC-FT	3180	9530	3970	9000	3480	9530	10860	12650	6740	3690	1770	658
CFSM	4.45	13.8	5.57	12.6	5.41	13.4	15.7	17.7	9.76	5.17	2.47	.95
IN.	5.13	15.41	6.43	14.56	5.63	15.41	17.56	20.45	10.90	5.96	2.85	1.06

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1992 - 1993, BY WATER YEAR (WY)

	34.4	193	106	189	86.7	99.4	150	148	73.9	43.9	20.9	40.9
MEAN	34.4	193	106	189	86.7	99.4	150	148	73.9	43.9	20.9	40.9
MAX	51.6	226	148	231	110	155	183	206	113	59.9	28.7	70.8
(WY) 1993	1992	1992	1992	1992	1992	1993	1993	1993	1993	1993	1993	1992
MIN	17.1	160	64.6	146	62.7	43.8	117	90.4	34.6	27.9	13.1	11.1
(WY) 1992	1993	1993	1993	1993	1993	1992	1992	1992	1992	1992	1992	1993

SUMMARY STATISTICS FOR 1992 CALENDAR YEAR FOR 1993 WATER YEAR WATER YEARS 1992 - 1993

	30858.0	37840.7	98.7	1993
ANNUAL TOTAL	30858.0	37840.7	98.7	1993
ANNUAL MEAN	84.3	104	104	1992
HIGHEST ANNUAL MEAN			93.8	1992
LOWEST ANNUAL MEAN			1400	Jan 25 1993
HIGHEST DAILY MEAN	1080	Jan 23	1400	Jan 25 1993
LOWEST DAILY MEAN	6.7	Sep 2	5.2	Oct 10 1991
ANNUAL SEVEN-DAY MINIMUM	7.0	Aug 28	5.5	Oct 9 1991
ANNUAL RUNOFF (AC-FT)	61210	75060	71530	
ANNUAL RUNOFF (CFSM)	7.27	8.94	8.51	
ANNUAL RUNOFF (INCHES)	98.96	121.35	115.65	
10 PERCENT EXCEEDS	163	207	219	
50 PERCENT EXCEEDS	45	72	54	
90 PERCENT EXCEEDS	13	16	12	

e Estimated

SNOHOMISH RIVER BASIN

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12137300 SPADA LAKE NEAR STARTUP, WA

LOCATION.--Lat 47°58'28", long 121°41'10", in NW 1/4 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 sea level (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.

COOPERATION.--Elevation at 1200 and 2400 hours and capacity table furnished by Snohomish County Public Utility District No. 1.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents observed, 164,599 acre-ft Nov. 23, 1990, elevation, 1,455.8 ft; minimum contents 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, 143,963 acre-ft June 12, elevation, 1,444.9 ft; minimum contents observed, 69,140 acre-ft Jan. 23, elevation, 1,395.5 ft.

MONTHEND ELEVATION AND CONTENTS AT 2400, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

Date	Elevation (feet)	Contents (acre-feet)	Change in contents (acre-feet)
Sept. 30.....	1,425.2	110,436	--
Oct. 31.....	1,414.4	94,127	-16,309
Nov. 30.....	1,417.3	98,321	+4,194
Dec. 31.....	1,408.6	85,908	-12,413
CAL YR 1992.....			-15,305
Jan. 31.....	1,417.8	99,044	+13,136
Feb. 28.....	1,416.4	97,019	-2,025
Mar. 31.....	1,435.2	126,863	+29,844
Apr. 30.....	1,443.0	140,499	+13,636
May 31.....	1,444.2	142,687	+2,188
June 30.....	1,444.0	142,322	-365
July 31.....	1,444.5	143,234	+912
Aug. 31.....	1,437.1	130,096	-13,138
Sept. 30.....	1,417.9	99,188	-30,908
WTR YR 1993.....	--	--	-11,248

12137800 SULTAN RIVER BELOW DIVERSION DAM, NEAR SULTAN, WA

LOCATION.--Lat 47°57'34", long 121°47'46", in SE 1/4 NE 1/4 sec.32, T.29 N., R.8 E., Snohomish County, Hydrologic Unit 17110009, on right bank 50 ft upstream 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 and square notch sharp-crested weir in gate of dam. Datum of gage is 600.00 ft above sea level (City of Everett). Prior to Oct. 1, 1989, recording gage at site 350 ft downstream at different datum, Mar. 16 to Sept. 21, 1993, recording gage at site 1,200 ft downstream, at different datum.

REMARKS.--Records good except for estimated daily discharges, which are fair and those above 400 ft³/s, which are poor. 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, and for municipal water supply at Lake Chaplain. Since July 1984, undetermined flows are returned to river at diversion dam by pipeline from Lake Chaplain for maintenance of instream flow requirements. Discharge for Jan. 16 to Feb. 20, 1992, furnished by Snohomish County P.U.D.

AVERAGE DISCHARGE.--10 years, 225 ft³/s, 163,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 19,000 ft³/s Nov. 24, 1990, gage height, 63.79 ft, from rating curve extended above 3,200 ft³/s; minimum discharge, 23 ft³/s Oct. 30, 1988, result of regulation; minimum daily, 35 ft³/s Aug. 23-25, 1983.

EXTREMES FOR CURRENT PERIOD.--Maximum discharge, 1,930 ft³/s Jan. 25, gage height, 57.10 ft; minimum discharge, 101 ft³/s Aug. 3, result of regulation; minimum daily, 109 ft³/s Aug. 2.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	174	218	159	113	175	190	181	203	261	120	114	121
2	176	175	132	114	175	209	192	207	246	121	109	123
3	178	130	121	113	174	206	225	200	223	125	113	125
4	176	138	117	114	174	213	206	217	229	124	122	125
5	175	126	124	114	178	210	179	202	234	121	115	125
6	177	124	117	114	175	201	179	221	225	127	114	125
7	178	430	119	113	174	196	189	215	241	130	114	124
8	178	239	120	114	173	197	217	278	230	127	114	122
9	177	188	121	117	172	195	239	213	264	128	113	122
10	177	180	118	117	173	196	243	202	262	130	122	121
11	177	203	118	117	173	199	238	206	285	129	120	123
12	179	163	116	115	173	199	225	202	320	130	122	125
13	181	142	113	115	173	201	210	207	275	126	125	130
14	176	135	160	115	173	230	213	204	244	138	129	155
15	180	124	119	148	173	e240	191	205	233	137	129	170
16	185	143	118	175	173	180	193	201	176	136	127	171
17	190	147	117	175	174	177	203	202	119	186	123	171
18	190	160	116	175	174	191	240	206	120	156	119	170
19	203	243	125	177	173	172	213	208	118	140	120	173
20	212	175	202	e180	176	195	191	210	120	312	117	195
21	206	152	205	e215	175	202	190	215	127	283	116	179
22	175	224	342	174	174	336	191	208	156	147	116	177
23	181	161	289	172	172	494	190	205	128	124	e138	177
24	179	130	242	321	172	263	e230	203	126	119	e115	176
25	177	127	152	1090	172	219	e260	202	129	111	e115	177
26	183	124	249	390	173	197	e230	204	129	117	e147	177
27	183	143	164	212	174	187	212	205	137	117	121	176
28	178	177	123	179	174	180	194	207	139	123	118	177
29	179	145	118	174	---	178	291	232	126	130	118	176
30	183	276	115	171	---	174	241	216	120	125	121	175
31	198	---	115	174	---	173	---	237	---	117	122	---
TOTAL	5661	5242	4666	5907	4864	6600	6396	6543	5742	4356	3728	4583
MEAN	183	175	151	191	174	213	213	211	191	141	120	153
MAX	212	430	342	1090	178	494	291	278	320	312	147	195
MIN	174	124	113	113	172	172	179	200	118	111	109	121
AC-FT	11230	10400	9260	11720	9650	13090	12690	12980	11390	8640	7390	9090
CFSM	2.37	2.27	1.95	2.47	2.25	2.76	2.77	2.74	2.48	1.82	1.56	1.98
IN.	2.73	2.53	2.25	2.85	2.35	3.18	3.09	3.16	2.77	2.10	1.80	2.21

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1983 - 1993, BY WATER YEAR (WY)

	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993
MEAN	237	490	168	255	251	249	237	281	211	204	184
MAX	726	1593	278	898	715	610	483	675	652	983	448
(WY)	1986	1991	1990	1984	1984	1984	1984	1984	1983	1985	1983
MIN	159	91.9	93.8	117	166	193	179	178	137	108	60.6
(WY)	1988	1988	1988	1988	1988	1989	1987	1988	1987	1988	1984

SUMMARY STATISTICS FOR 1992 CALENDAR YEAR FOR 1993 WATER YEAR WATER YEARS 1983 - 1993

	1992	1993	1983-1993
ANNUAL TOTAL	63997	64288	225
ANNUAL MEAN	175	176	433
HIGHEST ANNUAL MEAN			144
LOWEST ANNUAL MEAN			1984
HIGHEST DAILY MEAN	570	1090	16600
LOWEST DAILY MEAN	112	109	35
ANNUAL SEVEN-DAY MINIMUM	114	114	42
ANNUAL RUNOFF (AC-FT)	126900	127500	163100
ANNUAL RUNOFF (CFSM)	2.27	2.28	2.92
ANNUAL RUNOFF (INCHES)	30.88	31.02	39.68
10 PERCENT EXCEEDS	234	233	298
50 PERCENT EXCEEDS	176	175	175
90 PERCENT EXCEEDS	116	117	114

e Estimated

12137800 SULTAN RIVER BELOW DIVERSION DAM, NEAR SULTAN, WA--Continued

WATER-QUALITY RECORDS

PERIOD OF DAILY RECORD.--

WATER TEMPERATURE: July 1984 to current year.

INSTRUMENTATION.--Temperature recorder since July 1984.

EXTREMES FOR PERIOD OF DAILY RECORD.--

WATER TEMPERATURE: Maximum, 16.5°C Sept. 14, 1989; minimum, 1.0°C Feb. 3, 4, 1989, Feb. 13-19, 1990.

EXTREMES FOR CURRENT YEAR.--

WATER TEMPERATURE: Maximum, 14.0°C several days in September; minimum, 1.5°C several days in January and February.

WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
OCTOBER			NOVEMBER			DECEMBER			JANUARY			
1	12.5	12.0	12.0	10.5	10.0	10.0	6.0	5.5	6.0	3.0	2.0	2.5
2	12.5	12.0	12.0	10.5	8.5	9.5	6.0	5.0	5.5	3.5	2.0	3.0
3	12.5	12.0	12.0	9.0	8.0	8.5	5.5	4.5	5.0	3.0	1.5	2.5
4	12.5	11.5	12.0	9.0	8.5	9.0	5.0	4.0	4.5	3.0	2.0	2.5
5	12.0	11.5	12.0	9.5	8.5	9.0	5.5	4.0	5.0	3.0	1.5	2.0
6	12.0	11.5	12.0	9.5	8.5	9.0	5.5	4.5	5.0	2.5	1.5	2.0
7	13.0	11.5	12.0	9.5	8.5	9.0	5.5	4.5	5.0	2.0	1.5	1.5
8	12.5	12.0	12.0	9.0	7.5	8.5	5.0	4.5	5.0	2.5	1.5	2.0
9	12.5	11.5	12.0	8.5	7.0	7.5	5.5	4.5	5.0	2.5	1.5	2.0
10	12.0	11.5	12.0	8.0	7.5	8.0	5.0	3.5	4.5	2.5	1.5	2.0
11	12.0	11.5	12.0	8.0	7.0	7.5	4.5	3.5	4.0	2.0	1.5	1.5
12	12.0	12.0	12.0	8.5	7.5	8.0	5.0	4.0	4.5	2.0	1.5	1.5
13	12.0	11.5	12.0	9.0	8.0	8.0	5.0	4.5	4.5	2.5	1.5	2.0
14	12.0	11.5	11.5	8.5	7.5	8.0	5.0	4.0	4.5	3.0	2.0	2.5
15	11.5	11.0	11.5	8.5	7.5	8.0	4.5	3.5	4.0	3.0	2.0	2.5
16	11.5	11.0	11.5	8.5	8.0	8.5	4.5	3.5	4.0	3.0	2.0	2.5
17	11.5	11.5	11.5	9.0	8.0	8.5	4.5	3.5	4.0	3.0	2.0	2.5
18	11.5	11.5	11.5	8.5	8.0	8.0	4.5	3.5	4.0	3.0	2.0	2.5
19	11.5	11.0	11.0	8.0	7.0	7.5	4.0	3.0	3.5	3.0	2.0	2.5
20	11.5	11.0	11.5	7.5	7.0	7.0	4.0	2.5	3.5	---	---	---
21	11.0	11.0	11.0	7.5	7.0	7.0	4.5	3.5	4.0	---	---	---
22	11.0	11.0	11.0	7.5	6.5	7.0	4.5	4.0	4.0	3.0	2.5	2.5
23	11.5	11.0	11.5	7.0	5.5	6.0	5.0	4.0	5.0	3.0	2.0	2.5
24	11.5	11.0	11.5	6.0	5.0	5.5	5.0	4.5	5.0	3.0	2.0	2.5
25	11.0	11.0	11.0	6.0	5.0	5.5	4.5	4.0	4.5	4.0	2.0	3.5
26	11.0	10.5	11.0	6.5	5.5	6.0	4.5	3.0	4.0	4.0	3.5	4.0
27	11.0	10.5	11.0	7.0	6.5	6.5	4.5	3.5	4.0	4.5	3.5	4.0
28	11.0	10.5	10.5	7.0	6.0	6.5	5.0	4.0	4.5	4.5	4.0	4.0
29	11.0	10.5	10.5	6.5	6.0	6.0	4.0	3.5	4.0	4.5	3.0	4.0
30	11.0	10.0	10.5	6.5	6.0	6.5	3.5	3.0	3.0	4.0	3.0	3.5
31	10.5	10.0	10.5	---	---	---	3.5	2.5	3.0	3.5	2.5	3.0
MONTH	13.0	10.0	11.5	10.5	5.0	7.6	6.0	2.5	4.4	---	---	---

SNOHOMISH RIVER BASIN

12137800 SULTAN RIVER BELOW DIVERSION DAM, NEAR SULTAN, WA--Continued

WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
FEBRUARY			MARCH			APRIL			MAY			
1	4.0	2.5	3.0	3.0	2.5	2.5	6.0	5.0	5.5	7.5	6.5	7.0
2	3.5	2.5	3.0	3.5	2.5	3.0	6.0	5.0	5.5	8.0	6.5	7.0
3	4.0	2.5	3.0	3.5	2.5	3.0	6.0	5.0	5.5	7.5	6.0	7.0
4	4.0	2.5	3.0	3.5	3.0	3.0	6.5	5.0	5.5	7.5	6.5	7.0
5	4.0	2.5	3.5	4.0	3.0	3.5	6.0	5.0	5.5	8.5	6.5	7.5
6	4.0	3.0	3.5	---	---	---	6.0	5.0	5.5	7.5	6.5	7.0
7	4.0	3.0	3.5	---	---	3.5	6.5	5.5	6.0	7.5	6.5	7.0
8	4.0	3.0	3.5	4.0	3.5	3.5	6.5	5.5	6.0	8.0	6.5	7.0
9	4.0	3.5	4.0	---	---	---	6.5	5.5	6.0	8.5	6.5	7.5
10	4.5	3.5	4.0	4.5	3.0	3.5	6.5	5.5	6.0	10.0	7.0	8.5
11	4.0	3.0	3.5	4.0	3.0	3.5	6.0	5.0	5.5	8.5	7.0	8.0
12	4.0	3.0	3.5	4.0	3.0	3.5	6.0	5.0	5.5	9.0	7.5	8.0
13	4.0	3.0	3.5	4.5	3.0	3.5	6.0	5.0	5.5	9.5	7.5	8.5
14	4.0	3.0	3.5	4.5	3.5	4.0	7.0	5.5	6.0	8.5	7.5	8.0
15	4.0	2.5	3.0	5.0	3.5	4.5	7.0	6.0	6.5	8.5	7.0	7.5
16	3.5	2.0	2.5	4.5	3.5	4.0	6.5	5.5	6.0	8.5	7.0	7.5
17	3.0	2.0	2.5	4.5	3.5	4.0	7.0	5.5	6.0	9.0	7.0	8.0
18	3.0	2.0	2.5	5.5	4.0	4.5	6.5	5.5	6.0	9.0	7.5	8.0
19	3.0	2.0	2.5	5.0	4.0	4.5	7.0	5.5	6.0	9.0	7.5	8.0
20	3.5	2.0	3.0	5.0	4.0	4.5	7.5	5.5	7.0	9.0	7.5	8.0
21	3.0	2.5	3.0	5.5	4.0	5.0	7.5	6.0	6.5	8.5	7.5	8.0
22	3.5	2.5	3.0	5.5	4.5	5.0	7.0	6.0	6.5	8.5	7.0	7.5
23	3.0	2.5	2.5	6.0	4.5	5.5	7.0	6.0	6.5	8.5	7.0	8.0
24	3.0	2.0	2.5	5.5	4.5	5.0	7.0	6.0	6.5	9.5	7.0	8.0
25	3.0	1.5	2.5	5.5	4.0	4.5	7.0	6.0	6.5	8.5	7.5	8.0
26	3.0	2.0	2.5	5.0	4.0	4.5	7.0	6.0	6.5	8.5	7.5	8.0
27	3.0	2.0	2.5	5.5	4.0	4.5	7.0	6.0	6.5	8.5	7.5	8.0
28	3.5	2.0	2.5	5.0	4.0	4.5	7.0	6.0	6.5	9.0	7.5	8.0
29	---	---	---	5.0	4.0	4.5	7.0	6.5	6.5	9.0	7.5	8.5
30	---	---	---	5.0	4.0	4.5	7.5	6.5	7.0	9.0	7.5	8.5
31	---	---	---	5.5	4.0	5.0	---	---	---	8.5	7.5	8.0
MONTH	4.5	1.5	3.0	---	---	---	7.5	5.0	6.1	10.0	6.0	7.8

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
JUNE			JULY			AUGUST			SEPTEMBER			
1	8.5	7.5	8.0	10.0	9.0	9.5	13.0	11.0	12.0	13.0	11.5	12.0
2	9.0	8.0	8.5	10.0	8.5	9.0	13.0	11.5	12.0	13.0	12.0	12.5
3	8.5	7.5	8.0	10.0	8.5	9.0	13.0	11.5	12.0	13.5	12.0	12.5
4	8.5	8.0	8.0	10.0	8.0	9.0	13.0	11.0	12.0	13.0	12.0	12.5
5	9.0	8.0	8.5	10.0	8.5	9.0	13.0	11.0	12.5	13.5	12.0	12.5
6	9.5	7.5	8.5	10.0	9.0	9.5	12.5	11.0	12.0	13.5	12.0	13.0
7	9.0	7.5	8.5	10.0	8.5	9.5	13.0	10.0	12.0	13.5	12.5	13.0
8	8.5	7.5	8.0	11.0	9.5	10.0	12.5	11.0	11.5	14.0	12.5	13.0
9	8.5	8.0	8.0	10.5	9.5	10.0	12.0	11.0	11.5	14.0	12.5	13.0
10	9.5	7.5	8.5	10.0	8.5	9.5	12.0	11.0	11.5	14.0	13.0	13.5
11	8.5	7.5	8.0	10.0	8.5	9.5	12.0	11.0	11.5	13.5	12.5	13.0
12	9.0	8.0	8.5	10.0	8.5	9.5	12.0	10.0	11.0	13.5	12.5	13.0
13	9.0	7.5	8.5	10.0	8.5	9.5	11.5	9.5	10.5	13.5	12.5	13.0
14	9.5	8.0	9.0	10.0	9.0	9.5	11.0	10.0	10.5	14.0	13.0	13.5
15	9.5	8.5	9.0	10.0	9.0	9.5	10.5	9.5	10.0	14.0	13.0	13.5
16	10.0	8.5	9.0	10.0	9.0	9.5	11.0	9.5	10.5	14.0	13.0	13.5
17	12.0	9.0	10.0	10.5	9.5	10.0	11.5	10.0	10.5	14.0	13.0	13.5
18	12.0	9.5	10.5	11.5	9.5	10.5	12.0	10.0	11.0	14.0	13.0	13.5
19	11.5	9.5	10.5	10.5	9.5	10.0	12.0	10.5	11.0	14.0	13.0	13.5
20	11.0	9.0	10.0	11.5	10.0	11.0	12.0	10.5	11.5	14.0	12.0	13.0
21	10.0	8.5	9.5	11.5	10.5	11.0	11.5	10.5	11.0	13.5	12.5	13.0
22	9.0	8.0	8.5	11.5	10.5	11.0	11.5	10.5	11.0	13.5	12.5	13.0
23	10.0	8.5	9.0	12.5	10.5	11.5	11.5	10.5	11.0	13.5	12.5	13.0
24	11.0	8.0	9.5	11.5	10.5	11.0	12.0	11.0	11.5	13.5	12.5	13.0
25	11.5	9.0	10.0	11.5	10.5	11.0	12.0	11.0	11.5	13.5	12.5	13.0
26	11.0	9.5	10.0	11.5	10.5	11.0	12.5	11.0	12.0	13.5	12.5	13.0
27	11.0	9.0	10.0	12.0	10.5	11.5	13.5	12.0	12.5	14.0	13.0	13.5
28	10.0	8.5	9.5	11.5	11.0	11.5	12.5	11.5	12.0	14.0	13.0	13.5
29	10.5	8.5	9.5	12.0	11.0	11.5	13.0	11.0	12.0	14.0	13.0	13.5
30	10.5	9.0	9.5	13.0	10.5	11.5	13.0	11.5	12.0	14.0	13.0	13.5
31	---	---	---	12.5	10.5	11.5	13.0	11.5	12.0	---	---	---
MONTH	12.0	7.5	9.0	13.0	8.0	10.2	13.5	9.5	11.5	14.0	11.5	13.1

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 SW 1/4 SW 1/4 sec.17, T.28 N., R.8 E., Snohomish County, Hydrologic Unit 17110009, on left bank, just 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 current year.

GAGE.--Water-stage recorder. Datum of gage is 267.0 ft above sea level (levels by Snohomish County Public Utility District). Prior to Oct. 1, 1991, at site on right bank, 100 ft upstream at same datum.

REMARKS.--No estimated daily discharges. Records good. 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, at the power plant. Since July 1984, an undetermined flow was returned to river at upstream diversion dam by pipeline from Lake Chaplain for instream flow requirement. Some flows diverted into Lake Chaplain for municipal use by City of Everett.

AVERAGE DISCHARGE.--10 years, 703 ft³/s, 509,300 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 22,300 ft³/s Nov. 24, 1990, gage height, 15.03 ft, from rating curve extended above 4,500 ft³/s; minimum discharge, 126 ft³/s July 19, 1987, gage height, 4.35 ft.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 2,760 ft³/s Jan. 25, gage height, 8.39 ft; minimum discharge, 221 ft³/s Aug. 21, 22, 30, Sept. 2.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	372	579	1290	636	361	360	472	1480	692	630	272	230
2	371	605	1270	641	356	371	485	1500	742	498	269	367
3	372	550	1100	640	348	376	536	1480	777	480	277	574
4	369	494	931	639	346	373	531	1520	776	477	281	706
5	367	478	1010	637	348	365	580	1490	778	473	274	705
6	369	462	797	640	343	347	524	1530	646	474	269	708
7	369	906	1030	636	339	332	519	1530	681	438	269	706
8	369	693	930	564	336	329	637	1610	775	398	268	702
9	368	789	696	641	333	326	801	1530	697	312	266	701
10	368	1210	631	638	333	325	808	1210	734	306	272	700
11	367	1160	652	633	328	327	817	864	834	298	274	697
12	369	1100	644	450	352	326	821	911	1030	386	272	704
13	374	1060	634	321	326	329	785	1240	1030	297	267	707
14	365	1120	700	321	324	344	1030	1440	962	316	264	614
15	414	1020	658	324	375	503	694	1430	943	311	265	389
16	448	1050	644	324	776	514	743	1010	865	306	594	390
17	486	1110	640	323	516	422	748	982	766	345	574	403
18	486	1080	644	324	482	353	792	990	566	331	484	413
19	509	1260	658	330	402	332	782	881	488	291	373	415
20	633	1390	816	358	347	351	749	735	485	550	242	414
21	880	1360	829	362	346	367	741	760	486	609	227	408
22	840	1350	860	339	348	459	738	751	561	366	226	419
23	827	1450	895	331	342	809	741	746	515	311	262	417
24	823	1230	706	434	341	489	784	744	498	291	279	415
25	816	1120	665	1730	341	602	824	738	495	276	299	418
26	816	987	854	740	333	481	803	670	490	275	683	417
27	743	822	771	469	331	461	945	598	498	273	454	417
28	587	920	684	404	332	451	1290	606	704	284	229	379
29	516	849	671	387	---	470	1580	641	689	298	229	320
30	520	1080	653	377	---	462	1600	617	605	339	231	301
31	541	---	646	367	---	459	---	640	---	280	230	---
TOTAL	16054	29284	24609	15960	10385	12815	23900	32874	20808	11519	9675	15156
MEAN	518	976	794	515	371	413	797	1060	694	372	312	505
MAX	880	1450	1290	1730	776	809	1600	1610	1030	630	683	708
MIN	365	462	631	321	324	325	472	598	485	273	226	230
AC-FT	31840	58080	48810	31660	20600	25420	47410	65210	41270	22850	19190	30060

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1984 - 1993, BY WATER YEAR (WY)

	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993
MEAN	528	1407	951	844	812	695	799	849	652	389
MAX	1008	3080	1727	1416	1568	964	1284	1257	1181	684
(WY)	1986	1991	1991	1990	1991	1987	1988	1984	1984	1993
MIN	227	246	261	401	309	344	276	389	256	198
(WY)	1984	1988	1986	1985	1985	1985	1992	1992	1992	1985

SUMMARY STATISTICS

FOR 1992 CALENDAR YEAR

FOR 1993 WATER YEAR

WATER YEARS 1984 - 1993

ANNUAL TOTAL	187463	223039	
ANNUAL MEAN	512	611	
HIGHEST ANNUAL MEAN			702
LOWEST ANNUAL MEAN			1038
HIGHEST DAILY MEAN			527
LOWEST DAILY MEAN	1870	Jan 31	20100
ANNUAL SEVEN-DAY MINIMUM	187	Jul 18	157
ANNUAL RUNOFF (AC-FT)	190	Jul 15	157
10 PERCENT EXCEEDS	371800		42400
50 PERCENT EXCEEDS	1100		1040
90 PERCENT EXCEEDS	343		520
	195		300
			197

SNOHOMISH RIVER BASIN

12138160 SULTAN RIVER BELOW POWERPLANT, NEAR SULTAN, WA--Continued

WATER-QUALITY RECORDS

PERIOD OF DAILY RECORD.--

WATER TEMPERATURE: June 1984 to current year.

INSTRUMENTATION.--Temperature recorder since June 1984.

EXTREMES FOR PERIOD OF DAILY RECORD.--

WATER TEMPERATURE: Maximum, 17.5°C Sept. 5-7, 1986; minimum, 1.0°C Feb. 2-5, 1989.

EXTREMES FOR CURRENT YEAR.--

WATER TEMPERATURE: Maximum, 15.0°C Sept. 29, 30; minimum, 1.5°C Jan. 12, 13.

WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993												
DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
OCTOBER			NOVEMBER			DECEMBER			JANUARY			
1	13.0	12.5	12.5	10.5	10.0	10.5	6.5	6.0	6.0	3.0	2.5	2.5
2	12.5	12.5	12.5	10.5	10.0	10.0	6.5	6.0	6.0	3.0	2.5	3.0
3	12.5	12.5	12.5	10.0	9.5	10.0	6.0	5.5	6.0	2.5	2.0	2.5
4	12.5	12.0	12.5	10.0	9.5	9.5	5.5	5.0	5.5	2.5	2.5	2.5
5	12.5	11.5	12.0	9.5	9.5	9.5	5.5	4.5	5.0	2.5	2.0	2.0
6	12.5	11.5	12.0	9.5	9.5	9.5	5.0	5.0	5.0	2.0	2.0	2.0
7	12.5	12.0	12.5	9.5	9.0	9.0	5.5	5.0	5.5	2.0	2.0	2.0
8	12.5	12.0	12.5	9.0	8.0	9.0	5.5	5.0	5.0	2.5	2.0	2.0
9	12.5	11.5	12.0	8.5	8.0	8.0	5.0	5.0	5.0	2.5	2.0	2.0
10	12.5	12.0	12.0	8.5	8.5	8.5	5.0	4.5	4.5	2.0	2.0	2.0
11	12.5	12.0	12.5	8.5	8.0	8.5	4.5	4.5	4.5	2.0	2.0	2.0
12	12.5	12.0	12.5	8.5	8.0	8.5	4.5	4.5	4.5	2.0	1.5	2.0
13	12.5	11.5	12.0	8.5	8.5	8.5	5.0	4.5	4.5	2.5	1.5	2.0
14	12.0	11.0	11.5	8.5	8.5	8.5	5.0	4.5	5.0	2.5	2.0	2.5
15	11.5	10.5	11.5	8.5	8.5	8.5	4.5	4.0	4.5	2.5	2.5	2.5
16	11.5	11.0	11.5	8.5	8.5	8.5	4.0	4.0	4.0	2.5	2.0	2.5
17	12.0	11.5	12.0	8.5	8.5	8.5	4.0	4.0	4.0	2.5	2.0	2.5
18	12.0	11.5	12.0	8.5	8.0	8.5	4.0	4.0	4.0	2.5	2.0	2.0
19	12.0	11.5	11.5	8.0	7.5	8.0	4.0	3.5	3.5	2.5	2.5	2.5
20	12.0	11.5	11.5	8.0	7.5	8.0	3.5	3.5	3.5	2.5	2.5	2.5
21	12.0	11.5	11.5	8.0	7.5	8.0	4.0	3.5	4.0	3.0	2.5	2.5
22	12.0	11.5	11.5	7.5	7.5	7.5	4.5	4.0	4.5	2.5	2.5	2.5
23	12.0	11.5	12.0	7.5	7.0	7.0	5.0	4.5	5.0	2.5	2.5	2.5
24	12.0	11.5	11.5	7.0	6.5	7.0	5.0	4.5	5.0	2.5	2.5	2.5
25	11.5	11.5	11.5	6.5	6.5	6.5	4.5	4.0	4.5	3.5	2.0	3.0
26	11.5	11.0	11.5	6.5	6.5	6.5	4.5	3.5	4.0	4.0	3.5	3.5
27	11.5	11.5	11.5	6.5	6.5	6.5	4.0	3.5	4.0	4.0	4.0	4.0
28	11.5	11.0	11.0	7.0	6.5	7.0	4.0	3.5	4.0	4.0	4.0	4.0
29	11.0	11.0	11.0	6.5	6.0	6.5	3.5	3.5	3.5	4.0	3.5	4.0
30	11.0	10.5	11.0	6.5	6.5	6.5	3.5	3.0	3.0	3.5	3.0	3.5
31	10.5	10.5	10.5	---	---	---	3.0	2.5	3.0	3.5	3.0	3.0
MONTH	13.0	10.5	11.8	10.5	6.0	8.2	6.5	2.5	4.5	4.0	1.5	2.6

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WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
FEBRUARY				MARCH			APRIL			MAY		
1	3.5	3.0	3.0	3.0	2.5	3.0	6.5	5.5	6.0	7.0	6.5	7.0
2	3.5	3.0	3.0	3.0	3.0	3.0	6.0	6.0	6.0	7.0	6.5	7.0
3	3.5	2.5	3.0	3.0	3.0	3.5	6.5	6.0	6.0	7.5	6.5	7.0
4	3.5	3.0	3.0	3.5	3.5	3.5	6.5	5.5	6.0	7.5	7.0	7.0
5	4.0	3.5	3.5	4.5	3.5	4.0	6.5	5.5	6.0	7.5	7.0	7.0
6	4.0	3.5	4.0	4.5	4.0	4.5	6.0	5.5	6.0	7.5	7.0	7.0
7	4.0	3.5	3.5	4.5	4.0	4.5	7.0	6.0	6.5	7.5	7.0	7.5
8	4.0	3.5	4.0	4.5	4.0	4.5	7.0	6.5	6.5	7.5	7.0	7.5
9	4.5	4.0	4.0	4.5	3.5	4.0	6.5	6.0	6.5	7.5	7.0	7.5
10	4.5	4.0	4.0	4.5	3.5	4.0	6.5	6.0	6.5	10.5	7.5	9.0
11	4.0	3.5	4.0	4.5	3.5	4.0	6.5	6.0	6.0	10.0	7.5	8.5
12	4.0	3.5	3.5	4.5	3.5	4.0	6.5	6.0	6.0	10.0	8.0	9.0
13	4.0	4.0	4.0	4.5	3.5	4.0	6.5	5.5	6.0	9.5	7.5	8.5
14	4.0	3.5	4.0	4.5	4.5	4.5	7.0	6.0	6.5	8.0	7.5	8.0
15	3.5	3.0	3.0	5.5	4.0	5.0	7.5	6.5	7.0	8.0	7.5	8.0
16	3.0	2.5	2.5	5.0	4.0	4.5	7.0	6.5	6.5	9.0	7.5	8.0
17	2.5	2.0	2.0	5.0	4.0	4.5	7.0	6.5	6.5	9.5	8.0	8.5
18	2.5	2.0	2.0	5.5	5.0	5.0	7.0	6.5	7.0	9.5	8.0	8.5
19	2.5	2.0	2.5	5.5	4.5	5.0	7.0	6.0	6.5	9.5	8.5	9.0
20	3.0	2.5	2.5	5.5	5.0	5.0	8.5	6.5	7.5	10.0	8.5	9.0
21	3.0	2.5	3.0	6.0	5.0	5.5	8.0	7.0	7.5	9.0	8.5	8.5
22	3.5	2.5	3.0	6.5	5.5	5.5	7.5	7.0	7.0	9.0	8.0	8.5
23	3.0	2.5	2.5	6.5	6.0	6.5	7.5	7.0	7.0	9.5	8.0	8.5
24	2.5	2.0	2.5	6.0	5.5	5.5	7.5	7.0	7.0	10.0	8.0	9.0
25	2.5	2.0	2.0	5.5	4.5	5.0	7.5	7.0	7.5	9.5	8.5	9.0
26	2.5	2.0	2.5	5.5	4.5	5.0	7.5	7.0	7.0	10.0	8.5	9.0
27	3.0	2.0	2.5	5.5	4.5	5.0	7.0	6.5	7.0	9.5	8.5	9.0
28	3.0	2.5	2.5	5.5	5.0	5.0	7.0	6.5	7.0	10.0	9.0	9.5
29	---	---	---	5.5	5.0	5.0	7.0	7.0	7.0	10.5	9.0	9.5
30	---	---	---	5.0	4.5	5.0	7.0	6.5	7.0	10.0	9.0	9.5
31	---	---	---	5.5	4.5	5.0	---	---	---	9.5	9.0	9.0
MONTH	4.5	2.0	3.1	6.5	2.5	4.6	8.5	5.5	6.6	10.5	6.5	8.3
DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
JUNE				JULY			AUGUST			SEPTEMBER		
1	10.0	9.0	9.5	10.5	10.0	10.0	13.0	12.0	12.5	14.0	12.5	13.0
2	9.5	9.0	9.0	10.5	10.0	10.0	13.0	12.0	12.5	13.5	12.5	13.0
3	9.0	8.5	9.0	10.5	9.5	10.0	13.5	12.0	13.0	13.5	13.0	13.0
4	9.5	9.0	9.0	10.5	9.5	10.0	13.5	12.5	13.0	13.5	13.0	13.0
5	10.0	9.5	9.5	10.5	9.5	10.0	14.0	12.0	13.0	13.5	13.0	13.0
6	9.5	9.0	9.5	10.5	10.0	10.0	13.0	12.0	12.5	14.0	13.0	13.5
7	9.5	9.0	9.5	10.5	9.5	10.0	12.5	11.0	12.0	14.0	13.0	13.5
8	9.5	9.0	9.0	12.0	10.0	11.0	12.5	11.5	12.0	14.0	13.5	14.0
9	9.5	9.0	9.0	11.5	10.5	11.0	12.0	11.5	12.0	14.0	13.5	14.0
10	10.0	9.0	9.5	11.0	10.0	10.5	12.0	11.5	11.5	14.5	13.5	14.0
11	9.5	9.0	9.0	11.0	10.0	10.5	13.0	11.0	12.0	14.0	13.5	13.5
12	10.0	9.0	9.5	10.5	9.5	10.0	12.0	11.0	11.5	14.0	13.5	13.5
13	10.0	9.0	9.5	11.0	10.0	10.5	11.5	10.5	11.5	14.0	13.5	13.5
14	10.0	9.5	9.5	10.5	10.0	10.5	11.0	11.0	11.0	14.0	13.5	13.5
15	10.0	9.5	9.5	10.5	10.0	10.0	11.5	10.5	11.0	14.0	13.0	13.5
16	10.0	9.5	10.0	10.5	10.0	10.5	11.0	10.0	11.0	14.5	13.5	14.0
17	11.0	9.5	10.5	11.0	10.5	11.0	11.0	10.5	11.0	14.5	13.5	14.0
18	12.0	10.0	11.0	12.5	10.5	11.5	11.5	10.5	11.5	14.0	13.0	13.5
19	11.5	10.5	11.0	12.0	11.0	11.5	12.5	11.0	11.5	14.0	13.0	13.5
20	11.5	10.0	11.0	12.0	11.0	11.5	13.5	11.5	12.5	13.5	12.5	13.0
21	11.0	9.5	10.0	12.0	11.5	11.5	12.5	12.0	12.0	13.5	12.5	13.0
22	10.0	9.0	9.5	11.5	11.0	11.5	12.0	11.5	12.0	14.5	12.5	13.5
23	10.5	9.0	9.5	12.0	11.5	11.5	12.0	11.5	12.0	14.5	13.0	13.5
24	11.0	9.0	10.0	12.0	11.0	11.5	12.5	12.0	12.0	14.0	13.0	13.5
25	11.5	10.0	11.0	11.5	11.0	11.5	12.5	11.5	12.0	14.0	13.0	13.5
26	11.5	10.5	11.0	12.0	11.0	11.5	12.5	11.5	12.5	14.0	13.0	13.5
27	11.5	10.5	10.5	12.0	11.5	12.0	13.5	12.5	13.0	14.0	13.5	13.5
28	10.5	9.5	10.0	12.0	11.5	11.5	13.0	12.5	13.0	14.0	13.0	13.5
29	10.0	9.0	10.0	12.0	11.5	11.5	13.5	12.0	12.5	15.0	13.0	14.0
30	10.5	9.5	10.0	12.5	11.0	11.5	13.5	12.0	13.0	15.0	13.5	14.0
31	---	---	---	13.0	11.5	12.5	13.5	12.5	13.0	---	---	---
MONTH	12.0	8.5	9.8	13.0	9.5	10.9	14.0	10.0	12.1	15.0	12.5	13.5
YEAR	15.0	1.5	8.0									

SNOHOMISH RIVER BASIN

12141300 MIDDLE FORK SNOQUALMIE RIVER NEAR TANNER, WA

LOCATION.--Lat 47°29'10", long 121°38'48", in SW 1/4 SE 1/4 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 for estimated daily discharges, which are fair. No regulation or diversion upstream from station. Water temperatures June 1979 to September 1980. U.S. Geological Survey satellite telemeter at station.

AVERAGE DISCHARGE.--32 years, 1,232 ft³/s, 108.64 in/yr, 892,600 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 30,200 ft³/s Dec. 2, 1977, gage height, 14.93 ft; maximum gage height, 14.97 ft Nov. 24, 1990; minimum discharge, 91 ft³/s Oct. 29-31, 1987, gage height, 0.61 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)
Jan. 25	0915	*15,900	11.29	No other peak greater than base discharge.			
Jan. 25	0915	(a)	*12.01				

Minimum discharge, 122 ft³/s Sept. 29, 30.

(a) From crest-stage gage.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	e545	1070	1140	478	980	282	868	2570	2080	790	535	190
2	e490	1550	e810	445	892	311	1070	e3400	1540	962	500	188
3	448	979	e680	440	821	337	1350	e2300	1300	935	473	185
4	423	1120	604	426	758	804	1260	e3000	1170	841	444	183
5	377	1130	536	387	753	1860	962	e2300	1200	754	411	182
6	345	860	491	357	748	1780	875	e2900	1210	701	390	179
7	318	3360	456	e340	814	1310	1010	e2500	1800	641	370	173
8	308	2580	451	e320	856	1140	1140	e2900	1940	602	344	169
9	307	1770	489	e300	877	1020	1800	e2500	1740	582	320	165
10	281	1210	499	e290	972	880	1450	e3100	1920	529	306	162
11	265	1470	523	e270	853	763	1340	e3500	1790	511	293	163
12	264	1670	459	e260	732	669	1190	e4200	1790	491	279	201
13	521	1520	427	e250	664	596	981	3630	1350	454	270	174
14	400	1480	1920	e245	616	865	890	2600	1230	538	265	161
15	326	1260	1350	e240	559	3630	892	2140	1460	539	257	161
16	292	1070	893	e240	488	1570	915	1860	1320	545	256	155
17	318	969	737	e240	442	1120	963	2050	1130	654	278	146
18	340	1180	622	242	426	1520	1240	2540	1060	675	262	140
19	681	1320	597	245	410	1190	1190	2690	1000	582	250	138
20	776	1170	755	313	390	1070	990	2930	905	1200	242	172
21	947	1230	855	389	369	1020	979	2790	818	1440	238	172
22	990	1830	1770	325	355	2490	1100	3170	1000	1000	228	154
23	703	1300	2020	290	334	5190	1230	2060	1610	946	282	143
24	557	e960	1450	762	315	2620	1270	1760	1080	841	410	136
25	475	e780	1100	11600	300	1610	1770	1770	929	782	349	132
26	420	669	1020	6250	289	1220	1850	1550	891	690	277	129
27	380	750	924	3370	283	1030	2150	1660	1090	624	243	127
28	351	938	762	2100	275	908	1550	1770	1030	587	227	126
29	350	740	657	1580	---	846	2960	1880	927	648	216	125
30	362	e1570	587	1260	---	755	4400	1480	845	778	204	125
31	575	---	524	1100	---	687	---	1960	---	606	197	---
TOTAL	14135	39505	26108	35354	16571	41093	41635	77460	39155	22468	9616	4756
MEAN	456	1317	842	1140	592	1326	1388	2499	1305	725	310	159
MAX	990	3360	2020	11600	980	5190	4400	4200	2080	1440	535	201
MIN	264	669	427	240	275	282	868	1480	818	454	197	125
AC-FT	28040	78360	51790	70120	32870	81510	82580	153600	77660	44570	19070	9430
CFSM	2.96	8.55	5.47	7.41	3.84	8.61	9.01	16.2	8.48	4.71	2.01	1.03
IN.	3.41	9.54	6.31	8.54	4.00	9.93	10.06	18.71	9.46	5.43	2.32	1.15

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1961 - 1993, BY WATER YEAR (WY)

	796	1581	1626	1556	1312	1026	1337	1813	1843	992	431	514
MEAN	796	1581	1626	1556	1312	1026	1337	1813	1843	992	431	514
MAX	1978	4414	3997	3070	2940	2836	2231	3060	4012	2370	1218	1241
(WY)	1991	1991	1976	1984	1982	1972	1989	1972	1974	1974	1964	1968
MIN	105	298	441	427	387	549	601	996	553	411	219	159
(WY)	1988	1980	1986	1979	1969	1962	1992	1992	1992	1987	1986	1993

SUMMARY STATISTICS	FOR 1992 CALENDAR YEAR	FOR 1993 WATER YEAR	WATER YEARS 1961 - 1993
ANNUAL TOTAL	320736	367856	
ANNUAL MEAN	876	1008	1232
HIGHEST ANNUAL MEAN			1832
LOWEST ANNUAL MEAN			845
HIGHEST DAILY MEAN	6740	Jan 28	23100
LOWEST DAILY MEAN	142	Sep 3	91
ANNUAL SEVEN-DAY MINIMUM	147	Aug 28	92
ANNUAL RUNOFF (AC-FT)	636200	729600	892400
ANNUAL RUNOFF (CFSM)	5.69	6.54	8.00
ANNUAL RUNOFF (INCHES)	77.48	88.86	108.69
10 PERCENT EXCEEDS	1570	2030	2440
50 PERCENT EXCEEDS	657	763	877
90 PERCENT EXCEEDS	246	239	280

e Estimated

12142000 NORTH FORK SNOQUALMIE RIVER NEAR SNOQUALMIE FALLS, WA

LOCATION.--Lat 47°36'54", long 121°42'44", in NW 1/4 NW 1/4 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 except for estimated daily discharges, which are fair. No regulation or diversion upstream from station. Daily water temperatures June 1979 to August 1980. U.S. Geological Survey satellite telemeter at station.

AVERAGE DISCHARGE.--52 years (water years 1930-49, 1962-93), 497 ft³/s, 105.46 in/yr, 360,100 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 discharge 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)
Nov. 7	0830	4,380	7.74	Mar. 15	0500	4,300	7.69
Jan. 25	0900	*10,500	*11.37				

Minimum discharge, 58 ft³/s Sept. 29, 30.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	238	536	650	237	469	133	376	1030	698	292	244	101
2	215	879	451	222	417	144	488	1280	598	462	222	97
3	202	481	363	215	392	158	626	845	487	429	204	94
4	193	534	314	209	381	316	584	1080	458	375	188	90
5	176	523	278	192	424	980	415	825	488	318	174	88
6	162	380	254	175	415	800	365	1010	466	292	164	85
7	151	2360	234	e160	440	541	466	863	768	270	156	82
8	145	1100	232	e150	437	455	616	983	716	248	147	79
9	144	741	241	e145	425	410	945	828	763	230	140	75
10	134	520	226	e135	480	349	725	1020	857	213	134	73
11	126	595	232	e135	405	303	645	1110	691	206	129	71
12	122	790	212	e130	340	269	580	1320	973	205	124	82
13	236	718	198	e125	307	244	486	1120	628	189	120	78
14	195	654	883	e125	286	406	436	824	541	192	118	73
15	160	521	608	e120	258	2350	428	692	626	212	115	72
16	145	457	399	e120	226	743	459	617	563	230	118	70
17	157	430	336	e115	200	509	455	689	449	293	128	69
18	158	513	287	e115	194	882	630	819	411	333	120	67
19	399	569	267	e120	189	596	635	807	376	272	111	64
20	432	503	348	184	182	503	502	893	337	683	105	71
21	744	524	373	241	172	483	480	945	311	743	100	83
22	571	802	591	183	167	1280	548	1170	382	479	96	74
23	361	568	878	161	158	2470	610	691	607	451	174	69
24	281	425	698	432	148	1060	636	616	391	373	328	66
25	240	352	546	6890	141	652	963	600	333	348	226	63
26	211	307	500	2980	137	504	901	539	311	302	171	62
27	190	436	446	1430	137	424	934	571	375	268	145	62
28	175	638	372	910	134	374	670	663	375	256	130	61
29	174	429	322	707	---	351	1370	691	364	288	119	59
30	180	964	291	560	---	319	1880	536	337	392	112	58
31	312	---	262	513	---	291	---	650	---	285	106	---
TOTAL	7329	19249	12292	18136	8061	19299	19854	26327	15680	10129	4668	2238
MEAN	236	642	397	585	288	623	662	849	523	327	151	74.6
MAX	744	2360	883	6890	480	2470	1880	1320	973	743	328	101
MIN	122	307	198	115	134	133	365	536	311	189	96	58
AC-FT	14540	38180	24380	35970	15990	38280	39380	52220	31100	20090	9260	4440
CFSM	3.69	10.0	6.20	9.14	4.50	9.73	10.3	13.3	8.17	5.11	2.35	1.17
IN.	4.26	11.19	7.14	10.54	4.69	11.22	11.54	15.30	9.11	5.89	2.71	1.30

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1930 - 1993, BY WATER YEAR (WY)

MEAN	374	662	710	639	513	467	588	719	637	304	134	215
MAX	906	1894	1856	1310	1295	1250	946	1248	1338	733	439	574
(WY)	1935	1991	1934	1934	1982	1972	1932	1936	1974	1972	1964	1941
MIN	38.3	85.4	209	124	201	225	279	327	145	70.3	45.0	44.2
(WY)	1988	1937	1986	1937	1938	1992	1975	1992	1934	1940	1930	1938

SUMMARY STATISTICS

FOR 1992 CALENDAR YEAR

FOR 1993 WATER YEAR

WATER YEARS 1930 - 1993

ANNUAL TOTAL	135092	163262	497
ANNUAL MEAN	369	447	736
HIGHEST ANNUAL MEAN			1972
LOWEST ANNUAL MEAN			335
HIGHEST DAILY MEAN	3320	Jan 23	9580
LOWEST DAILY MEAN	61	Sep 3	33
ANNUAL SEVEN-DAY MINIMUM	64	Aug 28	34
ANNUAL RUNOFF (AC-FT)	268000	323800	359900
ANNUAL RUNOFF (CFSM)	5.77	6.99	7.76
ANNUAL RUNOFF (INCHES)	78.52	94.90	105.47
10 PERCENT EXCEEDS	699	859	1000
50 PERCENT EXCEEDS	246	351	351
90 PERCENT EXCEEDS	118	114	93

e Estimated

SNOHOMISH RIVER BASIN

12143400 SOUTH FORK SNOQUALMIE RIVER ABOVE ALICE CREEK, NEAR GARCIA, WA

LOCATION.--Lat 47°24'55", long 121°35'10", in SW 1/4 SW 1/4 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 1,437.67 ft above Washington Highway Department datum. Oct. 1, 1960, to Sept. 30, 1987, recording gage at same site at datum 10.00 ft higher.

REMARKS.--Records good except for estimated daily discharges, which are fair. No regulation or diversion upstream from station. Chemical analyses October to November 1971. Water temperatures May 1979 to September 1980. U.S. Geological Survey satellite telemeter at station.

AVERAGE DISCHARGE.--33 years, 299 ft³/s, 97.61 in/yr, 216,600 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 8,450 ft³/s Nov. 23, 1986, gage height, 8.33 ft, datum then in use; minimum discharge, 19 ft³/s Oct. 30, 31, 1987.

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)
Jan. 25	1130	*2,300	*13.94	Mar. 23	0100	1,610	13.15

Minimum daily discharge, 33 ft³/s Sept. 29, 30.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	113	226	230	124	233	e71	309	780	450	206	120	49
2	102	320	187	117	207	e74	373	952	363	213	113	47
3	96	226	161	115	187	78	468	718	308	198	104	45
4	88	278	143	110	172	157	423	681	286	184	98	44
5	82	285	131	100	165	350	338	592	283	169	93	43
6	77	223	122	87	159	393	312	747	277	160	88	43
7	72	786	117	81	161	320	320	632	347	150	85	42
8	71	508	116	e78	171	309	385	666	388	142	82	41
9	70	366	113	e76	185	296	561	572	398	136	78	41
10	65	278	109	e73	194	263	461	810	399	126	76	40
11	63	366	106	e70	183	232	408	1010	373	122	73	41
12	61	397	98	e68	168	207	355	1180	428	118	70	47
13	99	345	94	e66	159	189	312	1010	328	114	69	41
14	77	306	409	e64	151	276	297	781	314	130	68	39
15	67	264	297	e63	141	946	308	666	334	118	66	40
16	64	233	211	e62	123	491	309	606	301	120	66	39
17	79	230	181	e61	110	357	339	664	272	135	66	38
18	80	288	157	e60	e100	390	389	754	250	130	62	37
19	183	297	148	64	e96	334	342	736	231	122	59	38
20	162	261	148	71	e92	328	321	733	210	215	57	45
21	136	284	153	77	e88	313	354	669	193	231	56	42
22	151	398	212	68	e84	671	405	646	256	196	55	38
23	121	307	293	64	e80	1320	429	474	495	203	64	37
24	106	235	254	168	e78	786	470	463	323	185	96	36
25	95	197	219	1730	e75	521	582	443	273	168	76	35
26	87	172	232	1310	e73	415	620	411	245	152	64	35
27	81	168	209	800	e71	360	651	460	249	140	58	34
28	77	170	181	510	e70	324	494	470	236	134	55	34
29	77	151	161	383	---	301	726	441	232	142	54	33
30	80	281	146	314	---	265	1040	361	211	159	52	33
31	130	---	134	268	---	245	---	498	---	132	50	---
TOTAL	2912	8846	5472	7302	3776	11582	13101	20626	9253	4850	2273	1197
MEAN	93.9	295	177	236	135	374	437	665	308	156	73.3	39.9
MAX	183	786	409	1730	233	1320	1040	1180	495	231	120	49
MIN	61	151	94	60	70	71	297	361	193	114	50	33
AC-FT	5780	17550	10850	14480	7490	22970	25990	40910	18350	9620	4510	2370
CFSM	2.26	7.09	4.24	5.66	3.24	8.98	10.5	16.0	7.41	3.76	1.76	.96
IN.	2.60	7.91	4.89	6.53	3.38	10.36	11.72	18.44	8.27	4.34	2.03	1.07

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1961 - 1993, BY WATER YEAR (WY)

	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	
MEAN	163	372	383	355	318	269	385	535	456	193	73.0	91.3																						
MAX	410	1271	1115	743	764	715	660	849	1208	615	212	234																						
(WY)	1966	1991	1976	1984	1982	1972	1990	1972	1974	1974	1964	1968																						
MIN	21.2	61.3	77.7	87.7	77.0	125	171	259	95.6	64.1	34.5	29.9																						
(WY)	1988	1988	1986	1979	1969	1962	1967	1992	1992	1977	1987	1987																						

SUMMARY STATISTICS

FOR 1992 CALENDAR YEAR

FOR 1993 WATER YEAR

WATER YEARS 1961 - 1993

ANNUAL TOTAL	76263	91190	299
ANNUAL MEAN	208	250	430
HIGHEST ANNUAL MEAN			201
LOWEST ANNUAL MEAN			1977
HIGHEST DAILY MEAN	1480	1730	6950
LOWEST DAILY MEAN	30	33	19
ANNUAL SEVEN-DAY MINIMUM	31	34	20
ANNUAL RUNOFF (AC-FT)	151300	180900	216600
ANNUAL RUNOFF (CFSM)	5.01	6.01	7.19
ANNUAL RUNOFF (INCHES)	68.20	81.54	97.64
10 PERCENT EXCEEDS	406	537	641
50 PERCENT EXCEEDS	153	171	205
90 PERCENT EXCEEDS	43	57	52

e Estimated

12143600 SOUTH FORK SNOQUALMIE RIVER AT EDGEWICK, WA

LOCATION.--Lat 47°27'10", long 121°43'00", in NE 1/4 NE 1/4 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 current year.

GAGE.--Water-stage recorder. Datum of gage is 571.24 ft above sea level. Prior to August 3, 1983, gage at site 45 ft downstream at elevation 5.90 ft higher.

REMARKS.--Records good except for estimated daily discharges, which are fair. Minor regulation at Twin Falls and Weeks hydroelectric project, upstream from station. No diversions.

AVERAGE DISCHARGE.--12 years (water years 1964-65, 1984-93), 432 ft³/s, 89.02 in/yr, 313,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 10,800 ft³/s Nov. 24, 1990, gage height, 13.85 ft; minimum discharge, 31 ft³/s Oct. 14, 1991.

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)
Jan. 25	1400	*4,190	*11.14	Mar. 23	0115	2,620	10.29

Minimum discharge, 44 ft³/s Sept. 14.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	162	309	407	188	357	e95	413	1070	608	297	177	85
2	152	438	313	174	316	e105	504	1290	492	313	166	84
3	140	334	260	174	285	125	641	976	414	299	159	83
4	130	368	230	165	263	245	632	931	382	275	151	80
5	120	415	208	151	251	542	493	814	369	253	143	80
6	113	320	192	134	241	644	434	967	362	236	139	78
7	107	1010	183	119	247	497	466	875	442	215	130	76
8	104	754	179	e110	270	452	510	875	570	202	126	75
9	105	558	176	e105	289	429	802	793	560	193	129	74
10	99	413	173	e98	308	380	693	1030	622	185	127	74
11	94	525	167	e95	292	332	620	1320	547	171	123	72
12	92	610	154	e92	264	298	531	1550	653	171	120	80
13	133	534	145	e89	244	269	457	1340	500	159	116	75
14	114	464	594	e87	232	338	423	991	445	197	114	72
15	98	397	484	e86	214	1400	423	855	457	171	112	72
16	95	347	333	e85	189	744	431	751	422	169	112	71
17	109	327	281	e84	168	525	457	807	378	188	113	70
18	112	399	239	e83	e150	557	544	911	350	185	107	68
19	223	438	224	100	e130	489	481	898	317	172	103	68
20	228	394	228	112	e120	464	441	917	289	268	101	76
21	207	484	236	125	e115	443	470	822	264	334	97	75
22	237	700	315	113	e110	888	537	814	315	281	96	70
23	192	537	466	104	e105	2160	570	614	723	294	102	67
24	163	386	416	194	e100	1210	604	574	493	277	146	65
25	148	308	357	2860	e96	773	777	569	400	257	123	65
26	136	278	356	2110	e94	600	847	504	350	232	107	64
27	125	259	329	1240	e92	507	953	556	343	210	99	63
28	118	270	286	784	e90	453	707	600	338	200	94	61
29	117	237	250	589	---	419	903	583	335	204	93	60
30	120	476	225	477	---	371	1490	471	312	226	90	59
31	166	---	203	409	---	339	---	595	---	193	87	---
TOTAL	4259	13289	8609	11336	5632	17093	18254	26663	13052	7027	3702	2162
MEAN	137	443	278	366	201	551	608	860	435	227	119	72.1
MAX	237	1010	594	2860	357	2160	1490	1550	723	334	177	85
MIN	92	237	145	83	90	95	413	471	264	159	87	59
AC-FT	8450	26360	17080	22480	11170	33900	36210	52890	25890	13940	7340	4290
CFSM	2.08	6.72	4.21	5.55	3.05	8.37	9.23	13.1	6.60	3.44	1.81	1.09
IN.	2.40	7.50	4.86	6.40	3.18	9.65	10.30	15.05	7.37	3.97	2.09	1.22

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1962 - 1993, BY WATER YEAR (WY)

	235	711	439	542	474	423	633	687	539	222	108	112
MEAN	235	711	439	542	474	423	633	687	539	222	108	112
MAX	610	1792	787	1137	1076	593	921	910	1254	653	282	283
(WY)	1986	1991	1992	1984	1991	1987	1989	1985	1964	1964	1964	1964
MIN	44.1	99.2	138	180	201	255	357	321	132	99.4	62.8	54.1
(WY)	1988	1988	1986	1985	1993	1985	1986	1992	1992	1992	1987	1987

SUMMARY STATISTICS	FOR 1992 CALENDAR YEAR	FOR 1993 WATER YEAR	WATER YEARS 1962 - 1993
ANNUAL TOTAL	113671	131078	
ANNUAL MEAN	311	359	
HIGHEST ANNUAL MEAN			432
LOWEST ANNUAL MEAN			594
HIGHEST DAILY MEAN	2500	2860	325
LOWEST DAILY MEAN	51	59	9520
ANNUAL SEVEN-DAY MINIMUM	53	62	42
ANNUAL RUNOFF (AC-FT)	225500	260000	312900
ANNUAL RUNOFF (CFSM)	4.71	5.45	6.55
ANNUAL RUNOFF (INCHES)	64.17	73.99	89.04
10 PERCENT EXCEEDS	554	775	866
50 PERCENT EXCEEDS	231	264	297
90 PERCENT EXCEEDS	71	88	75

e Estimated

SNOHOMISH RIVER BASIN

12143700 BOXLEY CREEK NEAR CEDAR FALLS, WA

LOCATION.--Lat 47°25'58", long 121°45'04", in NE 1/4 SW 1/4 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.--No estimated daily discharges. Records fair. No regulation or diversion upstream from station. Flow is mostly seepage from Chester Morse Lake.

AVERAGE DISCHARGE.--48 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, 3.47 ft Nov. 30, Dec. 1, 1990; no flow at times during water years 1967, 1968, and 1988.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 107 ft³/s July 2, 3, 5, gage height, 3.40 ft; minimum discharge, 0.28 ft³/s Oct. 10-12, 14, 22-24.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.34	.41	1.9	15	12	10	12	77	83	99	80	47
2	.34	.39	2.4	16	12	10	14	77	83	103	79	45
3	.34	.38	2.8	16	11	10	16	79	83	104	78	43
4	.33	.42	3.4	16	11	10	19	81	82	102	78	42
5	.32	.41	4.2	16	11	10	22	81	82	102	77	42
6	.31	.41	5.3	16	10	10	25	85	80	101	77	41
7	.31	.48	5.9	17	10	9.5	28	86	79	101	76	40
8	.31	.51	6.2	17	10	9.3	32	86	79	100	75	39
9	.30	.49	5.6	17	10	9.3	37	85	79	99	73	39
10	.30	.50	6.6	17	10	9.1	41	86	80	98	72	37
11	.28	.56	7.8	17	10	8.2	46	86	81	100	71	37
12	.29	.52	8.4	17	10	8.2	48	85	81	100	70	37
13	.30	.52	9.1	17	10	8.2	54	84	81	99	68	35
14	.30	.55	11	17	10	8.3	60	83	82	98	67	34
15	.30	.57	11	16	10	8.4	63	82	82	97	66	33
16	.30	.58	12	16	10	8.2	66	82	84	96	64	33
17	.30	.58	12	16	10	7.6	69	82	84	96	62	32
18	.33	.61	12	16	10	7.6	72	81	86	93	62	31
19	.35	.67	13	16	10	7.5	74	81	88	91	60	31
20	.35	.64	13	16	10	6.7	77	81	89	90	58	31
21	.37	.75	14	15	10	6.6	77	79	89	88	58	30
22	.28	.79	14	15	10	7.2	77	79	89	87	56	29
23	.29	.76	14	14	10	7.9	76	79	91	85	55	28
24	.29	.83	14	14	10	7.5	74	80	88	84	54	28
25	.31	.83	14	15	10	7.5	74	82	90	83	52	27
26	.32	.85	14	15	10	7.5	74	83	92	82	52	26
27	.33	.94	14	14	10	7.5	74	84	94	81	50	26
28	.33	.99	15	13	10	8.0	75	84	96	81	49	25
29	.36	1.1	15	13	---	8.8	75	83	98	81	49	25
30	.40	1.6	15	12	---	10	77	83	98	81	47	24
31	.41	---	15	12	---	11	---	83	---	80	47	---
TOTAL	9.99	19.64	311.6	479	287	265.6	1628	2549	2573	2882	1982	1017
MEAN	.32	.65	10.1	15.5	10.2	8.57	54.3	82.2	85.8	93.0	63.9	33.9
MAX	.41	1.6	15	17	12	11	77	86	98	104	80	47
MIN	.28	.38	1.9	12	10	6.6	12	77	79	80	47	24
AC-FT	20	39	618	950	569	527	3230	5060	5100	5720	3930	2024

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1945 - 1993, BY WATER YEAR (WY)

MEAN	3.86	8.11	25.0	27.6	28.0	22.1	18.1	32.0	49.4	42.2	25.1	9.92
MAX	34.5	78.4	94.5	79.1	103	79.5	68.3	82.2	129	93.0	74.8	40.3
(WY)	1960	1948	1991	1950	1953	1950	1950	1993	1946	1993	1955	1955
MIN	.088	.008	.11	.48	1.88	2.54	1.21	5.99	7.52	11.0	2.18	.29
(WY)	1988	1988	1988	1953	1977	1966	1962	1963	1963	1978	1992	1987

SUMMARY STATISTICS	FOR 1992 CALENDAR YEAR	FOR 1993 WATER YEAR	WATER YEARS 1945 - 1993
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ANNUAL TOTAL		3729.80		14003.83					
ANNUAL MEAN		10.2		38.4				24.3	
HIGHEST ANNUAL MEAN								51.9	1950
LOWEST ANNUAL MEAN								6.75	1977
HIGHEST DAILY MEAN	29	Jun 4		104	Jul 3	177			Dec 1 1990
LOWEST DAILY MEAN	.28	Oct 11		.28	Oct 11	.00			Oct 31 1966
ANNUAL SEVEN-DAY MINIMUM	.30	Oct 9		.30	Oct 9	.00			Oct 31 1966
ANNUAL RUNOFF (AC-FT)	7400			27780		17600			
10 PERCENT EXCEEDS	22			86		62			
50 PERCENT EXCEEDS	11			17		16			
90 PERCENT EXCEEDS	.41			.42		1.1			

12143800 RATTLESNAKE LAKE AT CEDAR FALLS, WA

LOCATION.--Lat 47°25'39", long 121°46'29", in SW 1/4 SW 1/4 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 sea level (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 Water Department. Many days estimated by Seattle Water Department during the period Oct. 5 to Mar. 10.

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, 908.02 ft June 25, 26; minimum observed, 866.56 ft Nov. 6.

GAGE HEIGHT, FEET, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY OBSERVATION AT 07:30 VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	873.10	866.86	871.75	e891.50	899.56	896.94	896.22	905.14	907.76	907.84	907.78	907.04
2	873.09	866.84	871.90	891.50	899.65	896.86	896.22	905.56	907.81	907.85	907.78	906.97
3	872.80	866.75	872.80	892.25	899.70	896.80	896.16	905.90	907.82	907.93	907.78	906.90
4	872.60	866.68	873.20	e892.50	899.85	896.79	896.18	906.28	907.82	907.92	907.78	906.85
5	---	866.62	873.50	e892.70	899.90	896.69	896.22	906.52	907.82	907.91	907.76	906.76
6	---	866.56	874.30	e892.90	899.70	896.58	896.30	906.80	907.80	907.90	907.76	906.68
7	---	866.70	874.75	e893.20	899.68	896.50	896.42	907.04	907.82	907.90	907.75	906.64
8	---	866.70	875.10	e893.50	899.45	896.42	896.58	907.26	907.86	907.88	907.72	906.58
9	---	866.85	875.88	e893.80	899.50	896.30	896.82	907.42	907.86	907.86	907.70	906.50
10	871.18	866.90	876.40	e894.10	899.35	e896.24	897.09	907.58	907.88	907.86	907.68	906.42
11	870.80	---	876.90	e894.25	899.28	896.18	897.48	907.80	907.90	907.86	907.66	906.36
12	870.60	867.01	877.44	e894.30	899.09	896.10	897.90	907.89	907.92	907.85	907.65	906.31
13	870.38	867.12	877.90	e894.50	898.95	895.98	898.45	907.94	907.93	907.82	907.64	906.25
14	870.19	867.08	878.65	894.70	898.82	895.88	898.98	907.96	907.94	907.82	907.63	906.18
15	869.88	867.15	879.30	895.10	898.66	895.96	899.49	907.96	907.96	907.83	907.62	906.12
16	869.50	867.22	880.09	895.28	898.50	895.90	900.09	907.94	907.93	907.83	907.60	906.05
17	869.20	867.30	880.91	895.40	898.40	895.90	900.54	907.84	907.90	907.82	907.60	906.00
18	869.00	867.46	881.66	895.50	e898.40	895.88	900.96	907.84	907.87	907.81	907.58	905.92
19	868.75	867.41	882.38	895.70	898.20	895.82	901.34	907.80	907.83	907.79	907.56	905.86
20	e868.50	867.86	883.08	895.98	898.04	895.78	901.50	907.80	907.80	907.80	907.52	905.82
21	e868.20	868.10	883.84	896.16	897.92	895.70	902.12	907.80	907.78	907.82	907.48	905.75
22	e868.00	e868.30	884.58	896.30	897.78	895.66	902.34	907.80	907.78	907.82	907.45	905.69
23	e867.60	e868.50	885.34	896.36	897.60	895.82	902.64	907.74	907.96	907.82	907.40	905.60
24	e867.21	868.80	886.14	896.46	897.51	895.94	902.96	907.72	907.98	907.82	907.50	905.54
25	e866.90	869.00	886.90	896.79	897.40	896.12	903.30	907.72	908.02	907.84	907.45	905.45
26	e866.80	e869.50	887.20	897.20	897.28	896.24	903.56	907.70	908.02	907.81	907.40	905.36
27	867.45	869.97	888.30	897.79	897.16	896.24	903.82	907.69	907.98	907.80	907.34	905.29
28	867.22	870.45	888.84	898.30	897.02	896.36	904.00	907.69	907.98	907.79	907.28	905.20
29	e867.00	871.18	e889.30	898.70	---	896.30	904.36	907.74	907.98	907.80	907.22	905.10
30	866.98	871.50	e890.00	899.10	---	896.28	904.79	907.70	907.95	907.80	907.16	905.02
31	866.90	---	e890.75	899.30	---	896.20	---	907.75	---	907.78	907.10	---
MAX	---	---	890.75	899.30	899.90	896.94	904.79	907.96	908.02	907.93	907.78	907.04
MIN	---	---	871.75	891.50	897.02	895.66	896.16	905.14	907.76	907.78	907.10	905.02

e Estimated

SNOHOMISH RIVER BASIN

12143900 BOXLEY CREEK NEAR EDGEWICK, WA

LOCATION.--Lat 47°26'56", long 121°43'50", in SW 1/4 SE 1/4 NW 1/4 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.

REVISED RECORDS.--WDR WA-90-1: 1982 (M), 1988 (M).

GAGE.--Water-stage recorder. Elevation of gage is 650 ft, from topographic map.

REMARKS.--Records good except for estimated daily discharges, which are poor. Many small diversions for domestic use upstream from station. No regulation; flow is mostly seepage from Chester Morse Lake.

AVERAGE DISCHARGE.--12 years (water years 1982-93), 41.8 ft³/s, 30,280 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 220 ft³/s Dec. 4, 1990, gage height, 5.09 ft; minimum discharge, 8.3 ft³/s Nov. 10, 1986.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 123 ft³/s June 22, gage height, 4.79 ft; minimum daily discharge, 11 ft³/s Oct. 15, 16.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	e15	e15	16	25	25	21	29	95	103	112	96	53
2	e14	e14	15	25	24	21	32	97	103	116	97	53
3	e14	e13	15	26	23	21	33	97	104	114	102	52
4	e15	e14	15	26	22	22	34	98	105	113	100	51
5	e14	e13	15	25	22	22	35	99	105	112	98	50
6	e14	e14	15	26	22	21	42	102	105	112	96	50
7	e13	e16	16	26	22	21	43	101	104	112	93	47
8	e13	e14	17	25	22	21	37	102	104	110	89	45
9	e13	e15	18	25	22	20	44	102	103	109	86	40
10	e12	e14	21	25	21	20	50	99	104	109	83	38
11	e12	e16	21	25	21	20	48	98	105	109	81	38
12	e12	e15	21	24	21	20	56	99	105	108	84	38
13	e13	e14	22	24	20	20	58	101	105	107	82	40
14	e12	e13	28	24	20	21	62	103	105	108	81	42
15	e11	e13	24	24	20	24	65	104	104	108	79	41
16	e11	e12	23	24	20	20	69	106	103	108	76	39
17	e12	e12	22	24	20	20	75	105	102	108	74	40
18	e12	e13	21	23	20	21	75	102	101	110	72	39
19	e13	e14	24	23	20	21	82	100	102	111	71	38
20	e12	e16	28	26	20	21	83	97	103	110	69	37
21	e13	24	29	25	20	21	85	98	104	110	67	34
22	e12	19	30	25	20	26	84	98	105	108	66	33
23	e12	16	29	24	20	34	85	99	111	107	65	31
24	e12	14	28	26	20	32	82	100	110	106	66	29
25	e13	13	27	35	20	29	86	100	112	105	62	27
26	e12	12	27	34	20	27	91	100	113	104	62	26
27	e12	14	27	31	22	27	88	101	114	103	61	25
28	e12	13	27	28	21	26	91	101	117	103	59	27
29	e13	12	27	27	---	26	94	100	117	103	57	27
30	e13	19	26	27	---	27	95	100	113	101	56	28
31	e14	---	25	26	---	27	---	101	---	98	55	---
TOTAL	395	436	699	803	590	720	1933	3105	3191	3354	2385	1158
MEAN	12.7	14.5	22.5	25.9	21.1	23.2	64.4	100	106	108	76.9	38.6
MAX	15	24	30	35	25	34	95	106	117	116	102	53
MIN	11	12	15	23	20	20	29	95	101	98	55	25
AC-FT	783	865	1390	1590	1170	1430	3830	6160	6330	6650	4730	2300

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1980 - 1993, BY WATER YEAR (WY)

	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993
MEAN	19.4	24.3	36.0	38.4	45.9	46.4	45.4	60.2	65.8	54.4	39.2	26.5		
MAX	33.9	62.4	121	65.0	88.9	114	85.7	113	106	108	76.9	38.6		
(WY)	1991	1991	1991	1991	1982	1982	1988	1988	1993	1993	1993	1993		
MIN	11.0	11.9	12.9	11.4	15.0	20.8	28.0	27.2	29.8	22.9	16.4	12.2		
(WY)	1988	1988	1988	1988	1988	1985	1992	1992	1992	1992	1992	1987		

SUMMARY STATISTICS	FOR 1992 CALENDAR YEAR	FOR 1993 WATER YEAR	WATER YEARS 1980 - 1993
ANNUAL TOTAL	9663	18769	
ANNUAL MEAN	26.4	51.4	41.8
HIGHEST ANNUAL MEAN			66.6
LOWEST ANNUAL MEAN			28.1
HIGHEST DAILY MEAN	110	117	198
LOWEST DAILY MEAN	11	11	8.6
ANNUAL SEVEN-DAY MINIMUM	12	12	10
ANNUAL RUNOFF (AC-FT)	19170	37230	30270
10 PERCENT EXCEEDS	38	105	77
50 PERCENT EXCEEDS	26	29	35
90 PERCENT EXCEEDS	13	14	16

e Estimated

12144000 SOUTH FORK SNOQUALMIE RIVER AT NORTH BEND, WA

LOCATION.--Lat 47°29'35", long 121°47'20", in SW 1/4 NE 1/4 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 1984 to current year.

REVISED RECORDS.--WSP 1316: 1918-19(M). WSP 1932: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 439.33 ft above sea level. 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 for estimated daily discharges and flows above 2,000 ft³/s, which are fair. City of North Bend diverts about 0.8 ft³/s daily from Clough Creek for municipal use. Minor regulation at Twin Falls and Weeks Falls projects upstream from station.

AVERAGE DISCHARGE.--54 years (water years 1908-26, 1930-38, 1946-49, 1961-73, 1985-93), 543 ft³/s, 90.26 in/yr, 393,400 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge recorded, 10,900 ft³/s Nov. 24, 1990, gage height, 19.09 ft, from rating curve extended above 3,900 ft³/s; 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.--Peak discharges greater than base discharge of 2,200 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Jan. 25	1315	*4,280	*12.82	Mar. 23	unknown	unknown	unknown

Minimum discharge, 131 ft³/s Oct. 15, due to regulation.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	e215	339	530	307	473	e170	450	1190	762	499	335	193
2	200	456	433	290	426	e180	503	1370	652	516	321	186
3	189	384	374	289	392	201	644	1110	577	511	309	185
4	179	390	333	281	363	265	677	1040	541	488	304	183
5	169	461	310	260	351	e600	560	954	521	461	293	183
6	162	376	287	246	338	e700	505	1050	516	441	289	182
7	156	e1050	276	229	334	559	535	1010	566	422	282	180
8	145	779	270	e220	353	516	575	975	706	407	272	174
9	147	630	275	e210	375	497	855	931	687	390	266	170
10	143	495	275	e200	388	453	792	1070	789	379	258	168
11	142	570	278	e195	373	407	752	1370	697	365	254	167
12	140	649	258	e190	349	365	670	e1600	793	366	250	169
13	169	597	248	e185	328	343	601	1450	674	344	245	171
14	162	534	653	e180	316	358	562	1100	610	384	243	168
15	145	469	620	e175	299	e1500	544	987	619	349	239	161
16	140	418	465	e170	270	826	562	868	597	343	238	167
17	149	391	409	e165	250	619	577	911	550	360	237	164
18	157	457	360	e165	e240	628	555	989	509	363	232	155
19	236	501	350	192	e230	576	617	993	471	344	225	153
20	268	476	372	209	e220	547	568	1010	443	431	221	158
21	252	540	390	229	e210	526	579	908	419	497	219	155
22	272	741	434	214	e200	738	645	934	448	446	218	157
23	239	642	570	202	e190	e2300	682	765	858	455	217	153
24	213	490	551	259	e180	1280	703	698	706	446	257	151
25	199	414	498	2870	e175	855	853	711	616	425	238	150
26	186	365	485	2190	e170	686	955	637	559	403	222	148
27	175	359	461	1340	e170	592	1070	673	538	383	215	148
28	170	369	411	887	e165	532	861	740	532	365	206	145
29	167	336	377	705	---	497	963	722	537	359	202	141
30	171	557	349	599	---	451	1560	618	521	382	198	139
31	205	---	324	528	---	415	---	698	---	353	196	---
TOTAL	5662	15235	12226	14381	8128	19182	21075	30082	18014	12677	7701	4924
MEAN	183	508	394	464	290	619	702	970	600	409	248	164
MAX	272	1050	653	2870	473	2300	1560	1600	858	516	335	193
MIN	140	336	248	165	165	170	450	618	419	343	196	139
AC-FT	11230	30220	24250	28520	16120	38050	41800	59670	35730	25140	15270	9770
CFSM	2.24	6.22	4.83	5.68	3.55	7.57	8.60	11.9	7.35	5.01	3.04	2.01
IN.	2.58	6.94	5.57	6.55	3.70	8.73	9.60	13.70	8.20	5.77	3.51	2.24

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1907 - 1993, BY WATER YEAR (WY)

	MEAN	324	629	694	711	623	599	702	856	750	357	171	173
MAX	843	2164	2267	1579	1283	1516	1171	1271	1763	940	405	421	
(WY)	1934	1991	1934	1924	1972	1932	1949	1974	1974	1964	1933		
MIN	76.5	92.4	213	218	178	190	352	354	210	100	84.8	76.8	
(WY)	1988	1930	1931	1937	1922	1922	1967	1915	1992	1926	1910	1910	

SUMMARY STATISTICS

FOR 1992 CALENDAR YEAR

FOR 1993 WATER YEAR

WATER YEARS 1907 - 1993

ANNUAL TOTAL	140321	169287	
ANNUAL MEAN	383	464	
HIGHEST ANNUAL MEAN			547
LOWEST ANNUAL MEAN			809
HIGHEST DAILY MEAN	2610	Jan 29	1972
LOWEST DAILY MEAN	99	Sep 1	1915
ANNUAL SEVEN-DAY MINIMUM	101	Aug 27	10100
ANNUAL RUNOFF (AC-FT)	278300		65
ANNUAL RUNOFF (CFSM)	4.69		66
ANNUAL RUNOFF (INCHES)	63.89		66
10 PERCENT EXCEEDS	644		90.91
50 PERCENT EXCEEDS	322		1050
90 PERCENT EXCEEDS	134		430
			128

e Estimated

SNOHOMISH RIVER BASIN

12144500 SNOQUALMIE RIVER NEAR SNOQUALMIE, WA

LOCATION.--Lat 47°32'43", long 121°50'28", in SW 1/4 SW 1/4 sec.19, T.24 N., R.8 E., King County, Hydrologic Unit 17110010, on left bank 0.3 mi downstream from Snoqualmie Falls, 0.4 mi upstream from Tokul Creek, 1.5 mi northwest of Snoqualmie, and at mile 40.0.

DRAINAGE AREA.--375 mi².

PERIOD OF RECORD.--May 1898 to July 1899; August to September 1899 (monthly discharge only); January to July 1900, September 1902 to July 1904; August to September 1904 (monthly discharge only); October 1904 to September 1905 and November to December 1906 (gage heights only); August 1907 to May 1926 (monthly discharge only); June 1926 to September 1927; October 1927 to September 1932 (monthly discharge only); August 1958 to current year. Published as "near Snoqualmie Falls" 1904-06.

GAGE.--Water-stage recorder. Elevation of gage is 120 ft, from river-profile map. Prior to Nov. 3, 1902, and Nov. 1 to Dec. 31, 1906, nonrecording gages upstream and downstream from Snoqualmie Falls at different datum. Nov. 3, 1902, to Sept. 30, 1905, nonrecording gage at site 4 mi upstream and 300 ft downstream from South Fork, at different datum.

REMARKS.--Records good. Medium and low flows affected by powerplant 0.1 mi upstream from station. U.S. Geological Survey satellite telemeter at station.

AVERAGE DISCHARGE.--63 years (water years 1899, 1903-04, 1908-32, 1959-93), 2,579 ft³/s, 93.39 in/yr, 1,868,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 78,800 ft³/s Nov. 24, 1990, gage height, 21.55 ft, from inside high-water mark; minimum discharge, 9.7 ft³/s Aug. 14, 27, 1958, gage height, -0.53 ft; minimum daily discharge, 88 ft³/s Aug. 8, 1960.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 27,100 ft³/s Jan. 25, gage height, 14.77 ft; minimum discharge, 298 ft³/s Sept. 28.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1190	2120	3120	1280	2460	759	2040	6240	4420	1900	1380	611
2	1080	3150	2230	1190	2200	791	2530	6810	3450	2300	1270	598
3	1000	2260	1840	1180	2020	837	3160	5310	2900	2350	1200	588
4	951	2180	1600	1150	1880	1330	3280	5520	2620	2130	1130	576
5	857	2540	1430	1060	1900	3650	2490	4710	2650	1900	1070	568
6	802	1900	1310	968	1850	4030	2150	5420	2600	1760	1020	556
7	750	6580	1210	913	1940	2940	2500	5180	3550	1640	973	548
8	720	5500	1230	917	2030	2530	2670	5430	4360	1530	930	530
9	725	4020	1300	883	2050	2320	4460	4940	3750	1450	886	526
10	682	2770	1320	820	2240	2010	3850	5280	4750	1360	855	513
11	654	3080	1400	760	2040	1770	3530	6760	3950	1290	826	505
12	633	3750	1240	771	1780	1570	3160	7690	4530	1270	803	547
13	985	3500	1130	796	1620	1420	2680	7450	3480	1190	774	538
14	917	3260	3610	801	1510	1560	2400	5520	2990	1350	766	510
15	770	2770	3420	767	1390	7970	2320	4730	3320	1330	756	496
16	703	2340	2270	731	1240	4230	2430	4010	3200	1370	760	489
17	723	2140	1890	721	1120	2900	2390	4240	2690	1530	781	480
18	751	2520	1620	701	1080	3560	3070	4950	2480	1680	760	467
19	1280	2850	1560	727	1050	3030	3080	5280	2300	1480	712	460
20	1700	2730	1960	817	1010	2620	2610	5640	2110	2430	711	503
21	2070	2690	2080	1140	963	2490	2490	5280	1920	3430	685	522
22	2220	4120	2900	935	925	4080	2780	6260	2020	2450	671	494
23	1580	3310	4520	836	882	11500	3090	4410	3810	2320	736	471
24	1270	2410	3400	960	842	6690	3130	3670	2740	2080	1120	454
25	1090	1960	2780	20000	804	4260	4340	3690	2290	1960	994	445
26	967	1680	2460	13200	787	3230	4630	3210	2110	1760	824	435
27	877	1790	2340	8060	772	2690	5190	3290	2300	1580	741	429
28	814	2460	1950	5260	757	2340	3940	3760	2340	1490	703	416
29	810	1920	1700	4000	---	2160	5310	3870	2180	1560	675	424
30	822	3470	1540	3180	---	1950	9760	3130	2070	1870	651	411
31	1100	---	1390	2770	---	1780	---	3610	---	1560	630	---
TOTAL	31493	87770	63750	78294	41142	94997	101460	155290	89880	55300	26793	15110
MEAN	1016	2926	2056	2526	1469	3064	3382	5009	2996	1784	864	504
MAX	2220	6580	4520	20000	2460	11500	9760	7690	4750	3430	1380	611
MIN	633	1680	1130	701	757	759	2040	3130	1920	1190	630	411
AC-FT	62470	174100	126400	155300	81610	188400	201200	308000	178300	109700	53140	29970
CFSM	2.71	7.80	5.48	6.73	3.92	8.17	9.02	13.4	7.99	4.76	2.30	1.34
IN.	3.12	8.71	6.32	7.77	4.08	9.42	10.06	15.40	8.92	5.49	2.66	1.50

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1959 - 1993, BY WATER YEAR (WY)

MEAN	1744	3559	3691	3561	3015	2464	3039	3760	3532	1858	884	1158
MAX	3931	10100	8886	6414	6676	6735	4696	6055	7568	4393	2263	3937
(WY)	1960	1991	1976	1984	1982	1972	1989	1972	1974	1974	1964	1959
MIN	348	716	1211	1162	1215	1367	1478	1895	1077	815	477	429
(WY)	1988	1980	1986	1979	1969	1962	1967	1992	1992	1987	1979	1966

SUMMARY STATISTICS

FOR 1992 CALENDAR YEAR

FOR 1993 WATER YEAR

WATER YEARS 1959 - 1993

ANNUAL TOTAL	664088	841279	2685
ANNUAL MEAN	1814	2305	3939
HIGHEST ANNUAL MEAN			1896
LOWEST ANNUAL MEAN			1972
HIGHEST DAILY MEAN	12200	20000	54700
LOWEST DAILY MEAN	321	411	88
ANNUAL SEVEN-DAY MINIMUM	331	431	274
ANNUAL RUNOFF (AC-FT)	1317000	1669000	1945000
ANNUAL RUNOFF (CFSM)	4.84	6.15	7.16
ANNUAL RUNOFF (INCHES)	65.88	83.45	97.27
10 PERCENT EXCEEDS	3270	4480	5020
50 PERCENT EXCEEDS	1400	1900	2080
90 PERCENT EXCEEDS	573	679	655

SNOHOMISH RIVER BASIN

173

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.--No estimated daily discharges. Records good except for the period Sept. 1-30, which is fair. Some small diversions for irrigation and domestic use upstream from station. No regulation. U.S. Geological Survey satellite telemeter at station.

AVERAGE DISCHARGE.--32 years (water years 1946-50, 1965-72, 1975-93), 133 ft³/s, 59.02 in/yr, 96,360 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 6,220 ft³/s Nov. 24, 1990, gage height, 6.56 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)
Dec. 14	1000	1,340	4.09	Jan. 25	1130	*2,020	*4.67

Minimum discharge, 11 ft³/s Sept. 26-30.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	19	110	275	90	131	33	82	299	128	81	52	17
2	19	122	195	82	114	36	89	299	126	130	46	16
3	26	83	150	90	100	56	151	234	103	110	44	16
4	25	93	125	86	90	79	141	226	91	93	38	15
5	20	78	107	76	83	86	108	190	82	82	34	15
6	19	67	95	67	77	70	102	191	77	71	32	15
7	17	232	84	66	73	60	112	178	193	63	31	13
8	17	243	121	63	69	57	139	165	201	55	30	12
9	21	234	181	58	69	53	302	143	275	50	28	12
10	17	155	196	54	71	48	280	156	262	46	27	12
11	16	260	236	52	62	44	443	119	198	45	26	12
12	16	226	170	52	58	41	301	104	162	43	25	13
13	29	168	139	51	54	39	219	91	127	40	24	12
14	23	131	792	47	52	69	172	80	108	46	24	12
15	20	107	442	46	49	355	145	72	109	45	24	12
16	18	91	262	44	45	200	124	65	96	48	27	12
17	20	86	199	44	42	168	128	58	80	51	30	12
18	23	122	157	43	41	171	125	52	69	44	25	12
19	49	231	224	70	41	132	106	48	60	38	22	12
20	47	203	545	132	40	127	93	60	54	91	21	13
21	84	341	444	181	39	112	87	83	49	90	20	13
22	70	455	348	134	37	331	85	112	77	88	19	12
23	49	292	309	109	36	806	96	75	367	94	22	12
24	41	199	286	178	34	409	123	60	153	87	37	12
25	37	149	227	1220	33	242	224	54	108	82	26	12
26	32	120	199	942	32	172	253	49	88	71	22	11
27	29	153	168	475	31	133	239	47	77	60	20	11
28	28	205	143	317	31	107	181	56	100	60	19	11
29	31	154	124	239	---	95	262	94	110	72	20	11
30	38	358	111	188	---	84	399	62	84	85	18	11
31	80	---	99	155	---	74	---	107	---	61	17	---
TOTAL	980	5468	7153	5451	1634	4489	5311	3629	3814	2122	850	381
MEAN	31.6	182	231	176	58.4	145	177	117	127	68.5	27.4	12.7
MAX	84	455	792	1220	131	806	443	299	367	130	52	17
MIN	16	67	84	43	31	33	82	47	49	38	17	11
AC-FT	1940	10850	14190	10810	3240	8900	10530	7200	7570	4210	1690	756
CFSM	1.03	5.96	7.54	5.75	1.91	4.73	5.79	3.83	4.15	2.24	.90	.42
IN.	1.19	6.65	8.70	6.63	1.99	5.46	6.46	4.41	4.64	2.58	1.03	.46

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1945 - 1993, BY WATER YEAR (WY)

	70.5	214	255	275	229	184	153	86.3	65.6	31.3	20.2	35.0
MEAN	70.5	214	255	275	229	184	153	86.3	65.6	31.3	20.2	35.0
MAX	266	602	472	458	476	389	255	166	158	86.9	51.2	96.7
(WY)	1948	1991	1976	1971	1972	1950	1950	1948	1964	1983	1976	1964
MIN	7.77	23.7	105	94.7	53.7	58.4	74.4	38.0	19.0	13.2	7.04	9.71
(WY)	1988	1988	1986	1985	1977	1992	1983	1947	1992	1967	1967	1987

SUMMARY STATISTICS

FOR 1992 CALENDAR YEAR

FOR 1993 WATER YEAR

WATER YEARS 1945 - 1993

ANNUAL TOTAL	33484	41282	133
ANNUAL MEAN	91.5	113	206
HIGHEST ANNUAL MEAN			77.8
LOWEST ANNUAL MEAN			3340
HIGHEST DAILY MEAN	1100	Jan 28	Nov 24 1990
LOWEST DAILY MEAN	11	Aug 19	Aug 21 1967
ANNUAL SEVEN-DAY MINIMUM	11	Aug 19	Aug 15 1967
ANNUAL RUNOFF (AC-FT)	66420	81880	96300
ANNUAL RUNOFF (CFSM)	2.99	3.70	4.34
ANNUAL RUNOFF (INCHES)	40.71	50.19	59.02
10 PERCENT EXCEEDS	223	240	305
50 PERCENT EXCEEDS	48	79	80
90 PERCENT EXCEEDS	13	18	15

SNOHOMISH RIVER BASIN

12147500 NORTH FORK TOLT RIVER NEAR CARNATION, WA

LOCATION.--Lat 47°42'45", long 121°47'15", in SW 1/4 NE 1/4 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.--No estimated daily discharges. Records good. No regulation or diversion upstream from station.

AVERAGE DISCHARGE.--36 years (water years 1953-63, 1969-93), 356 ft³/s, 121.16 in/yr, 257,900 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 discharge, 31 ft³/s Sept. 22, 23, 1986.

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)
Nov. 7	0800	3,370	9.30	Jan. 25	0515	*8,230	*a12.72

Minimum discharge, 54 ft³/s Sept. 29, 30.

a From maximum stage indicator.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	126	323	437	228	376	151	287	622	331	189	171	89
2	118	449	325	216	346	164	367	662	295	269	161	87
3	122	272	279	211	334	196	462	480	263	243	152	86
4	120	276	253	203	333	509	388	638	269	218	144	84
5	107	254	234	191	358	841	283	491	277	197	138	82
6	100	204	219	181	352	528	262	598	253	185	133	80
7	94	1610	205	177	368	385	282	522	630	177	129	75
8	90	681	206	172	377	335	485	692	406	169	126	73
9	87	435	211	167	381	300	658	499	518	160	121	72
10	84	306	198	161	441	265	473	620	470	154	117	71
11	81	384	193	153	339	239	485	563	373	153	114	70
12	80	482	182	151	294	218	409	628	1070	153	111	73
13	140	413	176	150	271	203	338	496	450	147	108	71
14	105	357	588	146	256	463	372	409	343	177	108	69
15	90	294	362	143	237	1280	361	358	368	167	106	68
16	84	281	268	139	218	421	349	330	335	168	110	66
17	93	280	237	135	205	339	349	341	281	246	122	65
18	96	315	211	133	201	607	445	369	258	219	110	63
19	188	401	214	137	195	369	495	350	240	183	102	63
20	201	347	294	268	190	371	365	377	222	597	98	74
21	403	398	302	308	183	370	341	448	211	601	95	73
22	262	612	555	241	177	1200	358	450	271	336	93	66
23	173	413	630	216	170	1340	415	312	305	301	150	63
24	141	310	548	654	164	559	451	287	237	246	241	61
25	125	265	408	4310	160	377	647	274	214	223	152	59
26	114	238	469	1640	155	318	603	250	203	199	122	57
27	106	432	393	853	153	286	614	250	225	185	108	56
28	100	585	324	631	151	265	440	257	251	183	102	55
29	105	345	288	530	---	257	968	338	225	216	97	54
30	112	745	265	433	---	238	1080	253	204	245	94	54
31	208	---	245	405	---	224	---	321	---	188	91	---
TOTAL	4055	12707	9719	13683	7385	13618	13832	13485	9998	7094	3826	2079
MEAN	131	424	314	441	264	439	461	435	333	229	123	69.3
MAX	403	1610	630	4310	441	1340	1080	692	1070	601	241	89
MIN	80	204	176	133	151	151	262	250	203	147	91	54
AC-FT	8040	25200	19280	27140	14650	27010	27440	26750	19830	14070	7590	4120
CFSM	3.28	10.6	7.86	11.1	6.61	11.0	11.6	10.9	8.35	5.74	3.09	1.74
IN.	3.78	11.85	9.06	12.76	6.89	12.70	12.90	12.57	9.32	6.61	3.57	1.94

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1953 - 1993, BY WATER YEAR (WY)

	247	488	530	529	451	365	433	424	347	199	116	162
MEAN	247	488	530	529	451	365	433	424	347	199	116	162
MAX	536	1145	1065	1160	1008	898	709	646	731	496	222	563
(WY)	1960	1991	1976	1953	1982	1972	1959	1972	1955	1955	1955	1959
MIN	38.5	69.0	192	222	166	172	249	214	136	80.1	48.7	50.1
(WY)	1988	1953	1986	1957	1969	1992	1992	1992	1992	1958	1958	1987

SUMMARY STATISTICS

FOR 1992 CALENDAR YEAR

FOR 1993 WATER YEAR

WATER YEARS 1953 - 1993

ANNUAL TOTAL	90136	111481	
ANNUAL MEAN	246	305	
HIGHEST ANNUAL MEAN			356
LOWEST ANNUAL MEAN			526
HIGHEST DAILY MEAN	2080	Jan 23	249
LOWEST DAILY MEAN	48	Sep 3	5560
ANNUAL SEVEN-DAY MINIMUM	50	Aug 28	31
ANNUAL RUNOFF (AC-FT)	178800		34
ANNUAL RUNOFF (CFSM)	6.17		257700
ANNUAL RUNOFF (INCHES)	84.04		8.91
10 PERCENT EXCEEDS	469		121.13
50 PERCENT EXCEEDS	176		662
90 PERCENT EXCEEDS	75		278
			88

SNOHOMISH RIVER BASIN

175

12147600 SOUTH FORK TOLT RIVER NEAR INDEX, WA

LOCATION.--Lat 47°42'25", long 121°35'56", in NE 1/4 SW 1/4 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 0.15 ft lower. Oct. 1, 1961 to Sept. 30, 1992, at datum 1.00 ft lower.

REMARKS.--Records fair except flows above 600 ft³/s, which are poor. No regulation or diversion upstream from station. U.S. Geological Survey satellite telemeter at station.

AVERAGE DISCHARGE.--28 years (water years 1961-63, 1969-93), 54.9 ft³/s, 139.61 in/yr, 39,780 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 2,190 ft³/s Jan. 23, 1982; maximum gage height, 8.13 ft, present datum, Dec. 14, 1959; minimum discharge, 2.2 ft³/s Oct. 9, 10, 1989.

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. 7	0545	556	4.23	Jan. 25	0345	*1,290	*6.06
Minimum discharge, 2.6 ft ³ /s Sept. 27-30.							

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	17	79	41	11	31	6.7	34	108	55	23	22	6.1
2	15	141	26	11	27	9.6	60	127	45	40	18	5.7
3	15	52	20	10	24	14	77	77	40	41	16	5.4
4	13	71	16	9.9	22	89	58	101	36	33	14	5.3
5	12	58	14	8.8	24	159	36	79	37	27	12	5.1
6	10	54	13	e8.6	25	101	29	111	43	25	11	4.7
7	9.5	332	11	8.7	31	66	33	89	110	23	10	4.5
8	9.0	114	11	8.2	35	53	56	105	66	20	9.5	4.3
9	8.7	53	12	7.5	37	43	99	77	79	18	8.8	4.3
10	8.1	32	11	6.8	46	34	66	113	74	16	8.1	4.0
11	7.4	44	11	6.6	33	27	51	118	71	17	7.5	4.4
12	7.7	75	9.1	6.6	25	23	41	147	152	17	6.7	5.5
13	22	62	8.6	6.7	23	19	33	108	70	15	6.6	4.6
14	14	48	11.6	6.3	20	84	32	80	52	18	6.6	4.1
15	11	35	42	5.8	17	223	46	66	62	19	6.5	4.0
16	9.5	30	24	5.3	14	63	44	59	54	22	7.4	3.8
17	17	29	19	5.2	e13	39	49	68	41	35	10	3.6
18	15	40	15	5.0	11	81	72	85	37	48	8.0	3.3
19	58	45	17	5.0	11	49	63	81	33	38	6.6	3.4
20	49	33	20	11	9.7	44	45	88	28	117	5.9	4.3
21	46	42	19	11	9.1	43	45	113	25	97	5.4	4.3
22	44	75	47	8.0	8.4	168	55	119	53	55	5.3	3.8
23	30	34	61	6.9	7.8	220	71	65	60	49	18	3.4
24	24	23	61	138	7.1	90	83	59	37	38	39	3.1
25	20	18	34	650	6.6	48	122	55	31	34	22	3.1
26	17	16	38	240	6.1	35	110	48	28	27	15	2.9
27	15	38	28	119	5.8	29	107	50	34	23	11	2.7
28	13	52	21	73	5.8	26	66	52	30	23	9.2	2.6
29	15	29	16	52	---	24	141	61	30	33	8.1	2.8
30	18	117	14	40	---	21	156	44	26	41	7.2	2.9
31	58	---	12	35	---	19	---	60	---	27	6.6	---
TOTAL	627.9	1871	807.7	1526.9	535.4	1950.3	1980	2613	1539	1059	348.0	122.0
MEAN	20.3	62.4	26.1	49.3	19.1	62.9	66.0	84.3	51.3	34.2	11.2	4.07
MAX	58	332	116	650	46	223	156	147	152	117	39	6.1
MIN	7.4	16	8.6	5.0	5.8	6.7	29	44	25	15	5.3	2.6
AC-FT	1250	3710	1600	3030	1060	3870	3930	5180	3050	2100	690	242
CFSM	3.79	11.7	4.88	9.22	3.58	11.8	12.4	15.8	9.61	6.40	2.10	.76
IN.	4.37	13.03	5.63	10.64	3.73	13.59	13.79	18.20	10.72	7.38	2.42	.85

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1960 - 1993, BY WATER YEAR (WY)

	MEAN	39.8	78.7	74.8	72.9	65.4	46.2	64.4	81.2	68.3	32.4	14.4	26.2
MAX	107	181	165	154	150	93.4	116	140	160	81.3	37.4	56.9	
(WY)	1986	1991	1976	1990	1982	1972	1988	1972	1974	1974	1975	1969	
MIN	6.24	14.0	20.0	19.8	9.41	18.4	28.6	26.0	13.1	13.2	4.87	4.07	
(WY)	1988	1980	1986	1981	1969	1962	1975	1992	1992	1961	1986	1993	

SUMMARY STATISTICS

FOR 1992 CALENDAR YEAR

FOR 1993 WATER YEAR

WATER YEARS 1960 - 1993

ANNUAL TOTAL	12231.7	14980.2	
ANNUAL MEAN	33.4	41.0	
HIGHEST ANNUAL MEAN			54.9
LOWEST ANNUAL MEAN			77.8
HIGHEST DAILY MEAN	500	Jan 23	1160
LOWEST DAILY MEAN	3.6	Sep 2	2.3
ANNUAL SEVEN-DAY MINIMUM	3.8	Aug 28	2.4
ANNUAL RUNOFF (AC-FT)	24260	29710	39760
ANNUAL RUNOFF (CFSM)	6.26	7.69	10.3
ANNUAL RUNOFF (INCHES)	85.21	104.36	139.64
10 PERCENT EXCEEDS	62	89	117
50 PERCENT EXCEEDS	18	27	33
90 PERCENT EXCEEDS	6.8	5.8	8.2

e Estimated

SNOHOMISH RIVER BASIN

12147900 SOUTH FORK TOLT RESERVOIR NEAR CARNATION, WA

LOCATION.--Lat 47°41'38", long 121°47'10", in NW 1/4 SW 1/4 sec.32, T.26 N., R.9 E., King County, Hydrologic Unit 17110010, on top and near the center of the dam, 11.4 mi northeast of Carnation, and at mile 8.4.

DRAINAGE AREA.--18.8 mi².

PERIOD OF RECORD.--October 1991 to current year.

GAGE.--Water-stage recorder. Datum of gage is sea level (Seattle Water Department bench mark).

REMARKS.--Reservoir is formed by earthfill dam, with a concrete glory hole spillway, completed in 1962. Water used for municipal water supply by Seattle Water Department. Usable capacity, 15,600 acre-ft between elevations 1,749 ft (minimum pool) and 1,765 ft (maximum normal pool). Top of dam is at 1,775 ft with top of spillway at 1,757 ft. Flood control between elevations 1,749 and 1,757 ft. U.S. Geological Survey satellite telemeter at station.

COOPERATION.--Capacity table furnished by Seattle Water Department.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 59,220 acre-ft Apr. 30, 1993, elevation, 1,766.26 ft; minimum contents, 25,980 acre-ft Nov. 4, 1991, elevation, 1,728.72ft.

EXTREMES FOR CURRENT YEAR.--Maximum contents, 59,220 acre-ft Apr. 30, elevation, 1,766.26 ft; minimum contents, 26,430 acre-ft Oct. 30, 31, elevation, 1,729.42.

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

1,690	8,100	1,730	26,800	1,760	52,900
1,700	11,300	1,740	34,400	1,765	57,900
1,710	15,400	1,750	43,200	1,780	73,600
1,720	20,400				

RESERVOIR ELEVATION SURFACE WATER (FEET), WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY OBSERVATION AT 24:00 VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1733.50	1729.79	1738.96	1745.08	1754.98	1756.85	1763.17	1766.05	1765.36	1764.42	1763.51	1757.74
2	1733.28	1730.30	1739.07	1745.12	1754.96	1756.84	1763.40	1765.94	1765.33	1764.45	1763.39	1757.51
3	1733.10	1730.34	1739.16	1745.22	1755.14	1756.90	1763.67	1765.76	1765.28	1764.42	1763.22	1757.28
4	1732.93	1730.61	1739.19	1745.26	1755.22	1757.33	1763.75	1765.79	1765.28	1764.40	1762.98	1757.05
5	1732.72	1730.70	1739.17	1745.27	1755.36	1758.13	1763.74	1765.66	1765.23	1764.36	1762.74	1756.80
6	1732.49	1730.91	1739.16	1745.28	1755.53	1758.56	1763.76	1765.68	1765.34	1764.30	1762.48	1756.56
7	1732.23	1733.37	1739.13	1745.26	1755.73	1758.83	1763.84	1765.60	1765.64	1764.19	1762.29	1756.30
8	1732.00	1734.13	1739.14	1745.24	1755.86	1759.04	1764.08	1765.62	1765.59	1764.03	1762.14	1756.03
9	1731.75	1734.36	1739.13	1745.22	1756.09	1759.22	1764.55	1765.55	1765.72	1763.87	1761.97	1755.74
10	1731.50	1734.41	1739.24	1745.20	1756.39	1759.32	1764.95	1765.54	1765.67	1763.69	1761.74	1755.47
11	1731.26	1734.65	1739.22	1745.18	1756.55	1759.46	1765.20	1765.53	1765.70	1763.58	1761.51	1755.24
12	1731.09	1734.99	1739.19	1745.07	1756.69	1759.34	1765.28	1765.62	1765.91	1763.46	1761.25	1754.99
13	1730.94	1735.19	1739.19	1744.98	1756.80	1759.25	1765.33	1765.52	1765.71	1763.35	1761.08	1754.73
14	1730.72	1735.27	1740.06	1744.93	1756.89	1759.84	1765.38	1765.43	1765.57	1763.25	1760.92	1754.49
15	1730.49	1735.25	1740.38	1744.90	1756.95	1761.23	1765.44	1765.40	1765.54	1763.17	1760.72	1754.24
16	1730.30	1735.21	1740.57	1744.87	1756.90	1761.46	1765.44	1765.37	1765.45	1763.05	1760.57	1754.02
17	1730.16	1735.19	1740.70	1744.81	1756.98	1761.47	1765.53	1765.34	1765.34	1763.08	1760.42	1753.81
18	1729.96	1735.23	1740.80	1744.81	1757.01	1761.77	1765.67	1765.39	1765.26	1763.05	1760.27	1753.58
19	1730.01	1735.48	1741.08	1744.83	1756.98	1761.83	1765.64	1765.40	1765.13	1763.11	1760.08	1753.38
20	1730.03	1735.51	1741.39	1744.95	1757.00	1761.89	1765.47	1765.41	1764.97	1763.59	1759.84	1753.19
21	1730.46	1735.81	1741.67	1745.01	1757.04	1762.00	1765.43	1765.62	1764.80	1763.86	1759.59	1752.91
22	1730.61	1736.39	1742.29	1745.02	1757.02	1763.09	1765.44	1765.68	1764.91	1763.96	1759.35	1752.62
23	1730.59	1736.55	1742.88	1745.02	1757.01	1764.00	1765.48	1765.55	1764.94	1763.99	1759.32	1752.39
24	1730.46	1736.57	1743.44	1746.41	1757.00	1763.86	1765.67	1765.44	1764.95	1763.99	1759.28	1752.20
25	1730.28	1736.58	1743.76	1752.16	1756.96	1763.66	1765.87	1765.33	1764.94	1763.95	1759.14	1752.05
26	1730.08	1736.53	1744.30	1754.04	1756.94	1763.50	1765.96	1765.25	1764.82	1763.88	1758.99	1751.85
27	1729.95	1736.95	1744.59	1754.79	1756.89	1763.39	1765.86	1765.21	1764.73	1763.78	1758.84	1751.59
28	1729.80	1737.33	1744.74	1755.28	1756.85	1763.31	1765.71	1765.26	1764.64	1763.72	1758.67	1751.30
29	1729.58	1737.58	1744.84	1755.49	---	1763.26	1766.17	1765.28	1764.57	1763.70	1758.48	1750.99
30	1729.42	1738.69	1744.97	1755.36	---	1763.18	1766.14	1765.21	1764.51	1763.66	1758.26	1750.72
31	1729.56	---	1745.02	1755.18	---	1763.10	---	1765.32	---	1763.60	1758.00	---
MEAN	1731.01	1734.66	1741.17	1747.27	1756.42	1760.80	1765.03	1765.51	1765.23	1763.77	1760.68	1754.23
MAX	1733.50	1738.69	1745.02	1755.49	1757.04	1764.00	1766.17	1766.05	1765.91	1764.45	1763.51	1757.74
MIN	1729.42	1729.79	1738.96	1744.81	1754.96	1756.84	1763.17	1765.21	1764.51	1763.05	1758.00	1750.72
(†)	26520	33400	38820	48220	49840	56000	59090	58230	57410	56500	50960	43900
(‡)	-3080	+6880	+5420	+9400	+1620	+6160	+3090	-860	-820	-910	-5540	-7060

CAL YR 1992 MEAN 1744.09 MAX 1757.47 MIN 1729.42 AC-FT† -3550
WTR YR 1993 MEAN 1753.78 MAX 1766.17 MIN 1729.42 AC-FT† +14300

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

‡ Change in contents, in acre-feet.

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LOCATION.--Lat 47°41'22", long 121°42'44", in SW 1/4 SW 1/4 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.

PERIOD OF RECORD.--October 1952 to December 1963, June 1969 to current year.

REMARKS.--No estimated daily discharges. 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 76 ft³/s upstream from the station. U.S. Geological Survey satellite telemeter at station.

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.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1964 - 1993, BY WATER YEAR (WY)

SUMMARY STATISTICS

SUMMARY STATISTICS	FOR 1992 CALENDAR YEAR		FOR 1993 WATER YEAR		WATER YEARS 1964 - 1993		
ANNUAL TOTAL	24807		30659				
ANNUAL MEAN	67.8		84.0		109		
HIGHEST ANNUAL MEAN					195		1972
LOWEST ANNUAL MEAN					52.3		1977
HIGHEST DAILY MEAN	667	Feb 1	500	Apr 30	3500		Nov 24 1990
LOWEST DAILY MEAN	33	Aug 26	44	Dec 7	19		Oct 6 1963
ANNUAL SEVEN-DAY MINIMUM	33	Aug 25	46	Dec 4	24		Oct 25 1963
ANNUAL RUNOFF (AC-FT)	49200		60810		79100		
10 PERCENT EXCEEDS	71		162		225		
50 PERCENT EXCEEDS	52		59		63		
90 PERCENT EXCEEDS	38		49		37		

SNOHOMISH RIVER BASIN

12148300 SOUTH FORK TOLT RIVER BELOW REGULATING BASIN, NEAR CARNATION, WA

LOCATION.--Lat 47°41'49", long 121°47'10", in SW 1/4 NE 1/4 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 except for estimated daily discharges, which are fair. Flow regulated by South Fork Tolt Reservoir 6.1 mi upstream, capacity, 57,830 acre-ft. During the current water year the Seattle Water Department diverted an average daily discharge of about 76 ft³/s. U.S. Geological Survey satellite telemeter at station.

AVERAGE DISCHARGE.--11 years (water years 1983-93, 146 ft³/s, 105,800 acre-ft/yr, unadjusted.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge not determined, Nov. 24, 1990; maximum daily discharge, 3,700 ft³/s Nov. 24, 1990; minimum discharge, 36 ft³/s on many days during July and August, 1982.

EXTREMES FOR CURRENT YEAR.--Maximum discharge 688 ft³/s Apr. 30, gage height, 5.48 ft; minimum discharge, 56 ft³/s Jan. 18, 19.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	67	74	113	78	245	77	97	522	123	85	88	72
2	69	81	102	74	e167	78	102	495	124	91	86	72
3	70	75	93	72	e84	79	108	397	114	89	85	72
4	68	80	90	72	e83	80	104	386	110	87	83	72
5	67	76	86	72	e82	87	99	358	106	86	82	71
6	66	73	80	69	e82	87	98	362	106	85	81	71
7	65	171	75	69	e82	85	96	345	212	83	81	72
8	65	135	74	69	e82	85	106	329	235	82	80	75
9	64	111	75	67	e83	83	129	303	239	81	80	74
10	63	97	73	66	e84	82	121	290	276	81	79	74
11	63	113	79	64	e82	80	137	273	252	83	78	74
12	63	107	73	63	e81	80	149	271	356	81	76	74
13	68	99	69	62	80	78	148	279	340	80	76	74
14	64	93	107	61	80	85	164	209	251	83	77	73
15	64	88	92	61	79	151	169	158	217	83	76	74
16	64	87	80	59	77	109	173	147	186	82	78	73
17	64	85	74	58	76	99	173	137	160	86	78	72
18	62	85	71	56	76	103	209	133	129	89	76	69
19	67	103	71	57	78	97	260	134	108	86	75	69
20	67	94	112	63	78	96	231	144	95	123	75	71
21	77	104	116	71	77	96	183	169	91	122	75	69
22	72	134	131	67	76	132	166	226	96	110	74	68
23	68	117	153	64	76	352	164	196	97	104	76	68
24	67	105	146	76	75	393	188	160	90	99	78	68
25	66	96	128	327	75	291	325	132	89	97	75	68
26	65	92	127	278	75	212	389	112	87	93	74	68
27	65	98	120	193	75	163	419	100	88	91	74	67
28	65	110	103	152	76	136	346	100	89	91	73	67
29	65	103	95	166	---	119	400	108	90	95	73	67
30	66	122	88	252	---	106	644	103	87	93	73	66
31	70	---	83	250	---	100	---	107	---	89	72	---
TOTAL	2056	3008	2979	3208	2466	3901	6097	7185	4643	2810	2407	2124
MEAN	66.3	100	96.1	103	88.1	126	203	232	155	90.6	77.6	70.8
MAX	77	171	153	327	245	393	644	522	356	123	88	75
MIN	62	73	69	56	75	77	96	100	87	80	72	66
AC-FT	4080	5970	5910	6360	4890	7740	12090	14250	9210	5570	4770	4210

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1982 - 1993, BY WATER YEAR (WY)

	MEAN	80.4	239	198	263	160	154	159	171	125	70.5	58.0	67.7
MAX	147	597	425	579	365	263	380	307	241	118	77.6	112	112
(WY)	1986	1991	1991	1984	1990	1982	1989	1984	1990	1983	1993	1983	1983
MIN	41.2	43.5	70.2	66.3	88.1	73.2	73.1	68.0	53.7	41.9	38.5	42.4	42.4
(WY)	1988	1988	1988	1988	1993	1992	1992	1992	1992	1982	1982	1987	1987

SUMMARY STATISTICS

FOR 1992 CALENDAR YEAR

FOR 1993 WATER YEAR

WATER YEARS 1982 - 1993

ANNUAL TOTAL	33682	42884	
ANNUAL MEAN	92.0	117	146
HIGHEST ANNUAL MEAN			217
LOWEST ANNUAL MEAN			98.6
HIGHEST DAILY MEAN	763	Feb 1	644
LOWEST DAILY MEAN	45	Aug 25	56
ANNUAL SEVEN-DAY MINIMUM	45	Aug 25	59
ANNUAL RUNOFF (AC-FT)	66810	85060	105800
10 PERCENT EXCEEDS	107	228	303
50 PERCENT EXCEEDS	70	85	87
90 PERCENT EXCEEDS	50	67	55

e Estimated

12148500 TOLT RIVER NEAR CARNATION, WA

LOCATION.--Lat 47°41'45", long 121°49'22", in SE 1/4 NE 1/4 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 sea level (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 76 ft³/s upstream from station for municipal use. Chemical analyses July 1960 to September 1970. U.S. Geological Survey satellite telemeter at station.

AVERAGE DISCHARGE.--59 years (water years 1929-31, 1938-93), 579 ft³/s, 419,500 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 17,400 ft³/s Dec. 15, 1959, gage height, 13.04 ft; minimum discharge, 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)
Nov. 7	0730	3,960	8.60	Jan. 25	0600	*9,890	*10.78

Minimum discharge, 122 ft³/s Sept. 29, 30.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	219	449	651	358	728	218	466	1300	527	305	293	166
2	212	600	506	337	593	234	563	1300	479	418	278	163
3	218	393	435	328	464	274	692	1000	426	387	264	161
4	213	409	391	318	453	569	615	1170	425	353	250	159
5	196	376	358	304	473	969	469	996	435	324	240	156
6	187	321	335	282	463	659	441	1130	398	306	232	154
7	179	2000	313	277	475	495	455	1040	955	293	229	152
8	175	956	318	269	481	434	692	1160	754	281	222	154
9	171	641	326	260	487	394	955	942	850	268	215	151
10	166	478	316	252	561	350	744	1040	874	258	210	150
11	163	586	333	241	448	320	808	970	729	259	206	149
12	162	676	309	237	392	296	742	1020	1520	257	202	152
13	229	582	293	e232	360	277	647	897	896	247	197	149
14	189	511	793	228	341	471	708	728	683	299	198	146
15	172	430	561	222	321	1490	684	599	675	284	194	145
16	165	411	433	217	299	595	665	542	611	283	203	143
17	174	405	389	213	281	486	655	533	516	371	216	140
18	176	443	345	209	274	760	790	559	449	350	199	136
19	273	575	350	219	267	522	921	541	400	300	189	134
20	293	515	559	314	262	514	737	588	362	794	182	150
21	531	591	579	336	253	514	e655	680	343	854	178	147
22	379	867	833	275	250	1220	e656	763	413	537	175	138
23	272	631	939	253	242	1890	e715	571	467	480	238	136
24	233	504	819	668	233	1140	e780	494	383	405	360	137
25	214	421	632	5020	227	820	e1140	449	339	371	249	131
26	201	374	705	2030	222	662	e1160	397	323	336	210	130
27	192	594	619	1160	219	567	1150	382	349	311	194	128
28	185	779	521	879	216	491	912	392	388	312	184	125
29	191	516	463	789	---	462	1450	517	360	357	178	123
30	201	1040	423	814	---	416	1890	395	329	400	174	122
31	312	---	386	768	---	389	---	478	---	321	170	---
TOTAL	6843	18074	15233	18309	10285	18898	23957	23573	16658	11321	6729	4327
MEAN	221	602	491	591	367	610	799	760	555	365	217	144
MAX	531	2000	939	5020	728	1890	1890	1300	1520	854	360	166
MIN	162	321	293	209	216	218	441	382	323	247	170	122
AC-FT	13570	35850	30210	36320	20400	37480	47520	46760	33040	22460	13350	8580

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1928 - 1993, BY WATER YEAR (WY)

	443	785	885	847	738	602	678	690	559	297	181	252
MEAN	443	785	885	847	738	602	678	690	559	297	181	252
MAX	933	1781	1897	2058	1634	1472	1275	1208	1204	802	485	954
(WY)	1960	1991	1976	1953	1982	1972	1959	1948	1964	1955	1964	1959
MIN	79.5	123	305	246	163	267	289	310	205	120	74.9	72.9
(WY)	1988	1953	1986	1929	1929	1992	1941	1992	1992	1958	1958	1940

SUMMARY STATISTICS

FOR 1992 CALENDAR YEAR

FOR 1993 WATER YEAR

WATER YEARS 1928 - 1993

ANNUAL TOTAL	137197	174207	
ANNUAL MEAN	375	477	
HIGHEST ANNUAL MEAN			579
LOWEST ANNUAL MEAN			922
HIGHEST DAILY MEAN	2520	5020	11400
LOWEST DAILY MEAN	103	122	53
ANNUAL SEVEN-DAY MINIMUM	106	128	56
ANNUAL RUNOFF (AC-FT)	272100	345500	419800
10 PERCENT EXCEEDS	672	886	1120
50 PERCENT EXCEEDS	269	383	447
90 PERCENT EXCEEDS	140	172	139

e Estimated

12150800 SNOHOMISH RIVER NEAR MONROE, WA

LOCATION.--Lat 47°49'52", long 122°02'50", in NE 1/4 NW 1/4 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.

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 sea level. 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 at sea level datum.

REMARKS.--No estimated daily discharges. Records good. 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 76 ft³/s upstream from station from South Fork Tolt River for municipal use and the City of Everett diverted an undetermined amount of discharge upstream from the station from Sultan River for municipal use. Chemical analyses December 1974 to January 1976, July 1979 to September 1986. Unpublished records of water temperature and suspended-sediment concentration are available in the Tacoma office of the U.S. Geological Survey.

AVERAGE DISCHARGE.--30 years, 9,539 ft³/s, 84.28 in/yr, 6,911,000 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, 150,000 ft³/s Nov. 25, 1990, gage height, 25.30 ft, from rating curve extended above 80,000 ft³/s; minimum discharge, 763 ft³/s Oct., 30, 31, 1987, gage height, 0.51 ft.

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)
Jan. 25	1800	*52,700	*14.27	No other peak greater than base discharge.			
Minimum discharge, 1,470 ft ³ /s Sept. 30.							

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3970	5660	11700	5340	8740	2860	6500	22900	13500	5950	4650	2160
2	3560	7590	9070	4970	7860	3000	7430	21100	11700	6110	4280	2160
3	3430	7870	7570	4770	7070	3240	8690	18600	10300	6490	4050	2290
4	3340	6380	6550	4820	6550	4040	9970	16700	9420	6150	3850	2450
5	3050	7350	5960	4530	6310	8240	8540	15800	9330	5710	3650	2430
6	2820	6340	5390	4230	6170	10900	7500	16700	9190	5360	3470	2420
7	2650	17100	5070	3990	6180	9220	7450	17900	10500	5060	3340	2370
8	2510	19900	5110	3800	6360	7980	8040	17000	12000	4780	3200	2320
9	2420	14800	5130	3790	6510	7480	12700	16500	11000	4530	3060	2280
10	2350	11000	5060	3620	6870	6820	13000	15800	14300	4330	2940	2250
11	2270	10100	5990	3480	6750	6140	11900	20300	12300	4120	2850	2210
12	2180	11100	5630	3210	6150	5560	11200	24200	15000	4140	2750	2250
13	2430	10900	5090	3020	5630	5120	9920	26900	13000	3910	2670	2310
14	2970	10100	6700	3000	5290	4970	10100	20700	10700	4140	2610	2210
15	2630	9220	11100	2900	5000	14900	9180	17900	10800	4160	2600	1910
16	2410	8440	8320	2800	4970	13900	9060	15200	10500	4080	2760	1850
17	2390	8310	7020	2720	4450	9470	8620	15000	9250	4480	2990	1800
18	2510	8160	6230	2670	4150	9090	10000	16400	8530	4950	2870	1780
19	3000	9360	5750	2670	3980	9300	11600	18400	7940	4500	2630	1740
20	5510	10400	7390	3360	3810	8030	10200	18300	7380	6210	2410	1840
21	6220	9440	8540	4350	3690	7890	9230	17100	6900	9980	2320	1950
22	7060	12100	8840	4110	3600	8730	9460	19100	6960	7770	2260	1920
23	5830	12200	13600	3610	3450	29400	9870	15800	8970	6810	2520	1840
24	4850	9550	11800	3560	3280	24200	10100	13000	8300	6180	4230	1800
25	4270	7900	10200	36000	3140	16000	12300	12900	7060	5740	4040	1760
26	3870	6890	9180	39900	3020	11800	14600	11800	6640	5310	3500	1710
27	3560	6510	9540	31000	2940	9700	15700	11500	6840	4880	3170	1680
28	3200	8490	8060	20600	2880	8420	14200	12100	7220	4700	2580	1640
29	3000	7570	7050	15200	---	7740	14200	12900	6860	4920	2440	1550
30	2990	9400	6350	11900	---	7150	26300	11200	6420	5800	2330	1500
31	3500	---	5780	9960	---	6550	---	10700	---	5330	2230	---
TOTAL	106750	290130	234770	253880	144800	287840	327560	520400	288810	166580	95250	60380
MEAN	3444	9671	7573	8190	5171	9285	10920	16790	9627	5374	3073	2013
MAX	7060	19900	13600	39900	8740	29400	26300	26900	15000	9980	4650	2450
MIN	2180	5660	5060	2670	2880	2860	6500	10700	6420	3910	2230	1500
AC-FT	211700	575500	465700	503600	287200	570900	649700	1032000	572900	330400	188900	119800
CFSM	2.24	6.29	4.93	5.33	3.36	6.04	7.10	10.9	6.26	3.50	2.00	1.31
IN.	2.58	7.02	5.68	6.14	3.50	6.97	7.93	12.60	6.99	4.03	2.31	1.46

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1963 - 1993, BY WATER YEAR (WY)

MEAN	5609	12110	13370	12910	11010	9164	10330	13180	12800	7033	3088	3572
MAX	12380	34800	29580	22000	24300	25700	16050	20450	24730	15290	7885	7646
(WY)	1968	1991	1976	1984	1982	1972	1989	1972	1974	1964	1964	1978
MIN	894	2624	3966	4401	4606	4859	5340	7743	4070	2683	1413	1133
(WY)	1988	1988	1986	1979	1973	1985	1975	1992	1992	1987	1987	1987

SUMMARY STATISTICS

FOR 1992 CALENDAR YEAR

FOR 1993 WATER YEAR

WATER YEARS 1963 - 1993

ANNUAL TOTAL	2379080	2777150	9539
ANNUAL MEAN	6500	7609	13670
HIGHEST ANNUAL MEAN			6577
LOWEST ANNUAL MEAN			1977
HIGHEST DAILY MEAN	39000	39900	132000
LOWEST DAILY MEAN	1070	1500	777
ANNUAL SEVEN-DAY MINIMUM	1120	1660	796
ANNUAL RUNOFF (AC-FT)	4719000	5508000	6911000
ANNUAL RUNOFF (CFSM)	4.23	4.95	6.21
ANNUAL RUNOFF (INCHES)	57.58	67.22	84.33
10 PERCENT EXCEEDS	11100	14900	18100
50 PERCENT EXCEEDS	5460	6310	7530
90 PERCENT EXCEEDS	1930	2410	2300

SNOHOMISH RIVER BASIN

12155300 PILCHUCK RIVER NEAR SNOHOMISH, WA

LOCATION.--Lat 47°56'06", long 122°04'19", in NW 1/4 NW 1/4 sec.8, T.28 N., R.6 E., Snohomish County, Hydrologic Unit 17110011, on left bank, 1.8 mi northeast of Snohomish, and at mile 3.6.

DRAINAGE AREA.--127 mi².

PERIOD OF RECORD.--May 1992 to current year.

GAGE.--Water-stage recorder. Datum of gage is 30.00 ft above sea level.

REMARKS.--Records good except those above 3,500 ft³/s, which are poor.

AVERAGE DISCHARGE.--1 year (water year 1993) 373 ft³/s, 39.88 in/yr, 270,200 acre-ft/yr.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of Nov. 24, 1990, reached a stage of 18.75 ft, from high-water mark at former bridge, discharge, 7,100 ft³/s (from slope area measurement of peak flow).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, unknown Jan. 25, 1993, gage height, 17.71 ft, from high-water mark; minimum discharge, 56 ft³/s Sept. 1-3, 7, 1992.

EXTREMES FOR PERIOD.--

Water year 1992 (May to September): Maximum discharge, 1,140 ft³/s May 10, gage height, 11.22 ft; minimum, 56 ft³/s Sept. 1-3, 7.

Water year 1993: Maximum discharge, unknown Jan. 25, gage height, 17.71 ft, from high-water mark; minimum discharge, 71 ft³/s Oct. 11, 12.

DAILY MEAN VALUES

DAY	MAY	JUN	JUL	AUG	SEP
1	---	86	120	72	57
2	---	84	101	71	56
3	---	82	91	74	57
4	---	79	89	72	59
5	213	78	524	69	61
6	193	78	517	75	58
7	174	78	324	114	57
8	159	76	221	166	163
9	167	77	179	109	145
10	713	76	153	94	90
11	480	83	145	84	76
12	303	104	132	79	71
13	239	384	120	77	94
14	207	398	114	72	101
15	182	201	114	70	81
16	164	150	104	67	72
17	152	129	95	66	68
18	142	116	89	64	65
19	134	110	85	63	63
20	126	99	84	67	70
21	122	92	83	64	177
22	121	87	82	67	109
23	113	88	91	71	89
24	108	83	138	65	266
25	104	78	119	63	446
26	107	75	99	61	261
27	104	73	90	60	295
28	98	72	83	60	182
29	95	142	78	58	139
30	91	193	76	58	116
31	88	---	73	58	---
TOTAL	---	3551	4413	2310	3644
MEAN	---	118	142	74.5	121
MAX	---	398	524	166	446
MIN	---	72	73	58	56
AC-FT	---	7040	8750	4580	7230
CFSM	---	.93	1.12	.59	.96
IN.	---	1.04	1.29	.68	1.07

SNOHOMISH RIVER BASIN

183

12155300 PILCHUCK RIVER NEAR SNOHOMISH, WA--Continued

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	103	228	761	342	476	180	313	595	404	218	234	102
2	95	236	529	303	419	196	355	701	378	241	206	99
3	94	246	415	290	386	224	502	657	319	244	186	96
4	92	233	344	301	359	317	691	700	284	232	170	97
5	92	264	301	276	360	537	511	601	313	213	156	96
6	84	195	269	243	341	420	424	776	271	199	145	97
7	84	1130	244	225	331	318	431	914	307	196	147	90
8	80	760	240	218	318	277	513	1010	287	190	145	87
9	75	569	332	206	321	256	740	883	287	174	136	88
10	73	374	384	197	313	242	746	753	487	164	131	87
11	72	483	543	186	293	225	775	636	590	157	127	86
12	77	506	531	176	269	213	800	566	732	155	127	86
13	86	383	453	170	254	201	690	497	583	151	119	85
14	94	309	817	165	246	203	678	418	426	207	113	83
15	81	255	861	159	236	498	621	372	422	241	111	84
16	77	369	636	153	223	324	585	340	398	244	119	82
17	76	562	513	147	213	290	532	315	335	358	128	77
18	88	544	424	142	206	345	630	298	285	456	125	76
19	155	784	385	147	204	307	630	286	251	322	110	79
20	252	836	639	308	e195	298	514	291	228	1150	105	129
21	327	601	896	489	e190	376	451	279	214	1570	101	138
22	238	892	1040	365	e185	488	443	277	278	742	99	108
23	170	718	1690	300	e180	2170	440	251	409	514	128	e96
24	138	503	1230	293	e175	1010	429	238	303	382	232	e90
25	124	402	832	e5000	e175	666	532	226	244	322	180	e86
26	113	335	841	e3000	e170	521	674	210	220	271	151	e84
27	104	352	896	1410	e170	440	665	201	265	238	136	e82
28	99	594	673	949	e170	387	553	209	329	241	121	e80
29	98	454	540	797	---	366	735	247	270	354	114	e79
30	103	893	460	622	---	344	912	233	244	375	109	e78
31	138	---	395	543	---	314	---	249	---	287	105	---
TOTAL	3582	15010	19114	18122	7378	12953	17515	14229	10363	10808	4316	2727
MEAN	116	500	617	585	263	418	584	459	345	349	139	90.9
MAX	327	1130	1690	5000	476	2170	912	1010	732	1570	234	138
MIN	72	195	240	142	170	180	313	201	214	151	99	76
AC-FT	7100	29770	37910	35940	14630	25690	34740	28220	20560	21440	8560	5410
CFSM	.91	3.94	4.85	4.60	2.07	3.29	4.60	3.61	2.72	2.75	1.10	.72
IN.	1.05	4.40	5.60	5.31	2.16	3.79	5.13	4.17	3.04	3.17	1.26	.80

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1992 - 1993, BY WATER YEAR (WY)

MEAN	116	500	617	585	263	418	584	459	232	245	107	106
MAX	116	500	617	585	263	418	584	459	345	349	139	121
(WY)	1993	1993	1993	1993	1993	1993	1993	1993	1993	1993	1993	1992
MIN	116	500	617	585	263	418	584	459	118	142	74.5	90.9
(WY)	1993	1993	1993	1993	1993	1993	1993	1993	1992	1992	1992	1993

SUMMARY STATISTICS

FOR 1993 WATER YEAR

WATER YEARS 1992 - 1993

ANNUAL TOTAL	136117		
ANNUAL MEAN	373		
HIGHEST ANNUAL MEAN	373		1993
LOWEST ANNUAL MEAN	373		1993
HIGHEST DAILY MEAN	5000	Jan 25	1993
LOWEST DAILY MEAN	72	Oct 11	1992
ANNUAL SEVEN-DAY MINIMUM	78	Oct 6	1992
ANNUAL RUNOFF (AC-FT)	270000		270200
ANNUAL RUNOFF (CFSM)	2.94		2.94
ANNUAL RUNOFF (INCHES)	39.87		39.90
10 PERCENT EXCEEDS	737		637
50 PERCENT EXCEEDS	279		207
90 PERCENT EXCEEDS	95		77

e Estimated

STILLAGUAMISH RIVER BASIN

12167000 NORTH FORK STILLAGUAMISH RIVER NEAR ARLINGTON, WA

LOCATION.--Lat 48°15'42", long 122°02'47", in SW 1/4 NW 1/4 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 sea level.

REMARKS.--No estimated daily discharges. Records good. 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. U.S. Geological Survey satellite telemeter at station.

AVERAGE DISCHARGE.--65 years, 1,893 ft³/s, 98.12 in/yr, 1,371,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 36,700 ft³/s Nov. 24, 1990, gage height, 15.20 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)
Jan. 25	1015	*23,400	*12.47	Mar. 23	0200	18,200	11.16
Minimum discharge, 208 ft ³ /s Sept. 27-30.							

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	568	1800	1950	869	1830	572	1310	2040	1440	844	738	316
2	507	1770	1440	805	1650	636	1640	4830	1210	806	671	306
3	505	1180	1200	803	1580	760	2250	2850	1130	769	620	301
4	474	1320	1060	773	1530	1650	2040	2220	1050	755	576	291
5	421	1240	959	699	1710	3250	1540	1880	1060	709	530	287
6	385	984	882	624	1680	2410	1380	2510	958	671	495	287
7	343	6680	827	617	1720	1930	1770	2280	974	642	473	279
8	314	3240	819	639	1670	1730	2230	2860	904	607	453	275
9	292	2140	1120	588	1650	1540	2600	2530	1550	577	431	269
10	273	1510	1010	524	1730	1330	2220	2240	2560	558	412	262
11	260	1910	960	523	1540	1170	2010	2380	1820	530	393	256
12	256	1670	877	567	1350	1060	1760	2480	2230	529	369	269
13	431	1440	809	509	1220	982	1540	2400	1700	521	353	256
14	357	1320	1990	530	1120	1250	1560	1860	1370	606	347	254
15	293	1160	1640	504	1040	3510	1650	1660	1770	550	349	285
16	262	1660	1220	470	929	1770	1700	1460	1600	520	368	264
17	279	2120	1070	446	857	1640	1600	1450	1280	548	369	246
18	336	1620	919	435	827	2690	1990	1500	1140	579	347	233
19	1330	2180	882	444	806	1810	1700	1570	1050	510	334	231
20	1490	2070	1350	1320	800	2040	1460	1500	969	1460	324	299
21	1330	2450	1640	1810	763	2070	1450	1520	899	1670	313	284
22	1040	3850	2750	1140	731	4240	1540	1540	1430	1140	309	256
23	852	2060	3760	906	688	10400	1680	1320	1840	1120	529	239
24	716	1490	3180	1780	639	3750	1740	1180	1420	922	762	227
25	647	1240	2080	15700	608	2470	2220	1160	1150	823	701	224
26	576	1080	1850	5880	590	1970	2920	1110	1040	743	491	218
27	520	2450	1610	4270	598	1700	3670	1100	1080	677	406	213
28	476	2550	1350	3110	576	1520	2250	1210	1100	752	365	212
29	509	1580	1170	2620	---	1430	2510	1260	1050	1040	384	211
30	523	2830	1060	2120	---	1320	2390	1110	936	1110	349	211
31	954	---	955	1980	---	1240	---	1170	---	861	330	---
TOTAL	17519	60594	44389	54005	32432	65840	58320	58180	39710	24149	13891	7761
MEAN	565	2020	1432	1742	1158	2124	1944	1877	1324	779	448	259
MAX	1490	6680	3760	15700	1830	10400	3670	4830	2560	1670	762	316
MIN	256	984	809	435	576	572	1310	1100	899	510	309	211
AC-FT	34750	120200	88050	107100	64330	130600	115700	115400	78760	47900	27550	15390
CFSM	2.16	7.71	5.47	6.65	4.42	8.11	7.42	7.16	5.05	2.97	1.71	.99
IN.	2.49	8.60	6.30	7.67	4.60	9.35	8.28	8.26	5.64	3.43	1.97	1.19

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1928 - 1993, BY WATER YEAR (WY)

MEAN	1501	2739	3016	2768	2452	2107	2243	2186	1682	890	465	693
MAX	3832	8008	6177	5852	5632	5814	4040	3638	3348	2165	1049	2418
(WY)	1968	1991	1980	1953	1982	1972	1959	1949	1974	1922	1964	1959
MIN	171	223	871	484	467	898	812	1091	510	290	166	140
(WY)	1988	1927	1986	1937	1929	1992	1941	1992	1992	1940	1938	1938

SUMMARY STATISTICS	FOR 1992 CALENDAR YEAR	FOR 1993 WATER YEAR	WATER YEARS 1928 - 1993
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ANNUAL TOTAL	462270		476790						
ANNUAL MEAN	1263		1306			1893			
HIGHEST ANNUAL MEAN						2808			1974
LOWEST ANNUAL MEAN						1123			1930
HIGHEST DAILY MEAN	9760	Jan 24	15700	Jan 25	34200			Nov 24	1990
LOWEST DAILY MEAN	154	Sep 7	211	Sep 29	123			Sep 23	1938
ANNUAL SEVEN-DAY MINIMUM	163	Sep 1	217	Sep 24	128			Sep 17	1938
ANNUAL RUNOFF (AC-FT)	916900		945700		1371000				
ANNUAL RUNOFF (CFSM)	4.82		4.99		7.22				
ANNUAL RUNOFF (INCHES)	65.64		67.70		98.15				
10 PERCENT EXCEEDS	2450		2380		3710				
50 PERCENT EXCEEDS	863		1100		1370				
90 PERCENT EXCEEDS	282		308		345				

STILLAGUAMISH RIVER BASIN

185

12168500 PILCHUCK CREEK NEAR BRYANT, WA

LOCATION.--Lat 48°15'58", long 122°09'46", in NE 1/4 NE 1/4 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).

REVISED RECORDS.--WSP 1316: 1930-31(M). WSP 1932: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 119.8 ft above sea level (stadia traverse). Prior to Oct. 1, 1931, nonrecording gage at site 100 ft downstream at different datum.

REMARKS.--No estimated daily discharges. Records good. No regulation or diversion upstream from station. Water temperatures March 1952 to August 1968, March 1969 to September 1972.

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 discharge observed, 0.5 ft³/s Aug. 29 to Sept. 1, 1931, gage height, 0.90 ft, site and datum then in use.

EXTREMES FOR CURRENT YEAR.--Maximum discharge during period June to October, 1,340 ft³/s Oct. 23, gage height, 4.37 ft; minimum discharge, 4.5 ft³/s Oct. 12.

DISCHARGE, CUBIC FEET PER SECOND, JUNE TO OCTOBER 1993
DAILY MEAN VALUES

DAY	JUN	JUL	AUG	SEP	OCT
1	299	59	79	12	8.0
2	160	53	61	11	8.3
3	135	49	52	10	8.0
4	107	47	45	10	8.2
5	107	44	39	9.8	8.0
6	85	39	36	9.0	8.9
7	73	37	34	8.8	11
8	62	34	32	8.8	12
9	260	30	30	8.8	10
10	769	29	29	8.5	7.7
11	336	29	27	8.0	6.1
12	575	29	25	8.5	5.0
13	324	28	23	11	5.4
14	186	35	23	11	7.6
15	307	30	23	13	114
16	240	29	25	15	46
17	151	27	27	13	36
18	111	26	28	11	25
19	91	24	24	11	32
20	76	276	22	23	30
21	68	304	21	27	20
22	167	160	20	18	18
23	207	345	32	14	713
24	123	135	48	12	349
25	87	97	49	11	125
26	70	74	30	11	78
27	69	59	25	10	60
28	80	93	20	10	61
29	86	205	19	10	64
30	68	216	16	8.3	52
31	---	114	13	---	99
TOTAL	5479	2756	977	352.5	2036.2
MEAN	183	88.9	31.5	11.7	65.7
MAX	769	345	79	27	713
MIN	62	24	13	8.0	5.0
AC-FT	10870	5470	1940	699	4040
CFSM	3.51	1.71	.61	.23	1.26
IN.	3.92	1.97	.70	.25	1.46

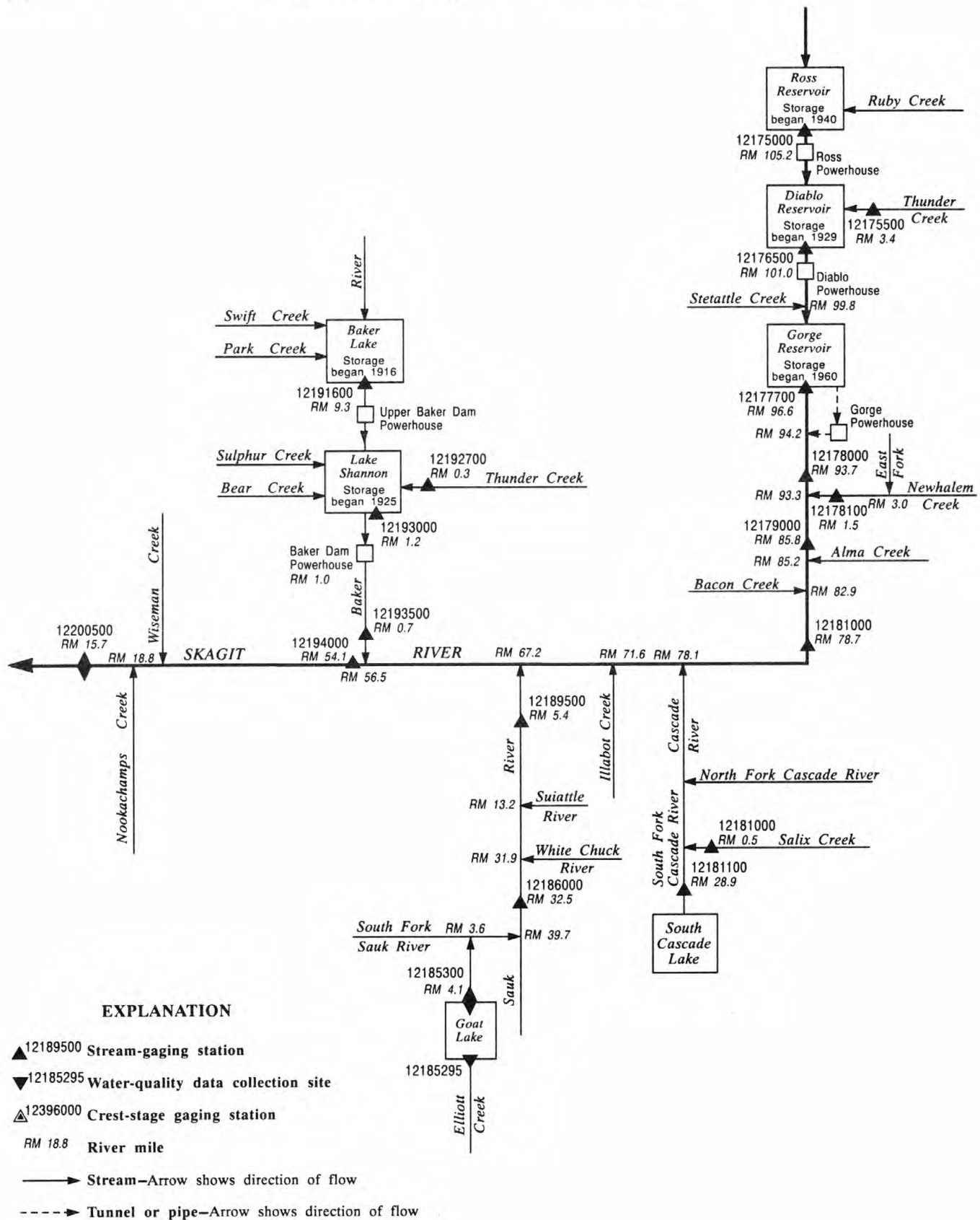


Figure 16. Gaging stations in Skagit River Basin.

SKAGIT RIVER BASIN

187

12175000 ROSS RESERVOIR NEAR NEWHALEM, WA
(International gaging station)

LOCATION.--Lat 48°43'58", long 121°04'02", in SE 1/4 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 sea level, U.S. Coast and Geodetic Survey datum; and 0.88 ft above sea level, 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. U.S. Geological Survey satellite telemeter at station.

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 contents 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, 1,434,036 acre-ft Aug. 16, elevation, 1,602.44 ft; minimum contents, 583,836 acre-ft Mar. 22, elevation, 1,511.90 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)

1,490	454,480	1,550	888,320
1,500	509,240	1,575	1,130,200
1,540	800,920	1,603	1,440,700

ELEVATION (FEET NGVD), WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY OBSERVATION AT 24:00 VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1587.04	1579.96	1566.20	1551.33	1532.72	1515.21	1515.93	1520.06	1578.89	1599.56	1602.27	1601.70
2	1586.95	1579.38	1565.78	1550.69	1532.24	1515.09	1515.91	1520.92	1580.12	1599.64	1602.30	1601.48
3	1586.84	1578.58	1565.18	1550.32	1531.61	1514.62	1516.04	1521.54	1581.25	1599.79	1602.30	1601.30
4	1586.73	1578.32	1564.63	1549.80	1531.24	1514.33	1516.04	1522.28	1582.36	1599.74	1602.32	1601.16
5	1586.50	1577.65	1564.11	1548.72	1530.85	1514.02	1516.08	1522.98	1583.39	1599.86	1602.31	1601.25
6	1586.20	1576.82	1563.49	1547.71	1530.45	1514.00	1515.95	1524.15	1584.44	1599.95	1602.30	1601.28
7	1585.99	1576.99	1562.94	1546.70	1530.20	1513.79	1516.01	1525.15	1585.48	1600.02	1602.27	1601.08
8	1585.74	1576.87	1562.44	1546.06	1529.66	1513.60	1516.10	1525.98	1586.35	1600.09	1602.29	1600.85
9	1585.48	1576.47	1561.89	1545.22	1529.11	1513.51	1516.30	1526.84	1587.21	1600.11	1602.23	1600.60
10	1585.26	1575.83	1561.29	1544.75	1528.55	1513.44	1516.45	1528.00	1588.26	1600.25	1602.22	1600.41
11	1585.20	1575.23	1560.80	1544.04	1527.95	1513.18	1516.60	1530.50	1589.11	1600.31	1602.23	1600.36
12	1585.05	1574.59	1560.05	1543.34	1527.47	1512.90	1516.72	1534.14	1589.87	1600.37	1602.29	1600.23
13	1584.91	1574.00	1559.52	1542.58	1526.76	1512.70	1516.53	1538.35	1590.58	1600.51	1602.29	1600.05
14	1584.63	1573.39	1558.95	1541.79	1526.21	1512.75	1516.68	1542.20	1591.09	1600.68	1602.32	1599.93
15	1584.24	1572.94	1558.24	1541.25	1525.41	1512.48	1516.74	1545.56	1591.95	1600.79	1602.36	1599.79
16	1583.81	1572.52	1557.70	1540.31	1524.76	1512.29	1516.77	1548.50	1592.58	1600.88	1602.30	1599.59
17	1583.49	1572.15	1557.30	1539.81	1523.91	1512.24	1516.79	1551.05	1593.30	1601.01	1602.28	1599.43
18	1583.48	1571.79	1556.70	1539.22	1522.99	1512.14	1516.87	1553.57	1594.05	1601.12	1602.23	1599.29
19	1582.83	1571.47	1556.24	1538.49	1522.05	1512.09	1517.02	1556.37	1594.79	1601.35	1602.21	1599.10
20	1583.10	1571.09	1555.85	1538.04	1521.38	1512.03	1517.04	1559.29	1595.46	1601.99	1602.26	1598.88
21	1583.35	1570.75	1555.59	1537.22	1520.62	1511.94	1516.95	1561.57	1596.02	1602.21	1602.27	1598.67
22	1583.42	1570.43	1555.46	1536.45	1519.78	1512.21	1517.17	1563.49	1596.55	1602.15	1602.42	1598.55
23	1583.43	1569.83	1555.26	1535.52	1518.70	1513.34	1517.44	1565.03	1596.97	1602.18	1602.27	1598.26
24	1583.39	1569.40	1555.11	1535.35	1517.85	1514.28	1517.63	1566.49	1597.30	1602.21	1602.16	1598.00
25	1583.38	1568.89	1554.65	1535.25	1517.20	1514.79	1517.85	1568.00	1597.62	1602.24	1602.01	1597.74
26	1583.19	1568.32	1554.49	1534.83	1516.55	1515.25	1518.29	1569.63	1597.98	1602.28	1601.85	1597.50
27	1582.90	1567.99	1554.43	1534.81	1516.12	1515.51	1518.62	1571.30	1598.54	1602.18	1601.84	1597.20
28	1582.43	1567.46	1553.95	1534.65	1515.76	1515.72	1519.01	1572.92	1598.85	1602.21	1601.91	1597.05
29	1581.86	1567.09	1553.56	1534.25	---	1515.91	1519.24	1574.46	1599.20	1602.29	1601.93	1596.81
30	1581.01	1566.61	1552.80	1533.74	---	1515.84	1519.51	1575.73	1599.47	1602.13	1601.86	1596.62
31	1580.27	---	1552.00	1533.18	---	1516.02	---	1577.50	---	1602.06	1601.82	---
MAX	1587.04	1579.96	1566.20	1551.33	1532.72	1516.02	1519.51	1577.50	1599.47	1602.29	1602.42	1601.70
MIN	1580.27	1566.61	1552.00	1533.18	1515.76	1511.94	1515.91	1520.06	1578.89	1599.56	1601.82	1596.62
†	1185662	1044839	906300	743946	610596	612433	637633	1156350	1399152	1429514	1426676	1366268
‡	-74268	-140823	-138539	-162354	-133350	+1837	+25200	+518717	+242802	+30362	-2838	-60408

CAL YR 1992 MAX 1597.90 MIN 1531.83 AC-FT† -260494
WTR YR 1993 MAX 1602.42 MIN 1511.94 AC-FT‡ +106338

† 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 SE 1/4 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 fair except for estimated daily discharges, which are poor. No regulation or diversion upstream from station. Large diurnal fluctuations caused by snowmelt during summer months.

AVERAGE DISCHARGE.--63 years, 614 ft³/s, 79.41 in/yr, 444,800 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 discharge 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)
May 11	0445	*3,320	*7.93	May 21	1315	2,740	7.37

Minimum daily discharge, 64 ft³/s Jan. 19.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	464	213	176	e113	e190	89	194	418	1220	556	786	493
2	475	202	166	e108	e180	88	192	511	1500	587	889	607
3	463	178	144	e101	e175	88	194	723	1320	569	1040	724
4	317	182	139	e97	e168	96	197	593	1240	605	1100	693
5	250	185	138	e94	e170	115	192	482	1110	639	1140	772
6	e235	171	137	e91	e172	135	191	416	1150	624	1180	790
7	219	778	136	e87	e175	139	e194	875	1280	643	1050	814
8	210	421	134	e85	e178	139	e215	1850	1240	684	959	761
9	203	293	132	e82	e180	140	244	2230	944	776	842	801
10	200	236	131	e80	178	135	229	2690	1430	769	726	783
11	227	213	e129	e78	171	129	221	2890	1060	756	e680	648
12	285	196	e128	e75	159	125	213	2670	843	630	e640	463
13	423	187	e127	e71	148	120	205	2570	686	634	e615	342
14	212	192	e168	e68	139	123	199	2330	858	718	e595	357
15	167	202	e190	e66	130	153	198	1990	1270	683	e610	378
16	153	223	e160	e74	117	139	198	1780	1110	632	e630	292
17	147	256	e137	e71	115	137	199	1590	1140	722	e615	279
18	229	225	e128	e67	112	150	215	1710	1190	835	e595	271
19	543	205	e120	e64	111	146	212	1810	1190	847	e575	252
20	608	192	e165	e88	109	144	210	2150	1070	1210	e560	238
21	668	182	e170	e103	107	144	212	2540	992	1040	e540	211
22	508	181	e200	e70	104	202	227	2030	832	880	e525	193
23	605	177	e290	e82	100	573	240	1560	707	847	e880	189
24	642	173	e240	e100	100	568	269	1240	599	788	e190	190
25	425	170	e190	e500	97	458	269	1120	670	757	546	184
26	312	167	e170	e430	93	360	270	1240	861	832	468	202
27	259	191	e155	e340	91	299	320	1360	1020	928	459	298
28	227	209	e145	e280	90	253	395	1490	732	1110	425	358
29	207	178	e137	e245	---	227	530	1580	615	1220	426	414
30	188	181	e128	e220	---	208	455	1660	567	989	448	399
31	178	---	e120	e205	---	196	---	1530	---	780	482	---
TOTAL	10249	6759	4830	4235	3859	6018	7299	49628	30446	24290	21816	13396
MEAN	331	225	156	137	138	194	243	1601	1015	784	704	447
MAX	668	778	290	500	190	573	530	2890	1500	1220	1180	814
MIN	147	167	120	64	90	88	191	416	567	556	425	184
AC-FT	20330	13410	9580	8400	7650	11940	14480	98440	60390	48180	43270	26570
CFSM	3.15	2.15	1.48	1.30	1.31	1.85	2.32	15.2	9.67	7.46	6.70	4.25
IN.	3.63	2.39	1.71	1.50	1.37	2.13	2.59	17.58	10.79	8.61	7.73	4.75

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1931 - 1993, BY WATER YEAR (WY)

	445	385	319	252	229	210	380	886	1319	1312	986	620
MEAN	445	385	319	252	229	210	380	886	1319	1312	986	620
MAX	917	1487	1023	842	683	663	1057	1601	2072	1935	1334	894
(WY)	1934	1991	1981	1984	1991	1972	1934	1993	1948	1975	1972	1967
MIN	200	110	95.2	78.4	57.3	91.1	172	432	837	784	704	367
(WY)	1978	1936	1931	1979	1936	1956	1975	1977	1981	1993	1993	1985

SUMMARY STATISTICS	FOR 1992 CALENDAR YEAR	FOR 1993 WATER YEAR	WATER YEARS 1931 - 1993
ANNUAL TOTAL	239287	182825	
ANNUAL MEAN	654	501	614
HIGHEST ANNUAL MEAN			863
LOWEST ANNUAL MEAN			452
HIGHEST DAILY MEAN	2440	2890	8950
LOWEST DAILY MEAN	120	64	50
ANNUAL SEVEN-DAY MINIMUM	131	69	52
ANNUAL RUNOFF (AC-FT)	474600	362600	444900
ANNUAL RUNOFF (CFSM)	6.23	4.77	5.85
ANNUAL RUNOFF (INCHES)	84.78	64.77	79.47
10 PERCENT EXCEEDS	1460	1160	1350
50 PERCENT EXCEEDS	386	252	417
90 PERCENT EXCEEDS	169	110	132

e Estimated

12178000 SKAGIT RIVER AT NEWHALEM, WA

LOCATION.--Lat 48°40'19", long 121°14'48", in SW 1/4 SE 1/4 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 sea level (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.--No estimated daily discharges. 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 (station 12175000) since March 1940, Diablo Reservoir (station 12176500) since October 1929, and Gorge Reservoir (station 12177700) since June 1960, having a combined total capacity of 1,533,000 acre-ft. U.S. Geological Survey satellite telemeter at station. Chemical analyses October 1973 to September 1974.

AVERAGE DISCHARGE.--85 years (water years 1909-93), 4,398 ft³/s, 3,186,000 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 discharge, 54 ft³/s Nov. 1, 1943, gage height, 78.15 ft; minimum daily discharge, 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, 7,630 ft³/s Jan. 14, gage height, 85.25 ft; minimum discharge, 1,530 ft³/s Oct. 11, gage height, 81.39 ft; minimum daily discharge, 1,570 ft³/s June 13, 22.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2370	4440	4130	3670	3960	2510	2350	2400	2690	2380	2660	2610
2	2400	4650	4260	3810	3590	2380	2360	2390	2240	2590	2990	2480
3	2590	5190	4130	3970	3860	2370	2370	1800	2110	2630	3750	3410
4	1800	4650	4170	3740	3850	2510	2370	1780	1820	2630	3740	3010
5	2680	4010	4100	5150	3630	2530	2370	1780	1730	2630	3900	1800
6	2660	4940	4170	5580	3230	2530	2360	2030	1820	2630	3750	1940
7	2360	4600	4220	5270	2640	2530	2360	1920	2230	2610	3540	3480
8	2370	3660	4200	3540	3660	2510	2370	1870	2610	2610	3370	3610
9	2460	4610	4130	4020	4070	2410	2370	1780	2160	2610	3480	3700
10	2030	5200	4160	3190	4330	2380	2370	1850	2450	2610	2910	3350
11	1700	5340	4100	4050	4240	2370	2370	3380	1690	2620	2270	3050
12	2460	5130	4200	3760	4720	2400	2370	5440	1580	2630	2310	2560
13	2310	4940	4080	4190	4710	2400	2700	4820	1570	2630	2470	2410
14	3250	4070	3750	4130	3430	2470	2350	4340	2000	2700	2250	2620
15	3250	4890	4220	3610	4160	2490	2350	3050	3090	2640	2490	2650
16	3120	4140	4120	3940	4350	2500	2350	2520	2530	2640	4450	2460
17	2400	4150	3950	2780	4110	2540	2350	3090	2230	2660	4760	2380
18	1790	4130	3670	3760	4700	2580	2350	2660	1900	2640	3300	2330
19	2100	4110	3230	3850	4970	2550	2360	3020	1860	2650	3050	2210
20	2680	3830	2810	3700	4010	2370	2350	4480	1770	2660	2430	2490
21	2310	4080	2680	4190	4080	2380	2360	3160	1590	3770	2160	2560
22	3190	4240	2040	4320	4500	2520	2370	2330	1570	5060	2160	2180
23	2900	4400	2030	4230	4710	3310	2370	1910	1700	4610	2440	2540
24	2440	3960	2340	2770	4470	2560	2370	2410	1840	4050	3180	2750
25	2480	4130	3070	3970	3920	2540	2370	2140	1760	3930	3260	2520
26	3260	4000	3030	3180	3120	2490	2370	2190	1880	4080	2900	2780
27	3770	3890	3110	2660	2630	2360	2380	1900	1900	4210	2410	2640
28	3780	4110	2760	2840	2450	2370	2380	2260	1900	4780	2060	2050
29	5020	4140	2800	3280	---	2360	2380	3060	1840	4770	2060	2850
30	5120	4030	3920	3860	---	2360	2380	2040	5200	2140	2140	2560
31	5040	---	3920	3880	---	2350	---	2120	---	4290	2120	---
TOTAL	88090	131660	111500	118890	110100	76930	71280	82240	59360	101150	90760	79980
MEAN	2842	4389	3597	3835	3932	2482	2376	2653	1979	3263	2928	2666
MAX	5120	5340	4260	5580	4970	3310	2700	5440	3090	5200	4760	3700
MIN	1700	3660	2030	2660	2450	2350	2350	1780	1570	2380	2060	1800
AC-FT	174700	261100	221200	235800	218400	152600	141400	163100	117700	200600	180000	158600

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1961 - 1993, BY WATER YEAR (WY)

	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993
MEAN	2915	4489	4828	5239	5218	4570	3810	3647	5831	6190	3830	2886																					
MAX	4638	14530	8329	7599	10190	6783	5888	6767	17110	12490	6770	3786																					
(WY)	1968	1991	1976	1980	1991	1974	1991	1976	1972	1972	1976	1983																					
MIN	1419	2341	2909	3335	3401	2482	2273	1513	1979	1729	1750	1427																					
(WY)	1978	1978	1986	1988	1973	1993	1979	1970	1993	1977	1977	1977																					

SUMMARY STATISTICS	FOR 1992 CALENDAR YEAR	FOR 1993 WATER YEAR	WATER YEARS 1961 - 1993
ANNUAL TOTAL	1461720	1121940	
ANNUAL MEAN	3994	3074	4451
HIGHEST ANNUAL MEAN			6858
LOWEST ANNUAL MEAN			3074
HIGHEST DAILY MEAN	7410	5580	31600
LOWEST DAILY MEAN	1610	1570	963
ANNUAL SEVEN-DAY MINIMUM	1850	1730	1110
ANNUAL RUNOFF (AC-FT)	28990000	22250000	32240000
10 PERCENT EXCEEDS	6580	4370	6810
50 PERCENT EXCEEDS	3940	2660	4000
90 PERCENT EXCEEDS	2110	2030	2140

SKAGIT RIVER BASIN

12178100 NEWHALEM CREEK NEAR NEWHALEM, WA

LOCATION.--Lat 48°39'22", long 121°14'14", in SE 1/4 SE 1/4 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.

REVISED RECORDS.--WDR WA-84-1: 1983.

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 except for estimated daily discharges, which are poor. No regulation or diversion upstream from station.

AVERAGE DISCHARGE.--32 years, 174 ft³/s, 84.69 in/yr, 126,100 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 discharge, 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)
May 12	1900	*935	*4.32	No other peak greater than base discharge.			
Minimum daily discharge, 20 ft ³ /s Jan. 19.							

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	64	e102	e125	e49	127	e46	e86	194	352	138	127	56
2	60	e86	e105	e45	124	46	e93	306	319	138	122	55
3	60	e91	e86	e42	123	45	e101	208	286	136	122	56
4	55	e99	e78	e39	125	56	e108	176	275	133	119	55
5	49	e86	e72	e36	127	102	e93	178	279	133	122	55
6	e47	e82	e68	e34	131	115	e85	275	294	131	113	54
7	e44	e440	e65	e32	132	115	e94	202	285	125	107	53
8	e41	e290	e63	e30	129	e103	e130	176	213	126	101	52
9	e39	e200	e61	e28	126	e98	e170	160	362	133	94	51
10	e38	e145	e59	e27	127	e90	e140	354	369	127	86	51
11	e38	e92	60	e25	125	e80	e120	554	273	124	81	57
12	e51	e88	57	e24	117	e75	e105	737	274	124	76	56
13	e74	e87	55	e23	e98	e71	e100	633	214	141	72	e49
14	e56	e86	76	e22	e88	e85	98	538	306	173	68	e47
15	47	e86	79	e21	e80	e172	96	456	463	154	69	e54
16	e36	e88	73	e23	77	e130	e97	428	351	146	71	e47
17	e38	e89	e65	e22	72	e110	e96	423	316	155	69	e43
18	e41	e90	e60	e21	70	e132	e100	496	306	192	66	e40
19	e132	e91	e54	e20	68	e120	e98	551	288	169	64	e37
20	e160	e91	e73	e39	65	e112	e94	506	242	345	61	e48
21	e190	e92	e82	e46	62	e130	e88	426	212	259	58	e43
22	e155	e98	e90	e39	58	e150	e90	392	198	189	54	e41
23	e120	e94	e150	e32	56	e240	95	309	224	164	99	e38
24	e95	e90	e130	e50	e52	e160	102	320	195	151	94	e37
25	e82	e85	e100	114	e51	e138	129	345	201	148	85	e35
26	e67	e83	e80	216	e49	e122	144	391	212	147	73	e34
27	e57	e89	e68	208	e48	e111	146	423	252	139	67	e33
28	e52	e90	e62	167	e47	e101	133	478	179	175	65	e36
29	e48	e85	e59	141	---	e94	140	446	161	204	62	e37
30	e50	e95	e56	122	---	e88	177	309	145	195	59	e35
31	e62	---	e52	124	---	e82	---	357	---	147	57	---
TOTAL	2148	3410	2363	1861	2554	3319	3348	11747	8046	4961	2583	1385
MEAN	69.3	114	76.2	60.0	91.2	107	112	379	268	160	83.3	46.2
MAX	190	440	150	216	132	240	177	737	463	345	127	57
MIN	36	82	52	20	47	45	85	160	145	124	54	33
AC-FT	4260	6760	4690	3690	5070	6580	6640	23300	15960	9840	5120	2750
CFSM	2.48	4.07	2.73	2.15	3.27	3.84	4.00	13.6	9.61	5.74	2.99	1.65
IN.	2.86	4.55	3.15	2.48	3.41	4.43	4.46	15.66	10.73	6.61	3.44	1.85

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1961 - 1993, BY WATER YEAR (WY)

	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993
MEAN	121	177	167	129	122	105	146	277	367	266	123	90.7																					
MAX	351	544	552	340	313	290	267	448	594	476	254	192																					
(WY)	1968	1991	1981	1984	1991	1972	1989	1972	1974	1972	1976	1978																					
MIN	28.2	43.4	44.7	29.2	39.9	48.7	68.7	145	211	110	60.3	41.6																					
(WY)	1988	1980	1979	1979	1969	1962	1975	1977	1992	1977	1992	1990																					

SUMMARY STATISTICS	FOR 1992 CALENDAR YEAR	FOR 1993 WATER YEAR	WATER YEARS 1961 - 1993
ANNUAL TOTAL	46527	47725	
ANNUAL MEAN	127	131	174
HIGHEST ANNUAL MEAN			244
LOWEST ANNUAL MEAN			114
HIGHEST DAILY MEAN	740	737	5300
LOWEST DAILY MEAN	33	20	20
ANNUAL SEVEN-DAY MINIMUM	38	22	22
ANNUAL RUNOFF (AC-FT)	92290	94660	125800
ANNUAL RUNOFF (CFSM)	4.56	4.69	6.23
ANNUAL RUNOFF (INCHES)	62.04	63.63	84.59
10 PERCENT EXCEEDS	229	289	370
50 PERCENT EXCEEDS	95	94	116
90 PERCENT EXCEEDS	48	41	50

e Estimated

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 SW 1/4 NE 1/4 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.

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 sea level (river-profile survey).

REMARKS.--No estimated daily discharges. Records good. All diversions returned to river upstream from gage. Flow regulated by Ross Reservoir (station 12175000), Diablo Reservoir (station 12176500), and Gorge Reservoir (station 12177700) since 1960. Water temperatures January 1953 to September 1973, September 1974 to September 1985. Chemical analyses July 1959 to July 1960.

AVERAGE DISCHARGE.--43 years, 5,384 ft³/s, 3,901,000 acre-ft/yr, unadjusted.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 40,200 ft³/s Nov. 10, 1990, gage height, 17.71 ft; minimum discharge, 990 ft³/s Dec. 29, 1957, gage height, 4.55 ft; minimum daily discharge, 1,110 ft³/s Oct. 7, 1979.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 9,820 ft³/s May 12, gage height, 9.36 ft; minimum discharge, 1,590 ft³/s Oct. 11.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2640	5010	4600	3890	4640	2630	2720	3250	4250	2840	3230	2660
2	2570	5160	4670	4060	4160	2530	2740	3610	3470	3030	3390	2610
3	2770	5500	4530	4220	4400	2510	2790	2680	3180	3090	4290	3450
4	1970	5120	4530	3880	4410	2700	2790	2530	2810	3080	4200	3180
5	2770	4560	4430	5370	4200	2930	2750	2520	2740	3100	4380	1990
6	2740	5280	4460	5740	3790	3000	2720	3190	2810	3060	4180	1950
7	2460	6420	4550	5530	3160	3000	2720	2840	3360	2990	3930	3560
8	2430	4630	4480	3800	4130	2980	2850	2650	2720	3020	3730	3720
9	2530	5310	4430	4210	4640	2880	3010	2470	3450	3030	3810	3850
10	2100	5670	4420	3360	4900	2770	2930	3070	4200	3000	3190	3510
11	1760	5880	4360	4200	4790	2710	2870	5550	2820	3030	2530	3170
12	2500	5590	4430	3970	5220	2720	2830	8630	2640	3060	2520	2700
13	2510	5350	4270	4350	5150	2680	3140	7690	2390	3050	2640	2490
14	3280	4680	4120	4280	3880	2780	2750	6690	2970	3240	2690	2690
15	3380	5380	4570	3770	4490	2940	2740	4950	4850	3140	2690	2760
16	3160	4810	4430	4060	4690	2860	2740	4240	3890	3110	4560	2530
17	2510	4720	4240	2910	4410	2920	2740	4760	3390	3110	5010	2420
18	2140	4650	3910	3900	4960	3210	2800	4640	3000	3250	3600	2390
19	2860	4640	3490	3960	5280	3080	2780	5150	2860	3280	3290	2260
20	3530	4260	3040	3950	4280	2840	2750	6680	2660	3930	2660	2550
21	3230	4510	2940	4330	4340	2840	2770	4970	2350	4750	2330	2620
22	3970	4750	2310	4480	4770	3590	2820	4010	2240	5820	2310	2250
23	3500	4840	2340	4400	4940	5920	2830	3160	2440	5450	2790	2600
24	2910	4400	2670	2980	4710	3980	2870	3670	2520	4830	3420	2770
25	2820	4500	3440	5030	4160	3490	3020	3530	2400	4560	3530	2590
26	3450	4370	3380	4120	3350	3250	3090	3700	2580	4670	3120	2870
27	4000	4640	3420	3620	2770	2980	3150	3520	2730	4790	2610	2710
28	3920	4780	3010	3610	2600	2900	3040	3960	2510	5460	2200	2150
29	5110	4710	3050	3960	---	2830	3050	4860	2450	5720	2170	2920
30	5340	4580	4140	4430	---	2770	3150	3630	2550	6010	2260	2650
31	5250	---	4180	4470	---	2720	---	3430	---	4930	2210	---
TOTAL	96110	148700	120840	128840	121220	93940	85950	130230	89230	119430	99240	82570
MEAN	3100	4957	3898	4156	4329	3030	2865	4201	2974	3853	3201	2752
MAX	5340	6420	4670	5740	5280	5920	3150	8630	4850	6010	5010	3850
MIN	1760	4260	2310	2910	2600	2510	2720	2470	2240	2840	2170	1950
AC-FT	190600	294900	239700	255600	240400	186300	170500	258300	177000	236900	196800	163800

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1951 - 1993, BY WATER YEAR (WY)

	MEAN	4000	5646	5737	5892	5828	5021	4738	5230	7220	7422	4444	3457
MAX	8120	18260	9775	7981	11940	7317	8754	9418	18610	14100	7865	5189	
(WY)	1960	1991	1981	1980	1991	1974	1951	1951	1972	1972	1976	1959	
MIN	1712	2806	3174	3656	3755	3030	2753	2469	2974	2273	2271	1780	
(WY)	1978	1973	1986	1988	1979	1993	1979	1970	1993	1977	1977	1977	

SUMMARY STATISTICS	FOR 1992 CALENDAR YEAR	FOR 1993 WATER YEAR	WATER YEARS 1951 - 1993
ANNUAL TOTAL	1646950	1316300	
ANNUAL MEAN	4500	3606	5384
HIGHEST ANNUAL MEAN			8028
LOWEST ANNUAL MEAN			3606
HIGHEST DAILY MEAN	9160	8630	34900
LOWEST DAILY MEAN	1700	1760	1110
ANNUAL SEVEN-DAY MINIMUM	1930	2330	1400
ANNUAL RUNOFF (AC-FT)	3267000	2611000	3901000
10 PERCENT EXCEEDS	7140	4960	7920
50 PERCENT EXCEEDS	4310	3280	4920
90 PERCENT EXCEEDS	2510	2520	2800

SKAGIT RIVER BASIN

12181000 SKAGIT RIVER AT MARBLEMOUNT, WA

LOCATION.--Lat 48°32'02", long 121°25'43", in NE 1/4 SW 1/4 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, of which 400 mi² is in Canada.

WATER-DISCHARGE RECORDS

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. WDR WA-90-1: 1983, 1976-87 (M).

GAGE.--Water-stage recorder. Datum of gage is 305.1 ft above sea level (river-profile survey).

REMARKS.--Water-discharge records good. All diversions returned to river upstream from gage. Flow regulated by Ross Reservoir (station 12175000), Diablo Reservoir (station 12176500), and Gorge Reservoir (station 12177700) since 1960. U.S. Geological Survey satellite telemeter at station.

AVERAGE DISCHARGE.--22 years (water years 1947-51, 1977-93), 6,041 ft³/s, 4,377,000 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 discharge, 620 ft³/s Mar. 6, 1944, gage height, 0.55 ft; minimum daily discharge, 1,190 ft³/s Feb. 25, 1944.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 13,100 ft³/s May 13, gage height, 5.68 ft; minimum discharge, 1,800 ft³/s Sept. 6; minimum daily discharge, 2,050 ft³/s Oct. 11.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3300	6350	5350	4260	5520	2820	3260	4340	5930	3460	4030	2750
2	3080	6350	5290	4440	4980	2740	3290	5050	4860	3660	e4350	2850
3	3310	6470	5230	4610	5140	2700	3430	3760	4460	3710	4850	3610
4	2440	6260	5110	4130	5200	2960	3430	3460	3940	3690	4770	3550
5	3230	5680	4960	5670	5020	3640	3290	3450	3880	3720	5020	2360
6	3220	6140	4950	6030	4610	3700	3220	4690	3940	3670	4720	2070
7	2920	8970	5050	5890	3950	3680	3240	4040	4550	3550	4480	3850
8	2820	5990	4940	4260	4790	3650	3540	3730	3710	3590	4250	4100
9	2970	6150	4900	4490	5380	3500	3900	3390	4900	3620	4320	4280
10	2470	6300	4870	3700	5650	3300	3670	4460	6310	3560	3630	3950
11	2050	6630	4770	4410	5500	3180	3550	7620	4300	3580	2930	3580
12	2790	6240	4780	4290	5910	3130	3460	11400	4220	3620	2830	3110
13	3170	6000	4660	4630	5740	3050	3660	10300	3480	3590	2920	2810
14	3710	5520	4740	4490	4530	3190	3300	8800	3990	3870	2750	2940
15	3980	5950	5120	4060	4900	3660	3260	6810	6640	3720	2950	e3050
16	3630	5800	4920	4240	5170	3390	3290	6000	5430	3660	4790	e2800
17	3020	5560	4670	3170	4840	3550	3280	6480	4680	3610	5450	e2670
18	2740	5390	4280	4030	5300	4290	3430	6630	4240	3840	4100	e2600
19	4080	5390	3960	4150	5690	3850	3370	7220	4000	3880	3660	e2500
20	5000	4940	3440	4370	4670	3520	3300	8800	3720	5190	3060	e2800
21	4590	5110	3330	4540	4680	3530	3330	6830	3240	5810	2610	e2900
22	5190	5590	2720	4750	5140	5050	3470	5880	3090	6630	2550	e2500
23	4640	5580	2850	4670	5220	8880	3520	4650	3620	6570	3200	e2950
24	3880	5080	3250	3400	5030	5670	3610	5040	3450	5760	3710	e3100
25	3660	5070	4010	6700	4480	4700	3950	5080	3210	5310	3910	e2900
26	4150	4950	3950	5590	3730	4240	4050	5290	3440	5380	3490	e3200
27	4670	5810	3950	5020	3030	3810	4150	5220	3680	5550	2940	e3000
28	4610	5730	3520	4710	2830	3630	3890	5740	3280	6240	2400	2350
29	e6100	5520	3550	4910	---	3490	3970	6670	3200	6830	2330	3100
30	e6400	5460	4490	5210	---	3370	4190	5070	3200	6990	2400	2910
31	6050	---	4600	5390	---	3270	---	4840	---	5740	2370	---
TOTAL	117870	175980	136210	144210	136630	117140	106300	180740	124590	141600	111770	91140
MEAN	3802	5866	4394	4652	4880	3779	3543	5830	4153	4568	3605	3038
MAX	6400	8970	5350	6700	5910	8880	4190	11400	6640	6990	5450	4280
MIN	2050	4940	2720	3170	2830	2700	3220	3390	3090	3460	2330	2070
AC-FT	233800	349100	270200	286000	271000	232300	210800	358500	247100	280900	221700	180800

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1943 - 1993, BY WATER YEAR (WY)

	MEAN	MAX	(WY)	MIN	(WY)
1943	4122	7258	1948	2071	1978
1944	6372	22270	1991	1864	1944
1945	6295	11630	1981	2609	1944
1946	6470	8719	1980	2450	1944
1947	6845	13830	1991	2115	1944
1948	5668	8438	1950	2222	1948
1949	5472	9534	1951	3394	1979
1950	6469	10630	1951	3680	1977
1951	7631	13140	1982	4153	1993
1952	7869	14730	1950	2891	1977
1953	4966	9047	1976	2884	1977
1954	3960	5240	1978	2144	1977

SUMMARY STATISTICS

FOR 1992 CALENDAR YEAR

FOR 1993 WATER YEAR

WATER YEARS 1943 - 1993

ANNUAL TOTAL	1988120	1584180		
ANNUAL MEAN	5432	4340		
HIGHEST ANNUAL MEAN			6041	
LOWEST ANNUAL MEAN			9617	1991
HIGHEST DAILY MEAN	12500	11400	50000	Nov 10 1990
LOWEST DAILY MEAN	1900	2050	1190	Feb 25 1944
ANNUAL SEVEN-DAY MINIMUM	2190	2580	1520	Feb 20 1944
ANNUAL RUNOFF (AC-FT)	3943000	3142000	4376000	
10 PERCENT EXCEEDS	8200	5990	9310	
50 PERCENT EXCEEDS	5110	4050	5400	
90 PERCENT EXCEEDS	3160	2920	3030	

e Estimated

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WATER-QUALITY RECORDS

WATER TEMPERATURE: March 1986 to current year.

REMARKS.--Temperature probe is located in an open-bottom corrugated metal pipe well.

WATER TEMPERATURE: Maximum, 14.5°C Aug. 12, 1990; minimum, 1.5°C Feb. 24-26, 1993.

WATER TEMPERATURE: Maximum recorded, 13.5°C Aug. 11, 12, Sept. 6, may have been higher during period of no record; minimum, 1.5°C Feb. 24-26.

[illegible]

12181000 SKAGIT RIVER AT MARBLEMOUNT, WA--Continued

WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
FEBRUARY				MARCH			APRIL			MAY		
1	4.0	3.0	3.5	3.0	2.5	3.0	5.5	5.0	5.0	7.0	6.0	6.5
2	4.0	3.5	3.5	4.0	3.0	3.5	6.0	4.5	5.0	7.5	6.0	6.5
3	4.0	3.0	3.5	4.0	3.0	3.5	5.5	5.0	5.0	7.0	6.0	6.5
4	4.0	3.0	3.5	3.5	3.0	3.5	7.0	5.0	5.5	8.0	6.5	7.0
5	4.0	3.5	3.5	4.0	3.0	3.5	6.0	4.5	5.0	9.0	6.5	7.5
6	4.0	3.5	4.0	5.0	3.5	4.0	5.5	4.5	5.0	8.0	6.5	7.0
7	4.5	3.5	4.0	5.0	3.5	4.0	7.0	5.0	6.0	7.0	6.0	6.5
8	4.0	3.5	3.5	5.0	4.0	4.5	6.0	5.0	5.5	7.5	6.0	7.0
9	4.0	3.5	3.5	5.0	3.5	4.0	6.5	5.0	5.5	8.5	6.5	7.5
10	4.0	3.0	3.5	5.0	3.5	4.0	6.5	5.0	5.5	10.0	7.0	8.5
11	4.0	3.0	3.5	5.0	3.0	4.0	6.0	5.0	5.5	10.0	7.0	8.0
12	4.0	3.0	3.5	4.5	3.0	4.0	7.0	5.0	5.5	9.5	7.0	8.0
13	3.5	3.5	3.5	5.0	3.0	4.0	6.0	5.0	5.5	8.0	7.0	7.5
14	4.0	3.0	3.5	4.0	3.5	4.0	8.0	5.0	6.0	9.0	7.0	8.0
15	3.0	2.5	3.0	5.0	4.0	4.0	7.0	5.5	6.0	10.0	7.0	8.5
16	3.0	2.0	2.5	5.0	3.0	4.0	7.0	5.0	6.0	10.5	7.5	9.0
17	3.0	2.0	2.5	4.5	4.0	4.0	7.0	5.5	6.5	10.5	7.5	9.0
18	2.5	2.0	2.0	5.0	4.0	4.5	7.0	5.5	6.0	11.0	8.0	9.5
19	2.5	2.0	2.5	5.5	4.0	4.5	8.0	5.0	6.5	10.5	8.0	9.0
20	3.0	2.5	2.5	5.0	4.0	4.5	8.0	5.0	6.5	10.0	8.0	9.0
21	3.0	2.5	2.5	5.0	4.0	4.5	7.5	6.0	7.0	8.5	8.0	8.5
22	3.0	2.0	2.5	4.5	4.0	4.5	7.5	6.0	7.0	9.5	8.0	8.5
23	2.5	2.0	2.5	5.0	4.0	4.5	8.0	6.0	7.0	11.0	7.0	9.0
24	2.5	1.5	2.0	5.5	4.0	5.0	7.5	6.0	6.5	11.5	8.0	9.5
25	3.0	1.5	2.0	6.5	4.5	5.0	6.5	6.0	6.5	11.5	8.0	9.5
26	3.0	1.5	2.5	6.0	4.0	5.0	6.5	5.5	6.0	12.0	8.5	10.0
27	3.0	2.0	2.5	6.0	4.5	5.0	7.5	5.5	6.5	12.5	9.0	10.5
28	4.0	2.0	3.0	6.5	4.0	5.0	6.5	5.5	6.0	11.0	9.0	10.0
29	---	---	---	6.0	4.5	5.0	7.0	6.0	6.5	10.5	8.5	9.5
30	---	---	---	6.0	4.5	5.0	8.0	6.0	7.0	10.0	8.5	9.5
31	---	---	---	6.5	4.0	5.0	---	---	---	9.5	9.0	9.5
MONTH	4.5	1.5	3.0	6.5	2.5	4.3	8.0	4.5	6.0	12.5	6.0	8.4

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
JUNE				JULY			AUGUST			SEPTEMBER		
1	10.5	8.5	9.0	12.0	10.0	11.0	---	---	---	13.0	10.0	11.0
2	9.5	8.5	9.0	11.0	10.0	10.5	---	---	---	13.0	10.0	11.5
3	10.0	8.5	9.0	10.5	10.0	10.5	---	---	---	12.5	10.5	11.5
4	11.0	8.5	9.5	11.0	10.0	10.5	12.5	10.5	11.5	12.5	10.5	11.5
5	11.5	9.0	10.0	11.0	10.0	10.5	12.5	10.5	11.5	13.0	10.5	11.5
6	12.0	9.5	10.5	11.0	9.5	10.5	13.0	10.5	11.5	13.5	10.5	12.0
7	10.0	9.5	9.5	12.0	9.5	10.5	13.0	11.0	11.5	12.5	10.5	11.5
8	10.5	8.5	9.5	13.0	9.5	11.0	12.0	11.0	11.0	12.5	10.5	11.5
9	9.5	8.5	9.0	12.0	10.0	11.0	11.5	10.5	11.0	12.5	10.5	11.5
10	10.0	8.0	9.0	11.5	10.0	10.5	11.5	10.5	11.0	12.5	10.5	11.5
11	9.0	8.5	8.5	10.5	10.0	10.0	13.5	10.0	11.5	11.0	10.0	10.5
12	9.5	8.0	8.5	11.0	9.5	10.0	13.5	10.0	11.5	12.0	10.0	10.5
13	11.0	8.0	9.5	11.0	9.5	10.5	13.0	10.5	11.5	12.0	9.5	10.5
14	10.0	9.0	9.5	11.0	10.0	10.0	11.5	11.0	11.0	10.5	9.5	10.0
15	10.0	9.0	9.5	11.0	10.0	10.0	11.5	10.5	11.0	11.5	10.0	10.5
16	12.0	9.0	10.5	11.5	9.5	10.5	11.0	10.5	10.5	---	---	---
17	12.5	9.5	11.0	12.0	10.0	10.5	12.0	10.5	11.0	---	---	---
18	13.0	9.5	11.5	12.5	10.0	11.0	12.5	10.5	11.5	---	---	---
19	12.5	10.0	11.0	11.5	10.0	11.0	13.0	10.5	11.5	---	---	---
20	13.0	9.5	11.0	10.5	9.5	10.0	12.5	11.0	11.5	---	---	---
21	11.5	9.5	10.0	11.0	9.5	10.0	11.5	10.5	11.0	---	---	---
22	10.0	9.0	9.5	10.5	9.5	10.0	12.0	10.5	11.0	---	---	---
23	9.5	8.5	9.0	11.0	10.0	10.0	11.5	10.5	11.0	---	---	---
24	11.5	8.5	10.0	---	---	---	11.5	10.5	10.5	---	---	---
25	13.0	9.5	11.0	---	---	---	12.0	10.0	10.5	---	---	---
26	13.0	10.0	11.5	---	---	---	12.5	9.5	11.0	---	---	---
27	11.5	10.0	11.0	---	---	---	12.0	10.0	11.0	---	---	---
28	10.5	9.5	10.0	---	---	---	12.5	10.0	11.0	11.5	9.5	10.5
29	11.0	9.5	10.0	---	---	---	13.0	10.0	11.5	11.5	9.5	10.5
30	11.0	9.5	10.5	---	---	---	13.0	10.0	11.5	11.5	9.5	10.5
31	---	---	---	---	---	---	12.5	10.0	11.0	---	---	---
MONTH	13.0	8.0	9.9	---	---	---	---	---	---	---	---	---

SKAGIT RIVER BASIN

195

12185295 GOAT LAKE INLET NEAR MONTE CRISTO, WA

LOCATION.--Lat 48°00'52", long 121°20'51", in NE 1/4 sec.11, T.29 N., R.11 E. (unsurveyed), at Goat Lake Inlet, Snohomish County, Hydrologic Unit 17110006, and 2.5 mi northeast of Monte Cristo.

DRAINAGE AREA.--2.1 mi².

PERIOD OF RECORD.--January 1983 to September 1993 (discontinued).

REMARKS.--Samples were analyzed using low-ionic analytical methods in order to provide lower limits of detection for some constituents. Quality of water analyses for dissolved aluminum and dissolved iron were determined from water filtered through a 0.10 micrometer filter. Discharge measured intermittently at same site when water-quality samples are collected.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DATE	TIME	DIS-CHARGE, INST. (CUBIC FEET PER SECOND)	SPE-CIFIC CON-DUCT-ANCE (US/CM)	PH (STAND-ARD UNITS)	TEMPER-ATURE WATER (DEG C)	HARD-NESS, (MG/L AS CACO3)	HARD-NESS, NONCARB (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)	SODIUM PERCENT
OCT 07...	0835	3.9	18	6.6	6.0	6	0	1.8	0.40	0.50	14
MAY 18...	1040	65	14	6.8	4.5	5	0	1.3	0.38	0.83	24
JUL 29...	1140	24	14	6.9	6.0	6	0	1.7	0.45	0.29	9
DATE		SODIUM AD-SORP-TION RATIO	POTAS-SIUM, DIS-SOLVED (MG/L AS K)	ALKA-LINITY, DIS IT, FIELD (MG/L AS CACO3)	BICAR-BONATE, DIS IT, FIELD (MG/L AS HCO3)	CAR-BONATE DIS IT, DIS-SOLVED (MG/L CO3)	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)
OCT 07...		0.1	0.22	6	7	0	1.4	0.28	0.03	<0.01	3.1
MAY 18...		0.2	0.60	5	6	0	1.3	0.29	--	--	1.6
JUL 29...		0.0	0.15	6	7	0	1.4	0.12	--	--	1.9
DATE		SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L)	SOLIDS, DIS-SOLVED (TONS PER AC-FT)	SOLIDS, DIS-SOLVED (TONS PER DAY)	NITRO-GEN, AMMONIA, DIS-SOLVED (MG/L AS N)	NITRO-GEN, NITRATE, DIS-SOLVED (MG/L AS N)	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)	CARBON, ORGANIC, DIS-SOLVED (MG/L AS C)
OCT 07...		12	0.02	0.12	0.007	0.11	0.001	<10	7	8	0.4
MAY 18...		10	0.01	1.67	--	0.06	--	--	--	8	0.6
JUL 29...		10	0.01	0.63	--	0.04	--	3	--	8	0.5

12185300 ELLIOTT CREEK AT GOAT LAKE OUTLET, NEAR MONTE CRISTO, WA

LOCATION.--Lat 48°01'20", long 121°21'19", in SW 1/4 SE 1/4 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.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1982 to September 1993 (discontinued).

REVISED RECORDS.--WDR-84-1: Drainage area.

GAGE.--Water-stage recorder. Elevation of gage is 3,200 ft, from topographic map.

REMARKS.--Records fair except for estimated daily discharges, which are poor. No regulation or diversion upstream from station.

AVERAGE DISCHARGE.--10 years, 32.3 ft³/s, 144.32 in/yr, 23,300 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,380 ft³/s Dec. 4, 1989, gage height, 2.90 ft, from rating curve extended above 100 ft³/s; minimum daily discharge, 2.1 ft³/s Jan. 18, 19, 1993.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 108 ft³/s May 11, gage height, 1.31 ft; minimum daily discharge, 2.1 ft³/s Jan. 18, 19.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	e15	e9.3	e12	e4.8	e16	4.9	15	39	83	31	30	12
2	e14	e11	e10	e4.4	e14	4.9	15	48	69	27	29	12
3	e13	e9.4	e8.8	e4.2	e13	4.9	15	48	59	27	30	12
4	e12	e10	e8.0	e3.9	13	6.1	15	41	54	30	28	12
5	e11	e10	e7.3	e3.6	12	8.5	15	36	53	30	27	12
6	e10	e9.0	e6.9	e3.5	12	11	15	38	53	30	25	12
7	e9.8	e40	e6.5	e3.3	12	13	15	44	55	29	23	12
8	e9.3	e30	e6.2	e3.1	12	14	21	44	55	29	21	12
9	e8.7	e21	e6.0	e3.0	12	14	28	40	52	29	19	12
10	e8.3	e14	e5.8	e2.8	13	14	30	58	64	29	17	12
11	e8.0	e11	e5.6	e2.7	13	14	29	103	57	29	16	12
12	e9.0	e9.5	e5.5	e2.6	13	14	25	101	49	28	15	11
13	e10	e9.3	e5.4	e2.4	13	13	22	99	42	26	15	11
14	e8.8	e9.2	e6.5	e2.3	13	13	20	92	39	26	15	10
15	e8.2	e9.3	e7.6	e2.2	11	15	19	88	49	26	15	11
16	e7.8	e9.4	e7.0	e2.2	9.8	16	18	81	56	25	15	9.5
17	e8.4	e9.5	e6.4	e2.2	8.4	16	18	79	55	25	15	9.0
18	e10	e9.5	e6.1	e2.1	8.3	16	19	86	54	25	15	8.5
19	e13	e9.6	e6.0	e2.1	7.6	16	20	90	54	28	16	8.3
20	e18	e9.7	e7.7	e3.5	7.4	16	20	92	51	44	16	8.3
21	e15	e9.8	e8.7	e4.8	7.0	16	20	92	46	50	16	8.2
22	e14	e10	e10	e4.0	7.0	22	20	92	44	41	31	7.8
23	e12	e10	e13	e3.8	6.6	68	20	80	42	36	39	7.5
24	e10	e9.4	e12	e4.4	6.2	64	21	70	37	32	30	7.1
25	e8.5	e9.2	e10	e50	5.7	46	24	73	35	32	23	6.8
26	e7.5	e9.0	e9.0	e42	5.2	35	29	73	35	32	18	6.3
27	e6.7	e9.3	e8.5	e34	5.1	27	30	74	43	31	16	6.1
28	e6.0	e9.6	e6.5	e27	4.9	23	30	82	45	31	14	5.7
29	e5.6	e9.0	e6.0	e21	---	20	27	82	37	36	13	5.6
30	e5.3	e10	e9.5	e19	---	18	35	78	33	40	12	5.6
31	e6.6	---	e5.0	e17	---	15	---	79	---	35	12	---
TOTAL	309.5	355.0	235.5	287.9	281.2	598.3	650	2222	1500	969	626	285.3
MEAN	9.98	11.8	7.60	9.29	10.0	19.3	21.7	71.7	50.0	31.3	20.2	9.51
MAX	18	40	13	50	16	68	35	103	83	50	39	12
MIN	5.3	9.0	5.0	2.1	4.9	4.9	15	36	33	25	12	5.6
AC-FT	614	704	467	571	558	1190	1290	4410	2980	1920	1240	566
CFSM	3.30	3.91	2.51	3.07	3.31	6.37	7.15	23.7	16.5	10.3	6.66	3.14
IN.	3.80	4.36	2.89	3.53	3.45	7.35	7.98	27.28	18.42	11.90	7.69	3.50

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1983 - 1993, BY WATER YEAR (WY)

MEAN	26.6	43.7	19.8	19.7	18.0	17.5	29.7	55.9	63.6	49.6	26.3	17.9
MAX	57.2	142	57.2	55.2	46.8	31.8	42.9	79.1	83.9	71.1	40.5	29.1
(WY)	1989	1991	1990	1984	1986	1987	1990	1987	1989	1983	1991	1983
MIN	5.19	11.7	5.35	6.92	5.44	5.35	15.6	41.2	39.8	25.2	17.0	9.51
(WY)	1988	1988	1986	1985	1985	1985	1984	1984	1992	1992	1992	1993

SUMMARY STATISTICS

FOR 1992 CALENDAR YEAR

FOR 1993 WATER YEAR

WATER YEARS 1983 - 1993

ANNUAL TOTAL	7948.1	8319.7	32.2
ANNUAL MEAN	21.7	22.8	44.5
HIGHEST ANNUAL MEAN			22.8
LOWEST ANNUAL MEAN			900
HIGHEST DAILY MEAN	71	103	Dec 4 1989
LOWEST DAILY MEAN	5.0	2.1	Jan 18 1993
ANNUAL SEVEN-DAY MINIMUM	5.9	2.2	Jan 13 1993
ANNUAL RUNOFF (AC-FT)	15770	16500	23340
ANNUAL RUNOFF (CFSM)	7.17	7.52	10.6
ANNUAL RUNOFF (INCHES)	97.58	102.14	144.47
10 PERCENT EXCEEDS	47	53	65
50 PERCENT EXCEEDS	16	14	21
90 PERCENT EXCEEDS	7.8	5.6	7.1

e Estimated

SKAGIT RIVER BASIN

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12185300 ELLIOTT CREEK AT GOAT LAKE OUTLET, NEAR MONTE CRISTO, WA--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--January 1983 to October 1993 (discontinued).

REMARKS.--Samples were analyzed using low-ionic analytical methods in order to provide lower limits of detection for some constituents. 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 1992 OCTOBER 1993

DATE	TIME	DIS- CHARGE, INST. (CUBIC FEET PER SECOND)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH (STAND- ARD UNITS)	TEMPER- ATURE WATER (DEG C)	HARD- NESS, (MG/L AS CACO3)	HARD- NESS, NONCARB (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)	SODIUM PERCENT
OCT 07...	1030	9.8	18	6.6	9.0	7	0	2.2	0.48	0.40	10
DEC 15...	1245	e7.6	19	6.7	1.5	7	0	2.2	0.48	0.60	14
FEB 03...	1045	14	17	6.7	2.5	6	0	1.8	0.44	0.53	14
FEB 23...	1245	e13	18	6.5	2.0	6	0	1.9	0.43	0.56	15
APR 26...	1000	32	20	6.8	5.5	9	0	2.5	0.56	0.62	13
MAY 18...	1020	93	16	6.8	18.0	4	0	1.2	0.33	--	--
JUN 29...	1150	36	15	6.9	9.5	6	1	1.8	0.44	0.42	12
JUL 29...	1030	e13	17	6.9	10.5	7	1	2.0	0.48	0.38	10
OCT 13...	1045	6.1	20	7.1	11.0	7	0	2.1	0.51	0.48	12
DATE	SODIUM AD- SORP- TION RATIO	POTAS- SIUM, DIS- SOLVED (MG/L AS K)	ALKA- LINITY, DIS IT, FIELD (MG/L AS CACO3)	BICAR- BONATE, DIS IT, FIELD (MG/L AS HCO3)	CAR- BONATE, DIS IT, FIELD (MG/L CO3)	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)	
OCT 07...	0.1	0.27	8	10	0	1.3	0.23	0.02	<0.01	3.1	
DEC 15...	0.1	0.35	7	9	0	1.4	0.31	<0.01	<0.01	3.9	
FEB 03...	0.1	0.59	7	9	0	1.4	0.39	--	--	3.5	
FEB 23...	0.1	0.33	7	9	0	1.4	0.37	--	--	3.9	
APR 26...	0.1	0.41	9	10	0	1.6	0.38	--	--	4.0	
MAY 18...	--	0.76	5	6	0	1.3	--	--	--	2.8	
JUN 29...	0.1	0.21	6	7	0	1.3	0.25	--	--	2.3	
JUL 29...	0.1	0.22	7	8	0	1.3	0.17	--	--	2.4	
OCT 13...	0.1	0.33	8	10	0	1.3	0.42	--	--	2.6	
DATE	SOLIDS, SUM OF CONSTI- TUENTS, DIS- SOLVED (MG/L)	SOLIDS, DIS- SOLVED (TONS PER AC-FT)	SOLIDS, DIS- SOLVED (TONS PER DAY)	NITRO- GEN, AMMONIA, DIS- SOLVED (MG/L AS N)	NITRO- GEN, NITRATE, DIS- SOLVED (MG/L AS N)	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)	CARBON, ORGANIC, DIS- SOLVED (MG/L AS C)	
OCT 07...	13	0.02	0.34	0.007	0.02	<0.001	<10	7	12	0.6	
DEC 15...	14	0.02	e0.29	<0.001	0.06	<0.001	40	17	9	0.5	
FEB 03...	13	0.02	0.50	--	--	--	--	--	20	1.0	
FEB 23...	14	0.02	e0.49	--	0.09	--	--	--	10	0.8	
APR 26...	15	0.02	1.32	--	0.09	--	--	5	50	0.4	
MAY 18...	--	--	--	--	0.07	--	--	--	10	0.4	
JUN 29...	10	0.01	0.99	--	0.03	--	--	--	9	0.4	
JUL 29...	11	0.02	e0.39	--	0.03	--	3	6	20	0.6	
OCT 13...	12	0.02	0.20	--	--	--	--	--	31	0.5	

e - Estimated

SKAGIT RIVER BASIN

12186000 SAUK RIVER ABOVE WHITE CHUCK RIVER, NEAR DARRINGTON, WA

LOCATION.--Lat 48°10'08", long 121°28'10", on north line NE 1/4 NE 1/4 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 for estimated daily discharges, which are fair. No regulation or diversion upstream from station. U.S. Geological Survey satellite telemeter at station.

AVERAGE DISCHARGE.--70 years (water years 1918-22, 1929-93), 1,131 ft³/s, 101.04 in/yr, 819,400 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 discharge, 94 ft³/s Oct. 27-31, 1987.

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)
May 12	2330	*5,140	*6.45	No other peak greater than base discharge.			
Minimum discharge, 101 ft ³ /s Jan. 19, 20.							

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	386	558	730	304	778	264	634	1640	2320	820	690	291
2	355	677	584	e265	724	268	676	1950	1920	816	670	288
3	341	556	494	e249	680	272	763	1650	1760	822	659	292
4	322	614	440	e234	649	359	800	1420	1630	844	628	286
5	287	626	e414	e222	643	629	707	1310	1630	785	595	284
6	267	523	e385	e207	646	766	653	1790	1690	739	562	283
7	250	2560	e373	e192	661	708	653	1680	1750	699	517	281
8	240	1750	e368	e180	671	660	861	1600	1460	729	472	276
9	227	1170	e350	e169	685	630	1300	1460	1700	740	434	271
10	218	883	e340	e159	698	576	1110	2160	1930	668	410	269
11	212	e600	e334	e151	678	524	950	3390	1570	645	390	254
12	222	e360	e327	e144	615	481	843	4300	1530	632	380	254
13	273	e555	e320	e137	557	446	765	4210	1340	597	375	230
14	238	e335	e500	e131	515	506	744	3250	1390	647	364	227
15	217	e550	e600	e125	473	1150	732	2840	1700	621	358	254
16	207	e555	e510	138	426	784	740	2630	1680	570	356	222
17	214	e570	e430	131	392	679	728	2670	1550	641	360	211
18	227	e570	e370	127	378	830	948	3130	1550	648	352	203
19	725	e580	e340	118	366	738	942	3540	1490	647	355	197
20	1020	e580	e450	227	357	705	824	3390	1320	1220	357	221
21	1130	e572	e500	312	337	685	798	3130	1220	1340	349	212
22	892	e630	e550	254	328	1280	864	3000	1270	995	327	198
23	686	e590	e900	230	311	3260	883	2330	1330	879	640	189
24	554	e572	e800	290	296	1960	940	2190	1130	785	791	185
25	470	e544	e620	2910	285	1380	1180	2270	1060	764	533	179
26	407	e530	e510	2380	275	1120	1380	2220	1120	735	417	172
27	365	e570	e440	1920	270	950	1390	2350	1270	708	370	172
28	334	e580	e380	1370	265	830	1170	2680	1080	753	343	180
29	319	e530	366	1080	---	755	1330	2660	971	804	333	182
30	309	e590	344	904	---	683	1810	2110	879	970	312	178
31	344	---	320	832	---	624	---	2300	---	751	302	---
TOTAL	12258	21300	14389	16092	13959	25502	28108	77250	44240	24014	14001	6941
MEAN	395	710	464	519	499	823	937	2492	1475	775	452	231
MAX	1130	2560	900	2910	778	3260	1810	4300	2320	1340	791	292
MIN	207	523	320	118	265	264	634	1310	879	570	302	172
AC-FT	24310	42250	28540	31920	27690	50580	55750	153200	87750	47630	27770	13770
CFSM	2.60	4.67	3.05	3.42	3.28	5.41	6.16	16.4	9.70	5.10	2.97	1.52
IN.	3.00	5.21	3.52	3.94	3.42	6.24	6.88	18.91	10.83	5.88	3.43	1.76

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1918 - 1993, BY WATER YEAR (WY)

MEAN	799	1172	1245	998	888	759	1080	1895	2206	1421	603	495
MAX	2174	4117	3512	2584	2369	2442	1991	2965	3648	2875	1393	1504
(WY)	1968	1991	1918	1953	1951	1972	1934	1949	1974	1954	1954	1920
MIN	119	137	347	224	167	293	458	1119	895	396	215	177
(WY)	1988	1937	1986	1979	1929	1955	1975	1977	1941	1941	1941	1942

SUMMARY STATISTICS	FOR 1992 CALENDAR YEAR	FOR 1993 WATER YEAR	WATER YEARS 1918 - 1993
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ANNUAL TOTAL	290530		298054				
ANNUAL MEAN	794		817			1127	
HIGHEST ANNUAL MEAN						1557	1950
LOWEST ANNUAL MEAN						733	1944
HIGHEST DAILY MEAN	4110	Jan 28	4300	May 12	27000		Dec 26 1980
LOWEST DAILY MEAN	171	Sep 7	118	Jan 19	94		Oct 28 1987
ANNUAL SEVEN-DAY MINIMUM	182	Aug 28	130	Jan 13	96		Oct 24 1987
ANNUAL RUNOFF (AC-FT)	576300		591200		816200		
ANNUAL RUNOFF (CFSM)	5.22		5.37		7.41		
ANNUAL RUNOFF (INCHES)	71.10		72.94		100.71		
10 PERCENT EXCEEDS	1430		1750		2350		
50 PERCENT EXCEEDS	607		615		812		
90 PERCENT EXCEEDS	249		225		297		

e Estimated

SKAGIT RIVER BASIN

199

12189500 SAUK RIVER NEAR SAUK, WA

LOCATION.--Lat 48°25'29", long 121°34'02", in NW 1/4 NW 1/4 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 Suiattle 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 Suiattle Crossing, near Sauk" 1910-12.

REVISED RECORDS.--WSP 1286: 1929, 1937, 1939.

GAGE.--Water-stage recorder. Datum of gage is 266 ft above sea level (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. U.S. Geological Survey satellite telemeter at station.

REMARKS.--Records good. No regulation. Small diversion for millpond at Darrington and for domestic use. Summer flows augmented by glacier melt at source.

AVERAGE DISCHARGE.--65 years (water years 1929-93), 4,336 ft³/s, 82.47 in/yr, 3,141,000 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 discharge, 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)
May 13	0400	*17,400	*8.54	No other peak greater than base discharge.			
Minimum discharge, 948 ft ³ /s Sept. 26, 27.							

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1780	2240	3430	1890	3660	1190	2540	5180	9290	3400	3350	1560
2	1740	2210	2930	1820	3460	1200	2830	8300	7650	3390	3290	1600
3	1710	1980	2410	1820	3350	1210	3100	6730	7070	3290	3400	1670
4	1690	2270	2190	1830	3260	1470	3370	5290	6510	3420	3400	1680
5	1610	2310	2100	1760	3350	2950	2900	4590	6500	3250	3210	1640
6	1350	2250	2000	1620	3410	3060	2660	6580	6780	3070	3130	1680
7	1270	6510	1900	1590	3500	2570	2900	6520	7120	2890	2960	1660
8	1220	5070	1830	1610	3450	2290	3340	5950	6150	2940	2650	1640
9	1160	3510	2060	1590	3410	2250	5640	5610	6080	3080	2510	1580
10	1140	2570	2000	1530	3430	2060	4840	6950	8210	2840	2300	1610
11	1210	2600	1960	1450	3170	1900	4020	11800	6510	2780	2150	1540
12	e1240	2430	1820	1410	2760	1800	3460	14200	7010	2810	2140	1410
13	e1410	2270	1720	1450	2460	1730	3050	15100	5900	2560	2140	1270
14	e1190	2220	2190	1560	2270	1820	2840	11800	5590	2850	2060	1240
15	e1120	2250	2600	1490	2110	5230	2780	10400	7400	2990	2040	1380
16	1110	2160	2190	1450	1910	3370	2890	9490	7240	2760	2060	1230
17	1130	2510	2020	1410	1760	2730	2710	9350	6690	3240	2080	1180
18	1200	2540	1830	1400	1700	3790	3420	10400	6650	3350	2110	1140
19	2120	2490	1730	1370	1660	3080	3480	12300	6570	3080	2050	1120
20	2680	2640	2160	1660	1630	2680	2910	12600	5910	5690	2110	1160
21	2990	2500	2310	2590	1540	2650	2700	10600	5360	7040	2140	1170
22	2530	3060	2760	1920	1490	4000	2930	9710	5380	5130	1900	1080
23	2210	2820	4230	1660	1430	12300	2940	7990	5670	4490	2620	1030
24	1950	2360	4010	1640	1350	8150	2970	7310	4920	4000	3270	1000
25	1890	2230	3510	10000	1290	5550	3710	7840	4510	3770	2490	975
26	1780	2040	3120	8610	1260	4210	4690	7630	4750	3680	1970	969
27	1690	2380	2950	7340	1230	3540	5290	8480	5400	3570	1780	1020
28	1590	2660	2560	6410	1200	3210	4020	9550	4700	3840	1680	1090
29	1580	2590	2260	4870	---	2990	3900	9590	4170	4150	1660	1100
30	1540	2790	2090	4000	---	2740	5370	7890	3740	4410	1600	1130
31	1710	---	1970	3790	---	2490	---	7920	---	3560	1590	---
TOTAL	50540	80460	74840	84540	66500	100210	104200	273650	185430	111320	73840	39554
MEAN	1630	2682	2414	2727	2375	3233	3473	8827	6181	3591	2382	1318
MAX	2990	6510	4230	10000	3660	12300	5640	15100	9290	7040	3400	1680
MIN	1110	1980	1720	1370	1200	1190	2540	4590	3740	2560	1590	969
AC-FT	100200	159600	148400	167700	131900	198800	206700	542800	367800	220800	146500	78460
CFSM	2.28	3.76	3.38	3.82	3.33	4.53	4.86	12.4	8.66	5.03	3.34	1.85
IN.	2.63	4.19	3.90	4.40	3.46	5.22	5.43	14.26	9.66	5.80	3.85	2.06

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1929 - 1993, BY WATER YEAR (WY)

	MEAN	2825	4329	4627	4063	3738	3215	4012	6544	7981	5713	2844	2131
MAX	6770	14650	11580	8615	9062	9443	7375	10570	13520	10610	5529	4941	
(WY)	1968	1991	1934	1974	1951	1972	1934	1949	1974	1972	1974	1959	
MIN	751	724	1457	1199	793	1523	2039	4061	3715	2515	1696	1089	
(WY)	1988	1930	1953	1979	1929	1955	1975	1977	1941	1941	1987	1942	

SUMMARY STATISTICS

FOR 1992 CALENDAR YEAR

FOR 1993 WATER YEAR

WATER YEARS 1929 - 1993

ANNUAL TOTAL	1204420	1245084										
ANNUAL MEAN	3291	3411										
HIGHEST ANNUAL MEAN										4336		
LOWEST ANNUAL MEAN										6048		1972
HIGHEST DAILY MEAN	14600	Jan 29	15100	May 13	69900	Nov 24	1990			2887		1941
LOWEST DAILY MEAN	1110	Oct 16	969	Sep 26	578	Dec 4	1929			2887		1941
ANNUAL SEVEN-DAY MINIMUM	1200	Oct 12	1020	Sep 22	604	Nov 29	1929			2887		1941
ANNUAL RUNOFF (AC-FT)	2389000		2470000		3142000					6.07		
ANNUAL RUNOFF (CFSM)	4.61		4.78		6.07					82.52		
ANNUAL RUNOFF (INCHES)	62.75		64.87		82.52					8340		
10 PERCENT EXCEEDS	5200		6970		8340					3330		
50 PERCENT EXCEEDS	2740		2650		3330					1540		
90 PERCENT EXCEEDS	1610		1350		1540							

e Estimated

SKAGIT RIVER BASIN
RESERVOIRS IN SKAGIT RIVER BASIN, WA

12175000 ROSS RESERVOIR.--(Station 12175000).

12176500 DIABLO RESERVOIR

LOCATION.--Lat 48°42'56", long 121°07'52", in SE 1/4 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 sea level (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. U.S. Geological Survey satellite telemeter at station. Midnight elevations for Jan. 3, 4, 8, 31, Feb. 1 and Aug. 24, 25, furnished by City of Seattle.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 90,600 acre-ft July 14, 1933, elevation, 1,206.5 ft; minimum contents not determined.

EXTREMES FOR CURRENT YEAR.--Maximum contents, 88,847 acre-ft June 15, elevation, 1,204.87 ft; minimum contents, 71,064 acre-ft Oct. 6, elevation, 1,183.19 ft.

12177700 GORGE RESERVOIR

LOCATION.--Lat 48°41'53", long 121°12'25", in NW 1/4 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 sea level (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 observed contents since normal low operating level was reached in December 1960, 884 acre-ft Aug. 19, 1993, elevation, 806.25 ft.

EXTREMES FOR CURRENT YEAR.--Maximum contents, 8,570 acre-ft May 17, elevation, 875.35 ft; minimum observed contents, 884 acre-ft Aug. 19, elevation, 806.25 ft.

12191600 BAKER LAKE

LOCATION.--Lat 48°38'58", long 121°41'22", in SW 1/4 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 sea level.

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. U.S. Geological Survey satellite telemeter at station.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 287,930 acre-ft July 12, 1972, elevation, 724.49 ft; minimum contents 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, 282,197 acre-ft Sept. 8, elevation, 723.34 ft; minimum contents, 162,389 acre-ft Jan. 13, elevation, 695.12 ft.

12193000 LAKE SHANNON

LOCATION.--Lat 48°32'53", long 121°44'22", in SW 1/4 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 sea level. 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. Capacity table furnished by Puget Sound Power and Light Co. 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. U.S. Geological Survey satellite telemeter at station. Midnight elevations for Apr. 13 to May 12, May 28 to June 21, furnished by Puget Sound Power & Light.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 161,470 acre-ft Sept. 17, 1968, elevation, 439.50 ft; minimum contents 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, 158,825 acre-ft Aug. 18, elevation, 438.31 ft; minimum contents, 62,109 acre-ft Apr. 6, elevation, 386.75 ft.

SKAGIT RIVER BASIN

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Reservoirs in Skagit River basin--Continued

MONTHEND ELEVATION AND CONTENTS AT 2400, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

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.....	1,184.11	71,744	--	872.34	7,864	--
Oct.	31.....	1,200.41	84,874	+13,130	871.75	7,731	-133
Nov.	30.....	1,203.59	87,689	+2,815	874.22	8,299	+568
Dec.	31.....	1,200.91	85,314	-2,375	873.15	8,049	-250
CAL YR 1992.....		--	--	-1,348	--	--	+138
Jan.	31.....	1,202.32	86,556	+1,242	872.92	7,996	-53
Feb.	28.....	1,202.39	86,618	+62	870.77	7,515	-481
Mar.	31.....	1,202.40	86,627	+9	872.91	7,993	+478
Apr.	30.....	1,204.17	88,211	+1,584	873.76	8,191	+198
May	31.....	1,203.03	87,188	-1,023	874.01	8,249	+58
June	30.....	1,201.27	85,631	-1,557	872.20	7,832	-417
July	31.....	1,202.49	86,707	+1,076	873.42	8,112	+280
Aug.	31.....	1,201.78	86,080	-627	870.75	7,511	-601
Sept.	30.....	1,203.31	87,437	+1,357	872.91	7,993	+482
WTR YR 1993.....		--	--	+15,693	--	--	+129
		12191600	Baker Lake		12193000	Lake Shannon	
Sept.	30.....	719.67	264,327	--	432.06	145,335	--
Oct.	31.....	708.25	212,897	-51,430	431.95	145,103	-232
Nov.	30.....	700.54	182,075	-30,822	429.70	140,416	-4,687
Dec.	31.....	700.83	183,171	+1,096	420.08	121,326	-19,090
CAL YR 1992.....		--	--	-9,154	--	--	-11,819
Jan.	31.....	697.48	170,763	-12,408	418.87	119,042	-2,284
Feb.	28.....	695.58	164,000	-6,763	399.08	82,659	-36,383
Mar.	31.....	708.70	214,801	+50,801	400.49	85,136	+2,477
Apr.	30.....	715.49	244,761	+29,960	408.05	98,873	+13,737
May	31.....	720.63	268,940	+24,179	430.72	142,530	+43,657
June	30.....	720.08	266,288	-2,652	427.27	135,455	-7,075
July	31.....	722.25	276,823	+10,535	435.98	153,717	+18,262
Aug.	31.....	722.26	276,872	+49	435.71	153,132	-585
Sept.	30.....	712.44	231,023	-45,849	433.44	148,257	-4,875
WTR YR 1993.....		--	--	-33,304	--	--	+2,922

SKAGIT RIVER BASIN

12192700 THUNDER CREEK NEAR CONCRETE, WA

LOCATION.--Lat 48°36'08", long 121°42'17", in SE 1/4 SW 1/4 SE 1/4 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. August 1982 to March 28, 1990, recording gage at same site at datum 10.00 ft higher.

REMARKS.--Records fair except for estimated daily discharges, which are poor. No regulation or diversion upstream from station.

AVERAGE DISCHARGE.--11 years, 137 ft³/s, 83.06 in/yr, 99,260 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge not determined, Nov. 24, 1990, gage height, unknown; minimum discharge, 11 ft³/s Oct. 20-23, 1987.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 817 ft³/s Jan. 25, gage height, 15.61 ft; minimum discharge, 20 ft³/s Sept. 29, 30.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	38	176	116	60	157	80	113	207	156	66	e68	28
2	35	149	102	58	148	80	119	242	143	63	e62	28
3	35	110	94	58	146	80	137	190	130	61	e58	27
4	35	145	93	56	147	102	137	185	122	58	e55	27
5	33	120	86	53	158	150	120	178	118	56	e53	26
6	30	101	76	52	160	149	112	247	113	53	e50	26
7	28	386	74	52	160	138	115	193	115	53	e48	26
8	27	213	74	49	155	139	135	202	105	51	e47	25
9	27	138	74	48	151	137	151	191	196	48	e45	25
10	26	108	69	47	153	126	138	226	194	48	e45	24
11	25	110	66	45	143	117	133	278	158	47	e44	27
12	30	106	62	45	134	111	127	339	205	48	e42	33
13	55	106	62	45	127	106	118	278	154	47	e41	26
14	34	114	135	44	121	107	115	228	169	49	e40	27
15	30	105	87	44	113	184	118	204	189	46	e41	30
16	28	143	80	42	107	136	125	204	155	44	e43	26
17	30	152	74	40	103	146	124	209	137	47	e41	25
18	49	127	66	40	102	250	136	229	124	46	e39	24
19	113	124	68	42	101	175	125	226	115	43	e38	24
20	111	110	70	68	98	153	119	221	108	97	e36	26
21	94	122	71	64	95	151	123	192	104	83	e35	27
22	92	145	94	55	92	240	134	191	117	70	e36	25
23	83	113	119	51	90	579	141	165	140	109	e50	24
24	69	101	111	75	86	267	151	163	94	77	37	23
25	61	98	93	675	85	195	182	163	84	70	34	23
26	54	85	86	e420	84	166	184	163	80	65	33	22
27	50	205	80	247	83	146	188	162	82	60	31	21
28	45	180	77	203	82	132	170	178	76	80	31	21
29	45	125	70	177	---	125	187	174	77	e94	32	20
30	46	132	65	159	---	118	206	141	70	e88	30	20
31	69	---	63	165	---	113	---	150	---	e78	29	---
TOTAL	1527	4149	2557	3279	3381	4898	4183	6319	3830	1945	1314	756
MEAN	49.3	138	82.5	106	121	158	139	204	128	62.7	42.4	25.2
MAX	113	386	135	675	160	579	206	339	205	109	68	33
MIN	25	85	62	40	82	80	112	141	70	43	29	20
AC-FT	3030	8230	5070	6500	6710	9720	8300	12530	7600	3860	2610	1500
CFSM	2.20	6.17	3.68	4.72	5.39	7.05	6.22	9.10	5.70	2.80	1.89	1.12
IN.	2.54	6.89	4.25	5.45	5.61	8.13	6.95	10.49	6.36	3.23	2.18	1.26

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1982 - 1993, BY WATER YEAR (WY)

	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993
MEAN	87.3	217	130	155	158	139	182	221	193	92.3	42.5	39.0
MAX	243	519	289	272	277	197	294	309	313	158	111	75.4
(WY)	1986	1991	1990	1984	1991	1990	1988	1985	1985	1983	1991	1984
MIN	12.5	65.2	75.2	75.8	64.6	61.9	121	106	52.8	41.5	19.7	19.4
(WY)	1988	1988	1984	1988	1985	1985	1983	1992	1992	1987	1987	1987

SUMMARY STATISTICS

FOR 1992 CALENDAR YEAR

FOR 1993 WATER YEAR

WATER YEARS 1982 - 1993

ANNUAL TOTAL	35271	38138	138
ANNUAL MEAN	96.4	104	187
HIGHEST ANNUAL MEAN			104
LOWEST ANNUAL MEAN			2300
HIGHEST DAILY MEAN	581	Jan 31	675
LOWEST DAILY MEAN	14	Sep 3	20
ANNUAL SEVEN-DAY MINIMUM	15	Aug 28	21
ANNUAL RUNOFF (AC-FT)	69960	75650	99660
ANNUAL RUNOFF (CFSM)	4.30	4.66	6.14
ANNUAL RUNOFF (INCHES)	58.58	63.34	83.44
10 PERCENT EXCEEDS	170	189	270
50 PERCENT EXCEEDS	88	94	110
90 PERCENT EXCEEDS	24	30	27

e Estimated

SKAGIT RIVER BASIN

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12193500 BAKER RIVER AT CONCRETE, WA

LOCATION.--Lat 48°32'24", long 121°44'31", in NW 1/4 NW 1/4 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 sea level. 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.--No estimated daily discharges. Records good except those below 100 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 (stations 12191600 and 12191300). U.S. Geological Survey satellite telemeter at station.

AVERAGE DISCHARGE.--54 years (water years 1911-14, 1944-93), 2,650 ft³/s, 121.17 in/yr, 1,920,000 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 discharge, 30 ft³/s Mar. 21-26, 1973, Apr. 26-28, May 7-9, 11, 1983, Apr. 20, 24-28, 1986.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 4,480 ft³/s June 4, elevation, 175.16 ft; minimum discharge, 36 ft³/s Mar. 30; minimum daily, 47 ft³/s Apr. 15.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2090	3780	3000	2170	1990	126	3370	3580	4010	1940	3020	496
2	1880	3140	1600	2580	2160	580	3130	3600	4020	1920	2480	113
3	1890	3970	2980	1660	2070	466	3610	3630	3820	140	1860	1570
4	2250	2910	2980	2060	1010	306	3630	3030	4040	137	1890	424
5	3010	3070	2760	1910	2000	126	2620	855	4030	140	2030	1040
6	2410	3030	2050	2410	130	126	1470	3560	4020	1940	1920	919
7	2310	2940	2380	2110	129	126	110	3700	4010	142	1000	380
8	2580	4000	2160	2180	129	126	99	3760	4010	490	1940	1250
9	2480	3730	2190	2000	2220	478	58	3590	4010	946	1590	2270
10	3010	4000	2400	2200	2060	361	56	2120	4010	416	1600	1170
11	3010	4000	2360	2320	2160	458	56	3850	4010	450	1660	1260
12	2590	4000	2510	2130	2190	757	67	3870	4010	1140	1560	1650
13	2980	3900	2290	1740	1950	497	161	3890	4010	435	896	1910
14	2060	2190	989	950	1910	812	97	3910	4010	363	133	2350
15	2070	2170	2920	753	2110	1780	47	3930	4010	377	1110	2850
16	2360	1980	1420	2070	2330	1840	48	2320	4020	541	1410	2180
17	1810	2200	1860	126	3140	1880	53	3980	4010	421	1060	2940
18	1840	2060	548	126	3160	1710	58	4010	4010	471	962	2950
19	1990	2060	407	801	3200	844	61	4020	4010	2920	2310	2820
20	1950	2190	1490	130	3220	129	116	3940	4010	3690	2150	1920
21	1930	2820	133	130	3290	129	176	4040	4010	3910	134	2210
22	2010	3320	834	581	3230	1820	2190	4060	4010	3820	447	2250
23	1950	3680	657	429	2380	2040	2240	3990	4000	3890	2210	1850
24	2100	2980	538	1060	2350	3370	1850	3940	2740	3000	2050	2160
25	2230	2410	435	2560	2450	3760	2110	3940	1420	2960	2130	1720
26	2180	2960	133	3200	2140	3790	2420	3900	2050	2960	2070	1820
27	2320	3360	133	2890	126	3680	3280	3870	2000	2970	810	1890
28	2920	3570	133	2020	126	3720	3270	3800	2270	2250	129	1870
29	3990	3010	2030	2110	---	3750	3320	4040	2100	2280	641	1730
30	3990	3010	2270	2300	---	3280	3340	4030	1990	2500	1210	1910
31	3910	---	3070	981	---	3600	---	4020	---	3130	1260	---
TOTAL	76100	92440	51660	50687	55360	46467	43113	112775	106680	52689	45672	51872
MEAN	2455	3081	1666	1635	1977	1499	1437	3638	3556	1700	1473	1729
MAX	3990	4000	3070	3200	3290	3790	3630	4060	4040	3910	3020	2950
MIN	1810	1980	133	126	126	126	47	855	1420	137	129	113
AC-FT	150900	183400	102500	100500	109800	92170	85510	223700	211600	104500	90590	102900
MEAN†	1614	2486	1374	1398	1200	2364	2172	4740	3394	2167	1464	877
CFSM†	5.43	8.37	4.63	4.71	4.04	7.96	7.31	15.96	11.43	7.30	4.93	2.95
IN.†	6.27	9.34	5.34	5.43	4.21	9.18	8.16	18.40	12.75	8.42	5.68	3.29
AC-FT†	99240	147900	84510	86000	66650	145400	129200	291500	201900	133300	90050	52180

CAL YR 1992 TOTAL 816366 MEAN 2231 MAX 9990 MIN 69 AC-FT 1619000 MEAN† 2220 CFSM† 7.47 IN.† 101.70 AC-FT† 1611000
WTR YR 1993 TOTAL 785515 MEAN 2152 MAX 4060 MIN 47 AC-FT 1558000 MEAN† 2110 CFSM† 7.10 IN.† 96.46 AC-FT† 1528000

† 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 SE 1/4 NE 1/4 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 sea level. 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.--No estimated daily discharges. Records excellent. Flow regulated by Ross Reservoir (station 12175000), and Diablo and Gorge Reservoirs, Baker Lake, and Lake Shannon (stations 12176500, 12177700, 12191600, 12193000). Chemical analyses November 1970 to September 1971, October 1973 to September 1974. U.S. Geological Survey satellite telemeter at station.

AVERAGE DISCHARGE.--69 years, 15,030 ft³/s, 10,889,000 acre-ft/yr, unadjusted.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 154,000 ft³/s Nov. 27, 1949, gage height, 40.8 ft; minimum discharge, 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, 2,360 ft³/s Dec. 12, 1929.

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, 39,300 ft³/s May 13, gage height, 23.95 ft; minimum discharge, 3,980 ft³/s Sept. 29.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	8100	13500	13200	9100	12500	5120	10700	14800	22800	10600	12900	5260
2	7370	12900	10800	9490	12100	5590	10600	18800	19800	10700	11200	5340
3	7580	13200	11800	8650	11800	5400	11500	16600	18700	8640	11800	7260
4	7330	12500	11400	8510	10800	5520	11800	14500	17600	8770	11700	6540
5	7900	12500	10900	9310	11700	7420	10300	11600	17400	8620	11700	6210
6	7490	11600	9830	10300	9670	7950	8630	16800	17800	10400	11400	5440
7	7070	20800	10300	10100	9210	7660	7380	16800	18600	8030	9920	5980
8	7010	18600	9730	8900	9430	7450	7740	15700	17200	8410	10200	7580
9	6970	15700	10100	8350	12200	7640	10100	15000	16900	9220	9700	8730
10	7240	14700	10200	8050	12400	7040	9430	14800	22700	8290	8810	7460
11	6940	15100	9930	8290	12200	6790	8850	24500	18400	8220	7930	7160
12	6730	14600	9770	8130	12100	6860	8320	32000	18800	9170	7610	7090
13	8540	14000	9510	8110	11600	6390	7890	34500	16900	7970	6850	6590
14	7250	12200	8910	7110	10700	6790	7860	28800	16100	8580	5930	6890
15	7500	11600	11600	6580	10200	10700	7450	25300	21200	8640	6980	8080
16	7260	12500	9500	7800	10800	9600	7550	21700	20500	8570	8380	6730
17	6660	12800	9410	5440	10900	9250	7360	23000	18700	8780	9740	7320
18	6130	12000	7370	5420	11200	10800	8030	24200	18100	9590	8530	7220
19	8660	11900	7090	6430	11800	9270	8130	26700	17700	12000	8980	6940
20	11700	11800	8190	6590	11000	7780	7670	28900	16800	16800	8590	6230
21	11800	12200	6790	7310	10600	7750	7530	24800	15500	20000	6010	6600
22	11400	14600	7490	7440	11100	10900	10000	23100	15100	18000	5830	6470
23	10400	14000	8940	7120	10100	25300	10300	20100	15900	17500	9090	5870
24	9410	12200	8790	6930	9880	18800	10100	19100	13700	15300	10300	6290
25	8800	11000	8770	21000	9370	15700	11300	20200	11300	14300	9760	6030
26	8500	11200	8150	19900	8370	14300	12700	19900	12400	14100	8640	5990
27	8850	12900	7960	17600	5540	13100	14200	21100	13400	14000	6510	6090
28	9340	14000	7230	14300	5240	12400	13100	22500	12500	14000	5160	6010
29	11300	12600	8840	13300	---	12000	13100	23600	11600	15600	5470	5930
30	11600	13600	9210	12800	---	11000	14700	20400	10900	16200	6000	6420
31	11800	---	10500	11700	---	11000	---	19600	---	14700	6060	---
TOTAL	264630	402800	292210	300060	294510	303270	294320	659400	505000	363700	267680	197750
MEAN	8536	13430	9426	9679	10520	9783	9811	21270	16830	11730	8635	6592
MAX	11800	20800	13200	21000	12500	25300	14700	34500	22800	20000	12900	8730
MIN	6130	11000	6790	5420	5240	5120	7360	11600	10900	7970	5160	5260
AC-FT	524900	799000	579600	595200	584200	601500	583800	1308000	1002000	721400	530900	392200

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1925 - 1993, BY WATER YEAR (WY)

	MEAN	11080	15090	15880	14500	13560	11880	13820	20710	25030	19410	10810	8527
MAX	22550	49160	34660	25240	28840	23380	29270	36310	43320	37430	20930	16400	
(WY)	1968	1991	1976	1935	1991	1972	1934	1925	1972	1972	1976	1959	
MIN	3808	2876	5289	4485	3195	6224	7825	11440	12300	8856	6403	4852	
(WY)	1926	1937	1930	1930	1929	1929	1973	1977	1926	1977	1941	1942	

SUMMARY STATISTICS

FOR 1992 CALENDAR YEAR

FOR 1993 WATER YEAR

WATER YEARS 1925 - 1993

ANNUAL TOTAL	4431370	4145330											
ANNUAL MEAN	12110	11360											
HIGHEST ANNUAL MEAN										15030			
LOWEST ANNUAL MEAN										21270			
HIGHEST DAILY MEAN										9629			1944
LOWEST DAILY MEAN										135000		Nov 10	1990
ANNUAL SEVEN-DAY MINIMUM										2360		Dec 12	1929
ANNUAL RUNOFF (AC-FT)										2400		Oct 17	1925
10 PERCENT EXCEEDS										10890000			
50 PERCENT EXCEEDS										26400			
90 PERCENT EXCEEDS										12700			

e Estimated

SKAGIT RIVER BASIN

12200500 SKAGIT RIVER NEAR MOUNT VERNON, WA--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1959-70, 1974 to September 1993 (discontinued).

PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: February 1974 to November 1981.

WATER TEMPERATURE: July 1962 to August 1970, February 1974 to November 1981.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DATE	TIME	DIS-CHARGE, INST. (CUBIC FEET PER SECOND)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH (STAND- ARD UNITS)	TEMPER- ATURE WATER (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)
NOV 17...	1145	14300	57	7.5	9.0	4.5	13.1	113	--	24	22
JAN 28...	1315	16900	55	7.6	5.0	9.2	12.6	98	K15	41	23
MAR 25...	1015	19900	52	7.4	6.0	6.5	14.2	114	K4	K15	21
MAY 27...	1210	22300	39	7.3	12.5	7.9	11.0	104	20	K10	15
JUL 22...	1235	18400	43	7.2	12.5	2.6	11.0	103	83	68	18
SEP 21...	1130	5740	59	7.6	13.5	0.8	10.3	97	K16	K8	25

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)	SODIUM PERCENT	SODIUM AD- SORP- TION RATIO	POTAS- SIUM, DIS- SOLVED (MG/L AS K)	ALKA- LINITY, DIS IT, FIELD (MG/L AS CACO3)	BICAR- BONATE, DIS IT, FIELD (MG/L AS HCO3)	CAR- BONATE, DIS IT, FIELD (MG/L AS CO3)
NOV 17...	3	6.8	1.3	1.2	10	0.1	0.6	20	24	0
JAN 28...	3	6.7	1.5	1.4	11	0.1	0.5	20 *	24 *	0 *
MAR 25...	1	6.2	1.3	1.4	12	0.1	0.5	20 *	24 *	0 *
MAY 27...	0	4.7	0.8	1.0	12	0.1	0.5	14	19	0
JUL 22...	2	5.5	1.0	1.0	11	0.1	0.5	16	19	0
SEP 21...	3	7.6	1.5	1.4	10	0.1	0.7	23	27	0

DATE	SULFATE, DIS- SOLVED (MG/L AS SO4)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	FLUO- RIDE, DIS- SOLVED (MG/L AS F)	SILICA, DIS- SOLVED (MG/L AS SIO2)	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L)	SOLIDS, SUM OF CONSTI- TUENTS, DIS- SOLVED (MG/L)	SOLIDS, DIS- SOLVED (TONS PER AC-FT)	SOLIDS, DIS- SOLVED (TONS PER DAY)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N)	NITRO- GEN, NO2+NO3, DIS- SOLVED (MG/L AS N)
NOV 17...	4.5	0.8	<0.1	6.1	47	34	0.06	1810	0.01	0.15
JAN 28...	3.6	0.9	<0.1	7.2	33	35	0.05	1510	0.02	0.30
MAR 25...	3.8	0.8	<0.1	6.7	31	34	0.04	1670	0.01	0.22
MAY 27...	3.0	0.5	<0.1	5.6	22	26	0.03	1320	<0.01	0.08
JUL 22...	3.0	0.5	<0.1	5.2	30	26	0.04	1490	<0.01	0.08
SEP 21...	5.2	1.2	0.1	7.6	47	39	0.06	728	<0.01	0.07

SKAGIT RIVER BASIN

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12200500 SKAGIT RIVER NEAR MOUNT VERNON, WA--Continued

WATER-QUALITY RECORDS

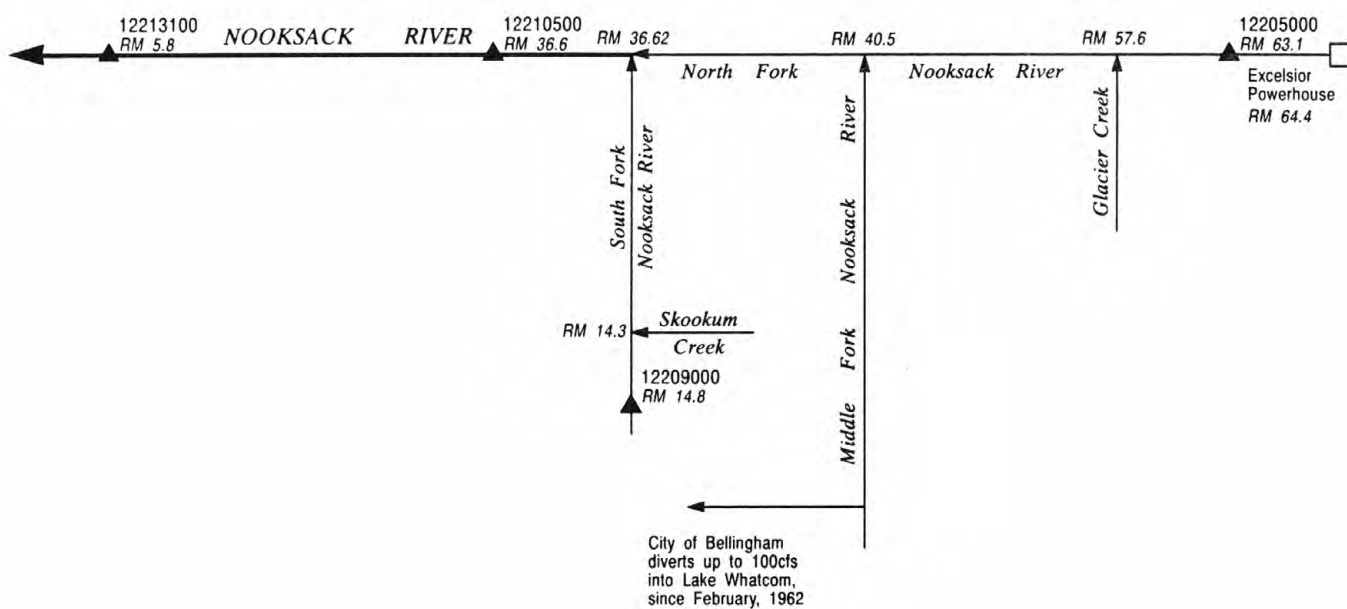
WATER-QUALITY DATA, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DATE	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)	BARIUM, DIS- SOLVED (UG/L AS BA)	COBALT, DIS- SOLVED (UG/L AS CO)	IRON, DIS- SOLVED (UG/L AS FE)	LITHIUM, DIS- SOLVED (UG/L AS LI)
NOV 17...	<0.01	<0.2	0.05	<0.01	<0.01	20	7	<3	50	<4
JAN 28...	0.03	<0.2	0.13	<0.01	<0.01	--	--	--	--	--
MAR 25...	0.02	0.2	0.02	<0.01	<0.01	50	7	<3	52	<4
MAY 27...	0.01	<0.2	0.05	<0.01	<0.01	40	6	<3	29	<4
JUL 22...	0.03	<0.2	<0.01	0.02	<0.01	30	7	<3	33	<4
SEP 21...	0.02	<0.2	0.01	<0.01	<0.01	--	--	--	--	--

DATE	MANGA- NESE, DIS- SOLVED (UG/L AS MN)	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)	SEDI- MENT, SUS- PENDEDED (MG/L)	SEDI- MENT, DIS- CHARGE, SUS- PENDEDED (T/DAY)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM
NOV 17...	4	<10	2	<1	<1	36	<6	186	7180	34
JAN 28...	--	--	--	--	--	--	--	198	9030	36
MAR 25...	3	<10	1	<1	<1	35	<6	163	8760	21
MAY 27...	3	<10	1	<1	<1	26	<6	136	8190	26
JUL 22...	2	<10	<1	<1	<1	29	<6	107	5320	17
SEP 21...	--	--	--	--	--	--	--	24	372	42

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

* - Whole water sample rather than filtered



EXPLANATION

- ▲ 12205000 Stream-gaging station
- ▼ 14142500 Water-quality data collection site
- ▲ 12396000 Crest-stage gaging station
- RM 63.1 River mile
- Stream—Arrow shows direction of flow
- - - - -→ Tunnel or pipe—Arrow shows direction of flow

Figure 17. 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 SE 1/4 SW 1/4 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 fair except for estimated daily discharges, which are poor. No diversion upstream from station. Some regulation at low flow by powerplant at Excelsior. Summer flows augmented by glacier melt. U.S. Geological Survey satellite telemeter at station.

AVERAGE DISCHARGE.--56 years, 776 ft³/s, 100.36 in/yr, 562,200 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 11,200 ft³/s Nov. 10, 1989, gage height, 9.56 ft; minimum discharge, 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)
June 9	2130	*3,890	*4.54	No other peak greater than base discharge.			
Minimum daily discharge, 150 ft ³ /s Jan. 18.							

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	493	655	476	e200	424	e167	e340	662	2010	754	828	437
2	458	536	441	e200	399	e170	e375	754	1550	765	886	497
3	446	439	430	e195	386	e175	e390	625	1310	725	938	527
4	e360	537	405	e180	385	e350	e375	600	1290	723	948	527
5	e310	480	382	e175	424	387	e350	609	1350	708	914	533
6	286	449	366	e170	435	377	e340	1050	1460	668	902	533
7	271	1470	327	e170	434	356	e325	849	1500	628	785	524
8	272	809	305	e178	425	360	710	692	1210	690	705	501
9	259	593	299	e170	414	346	806	614	2140	706	623	526
10	278	496	284	e170	409	e315	553	1350	2420	652	588	501
11	292	470	272	e170	384	e285	491	2020	1480	657	585	423
12	428	429	258	e168	360	e260	449	2730	1590	714	571	354
13	504	427	252	e167	341	e250	407	2650	1250	707	569	297
14	302	440	354	e167	e305	e230	381	2180	1400	683	538	327
15	267	429	299	e163	e280	353	378	1940	1770	648	561	319
16	252	524	276	e158	e260	e300	379	1860	1440	671	627	284
17	244	501	264	e152	e230	e360	388	1850	1400	666	604	278
18	608	433	240	e150	e225	499	450	2110	1470	682	587	269
19	1030	436	245	e158	e220	378	417	2350	1420	728	655	261
20	1480	408	251	e210	e215	364	388	2500	1240	1180	693	269
21	1180	482	243	e270	e205	360	402	2310	1090	963	609	239
22	1220	534	253	e230	e200	953	448	1940	998	871	608	221
23	1140	445	265	e200	e195	1970	429	1530	979	1430	1560	216
24	878	411	283	e450	e185	997	478	1530	805	1010	818	209
25	553	403	262	e1000	e175	675	636	1730	922	884	554	212
26	452	389	256	660	e170	547	626	1880	1040	860	467	222
27	390	1040	242	639	e168	477	579	1980	1220	826	437	279
28	356	673	236	565	e165	430	528	2140	907	1330	412	307
29	365	516	e225	489	---	399	543	2140	811	1400	405	322
30	421	546	e220	435	---	e370	632	1610	764	1120	412	301
31	557	---	e200	438	---	e350	---	1790	---	858	420	---
TOTAL	16352	16400	9111	8847	8418	13810	13993	50575	40236	25907	20809	10715
MEAN	527	547	294	285	301	445	466	1631	1341	836	671	357
MAX	1480	1470	476	1000	435	1970	806	2730	2420	1430	1560	533
MIN	244	389	200	150	165	167	325	600	764	628	405	209
AC-FT	32430	32530	18070	17550	16700	27390	27760	100300	79810	51390	41270	21250
CFSM	5.02	5.21	2.80	2.72	2.86	4.24	4.44	15.5	12.8	7.96	6.39	3.40
IN.	5.79	5.81	3.23	3.13	2.98	4.89	4.96	17.92	14.26	9.18	7.37	3.80

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1938 - 1993, BY WATER YEAR (WY)

	MEAN	665	739	635	488	467	393	557	1124	1533	1306	805	588
MAX	1358	2143	1354	1126	1401	1061	929	1631	2459	2112	1386	1122	
(WY)	1968	1991	1940	1968	1991	1972	1990	1993	1948	1974	1974	1978	
MIN	210	216	232	147	165	191	253	686	893	725	473	353	
(WY)	1988	1953	1979	1979	1956	1948	1975	1962	1941	1940	1941	1989	

SUMMARY STATISTICS

FOR 1992 CALENDAR YEAR

FOR 1993 WATER YEAR

WATER YEARS 1938 - 1993

ANNUAL TOTAL	266952	235173	
ANNUAL MEAN	729	644	
HIGHEST ANNUAL MEAN			777
LOWEST ANNUAL MEAN			1042
HIGHEST DAILY MEAN	4880	Apr 29	2730
LOWEST DAILY MEAN	200	Dec 31	150
ANNUAL SEVEN-DAY MINIMUM	234	Dec 25	159
ANNUAL RUNOFF (AC-FT)	529500	466500	562600
ANNUAL RUNOFF (CFSM)	6.95	6.14	7.40
ANNUAL RUNOFF (INCHES)	94.58	83.32	100.48
10 PERCENT EXCEEDS	1340	1430	1540
50 PERCENT EXCEEDS	536	450	595
90 PERCENT EXCEEDS	291	216	256

e Estimated

NOOKSACK RIVER BASIN

12209000 SOUTH FORK NOOKSACK RIVER NEAR WICKERSHAM, WA

LOCATION.--Lat 48°39'52", long 122°09'56", in lot 2, SW 1/4 SW 1/4 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).

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.--No estimated daily discharges. Records good. 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, 22,400 ft³/s Nov. 23, 1990, gage height, 13.20 ft, from rating curve extended above 11,000 ft³/s; minimum discharge, 59 ft³/s Oct. 20-25, 30, 31, 1987, gage height, 1.79 ft.

EXTREMES FOR PERIOD MAY TO NOVEMBER 1993.--Maximum discharge during period May to November 1993, 3,600 ft³/s Nov. 29, gage height, 5.85 ft; minimum discharge, 72 ft³/s Oct. 4, 5, 11.

DISCHARGE, CUBIC FEET PER SECOND, MAY TO NOVEMBER 1993
DAILY MEAN VALUES

DAY	MAY	JUN	JUL	AUG	SEP	OCT	NOV
1	---	936	323	275	116	74	172
2	---	723	304	250	113	74	329
3	---	659	290	235	111	74	454
4	---	587	279	222	110	73	274
5	---	561	264	209	107	73	218
6	---	546	249	200	107	99	194
7	---	531	240	195	102	94	177
8	---	473	233	189	99	85	165
9	---	1280	232	182	99	79	155
10	---	1460	223	184	97	75	147
11	---	941	214	181	98	74	140
12	1790	1570	229	171	123	74	135
13	1530	955	252	165	103	101	133
14	1150	807	265	160	103	212	136
15	1010	1100	231	163	107	217	358
16	930	863	215	172	98	157	234
17	995	674	209	166	93	127	219
18	1090	602	202	158	91	202	199
19	1130	543	195	151	91	239	192
20	1250	483	537	144	106	153	672
21	1250	444	557	139	96	126	922
22	1180	542	376	140	91	671	382
23	910	762	819	187	88	1600	274
24	808	546	442	180	87	573	254
25	804	440	352	168	85	310	254
26	796	415	306	151	82	232	222
27	790	433	275	139	80	202	255
28	952	389	348	133	79	209	798
29	829	383	426	129	77	182	2590
30	677	356	409	125	75	169	1410
31	718	---	318	120	---	193	---
TOTAL	---	21004	9814	5383	2914	6823	12064
MEAN	---	700	317	174	97.1	220	402
MAX	---	1570	819	275	123	1600	2590
MIN	---	356	195	120	75	73	133
AC-FT	---	41660	19470	10680	5780	13530	23930
CFSM	---	6.80	3.07	1.69	.94	2.14	3.90
IN.	---	7.59	3.54	1.94	1.05	2.46	4.36

12210500 NOOKSACK RIVER AT DEMING, WA

LOCATION.--Lat 48°48'38", long 122°12'13", in lot 12, NE 1/4 SE 1/4 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 sea level. 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 fair except those above 9,000 ft³/s, which are 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.--51 years (water years 1936-57, 1965-93), 3,330 ft³/s, 77.13 in/yr, 2,403,000 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 daily discharge, 430 ft³/s Oct. 29, Nov. 9, 1987.

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	(ft ³ /s)	(ft)	Date	Time	(ft ³ /s)	(ft)
Jan. 25	1200	*19,600	*10.06	No other peak greater than base discharge.			
Minimum daily discharge, 800 ft ³ /s Sept. 24.							

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1700	2650	3620	1550	3170	1070	2470	4150	4870	2340	2360	1160
2	1600	2900	3000	1500	2910	1090	2750	5310	4060	2300	2370	1280
3	1570	2150	2620	1510	2800	1110	3220	4140	3600	2180	2440	1380
4	1400	2710	2390	1490	2670	1880	3230	3750	3280	2150	2440	1390
5	1230	2470	2220	1360	2910	3190	2670	3520	3380	2090	2340	1350
6	1140	2050	2090	1250	2870	2930	2450	5130	3360	1990	2300	1390
7	1080	7320	1990	1250	2860	2510	2480	4560	3390	1890	2110	1450
8	1040	5270	1960	1300	2720	2370	3740	4660	3060	1910	1940	1390
9	1010	3870	2270	1210	2630	2260	5020	4100	4490	1990	1780	1410
10	1000	3090	2020	1190	2600	1950	3810	4660	7290	1880	1680	1410
11	1060	3070	1890	1180	2380	1740	3440	5990	5000	1840	1660	1260
12	1110	2830	1760	1170	2150	1630	3130	6880	6200	1990	1590	1160
13	2190	2670	1680	1160	2000	1520	2830	6930	4800	2030	1570	1000
14	1400	2670	3200	1160	1860	1700	2730	5680	4260	2200	1500	990
15	1160	2480	2650	1130	1710	3600	2740	5150	5290	1960	1480	1040
16	1070	2870	2220	1070	1540	2290	2910	4690	4530	1850	1700	984
17	1040	3080	2020	1020	1450	2560	2910	4720	3980	1870	1620	e940
18	1350	2730	1800	1000	1410	4190	3580	4970	3800	1850	1580	e900
19	2310	3070	1780	1050	1390	2830	3080	5390	3660	1830	1640	e900
20	2910	2860	2130	1730	1370	2700	2740	6180	3350	2980	1750	e920
21	5540	3350	2340	2180	1310	2840	2720	5600	3080	3250	1630	e920
22	3900	4750	2550	1710	1270	4460	3060	5460	3240	2630	1530	e880
23	3520	3500	3180	1470	1210	11800	2940	4510	4000	4740	2740	e820
24	2720	2880	3030	2000	1150	6850	3170	4060	3190	3300	2140	e800
25	2140	2540	2600	15100	1110	4930	3830	4180	2950	2760	1630	e810
26	1810	2320	2500	8340	1080	4010	3980	4280	2990	2530	1350	e810
27	1580	5110	2340	6160	1070	3450	4520	4390	3230	2380	1250	e880
28	1450	4820	2120	4920	1060	3080	3790	4790	2800	2970	1150	e940
29	1420	3480	1960	4130	---	2880	3990	4840	2620	3620	1110	991
30	1440	4300	1820	3530	---	2670	4240	3990	2510	3100	1130	987
31	1780	---	1690	3380	---	2510	---	4080	---	2520	1140	---
TOTAL	55670	99860	71440	78200	54660	94600	98170	150740	116260	74920	54650	32522
MEAN	1796	3329	2305	2523	1952	3052	3272	4863	3875	2417	1763	1084
MAX	5540	7320	3620	15100	3170	11800	5020	6930	7290	4740	2740	1450
MIN	1000	2050	1680	1000	1060	1070	2450	3520	2510	1830	1110	800
AC-FT	110400	198100	141700	155100	108400	187600	194700	299000	230600	148600	108400	64510
CFSM	3.08	5.70	3.95	4.32	3.34	5.23	5.60	8.33	6.64	4.14	3.02	1.86
IN.	3.55	6.36	4.55	4.98	3.48	6.03	6.25	9.60	7.41	4.77	3.48	2.07

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1935 - 1993, BY WATER YEAR (WY)

	MEAN	2659	3886	4158	3560	3328	2870	3308	4477	4671	3335	1980	1741
MAX	7237	10030	9668	6989	7207	7347	5323	6750	7815	6180	3526	3888	
(WY)	1968	1991	1976	1984	1961	1972	1988	1936	1937	1974	1974	1978	
MIN	595	672	1265	957	1349	1585	1584	2669	2368	1652	1279	941	
(WY)	1988	1937	1986	1937	1936	1985	1975	1978	1940	1940	1987	1989	

SUMMARY STATISTICS

FOR 1992 CALENDAR YEAR

FOR 1993 WATER YEAR

WATER YEARS 1935 - 1993

ANNUAL TOTAL	927904	981692	
ANNUAL MEAN	2535	2690	
HIGHEST ANNUAL MEAN			3318
LOWEST ANNUAL MEAN			4647
HIGHEST DAILY MEAN	11600	15100	39600
LOWEST DAILY MEAN	724	800	430
ANNUAL SEVEN-DAY MINIMUM	803	843	441
ANNUAL RUNOFF (AC-FT)	1840000	1947000	2403000
ANNUAL RUNOFF (CFSM)	4.34	4.61	5.68
ANNUAL RUNOFF (INCHES)	59.11	62.53	77.18
10 PERCENT EXCEEDS	3910	4700	6130
50 PERCENT EXCEEDS	2180	2440	2800
90 PERCENT EXCEEDS	1190	1110	1290

e Estimated

NOOKSACK RIVER BASIN

12213100 NOOKSACK RIVER AT FERNDAL, WA

LOCATION.--Lat 48°50'42", long 122°35'17", in NE 1/4 NW 1/4 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.--Annual maximum stage only, water years 1918, 1922, 1932, 1935. Annual maximum, water years 1946, 1950-66. 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 sea level. Prior to July 18, 1968, at site 220 ft upstream at datum 4.21 ft higher.

REMARKS.--Records good except for estimated daily discharges, 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. Cities of Ferndale and Lynden divert about 10 ft³/s for municipal use. Chemical analyses October 1961 to September 1970. U.S. Geological Survey satellite telemeter at station.

AVERAGE DISCHARGE.--27 years, 3,839 ft³/s, 66.33 in/yr, 2,781,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum recorded discharge, 57,000 ft³/s Nov. 10, 1990, gage height, 23.56 ft; minimum discharge, 463 ft³/s Oct. 26, Nov. 9, 10, 1987.

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)
Jan. 25	1800	*19,000	*15.28	Mar. 23	1100	16,800	14.22
Minimum discharge, 875 ft ³ /s Sept. 25.							

REVISIONS.--Some peak discharges and the annual maximum (*) reported for some water years have been revised as shown in the following table. They supersede figures published in the reports for 1976, 1980, 1984, 1990 and 1991.

Water year	Date	Discharge (ft ³ /s)	Gage height (ft)
1976	Dec. 3, 1975	*46,700	*21.97
1980	Dec. 15, 1979	*36,400	*20.14
1984	Jan. 5, 1984	*41,500	*21.08
1990	Nov. 11, 1989	*47,800	*22.15
1991	Nov. 10, 1990	*57,000	*23.56
	Nov. 24, 1990	48,500	22.26

Revised daily discharges, in cubic feet per second, for period in November 1990 are given below. These figures supersede those published in the 1991 report.

	Nov. 10....44,200	Nov. 24....38,700					
	Nov. 11....48,200	Nov. 25....37,700					
	TOTAL	MEAN	MAX	MIN	ACRE/FT	CFSM	IN
November 1990	419520	13980	48200	3750	832100	17.8	19.86
CAL YR 1990	1803526	4941	48200	945	3577000	6.29	85.36
WTR YR 1991	1880516	5152	48200	945	3730000	6.55	89.00

NOOKSACK RIVER BASIN

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12213100 NOOKSACK RIVER AT FERNDAL, WA --Continued

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1970	3040	5400	e1900	3950	1280	2600	4290	5650	2700	2610	1290
2	1860	3620	4060	e1850	3620	1300	2870	5880	4770	2630	2520	1350
3	1770	3040	3440	e1850	3420	1310	3260	4890	4270	2500	2570	1460
4	1640	3030	3070	e1800	3260	1610	3800	4070	3810	2450	e2600	1490
5	1420	3580	2810	e1650	3310	2810	3090	3790	3830	2390	e2500	1460
6	1280	2750	2600	e1500	3340	3240	2710	5130	3790	2290	e2450	1480
7	1200	7210	2460	e1500	3320	2700	2610	5710	3810	2190	e2300	1510
8	1140	7160	2340	e1590	3170	2480	3140	5000	3580	2150	e2100	1500
9	1110	4960	2770	e1490	3050	2440	6370	4860	3560	2220	e1950	1450
10	1050	3740	2570	e1450	2990	2170	4570	4720	9390	2140	e1850	1520
11	1110	3480	2390	e1440	2850	1940	3810	6900	6120	2080	e1810	1430
12	1130	3370	2200	e1410	2610	1790	3470	7740	6800	2100	1770	1320
13	2230	3070	2040	e1400	2420	1690	3130	8970	6290	2260	1730	1190
14	1700	3020	3140	e1400	2270	1670	2990	6750	4850	2320	1670	1110
15	1320	2830	3480	e1360	2100	3230	2880	6170	6070	2260	1610	1160
16	1190	2970	2750	e1300	1920	2680	3050	5350	5750	2090	1770	1090
17	1110	3470	2470	e1230	1790	2370	2930	5400	4730	2060	1770	1060
18	1120	3190	2190	e1200	1720	4310	3580	5510	4410	2050	1720	1040
19	2140	3380	2040	e1280	1680	3400	3330	6270	4210	2020	1730	1000
20	3180	3550	2420	1770	1660	2920	2910	7380	3880	2480	1820	1030
21	6820	3470	3040	3180	1590	3170	2740	6540	3560	3690	1810	1050
22	5600	6580	3110	2470	1530	3430	2970	6480	3420	2810	1650	1000
23	5170	4970	3970	1930	1460	13700	2930	5570	4350	4700	2280	923
24	3870	3690	3970	1910	1410	9260	2960	4720	3810	3930	2490	918
25	3110	3210	3420	13700	1360	5980	3460	4750	3320	3110	1950	888
26	2530	2840	3330	12200	1320	4610	4150	4820	3340	2830	1590	901
27	2180	4580	e3000	9150	1300	3840	4640	4910	3480	2660	1460	942
28	1950	7310	e2700	7010	1290	3380	4100	5390	3300	2650	1360	1020
29	1850	4660	e2400	5720	---	3110	4060	5640	2980	4010	1300	1060
30	1830	5650	e2200	4730	---	2880	4470	4700	2910	3420	1290	1060
31	1990	---	e2050	4230	---	2680	---	4500	---	2870	1290	---
TOTAL	67570	121420	89830	96600	65710	103380	103580	172800	134040	82060	59320	35702
MEAN	2180	4047	2898	3116	2347	3335	3453	5574	4468	2647	1914	1190
MAX	6820	7310	5400	13700	3950	13700	6370	8970	9390	4700	2610	1520
MIN	1050	2750	2040	1200	1290	1280	2600	3790	2910	2020	1290	888
AC-FT	134000	240800	178200	191600	130300	205100	205500	342700	265900	162800	117700	70810
CFSM	2.77	5.15	3.69	3.96	2.99	4.24	4.39	7.09	5.68	3.37	2.43	1.51
IN.	3.20	5.75	4.25	4.57	3.11	4.89	4.90	8.18	6.34	3.88	2.81	1.69

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1967 - 1993, BY WATER YEAR (WY)

	MEAN	2598	4934	5058	4780	4360	3654	3682	4592	4927	3534	2099	1879
MAX	6815	13980	9992	8720	8197	9339	5723	6526	8285	6156	3511	4074	
(WY)	1968	1991	1976	1984	1982	1972	1988	1969	1974	1972	1976	1978	
MIN	629	1276	1539	1149	1920	1864	1746	2998	2411	1988	1338	917	
(WY)	1988	1988	1986	1979	1985	1985	1975	1978	1992	1977	1987	1989	

SUMMARY STATISTICS

FOR 1992 CALENDAR YEAR

FOR 1993 WATER YEAR

WATER YEARS 1967 - 1993

ANNUAL TOTAL	1114319		1132012									
ANNUAL MEAN	3045		3101									
HIGHEST ANNUAL MEAN												
LOWEST ANNUAL MEAN												
HIGHEST DAILY MEAN	16200	Jan 24	13700	Jan 25								
LOWEST DAILY MEAN	806	Sep 18	888	Sep 25								
ANNUAL SEVEN-DAY MINIMUM	906	Sep 14	942	Sep 22								
ANNUAL RUNOFF (AC-FT)	2210000		2245000									
ANNUAL RUNOFF (CFSM)	3.87		3.95									
ANNUAL RUNOFF (INCHES)	52.74		53.58									
10 PERCENT EXCEEDS	5000		5530									
50 PERCENT EXCEEDS	2460		2750									
90 PERCENT EXCEEDS	1340		1300									

e Estimated

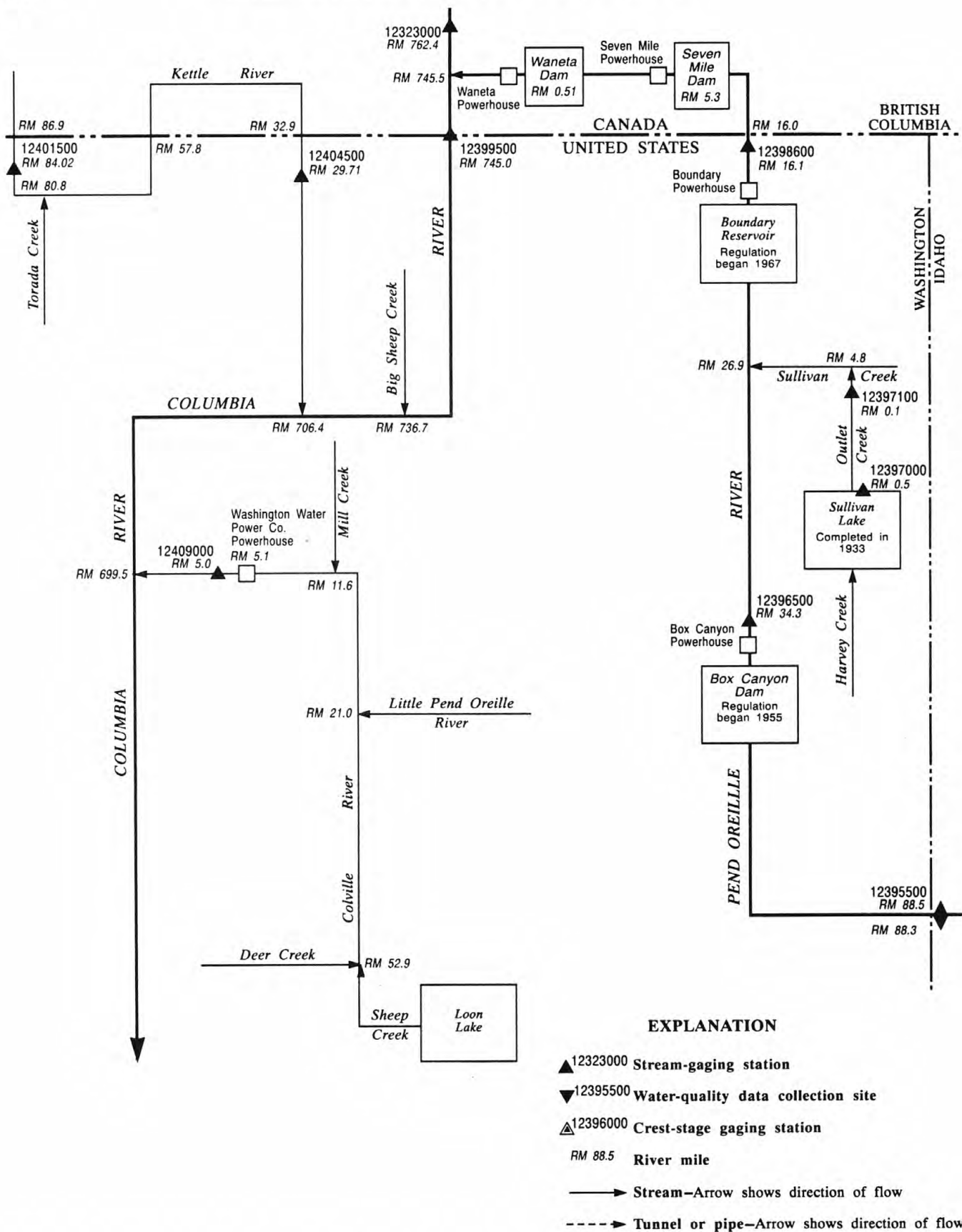


Figure 18. Gaging stations in Columbia River Basin above and including Colville and Pend Oreille River Basins.

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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.

PERIOD OF RECORD.--April 1913 to current year in reports of Geological Survey and Water Survey of Canada.
Published as "at Trail, British Columbia" 1913-37.

GAGE.--Water-stage recorder. Datum of gage is 1,329.90 ft above sea level, 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.

COOPERATION.--Discharge records furnished by Water Resources Branch of Canada. This station is maintained by Canada under agreement with the United States.

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.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	57600	40700	62900	85500	54000	41700	32700	38100	66000	60000	45600	53000
2	53600	38700	62100	80900	61400	38100	32900	38500	66700	67500	42400	53000
3	57900	41300	61000	77300	64600	37400	33300	38800	65000	71000	46600	49400
4	61000	44200	58900	78800	66700	37100	33400	38800	65000	75600	51600	44500
5	58000	44600	58800	89300	71300	36000	30900	39200	62200	78400	55100	45600
6	55400	44600	63700	103000	66000	36000	28600	41000	61800	74900	61800	45600
7	57500	39300	66800	112000	55400	37400	28800	43400	61800	74200	67800	50100
8	59400	30200	74100	111000	54000	36700	32900	43100	60400	74900	73100	54700
9	60700	33200	74000	104000	57600	35700	33100	42700	58600	73500	73100	56500
10	57700	39800	73800	92900	57600	36000	33100	43100	59000	76600	71000	58300
11	54700	44000	73400	89700	56500	37100	33200	46300	57600	80200	68500	59000
12	54700	40600	78900	83300	58300	37800	34100	52300	57200	86500	68900	59000
13	55400	40400	85000	74900	53000	35700	35700	60400	57200	89000	66700	55100
14	55100	44500	84700	73100	47000	33300	35700	62900	56900	87600	61400	53700
15	54000	53700	79000	69900	49100	38100	35700	66400	56900	86200	57900	53300
16	52500	55100	77500	65300	53000	39900	35700	68200	54700	86900	59000	53000
17	52500	55400	77500	64600	58300	37400	35300	67500	51200	85100	60400	53000
18	52800	56100	80500	66400	67800	32100	34800	67500	47000	82600	63900	48000
19	53100	55700	90400	66000	68200	31500	33600	68500	48700	77000	69200	42400
20	46800	53800	107000	65300	61800	30400	33400	72000	48000	69600	69200	41300
21	39400	64700	115000	65700	54000	28900	34100	72700	48000	62900	64600	39900
22	37100	77500	118000	66400	57900	28800	36400	71700	49400	56900	62900	39600
23	35600	81800	117000	66000	61100	29100	36700	69900	48400	53700	64300	39600
24	34800	83800	106000	65000	61400	28400	36700	68900	48400	43400	67100	39600
25	33500	85500	103000	64300	62200	28600	36700	66700	49400	39200	67100	41000
26	34000	78600	95000	64300	65300	36700	36400	67500	52300	42000	69200	42400
27	34300	74500	86900	65300	59700	34900	37800	64600	56500	41700	71000	42400
28	34700	65900	84700	61100	48400	34100	37800	66000	57200	37100	62200	42700
29	37400	62400	85000	56500	---	32100	37800	69200	57200	37100	54000	39600
30	37700	62600	86000	55100	---	32700	37800	67100	55800	37400	50500	36700
31	39500	---	85700	53000	---	32600	---	65000	---	36400	50500	---
TOTAL	1508400	1633200	2572300	2335900	1651600	1072300	1035100	1788000	1684500	2045100	1916600	1432000
MEAN	48660	54440	82980	75350	58990	34590	34500	57680	56150	65970	61830	47730
MAX	61000	85500	118000	112000	71300	41700	37800	72700	66700	89000	73100	59000
MIN	33500	30200	58800	53000	47000	28400	28600	38100	47000	36400	42400	36700
AC-FT	2992000	3239000	5102000	4633000	3276000	2127000	2053000	3546000	3341000	4056000	3802000	2840000
CAL YR 1992	TOTAL 26336300		MEAN 71960	MAX 175000		MIN 29600	AC-FT 52240000					
WTR YR 1993	TOTAL 20675000		MEAN 56640	MAX 118000		MIN 28400	AC-FT 41010000					

PEND OREILLE RIVER BASIN

12395500 PEND OREILLE RIVER AT NEWPORT, WA

LOCATION.--Lat 48°10'56", long 117°02'00", in SE 1/4 SE 1/4 SW 1/4 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.

WATER-DISCHARGE RECORDS

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

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

GAGE.--Water-stage recorder. Datum of gage is 1,999.7 ft above sea level. Prior to Sept. 22, 1928, nonrecording gages at Priest River, Newport, or Metairie Falls at various datums (see description, WSP 532, p. 92). Sept. 22, 1928, to Sept. 30, 1935, at datum 40.44 ft higher, and Oct. 1, 1935, to Sept. 30, 1941, water-stage recorder at datum 0.30 ft higher. Since December 1952, auxiliary water-stage recorder 2.74 mi downstream from base gage.

REMARKS.--Records good except for estimated daily discharges, which are fair. Flow regulated at Albeni Falls Dam and affected by storage in Pend Oreille Lake, Flathead Lake, Hungry Horse Reservoir, and several smaller reservoirs. Diversions upstream from station for irrigation of about 354,000 acres. Stage-discharge relation affected by backwater from Box Canyon Dam 54 mi downstream. Discharge computed from slope and conveyance of reach between base and auxiliary gage.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of June 1894 reached a stage of about 64.0 ft present site and datum, (from water surface profiles) discharge, about 200,000 ft³/s.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	24100	19000	15800	e11100	11600	e11500	16800	10700	44500	26100	25300	15100
2	25200	21500	17000	e11200	10200	15600	16900	10100	43900	25500	16900	15100
3	25100	25100	14800	e12000	10100	17400	17100	15600	42900	25100	13200	15200
4	25000	27500	10700	e12200	10200	15700	17000	19100	37600	26000	14900	15200
5	24900	27800	8320	e14800	10300	13400	17900	21000	35500	27200	14900	15200
6	25100	27300	10200	e16600	10300	12900	18000	21200	36500	32400	13000	13700
7	25100	27400	12100	e18000	10200	13000	18800	21100	32400	36800	12400	12700
8	25900	27100	11700	e17800	10400	13000	19600	21300	28600	37700	12300	12800
9	26400	26100	13300	e18000	9070	16900	19200	21700	29000	39000	12900	15400
10	26600	25700	12500	e19800	8450	19600	18800	22700	27200	41700	13700	15500
11	26400	25200	12200	e21000	8520	15300	19200	25800	24800	44500	13700	18400
12	26800	25000	11300	e21500	8580	12300	19400	27800	20900	38100	13100	18100
13	25900	24700	10600	e22000	8600	10600	18900	27400	20800	26700	12600	16700
14	26500	19500	10700	e21000	8610	10400	20500	29000	24100	25400	12300	16600
15	27300	14000	10800	e20200	9230	10400	20900	30700	26800	28800	12100	16400
16	27100	13300	e12200	e20600	e10400	10700	19000	31900	27000	32100	12200	16500
17	26900	12800	e16000	e19900	e11800	14100	17500	32300	27900	34300	12300	16500
18	26900	15000	e18000	e18400	e11500	18700	17700	38100	29200	32400	12900	16500
19	27200	18100	12800	e17000	e10600	14600	17700	44200	29400	25500	13200	16400
20	26900	18900	13100	e16400	e10500	8440	17200	48000	30500	25300	14400	16400
21	27000	11900	13300	e16900	e10300	8530	15500	52100	31200	21300	14200	16800
22	26700	12200	11800	e17300	e9800	8540	17700	52600	31700	26100	13300	16600
23	27100	14000	10400	e16900	e9500	8590	22800	52700	34700	24300	12700	20300
24	27300	16300	9360	e16900	e9400	10300	26100	52500	34800	27000	12300	24000
25	27400	15900	8170	14400	e9600	13800	25900	52600	31400	27800	12400	23900
26	27600	13700	8050	15200	e11200	14900	25300	52800	29600	26000	12700	23700
27	26900	12800	8190	18000	e12000	14700	22300	48200	28300	26300	16100	23600
28	20100	12700	e9600	14500	e11700	14800	21100	46500	28800	21200	14500	23400
29	16100	12500	10100	12900	---	16300	21100	52200	28500	23000	12800	20800
30	15900	12500	10800	12800	---	17200	21000	52700	27100	26800	13500	18700
31	16200	---	11300	12800	---	16900	---	50800	---	27400	14500	---
TOTAL	779600	575500	365190	518100	282660	419100	586900	1085400	925600	907800	427300	526200
MEAN	25150	19180	11780	16710	10090	13520	19560	35010	30850	29280	13780	17540
MAX	27600	27800	18000	22000	12000	19600	26100	52800	44500	44500	25300	24000
MIN	15900	11900	8050	11100	8450	8440	15500	10100	20800	21200	12100	12700
AC-FT	1546000	1142000	724400	1028000	560700	831300	1164000	2153000	1836000	1801000	847500	1044000

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1903 - 1993, BY WATER YEAR (WY)

	1903	1910	1920	1930	1940	1950	1960	1970	1980	1990
MEAN	17250	18170	15950	15280	16180	18710	27110	50200	62510	32990
MAX	31330	32280	32120	40010	31640	38420	56940	87470	114900	73730
(WY)	1960	1960	1934	1934	1965	1972	1956	1934	1933	1907
MIN	6208	6049	5987	4271	4380	6622	5507	15320	15220	7295
(WY)	1932	1937	1937	1937	1936	1937	1977	1977	1977	1988

SUMMARY STATISTICS

FOR 1992 CALENDAR YEAR

FOR 1993 WATER YEAR

WATER YEARS 1903 - 1993

ANNUAL TOTAL	5928320	7399350	
ANNUAL MEAN	16200	20270	25120
HIGHEST ANNUAL MEAN			37670
LOWEST ANNUAL MEAN			12920
HIGHEST DAILY MEAN	30000	May 8	135000
LOWEST DAILY MEAN	3280	Jan 31	2420
ANNUAL SEVEN-DAY MINIMUM	7040	Jan 28	3280
INSTANTANEOUS PEAK FLOW			54000
INSTANTANEOUS PEAK STAGE			b 41.03
INSTANTANEOUS LOW FLOW			6980
ANNUAL RUNOFF (AC-FT)	11760000	14680000	18200000
10 PERCENT EXCEEDS	26400	31500	53300
50 PERCENT EXCEEDS	15000	17700	18800
90 PERCENT EXCEEDS	9620	10400	8500

a Also occurred June 21, 1933, June 12, 1972.

b Also occurred May 31.

e Estimated

PEND OREILLE RIVER BASIN

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12395500 PEND OREILLE RIVER AT NEWPORT, WA--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--October 1988 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH WATER WHOLE FIELD (STAND- ARD UNITS)	TEMPER- ATURE AIR (DEG C)	TEMPER- ATURE WATER (DEG C)	OXYGEN, DIS- SOLVED (MG/L)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION)	COLI- FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)	STREP- TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML)	BICAR- BONATE WATER WH FET FIELD MG/L AS HCO3	CAR- BONATE WATER WH FET FIELD MG/L AS CO3
OCT												
05...	1400	25100	170	--	16.0	17.0	--	--	--	--	--	--
21...	0845	27200	174	--	10.5	11.0	--	--	--	--	--	--
NOV												
02...	0945	21400	163	--	6.0	9.5	--	--	--	--	--	--
16...	1300	13600	167	--	8.0	8.5	--	--	--	--	--	--
23...	1300	13800	170	8.5	1.5	6.0	11.8	102	<1	K11	100	1
30...	1130	11800	226	--	1.5	2.5	--	--	--	--	--	--
DEC												
14...	1130	10500	--	--	3.0	2.0	--	--	--	--	--	--
JAN												
14...	1200	e21000	179	8.1	8.0	1.0	12.8	98	<1	K7	100	0
14...	1210	--	--	--	--	--	--	--	--	--	--	--
25...	0945	16700	174	--	2.0	7.0	--	--	--	--	--	--
FEB												
09...	1420	9240	179	--	4.0	4.0	--	--	--	--	--	--
22...	1000	10100	180	--	--	--	--	--	--	--	--	--
MAR												
10...	1345	19300	168	8.3	11.0	2.5	13.3	104	<1	K1	100	0
10...	1400	19300	168	--	11.0	2.5	--	--	--	--	--	--
APR												
05...	1330	18200	--	--	--	--	--	--	--	--	--	--
13...	1145	18500	158	--	9.0	7.0	--	--	--	--	--	--
20...	1000	17700	146	--	8.5	7.0	--	--	--	--	--	--
MAY												
12...	1115	27800	150	8.2	35.5	13.5	11.0	114	K3	<1	83	0
JUL												
09...	1015	38200	155	8.2	17.0	16.0	9.8	108	K11	54	95	0
SEP												
14...	1045	16500	166	8.1	18.0	16.0	8.7	96	K1	<1	93	0
DATE		ALKA- LINITY WAT WH TOT FET FIELD MG/L AS CACO3	NITRO- GEN, DIS- NITRITE TOTAL (MG/L AS N)	NITRO- GEN, NITRITE DIS- SOLVED TOTAL (MG/L AS N)	NITRO- GEN, NO2+NO3 DIS- SOLVED TOTAL (MG/L AS N)	NITRO- GEN, NO2+NO3 DIS- SOLVED TOTAL (MG/L AS N)	NITRO- GEN, AMMONIA DIS- SOLVED TOTAL (MG/L AS N)	NITRO- GEN, AMMONIA DIS- SOLVED TOTAL (MG/L AS N)	NITRO- GEN,AM- MONIA + ORGANIC TOTAL (MG/L AS N)	PHOS- PHORUS ORTHO TOTAL (MG/L AS P)	PHOS- PHORUS ORTHO TOTAL (MG/L AS P)	PHOS- PHORUS ORTHO, DIS- SOLVED TOTAL (MG/L AS P)
OCT												
05...	--	0.006	--	0.007	--	0.010	--	<0.2	0.003	0.002	--	--
21...	--	0.009	--	0.013	--	0.007	--	<0.2	0.005	<0.001	--	--
NOV												
02...	--	0.002	--	<0.005	--	0.003	--	<0.2	0.005	<0.001	--	--
16...	--	0.005	--	0.009	--	0.020	--	<0.2	0.003	0.002	--	--
23...	86	0.030	0.030	<0.050	<0.050	0.010	<0.010	<0.2	0.020	0.010	<0.010	--
30...	--	0.007	--	0.008	--	0.026	--	0.2	0.016	0.003	--	--
DEC												
14...	--	<0.001	--	0.008	--	<0.002	--	<0.2	0.004	0.002	--	--
JAN												
14...	84	--	0.005	--	0.050	--	0.014	<0.2	0.012	--	0.009	--
14...	--	--	<0.010	--	0.054	--	0.010	<0.2	0.010	--	0.010	--
25...	--	--	0.012	--	0.066	--	0.021	<0.2	0.009	--	0.005	--
FEB												
09...	--	--	0.004	--	0.061	--	0.011	<0.2	0.006	--	0.001	--
22...	--	--	0.004	--	0.064	--	0.015	<0.2	0.004	--	<0.001	--
MAR												
10...	83	--	<0.010	--	<0.050	--	0.020	0.2	<0.010	--	<0.010	--
10...	--	--	<0.001	--	0.007	--	0.016	<0.2	0.009	--	0.006	--
APR												
05...	--	--	0.001	--	0.043	--	0.025	0.2	0.012	--	0.001	--
13...	--	--	0.003	--	0.027	--	0.023	<0.2	0.008	--	0.002	--
20...	--	--	0.001	--	0.013	--	0.023	0.5	0.014	--	<0.001	--
MAY												
12...	68	--	<0.010	--	<0.050	--	0.020	<0.2	<0.010	--	<0.010	--
JUL												
09...	78	--	<0.010	--	<0.050	--	0.050	<0.2	0.050	--	<0.010	--
SEP												
14...	76	--	<0.010	--	<0.050	--	0.020	<0.2	<0.010	--	<0.010	--

K Results based on counts outside ideal colony range.
e Estimated

PEND OREILLE RIVER BASIN

12395500 PEND OREILLE RIVER AT NEWPORT, ID--Continued

WATER-QUALITY DATA, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DATE	HARD- NESS TOTAL (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)	SODIUM PERCENT	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)
NOV 23...	76	21	5.7	2.9	8	0.8	5.8	0.9	0.1	6.1
MAR 10...	83	23	6.2	2.8	7	0.9	6.6	1.2	<0.1	6.4
MAY 12...	68	19	5.0	2.8	8	0.9	5.3	0.9	<0.1	7.2
SEP 14...	79	22	5.9	2.6	7	0.8	6.1	0.9	0.1	6.3
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)	ARSENIC DIS- SOLVED (UG/L AS AS)	BARIUM, DIS- SOLVED (UG/L AS BA)	CADMIUM DIS- SOLVED (UG/L AS CD)	CHRO- MIUM, DIS- SOLVED (UG/L AS CR)	COPPER, DIS- SOLVED (UG/L AS CU)	
NOV 23...	91	95	0.12	3390	<1	68	<1	2	3	
MAR 10...	93	97	0.13	4850	<1	69	<1	<1	12	
MAY 12...	86	82	0.12	6460	<1	58	<1	<1	2	
SEP 14...	92	91	0.13	4100	1	67	<1	<1	5	
DATE	IRON, DIS- SOLVED (UG/L AS FE)	LEAD, DIS- SOLVED (UG/L AS PB)	MANGA- NESE, DIS- SOLVED (UG/L AS MN)	MERCURY DIS- SOLVED (UG/L AS HG)	SELE- NIUM, DIS- SOLVED (UG/L AS SE)	SILVER, DIS- SOLVED (UG/L AS AG)	ZINC, DIS- SOLVED (UG/L AS ZN)	SEDI- MENT, SUS- PENDE (MG/L)	SEDI- MENT, DIS- CHARGE, SUS- PENDE (T/DAY)	
NOV 23...	7	<1	2	<0.1	<1	<1	26	1	37	
MAR 10...	7	<1	2	<0.1	<1	<1	37	4	208	
MAY 12...	6	<1	1	<0.1	<1	<1	7	3	225	
SEP 14...	4	<1	<1	<0.1	<1	<1	<3	3	134	

PEND OREILLE RIVER BASIN

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

LOCATION.--Lat 48°46'52", long 117°24'55", in SE 1/4 NE 1/4 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 sea level. 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.--No estimated daily discharges. U.S. Geological Survey records good except those less than 10,000 ft³/s, which are fair. Daily discharges for Jan. 8-14, provided by Pend Oreille Co. PUD at Box Canyon Dam powerplant. 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 upstream from station for irrigation.

AVERAGE DISCHARGE.--41 years, 26,780 ft³/s, 19,402,000 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; instantaneous no flow occurs most years (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, 56,800 ft³/s May 24, elevation, 1,997.97 ft; maximum elevation, 1,998.65 ft May 26 (backwater from Boundary Dam); minimum daily discharge, 8,710 ft³/s Dec. 27.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	22200	17100	13600	11900	13900	12600	18400	19800	49400	27500	27200	15400
2	24600	20600	17100	11600	11800	13900	18300	13600	46100	26500	22800	15600
3	25200	22600	17300	12300	10900	17100	18400	14700	44400	25800	15200	15500
4	25200	30600	13800	13200	10700	18000	18800	17600	41100	26300	14800	15600
5	24900	30400	10000	14200	11300	15900	19100	22400	38300	27000	16400	15900
6	25500	22700	9390	17800	11500	14100	19800	23300	36400	29100	15100	15600
7	25400	27200	11800	18400	11300	13500	19800	23600	36100	33700	13400	14000
8	25500	27800	12600	19400	11000	14100	20500	23100	31900	36900	13400	13100
9	26200	27200	13200	18100	10900	14900	21200	23500	29800	37800	13100	14600
10	26500	26600	14400	19200	9420	19500	21000	23700	28900	39800	13600	15500
11	26700	26300	12400	20100	9510	19300	21100	25500	27900	42200	14100	17300
12	26800	25700	12300	20600	9730	14400	21200	28400	24400	43000	14300	18700
13	26600	25600	11400	21000	9650	12100	21100	29000	22500	34200	13800	18200
14	25600	24500	11300	21200	9750	11500	21200	29500	22600	27500	13400	17200
15	27300	17200	11400	21400	9950	11200	22600	31500	26000	28300	13500	17500
16	27200	14700	11600	21600	10700	11500	22400	33000	27300	30200	13000	17000
17	27200	13200	14800	21500	12800	12500	20200	33100	28000	32700	13400	17200
18	27100	13600	19200	20600	12000	18400	19900	34400	28800	33100	13200	17200
19	27100	16800	17400	19900	12400	19100	20100	40900	29600	29900	13600	17200
20	27300	19100	14300	17800	11300	11800	19800	46400	30100	26800	13700	16900
21	27200	17400	13400	17400	11300	9990	18500	50900	31000	23800	15200	17400
22	27000	11700	13300	17800	11300	9960	18400	52600	32100	24500	14400	17600
23	26800	13600	11200	17800	10200	10800	21400	53300	32200	24900	14100	17600
24	27300	15000	10600	17500	9740	11200	26300	53500	35000	26300	12900	22500
25	27400	17700	9340	17200	10100	13800	27100	53300	33200	27600	12400	23900
26	27600	14900	9140	15100	11200	16600	28100	53700	31300	27800	13000	24400
27	27700	13500	8710	17400	13000	16700	26600	52500	29900	26400	14000	24600
28	25300	13100	10500	18400	13100	16400	24000	47600	28900	25500	16100	24500
29	19100	12800	10500	15000	---	16800	23400	50900	29200	22600	14100	23800
30	16800	13100	11300	14100	---	18800	23200	52900	28700	25200	13700	21300
31	16300	---	11500	13800	---	18500	---	53000	---	26200	14600	---
TOTAL	788600	592300	388780	543300	310450	454950	641900	1111200	961100	919100	455500	542800
MEAN	25440	19740	12540	17530	11090	14680	21400	35850	32040	29650	14690	18090
MAX	27700	30600	19200	21600	13900	19500	28100	53700	49400	43000	27200	24600
MIN	16300	11700	8710	11600	9420	9960	18300	13600	22500	22600	12400	13100
AC-FT	1564000	1175000	771100	1078000	615800	902400	1273000	2204000	1906000	1823000	903500	1077000
CAL YR 1992	TOTAL 6029100	MEAN 16470	MAX 30600	MIN 6110	AC-FT 11960000							
WTR YR 1993	TOTAL 7709980	MEAN 21120	MAX 53700	MIN 8710	AC-FT 15290000							

LOCATION.--Lat 48°50'21", long 117°17'15", in SW 1/4 NE 1/4 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 Metaline Falls.

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

REVISED RECORDS.--WSP 1933: Drainage area.

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

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

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

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

EXTREMES FOR CURRENT YEAR.--Maximum elevation observed, 2,588.16 ft Aug. 25, 31; minimum observed, 2,564.36 ft Mar. 1.

[illegible]

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LOCATION.--Lat 48°50'42", lon 117°17'12", in SW 1/4 SE 1/4 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.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 196 ft³/s Dec. 9, gage height, 10.38 ft; minimum daily discharge, 2.3 ft³/s Mar. 3-9.

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	64	129	107	39	17	e12	e2.5	3.4	11	15	20	24
2	151	128	105	39	16	e2.5	e2.5	3.6	11	15	20	24
3	150	127	105	39	e16	e2.3	e2.5	3.6	11	15	21	24
4	149	125	125	39	e16	e2.3	e2.6	3.6	11	15	21	24
5	159	124	139	39	e15	e2.3	e2.7	3.6	11	15	21	24
6	165	123	139	39	e15	e2.3	e2.7	3.7	12	15	21	24
7	164	122	139	39	e15	e2.3	e2.7	3.8	12	15	21	24
8	162	120	139	39	e15	e2.3	e2.7	3.8	12	15	21	24
9	161	119	163	39	e15	e2.3	e2.8	3.8	13	16	21	24
10	159	118	187	39	e15	e2.4	e2.8	3.9	13	16	21	24
11	159	116	178	39	e14	e2.4	e2.8	4.0	13	17	21	24
12	158	115	160	39	e14	e2.5	e2.8	4.1	13	17	21	24
13	156	131	137	39	e14	e2.6	e3.0	4.4	13	17	21	24
14	155	140	119	39	e14	e2.6	e3.2	4.7	14	17	21	24
15	153	139	109	39	e14	e2.7	3.2	4.9	14	18	22	24
16	152	136	107	39	e14	e2.7	3.2	5.3	14	18	23	24
17	151	134	107	39	e14	e2.7	3.2	5.7	14	19	23	24
18	149	132	105	39	e14	e2.6	3.3	5.9	14	19	23	24
19	147	131	104	39	e14	e2.6	3.2	6.3	14	19	23	24
20	146	129	103	39	e14	e2.6	3.2	6.8	14	19	23	24
21	145	127	102	39	e14	e2.5	3.2	7.3	14	19	23	23
22	142	126	87	38	e13	e2.5	3.2	7.8	15	19	23	23
23	140	123	43	38	e13	e2.5	3.2	7.8	15	19	23	23
24	139	121	41	38	e13	e2.5	3.2	8.2	15	19	23	23
25	139	119	40	38	e13	e2.5	3.2	8.6	15	19	23	23
26	137	116	39	38	e13	e2.5	3.4	8.9	15	19	23	23
27	135	115	39	30	e13	e2.5	3.3	9.3	15	19	23	23
28	133	115	39	19	e13	e2.5	3.4	9.7	15	19	23	23
29	133	112	39	18	---	e2.5	3.4	9.8	15	19	23	23
30	131	109	39	18	---	e2.5	3.4	9.9	15	20	23	23
31	131	---	39	17	---	e2.5	---	10	---	20	23	---
TOTAL	4515	3721	3124	1111	400	86.5	90.5	186.2	403	543	682	710
MEAN	146	124	101	35.8	14.3	2.79	3.02	6.01	13.4	17.5	22.0	23.7
MAX	165	140	187	39	17	12	3.4	10	15	20	23	24
MIN	64	109	39	17	13	2.3	2.5	3.4	11	15	20	23
AC-FT	8960	7380	6200	2200	793	172	180	369	799	1080	1350	1410

MEAN	217	199	75.3	45.1	31.5	31.7	25.1	30.6	134	44.4	23.0	27.0
MAX	395	343	382	201	130	323	132	239	437	129	40.0	157
(WY)	1991	1985	1960	1984	1984	1959	1974	1961	1974	1974	1976	1965
MIN	15.7	17.9	16.2	13.4	8.15	2.07	1.93	3.60	5.51	6.58	6.93	6.99
(WY)	1974	1962	1976	1979	1981	1990	1973	1977	1977	1977	1977	1977

ANNUAL TOTAL		14707.9			15572.2				
ANNUAL MEAN		40.2			42.7			72.6	
HIGHEST ANNUAL MEAN								132	1974
LOWEST ANNUAL MEAN								42.7	1993
HIGHEST DAILY MEAN	187		Dec 10		187	Dec 10		766	Nov 4 1976
LOWEST DAILY MEAN	2.5		Mar 15		2.3	Mar 3		1.5	Mar 5 1990
ANNUAL SEVEN-DAY MINIMUM	2.5		Mar 15		2.3	Mar 3		1.5	Mar 4 1990
ANNUAL RUNOFF (AC-FT)	29170				30890			5257	
10 PERCENT EXCEEDS	136				136			246	
50 PERCENT EXCEEDS	14				19			24	
90 PERCENT EXCEEDS	5.3				2.7			4.6	

e Estimated

PEND OREILLE RIVER BASIN

12398600 PEND OREILLE RIVER AT INTERNATIONAL BOUNDARY

LOCATION.--Lat 48°59'56", long 117°21'09", in SW 1/4 NE 1/4 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 Meteline Falls, and at mile 16.1.

DRAINAGE AREA.--25,200 mi², approximately.

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 Meteline Falls," October 1928 to September 1937 as "Clark Fork below Z Canyon, near Meteline Falls," and October 1938 to September 1964 as "below Z Canyon, near Meteline Falls." Concurrent records published for present site December 1962 to September 1964.

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

GAGE.--Daily discharge determined from flow through turbines plus spillway flow when present. Datum of gage is 1,700 ft city of Seattle Boundary Dam datum. Prior to Dec. 20, 1928, nonrecording gage at Meteline Falls at datum approximately 1,983.4 ft above sea level. Dec. 20, 1928, to Sept. 30, 1964, water-stage recorder at site 1.3 mi upstream at datum 1,721.18 ft above sea level (levels by Corps of Engineers).

REMARKS.--Flow regulated by Boundary Reservoir 0.9 mi upstream beginning April 1967, 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 1980 there were diversions for irrigation of 429,700 acres upstream from the station and there probably has not been any appreciable change since that time. Chemical analyses October 1973 to September 1986. Specific conductance records January 1974 to September 1981. Water temperature records April 1974 to September 1981.

COOPERATION.--Discharge records at Boundary Dam provided by Seattle City Light's Power Resources Branch except for Sept. 5, 6, which were estimated based on hydrographic comparison with powerplant record for Waneta Dam. The U.S. Geological Survey made 6 discharge measurements at this site during the year.

AVERAGE DISCHARGE.--81 years, 26,840 ft³/s, 19,446,000 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 discharge, no flow Aug. 14, 21, 28, Sept. 4, 1988, 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 daily discharge, 55,900 ft³/s May 23; minimum daily discharge, 4,990 ft³/s Dec. 27.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	22400	14600	15100	10700	14000	12000	16200	21900	48300	28200	25800	16200
2	25900	21800	16500	11200	12000	16000	16300	9890	48500	28400	26500	16000
3	25300	22900	17200	11900	10400	14000	16800	17000	46700	23300	12200	14700
4	24500	29200	12500	14400	9390	16800	16000	17500	42400	26700	13100	14000
5	25200	31800	9490	12800	10300	13800	19500	23400	40000	28000	16400	e14000
6	26600	21600	8210	18800	10700	12500	21300	24200	37600	29900	13900	e18000
7	26100	27000	11300	16200	11200	10400	20800	24800	35600	33600	12000	19300
8	26000	28100	12400	19400	10000	14700	17800	22700	35500	35900	13400	13000
9	25600	28400	13100	19300	10400	15000	21200	23500	30400	35400	12300	13400
10	25600	26400	14800	18800	8260	17800	20600	24500	29500	40400	13800	16200
11	27400	25600	13000	20400	8410	20300	21400	27500	26400	40600	13800	16500
12	24800	25300	12600	20300	9330	14400	22100	27100	26100	42400	16000	17000
13	29100	25800	10500	21400	8520	10200	19600	31000	22900	36500	14100	17800
14	26900	24300	11400	21500	9060	10700	21300	30800	24400	26500	12300	15800
15	25600	15100	11200	21100	9490	10500	21500	33000	24600	28300	12400	17500
16	25700	14700	12400	20200	9730	9720	21900	32300	27000	31400	12300	16700
17	26900	14600	15300	21800	13900	12300	21700	37000	29000	34400	14000	16500
18	26800	13800	19600	19700	13100	18500	17800	38100	27700	33300	13200	17200
19	26800	16400	17300	20000	11300	19900	20100	40800	28600	32500	13600	16000
20	29900	18000	13300	16600	10700	9660	18600	43700	31100	24900	13400	16200
21	28800	18400	13200	17100	9150	7770	18900	52700	30400	26500	14300	16700
22	26800	10800	13700	16900	12300	8740	17900	53300	33900	23000	13000	17500
23	23100	12600	10500	18900	11600	10100	22400	55900	32200	24900	13600	18700
24	28300	16800	9870	16700	8830	11500	28400	53300	36400	25900	12200	21800
25	29900	17100	9800	16700	8660	12400	27900	53600	33000	27400	12700	22700
26	27500	14400	9350	16100	10300	15400	29300	54300	32400	27700	13300	21600
27	26700	13400	4990	16700	11000	18400	26400	54000	31500	25800	13600	23600
28	24800	13400	10700	18400	12700	15300	23900	51600	28700	24200	14400	29000
29	18900	11000	11000	13700	---	16800	23600	51400	27500	22100	12200	22400
30	17500	14400	11000	13300	---	19100	22100	52000	29400	28800	13600	19400
31	17700	---	11100	14000	---	18500	---	51600	---	24800	12800	---
TOTAL	793100	587700	382410	535000	294730	433190	633300	1134390	977700	921700	440200	535400
MEAN	25580	19590	12340	17260	10530	13970	21110	36590	32590	29730	14200	17850
MAX	29900	31800	19600	21800	14000	20300	29300	55900	48500	42400	26500	29000
MIN	17500	10800	4990	10700	8260	7770	16000	9890	22900	22100	12000	13000
AC-FT	1573000	1166000	758500	1061000	584600	859200	1256000	2250000	1939000	1828000	873100	1062000
CAL YR 1992	TOTAL 6054600 MEAN 16540 MAX 31800 MIN 3170 AC-FT 12010000											
WTR YR 1993	TOTAL 7668820 MEAN 21010 MAX 55900 MIN 4990 AC-FT 15210000											

e Estimated

COLUMBIA RIVER MAIN STEM

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12399500 COLUMBIA RIVER AT INTERNATIONAL BOUNDARY
(International gaging station)

LOCATION.--Lat 49°00'03", long 117°37'42", in NE 1/4 SE 1/4 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 except for estimated daily discharges, which are fair. Flow regulated by eight major reservoirs and numerous smaller reservoirs and powerplants. It was estimated that 436,400 acres were under irrigation in the United States in 1980 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.--56 years, 99,360 ft³/s, 71,986,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 550,100 ft³/s June 12, 1948, elevation, 1,338.13 ft; minimum discharge, 18,000 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, 143,000 ft³/s July 12, elevation, 1,308.24 ft; minimum discharge, 29,200 ft³/s Mar. 29.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	79300	55500	e75000	e96300	70000	58400	50500	62900	120000	88000	71700	67700
2	78900	55000	e76000	e91900	72800	51000	53500	53100	123000	96300	71200	70300
3	82000	62500	e77000	e88300	74700	53600	52000	59100	115000	95200	61400	67500
4	86500	71100	e70000	e95700	74900	55200	51300	62300	113000	105000	65600	59600
5	83900	e77000	e68000	e102000	79000	51000	53600	63600	107000	106000	71800	62500
6	81800	e67000	e70000	e120000	78000	48300	51600	65300	103000	109000	78400	64700
7	83300	e59000	e81000	e130000	67400	49200	48600	75600	103000	113000	79500	63900
8	84300	e57000	e80000	129000	64700	50000	55800	69400	101000	113000	88400	69400
9	85700	e64000	e85000	125000	68300	51500	51500	70800	93000	112000	87800	70100
10	83100	e72000	e91000	112000	64600	54400	56100	71100	89100	117000	86000	77100
11	80900	66800	e83000	110000	65500	54300	54600	81100	88400	123000	83600	74700
12	81600	63400	e95000	107000	68900	53200	56600	89500	82600	132000	86300	77500
13	84200	63500	e96000	94000	60300	45700	60700	101000	81800	132000	78500	74200
14	84600	66700	e91000	97700	55300	42900	55800	107000	82400	118000	75000	72100
15	76300	72900	e90000	92800	58300	47700	58700	110000	83400	117000	70000	72100
16	77300	65900	e89000	87000	62500	50200	58700	110000	84600	120000	74300	70600
17	76900	68300	e90000	86400	70600	50200	58300	116000	82000	128000	75500	68500
18	80900	68100	e100000	88800	79400	48900	57600	113000	78600	121000	78400	64600
19	83500	70800	e115000	88500	82100	51000	53900	118000	81600	116000	83400	64200
20	75700	e73000	e124000	82200	70200	40400	55400	123000	79200	98100	84500	61100
21	63800	e88000	e126000	81500	64900	36900	53400	134000	78200	92400	78600	54200
22	62300	e91000	e130000	84600	67900	40500	54300	127000	83500	84700	76700	56200
23	58900	e91000	e122000	83900	73900	37100	61000	132000	86600	79700	79600	60200
24	59900	e100000	e112000	81300	70300	41800	67900	128000	82100	70100	79000	61200
25	63300	e100000	e110000	82100	71600	40500	68500	127000	88900	68100	81500	64500
26	60000	e91000	e99000	82600	75100	53200	67200	128000	84600	70900	83400	66200
27	60200	e85000	e92000	83200	72500	51200	70000	126000	92000	68300	85900	66300
28	59900	e74000	e96000	79000	61300	51900	62500	124000	83100	65200	82300	66200
29	53800	e71000	e93000	70300	---	49100	65300	128000	89300	60300	65700	66700
30	52000	e76000	e96000	72300	---	53000	63300	126000	90000	66000	65700	60500
31	56100	---	e94000	63500	---	51400	---	123000	---	61300	64500	---
TOTAL	2280900	2186500	2916000	2888900	1945000	1513700	1728200	3124800	2750000	3046600	2394200	1994600
MEAN	73580	72880	94060	93190	69460	48830	57610	100800	91670	98280	77230	66490
MAX	86500	100000	130000	130000	82100	58400	70000	134000	123000	132000	88400	77500
MIN	52000	55000	68000	63500	55300	36900	48600	53100	78200	60300	61400	54200
AC-FT	4524000	4337000	5784000	5730000	3858000	3002000	3428000	6198000	5455000	6043000	4749000	3956000
CAL YR 1992	TOTAL 32676700 MEAN 89280 MAX 197000 MIN 42000 AC-FT 64810000											
WTR YR 1993	TOTAL 28769400 MEAN 78820 MAX 134000 MIN 36900 AC-FT 57060000											

e Estimated

12400520 COLUMBIA RIVER AT NORTHPORT, WA
(National stream quality accounting network station)

LOCATION.--Lat 48°55'08", long 117°47'11", in NW 1/4 SE 1/4 sec.36, T.40 N., R.39 E., Stevens County, Hydrologic Unit 17020001, 0.4 mi downstream from State Highway 25 bridge at Northport, 10.3 mi downstream from gaging station at 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 "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 TEMPERATURE: November 1951 to September 1981.

SUSPENDED-SEDIMENT DISCHARGE: February 1910 to January 1911.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1992 TO SEPTMEBER 1993

DATE	TIME	DIS-CHARGE, INST. (CUBIC FEET PER SECOND)	SPE-CIFIC CON-DUCT-ANCE (US/CM)	PH (STAND-ARD UNITS)	TEMPER-ATURE WATER (DEG C)	TUR-BID-ITY (NTU)	OXYGEN, DIS-SOLVED (MG/L)	OXYGEN, SATUR-ATION	COLI-FORM, FECA, 0.7 UM-MF (COLS./100 ML)	STREP-TOCOCCHI, FECA, KF AGAR (COLS. PER 100 ML)
JAN 25...	1600	84800	150	8.0	2.0	0.6	13.2	98	87	K1
MAR 16...	1215	53400	160	8.2	3.0	0.6	14.1	107	<1	K1
MAY 27...	1240	126000	140	8.0	13.0	1.0	12.2	122	K5	K2
JUL 27...	1110	62800	140	8.0	16.5	0.3	9.9	107	K1	K10
SEP 28...	1220	65900	148	8.2	15.5	0.3	10.3	107	K10	K1
DATE	HARD-NESS (MG/L AS CaCO3)	HARD-NESS, NONCAR-BONATE (MG/L AS CaCO3)	CALCIUM, DIS-SOLVED (MG/L AS Ca)	MAGNE-SIUM, DIS-SOLVED (MG/L AS Mg)	SODIUM, DIS-SOLVED (MG/L AS Na)	SODIUM PERCENT	SODIUM AD-SORP-TION RATIO	POTAS-SIUM, DIS-SOLVED (MG/L AS K)	ALKA-LINITY, DIS IT, FIELD (MG/L AS CaCO3)	BICAR-BONATE, DIS IT, FIELD (MG/L AS HCO3)
JAN 25...	74	5	21	5.1	1.8	5	0.1	0.7	69	84
MAR 16...	73	9	21	5.0	2.0	6	0.1	0.6	64	78
MAY 27...	62	0	18	4.2	2.0	6	0.1	0.6	63	77
JUL 27...	69	6	20	4.5	2.3	7	0.1	0.6	62	76
SEP 28...	71	10	21	4.5	1.9	5	0.1	0.6	61	74
DATE	CAR-BONATE, DIS IT, FIELD (MG/L AS CO3)	SULFATE, DIS-SOLVED (MG/L AS SO4)	CHLO-RIDE, DIS-SOLVED (MG/L AS Cl)	FLUO-RIDE, DIS-SOLVED (MG/L AS F)	SILICA, DIS-SOLVED (MG/L AS SiO2)	SOLIDS, RESIDUE AT 180 DEG. C (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, DIS-SOLVED (MG/L AS N)
JAN 25...	0	9.9	0.8	0.1	4.7	85	86	0.12	19500	0.02
MAR 16...	0	11	1.0	0.1	4.8	87	84	0.12	12500	<0.01
MAY 27...	0	8.6	1.0	0.1	5.7	75	78	0.10	25500	<0.01
JUL 27...	0	9.6	1.0	<0.1	5.0	83	81	0.11	14100	0.02
SEP 28...	0	9.9	1.4	0.1	4.0	77	80	0.10	13700	<0.01
DATE	NITRO-GEN, NO2+NO3, DIS-SOLVED (MG/L AS N)	NITRO-GEN, AM-MONIA, 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)	BARIUM, DIS-SOLVED (UG/L AS BA)	COBALT, DIS-SOLVED (UG/L AS CO)	IRON, DIS-SOLVED (UG/L AS FE)
JAN 25...	0.14	0.02	<0.2	<0.01	<0.01	0.01	<10	33	<3	11
MAR 16...	0.11	0.03	<0.2	0.03	0.02	0.02	--	--	--	--
MAY 27...	0.05	0.02	<0.2	0.02	<0.01	0.01	<10	36	<3	<3
JUL 27...	<0.05	0.03	<0.2	0.02	<0.01	<0.01	20	36	<3	140
SEP 28...	<0.05	0.02	<0.2	0.04	<0.01	<0.01	<10	34	<3	5
DATE	LITHIUM, DIS-SOLVED (UG/L AS LI)	MANGA-NESE, DIS-SOLVED (UG/L AS MN)	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)	SEDI-MENT, SUS-PENDED (MG/L)	SEDI-MENT, DIS-CHARGE, SUS-PENDED (T/DAY)
JAN 25...	<4	2	<10	<1	<1	<1	100	<6	2	458
MAR 16...	--	--	--	--	--	--	--	--	4	577
MAY 27...	<4	2	<10	<1	<1	<1	81	<6	6	2040
JUL 27...	<4	2	<10	<1	<1	<1	93	<6	4	678
SEP 28...	<4	1	<10	<1	<1	<1	83	<6	2	356

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

225

e Estimated

KETTLE RIVER BASIN

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

LOCATION.--Lat 48°59'04", long 118°12'55", in SW 1/4 NW 1/4 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 above sea level. Prior to Jan. 3, 1930, nonrecording gage at same site and datum.

REMARKS.--Records excellent except for estimated daily discharges, 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. U.S. Geological Survey satellite telemeter at station.

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

AVERAGE DISCHARGE.--64 years, 2,882 ft³/s, 2,088,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 35,000 ft³/s May 29, 1948, gage height, 17.25 ft; minimum daily discharge, 70 ft³/s Jan. 11-31, 1930.

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 15	1530	*27,300	*14.91	No other peak greater than base discharge.			
Minimum daily discharge, 200 ft ³ /s Dec. 6.							

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	458	493	425	e280	e360	e310	1390	9060	9720	3640	3670	1160
2	446	490	e350	e260	e360	e320	1590	9540	10100	3470	3350	1100
3	439	488	e250	e280	e360	e330	2080	9810	9830	3530	3090	1040
4	424	493	e220	e280	e360	e350	2810	9560	9250	3740	2860	992
5	406	496	e210	e280	e350	e370	3380	9670	8300	3720	2680	945
6	391	485	e200	e280	e340	e390	3380	11500	7420	3510	2560	902
7	381	517	e220	e280	e330	e410	3220	13600	6750	3330	2470	864
8	374	535	e250	e280	e340	420	3210	12700	6280	3150	2300	832
9	367	542	e280	e280	e340	425	3720	11100	5880	3130	2130	798
10	361	526	e300	e280	e350	419	4410	10100	5670	3160	2000	766
11	356	508	e320	e280	e360	405	4640	12400	5810	3570	1890	735
12	355	474	e330	e280	e360	400	4670	17700	6120	4320	1800	704
13	352	450	e310	e280	e360	394	4630	22500	6070	4970	1700	683
14	349	448	e310	e290	e340	401	4530	25400	5650	4790	1620	685
15	362	457	e310	e300	e290	422	4460	26800	5220	4440	1630	730
16	367	488	e310	e310	e270	422	4500	25400	5120	4400	1780	721
17	376	526	e300	e310	e260	420	4570	23000	5330	4540	1970	717
18	367	527	e290	e310	e260	424	5230	20900	5270	4620	1990	702
19	360	527	e280	e300	e270	430	5880	19300	4750	4780	2020	686
20	358	540	e290	e330	e280	442	5820	19000	4320	4780	1850	674
21	373	546	e300	e320	e290	453	5900	19900	3980	4990	1710	724
22	385	545	e310	e320	e300	466	6350	17900	4210	6590	1640	838
23	418	517	e320	e310	e290	534	7040	15100	5010	6040	1570	900
24	473	474	e320	e330	e280	804	7580	12900	4440	5570	1450	864
25	508	396	e300	e350	e280	1100	8080	11900	4160	5240	1400	826
26	506	323	e290	e360	e290	1190	8890	11700	3860	5100	1350	789
27	489	e320	e290	e350	e300	1190	9220	11800	3710	4710	1310	758
28	476	331	e280	e370	e305	1220	8690	11500	4140	4290	1250	730
29	465	331	e280	e340	---	1260	8400	12000	4240	4040	1210	702
30	467	347	e280	e350	---	1300	8610	13300	3930	4070	1220	674
31	480	---	e280	e350	---	1340	---	10800	---	3960	1210	---
TOTAL	12689	14140	9005	9520	8875	18761	156870	467840	174540	134190	60680	24241
MEAN	409	471	290	307	317	605	5229	15090	5818	4329	1957	808
MAX	508	546	425	370	360	1340	9210	26800	10100	6590	3670	1160
MIN	349	320	200	260	260	310	1390	9060	3710	3130	1210	674
AC-FT	25170	28050	17860	18880	17600	37210	311200	928000	346200	266200	120400	48080

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1929 - 1993, BY WATER YEAR (WY)

	678	743	589	503	544	1007	4962	12110	9132	2749	834	639
MEAN	678	743	589	503	544	1007	4962	12110	9132	2749	834	639
MAX	3815	2600	2652	1450	1407	4247	12170	18070	17650	6928	3140	3773
(WY)	1942	1942	1942	1942	1935	1983	1934	1957	1974	1982	1976	1941
MIN	176	202	154	76.5	97.9	212	1478	4246	2888	759	250	157
(WY)	1988	1930	1930	1930	1930	1930	1937	1930	1987	1934	1973	1967

SUMMARY STATISTICS

FOR 1992 CALENDAR YEAR

FOR 1993 WATER YEAR

WATER YEARS 1929 - 1993

ANNUAL TOTAL	726810	1091351	
ANNUAL MEAN	1986	2990	
HIGHEST ANNUAL MEAN			2882
LOWEST ANNUAL MEAN			4469
HIGHEST DAILY MEAN	14200	May 8	26800
LOWEST DAILY MEAN	200	Dec 6	200
ANNUAL SEVEN-DAY MINIMUM	233	Dec 3	233
ANNUAL RUNOFF (AC-FT)	1442000	2165000	2088000
10 PERCENT EXCEEDS	5510	8960	9450
50 PERCENT EXCEEDS	575	717	779
90 PERCENT EXCEEDS	280	290	291

e Estimated

COLVILLE RIVER BASIN

227

12409000 COLVILLE RIVER AT KETTLE FALLS, WA

LOCATION.--Lat 48°35'40", Long 118°03'41", in NE 1/4 NE 1/4 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 except for estimated daily discharges, which are fair. Several diversions upstream from station for irrigation. Regulation at low flow by powerplant. U.S. Geological Survey satellite telemeter at station.

AVERAGE DISCHARGE.--71 years, 296 ft³/s, 214,500 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, 804 ft³/s May 5, gage height, 6.78 ft; minimum daily discharge, 54 ft³/s Oct. 1, result of regulation by powerplant.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	54	90	e85	e72	e120	115	525	784	273	146	224	126
2	62	88	e73	e72	e120	120	522	762	272	142	212	123
3	58	87	e62	e74	e120	122	544	745	285	149	200	114
4	60	87	e58	e78	e120	122	619	768	282	165	188	110
5	62	88	e56	e81	e120	126	665	796	259	165	180	108
6	63	91	e56	e83	e120	135	659	795	243	186	172	106
7	61	100	e70	e82	e120	140	641	799	232	196	167	103
8	62	120	e74	e82	e120	154	631	779	236	181	162	100
9	64	124	e70	e84	e124	161	649	744	234	192	156	96
10	62	107	e70	e85	e125	154	676	706	229	223	147	95
11	63	99	e70	e85	e124	161	676	671	225	238	134	98
12	63	98	e70	e85	e122	159	666	638	226	287	129	106
13	64	100	e70	e85	e119	149	656	605	230	285	127	110
14	63	97	e70	e88	e112	154	640	579	217	252	124	107
15	65	96	e69	e89	e100	160	628	555	204	236	131	113
16	67	95	e65	e90	e75	180	606	533	207	241	165	123
17	68	99	e62	e92	e80	194	590	508	202	262	191	120
18	69	103	e60	e94	e86	189	634	480	194	323	188	115
19	70	105	e60	e96	e90	210	715	454	180	313	173	114
20	71	107	e64	e100	e92	251	724	436	166	291	159	110
21	71	113	e68	e97	e94	257	711	422	165	338	151	110
22	76	118	e80	e96	e96	274	701	403	201	329	162	112
23	85	119	e82	e96	e96	469	691	388	213	313	162	111
24	82	110	e84	e98	e98	648	677	369	206	328	150	109
25	75	97	e84	e100	e100	701	686	341	187	328	145	108
26	74	70	e84	e105	e103	690	732	319	169	325	140	107
27	72	e79	e80	e110	e110	674	762	301	158	318	136	104
28	74	e86	e77	e110	116	650	745	285	157	299	133	103
29	75	e90	e75	e114	---	614	732	294	152	273	133	102
30	80	e90	e74	e115	---	579	767	303	152	254	138	98
31	85	---	e72	e116	---	546	---	279	---	237	134	---
TOTAL	2120	2953	2194	2854	3022	9258	19870	16841	6356	7815	4913	3261
MEAN	68.4	98.4	70.8	92.1	108	299	662	543	212	252	158	109
MAX	85	124	85	116	125	701	767	799	285	338	224	126
MIN	54	70	56	72	75	115	522	279	152	142	124	95
AC-FT	4210	5860	4350	5660	5990	18360	39410	33400	12610	15500	9740	6470

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1923 - 1993, BY WATER YEAR (WY)

	115	152	179	203	274	471	817	676	339	150	85.4	93.8
MEAN	115	152	179	203	274	471	817	676	339	150	85.4	93.8
MAX	301	401	783	1374	970	1410	2168	1744	1035	467	258	237
(WY)	1928	1928	1974	1974	1974	1983	1969	1948	1948	1948	1948	1927
MIN	35.8	49.5	56.3	32.9	65.7	127	128	93.8	48.4	20.6	12.0	22.7
(WY)	1932	1932	1932	1930	1937	1930	1930	1930	1926	1977	1931	1931

SUMMARY STATISTICS

FOR 1992 CALENDAR YEAR

FOR 1993 WATER YEAR

WATER YEARS 1923 - 1993

ANNUAL TOTAL	49205	81457										
ANNUAL MEAN	134	223										
HIGHEST ANNUAL MEAN										297		
LOWEST ANNUAL MEAN										768		1974
HIGHEST DAILY MEAN										70.5		1930
LOWEST DAILY MEAN										3360		Jan 20 1974
ANNUAL SEVEN-DAY MINIMUM										5.50		Aug 15 1930
ANNUAL RUNOFF (AC-FT)	97600	161600								5.3		Aug 14 1930
10 PERCENT EXCEEDS	284	640								695		
50 PERCENT EXCEEDS	100	124								168		
90 PERCENT EXCEEDS	49	70								64		

e Estimated

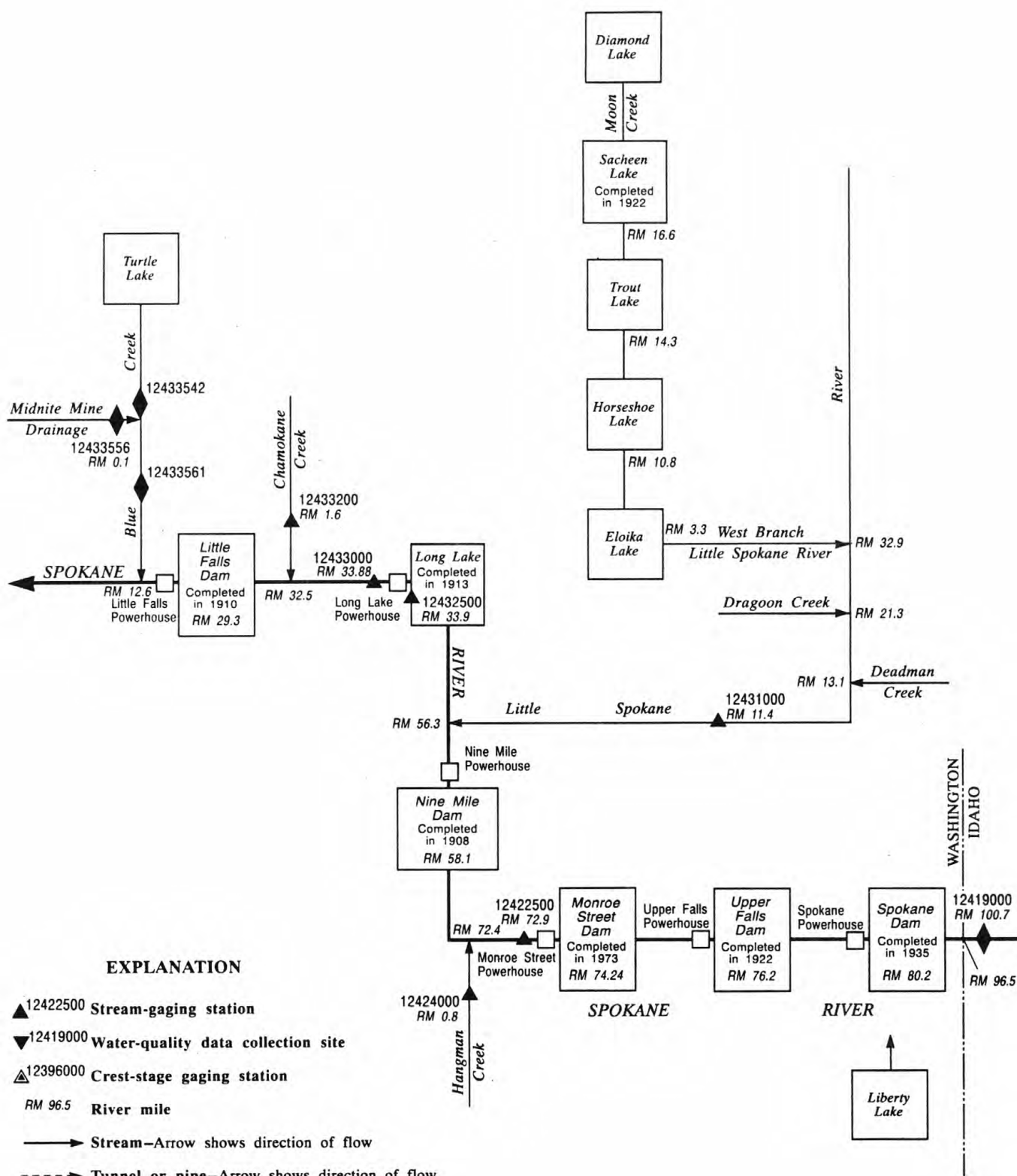


Figure 19. Gaging stations in Spokane River Basin.

SPOKANE RIVER BASIN

12419000 SPOKANE RIVER NEAR POST FALLS, ID

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LOCATION.--Lat 47°42'11", long 116°58'37", in SW 1/4 SW 1/4 SW 1/4 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.

WATER-DISCHARGE RECORDS

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

GAGE.--Water-stage recorder. Datum of gage is 2,050.00 ft referred to originally accepted elevation of 2,157.40 ft for the U.S. 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 sea level. 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. Flow regulated by dam at Post Falls and affected by storage in Coeur d'Alene Lake.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1540	2160	2730	2120	2350	1920	15800	16800	9880	2520	2720	287
2	1530	2390	3060	2040	2350	1910	15500	16900	9670	2140	2090	754
3	1530	2250	3390	1950	2350	1860	15500	17000	8700	1840	1420	1150
4	1530	2140	3380	1980	2350	1780	16100	17800	7530	2410	1190	1150
5	1530	2150	3360	e2110	2350	2000	17000	18700	7210	3700	1510	1150
6	1520	2150	3370	e1880	2350	1950	17600	19300	5750	3710	2210	1150
7	1530	2170	3360	e1820	2350	2030	17700	19600	5240	3710	2400	1150
8	1540	2160	3360	e1750	2350	2250	17600	20000	5240	3700	2270	1560
9	1550	2040	3360	e1660	2350	2700	17500	19700	4770	3350	2060	1780
10	1530	1940	3350	e1550	2350	2900	17500	19700	4110	3010	1710	1780
11	1940	2090	3320	e1580	2350	3070	17800	19200	3840	3010	1710	1780
12	2080	2150	3330	e1580	2360	3300	17900	19000	3850	3010	1500	1780
13	2090	2140	3320	e1580	2360	3460	17800	19400	3840	2730	1180	1780
14	2080	2150	3300	e1500	2360	3550	17600	20000	3830	2720	1180	1780
15	2110	2150	3480	1490	2350	3830	17200	20700	3840	3610	1180	1780
16	2090	2160	3570	1480	2350	4630	16700	21300	3950	3910	1440	1780
17	2090	2510	3560	1430	2350	5770	16100	21500	3800	4430	1640	1780
18	2090	2770	3370	1310	2280	6570	15800	21300	3800	5270	1470	1790
19	2320	2760	3190	1250	2230	7380	15400	20900	3780	4680	1160	1790
20	2440	2780	3140	1380	2240	8160	15200	20400	3750	4340	1410	2030
21	2370	2780	3100	1460	2240	9110	15800	20000	3440	4520	1810	2210
22	2340	2780	2910	1450	2240	9650	15600	19400	3430	4110	1810	2220
23	2330	2780	2610	1450	2240	10300	15500	18600	3600	3820	1810	2220
24	2330	2770	2550	1450	2170	11800	15400	17900	3190	3810	1810	2220
25	2330	2760	2430	1460	2120	14000	15300	17000	3380	3810	1420	2210
26	2330	2750	2370	1630	2030	15100	15500	15700	3050	4170	1160	2220
27	2320	2740	2220	1740	1930	15800	16100	13000	2520	2560	1160	2210
28	2320	2750	2130	2020	1930	16200	16600	9440	2520	1570	1160	2210
29	2030	2750	2130	2160	---	16400	16800	7770	2520	2940	1160	2210
30	1780	2760	2130	2280	---	16500	16800	7790	2520	3810	553	2200
31	1780	---	2120	2350	---	16000	---	8070	---	3380	294	---
TOTAL	60920	72830	93000	52890	63630	221880	494700	543870	136550	106300	47597	52111
MEAN	1965	2428	3000	1706	2272	7157	16490	17540	4552	3429	1535	1737
MAX	2440	2780	3570	2350	2360	16500	17900	21500	9880	5270	2720	2220
MIN	1520	1940	2120	1250	1930	1780	15200	7770	2520	1570	294	287
AC-FT	120800	144500	184500	104900	126200	440100	981200	1079000	270800	210800	94410	103400

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1913 - 1993, BY WATER YEAR (WY)

	1699	2847	4752	5115	6009	8009	14460	17680	9705	2090	956	1168
MAX	5460	13130	23660	24930	16340	25440	26050	31750	26710	10720	2133	1849
(WY)	1928	1928	1934	1934	1961	1972	1943	1917	1974	1916	1917	1985
MIN	782	627	784	996	1025	1751	3558	5141	1584	889	185	188
(WY)	1964	1936	1936	1931	1929	1929	1977	1992	1926	1977	1958	1949

SUMMARY STATISTICS

FOR 1992 CALENDAR YEAR

FOR 1993 WATER YEAR

WATER YEARS 1913 - 1993

ANNUAL TOTAL	1280553	1946278	6177
ANNUAL MEAN	3499	5332	11600
HIGHEST ANNUAL MEAN			2143
LOWEST ANNUAL MEAN			49800
HIGHEST DAILY MEAN	10700	21500	May 17
LOWEST DAILY MEAN	210	287	Sep 1
ANNUAL SEVEN-DAY MINIMUM	234	763	Aug 30
INSTANTANEOUS PEAK FLOW		23000	May 17
INSTANTANEOUS PEAK STAGE		18.56	May 17
INSTANTANEOUS LOW FLOW		270	Sep 2
INSTANTANEOUS LOW STAGE		5.33	Sep 2
ANNUAL RUNOFF (AC-FT)	2540000	3860000	4475000
10 PERCENT EXCEEDS	7490	16800	17400
50 PERCENT EXCEEDS	2500	2410	2940
90 PERCENT EXCEEDS	613	1510	906

a Occurred when recorder was not operating (determined from unpublished records collected by Washington Water and Power Co. for station at Liberty Bridge).

b Also occurred July 30, 1973.

c Also occurred July 21, 1977.

e Estimated

SPOKANE RIVER BASIN

12419000 SPOKANE RIVER NEAR POST FALLS, ID--Continued

PERIOD OF RECORD.--Water years 1973-81, July 1989 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DATE	TIME	DIS- CHARGE, INST. CUBIC FEET PER SECOND	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH WATER WHOLE FIELD (STAND- ARD UNITS)	TEMPER- ATURE AIR (DEG C)	TEMPER- ATURE WATER (DEG C)	OXYGEN, DIS- SOLVED (MG/L)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION)	COLI- FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)	STREP- TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML)
OCT 07...	1130	1560	62	--	12.0	14.5	--	--	--	--
20...	1530	2460	--	--	--	--	--	--	--	--
NOV 10...	1300	1960	59	7.9	7.0	8.0	10.3	93	K2	33
16...	0945	2160	--	--	--	--	--	--	--	--
DEC 09...	1430	2770	53	--	0.0	2.0	--	--	--	--
JAN 25...	1230	1400	62	7.5	5.0	2.0	12.7	99	K12	210
MAR 16...	1130	4440	61	7.1	8.0	3.0	12.6	100	K5	K4
MAY 14...	1000	19500	51	7.6	23.0	10.5	12.9	125	K3	K7
JUL 08...	1000	3680	48	7.1	16.5	17.0	8.6	97	K12	64
SEP 17...	1015	1710	55	7.5	15.0	16.0	8.8	96	32	K6

DATE	HARD- NESS TOTAL (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)	SODIUM PERCENT	POTAS- SIUM, DIS- SOLVED (MG/L AS K)	BICAR- BONATE WATER WH FET FIELD (MG/L AS HCO3)	CAR- BONATE WATER WH FET FIELD (MG/L AS CO3)	ALKA- LINITY WAT WH TOT FET FIELD (MG/L AS CACO3)	SULFATE DIS- SOLVED (MG/L AS SO4)
NOV 10...	22	6.0	1.7	1.8	15	0.7	27	0	23	5.1
MAR 16...	24	6.5	1.9	2.0	15	0.8	27	0	22	5.7
MAY 14...	20	5.2	1.6	1.8	16	0.9	23	0	19	4.1
JUL 08...	--	--	--	--	--	--	20	0	16	--
SEP 17...	21	5.6	1.7	1.7	14	0.8	26	0	21	4.7

DATE	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	FLUO- RIDE, DIS- SOLVED (MG/L AS F)	SILICA, DIS- SOLVED (MG/L AS SIO2)	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L)	SOLIDS, SUM OF CONSTI- TUENTS, DIS- SOLVED (MG/L)	SOLIDS, DIS- SOLVED (TONS PER AC-FT)	SOLIDS, DIS- SOLVED (TONS PER DAY)	NITRO- GEN, NITRATE TOTAL (MG/L AS N)	NITRO- GEN, NITRITE TOTAL (MG/L AS N)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N)
OCT 07...	--	--	--	--	--	--	--	0.048	0.013	--
20...	--	--	--	--	--	--	--	0.013	0.009	--
NOV 10...	0.7	<0.1	8.7	41	38	0.06	217	--	<0.010	<0.01
16...	--	--	--	--	--	--	--	0.017	0.014	--
DEC 09...	--	--	--	--	--	--	--	0.045	0.001	--
JAN 25...	--	--	--	--	--	--	--	0.062	--	0.02
MAR 16...	0.9	<0.1	9.3	49	41	0.07	587	--	--	<0.01
MAY 14...	0.7	<0.1	10	40	36	0.05	2110	--	--	<0.01
JUL 08...	--	--	--	--	--	--	--	0.057	--	<0.01
SEP 17...	0.7	0.1	8.5	39	37	0.05	180	0.051	--	<0.01

K Results based on counts outside ideal colony range.

12419000 SPOKANE RIVER NEAR POST FALLS, ID--Continued

WATER-QUALITY DATA, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DATE	NITRO- GEN, NO2+NO3 TOTAL (MG/L AS N)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N)	NITRO- GEN, AMMONIA TOTAL (MG/L AS N)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N)	NITRO- GEN, ORGANIC TOTAL (MG/L AS N)	NITRO- GEN,AM- MONIA + ORGANIC TOTAL (MG/L AS N)	PHOS- PHORUS TOTAL (MG/L AS P)	PHOS- PHORUS ORTHO TOTAL (MG/L AS P)	PHOS- PHORUS DIS- SOLVED (MG/L AS P)
OCT 07...	0.061	--	0.046	--	--	<0.2	0.013	0.005	--
OCT 20...	0.022	--	0.032	--	--	<0.2	0.014	0.002	--
NOV 10...	<0.050	<0.05	0.020	0.02	0.28	0.3	0.020	<0.010	<0.01
NOV 16...	0.031	--	0.041	--	--	<0.2	0.012	0.007	--
DEC 09...	0.046	--	0.021	--	--	<0.2	0.012	0.007	--
JAN 25...	--	0.08	--	0.06	--	<0.2	0.030	--	0.03
MAR 16...	--	<0.05	--	0.03	--	<0.2	0.020	--	<0.01
MAY 14...	--	<0.05	--	0.02	0.18	0.2	0.010	--	<0.01
JUL 08...	--	0.06	--	0.05	--	<0.2	0.020	--	<0.01
SEP 17...	--	0.05	--	0.04	--	<0.2	<0.010	--	<0.01

DATE	ARSENIC TOTAL (UG/L AS AS)	ARSENIC DIS- SOLVED (UG/L AS AS)	BARIUM, DIS- SOLVED (UG/L AS BA)	CADMIUM TOTAL RECOV- ERABLE (UG/L AS CD)	CADMIUM DIS- SOLVED (UG/L AS CD)	CHRO- MIUM, DIS- SOLVED (UG/L AS CR)	COPPER, TOTAL RECOV- ERABLE (UG/L AS CU)	COPPER, DIS- SOLVED (UG/L AS CU)	IRON, DIS- SOLVED (UG/L AS FE)	LEAD, TOTAL RECOV- ERABLE (UG/L AS PB)
OCT 07...	<1	--	--	<1	--	--	3	--	--	6
OCT 20...	<1	--	--	<1	--	--	3	--	--	3
NOV 10...	--	<1	13	--	<1	<1	--	1	17	--
NOV 16...	1	--	--	<1	--	--	3	--	--	3
DEC 09...	<1	--	--	<1	--	--	5	--	--	5
MAR 16...	--	<1	14	--	<1	<1	--	6	10	--
MAY 14...	--	<1	13	--	<1	<1	--	2	33	--
SEP 17...	--	<1	12	--	2	<1	--	11	10	--

DATE	LEAD, DIS- SOLVED (UG/L AS PB)	MANGA- NESE, DIS- SOLVED (UG/L AS MN)	MERCURY DIS- SOLVED (UG/L AS HG)	SELE- NIUM, DIS- SOLVED (UG/L AS SE)	SILVER, DIS- SOLVED (UG/L AS AG)	ZINC, TOTAL RECOV- ERABLE (UG/L AS ZN)	ZINC, DIS- SOLVED (UG/L AS ZN)	SEDI- MENT, SUS- PENDE (MG/L)	SEDI- MENT, DIS- CHARGE, SUS- PENDE (T/DAY)
OCT 07...	--	--	--	--	--	80	--	--	--
OCT 20...	--	--	--	--	--	70	--	--	--
NOV 10...	<1	4	<0.1	<1	<1	--	78	1	5.3
NOV 16...	--	--	--	--	--	80	--	--	--
DEC 09...	--	--	--	--	--	110	--	--	--
MAR 16...	<1	3	<0.1	<1	<1	--	100	2	24
MAY 14...	<1	1	<0.1	<1	<1	--	81	1	53
SEP 17...	1	1	<0.1	<1	<1	--	56	2	9.2

SPOKANE RIVER BASIN

12422500 SPOKANE RIVER AT SPOKANE, WA

LOCATION.--Lat 47°39'34", long 117°26'53", in SW 1/4 SW 1/4 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, of which about 122 mi² in the vicinity of Hayden Lake is noncontributing to this station.

PERIOD OF RECORD.--April 1891 to current year.

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 sea level (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.--No estimated daily discharges. Records good. Flow 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 upstream from 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. Chemical analyses October 1972 to September 1973.

AVERAGE DISCHARGE.--102 years, 6,745 ft³/s, 4,887,000 acre-ft/yr, unadjusted.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 49,000 ft³/s, estimated, May 31, 1894 (see WSP 532); minimum, 49.7 ft³/s Aug. 26, 1991, due to regulation for construction at Post Street Dam, but may have been lower during periods of missing record in 1991.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 21,600 ft³/s May 17, gage height, 24.71 ft; minimum daily discharge, 855 ft³/s Sept. 1.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1660	2140	2850	2410	2480	2210	15000	16400	9500	2850	3100	855
2	1600	2480	2960	2380	2480	2180	14700	16400	9510	2720	2620	861
3	1640	2440	3310	2250	2490	2210	14700	16500	9090	2290	2070	1300
4	1640	2290	3310	2300	2500	2080	15200	17200	7690	2430	1670	1340
5	1640	2300	3320	2320	2510	2150	16000	18100	7550	3590	1710	1340
6	1610	2300	3330	2260	2520	2320	16700	18700	6350	3760	2250	1380
7	1620	2370	3380	2130	2520	2250	17000	19100	5660	3780	2610	1340
8	1640	2330	3340	2150	2530	2470	16900	19500	5580	3750	2450	1460
9	1690	2410	3380	2030	2530	2650	16800	19500	5320	3670	2400	1850
10	1660	2070	3350	2030	2530	2980	16900	19200	4740	3250	2010	1850
11	1790	2220	3370	1910	2530	3070	17200	19000	4370	3220	1970	1840
12	2110	2330	3320	1820	2540	3270	17300	18700	4320	3220	1930	1880
13	2080	2300	3360	2010	2540	3390	17300	18900	4290	3090	1530	1870
14	2120	2330	3350	1810	2540	3520	17100	19500	4250	2910	1490	1900
15	2130	2340	3430	1830	2570	3640	16700	20200	4210	3510	1490	1900
16	2170	2330	3550	1810	2550	4190	16300	20800	4300	3900	1590	1890
17	2180	2440	3580	1810	2560	5100	15700	21000	4180	4110	1850	1910
18	2160	2770	3460	1700	2530	5830	15400	20900	4140	4970	1850	1890
19	2240	2800	3350	1620	2500	6470	15100	20600	4110	4800	1490	1910
20	2460	2780	3260	1660	2480	7220	14800	20100	4030	4240	1450	1990
21	2400	2860	3240	1780	2480	8060	15300	19600	3890	4450	1970	2210
22	2360	2850	3120	1770	2490	8700	15200	19200	3610	4270	1960	2250
23	2400	2810	2910	1750	2460	9210	15100	18500	3970	3940	1980	2260
24	2370	2870	2830	1760	2430	10400	15000	17700	3530	3890	1960	2280
25	2400	2860	2740	1790	2360	12500	14900	16800	3540	3900	1830	2270
26	2390	2830	2660	1820	2370	13700	15000	15600	3630	4060	1450	2270
27	2390	2850	2570	1990	2190	14600	15500	14100	2950	3490	1450	2280
28	2390	2850	2470	2130	2230	15000	16100	10600	2920	2140	1450	2280
29	2370	2860	2460	2270	---	15400	16300	8220	2910	2630	1400	2280
30	1990	2840	2440	2370	---	15500	16300	8010	2890	3740	1280	2280
31	1990	---	2440	2490	---	15200	---	7980	---	3620	863	---
TOTAL	63290	76250	96440	62160	69440	207470	477500	536610	147030	110190	57123	55216
MEAN	2042	2542	3111	2005	2480	6693	15920	17310	4901	3555	1843	1841
MAX	2460	2870	3580	2490	2570	15500	17300	21000	9510	4970	3100	2280
MIN	1600	2070	2440	1620	2190	2080	14700	7980	2890	2140	863	855
AC-FT	125500	151200	191300	123300	137700	411500	947100	1064000	291600	218600	113300	109500

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1891 - 1993, BY WATER YEAR (WY)

	MEAN	2138	3291	5099	5471	6112	8207	14230	18060	11140	3475	1804	1758
MAX	5643	13050	22910	25430	16420	25380	25030	32920	29850	11910	4744	3302	
(WY)	1928	1928	1934	1934	1951	1972	1943	1917	1894	1899	1899	1912	
MIN	1300	1151	1233	1339	1489	2047	3865	5214	2141	1270	653	932	
(WY)	1893	1940	1932	1931	1929	1929	1977	1992	1926	1973	1988	1966	

SUMMARY STATISTICS

FOR 1992 CALENDAR YEAR

FOR 1993 WATER YEAR

WATER YEARS 1891 - 1993

ANNUAL TOTAL	1317055	1958719	
ANNUAL MEAN	3599	5366	
HIGHEST ANNUAL MEAN			6744
LOWEST ANNUAL MEAN			12310
HIGHEST DAILY MEAN	10100	21000	2508
LOWEST DAILY MEAN	506	855	49000
ANNUAL SEVEN-DAY MINIMUM	545	1120	466
ANNUAL RUNOFF (AC-FT)	2612000	3885000	545
10 PERCENT EXCEEDS	7400	16300	17300
50 PERCENT EXCEEDS	2770	2620	3680
90 PERCENT EXCEEDS	897	1760	1520

LOCATION.--Lat 47°39'10", long 117°26'55", in NW 1/4 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.

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.

GAGE.--Water-stage recorder. Datum of gage is 1,717.42 ft above sea level (levels by Corps of Engineers). Prior to Nov. 22, 1948, nonrecording gage at site 0.5 mi upstream at different datum.

AVERAGE DISCHARGE.--44 years (water years 1949-77, 1979-93), 230 ft³/s, 4.53 in/yr, 166,600 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 20,600 ft³/s Feb. 3, 1963, gage height, 13.35 ft; minimum discharge, 0.74 ft³/s Sept. 5, 14, 1992.

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)
Mar. 15	2215	*5,080	*8.61	Mar. 23	2100	3,740	7.60
Mar. 18	2315	2,660	6.69	May 4	1915	2,850	6.89
Mar. 20	1930	3,030	7.02				

Minimum discharge, 1.1 ft³/s Oct. 1, 2, 6.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.1	4.5	e13	e10	347	e62	367	402	48	19	21	11
2	1.2	4.9	e10	e9.0	273	e63	356	334	47	18	20	11
3	1.6	5.0	e9.0	e9.0	223	64	390	319	46	18	19	11
4	1.4	5.8	e7.0	e10	215	72	965	1430	48	18	17	10
5	1.2	5.8	e7.0	e10	205	86	881	1920	46	18	16	9.7
6	1.1	6.1	e9.0	e9.0	200	1240	622	975	44	18	15	9.7
7	1.2	13	e11	e8.0	196	1900	474	776	40	19	14	9.8
8	1.5	12	e12	e9.0	199	1880	427	570	39	19	13	10
9	1.7	16	e13	e9.0	236	1150	435	450	37	20	12	9.1
10	1.7	15	e13	e10	313	1170	437	362	36	20	12	8.9
11	1.8	15	e12	e10	348	991	681	306	33	21	11	8.5
12	1.7	14	e12	e10	409	786	584	259	33	20	11	8.4
13	1.8	15	e11	e10	465	633	462	210	33	20	11	8.3
14	2.1	17	e9.0	e11	467	852	455	179	31	21	11	8.7
15	2.2	17	e8.0	e12	358	3050	534	159	30	20	11	9.5
16	1.9	16	e9.0	e13	243	2630	388	140	28	55	18	9.8
17	2.3	14	e9.0	e16	178	1270	324	126	36	46	15	9.9
18	2.6	13	e8.0	e19	157	1670	538	114	34	68	16	9.2
19	2.5	15	e8.0	e22	144	1760	571	102	27	75	15	9.3
20	2.6	17	e8.0	e35	107	2010	372	92	25	57	13	9.2
21	3.2	21	e9.0	e35	e107	2140	302	84	24	53	15	9.2
22	2.9	21	e10	e33	e103	1380	264	77	23	50	13	9.4
23	2.6	24	e12	49	e100	2230	280	78	23	45	12	10
24	2.7	30	e14	110	96	2820	266	76	22	46	11	10
25	2.9	28	e15	134	e70	1610	308	69	22	46	11	10
26	2.8	e23	e15	628	e60	1100	810	62	21	39	11	9.7
27	2.8	e22	e14	1160	e58	844	669	60	20	35	11	9.2
28	3.2	e25	e14	792	e60	685	422	56	22	33	11	9.7
29	3.8	e20	e13	579	---	565	334	54	21	29	12	9.9
30	4.8	e16	e12	469	---	475	334	54	20	25	11	9.3
31	4.5	---	e11	411	---	417	---	50	---	23	11	---
TOTAL	71.4	471.1	337.0	4651.0	5937	37605	14252	9945	959	1014	420	287.3
MEAN	2.30	15.7	10.9	150	212	1213	475	321	32.0	32.7	13.5	9.58
MAX	4.8	30	15	1160	467	3050	965	1920	48	75	21	11
MIN	1.1	4.5	7.0	8.0	58	62	264	50	20	18	11	8.3
AC-FT	142	934	668	9230	11780	74590	28270	19730	1900	2010	833	570
CFSM	.00	.02	.02	.22	.31	1.76	.69	.47	.05	.05	.02	.01
IN.	.00	.03	.02	.25	.32	2.03	.77	.54	.05	.05	.02	.02

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1948 - 1993, BY WATER YEAR (WY)

MEAN	17.2	42.8	183	448	709	760	353	199	78.5	21.7	13.0	13.0
MAX	33.9	201	1251	2018	1728	1914	928	1925	434	77.7	38.1	29.9
(WY)	1976	1984	1956	1974	1982	1969	1969	1948	1990	1948	1948	1975
MIN	2.30	10.4	10.9	24.0	47.8	44.1	27.0	15.1	6.21	2.43	1.29	1.01
(WY)	1993	1988	1993	1979	1977	1977	1977	1992	1992	1973	1992	1992

SUMMARY STATISTICS	FOR 1992 CALENDAR YEAR	FOR 1993 WATER YEAR	WATER YEARS 1948 - 1993
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ANNUAL TOTAL	21565.45		75949.8				
ANNUAL MEAN	58.9		208			230	
HIGHEST ANNUAL MEAN						548	1974
LOWEST ANNUAL MEAN						27.3	1977
HIGHEST DAILY MEAN	2170	Feb 21	3050	Mar 15	13500		Jan 16 1974
LOWEST DAILY MEAN		Sep 5		Oct 1		.81	Sep 5 1992
ANNUAL SEVEN-DAY MINIMUM	.92	Sep 14	1.3	Oct 1		.92	Sep 14 1992
ANNUAL RUNOFF (AC-FT)	42780		150600		166900		
ANNUAL RUNOFF (CFSM)	.086		.30			.33	
ANNUAL RUNOFF (INCHES)	1.16		4.10			4.54	
10 PERCENT EXCEEDS	115		599		579		
50 PERCENT EXCEEDS	10		21		41		
90 PERCENT EXCEEDS	1.1		6.0		8.8		

e Estimated

SPOKANE RIVER BASIN

12431000 LITTLE SPOKANE RIVER AT DARTFORD, WA

LOCATION.--Lat 47°47'05", long 117°24'12", in NE 1/4 NW 1/4 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.

DRAINAGE AREA.--665 mi².

PERIOD OF RECORD.--April 1929 to September 1932, December 1946 to current year.

REVISED RECORDS.--WSP 1216: Drainage area. WSP 1286: 1930, 1932 (M), 1947-49 (M). WSP1446: 1951 (M).

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.

REMARKS.--Records excellent except for estimated daily discharges, which are fair. No regulation. Small diversions for irrigation upstream from station. U.S. Geological Survey satellite telemeter at station. Chemical analyses, July 1960 to September 1970, water temperatures, July 1968 to September 1970.

AVERAGE DISCHARGE.--49 years (water years 1930-32, 1948-93), 295 ft³/s, 6.02 in/yr, 213,700 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 3,170 ft³/s Feb. 17, 1970, gage height, 7.29 ft; minimum discharge 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. 24	1215	*885	*4.61				

Minimum daily discharge, 87 ft³/s Oct. 2, 3.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	88	118	127	e98	154	138	482	506	200	126	149	113
2	87	119	129	e97	151	138	492	491	203	125	145	112
3	87	117	105	e96	147	134	520	478	209	132	143	109
4	89	117	112	e95	148	136	636	552	200	139	138	107
5	89	120	112	e94	145	142	650	597	208	139	133	106
6	89	120	109	e90	144	151	592	553	189	142	131	112
7	89	138	122	e92	143	180	565	559	180	148	129	107
8	91	152	124	e92	144	200	557	551	176	145	126	106
9	90	152	126	e93	145	200	581	529	172	143	124	104
10	90	143	127	e94	148	203	580	498	171	154	123	105
11	91	143	127	e95	151	202	606	470	167	158	121	105
12	92	143	127	e96	155	200	599	443	168	155	118	106
13	93	141	125	e96	157	199	583	421	165	154	118	106
14	93	139	124	e96	159	216	566	405	161	162	116	109
15	93	135	125	e95	152	336	546	387	162	162	116	114
16	94	134	125	e96	126	341	521	368	180	161	125	115
17	96	132	125	e96	e130	293	500	347	175	193	128	112
18	97	133	119	e98	e132	309	534	326	161	246	125	107
19	98	136	101	e100	e134	331	602	311	152	212	122	103
20	98	144	e102	115	e136	369	561	303	144	200	118	103
21	100	145	e103	138	e138	406	526	290	141	218	117	110
22	103	160	e105	141	e140	403	514	279	139	205	117	110
23	105	162	e107	143	145	535	529	273	138	194	115	111
24	105	148	e110	141	136	842	511	261	138	193	114	111
25	103	139	e107	144	133	721	533	245	133	191	112	110
26	103	132	e106	151	134	653	552	233	130	186	111	108
27	103	132	e104	159	134	602	548	225	128	178	109	108
28	105	131	e103	160	137	565	514	218	127	171	113	108
29	107	129	e101	159	---	535	497	213	131	165	117	108
30	112	131	e100	158	---	510	512	206	130	161	117	109
31	115	---	e99	154	---	491	---	201	---	155	115	---
TOTAL	2995	4085	3538	3572	3998	10681	16509	11739	4878	5213	3805	3254
MEAN	96.6	136	114	115	143	345	550	379	163	168	123	108
MAX	115	162	129	160	159	842	650	597	209	246	149	115
MIN	87	117	99	90	126	134	482	201	127	125	109	103
AC-FT	5940	8100	7020	7090	7930	21190	32750	23280	9680	10340	7550	6450
CFSM	.15	.20	.17	.17	.21	.52	.83	.57	.24	.25	.18	.16
IN.	.17	.23	.20	.20	.22	.60	.92	.66	.27	.29	.21	.16

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1929 - 1993, BY WATER YEAR (WY)

MEAN	156	190	232	273	395	553	622	413	257	164	133	138
MAX	234	357	824	1204	1108	1211	1301	1176	710	331	193	175
(WY)	1952	1984	1974	1974	1961	1950	1969	1948	1948	1948	1948	1952
MIN	87.9	113	114	99.6	143	167	168	132	98.2	80.3	67.8	80.3
(WY)	1932	1930	1933	1930	1993	1930	1977	1930	1931	1931	1931	1931

SUMMARY STATISTICS	FOR 1992 CALENDAR YEAR	FOR 1993 WATER YEAR	WATER YEARS 1929 - 1993
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ANNUAL TOTAL	57293		74267				
ANNUAL MEAN	157		203			295	
HIGHEST ANNUAL MEAN						554	1974
LOWEST ANNUAL MEAN						128	1931
HIGHEST DAILY MEAN	450	Jan 29	842	Mar 24	2800		Feb 17 1970
LOWEST DAILY MEAN	74	Aug 16	87	Oct 2		63	Jul 24 1930
ANNUAL SEVEN-DAY MINIMUM	75	Aug 15	88	Oct 1		65	Aug 13 1931
ANNUAL RUNOFF (AC-FT)	113600		147300			213800	
ANNUAL RUNOFF (CFSM)							
ANNUAL RUNOFF (INCHES)		3.20		4.31			6.44
10 PERCENT EXCEEDS	294		514			590	
50 PERCENT EXCEEDS	125		138			197	
90 PERCENT EXCEEDS	85		98			121	

e Estimated

SPOKANE RIVER BASIN

235

12432500 LONG LAKE AT LONG LAKE, WA

LOCATION.--Lat 47°50'12", long 117°50'20", in NW 1/4 SW 1/4 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, of which about 122 mi² in the vicinity of Hayden Lake is noncontributing to this station.

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 sea level (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 upstream from 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 contents, since filling reservoir in 1920, 214 acre-ft Feb. 16, 1985, elevation, 1,512.06 ft.

EXTREMES FOR CURRENT YEAR.--Maximum contents, 103,700 acre-ft Sept 20, elevation, 1,535.90 ft; minimum contents, 40,190 acre-ft Mar. 3, elevation, 1,522.30 ft.

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

1,512	0	1,526	56,330	1,534	94,240
1,513	3,570	1,528	65,460	1,535	99,190
1,517	18,640	1,531	79,740	1,536	104,200
1,520	30,550	1,532	84,540	1,537	109,300
1,522	38,880	1,533	89,360		

ELEVATION (FEET NGVD), WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY OBSERVATION AT 24:00 VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1535.33	1535.69	1535.46	1534.92	1523.80	1523.17	1535.32	1535.46	1535.79	1535.45	1535.15	1535.32
2	1535.50	1535.56	1535.43	1534.81	1523.60	1522.65	1535.42	1535.33	1535.61	1535.40	1535.30	1535.26
3	1535.68	1535.51	1535.50	1534.95	1523.38	1522.44	1535.30	1535.42	1535.60	1535.57	1535.07	1535.05
4	1535.61	1535.40	1535.50	1534.80	1523.18	1522.41	1535.40	1535.38	1535.74	1535.30	1535.32	1535.30
5	1535.35	1535.45	1535.36	1534.54	1523.44	1522.37	1535.45	1535.05	1535.64	1535.33	1535.38	1535.75
6	1535.42	1535.40	1535.43	1534.19	1523.20	1523.00	1535.44	1535.18	1535.55	1535.42	1535.38	1535.34
7	1535.36	1535.65	1535.40	1533.32	1522.87	1524.60	1535.43	1535.26	1535.65	1535.53	1535.58	1535.28
8	1535.40	1535.60	1535.34	1532.57	1523.00	1525.00	1535.40	1535.17	1535.80	1535.54	1535.45	1535.15
9	1535.25	1535.60	1535.47	1531.70	1522.85	1524.84	1535.37	1535.10	1535.85	1535.62	1535.58	1535.38
10	1535.40	1535.55	1535.70	1530.88	1523.25	1524.60	1535.36	1535.13	1535.78	1535.40	1535.48	1535.15
11	1535.54	1535.49	1535.58	1530.38	1523.49	1524.57	1535.49	1535.08	1535.74	1535.40	1535.50	1534.80
12	1535.45	1535.55	1535.53	1529.45	1523.48	1524.20	1535.49	1535.18	1535.78	1535.37	1535.33	1535.45
13	1535.60	1535.65	1535.62	1528.50	1523.62	1523.76	1535.28	1535.20	1535.76	1535.50	1535.20	1535.54
14	1535.60	1535.40	1535.60	1527.84	1523.90	1523.60	1535.20	1535.24	1535.77	1535.45	1535.35	1535.48
15	1535.64	1535.55	1535.51	1526.89	1524.10	1524.30	1535.16	1535.35	1535.72	1535.32	1535.53	1535.54
16	1535.40	1535.52	1535.60	1526.00	1524.41	1525.52	1535.20	1535.53	1535.70	1535.53	1535.28	1535.60
17	1535.50	1535.54	1535.62	1525.10	1524.48	1526.09	1535.18	1535.24	1535.30	1535.54	1535.46	1535.39
18	1535.70	1535.65	1535.52	1524.61	1524.18	1526.92	1535.30	1535.12	1535.02	1535.53	1535.52	1535.20
19	1535.45	1535.45	1535.34	1524.27	1523.85	1528.30	1535.37	1535.05	1535.73	1535.51	1535.32	1535.70
20	1535.60	1535.50	1535.67	1524.08	1524.14	1529.85	1535.20	1535.12	1535.75	1535.33	1535.10	1535.68
21	1535.60	1535.70	1535.45	1523.93	1524.98	1531.82	1535.40	1535.05	1535.54	1535.49	1535.22	1535.62
22	1535.40	1535.46	1535.30	1523.93	1524.86	1533.40	1535.40	1535.01	1535.26	1535.65	1535.42	1535.48
23	1535.34	1535.40	1535.40	1523.68	1524.25	1535.15	1535.30	1534.96	1535.50	1535.60	1535.38	1535.35
24	1535.58	1535.35	1535.45	1523.80	1524.15	1535.40	1535.34	1535.18	1535.31	1535.80	1535.24	1535.03
25	1535.50	1535.26	1535.55	1523.66	1523.73	1535.40	1535.38	1535.27	1535.30	1535.70	1535.31	1535.33
26	1535.45	1535.33	1535.38	1523.54	1523.05	1535.46	1535.45	1535.31	1535.49	1535.63	1535.42	1535.47
27	1535.62	1535.32	1535.48	1523.58	1522.79	1535.44	1535.49	1535.06	1535.47	1535.55	1535.36	1535.35
28	1535.58	1535.25	1535.25	1523.40	1523.50	1535.42	1535.48	1535.20	1535.52	1535.25	1535.56	1535.18
29	1535.68	1535.40	1534.95	1523.15	---	1535.45	1535.09	1535.62	1535.48	1534.92	1535.73	1535.05
30	1535.55	1535.52	1535.02	1523.68	---	1535.35	1535.30	1535.80	1535.70	1535.05	1535.63	1534.90
31	1535.58	---	1535.05	1523.55	---	1535.21	---	1535.80	---	1535.15	1535.30	---
MAX	1535.70	1535.70	1535.70	1534.95	1524.98	1535.46	1535.49	1535.80	1535.85	1535.80	1535.73	1535.75
MIN	1535.25	1535.25	1534.95	1523.15	1522.79	1522.37	1535.09	1534.96	1535.02	1534.92	1535.07	1534.80
(†)	102100	101800	99450	45640	45420	100200	100700	103200	102700	99950	100700	98700
(+)	+1300	-300	-2350	-53810	-220	+54780	+500	+2500	-500	-2750	+750	-2000

CAL YR 1992 MAX 1535.92 MIN 1527.40 AC-FT† -2250
WTR YR 1993 MAX 1535.85 MIN 1522.37 AC-FT† -2100

† Contents, in acre-feet, on last day of month.
+ Change in contents, in acre-feet.

SPOKANE RIVER BASIN

12433000 SPOKANE RIVER AT LONG LAKE, WA

LOCATION.--Lat 47°50'12", long 117°50'25", in NW 1/4 SW 1/4 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, of which about 122 mi² in the vicinity of Hayden Lake is noncontributing to this station.

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 sea level (levels by Washington Water Power Co.). Oct. 1, 1978, to Sept. 30, 1981, incorrectly published at datum 1,300 ft.

REMARKS.--Flow regulated by Coeur d'Alene Lake and Long Lake (station 12432500) for powerplants of Washington Water Power Co. About 25,000 acres irrigated upstream from station, largely from wells in the Spokane Valley. Chemical analyses October 1958 to September 1986. Specific conductance records March 1973 to September 1981. Water temperature July 1959 to September 1962, October 1966 to September 1970, March 1973 to September 1981.

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

AVERAGE DISCHARGE.--54 years, 7,726 ft³/s, 5,597,000 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, 23,000 ft³/s May 22, gage height, 70.05 ft; minimum discharge, 150 ft³/s Sept. 28, gage height, 59.80 ft.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2250	2520	3400	3400	3370	3860	16100	17400	10700	4460	3910	1450
2	1840	3620	3850	3260	3980	4140	15800	18000	11000	3540	3220	1610
3	1720	3180	4090	3080	4200	3440	16400	17800	11000	3050	3020	2610
4	2530	2950	4000	3840	4030	2950	16800	19900	8370	3420	2080	1280
5	2710	3250	4340	3630	3210	3010	17800	21200	9010	3930	1990	950
6	1920	3030	4090	3880	3890	3440	18100	21000	8140	4250	3070	3240
7	2390	2640	4220	5040	4460	1480	18200	20600	6340	4220	2710	2180
8	2310	3180	4380	5020	3440	4070	18200	21300	6130	4350	3460	2340
9	2490	3100	3650	4960	3660	4800	18200	21100	6130	4320	2830	1970
10	2330	3020	3780	4930	3110	5230	18200	20600	6160	4730	3200	3050
11	1920	2980	4220	4130	3290	4880	18300	20700	5620	3840	2580	3380
12	3010	2930	4130	4860	3670	5540	19000	19600	5170	4260	2930	954
13	2500	2840	4110	5230	3240	5660	19100	20000	5210	3630	2620	2280
14	3100	3700	4160	4230	3260	5460	18700	20300	5330	3880	2010	2360
15	2700	2820	4150	4870	3410	5020	18400	20800	5370	4250	1670	2360
16	3120	2910	4470	4890	2920	5670	17700	21200	5360	4260	3110	2850
17	1980	3070	4160	4700	3510	5710	17300	22700	5820	5030	2100	3320
18	2500	3300	4650	3860	4670	5720	16900	22500	6040	5790	2570	3100
19	3440	4210	4700	3410	3880	5750	16800	21500	3130	5980	2820	1280
20	2920	3450	3440	3400	2910	5800	16400	21100	4950	5770	2920	2560
21	3150	3420	4660	3030	1550	5840	16100	20900	5310	5080	2170	3030
22	3110	4210	4260	2680	3730	6400	16600	19900	5050	5060	2480	3350
23	2710	3860	3520	3220	4420	6780	16600	19500	4060	5020	2690	3300
24	2440	3830	3560	2570	3560	13300	16200	18100	5040	4280	3020	3690
25	3140	3920	2990	3070	4070	15100	16300	17800	4260	5100	2320	2190
26	3120	3400	3750	4120	4590	15800	16300	17000	4030	4940	1860	2490
27	2370	3590	3360	4250	3660	16600	16800	15900	4000	4850	2350	3330
28	3180	3750	3750	3990	1590	16900	17600	11400	3510	4150	1540	3430
29	2790	3290	3710	3940	---	16900	18300	8520	4040	3710	1680	3450
30	3500	3440	3270	2600	---	17400	17000	8610	3130	3800	2380	3350
31	2540	---	3290	3900	---	17300	---	9100	---	4240	2450	---
TOTAL	81730	99410	122110	121990	99280	239950	520200	576030	177410	137190	79760	76734
MEAN	2636	3314	3939	3935	3546	7740	17340	18580	5914	4425	2573	2558
MAX	3500	4210	4700	5230	4670	17400	19100	22700	11000	5980	3910	3690
MIN	1720	2520	2990	2570	1550	1480	15800	8520	3130	3050	1540	950
AC-FT	162100	197200	242200	242000	196900	475900	1032000	1143000	351900	272100	158200	152200
MEAN†	2657	3310	3899	3060	3543	8629	17348	18634	5907	4380	2585	2525
AC-FT†	163400	196900	239800	188200	196700	530700	1032000	1146000	351400	269400	159000	150200

CAL YR 1992 TOTAL 1582775 MEAN 4325 MAX 11200 MIN 210 AC-FT 3139000 MEAN† 4323 AC-FT† 3137000
WTR YR 1993 TOTAL 2331794 MEAN 6388 MAX 22700 MIN 950 AC-FT 4625000 MEAN† 6384 AC-FT† 4623000

† Adjusted for change in contents in Long Lake.

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 SE 1/4 SW 1/4 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, at mile 1.6, and 1.8 mi north of town of Long Lake.

DRAINAGE AREA.--179 mi².

PERIOD OF RECORD.--February 1971 to September 1978, April 1984 to September 1987 (seasonal records), October 1987 to current year.

GAGE.--Water-stage recorder. Datum of gage is 1,418.5 ft above sea level.

REMARKS.--Records excellent except for estimated daily discharges, which are good. No known regulation. Diversions upstream for irrigation, domestic use, and fish hatchery. Pumpage from ground-water wells can cause small fluctuations in discharge. Water temperature records April 1984 to September 1987 (seasonal records); October 1987 to September 1989.

AVERAGE DISCHARGE.--13 years (water years 1972-78, 1988-93), 51.8 ft³/s, 3.93 in/yr, 37,530 acre-ft/yr.

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 discharge, 9.4 ft³/s Dec. 30, 1988.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 661 ft³/s Mar. 24, gage height, 3.32 ft; minimum daily discharge, 15 ft³/s Jan. 6-8.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	e20	20	e17	e16	e21	e20	246	74	21	19	19	19
2	e19	18	e17	e16	e22	e20	235	69	22	19	19	19
3	e18	17	e17	e16	e22	21	250	68	21	21	19	19
4	e18	19	e17	e16	e22	e21	389	96	21	21	19	19
5	e18	18	e17	e16	23	e22	356	108	21	21	19	19
6	e18	18	e17	e15	23	24	276	87	20	21	19	19
7	e18	22	e18	e15	23	26	230	79	20	20	19	19
8	e19	19	e18	e15	23	26	217	72	20	20	19	19
9	19	18	e18	e16	23	26	239	66	20	20	19	19
10	19	18	e19	e16	23	26	233	61	20	21	19	19
11	19	19	e18	e16	23	25	214	57	20	21	19	20
12	18	18	e18	e16	23	25	183	52	20	20	19	20
13	19	18	e17	e16	24	25	164	47	20	20	19	20
14	18	18	e17	e17	24	25	148	45	20	20	19	20
15	18	18	e17	e18	24	26	136	42	20	20	19	21
16	19	17	e17	e18	23	26	122	39	20	21	20	21
17	19	17	e17	e18	23	26	119	36	20	26	20	21
18	19	19	e16	e18	23	27	181	35	20	22	20	21
19	19	20	e16	e18	23	27	209	33	19	21	19	21
20	19	20	e17	e18	23	33	164	32	19	22	19	21
21	20	21	e17	e18	22	42	136	30	20	21	19	21
22	20	25	e17	e18	22	58	121	29	20	21	19	21
23	19	22	e18	e18	21	106	116	28	20	21	19	21
24	19	20	e18	e19	20	461	106	27	19	21	19	21
25	19	19	e17	e20	20	451	103	25	19	21	20	21
26	19	19	e17	e20	e20	339	117	25	19	20	19	21
27	19	19	e16	e19	e20	261	105	24	19	20	20	21
28	19	19	e16	e19	e20	230	90	23	19	20	20	21
29	20	19	e16	e19	---	218	83	23	19	19	20	21
30	20	e18	e16	e19	---	249	78	22	19	19	19	21
31	20	---	e16	e20	---	236	---	22	---	19	19	---
TOTAL	587	572	529	539	623	3147	5366	1476	597	638	596	606
MEAN	18.9	19.1	17.1	17.4	22.2	102	179	47.6	19.9	20.6	19.2	20.2
MAX	20	25	19	20	24	461	389	108	22	26	20	21
MIN	18	17	16	15	20	20	78	22	19	19	19	19
AC-FT	1160	1130	1050	1070	1240	6240	10640	2930	1180	1270	1180	1200
CFSM	.11	.11	.10	.10	.12	.57	1.00	.27	.11	.11	.11	.11
IN.	.12	.12	.11	.11	.13	.65	1.12	.31	.12	.13	.12	.13

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1971 - 1993, BY WATER YEAR (WY)

	MEAN	27.1	28.7	46.9	43.9	50.2	116	152	59.5	33.2	26.3	25.2	25.6
MAX	40.3	47.5	236	221	154	351	564	257	67.9	45.9	41.4	39.1	39.1
(WY)	1976	1974	1974	1974	1974	1974	1975	1975	1975	1975	1975	1975	1975
MIN	18.9	19.1	17.1	17.4	21.5	29.9	22.6	19.6	19.5	19.9	18.7	18.1	18.1
(WY)	1993	1993	1993	1993	1990	1977	1992	1992	1992	1990	1992	1990	1990

SUMMARY STATISTICS	FOR 1992 CALENDAR YEAR	FOR 1993 WATER YEAR	WATER YEARS 1971 - 1993
ANNUAL TOTAL	9583	15276	
ANNUAL MEAN	26.2	41.9	51.8
HIGHEST ANNUAL MEAN			141
LOWEST ANNUAL MEAN			26.6
HIGHEST DAILY MEAN	156	461	1430
LOWEST DAILY MEAN	15	15	15
ANNUAL SEVEN-DAY MINIMUM	16	16	16
ANNUAL RUNOFF (AC-FT)	19010	30300	37530
ANNUAL RUNOFF (CFSM)	.15	.23	.29
ANNUAL RUNOFF (INCHES)	1.99	3.17	3.93
10 PERCENT EXCEEDS	45	104	101
50 PERCENT EXCEEDS	20	20	28
90 PERCENT EXCEEDS	18	17	20

e Estimated

SPOKANE RIVER BASIN

12433542 BLUE CREEK ABOVE MIDNITE MINE DRAINAGE, NEAR WELLPINIT, WA

LOCATION.--Lat 47°55'28", long 118°05'18", in NW 1/4 SE 1/4 sec.13, T.28 N., R.37 E., Stevens County, Hydrologic Unit 17010307, Spokane Indian Reservation, on right bank, 2.4 mi downstream from Turtle Lake, and 5.4 mi northwest of Wellpinit.

DRAINAGE AREA.--6.0 mi².

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--June 1984 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 2,070 ft, from topographic map.

REMARKS.--Water-discharge records good except for estimated daily discharges, which are fair, and discharges below 0.2 ft³/s, which are poor. No regulation or diversion upstream from station. U.S. Geological Survey satellite telemeter at station.

AVERAGE DISCHARGE.--9 years, 0.68 ft³/s, 1.54 in/yr, 493 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 16 ft³/s Mar. 12, 1986, gage height, 2.11 ft; minimum discharge, 0.01 ft³/s Aug. 12, 13, 1992, gage height, 0.86 ft.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 9.0 ft³/s Apr. 3, gage height, 1.88 ft; minimum daily discharge, 0.10 ft³/s several days November to January, the result of freezeup.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.12	.18	e.15	e.13	e.18	e.15	6.3	e3.9	1.0	.43	.26	.13
2	.12	.17	e.15	e.13	e.18	e.15	6.4	e3.8	1.0	.43	.25	.13
3	.12	.14	e.14	e.13	e.18	e.17	7.7	e4.0	.92	.48	.24	.11
4	.14	.19	e.12	e.13	e.19	e.17	8.1	e4.5	.91	.46	.24	.11
5	.14	.19	e.12	e.10	e.20	e.20	7.6	e5.0	.84	.43	.24	.11
6	.14	.17	e.11	e.10	e.20	e.23	7.3	e4.5	.79	.45	.23	.12
7	.13	.31	e.10	e.10	e.20	e.25	7.0	e4.0	.82	.41	.23	.11
8	.14	.19	e.12	e.13	e.20	e.28	7.1	e3.8	.79	.39	.21	.11
9	.12	.17	e.13	e.13	e.20	e.33	7.1	e3.5	.80	.39	.21	.13
10	.14	.14	e.13	e.13	e.20	e.36	7.0	e3.3	.74	.39	.21	.14
11	.14	.17	e.13	e.13	e.20	e.38	6.7	e3.1	.71	.45	.20	.14
12	.14	.17	e.13	e.13	e.20	e.39	6.4	e2.9	.73	.39	.20	.14
13	.14	.17	e.13	e.13	e.20	e.40	6.2	e2.8	.73	.36	.20	.14
14	.13	.17	e.13	e.14	e.20	e.43	6.1	e2.7	.71	.33	.20	.14
15	.14	.17	e.13	e.14	e.18	.45	6.0	e2.5	.68	.34	.21	.17
16	.14	.16	e.13	e.15	e.17	.48	5.9	e2.4	.68	.34	.27	.14
17	.14	.17	e.13	e.15	e.16	.49	5.8	e2.3	.68	.46	.24	.14
18	.14	.17	e.10	e.15	e.17	.60	6.4	e2.1	.66	.36	.21	.14
19	.14	.20	e.10	e.15	e.17	.60	5.8	e2.0	.64	.34	.21	.14
20	.14	.19	e.13	e.18	e.17	.65	5.6	e1.9	.61	.44	.20	.14
21	.22	.21	e.13	e.20	e.17	.69	5.4	e1.8	.65	.37	.19	.14
22	.21	.23	e.13	e.18	e.17	1.3	5.3	e1.7	.64	.40	.18	.14
23	.14	.19	e.14	e.16	e.17	3.6	5.1	e1.6	.64	.38	.17	.14
24	.14	e.14	e.15	e.18	e.16	3.1	5.1	e1.5	.62	.38	.18	.14
25	.14	e.10	e.14	e.20	e.14	e3.5	5.0	e1.4	.59	.38	.18	.14
26	.14	e.13	e.14	e.20	e.14	e3.5	5.2	1.3	.61	.34	.18	.14
27	.14	e.13	e.14	e.20	e.15	3.5	e4.7	1.2	.61	.32	.18	.14
28	.14	e.13	e.14	e.20	e.15	3.9	e4.4	1.2	.58	.30	.18	.15
29	.15	e.13	e.13	e.20	---	5.0	e4.2	1.1	.47	.28	.18	.17
30	.18	e.15	e.13	e.19	---	5.7	e4.1	1.1	.44	.28	.16	.16
31	.18	---	e.13	e.18	---	5.8	---	1.0	---	.26	.14	---
TOTAL	4.48	5.13	4.01	4.75	5.00	46.75	181.0	79.9	21.29	11.76	6.38	4.09
MEAN	.14	.17	.13	.15	.18	1.51	6.03	2.58	.71	.38	.21	.14
MAX	.22	.31	.15	.20	.20	5.8	8.1	5.0	1.0	.48	.27	.17
MIN	.12	.10	.10	.10	.14	.15	4.1	1.0	.44	.26	.14	.11
AC-FT	8.9	10	8.0	9.4	9.9	93	359	158	42	23	13	8.1
CFSM	.02	.03	.02	.03	.03	.25	1.01	.43	.12	.06	.03	.02
IN.	.03	.03	.02	.03	.03	.29	1.12	.50	.13	.07	.04	.03

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1984 - 1993, BY WATER YEAR (WY)

	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993
MEAN	.16	.21	.20	.20	.28	2.26	2.59	1.07	.60	.35
MAX	.23	.37	.34	.26	.48	8.25	6.03	2.58	1.12	.65
(WY)	1985	1985	1988	1988	1986	1986	1993	1993	1990	1984
MIN	.11	.14	.13	.14	.16	.34	.34	.30	.17	.14
(WY)	1989	1986	1993	1989	1990	1990	1990	1992	1992	1982

SUMMARY STATISTICS

FOR 1992 CALENDAR YEAR

FOR 1993 WATER YEAR

WATER YEARS 1984 - 1993

ANNUAL TOTAL	97.78	374.54	
ANNUAL MEAN	.27	1.03	
HIGHEST ANNUAL MEAN			.68
LOWEST ANNUAL MEAN			1.27
HIGHEST DAILY MEAN	.83 Mar 16	8.1 Apr 4	15 Mar 12 1986
LOWEST DAILY MEAN	.06 Aug 16	.10 Nov 25	.06 Aug 16 1992
ANNUAL SEVEN-DAY MINIMUM	.06 Aug 14	.11 Sep 2	.06 Aug 14 1992
ANNUAL RUNOFF (AC-FT)	194	743	495
ANNUAL RUNOFF (CFSM)	.045	.17	.11
ANNUAL RUNOFF (INCHES)	.61	2.32	1.55
10 PERCENT EXCEEDS	.61	4.0	1.3
50 PERCENT EXCEEDS	.17	.20	.23
90 PERCENT EXCEEDS	.09	.13	.13

e Estimated

12433542 BLUE CREEK ABOVE MIDNITE MINE DRAINAGE, NEAR WELLPINIT, WA--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--1980, June 1984 to December 1988, June 1989 to current year.

PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: June 1984 to December 1988, June 1989 to current year.

pH: July 1984 to December 1988, June 1989 to current year.

WATER TEMPERATURE: June 1984 to December 1988, June 1989 to current year.

INSTRUMENTATION.--Water-quality monitor since June 1984. Digital recorder set for one-hour-interval punch.

Electronic data logger, with 30 minute recording interval and satellite telemeter, installed April 27, 1993.

EXTREMES FOR PERIOD OF RECORD.--

SPECIFIC CONDUCTANCE: Maximum recorded, 203 microsiemens Aug. 29, 1992, but may have been higher during periods of missing record; minimum recorded, 80 microsiemens Mar. 27-30, 1986, but may have been lower during periods of missing record.

pH: Maximum recorded, 9.5 units, July 6, 7, 1986, but may have been higher during periods of missing record; minimum recorded, 6.2 units June 13, 1986, but may have been lower during periods of missing record.

WATER TEMPERATURE: Maximum recorded, 23.0°C July 9, 1985, but may have been higher during periods of missing record; minimum, 0.0°C on many days during winters.

EXTREMES FOR CURRENT YEAR.--

SPECIFIC CONDUCTANCE: No extremes due to more than 20 percent of missing record.

pH: No extremes due to more than 20 percent of missing record.

WATER TEMPERATURE: Maximum, 19.0°C July 28, Aug. 5, 6; minimum, 0.0°C during many days from November to March.

SPECIFIC CONDUCTANCE, US/CM @ 25 DEGREES CENTIGRADE, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	OCTOBER			NOVEMBER			DECEMBER			JANUARY		
1	140	139	140	140	132	134	134	130	133	128	127	128
2	140	139	140	135	132	134	137	133	135	131	127	129
3	142	139	141	134	132	133	143	137	140	131	128	129
4	143	142	142	133	129	131	148	142	145	130	127	128
5	142	141	141	133	129	131	150	147	148	128	127	127
6	142	140	141	132	130	131	152	148	149	132	128	130
7	140	136	139	132	127	129	150	141	146	134	132	133
8	138	136	137	138	131	134	141	128	134	134	129	132
9	138	136	137	138	132	136	---	---	---	129	127	128
10	137	135	136	136	132	134	---	---	---	130	127	129
11	137	135	136	133	129	131	---	---	---	130	128	129
12	137	135	136	132	129	131	---	---	---	130	128	129
13	138	136	137	133	131	132	---	---	---	130	119	122
14	137	135	136	134	132	134	---	---	---	123	119	120
15	136	134	135	135	133	134	---	---	---	127	123	125
16	136	134	135	136	134	135	---	---	---	129	126	127
17	135	132	134	135	134	134	---	---	---	130	127	129
18	135	132	133	135	132	134	---	---	---	127	125	126
19	134	132	133	134	128	131	---	---	---	126	124	125
20	134	132	133	132	129	131	---	---	---	128	125	127
21	137	132	135	132	124	129	---	---	---	130	127	129
22	148	136	144	126	122	124	---	---	---	129	125	126
23	149	141	146	133	123	128	---	---	---	128	125	126
24	148	140	144	143	133	140	---	---	---	130	127	129
25	143	137	141	152	143	150	---	---	---	129	125	127
26	139	136	137	156	151	154	---	---	---	126	124	125
27	138	134	135	152	139	146	---	---	---	128	124	126
28	134	132	134	139	132	135	---	---	---	130	127	128
29	133	132	132	133	129	131	---	---	---	131	128	130
30	134	132	133	130	128	129	---	---	---	132	131	131
31	134	132	133	---	---	---	---	---	---	132	130	131
MONTH	149	132	137	156	122	134	---	---	---	134	119	128

SPOKANE RIVER BASIN

12433542 BLUE CREEK ABOVE MIDNITE MINE DRAINAGE, NEAR WELLPINIT, WA--Continued

SPECIFIC CONDUCTANCE, US/CM @ 25 DEGREES CENTIGRADE, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
FEBRUARY			MARCH			APRIL			MAY			
1	133	131	132	---	---	---	---	---	---	---	---	---
2	133	132	133	---	---	---	---	---	---	---	---	---
3	135	132	133	---	---	---	---	---	---	---	---	---
4	136	134	135	---	---	---	---	---	---	---	---	---
5	135	133	134	---	---	---	---	---	---	---	---	---
6	134	133	134	---	---	---	---	---	---	---	---	---
7	134	132	133	---	---	---	---	---	---	---	---	---
8	135	133	134	---	---	---	---	---	---	---	---	---
9	135	133	134	---	---	---	---	---	---	---	---	---
10	133	131	132	---	---	---	---	---	---	---	---	---
11	133	131	132	---	---	---	---	---	---	111	104	107
12	135	133	133	---	---	---	---	---	---	110	105	107
13	136	134	135	---	---	---	---	---	---	110	104	107
14	136	134	135	---	---	---	---	---	---	111	106	108
15	---	136	---	---	---	---	---	---	---	111	105	108
16	---	---	---	---	---	---	---	91	---	113	107	110
17	---	---	---	---	---	---	95	92	93	114	108	111
18	---	---	---	---	---	---	98	91	95	115	110	112
19	---	---	---	---	---	---	98	92	95	115	110	112
20	---	---	---	---	---	---	98	92	96	115	110	113
21	---	---	---	---	---	---	100	92	96	115	112	114
22	---	---	---	---	---	---	100	94	97	115	111	113
23	---	---	---	---	---	---	101	94	98	115	112	114
24	---	---	---	123	118	121	101	95	98	116	112	114
25	---	---	---	120	115	118	104	95	99	118	111	113
26	---	---	---	121	116	118	104	94	99	116	112	114
27	---	---	---	124	118	122	---	---	---	116	112	114
28	---	---	---	126	112	120	---	---	---	117	112	114
29	---	---	---	121	111	115	---	---	---	118	113	115
30	---	---	---	121	115	117	---	---	---	117	112	114
31	---	---	---	119	102	111	---	---	---	119	115	117
MONTH	---	---	---	---	---	---	---	---	---	---	---	---
DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
JUNE			JULY			AUGUST			SEPTEMBER			
1	119	115	117	114	110	112	130	125	127	127	123	125
2	121	113	117	114	111	113	130	125	128	128	124	126
3	121	116	118	115	108	113	130	124	128	129	125	127
4	118	115	117	118	115	117	130	123	127	130	127	129
5	118	114	117	121	117	119	129	122	126	135	130	133
6	119	115	117	125	115	119	129	122	126	134	130	132
7	120	116	118	119	115	117	128	121	125	134	131	133
8	121	117	119	119	116	117	128	120	125	134	131	133
9	120	111	116	120	116	118	127	119	123	136	133	135
10	117	113	115	120	115	118	126	118	122	136	134	135
11	117	112	114	120	116	118	126	118	123	136	133	135
12	116	112	114	123	118	121	125	118	122	137	134	135
13	117	112	114	123	117	120	124	117	121	137	135	136
14	124	111	116	123	118	120	125	117	122	138	135	136
15	117	113	115	123	119	121	125	118	122	148	138	145
16	118	114	116	124	114	121	128	120	124	146	144	145
17	119	116	118	125	113	120	129	123	126	146	143	145
18	120	116	118	127	124	126	128	123	126	145	142	144
19	121	117	119	128	125	126	129	123	126	144	143	144
20	121	119	120	128	122	125	129	122	126	143	130	140
21	124	121	122	130	127	128	130	123	127	140	138	139
22	124	120	122	133	125	129	129	123	126	139	137	138
23	124	121	122	135	131	133	129	124	127	139	137	138
24	127	124	125	139	130	134	128	122	125	143	139	140
25	130	127	128	138	133	136	125	119	123	145	140	142
26	134	130	132	138	134	136	124	119	122	145	141	143
27	136	129	133	138	133	136	124	118	121	144	142	143
28	131	108	121	138	131	135	125	116	122	145	142	143
29	112	110	111	136	129	133	124	120	122	148	144	145
30	113	110	112	133	125	129	124	121	123	150	147	148
31	---	---	---	130	125	127	126	121	124	---	---	---
MONTH	136	108	119	139	108	124	130	116	124	150	123	138

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PH, WATER, WHOLE, FIELD, STANDARD UNITS, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DAY	MAX	MIN	MEDIAN	MAX	MIN	MEDIAN	MAX	MIN	MEDIAN	MAX	MIN	MEDIAN
OCTOBER				NOVEMBER			DECEMBER			JANUARY		
1	7.8	7.6	7.7	8.0	7.6	7.7	---	---	---	7.7	7.6	7.7
2	7.7	7.5	7.6	8.0	7.6	7.7	---	---	---	7.7	7.7	7.7
3	7.7	7.6	7.7	7.8	7.4	7.6	---	---	---	7.7	7.7	7.7
4	7.8	7.6	7.7	7.6	7.3	7.4	---	---	---	7.7	7.6	7.7
5	7.7	7.4	7.5	7.9	7.3	7.5	---	---	---	7.7	7.7	7.7
6	7.5	7.3	7.4	---	---	---	---	---	---	7.7	7.7	7.7
7	7.4	7.1	7.3	---	---	---	---	---	---	7.8	7.7	7.7
8	7.8	7.2	7.6	---	---	---	---	---	---	7.7	7.6	7.6
9	7.7	7.5	7.6	---	---	---	---	---	---	7.7	7.6	7.7
10	7.7	7.5	7.6	---	---	---	---	---	---	7.7	7.6	7.7
11	7.9	7.6	7.7	---	---	---	---	---	---	7.7	7.6	7.7
12	7.9	7.7	7.8	---	---	---	---	---	---	7.7	7.6	7.7
13	7.9	7.8	7.9	---	---	---	---	---	---	7.7	7.4	7.4
14	7.8	7.6	7.7	---	---	---	---	---	---	7.6	7.4	7.5
15	7.7	7.5	7.6	---	---	---	---	---	---	7.7	7.5	7.6
16	7.6	7.3	7.5	---	---	---	---	---	---	7.7	7.6	7.6
17	7.8	7.4	7.6	---	---	---	---	---	---	7.6	7.5	7.6
18	7.8	7.5	7.7	---	---	---	---	---	---	7.5	7.5	7.5
19	7.9	7.5	7.7	---	---	---	---	---	---	7.5	7.5	7.5
20	7.8	7.6	7.7	---	---	---	---	---	---	7.6	7.5	7.5
21	7.8	7.6	7.7	---	---	---	---	---	---	7.6	7.5	7.5
22	8.0	7.7	7.9	---	---	---	---	---	---	7.6	7.5	7.5
23	7.9	7.7	7.8	---	---	---	---	---	---	7.6	7.5	7.6
24	7.7	7.6	7.6	---	---	---	---	---	---	7.6	7.5	7.6
25	7.6	7.5	7.6	---	---	---	---	---	---	7.5	7.4	7.4
26	7.6	7.4	7.5	---	---	---	---	---	---	7.5	7.4	7.4
27	7.6	7.4	7.5	---	---	---	---	---	---	7.5	7.4	7.5
28	7.6	7.2	7.3	---	---	---	---	---	---	7.5	7.4	7.5
29	7.7	7.3	7.5	---	---	---	---	---	---	7.6	7.4	7.5
30	7.8	7.4	7.6	---	---	---	---	---	---	7.6	7.5	7.5
31	7.9	7.5	7.6	---	---	---	---	---	---	7.6	7.6	7.6
MAX	8.0	7.8	7.9	---	---	---	---	---	---	7.8	7.7	7.7
MIN	7.4	7.1	7.3	---	---	---	---	---	---	7.5	7.4	7.4
DAY	MAX	MIN	MEDIAN	MAX	MIN	MEDIAN	MAX	MIN	MEDIAN	MAX	MIN	MEDIAN
FEBRUARY				MARCH			APRIL			MAY		
1	7.6	7.6	7.6	7.7	7.6	7.7	---	---	---	---	---	---
2	7.8	7.6	7.6	7.7	7.6	7.7	---	---	---	---	---	---
3	7.7	7.6	7.7	7.7	7.6	7.7	---	---	---	---	---	---
4	7.7	7.6	7.6	7.7	7.6	7.6	---	---	---	---	---	---
5	7.7	7.6	7.7	7.7	7.6	7.7	---	---	---	---	---	---
6	7.7	7.6	7.6	7.7	7.6	7.7	---	---	---	---	---	---
7	7.7	7.6	7.6	7.7	7.7	7.7	---	---	---	---	---	---
8	7.7	7.6	7.7	7.7	7.7	7.7	---	---	---	---	---	---
9	7.6	7.6	7.6	7.8	7.7	7.8	---	---	---	---	---	---
10	7.6	7.6	7.6	7.8	7.7	7.8	---	---	---	---	---	---
11	7.8	7.5	7.6	7.8	7.8	7.8	---	---	---	8.2	7.6	7.6
12	7.6	7.6	7.6	7.8	7.7	7.8	---	---	---	8.2	7.5	7.6
13	7.6	7.6	7.6	7.8	7.7	7.7	---	---	---	8.2	7.6	7.6
14	7.7	7.6	7.6	7.7	7.7	7.7	---	---	---	8.1	7.6	7.7
15	7.7	7.7	7.7	7.8	7.6	7.7	---	---	---	8.1	7.6	7.7
16	7.7	7.7	7.7	7.8	7.6	7.7	8.0	---	---	8.1	7.6	7.7
17	7.7	7.6	7.6	7.7	7.7	7.7	8.0	7.9	7.9	8.1	7.6	7.7
18	7.6	7.6	7.6	7.7	7.6	7.7	8.0	7.8	7.9	8.1	7.6	7.7
19	7.6	7.6	7.6	7.7	7.6	7.7	8.0	7.8	7.9	8.0	7.6	7.7
20	7.6	7.6	7.6	7.7	7.6	7.7	8.0	7.8	7.9	8.0	7.6	7.7
21	7.6	7.6	7.6	7.7	7.6	7.7	8.0	7.8	7.9	7.9	7.6	7.7
22	7.6	7.6	7.6	7.7	7.7	7.7	8.0	7.8	7.9	8.0	7.6	7.7
23	7.7	7.6	7.7	7.8	7.7	7.7	8.0	7.8	7.9	8.0	7.6	7.7
24	7.7	7.7	7.7	7.8	7.7	7.7	8.0	7.8	7.9	8.0	7.6	7.7
25	7.7	7.7	7.7	7.8	7.7	7.7	8.1	7.8	7.9	8.0	7.6	7.7
26	7.7	7.7	7.7	7.8	7.6	7.7	8.1	7.8	7.9	7.9	7.5	7.6
27	7.7	7.6	7.7	7.8	7.7	7.7	---	---	---	7.9	7.5	7.6
28	7.7	7.7	7.7	7.8	7.7	7.7	---	---	---	7.8	7.5	7.6
29	---	---	---	7.7	7.7	7.7	---	---	---	7.8	7.5	7.6
30	---	---	---	7.8	7.5	7.7	---	---	---	7.8	7.5	7.5
31	---	---	---	---	---	---	---	---	---	7.7	7.4	7.5
MAX	7.8	7.7	7.7	---	---	---	---	---	---	---	---	---
MIN	7.6	7.5	7.6	---	---	---	---	---	---	---	---	---

SPOKANE RIVER BASIN

12433542 BLUE CREEK ABOVE MIDNITE MINE DRAINAGE, NEAR WELLPINIT, WA--Continued

PH, WATER, WHOLE, FIELD, STANDARD UNITS, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DAY	MAX	MIN	MEDIAN	MAX	MIN	MEDIAN	MAX	MIN	MEDIAN	MAX	MIN	MEDIAN
	JUNE			JULY			AUGUST			SEPTEMBER		
1	7.8	7.5	7.6	7.7	7.5	7.6	7.9	7.8	7.8	7.9	7.8	7.9
2	7.7	7.4	7.5	7.7	7.5	7.6	7.9	7.8	7.8	7.9	7.8	7.8
3	7.8	7.5	7.6	7.6	7.5	7.5	7.9	7.8	7.8	7.9	7.8	7.8
4	7.8	7.4	7.5	7.6	7.5	7.6	7.9	7.8	7.8	7.9	7.8	7.8
5	7.8	7.4	7.6	7.6	7.5	7.6	7.9	7.8	7.8	7.9	7.8	7.8
6	7.8	7.5	7.5	7.6	7.5	7.6	7.9	7.8	7.8	7.9	7.8	7.8
7	7.8	7.5	7.6	7.6	7.5	7.6	7.9	7.8	7.8	7.9	7.8	7.8
8	7.8	7.5	7.6	7.7	7.5	7.6	7.9	7.8	7.8	7.9	7.8	7.8
9	7.7	7.4	7.5	7.7	7.6	7.6	7.9	7.8	7.8	7.9	7.8	7.8
10	7.7	7.4	7.6	7.7	7.5	7.6	7.9	7.8	7.8	7.9	7.8	7.8
11	7.6	7.4	7.5	7.7	7.5	7.6	7.9	7.8	7.8	7.9	7.8	7.8
12	7.7	7.4	7.5	7.7	7.5	7.6	7.9	7.8	7.8	7.9	7.8	7.8
13	7.7	7.4	7.6	7.6	7.5	7.6	7.9	7.8	7.8	7.9	7.8	7.8
14	7.7	7.5	7.6	7.7	7.5	7.6	7.9	7.8	7.8	7.9	7.8	7.8
15	7.7	7.5	7.6	7.7	7.5	7.6	7.8	7.7	7.8	7.8	7.8	7.8
16	7.8	7.5	7.6	7.7	7.5	7.6	7.8	7.7	7.7	7.9	7.8	7.8
17	7.7	7.5	7.6	7.6	7.5	7.5	7.8	7.7	7.7	7.9	7.8	7.8
18	7.8	7.5	7.6	7.7	7.5	7.6	7.8	7.7	7.7	7.9	7.8	7.9
19	7.8	7.5	7.6	7.6	7.5	7.5	7.8	7.7	7.7	7.9	7.8	7.9
20	7.7	7.5	7.6	7.6	7.4	7.6	7.8	7.7	7.7	7.9	7.8	7.9
21	7.7	7.6	7.6	7.7	7.5	7.6	7.8	7.7	7.7	7.9	7.8	7.8
22	7.6	7.5	7.6	7.6	7.5	7.6	7.8	7.7	7.7	7.9	7.8	7.9
23	7.6	7.5	7.5	7.6	7.5	7.6	7.8	7.7	7.7	7.9	7.8	7.8
24	7.7	7.5	7.6	7.6	7.5	7.6	7.8	7.7	7.7	7.9	7.8	7.8
25	7.7	7.5	7.6	7.6	7.5	7.6	7.8	7.7	7.7	7.9	7.8	7.8
26	7.8	7.6	7.6	7.7	7.5	7.6	7.8	7.7	7.7	7.9	7.8	7.8
27	7.8	7.6	7.7	7.7	7.6	7.6	7.8	7.7	7.7	7.9	7.8	7.8
28	7.7	7.6	7.6	7.7	7.6	7.6	7.7	7.6	7.7	7.8	7.8	7.8
29	7.7	7.5	7.6	7.7	7.6	7.6	7.7	7.6	7.7	7.8	7.7	7.8
30	7.7	7.5	7.6	7.8	7.5	7.6	7.9	7.6	7.7	7.8	7.7	7.8
31	---	---	---	7.9	7.7	7.8	7.9	7.8	7.9	---	---	---
MAX	7.8	7.6	7.7	7.9	7.7	7.8	7.9	7.8	7.9	7.9	7.8	7.9
MIN	7.6	7.4	7.5	7.6	7.4	7.5	7.7	7.6	7.7	7.8	7.7	7.8

WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	OCTOBER			NOVEMBER			DECEMBER			JANUARY		
1	11.0	8.5	9.5	6.5	6.0	6.0	.0	.0	.0	.0	.0	.0
2	12.0	9.5	10.5	6.0	4.5	5.5	.0	.0	.0	.0	.0	.0
3	11.5	10.5	11.0	4.5	3.0	3.5	.0	.0	.0	.0	.0	.0
4	11.5	9.5	10.5	3.0	2.5	3.0	.0	.0	.0	.0	.0	.0
5	9.5	7.0	8.0	3.5	3.0	3.0	.0	.0	.0	.5	.0	.5
6	8.0	5.5	7.0	4.0	3.5	4.0	.0	.0	.0	.5	.0	.5
7	6.5	4.0	5.5	5.0	4.0	4.5	.0	.0	.0	.5	.0	.0
8	8.0	6.0	6.5	4.5	3.5	4.0	.0	.0	.0	.5	.0	.0
9	7.0	5.0	6.0	4.0	2.0	3.5	---	.0	---	.5	.0	.5
10	7.5	4.5	6.0	2.0	1.0	1.5	---	---	---	.5	.5	.5
11	8.5	6.0	7.0	2.0	1.5	1.5	---	---	---	.5	.0	.5
12	9.0	6.5	8.0	3.0	2.0	2.5	---	---	---	.5	.5	.5
13	9.0	5.5	7.5	4.0	3.0	3.5	---	---	---	.5	.0	.0
14	5.5	4.0	5.0	4.5	4.0	4.5	---	---	---	.0	.0	.0
15	4.5	2.0	3.0	4.5	4.5	4.5	---	---	---	.0	.0	.0
16	3.5	2.0	3.0	5.0	4.5	4.5	---	---	---	.0	.0	.0
17	5.0	3.0	4.0	5.0	4.5	4.5	---	---	---	.0	.0	.0
18	6.5	4.5	5.5	5.0	4.0	4.5	---	---	---	.0	.0	.0
19	7.5	5.0	6.0	4.0	2.5	3.0	---	---	---	.0	.0	.0
20	7.5	5.5	6.5	2.5	1.5	2.0	---	---	---	.0	.0	.0
21	8.5	7.5	8.0	1.5	.0	1.0	---	---	---	.0	.0	.0
22	9.5	8.5	9.0	.5	.0	.5	---	---	---	.0	.0	.0
23	8.5	7.5	8.0	.5	.0	.0	---	---	---	.0	.0	.0
24	7.5	5.5	6.5	.0	.0	.0	---	---	---	.0	.0	.0
25	6.5	4.5	5.0	.0	.0	.0	---	---	---	.0	.0	.0
26	4.5	3.5	4.0	.0	.0	.0	---	---	---	.0	.0	.0
27	4.0	2.5	3.0	.0	.0	.0	---	---	---	.0	.0	.0
28	3.0	1.5	2.0	.0	.0	.0	---	---	---	.0	.0	.0
29	5.0	3.0	4.0	.0	.0	.0	---	---	---	.0	.0	.0
30	5.5	5.0	5.0	.0	.0	.0	---	---	---	.0	.0	.0
31	6.5	5.5	6.0	---	---	---	---	.0	---	.0	.0	.0
MONTH	12.0	1.5	6.3	6.5	.0	2.5	---	---	---	.5	.0	.1

SPOKANE RIVER BASIN

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12433542 BLUE CREEK ABOVE MIDNITE MINE DRAINAGE, NEAR WELLPINIT, WA--Continued

WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
FEBRUARY			MARCH			APRIL			MAY			
1	.0	.0	.0	.0	.0	.0	---	---	---	---	---	---
2	.0	.0	.0	.0	.0	.0	---	---	---	---	---	---
3	.0	.0	.0	.0	.0	.0	---	---	---	---	---	---
4	.0	.0	.0	.0	.0	.0	---	---	---	---	---	---
5	.0	.0	.0	.0	.0	.0	---	---	---	---	---	---
6	.0	.0	.0	.0	.0	.0	---	---	---	---	---	---
7	.0	.0	.0	.5	.0	.0	---	---	---	---	---	---
8	.0	.0	.0	.5	.0	.5	---	---	---	---	---	---
9	.0	.0	.0	.5	.5	.5	---	---	---	---	---	---
10	.0	.0	.0	.5	.5	.5	---	---	---	---	---	---
11	.0	.0	.0	.5	.5	.5	---	---	---	17.0	8.0	12.0
12	.0	.0	.0	.5	.5	.5	---	---	---	17.5	8.5	12.5
13	.0	.0	.0	.5	.5	.5	---	---	---	16.5	9.0	12.5
14	.0	.0	.0	1.0	.5	.5	---	---	---	16.5	9.0	12.5
15	.0	.0	.0	1.0	.5	1.0	---	---	---	16.0	8.0	12.0
16	.0	.0	.0	1.0	.5	1.0	10.0	---	---	16.5	8.5	12.0
17	.0	.0	.0	1.5	1.0	1.0	9.5	6.5	7.5	16.5	8.5	12.0
18	.0	.0	.0	1.5	1.0	1.0	11.0	7.0	8.5	17.0	8.5	12.5
19	.0	.0	.0	2.0	1.0	1.5	11.0	5.0	7.5	15.5	9.0	12.0
20	.0	.0	.0	2.0	1.5	1.5	11.0	5.0	7.5	16.0	10.0	12.5
21	.0	.0	.0	3.0	1.5	2.0	12.5	6.5	9.0	13.5	9.5	11.5
22	.0	.0	.0	2.5	1.0	2.0	10.0	5.5	7.5	13.0	8.0	10.5
23	.0	.0	.0	2.0	1.0	1.5	10.0	5.0	7.5	15.0	8.5	11.5
24	.0	.0	.0	4.0	2.0	3.0	10.0	7.0	8.0	16.0	8.0	11.5
25	.0	.0	.0	4.5	3.0	3.5	10.0	6.5	8.0	15.0	8.5	12.0
26	.0	.0	.0	5.0	3.0	3.5	10.5	6.0	8.0	14.5	10.5	12.0
27	.0	.0	.0	5.5	2.0	3.5	---	---	---	16.0	9.0	12.5
28	.0	.0	.0	5.0	1.5	3.5	---	---	---	13.5	10.0	12.0
29	---	---	---	5.5	2.0	3.5	---	---	---	15.5	10.0	12.0
30	---	---	---	5.5	2.5	4.0	---	---	---	13.0	9.0	11.0
31	---	---	---	7.5	3.5	5.0	---	---	---	12.5	10.0	11.5
MONTH	.0	.0	.0	7.5	.0	1.5	---	---	---	---	---	---
DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
JUNE			JULY			AUGUST			SEPTEMBER			
1	14.5	10.0	12.0	15.5	10.0	13.0	17.5	11.0	14.0	15.0	9.5	12.0
2	12.5	10.0	11.0	14.5	11.5	13.0	18.5	12.5	15.0	15.5	10.0	12.5
3	14.5	10.0	12.0	13.5	10.5	12.0	18.5	13.0	16.0	15.5	10.5	13.0
4	13.5	9.5	11.5	15.0	10.5	13.0	18.5	13.0	16.0	15.5	11.0	13.0
5	15.5	10.0	12.5	16.5	11.5	14.0	19.0	13.5	16.0	16.5	12.0	14.0
6	14.5	9.5	12.5	15.5	11.5	13.5	19.0	13.5	16.0	15.5	10.5	13.0
7	14.0	11.0	12.5	15.5	11.0	13.0	18.5	13.0	15.5	15.0	10.5	13.0
8	14.5	9.5	12.0	16.0	11.0	13.5	17.5	12.5	15.0	15.5	10.5	13.0
9	12.0	9.5	11.0	15.0	12.5	14.0	16.5	11.5	14.0	15.5	10.5	13.0
10	14.5	7.5	11.0	14.5	11.5	13.0	16.5	11.5	14.0	15.5	10.5	13.0
11	11.5	8.0	10.0	15.0	12.0	13.0	17.0	12.0	14.5	13.5	10.5	11.5
12	13.0	7.5	10.0	13.5	10.5	12.0	16.5	11.0	13.5	12.0	8.0	10.0
13	15.5	8.5	12.0	15.0	10.0	12.5	17.0	11.0	14.0	11.5	7.5	10.0
14	14.5	11.0	12.5	15.0	11.0	13.0	16.0	11.5	13.5	11.0	8.0	9.5
15	15.5	10.5	13.0	14.5	11.0	12.5	16.0	13.5	14.5	11.5	9.5	10.5
16	16.0	10.5	13.0	14.5	11.5	13.0	14.5	13.0	13.5	11.0	6.5	9.0
17	17.5	11.0	14.5	13.5	11.5	12.5	15.5	13.5	14.0	10.5	6.0	8.5
18	18.5	11.5	15.0	14.5	11.5	13.0	16.5	12.0	14.0	10.5	6.0	8.0
19	18.5	11.5	15.0	13.5	11.0	12.5	18.0	12.5	15.0	10.0	6.5	8.0
20	18.5	11.0	14.5	14.0	12.0	13.0	18.0	14.0	15.5	8.0	5.5	7.0
21	16.5	12.5	14.5	14.5	12.0	13.0	16.5	14.5	15.5	8.0	5.0	6.5
22	12.5	9.0	10.5	13.5	11.5	12.5	17.0	12.0	14.5	8.0	4.0	6.0
23	11.5	7.5	9.5	14.5	12.0	13.0	16.0	13.0	14.5	8.5	4.0	6.5
24	15.5	8.0	11.5	14.0	12.5	13.5	13.5	9.5	11.5	9.0	4.5	7.0
25	17.0	10.0	13.5	14.0	12.0	13.0	13.5	8.5	11.0	9.0	5.0	7.0
26	17.5	11.5	14.5	17.0	12.0	14.5	14.0	8.0	11.0	9.0	5.0	7.0
27	15.5	12.0	13.5	17.5	12.5	15.0	14.0	9.5	11.5	9.5	5.0	7.0
28	12.5	9.0	11.0	19.0	13.0	16.0	13.0	9.5	11.5	10.0	6.0	8.0
29	15.0	8.5	11.5	16.5	14.5	15.5	13.5	8.5	11.0	11.0	7.0	9.0
30	15.5	9.5	12.5	16.0	11.0	13.5	13.5	8.5	11.0	11.0	8.0	9.5
31	---	---	---	16.5	10.5	13.0	13.0	9.0	11.0	---	---	---
MONTH	18.5	7.5	12.3	19.0	10.0	13.3	19.0	8.0	13.8	16.5	4.0	9.8

SPOKANE RIVER BASIN

12433556 MIDNITE MINE DRAINAGE NEAR WELLPINIT, WA

LOCATION.--Lat 47°55'27", long 118°05'20", in NW 1/4 SE 1/4 sec.13, T.28 N., R.37 E., Stevens County, Hydrologic Unit 17010307, Spokane Indian Reservation, on right bank, 2.4 mi downstream from Turtle Lake, 0.1 mi upstream from confluence with Blue Creek, and 5.4 mi northwest of Wellpinit.

DRAINAGE AREA.--1.3 mi².

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--June 1984 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 2,070, from topographic map.

REMARKS.--Water-discharge records fair except for estimated daily discharges, which are poor. Three ponds upstream from gage exist for mine surface-water retention; June 1987, three diversions from the upstream channels were added to retain and treat contaminated water for mixing and later release. U.S. Geological Survey satellite telemeter at station.

AVERAGE DISCHARGE.--9 years, 0.17 ft³/s, 123 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 5.7 ft³/s June 21, 1984, Mar. 7, 1986; maximum gage height, 1.67 ft Mar. 7, 1986; no flow during part of water years 1986 to 1992.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 1.3 ft³/s Mar. 23, gage height, 1.36 ft; minimum discharge, 0.02 ft³/s Oct. 1.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.03	.54	e.08	e.07	e.09	e.09	.45	.28	.49	.51	.36	.73
2	.03	.54	e.07	e.07	e.09	e.09	.43	.28	.66	.53	.29	.60
3	.05	.51	e.07	e.07	e.09	e.09	.53	.44	.58	.56	.47	.42
4	.06	.36	e.06	e.07	e.09	e.09	.51	.84	.57	.53	.41	.54
5	.11	.50	e.06	e.05	e.09	e.10	.44	.78	.54	.31	.35	.67
6	.32	.59	e.05	e.05	e.09	e.11	.37	.85	.53	.21	.45	.61
7	.30	.65	e.06	e.05	e.09	.14	.35	.56	.55	.45	.45	.55
8	.32	.57	e.07	e.07	e.09	.14	.36	.77	.51	.49	.46	.27
9	.26	.55	e.07	e.07	e.09	.16	.33	.40	.35	.42	.24	.15
10	.08	.45	e.07	e.07	e.09	.16	.33	.26	.54	.47	.11	.26
11	.06	.51	e.07	e.07	e.09	.19	.31	.25	.55	.24	.09	.38
12	.08	.47	e.07	e.07	e.09	.19	.31	.24	.54	.53	.08	.62
13	.35	.52	e.07	e.07	e.09	.21	.27	.24	.54	.57	.07	.67
14	.31	.24	e.07	e.07	e.09	.22	.25	.23	.51	.56	.08	.62
15	.30	.43	e.07	e.08	e.09	.23	.25	.21	.52	.44	.58	.75
16	.54	.46	e.07	e.08	e.08	.26	.25	.21	.56	.53	.34	.71
17	.31	.46	e.07	e.08	e.08	.26	.27	.20	.54	.60	.66	.76
18	.12	.52	e.06	e.08	e.09	.29	.34	.18	.55	.47	.67	.77
19	.18	.51	e.05	e.08	e.09	.29	.28	.42	.46	.37	.57	.81
20	.53	.25	e.07	e.08	e.09	.32	.28	.34	.50	.41	.41	.66
21	.59	.58	e.07	e.09	e.09	.33	.28	.20	.53	.50	.72	.18
22	.52	.21	e.07	e.09	e.08	.55	.27	.56	.53	.54	.67	.14
23	.52	e.10	e.07	e.08	e.08	1.2	.25	.56	.51	.49	.36	.13
24	.49	e.05	e.08	e.08	e.08	1.0	.26	.38	.54	.54	.71	.19
25	.33	e.05	e.07	e.09	e.08	.79	.30	.37	.52	.55	.72	.64
26	.54	e.06	e.07	e.09	e.08	.63	.31	.53	.52	.53	.73	.68
27	.53	e.07	e.07	e.09	e.09	.52	.28	.54	.37	.39	.57	.70
28	.53	e.07	e.07	e.09	e.09	.49	.28	.58	.24	.43	.74	.75
29	.54	e.07	e.07	e.09	---	.48	.29	.58	.50	.48	.77	.76
30	.54	e.09	e.07	e.09	---	.43	.28	.59	.52	.52	.75	.74
31	.44	---	e.07	e.09	---	.43	---	.60	---	.52	.70	---
TOTAL	9.91	10.98	2.11	2.37	2.45	10.48	9.71	13.47	15.37	14.69	14.58	16.46
MEAN	.32	.37	.068	.076	.087	.34	.32	.43	.51	.47	.47	.55
MAX	.59	.65	.08	.09	.09	1.2	.53	.85	.66	.60	.77	.81
MIN	.03	.05	.05	.05	.08	.09	.25	.18	.24	.21	.07	.13
AC-FT	20	22	4.2	4.7	4.9	21	19	27	30	29	29	33

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1984 - 1993, BY WATER YEAR (WY)

	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993
MEAN	.12	.15	.11	.13	.20	.44	.27	.19	.16	.12
MAX	.32	.37	.22	.25	.60	1.41	.60	.43	.51	.47
(WY)	1993	1993	1985	1986	1986	1986	1985	1993	1993	1993
MIN	.051	.076	.068	.075	.087	.13	.098	.064	.046	.027
(WY)	1992	1991	1993	1989	1993	1992	1992	1992	1992	1989

SUMMARY STATISTICS

FOR 1992 CALENDAR YEAR

FOR 1993 WATER YEAR

WATER YEARS 1984 - 1993

ANNUAL TOTAL	44.27	122.58	
ANNUAL MEAN	.12	.34	.17
HIGHEST ANNUAL MEAN			.34
LOWEST ANNUAL MEAN			.076
HIGHEST DAILY MEAN	.65 Nov 7	1.2 Mar 23	3.3 Mar 7 1986
LOWEST DAILY MEAN	.00 Aug 2	.03 Oct 1	.00 Jun 22 1986
ANNUAL SEVEN-DAY MINIMUM	.00 Aug 11	.06 Jan 1	.00 Aug 8 1990
ANNUAL RUNOFF (AC-FT)	88	243	126
10 PERCENT EXCEEDS	.31	.62	.39
50 PERCENT EXCEEDS	.08	.31	.11
90 PERCENT EXCEEDS	.02	.07	.04

e Estimated

12433556 MIDNITE MINE DRAINAGE NEAR WELLPINIT. WA--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--1980, June 1984 to current year.

PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: June 1984 to current year.

pH: June 1984 to current year.

WATER TEMPERATURE: June 1984 to current year.

INSTRUMENTATION.--Water-quality monitor since June 1984. Electronic data logger, with satellite telemetry, set for 30-minute recording interval. Prior to April 29, 1993, digital recorder with 60-minute recording interval.

EXTREMES FOR PERIOD OF RECORD.--

SPECIFIC CONDUCTANCE: Maximum recorded (more than 20 percent of record missing), 3,480 microsiemens

SPECIFIC CONDUCTANCE: Maximum recorded (more than 20 per cent) Sept. 6, 1993; minimum, 1,070 microsiemens Dec. 18, 1991.

pH: Maximum recorded, 8.3 units Sept. 11, 14, 1985, May 1, 2, 1992, but may have been higher during periods of missing record; minimum recorded, 4.5 units several days in February 1986, but may have been lower during periods of missing record.

WATER TEMPERATURE: Maximum recorded, 20.0°C Aug. 14, 1992, but may have been higher during periods of missing record; minimum, 0.0°C many days during winter.

EXTREMES FOR CURRENT YEAR.--

SPECIFIC CONDUCTANCE: Maximum recorded (more than 20 percent of record missing), 3,480 microsiemens Sept. 6;

SPECIFIC CONDUCTANCE, Maximum recorded (more than 20 percent of record missing), 3,480
minimum recorded (more than 20 percent of record missing), 1,610 microsiemens, Apr.3.

pH: Maximum, 7.9 units Nov. 23; minimum, 7.0 units Oct. 1.

WATER TEMPERATURE: Maximum, 18.0°C Aug. 20; minimum, 0.0°C many days November to March.

SPECIFIC CONDUCTANCE, US/CM @ 25 DEGREES CENTIGRADE, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

[illegible]

SPOKANE RIVER BASIN

12433556 MIDNITE MINE DRAINAGE NEAR WELLPINIT, WA--Continued

SPECIFIC CONDUCTANCE, US/CM @ 25 DEGREES CENTIGRADE, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
FEBRUARY			MARCH			APRIL			MAY			
1	2310	2290	2300	2350	2320	2330	1820	1740	1790	---	---	---
2	2320	2250	2300	2330	2310	2320	1810	1750	1800	---	---	---
3	2330	2310	2320	2330	2300	2320	1750	1610	1700	---	---	---
4	2320	2250	2300	2310	2120	2220	1740	1660	1690	---	---	---
5	2340	2310	2330	2230	2170	2200	1790	1740	1760	2620	2230	2520
6	2340	2310	2330	2210	2080	2160	1810	1780	1790	2690	2610	2640
7	2340	2260	2320	2200	2110	2170	1840	1810	1820	2720	2170	2470
8	2340	2290	2320	2210	2150	2190	1840	1770	1820	2710	2630	2660
9	2310	2250	2290	2240	2160	2210	1870	1820	1840	2710	2210	2440
10	2280	2240	2260	2270	2190	2240	1880	1810	1850	2230	2090	2150
11	2270	2220	2250	2300	2250	2270	1890	1860	1870	2100	2040	2070
12	2280	2240	2270	2300	2260	2290	1900	1890	1890	2060	2020	2040
13	2280	2190	2250	2320	2250	2290	1910	1880	1900	2050	2020	2030
14	2310	2220	2280	2280	2240	2260	1920	1890	1900	2060	2020	2040
15	2450	2310	2380	2250	2090	2190	1930	1900	1910	2080	2030	2050
16	2530	2440	2480	2240	2150	2210	1930	1900	1920	2090	2040	2060
17	2600	2480	2550	2250	2210	2230	1920	1720	1880	2110	2050	2070
18	2540	2390	2490	2220	2100	2180	1830	1650	1760	2110	2060	2080
19	2390	2360	2380	2200	2130	2160	1850	1830	1840	2720	1890	2410
20	2360	2340	2350	2160	2050	2110	1850	1820	1840	2760	2280	2540
21	2370	2350	2350	2120	2020	2080	1840	1810	1830	2460	2230	2290
22	2370	2330	2350	2020	---	---	1840	1820	1830	2860	2080	2710
23	2350	2330	2340	---	---	---	1840	1820	1830	2920	2730	2860
24	2370	2350	2350	---	---	---	1830	1790	1800	2920	2500	2720
25	2390	2360	2370	---	---	---	1820	1670	1780	2920	2470	2710
26	2400	2360	2380	---	---	---	1810	1690	1770	2820	2550	2760
27	2380	2340	2360	1910	1840	1880	1820	1800	1810	2820	2610	2770
28	2360	2320	2340	1880	1840	1860	1830	1800	1820	2830	2780	2810
29	---	---	---	1880	1810	1850	---	---	---	2850	2800	2830
30	---	---	---	1850	1810	1840	---	---	---	2850	2820	2840
31	---	---	---	1850	1790	1820	---	---	---	2840	2780	2820
MONTH	2600	2190	2340	---	---	---	---	---	---	---	---	---

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
JUNE			JULY			AUGUST			SEPTEMBER			
1	2830	2680	2750	3150	3110	3130	3290	3090	3240	---	---	---
2	2840	2680	2770	3160	3120	3140	3250	2850	3080	---	---	---
3	2790	2690	2760	3170	2980	3110	3270	3240	3250	---	3220	---
4	2780	2740	2770	3140	3070	3110	3270	3190	3250	3470	3390	3450
5	2790	2740	2770	3160	2720	3010	3230	3060	3160	3470	3450	3460
6	2780	2730	2770	2990	2520	2710	3270	3230	3250	3480	3320	3430
7	2780	2750	2760	3120	2780	3030	3280	3240	3260	3450	3270	3410
8	2770	2710	2760	3140	3050	3110	3300	3250	3270	3390	3160	3270
9	2710	2370	2550	3070	3020	3050	3300	3010	3160	3170	2980	3090
10	2740	2640	2690	3090	3000	3050	3010	2890	2940	3130	2910	3030
11	2760	2720	2740	3040	2690	2850	2900	2840	2860	3110	3040	3090
12	2760	2740	2750	3110	2600	3000	2840	2790	2820	3220	3070	3160
13	2770	2740	2760	3160	3110	3140	2810	2740	2780	3230	3190	3210
14	2760	2700	2740	3200	3150	3170	2890	2560	2740	3220	3110	3180
15	2770	2720	2750	3210	2960	3170	3340	2890	3270	3210	3170	3190
16	2790	2750	2770	3240	3000	3190	3340	2720	3080	3220	3180	3200
17	2810	2760	2780	3150	2970	3090	3300	3200	3270	3210	3190	3200
18	2830	2790	2800	3200	2990	3150	3320	3290	3300	3220	3170	3190
19	2820	2660	2770	3190	2830	3090	3320	3160	3290	3210	3190	3200
20	2790	2760	2780	3180	2770	3000	3280	2940	3180	3210	3100	3180
21	2790	2760	2770	3180	2930	3120	3330	3280	3310	3100	2940	3000
22	2820	2780	2790	3180	3010	3120	3340	3320	3330	2940	2870	2900
23	2830	2760	2810	3150	3000	3110	3330	3000	3200	2880	2820	2850
24	2830	2800	2820	3140	2970	3090	3410	3310	3360	2860	2760	2830
25	2840	2810	2830	3120	3040	3090	3430	3390	3410	3050	2860	2970
26	2870	2830	2850	3150	3100	3130	3440	3410	3430	3090	3040	3070
27	2860	2740	2790	3150	2890	3070	3450	3260	3410	3260	3090	3170
28	3050	2580	2740	3150	3010	3120	3450	3380	3430	3280	3250	3270
29	3120	3050	3090	3190	3120	3150	3470	3440	3460	3300	3270	3290
30	3140	3040	3110	3280	3170	3220	---	---	---	3330	3290	3300
31	---	---	---	3290	3280	3280	---	---	---	---	---	---
MONTH	3140	2370	2790	3290	2520	3090	---	---	---	---	---	---

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PH, WATER, WHOLE, FIELD, STANDARD UNITS, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

PH, WATER, WHOLE, FIELD, STANDARD UNITS, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DAY	MAX	MIN	MEDIAN	MAX	MIN	MEDIAN	MAX	MIN	MEDIAN	MAX	MIN	MEDIAN
OCTOBER			NOVEMBER			DECEMBER			JANUARY			
1	7.2	7.0	7.1	7.5	7.4	7.4	7.8	7.6	7.8	7.7	7.7	7.7
2	7.4	7.2	7.3	7.4	7.3	7.4	7.8	7.7	7.8	7.7	7.7	7.7
3	7.4	7.3	7.4	7.4	7.3	7.4	7.7	7.5	7.6	7.7	7.7	7.7
4	7.5	7.4	7.5	7.4	7.3	7.4	7.5	7.4	7.5	7.7	7.6	7.6
5	7.7	7.5	7.5	7.6	7.4	7.4	7.4	7.3	7.4	7.7	7.6	7.7
6	7.5	7.3	7.4	7.6	7.3	7.4	7.3	7.2	7.3	7.7	7.6	7.6
7	7.6	7.4	7.4	7.7	7.6	7.7	7.5	7.3	7.4	7.6	7.5	7.6
8	7.4	7.3	7.4	7.8	7.7	7.7	7.6	7.5	7.5	7.6	7.5	7.6
9	7.6	7.3	7.4	7.8	7.7	7.7	7.7	7.6	7.6	7.6	7.6	7.6
10	7.7	7.4	7.4	7.9	7.7	7.7	7.7	7.6	7.7	7.6	7.6	7.6
11	7.5	7.4	7.4	7.8	7.7	7.7	7.7	7.7	7.7	7.6	7.6	7.6
12	7.7	7.4	7.5	7.8	7.7	7.7	7.7	7.7	7.7	7.6	7.6	7.6
13	7.6	7.4	7.5	7.8	7.6	7.7	7.7	7.7	7.7	7.6	7.5	7.5
14	7.6	7.4	7.5	7.9	7.6	7.7	7.7	7.7	7.7	7.6	7.5	7.5
15	7.8	7.4	7.5	7.8	7.7	7.7	7.7	7.7	7.7	---	---	---
16	7.5	7.4	7.5	7.8	7.6	7.7	7.7	7.7	7.7	---	---	---
17	7.5	7.4	7.5	7.7	7.6	7.7	7.7	7.7	7.7	---	---	---
18	7.5	7.5	7.5	7.7	7.6	7.7	7.7	7.7	7.7	---	---	---
19	7.7	7.5	7.5	7.7	7.6	7.7	7.7	7.7	7.7	---	---	---
20	7.5	7.4	7.4	7.9	7.7	7.8	7.7	7.7	7.7	---	---	---
21	7.5	7.4	7.4	7.7	7.6	7.7	7.7	7.6	7.7	---	---	---
22	7.5	7.4	7.4	7.8	7.6	7.7	7.7	7.7	7.7	---	---	---
23	7.4	7.3	7.4	7.9	7.8	7.8	7.7	7.6	7.7	---	---	---
24	7.4	7.2	7.4	7.8	7.8	7.8	7.7	7.7	7.7	---	---	---
25	7.5	7.2	7.3	7.9	7.8	7.8	7.7	7.7	7.7	---	---	---
26	7.5	7.4	7.4	7.9	7.8	7.8	7.7	7.7	7.7	---	---	---
27	7.5	7.4	7.5	7.9	7.9	7.9	7.7	7.6	7.7	---	---	---
28	7.5	7.4	7.5	7.9	7.7	7.8	7.7	7.7	7.7	---	---	---
29	7.5	7.4	7.5	7.9	7.5	7.9	7.7	7.6	7.7	---	---	---
30	7.5	7.4	7.5	7.9	7.8	7.9	7.7	7.7	7.7	---	---	---
31	7.5	7.3	7.5	---	---	---	7.7	7.7	7.7	---	---	---
MAX	7.8	7.5	7.5	7.9	7.9	7.9	7.8	7.7	7.8	---	---	---
MIN	7.2	7.0	7.1	7.4	7.3	7.4	7.3	7.2	7.3	---	---	---
DAY	MAX	MIN	MEDIAN	MAX	MIN	MEDIAN	MAX	MIN	MEDIAN	MAX	MIN	MEDIAN
FEBRUARY			MARCH			APRIL			MAY			
1	---	---	---	7.6	7.4	7.5	7.5	7.4	7.5	---	---	---
2	---	---	---	---	---	---	7.5	7.5	7.5	---	---	---
3	---	---	---	---	---	---	7.5	7.5	7.5	---	---	---
4	---	---	---	---	---	---	7.6	7.5	7.5	7.5	7.4	7.5
5	7.6	7.5	7.6	---	---	---	7.6	7.4	7.5	7.6	7.4	7.5
6	7.6	7.5	7.6	7.6	7.5	7.5	7.5	7.5	7.5	7.5	7.4	7.4
7	7.6	7.4	7.5	7.6	7.5	7.5	7.5	7.5	7.5	7.6	7.4	7.5
8	7.6	7.4	7.5	7.6	7.5	7.6	7.5	7.5	7.5	7.5	7.4	7.5
9	7.5	7.5	7.5	7.6	7.5	7.6	7.5	7.5	7.5	7.5	7.4	7.4
10	7.5	7.5	7.5	7.6	7.5	7.6	7.5	7.5	7.5	7.5	7.4	7.4
11	7.6	7.5	7.5	7.6	7.5	7.6	7.5	7.5	7.5	7.5	7.4	7.4
12	7.6	7.5	7.5	7.6	7.5	7.6	7.5	7.5	7.5	7.5	7.4	7.4
13	7.6	7.5	7.5	7.6	7.5	7.6	7.5	7.5	7.5	7.5	7.4	7.4
14	7.6	7.5	7.6	7.6	7.5	7.6	7.5	7.5	7.5	7.5	7.4	7.4
15	7.6	7.5	7.5	7.6	7.5	7.6	7.5	7.4	7.5	7.5	7.4	7.5
16	7.5	7.3	7.4	7.6	7.4	7.5	7.5	7.4	7.5	7.5	7.4	7.5
17	7.4	7.2	7.4	7.5	7.5	7.5	7.5	7.4	7.5	7.5	7.4	7.5
18	7.4	7.2	7.3	7.6	7.5	7.5	7.5	7.4	7.5	7.5	7.4	7.5
19	7.4	7.3	7.4	7.6	7.5	7.6	7.5	7.4	7.5	7.7	7.3	7.4
20	7.5	7.4	7.4	7.6	7.5	7.6	7.5	7.4	7.5	7.5	7.3	7.3
21	7.5	7.5	7.5	7.6	7.5	7.5	7.5	7.4	7.4	7.5	7.3	7.4
22	7.6	7.5	7.6	7.5	7.5	7.5	7.5	7.4	7.5	7.7	7.3	7.4
23	7.6	7.6	7.6	7.5	7.4	7.4	7.5	7.4	7.5	7.4	7.3	7.3
24	7.6	7.6	7.6	7.4	7.4	7.4	7.5	7.4	7.5	7.5	7.3	7.4
25	7.6	7.6	7.6	7.4	7.4	7.4	7.5	7.4	7.5	7.6	7.3	7.4
26	7.6	7.5	7.6	7.5	7.4	7.4	7.5	7.4	7.5	7.6	7.4	7.5
27	7.6	7.5	7.5	7.5	7.4	7.5	7.5	7.4	7.5	7.6	7.4	7.4
28	7.6	7.4	7.5	7.5	7.4	7.5	7.5	7.4	7.5	7.5	7.4	7.4
29	---	---	---	7.5	7.4	7.5	---	---	---	7.5	7.4	7.4
30	---	---	---	7.5	7.5	7.5	---	---	---	7.5	7.4	7.4
31	---	---	---	7.5	7.4	7.5	---	---	---	7.4	7.4	7.4
MAX	---	---	---	---	---	---	---	---	---	---	---	---
MIN	---	---	---	---	---	---	---	---	---	---	---	---

SPOKANE RIVER BASIN

12433556 MIDNITE MINE DRAINAGE NEAR WELLPINIT, WA--Continued

PH, WATER, WHOLE, FIELD, STANDARD UNITS, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DAY	MAX	MIN	MEDIAN	MAX	MIN	MEDIAN	MAX	MIN	MEDIAN	MAX	MIN	MEDIAN
	JUNE			JULY			AUGUST			SEPTEMBER		
1	7.5	7.4	7.5	7.4	7.4	7.4	7.4	7.3	7.3	7.4	7.3	7.4
2	7.5	7.4	7.4	7.4	7.4	7.4	7.6	7.3	7.4	7.4	7.3	7.4
3	7.5	7.4	7.4	7.4	7.4	7.4	7.3	7.3	7.3	7.6	7.4	7.4
4	7.5	7.4	7.5	7.4	7.4	7.4	7.3	7.3	7.3	7.5	7.4	7.4
5	7.5	7.4	7.5	7.5	7.4	7.4	7.4	7.3	7.3	7.4	7.4	7.4
6	7.5	7.4	7.4	7.7	7.5	7.5	7.3	7.3	7.3	7.5	7.4	7.4
7	7.5	7.4	7.4	7.6	7.4	7.4	7.3	7.3	7.3	7.5	7.3	7.4
8	7.5	7.4	7.4	7.4	7.4	7.4	7.3	7.3	7.3	7.6	7.4	7.4
9	7.7	7.4	7.5	7.4	7.4	7.4	7.4	7.3	7.4	7.7	7.5	7.5
10	7.5	7.4	7.5	7.4	7.4	7.4	7.5	7.4	7.5	7.7	7.4	7.5
11	7.5	7.5	7.5	7.5	7.4	7.4	7.5	7.5	7.5	7.5	7.4	7.5
12	7.5	7.4	7.5	7.7	7.4	7.4	7.6	7.4	7.5	7.5	7.4	7.4
13	7.5	7.4	7.4	7.4	7.4	7.4	7.6	7.4	7.5	7.4	7.4	7.4
14	7.5	7.4	7.4	7.4	7.4	7.4	7.7	7.4	7.5	7.5	7.4	7.4
15	7.5	7.4	7.4	7.6	7.3	7.4	7.6	7.3	7.3	7.4	7.4	7.4
16	7.4	7.4	7.4	7.5	7.4	7.4	7.6	7.3	7.3	7.4	7.4	7.4
17	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.2	7.3	7.4	7.4	7.4
18	7.4	7.4	7.4	7.5	7.3	7.4	7.3	7.3	7.3	7.4	7.4	7.4
19	7.6	7.4	7.4	7.6	7.3	7.4	7.4	7.2	7.3	7.4	7.4	7.4
20	7.4	7.4	7.4	7.6	7.4	7.4	7.5	7.3	7.3	7.4	7.4	7.4
21	7.4	7.4	7.4	7.5	7.3	7.4	7.3	7.3	7.3	7.6	7.4	7.5
22	7.4	7.4	7.4	7.4	7.3	7.4	7.3	7.3	7.3	7.6	7.6	7.6
23	7.5	7.4	7.4	7.5	7.3	7.4	7.6	7.3	7.4	7.7	7.6	7.6
24	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.8	7.5	7.6
25	7.4	7.4	7.4	7.4	7.3	7.4	7.4	7.3	7.4	7.5	7.4	7.4
26	7.4	7.3	7.4	7.4	7.3	7.4	7.4	7.3	7.4	7.4	7.4	7.4
27	7.5	7.4	7.4	7.5	7.3	7.4	7.5	7.3	7.4	7.4	7.4	7.4
28	7.8	7.4	7.5	7.4	7.3	7.4	7.4	7.3	7.4	7.4	7.4	7.4
29	7.5	7.4	7.5	7.4	7.4	7.4	7.4	7.3	7.4	7.4	7.3	7.4
30	7.5	7.4	7.4	7.4	7.3	7.4	7.4	7.3	7.4	7.4	7.4	7.4
31	---	---	---	7.3	7.3	7.3	7.4	7.3	7.4	---	---	---
MAX	7.8	7.5	7.5	7.7	7.5	7.5	7.7	7.5	7.5	7.8	7.6	7.6
MIN	7.4	7.3	7.4	7.3	7.3	7.3	7.3	7.2	7.3	7.4	7.3	7.4

WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	OCTOBER			NOVEMBER			DECEMBER			JANUARY		
1	13.0	9.5	11.5	8.5	8.0	8.5	.0	.0	.0	.5	.0	.5
2	13.5	10.5	12.0	8.0	7.0	8.0	.0	.0	.0	.0	.0	.0
3	12.0	10.0	11.0	7.5	6.5	7.0	.0	.0	.0	.0	.0	.0
4	12.0	4.5	10.5	6.5	6.0	6.5	.0	.0	.0	.5	.0	.5
5	10.0	5.5	8.0	6.5	5.5	6.0	.0	.0	.0	.5	.0	.0
6	10.0	7.0	8.5	7.0	6.0	6.5	.0	.0	.0	.0	.0	.0
7	9.0	5.5	7.5	7.5	6.5	7.0	.0	.0	.0	.0	.0	.0
8	10.5	8.0	9.0	7.0	6.0	6.5	.0	.0	.0	.0	.0	.0
9	9.5	6.5	8.0	6.5	4.5	5.5	.5	.0	.0	.0	.0	.0
10	9.5	6.0	8.0	5.0	3.0	4.5	.5	.0	.5	.0	.0	.0
11	10.0	7.5	8.5	5.0	4.5	5.0	1.0	.5	1.0	.0	.0	.0
12	10.5	7.5	9.0	6.0	5.0	5.5	1.0	1.0	1.0	.0	.0	.0
13	10.0	6.5	9.0	6.5	5.5	6.0	1.0	1.0	1.0	.0	.0	.0
14	8.0	5.5	7.0	6.5	6.0	6.5	1.5	1.0	1.0	.5	.0	.0
15	6.0	2.5	5.0	6.5	6.0	6.5	1.0	.5	.5	.5	.5	.5
16	7.0	5.0	6.0	6.5	6.0	6.5	.5	.0	.5	.5	.0	.5
17	8.0	5.5	6.5	6.5	6.0	6.5	1.0	.5	.5	.5	.5	.5
18	8.5	6.0	7.0	6.5	5.5	6.5	.5	.0	.0	.5	.0	.0
19	9.5	6.0	8.0	5.5	4.5	5.0	.0	.0	.0	.5	.0	.0
20	10.5	7.0	9.0	4.5	3.5	4.0	.5	.0	.0	.5	.0	.0
21	11.0	10.0	10.5	4.5	2.0	3.5	.5	.5	.5	1.0	.0	1.0
22	11.0	10.0	10.5	3.5	3.0	3.0	.5	.0	.5	1.0	.5	1.0
23	10.5	9.5	10.0	3.0	.5	1.5	1.0	.5	1.0	.5	.0	1.5
24	10.0	8.5	9.5	1.0	.0	.5	1.0	.5	1.0	1.0	.5	1.0
25	9.5	7.5	8.5	.0	.0	.0	1.0	.5	.5	1.0	1.0	1.0
26	9.0	7.0	8.0	.0	.0	.0	1.0	1.0	1.0	1.5	1.0	1.0
27	8.0	6.5	7.5	.5	.0	.5	1.0	.5	1.0	1.5	1.0	1.5
28	7.5	6.0	7.0	1.0	.5	1.0	1.0	.5	.5	1.5	1.5	1.5
29	8.5	7.5	8.0	1.0	.5	1.0	.5	.5	.5	1.5	1.0	1.5
30	8.5	8.0	8.5	1.5	.0	1.0	.5	.5	.5	1.5	1.5	1.5
31	8.5	8.0	8.5	---	---	---	.5	.0	.5	1.5	.5	1.0
MONTH	13.5	2.5	8.6	8.5	.0	4.5	1.5	.0	.4	1.5	.0	.5

12433556 MIDNITE MINE DRAINAGE NEAR WELLPINIT, WA--Continued

WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
FEBRUARY			MARCH			APRIL			MAY			
1	1.5	1.0	1.5	.5	.0	.0	5.0	4.0	4.5	---	---	---
2	1.5	.5	1.5	.5	.5	.5	5.0	3.5	4.5	---	---	---
3	1.0	.0	.5	.5	.5	.5	5.5	4.5	5.0	---	---	---
4	1.5	1.0	1.0	.5	.5	.5	5.5	4.0	5.0	10.5	7.5	8.5
5	1.5	.5	1.0	1.0	.5	1.0	6.5	3.5	4.5	12.0	8.0	9.5
6	1.5	1.0	1.5	1.0	1.0	1.0	6.0	3.0	4.5	10.5	8.5	9.5
7	1.5	.5	1.0	1.5	1.0	1.0	6.5	4.5	5.5	9.5	6.0	8.0
8	1.5	1.0	1.0	1.5	1.0	1.5	6.0	4.5	5.5	11.5	6.5	9.0
9	1.5	1.5	1.5	1.5	1.0	1.5	6.5	4.5	5.5	11.0	6.5	9.0
10	1.5	1.5	1.5	2.0	.5	1.0	5.5	4.0	5.0	13.5	7.5	10.0
11	2.0	1.5	1.5	1.5	.0	1.0	6.0	4.5	5.0	14.5	8.5	11.0
12	2.0	1.5	1.5	2.0	.0	1.0	6.0	4.0	5.0	15.5	9.5	12.0
13	2.0	1.5	2.0	2.0	.0	1.0	6.5	3.5	5.0	14.5	10.0	12.0
14	2.0	.5	1.5	2.0	1.5	1.5	6.5	4.5	5.5	14.5	10.0	11.5
15	.5	.0	.0	2.5	1.5	2.0	6.5	4.0	5.0	14.0	9.0	11.0
16	.0	.0	.0	2.5	.5	1.5	7.5	4.0	5.5	14.5	9.5	11.5
17	.0	.0	.0	2.5	1.5	2.0	8.0	5.5	6.5	14.5	9.0	11.5
18	.0	.0	.0	2.5	2.0	2.0	9.0	6.0	7.5	15.0	9.5	12.0
19	.0	.0	.0	3.5	1.5	2.0	9.0	4.0	6.5	14.5	10.0	12.5
20	.0	.0	.0	3.0	2.0	2.5	9.0	4.0	6.0	14.5	11.5	13.0
21	.5	.0	.0	3.5	2.0	2.5	10.0	6.0	7.5	12.5	10.0	11.5
22	.5	.5	.5	3.0	1.0	2.5	8.5	5.0	7.0	13.0	9.5	11.5
23	.5	.5	.5	3.5	2.5	3.0	8.0	4.5	6.5	13.5	10.0	12.0
24	.5	.0	.0	4.0	2.5	3.0	8.5	6.0	7.0	14.0	9.5	11.5
25	.0	.0	.0	4.0	2.5	3.5	8.5	6.0	7.0	14.5	9.5	12.0
26	.0	.0	.0	5.0	2.0	3.5	8.5	5.0	7.0	14.5	12.0	13.0
27	.0	.0	.0	5.0	3.0	4.0	8.0	4.5	6.5	15.0	11.5	13.5
28	.5	.0	.0	5.0	3.0	3.5	7.5	4.5	6.0	14.5	12.0	13.5
29	---	---	---	5.0	3.0	4.0	---	---	---	14.5	12.0	13.0
30	---	---	---	5.0	3.0	4.0	---	---	---	14.0	11.0	12.5
31	---	---	---	6.0	3.0	4.5	---	---	---	14.0	12.5	13.5
MONTH	2.0	.0	.7	6.0	.0	2.0	---	---	---	---	---	---

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
JUNE			JULY			AUGUST			SEPTEMBER			
1	13.5	12.0	13.0	14.0	11.0	13.0	15.5	12.5	14.0	16.0	13.0	14.5
2	13.0	12.0	12.5	14.0	12.5	13.0	16.0	12.5	14.5	16.5	13.5	15.0
3	14.0	12.0	13.0	14.0	11.5	13.0	17.0	14.5	15.5	16.5	12.5	14.5
4	14.0	11.5	12.5	14.0	12.0	13.0	17.5	14.0	15.5	16.5	13.5	15.0
5	14.5	12.0	13.0	14.0	12.5	13.5	17.5	14.0	15.5	17.0	15.0	16.0
6	14.5	12.0	13.5	13.0	11.0	12.5	17.5	14.5	16.0	16.5	14.0	15.5
7	14.5	13.0	13.5	14.0	11.5	13.0	17.0	14.0	15.5	17.0	13.5	15.0
8	14.0	11.5	13.0	15.0	12.0	13.5	16.5	14.0	15.0	16.0	13.5	14.5
9	12.5	11.0	11.5	14.5	13.0	14.0	15.5	13.0	14.0	15.5	12.0	14.0
10	13.0	10.0	11.5	14.5	12.5	13.5	15.0	12.0	13.5	16.0	12.5	14.5
11	12.0	10.0	11.0	13.5	11.5	13.0	15.0	12.0	13.5	14.5	12.5	14.0
12	12.5	9.5	11.5	13.0	11.0	12.0	14.5	10.5	12.5	14.5	11.0	13.0
13	13.5	10.5	12.0	14.0	11.5	13.0	14.5	11.0	13.0	14.0	11.0	13.0
14	14.0	12.5	13.5	14.5	12.0	13.0	14.0	11.0	13.0	13.5	11.5	12.5
15	14.5	12.0	13.5	14.0	12.0	13.0	16.0	13.5	15.0	13.5	12.0	13.0
16	15.0	12.0	13.5	14.0	12.5	13.5	15.0	14.0	14.0	13.5	11.0	12.0
17	15.5	13.0	14.0	13.5	12.5	13.0	16.0	14.5	15.5	14.0	10.5	12.0
18	16.5	13.0	15.0	14.0	12.5	13.5	17.0	14.0	15.5	14.0	10.5	12.0
19	16.0	13.0	14.5	14.0	11.5	13.0	17.5	14.5	16.0	13.5	11.0	12.0
20	16.0	12.5	14.5	13.5	12.5	13.5	18.0	15.0	16.5	11.5	9.5	10.5
21	15.5	13.5	15.0	14.0	12.5	13.5	17.0	15.5	16.5	10.5	8.0	9.0
22	13.5	11.0	12.0	13.5	12.5	13.0	17.0	14.0	15.5	10.0	6.5	8.5
23	12.5	10.0	11.5	14.5	13.0	13.5	16.0	14.0	15.0	10.5	7.0	8.5
24	14.0	11.0	12.5	14.5	13.5	13.5	15.0	12.0	13.5	11.0	7.0	9.0
25	15.0	11.5	13.5	14.5	13.0	13.5	15.0	11.5	13.0	12.5	9.0	10.5
26	16.0	13.0	14.5	15.5	13.5	14.5	15.0	11.5	13.5	13.0	9.5	11.0
27	15.0	12.0	13.5	15.0	13.5	14.5	15.0	12.5	13.5	13.5	10.0	11.5
28	12.5	10.0	11.0	16.5	13.5	15.0	14.5	12.5	13.5	14.0	10.5	12.5
29	13.5	10.0	12.0	15.5	14.0	15.0	15.0	11.5	13.5	14.5	11.5	13.0
30	14.0	11.0	12.5	14.5	12.0	13.5	15.5	12.0	13.5	14.5	12.0	13.0
31	---	---	---	15.0	12.0	13.5	15.0	12.0	14.0	---	---	---
MONTH	16.5	9.5	12.9	16.5	11.0	13.4	18.0	10.5	14.5	17.0	6.5	12.6

SPOKANE RIVER BASIN

12433558 BLUE CREEK BELOW MIDNITE MINE DRAINAGE, NEAR WELLPINIT, WA

LOCATION.--Lat 47°55'24", long 118°05'20", in NW 1/4 SE 1/4 sec. 13, T.28 N., R.37 E., Stevens County, Hydrologic Unit 17010307, Spokane Indian Reservation, 100 ft downstream from mouth of unnamed tributary, and 2.4 mi southwest of Turtle Lake.

DRAINAGE AREA.--7.3 mi².

PERIOD OF RECORD.--1980, June 1984 to current year.

PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: June 1984 to current year.

pH: June 1984 to current year.

WATER TEMPERATURE: July 1984 to current year.

INSTRUMENTATION.--Water-quality monitor since June 1984. Electronic data logger, with satellite telemetry, set for 30-minute recording interval. Prior to April 28, 1993, digital recorder with 60-minute recording interval.

EXTREMES FOR PERIOD OF RECORD.--

SPECIFIC CONDUCTANCE: Maximum recorded, 3,030 microsiemens Sept. 20, 1993, but may have been higher during periods of missing record; minimum, 93 microsiemens Apr. 5, 1993.

pH: Maximum recorded, 8.4 units Apr. 11-13, 1988, several days during April and May, 1992, but may have been higher during period of missing record; minimum recorded, 5.2 units Feb. 27, 1986, but may have been lower during period of missing record Feb. 28 to Mar. 26, 1986.

WATER TEMPERATURE: Maximum recorded, 21.5°C July 9, 10, 1985, but may have been higher during periods of missing record; minimum, 0.0°C on many days during winters.

EXTREMES FOR CURRENT YEAR.--

SPECIFIC CONDUCTANCE: Maximum, 3,030 microsiemens Sept. 20; minimum, 93 microsiemens Apr. 5.

pH: No extremes due to more than 20 percent of missing record.

WATER TEMPERATURE: Maximum, 18.0°C July 28, Aug. 5, 6; minimum, 0.0°C during many days from December to March.

SPECIFIC CONDUCTANCE, US/CM @ 25 DEGREES CENTIGRADE, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	OCTOBER			NOVEMBER			DECEMBER			JANUARY		
1	789	589	687	2640	2350	2550	1310	1190	1250	1120	1100	1110
2	790	580	685	2660	2520	2620	1320	1180	1250	1120	1110	1110
3	810	630	753	2700	2480	2630	1360	1240	1300	1150	1110	1120
4	820	710	776	2700	1530	2180	1330	1230	1280	1180	1060	1110
5	1940	740	1010	2570	1520	2290	1370	1170	1270	1130	1090	1100
6	2350	1480	2100	2630	2430	2550	1360	1140	1240	1180	1110	1140
7	2420	1420	2030	2500	1870	2240	1420	1310	1370	1180	1120	1150
8	2490	1840	2210	2570	2350	2480	1310	1180	1240	1160	1100	1130
9	2460	1550	2090	2660	2410	2550	1190	1150	1170	1120	1100	1110
10	1550	1100	1280	2650	1980	2450	1240	1140	1170	1150	1110	1130
11	1110	950	1050	2580	2050	2430	1160	1130	1160	1120	1100	1110
12	1950	900	1060	2540	1890	2360	1160	1130	1150	1130	1110	1120
13	2490	1940	2190	2560	2210	2460	1150	1130	1140	1150	1100	1130
14	2530	1580	2210	2420	1630	1920	1140	1110	1130	1110	1080	1100
15	2600	1410	1980	2510	2020	2360	1150	1120	1140	1100	1080	1090
16	2670	2500	2590	2540	2060	2440	1170	1140	1160	1120	1090	1100
17	2620	1530	2140	2570	2250	2450	1160	1130	1140	1110	1090	1100
18	1530	1230	1350	2610	2300	2510	1170	1140	1150	1120	1080	1100
19	2400	1150	1440	2630	1850	2410	1170	1120	1150	1110	1090	1110
20	2640	2160	2520	2460	1590	1810	1230	1090	1120	1160	932	1040
21	2620	2060	2440	2550	1940	2410	1150	1110	1130	1020	922	966
22	2640	2100	2470	1940	1430	1600	1160	1110	1130	1070	1020	1050
23	2660	2470	2600	1750	1430	1510	1140	1120	1120	1110	1060	1070
24	2700	2320	2600	1590	1410	1500	1140	1100	1120	1090	1020	1070
25	2630	1770	2290	1640	1340	1520	1140	1110	1120	1020	976	1000
26	2700	2520	2640	1600	1440	1520	1130	1100	1110	1030	974	1010
27	2750	2580	2680	1440	1250	1330	1120	1090	1100	1050	993	1030
28	2800	2520	2680	1270	1230	1240	1120	1080	1100	1060	1030	1050
29	2740	2530	2660	1250	1210	1240	1120	1090	1100	1120	1030	1050
30	2660	2370	2580	1230	1200	1220	1110	1090	1100	1070	1040	1060
31	2630	1960	2420	---	---	---	1130	1100	1110	1080	1050	1060
MONTH	2800	580	1940	2700	1200	2090	1420	1080	1170	1180	922	1080

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SPECIFIC CONDUCTANCE, US/CM @ 25 DEGREES CENTIGRADE, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
FEBRUARY				MARCH			APRIL			MAY		
1	1070	1060	1060	1050	1040	1050	262	242	249	234	224	230
2	1070	1050	1060	1050	1030	1040	252	232	242	235	225	231
3	1090	1050	1070	1070	1020	1040	252	193	222	479	233	288
4	1080	1050	1070	1110	942	1010	203	153	194	556	406	499
5	1080	1060	1070	1000	972	988	153	93	123	607	332	530
6	1080	1040	1070	1000	912	973	193	153	174	620	578	597
7	1090	1040	1070	992	922	961	194	174	186	635	313	453
8	1090	1060	1070	1000	952	980	194	174	182	638	589	614
9	1080	1020	1050	1040	962	1000	174	154	171	634	317	421
10	1070	1020	1030	1050	992	1030	195	165	178	321	288	299
11	1070	1020	1040	1060	1010	1030	185	165	180	292	272	282
12	1070	1030	1050	1040	1010	1020	195	185	188	286	266	278
13	1070	1010	1050	1040	981	1010	195	176	186	290	271	282
14	1050	1020	1040	1010	981	997	206	136	169	298	279	288
15	1090	1020	1060	1010	881	962	206	196	201	305	290	297
16	1150	1040	1100	1040	931	1000	216	186	207	315	296	304
17	1230	1020	1140	1030	991	1010	247	197	213	326	306	315
18	1160	1070	1110	1010	891	963	247	197	210	336	319	329
19	1070	1040	1060	1020	911	974	217	207	213	737	334	545
20	1060	1040	1050	1010	961	982	218	207	214	766	418	557
21	1050	1030	1040	1050	950	1010	218	198	212	451	392	413
22	1050	1030	1050	960	830	925	218	198	209	874	406	750
23	1100	1030	1050	830	650	725	228	198	213	915	706	857
24	1070	1030	1040	670	570	635	229	209	218	922	539	712
25	1070	1040	1050	580	480	541	239	199	214	955	534	745
26	1080	1050	1060	520	450	491	230	199	212	1010	549	897
27	1070	1040	1060	480	400	449	230	220	225	1070	586	943
28	1080	1040	1050	431	341	391	230	218	225	1070	930	1030
29	---	---	---	341	291	316	230	224	227	1110	989	1050
30	---	---	---	291	261	276	231	221	226	1130	1020	1090
31	---	---	---	281	252	268	---	---	---	1180	989	1110
MONTH	1230	1010	1060	1110	252	840	262	93	203	1180	224	556
DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
JUNE				JULY			AUGUST			SEPTEMBER		
1	1200	773	992	1870	1740	1800	2330	1430	1960	2940	2860	2900
2	1250	1030	1170	1880	1770	1820	2270	1230	1720	2940	2210	2780
3	1210	867	1150	1870	1600	1790	2300	2170	2240	2890	1770	2380
4	1220	1130	1190	1860	1630	1790	2320	1720	2190	2890	2300	2730
5	1270	1130	1220	1870	926	1370	2300	1560	2000	2940	2790	2880
6	1300	992	1240	1760	787	1050	2360	2200	2280	2970	2120	2800
7	1340	1220	1270	1960	985	1680	2380	2230	2310	2960	2020	2720
8	1340	922	1260	2010	1490	1870	2400	2270	2340	2860	1690	2140
9	1350	637	954	1870	1570	1740	2450	1330	1780	2580	1390	1640
10	1430	1240	1350	1920	1680	1810	1380	1080	1240	2730	1500	2120
11	1440	1320	1380	1800	896	1170	1210	948	1090	2570	2240	2510
12	1440	1350	1390	2020	917	1830	1110	835	993	2970	2120	2820
13	1480	1350	1420	2110	1950	2030	1050	750	926	2980	2760	2930
14	1510	1090	1400	2120	2010	2060	1590	730	910	2980	2290	2840
15	1510	1160	1430	2110	1280	1910	2600	1590	2440	2960	2860	2900
16	1550	1430	1500	2160	1840	2090	2600	1130	1840	2990	2780	2930
17	1590	1450	1520	2060	1770	1960	2560	2320	2510	3000	2960	2980
18	1660	1440	1540	2120	1360	1940	2620	2490	2590	3010	2940	2990
19	1650	872	1440	2090	1200	1750	2660	1900	2490	3020	2980	3000
20	1620	1430	1550	2100	1140	1640	2670	1530	2170	3030	2110	2820
21	1620	1510	1550	2080	1710	1980	2710	2670	2700	2110	1700	1860
22	1660	1510	1580	2110	1830	2010	2740	2650	2700	1700	1510	1620
23	1680	1160	1590	2040	1610	1960	2780	1540	2150	1590	1420	1500
24	1730	1620	1660	2090	1920	2020	2850	2770	2800	2570	1340	1610
25	1750	1550	1670	2060	1970	2030	2850	2690	2810	2890	2570	2800
26	1760	1580	1700	2120	2030	2070	2860	2790	2830	2930	2820	2890
27	1720	1180	1470	2140	1360	1850	2860	1900	2610	2960	2890	2920
28	1680	788	1070	2160	1540	2010	2870	2660	2830	2980	2940	2960
29	1820	1650	1730	2260	2130	2160	2900	2850	2870	3000	2930	2970
30	1850	1530	1770	2330	2100	2250	2910	2840	2880	3010	2690	2880
31	---	---	---	2340	2220	2290	2910	2720	2860	---	---	---
MONTH	1850	637	1410	2340	787	1860	2910	730	2200	3030	1340	2590
YEAR	3030	93	1420									

SPOKANE RIVER BASIN

12433558 BLUE CREEK BELOW MIDNITE MINE DRAINAGE, NEAR WELLPINIT, WA--Continued

PH, WATER, WHOLE, FIELD, STANDARD UNITS, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DAY	MAX	MIN	MEDIAN	MAX	MIN	MEDIAN	MAX	MIN	MEDIAN	MAX	MIN	MEDIAN
OCTOBER				NOVEMBER			DECEMBER			JANUARY		
1	---	---	---	7.7	7.5	7.6	7.8	7.6	7.7	---	---	---
2	7.6	---	---	7.6	7.5	7.6	7.8	7.7	7.7	---	---	---
3	7.6	7.5	7.6	7.5	7.3	7.5	7.7	7.7	7.7	---	---	---
4	7.7	7.5	7.5	7.5	7.3	7.4	7.7	7.6	7.6	---	---	---
5	7.6	7.3	7.5	7.5	7.4	7.4	7.6	7.4	7.5	---	---	---
6	7.6	7.4	7.5	---	---	---	7.4	7.3	7.4	---	---	---
7	7.5	7.3	7.4	---	---	---	7.4	7.2	7.4	---	---	---
8	7.7	7.4	7.6	---	---	---	7.5	7.4	7.5	---	---	---
9	7.7	7.4	7.5	---	---	---	7.6	7.5	7.6	---	---	---
10	7.5	7.2	7.4	---	---	---	7.7	7.5	7.6	---	---	---
11	7.5	7.2	7.4	---	---	---	7.7	7.6	7.7	---	---	---
12	7.6	7.3	7.5	---	---	---	7.8	7.7	7.7	---	---	---
13	7.6	7.5	7.6	---	---	---	7.8	7.6	7.7	---	---	---
14	7.6	7.4	7.5	---	---	---	7.9	7.7	7.7	---	---	---
15	7.5	7.2	7.4	---	---	---	8.0	7.8	7.9	---	---	---
16	7.5	7.2	7.3	---	---	---	7.9	7.9	7.9	7.6	7.6	7.6
17	7.5	7.3	7.4	---	---	---	8.0	7.8	7.9	7.6	7.6	7.6
18	7.5	7.4	7.4	---	---	---	7.9	7.8	7.9	7.6	7.6	7.6
19	7.7	7.4	7.6	---	---	---	7.9	7.8	7.8	7.6	7.6	7.6
20	7.7	7.5	7.6	---	---	---	7.9	7.9	7.9	7.6	7.4	7.5
21	7.7	7.6	7.6	---	---	---	7.9	7.8	7.9	7.6	7.5	7.5
22	7.8	7.6	7.7	---	---	---	7.9	7.7	7.8	7.6	7.6	7.6
23	7.7	7.4	7.6	---	---	---	7.8	7.7	7.8	7.7	7.6	7.6
24	7.7	7.5	7.6	---	---	---	7.8	7.7	7.8	7.6	7.6	7.6
25	7.7	7.4	7.5	---	---	---	7.8	7.7	7.8	7.6	7.5	7.5
26	7.6	7.4	7.5	---	---	---	7.7	7.6	7.7	7.6	7.5	7.5
27	7.6	7.4	7.5	---	---	---	7.6	7.5	7.6	7.6	7.5	7.6
28	7.6	7.4	7.5	---	---	---	7.7	7.6	7.6	7.6	7.5	7.6
29	7.6	7.5	7.5	---	---	---	7.7	7.6	7.7	---	---	---
30	7.7	7.6	7.6	---	---	---	7.7	7.6	7.6	---	---	---
31	7.7	7.6	7.6	---	---	---	---	---	---	---	---	---
MAX	---	---	---	---	---	---	---	---	---	---	---	---
MIN	---	---	---	---	---	---	---	---	---	---	---	---
DAY	MAX	MIN	MEDIAN	MAX	MIN	MEDIAN	MAX	MIN	MEDIAN	MAX	MIN	MEDIAN
FEBRUARY				MARCH			APRIL			MAY		
1	---	---	---	---	---	---	---	---	---	8.1	7.8	7.9
2	---	---	---	---	---	---	---	---	---	8.1	7.8	7.9
3	---	---	---	---	---	---	---	---	---	7.9	7.8	7.8
4	---	---	---	---	---	---	---	---	---	8.0	7.8	7.8
5	---	---	---	---	---	---	---	---	---	8.1	7.8	7.8
6	---	---	---	---	---	---	---	---	---	8.1	7.7	7.8
7	---	---	---	---	---	---	---	---	---	8.1	7.7	7.8
8	---	---	---	---	---	---	---	---	---	8.1	7.7	7.7
9	---	---	---	---	---	---	---	---	---	8.1	7.7	7.7
10	---	---	---	---	---	---	---	---	---	8.1	7.6	7.7
11	---	---	---	---	---	---	---	---	---	8.0	7.4	7.5
12	---	---	---	---	---	---	---	---	---	8.0	7.4	7.6
13	---	---	---	---	---	---	---	---	---	8.0	7.5	7.6
14	---	---	---	---	---	---	---	---	---	8.0	7.5	7.6
15	---	---	---	---	---	---	---	---	---	7.9	7.5	7.6
16	---	---	---	---	---	---	---	---	---	7.9	7.5	7.6
17	---	---	---	---	---	---	---	---	---	7.9	7.5	7.6
18	---	---	---	---	---	---	---	---	---	7.9	7.5	7.6
19	---	---	---	---	---	---	---	---	---	7.9	7.5	7.6
20	---	---	---	---	---	---	---	---	---	7.9	7.5	7.6
21	---	---	---	---	---	---	---	---	---	7.8	7.5	7.6
22	---	---	---	---	---	---	---	---	---	7.8	7.5	7.6
23	---	---	---	---	---	---	---	---	---	7.9	7.5	7.6
24	---	---	---	---	---	---	---	---	---	7.9	7.5	7.6
25	---	---	---	---	---	---	---	---	---	7.9	7.5	7.7
26	---	---	---	---	---	---	---	---	---	7.8	7.6	7.6
27	---	---	---	---	---	---	---	---	---	7.9	7.5	7.6
28	---	---	---	---	---	---	7.9	---	---	7.7	7.5	7.6
29	---	---	---	---	---	---	8.0	7.8	7.9	7.8	7.5	7.6
30	---	---	---	---	---	---	8.1	7.8	7.9	7.7	7.5	7.6
31	---	---	---	---	---	---	---	---	---	7.6	7.5	7.6
MAX	---	---	---	---	---	---	---	---	---	8.1	7.8	7.9
MIN	---	---	---	---	---	---	---	---	---	7.6	7.4	7.5

SPOKANE RIVER BASIN

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12433558 BLUE CREEK BELOW MIDNITE MINE DRAINAGE, NEAR WELLPINIT, WA--Continued

PH, WATER, WHOLE, FIELD, STANDARD UNITS, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DAY	MAX	MIN	MEDIAN	MAX	MIN	MEDIAN	MAX	MIN	MEDIAN	MAX	MIN	MEDIAN
	JUNE			JULY			AUGUST			SEPTEMBER		
1	7.7	7.5	7.6	---	---	---	7.7	7.6	7.7	7.7	7.6	7.7
2	7.6	7.5	7.5	---	---	---	7.7	7.7	7.7	7.7	7.6	7.7
3	7.7	7.5	7.6	---	---	---	7.7	7.7	7.7	7.8	7.7	7.7
4	7.7	7.4	7.6	---	---	---	7.7	7.6	7.7	7.7	7.6	7.7
5	7.8	7.5	7.6	---	---	---	7.7	7.7	7.7	7.7	7.6	7.7
6	7.7	7.5	7.6	---	---	---	7.7	7.6	7.7	7.7	7.7	7.7
7	7.7	7.5	7.6	7.6	7.4	7.5	7.7	7.6	7.7	7.7	7.6	7.7
8	7.7	7.4	7.6	7.5	7.5	7.5	7.7	7.6	7.7	7.7	7.7	7.7
9	7.7	7.5	7.6	7.5	7.5	7.5	7.7	7.7	7.7	7.8	7.7	7.7
10	7.8	7.5	7.7	7.5	7.5	7.5	7.7	7.7	7.7	7.8	7.7	7.7
11	7.7	7.6	7.7	7.6	7.5	7.6	7.7	7.7	7.7	7.8	7.7	7.7
12	7.8	7.6	7.7	7.6	7.5	7.6	7.7	7.7	7.7	7.8	7.7	7.7
13	7.9	7.7	7.8	7.6	7.5	7.5	7.7	7.7	7.7	7.7	7.7	7.7
14	7.9	7.6	7.7	7.6	7.5	7.5	7.8	7.7	7.7	7.8	7.7	7.7
15	7.8	7.4	7.6	7.6	7.4	7.5	7.8	7.6	7.7	7.7	7.7	7.7
16	7.8	7.4	7.6	7.6	7.5	7.6	7.7	7.6	7.6	7.7	7.7	7.7
17	7.8	7.4	7.6	7.6	7.5	7.6	7.7	7.6	7.6	7.7	7.7	7.7
18	7.8	7.5	7.7	7.6	7.6	7.6	7.6	7.6	7.6	7.7	7.7	7.7
19	7.9	7.6	7.7	7.6	7.5	7.6	7.6	7.6	7.6	7.7	7.7	7.7
20	7.8	7.5	7.7	7.6	7.5	7.6	7.7	7.6	7.6	7.7	7.7	7.7
21	7.8	7.4	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.8	7.7	7.8
22	7.7	7.4	7.6	7.6	7.5	7.6	7.6	7.6	7.6	7.8	7.8	7.8
23	---	---	---	7.6	7.5	7.6	7.7	7.6	7.6	7.9	7.8	7.8
24	---	---	---	7.6	7.6	7.6	7.6	7.6	7.6	7.9	7.8	7.8
25	---	---	---	7.6	7.6	7.6	7.6	7.6	7.6	7.8	7.7	7.8
26	---	---	---	7.6	7.6	7.6	7.6	7.6	7.6	7.8	7.7	7.7
27	---	---	---	7.7	7.6	7.6	7.6	7.6	7.6	7.7	7.7	7.7
28	---	---	---	7.6	7.6	7.6	7.6	7.6	7.6	7.7	7.7	7.7
29	---	---	---	7.7	7.6	7.6	7.6	7.6	7.6	7.8	7.7	7.7
30	---	---	---	7.7	7.6	7.7	7.7	7.6	7.6	7.7	7.7	7.7
31	---	---	---	7.7	7.6	7.7	7.7	7.6	7.7	---	---	---
MAX	---	---	---	---	---	---	7.8	7.7	7.7	7.9	7.8	7.8
MIN	---	---	---	---	---	---	7.6	7.6	7.6	7.7	7.6	7.7

WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	OCTOBER			NOVEMBER			DECEMBER			JANUARY		
1	11.0	6.0	9.5	---	---	---	.5	.5	.5	.0	.0	.0
2	12.0	9.5	10.5	---	---	---	.5	.5	.5	.0	.0	.0
3	11.5	9.5	11.0	---	---	---	.5	.5	.5	.0	.0	.0
4	11.5	7.0	10.5	---	---	---	.5	.5	.5	.0	.0	.0
5	---	---	---	---	---	---	.5	.5	.5	.0	.0	.0
6	---	---	---	---	---	---	.5	.5	.5	.0	.0	.0
7	---	---	---	6.5	5.5	6.0	.5	.5	.5	.0	.0	.0
8	---	---	---	6.0	4.5	5.5	.5	.5	.5	.0	.0	.0
9	---	---	---	5.5	3.5	4.5	.5	.5	.5	.0	.0	.0
10	---	---	---	3.5	2.0	3.0	.5	.5	.5	.0	.0	.0
11	---	---	---	4.0	3.0	3.5	.5	.5	.5	.0	.0	.0
12	---	---	---	5.0	4.0	4.5	.5	.5	.5	.0	.0	.0
13	---	---	---	5.5	4.5	5.5	.5	.5	.5	.0	.0	.0
14	---	---	---	5.5	5.0	5.5	.5	.5	.5	.0	.0	.0
15	---	---	---	6.0	5.5	5.5	.5	.5	.5	.0	.0	.0
16	---	---	---	6.0	5.5	6.0	.5	.5	.5	.0	.0	.0
17	---	---	---	6.0	5.5	6.0	.5	.5	.5	.0	.0	.0
18	---	---	---	6.5	5.0	6.0	.5	.0	.5	.0	.0	.0
19	---	---	---	5.0	3.5	4.5	.0	.0	.0	.0	.0	.0
20	---	---	---	3.5	3.0	3.0	.5	.0	.0	.0	.0	.0
21	---	---	---	4.0	1.5	3.0	.5	.0	.5	.0	.0	.0
22	---	---	---	2.0	1.5	2.0	.5	.0	.5	.0	.0	.5
23	---	---	---	2.0	.5	1.0	.5	.5	.5	.0	.0	.0
24	---	---	---	.5	.5	.5	.5	.0	.5	.5	.0	.0
25	---	---	---	.5	.5	.5	.5	.0	.5	.5	.0	.5
26	---	---	---	.5	.5	.5	.5	.5	.5	.5	.5	.5
27	---	---	---	.5	.5	.5	.5	.5	.5	.5	.5	.5
28	---	---	---	1.0	.5	.5	.5	.0	.0	.5	.5	.5
29	---	---	---	1.0	.5	1.0	.0	.0	.0	.5	.5	.5
30	---	---	---	1.0	.5	1.0	.0	.0	.0	.5	.5	.5
31	---	---	---	---	---	---	.0	.0	.0	.5	.0	.5
MONTH	---	---	---	---	---	---	.5	.0	.4	.5	.0	.1

SPOKANE RIVER BASIN

12433558 BLUE CREEK BELOW MIDNITE MINE DRAIAAGE, NEAR WELLPINIT, WA--Continued

WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
FEBRUARY			MARCH			APRIL			MAY			
1	.5	.5	.5	.0	.0	.0	6.0	4.0	5.0	10.5	6.0	8.0
2	.5	.0	.5	.5	.0	.5	6.5	4.0	5.5	12.5	6.0	9.0
3	.5	.0	.0	.5	.0	.5	6.5	5.0	5.5	8.0	6.0	7.5
4	.5	.0	.5	.5	.0	.5	6.5	4.5	5.5	12.5	7.5	9.5
5	.5	.0	.5	.5	.5	.5	8.5	3.5	5.5	13.0	8.0	10.0
6	.5	.5	.5	.5	.5	.5	8.0	3.5	5.5	11.0	8.0	9.0
7	.5	.0	.5	.5	.5	.5	8.0	5.5	6.5	10.0	5.5	8.0
8	.5	.0	.5	.5	.5	.5	7.5	5.5	6.5	13.0	6.0	9.0
9	.5	.5	.5	1.0	.5	.5	8.5	5.0	6.5	12.5	6.0	9.0
10	.5	.5	.5	1.0	.0	.5	7.5	5.0	6.0	15.5	7.0	11.0
11	.5	.5	.5	1.0	.0	.5	8.5	5.5	6.5	16.5	8.0	12.0
12	.5	.5	.5	.5	.0	.5	8.5	5.0	6.5	17.0	8.5	12.5
13	.5	.5	.5	1.0	.0	.5	9.0	5.0	7.0	16.5	9.0	12.5
14	.5	.0	.5	1.0	.5	.5	8.5	6.0	7.0	16.5	9.0	12.0
15	.0	.0	.0	1.5	.5	1.0	9.0	5.0	7.0	16.0	8.0	11.5
16	.0	.0	.0	1.0	.0	.5	10.0	5.0	7.5	16.0	8.5	12.0
17	.0	.0	.0	1.5	.5	1.0	10.0	7.0	8.0	16.5	8.5	12.0
18	.0	.0	.0	1.5	.5	1.0	11.5	7.5	9.0	17.0	8.5	12.5
19	.0	.0	.0	2.0	.5	1.0	11.5	5.5	8.0	15.5	9.5	12.0
20	.0	.0	.0	1.5	1.0	1.5	11.0	5.5	8.0	15.5	10.5	13.0
21	.0	.0	.0	2.5	1.0	1.5	12.5	7.0	9.5	13.5	10.0	11.5
22	.0	.0	.0	2.0	.5	1.5	10.5	6.0	8.0	13.0	8.5	11.0
23	.5	.0	.5	1.5	1.0	1.5	10.0	5.5	7.5	14.5	9.0	11.5
24	.0	.0	.0	3.5	1.5	2.5	10.0	7.0	8.5	15.5	8.0	11.5
25	.0	.0	.0	4.0	2.0	3.0	10.0	7.0	8.0	15.0	8.5	12.0
26	.0	.0	.0	4.5	1.5	3.0	10.5	6.5	8.5	14.5	11.0	12.5
27	.0	.0	.0	5.5	2.0	3.5	9.5	5.5	7.5	15.5	10.0	12.5
28	.0	.0	.0	5.0	1.5	3.5	9.0	5.5	7.5	14.0	10.5	12.5
29	---	---	---	5.5	2.0	3.5	9.0	6.5	7.5	15.0	10.5	12.5
30	---	---	---	5.5	2.5	4.0	12.5	6.0	9.0	13.0	9.5	11.5
31	---	---	---	7.5	3.5	5.0	---	---	---	13.0	10.5	12.0
MONTH	.5	.0	.2	7.5	.0	1.5	12.5	3.5	7.1	17.0	5.5	11.1
DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
JUNE			JULY			AUGUST			SEPTEMBER			
1	14.5	10.5	12.5	15.0	11.0	13.0	16.5	12.0	14.0	15.5	11.5	13.5
2	13.0	10.5	11.5	14.0	12.5	13.0	17.0	12.5	14.5	16.0	12.5	14.0
3	14.5	10.5	12.5	14.0	11.0	12.5	17.5	13.5	15.5	16.0	11.0	13.5
4	13.5	10.5	12.0	15.0	11.5	13.0	17.5	13.5	15.5	16.0	12.5	14.5
5	15.0	10.5	12.5	15.5	12.0	13.5	18.0	13.5	16.0	16.5	14.0	15.5
6	14.5	10.5	13.0	15.0	11.5	13.0	18.0	14.0	16.0	16.0	13.0	14.5
7	14.0	12.0	13.0	14.5	11.0	13.0	17.5	13.5	15.5	16.0	12.5	14.5
8	14.5	10.5	12.5	15.5	11.5	13.5	16.5	13.0	15.0	15.5	12.0	14.0
9	12.5	10.0	11.0	14.5	12.5	14.0	16.0	12.0	14.0	15.0	11.0	13.0
10	14.0	8.5	11.5	14.5	12.0	13.0	16.0	11.5	14.0	15.5	11.5	13.5
11	11.5	9.0	10.5	14.5	12.0	13.0	16.5	12.0	14.0	14.0	11.5	13.0
12	12.5	8.0	10.5	13.0	11.0	12.0	16.0	10.5	13.5	13.5	10.0	12.0
13	14.5	9.0	12.0	14.5	10.5	12.5	16.5	11.0	13.5	13.5	10.0	12.0
14	14.0	11.5	13.0	14.5	11.5	13.0	15.5	11.5	13.5	13.0	10.0	11.5
15	15.0	11.0	13.0	14.0	11.5	12.5	15.5	14.0	14.5	13.0	11.0	12.0
16	15.5	11.5	13.5	14.0	12.0	13.0	14.5	13.0	13.5	12.5	9.5	11.0
17	16.5	12.0	14.0	13.0	12.0	12.5	15.5	14.0	14.5	13.0	9.0	11.0
18	17.5	12.0	15.0	14.5	12.0	13.0	16.5	13.0	15.0	13.0	9.0	11.0
19	17.5	12.0	14.5	14.0	11.0	12.5	17.5	13.5	15.5	12.5	9.5	11.0
20	17.5	11.5	14.5	14.0	12.5	13.0	17.5	14.0	16.0	10.5	8.0	9.5
21	16.0	13.0	14.5	14.5	12.0	13.0	17.0	15.0	16.0	9.0	6.5	8.0
22	13.0	10.0	11.5	13.5	12.0	12.5	17.0	13.5	15.0	9.0	5.0	7.0
23	12.0	8.5	10.5	14.5	12.5	13.5	15.5	13.0	14.5	9.0	5.0	7.5
24	15.0	9.5	12.0	14.0	13.0	13.5	14.0	11.0	12.5	10.0	5.5	8.0
25	16.5	11.0	13.5	14.0	12.5	13.5	14.0	10.0	12.5	11.5	7.5	9.5
26	17.0	12.0	14.5	16.0	12.5	14.5	14.5	10.5	12.5	12.0	8.0	10.0
27	15.0	12.0	13.5	16.5	13.0	14.5	14.0	11.5	13.0	12.5	8.5	10.5
28	12.5	9.0	11.0	18.0	13.5	15.5	14.0	11.5	12.5	13.0	9.5	11.5
29	14.0	9.5	12.0	15.5	14.0	15.0	14.5	10.5	12.5	13.5	10.0	12.0
30	15.0	10.5	12.5	15.0	11.5	13.0	14.5	11.0	13.0	13.5	11.0	12.5
31	---	---	---	15.5	11.0	13.0	14.5	11.0	13.0	---	---	---
MONTH	17.5	8.0	12.6	18.0	10.5	13.2	18.0	10.0	14.2	16.5	5.0	11.7

12433561 BLUE CREEK NEAR MOUTH, NEAR WELLPINIT, WA

LOCATION.--Lat 47°53'49", long 118°08'05", in NE 1/4 SW 1/4 sec.27, T.28 N., R.37 E., Stevens County, Hydrologic Unit 17010307, Spokane Indian Reservation, on right bank, 0.75 mi upstream from Franklin D. Roosevelt Lake, and 7.0 mi west of Wellpinit.

DRAINAGE AREA.--19.1 mi².

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--June 1984 to current year.

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

REMARKS.--Water-discharge records good except for estimated daily discharges, which are fair. Three ponds upstream from gage exist for mine surface-water retention. A small tributary (Midnite Mine drainage) is located approximately 3.0 mi upstream from station and consists of three converging branches. Diversion from all three branches into one of the ponds began in June 1987. U.S. Geological Survey satellite telemeter at station.

AVERAGE DISCHARGE.--9 years, 1.42 ft³/s, 1.01 in/yr, 1,030 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 93 ft³/s Mar. 7, 1986, gage height, 3.54 ft, from slope-area measurement of peak flow; minimum discharge, no flow for many days during most years.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 38 ft³/s Apr. 4, gage height, 3.19 ft; no flow several days in October.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.61	.22	e.15	e.60	e.60	17	6.3	2.4	.95	.50	.65
2	.00	.58	.21	e.15	e.60	e.60	17	5.8	2.7	1.0	.24	.63
3	.00	.43	.19	e.15	e.50	e.60	24	6.4	2.5	1.3	.44	.20
4	.00	.56	e.13	e.15	e.50	e.60	29	9.1	2.3	1.2	.43	.45
5	.00	.32	e.13	e.10	e.50	e1.3	21	7.4	2.2	.95	.32	.48
6	.00	.56	e.13	e.10	e.60	e2.5	18	7.3	2.1	.69	.44	.54
7	.00	.95	e.13	e.10	e.60	e2.5	16	6.5	2.1	.72	.38	.58
8	.09	.69	e.15	e.15	e.60	e2.5	17	6.7	2.0	.80	.35	.20
9	.10	.68	e.15	e.15	e.60	e2.2	16	5.9	1.8	.70	.27	.05
10	.08	.60	e.20	e.15	e.60	e2.1	15	5.5	1.9	.74	.12	.08
11	.03	.56	e.25	e.15	e.70	e2.1	14	5.3	1.9	.83	.10	.15
12	.03	.72	e.30	e.15	e.70	e2.1	12	4.9	1.8	.84	.09	.40
13	.07	.59	e.30	e.20	e.70	e2.1	12	4.7	1.7	.86	.08	.77
14	.19	.47	e.30	e.20	e.70	e2.1	11	4.3	1.6	.79	.08	.67
15	.11	.49	e.30	e.20	e.60	e2.1	11	4.2	1.6	.81	.34	1.1
16	.30	.59	e.25	e.20	e.50	e2.2	9.7	3.8	1.6	.78	.57	.93
17	.36	.64	e.15	e.20	e.50	e2.3	9.9	3.6	1.5	1.5	.76	.93
18	.09	.64	e.10	e.20	e.50	e2.3	16	3.4	1.4	1.0	.78	.97
19	.06	.96	e.10	e.20	e.50	2.4	12	3.4	1.3	.76	.69	.97
20	.22	.57	e.15	e.35	e.50	3.2	11	3.4	1.3	1.1	.36	1.0
21	.57	.98	e.15	e.35	e.50	3.5	11	3.1	1.4	.86	.77	.21
22	.69	.98	e.15	e.35	e.50	5.1	10	3.3	1.3	1.0	.75	.08
23	.55	.55	e.15	e.35	e.50	19	9.7	3.2	1.3	.93	.30	.06
24	.54	.31	e.15	e.35	e.45	22	9.8	2.9	1.2	.91	.61	.05
25	.38	.23	e.15	e.45	e.45	19	9.2	2.8	1.2	.94	.70	.40
26	.32	.25	e.15	e.60	e.45	18	10	2.7	1.1	.85	.70	.66
27	.46	.29	e.15	e.70	e.50	17	8.6	2.6	1.0	.67	.66	.65
28	.48	.29	e.15	e.70	e.60	15	7.9	2.6	.76	.55	.57	.69
29	.55	.23	e.15	e.60	---	16	7.7	2.5	1.0	.53	.78	.64
30	.65	.24	e.15	e.60	---	17	7.1	2.4	.99	.56	.71	.65
31	.67	---	e.15	e.60	---	16	---	2.5	---	.56	.67	---
TOTAL	7.59	16.56	5.49	9.05	15.55	206.00	399.6	138.5	48.95	26.68	14.56	15.84
MEAN	.24	.55	.18	.29	.56	6.65	13.3	4.47	1.63	.86	.47	.53
MAX	.69	.98	.30	.70	.70	22	29	9.1	2.7	1.5	.78	1.1
MIN	.00	.23	.10	.10	.45	.60	7.1	2.4	.76	.53	.08	.05
AC-FT	15	33	11	18	31	409	793	275	97	53	29	31
CFSM	.01	.03	.01	.02	.03	.35	.70	.23	.09	.05	.02	.03
IN.	.01	.03	.01	.02	.03	.40	.78	.27	.10	.05	.03	.03

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1984 - 1993, BY WATER YEAR (WY)

	MEAN	.19	.37	.38	.48	1.30	6.26	4.88	1.78	.92	.33	.12	.12
MAX	.42	.77	.82	.78	5.86	23.6	13.3	4.47	2.44	.86	.47	.53	
(WY)	1985	1985	1985	1985	1986	1986	1993	1993	1990	1993	1993	1993	1993
MIN	.037	.18	.16	.15	.28	.98	.55	.13	.037	.009	.000	.000	
(WY)	1989	1988	1989	1991	1990	1990	1990	1992	1992	1988	1988	1987	

SUMMARY STATISTICS

FOR 1992 CALENDAR YEAR

FOR 1993 WATER YEAR

WATER YEARS 1984 - 1993

ANNUAL TOTAL	171.14	904.37	
ANNUAL MEAN	.47	2.48	
HIGHEST ANNUAL MEAN			1.42
LOWEST ANNUAL MEAN			3.36
HIGHEST DAILY MEAN	3.1 Jan 29	29 Apr 4	.44 1986
LOWEST DAILY MEAN	.00 Jun 6	.00 Oct 1	.00 1992
ANNUAL SEVEN-DAY MINIMUM	.00 Jun 18	.00 Oct 1	.00 Mar 7 1986
ANNUAL RUNOFF (AC-FT)	339	1790	.00 Jul 30 1985
ANNUAL RUNOFF (CFSM)	.024	.13	.00 Aug 3 1986
ANNUAL RUNOFF (INCHES)	.33	1.76	.074
10 PERCENT EXCEEDS	1.5	8.8	1.01
50 PERCENT EXCEEDS	.19	.65	2.9
90 PERCENT EXCEEDS	.00	.15	.40
			.00

e Estimated

SPOKANE RIVER BASIN

12433561 BLUE CREEK NEAR MOUTH, NEAR WELLPINIT, WA--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--1980, June 1984 to current year.

PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: June 1984 to current year.

pH: June 1984 to current year.

WATER TEMPERATURE: June 1984 to current year.

INSTRUMENTATION.--Water-quality monitor since June 1984. Digital recorder set for one-hour-interval punch. Electronic data logger, with 30 minute recording interval and satellite telemeter, installed April 29, 1993.

EXTREMES FOR PERIOD OF RECORD.--

SPECIFIC CONDUCTANCE: Maximum recorded, 2,810 microsiemens Sept. 20, 30, 1993 (more than 20 percent of missing record), but may have been higher during periods of missing record; minimum recorded, 97 microsiemens Apr. 15, 1993 (more than 20 percent of missing record), but may have been lower during periods of missing record.

pH: Maximum recorded, 9.0 units May 20, 21, 23, 1985, May 27-29, 1987, but may have been higher during periods of missing record; minimum recorded, 7.0 units July 31, 1985, but may have been lower during periods of missing record.

WATER TEMPERATURE: Maximum recorded, 27.5°C July 9, 10, 1985, but may have been higher during periods of missing record; minimum, 0.0°C on many days during winters.

EXTREMES FOR CURRENT YEAR.--

SPECIFIC CONDUCTANCE: Maximum recorded, 2,810 microsiemens Sept. 20, 30 (more than 20 percent of missing record); minimum recorded, 97 microsiemens Apr. 15 (more than 20 percent of missing record).

pH: Maximum recorded, 8.6 units June 3 (more than 20 percent of missing record); minimum recorded, 7.4 units, many days August to September (more than 20 percent of missing record).

WATER TEMPERATURE: Maximum recorded, 19.5°C several days June to August; minimum, 0.0°C many days from November to March.

SPECIFIC CONDUCTANCE, US/CM @ 25 DEGREES CENTIGRADE, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	FEBRUARY			MARCH			APRIL			MAY		
1	---	---	---	579	569	574	205	176	191	---	---	---
2	---	---	---	569	558	562	186	176	180	---	---	---
3	---	---	---	568	527	533	187	167	176	---	---	---
4	---	---	---	567	517	544	238	167	192	---	---	---
5	637	486	543	586	486	559	188	168	175	---	---	---
6	526	445	476	525	475	501	180	169	173	---	---	---
7	495	445	464	525	454	488	181	170	176	---	---	---
8	514	444	483	464	383	416	212	171	182	---	---	---
9	493	444	465	393	353	371	292	212	240	---	---	---
10	532	493	512	363	332	344	213	193	200	---	---	---
11	532	512	521	342	321	332	194	174	184	---	---	---
12	522	471	496	341	331	332	194	135	175	---	---	---
13	471	450	463	348	333	338	156	125	147	---	---	---
14	460	439	449	349	331	340	146	126	136	---	---	---
15	459	429	444	344	325	336	147	97	132	---	---	---
16	568	448	478	328	289	314	198	127	172	---	---	---
17	578	467	508	315	300	311	199	179	192	---	---	---
18	577	407	460	319	305	315	210	189	195	---	---	---
19	436	406	419	323	311	315	211	200	203	---	---	---
20	446	425	442	324	305	317	222	201	208	---	---	---
21	515	425	494	321	307	318	212	182	196	---	---	---
22	474	454	464	324	296	318	203	183	194	---	---	---
23	493	473	481	316	239	273	204	183	193	---	---	---
24	523	493	513	250	223	234	205	175	194	---	---	---
25	572	522	558	238	217	226	196	176	187	---	---	---
26	571	561	567	240	220	230	197	176	186	---	---	---
27	571	550	561	231	221	223	188	177	183	---	---	---
28	569	550	560	222	211	221	208	188	193	---	---	---
29	---	---	---	222	203	211	---	---	---	---	---	---
30	---	---	---	213	194	204	---	---	---	---	---	---
31	---	---	---	205	194	198	---	---	---	---	---	---
MONTH	---	---	---	586	194	348	---	---	---	---	---	---

SPOKANE RIVER BASIN

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12433561 BLUE CREEK NEAR MOUTH, NEAR WELLPINIT, WA--Continued

SPECIFIC CONDUCTANCE, US/CM @ 25 DEGREES CENTIGRADE, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
JUNE			JULY			AUGUST			SEPTEMBER			
1	---	---	---	1580	1470	1540	1970	1940	1960	2610	2510	2590
2	---	---	---	1620	1540	1580	1940	1650	1810	2650	2520	2630
3	---	---	---	1610	1370	1550	1890	1590	1780	2630	2400	2540
4	---	---	---	1570	1490	1540	1940	1870	1910	2550	2170	2450
5	---	---	---	1590	1500	1560	1950	1810	1880	2620	2390	2540
6	---	---	---	1500	1170	1270	1940	1780	1880	2660	2590	2630
7	---	---	---	1420	1050	1250	2000	1930	1970	2690	2440	2630
8	---	---	---	1580	1260	1490	2030	1920	2010	2680	2460	2570
9	---	---	---	1580	1490	1530	2040	2010	2030	2540	2460	2490
10	---	---	---	1530	1490	1510	2020	1800	1910	2470	2170	2310
11	---	---	---	1580	1290	1480	1840	1680	1770	2350	2160	2260
12	---	---	---	1490	1120	1280	1740	1620	1670	2490	2300	2350
13	---	---	---	1640	1490	1570	1670	1530	1600	2640	2490	2590
14	---	---	---	1720	1630	1680	1600	1490	1540	2650	2520	2620
15	---	---	---	1760	1690	1720	1830	1210	1480	2660	2430	2610
16	---	---	---	1750	1510	1660	1940	1770	1860	2700	2650	2680
17	---	---	---	1630	1490	1570	2060	1550	1810	2750	2640	2710
18	---	---	---	1680	1600	1640	2180	1970	2100	2770	2720	2750
19	---	---	---	1670	1450	1590	2240	2130	2200	2790	2530	2720
20	---	---	---	1640	1410	1560	2210	1980	2110	2810	2780	2800
21	---	---	---	1620	1310	1470	2320	1830	2120	2800	2430	2630
22	---	---	---	1670	1600	1630	2370	2280	2340	2430	2250	2350
23	---	---	---	1670	1550	1600	2370	2230	2300	2380	2010	2230
24	---	---	---	1700	1590	1660	2410	2010	2260	2210	2130	2160
25	---	---	---	1690	1650	1670	2490	2410	2450	2310	1850	2080
26	---	---	---	1730	1680	1700	2520	2480	2500	2590	2310	2390
27	---	---	---	1750	1710	1740	2530	2430	2510	2680	2590	2630
28	---	---	---	1770	1530	1680	2520	2060	2430	2750	2630	2690
29	1450	1040	1280	1820	1660	1750	2580	2510	2550	2750	2530	2700
30	1530	1440	1490	1910	1810	1870	2600	2450	2580	2810	2530	2720
31	---	---	---	1960	1900	1930	2610	2450	2590	---	---	---
MONTH	---	---	---	1960	1050	1590	2610	1210	2060	2810	1850	2530

PH, WATER, WHOLE, FIELD, STANDARD UNITS, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DAY	MAX	MIN	MEDIAN	MAX	MIN	MEDIAN	MAX	MIN	MEDIAN	MAX	MIN	MEDIAN
FEBRUARY			MARCH			APRIL			MAY			
1	---	---	---	---	---	---	8.0	7.7	7.8	8.3	8.1	8.1
2	---	---	---	---	---	---	7.9	7.7	7.8	8.3	8.1	8.1
3	---	---	---	---	---	---	7.7	7.6	7.7	8.2	8.0	8.1
4	---	---	---	---	---	---	7.9	7.7	7.8	8.2	8.0	8.1
5	---	---	---	---	---	---	8.0	7.9	7.9	8.2	8.0	8.1
6	---	---	---	---	---	---	8.0	7.6	7.9	8.2	8.0	8.0
7	---	---	---	---	---	---	8.0	7.6	7.9	8.2	8.0	8.0
8	---	---	---	---	---	---	8.0	7.6	7.8	8.2	7.9	8.0
9	---	---	---	---	---	---	7.9	7.7	7.9	8.3	7.9	8.0
10	---	---	---	---	---	---	8.0	7.7	7.8	8.3	7.9	8.0
11	---	---	---	---	---	---	7.9	7.7	7.8	8.2	7.8	7.9
12	---	---	---	---	---	---	8.0	7.7	7.8	8.1	7.8	7.8
13	---	---	---	8.1	8.1	8.1	8.0	7.8	7.8	8.1	7.8	7.9
14	---	---	---	8.1	8.1	8.1	8.1	7.8	7.9	8.1	7.8	7.9
15	---	---	---	8.1	8.1	8.1	8.2	8.0	8.1	8.1	7.9	7.9
16	---	---	---	8.1	8.0	8.1	8.2	7.9	8.1	8.1	7.9	7.9
17	---	---	---	8.1	8.0	8.0	8.1	8.1	8.1	8.2	7.9	7.9
18	---	---	---	8.1	8.0	8.0	8.1	7.8	7.9	8.2	7.9	7.9
19	---	---	---	8.1	8.0	8.0	8.0	7.8	7.9	8.2	7.9	7.9
20	---	---	---	8.1	8.0	8.0	8.0	7.8	7.9	8.2	7.9	8.0
21	---	---	---	8.0	8.0	8.0	8.0	7.9	7.9	8.2	7.9	8.0
22	---	---	---	8.0	7.9	8.0	8.0	7.9	8.0	8.2	7.9	8.0
23	---	---	---	7.9	7.8	7.9	8.0	7.9	8.0	8.2	7.9	7.9
24	---	---	---	7.9	7.9	7.9	7.9	7.9	7.9	8.3	7.9	8.0
25	---	---	---	7.9	7.9	7.9	8.0	7.9	7.9	8.4	7.9	8.0
26	---	---	---	8.0	7.9	7.9	8.1	7.9	8.0	8.4	7.9	7.9
27	---	---	---	8.0	7.9	8.0	8.3	8.1	8.3	8.5	7.9	8.0
28	---	---	---	8.1	8.0	8.0	8.2	8.1	8.2	8.4	7.9	7.9
29	---	---	---	8.1	8.0	8.0	---	---	---	8.5	7.9	7.9
30	---	---	---	8.1	8.0	8.0	---	---	---	8.5	7.8	8.0
31	---	---	---	8.0	7.9	8.0	---	---	---	8.4	7.8	7.9
MAX	---	---	---	---	---	---	---	---	---	8.5	8.1	8.1
MIN	---	---	---	---	---	---	---	---	---	8.1	7.8	7.8

SPOKANE RIVER BASIN

12433561 BLUE CREEK NEAR MOUTH, NEAR WELLPINIT, WA--Continued

PH, WATER, WHOLE, FIELD, STANDARD UNITS, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DAY	MAX	MIN	MEDIAN	MAX	MIN	MEDIAN	MAX	MIN	MEDIAN	MAX	MIN	MEDIAN
	JUNE			JULY			AUGUST			SEPTEMBER		
1	8.5	7.8	8.0	8.1	7.8	7.9	8.2	7.6	7.6	8.0	7.5	7.5
2	8.4	7.8	7.9	8.1	7.8	7.8	8.3	7.6	7.6	7.9	7.5	7.5
3	8.6	7.8	7.9	8.1	7.7	7.8	8.3	7.6	7.6	7.9	7.4	7.5
4	8.5	7.8	7.9	8.0	7.7	7.8	8.3	7.6	7.6	7.9	7.5	7.6
5	8.5	7.8	7.9	8.0	7.7	7.7	8.3	7.5	7.6	7.9	7.5	7.6
6	8.5	7.8	7.9	7.9	7.6	7.7	8.3	7.6	7.6	7.9	7.5	7.6
7	8.5	7.8	7.9	8.0	7.6	7.7	8.3	7.6	7.6	7.9	7.5	7.6
8	8.5	7.8	7.9	7.9	7.6	7.7	8.3	7.4	7.6	7.9	7.4	7.5
9	8.5	7.8	8.0	8.0	7.6	7.7	8.4	7.5	7.6	7.8	7.4	7.4
10	8.5	7.9	8.0	8.0	7.6	7.6	8.4	7.5	7.6	7.9	7.4	7.5
11	8.4	7.9	8.0	8.0	7.6	7.7	8.2	7.5	7.5	7.9	7.4	7.6
12	8.4	7.9	8.0	8.1	7.6	7.7	8.1	7.4	7.6	7.9	7.6	7.6
13	8.3	7.9	7.9	8.0	7.6	7.7	8.2	7.4	7.5	7.8	7.6	7.6
14	8.3	7.8	7.9	8.1	7.6	7.7	8.2	7.5	7.5	7.8	7.5	7.6
15	8.2	7.8	7.9	8.1	7.6	7.7	8.1	7.5	7.6	7.7	7.5	7.6
16	8.2	7.9	7.9	8.1	7.6	7.7	7.7	7.6	7.6	7.7	7.5	7.6
17	8.1	7.9	7.9	8.0	7.6	7.7	8.0	7.6	7.6	7.7	7.5	7.6
18	8.1	7.8	7.9	8.1	7.6	7.7	8.0	7.5	7.6	7.7	7.5	7.6
19	8.1	7.8	7.9	8.1	7.7	7.7	8.0	7.5	7.6	7.7	7.5	7.6
20	8.0	7.8	7.9	8.1	7.6	7.7	8.1	7.4	7.5	7.7	7.5	7.6
21	8.0	7.8	7.8	8.2	7.7	7.8	8.0	7.5	7.6	7.7	7.5	7.5
22	8.0	7.8	7.8	8.0	7.7	7.8	8.0	7.5	7.6	7.7	7.5	7.5
23	8.0	7.7	7.8	8.2	7.7	7.7	8.0	7.4	7.5	7.6	7.4	7.5
24	8.0	7.7	7.8	8.2	7.7	7.8	8.0	7.4	7.6	7.7	7.4	7.4
25	8.0	7.7	7.8	8.1	7.7	7.8	8.0	7.5	7.6	7.7	7.4	7.5
26	8.0	7.7	7.8	8.2	7.6	7.7	7.9	7.5	7.5	7.6	7.4	7.5
27	8.0	7.7	7.8	8.2	7.6	7.7	8.1	7.4	7.5	7.6	7.5	7.5
28	8.1	7.7	7.9	8.3	7.6	7.7	8.1	7.4	7.6	7.6	7.4	7.5
29	8.1	7.8	7.9	8.3	7.7	7.7	8.0	7.5	7.5	7.6	7.5	7.5
30	8.1	7.8	7.9	8.2	7.6	7.7	8.1	7.5	7.5	7.7	7.4	7.5
31	---	---	---	8.2	7.6	7.7	8.1	7.5	7.6	---	---	---
MAX	8.6	7.9	8.0	8.3	7.8	7.9	8.4	7.6	7.6	8.0	7.6	7.6
MIN	8.0	7.7	7.8	7.9	7.6	7.6	7.7	7.4	7.5	7.6	7.4	7.4

WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	OCTOBER			NOVEMBER			DECEMBER			JANUARY		
1	---	---	---	---	---	---	.0	.0	.0	.0	.0	.0
2	---	---	---	---	---	---	.0	.0	.0	.0	.0	.0
3	---	---	---	5.5	3.5	4.5	.0	.0	.0	.0	.0	.0
4	---	---	---	5.0	4.0	4.5	.0	.0	.0	.0	.0	.0
5	---	---	---	5.5	4.5	5.0	.0	.0	.0	.0	.0	.0
6	---	---	---	5.5	4.5	5.0	.0	.0	.0	.0	.0	.0
7	---	---	---	6.5	5.0	5.5	.0	.0	.0	.0	.0	.0
8	---	---	---	5.5	4.0	5.0	.0	.0	.0	.0	.0	.0
9	---	---	---	4.5	2.5	3.5	.0	.0	.0	.0	.0	.0
10	---	---	---	3.0	.5	2.0	.0	.0	.0	.0	.0	.0
11	---	---	---	4.0	2.5	3.5	.0	.0	.0	.0	.0	.0
12	---	---	---	5.0	3.5	4.0	.0	.0	.0	.0	.0	.0
13	---	---	---	5.5	4.5	5.0	.0	.0	.0	.0	.0	.0
14	---	---	---	6.0	5.5	5.5	.0	.0	.0	.0	.0	.0
15	---	---	---	6.0	5.5	6.0	.0	.0	.0	.0	.0	.0
16	---	---	---	6.5	5.5	6.0	.0	.0	.0	.0	.0	.0
17	---	---	---	6.5	5.5	6.0	.0	.0	.0	.0	.0	.0
18	---	---	---	6.5	4.5	5.5	.0	.0	.0	.0	.0	.0
19	---	---	---	4.5	4.0	4.0	.0	.0	.0	---	---	---
20	---	---	---	4.0	2.5	3.5	.0	.0	.0	---	---	---
21	---	---	---	3.0	2.0	2.5	.0	.0	.0	---	---	---
22	---	---	---	4.0	2.0	3.0	.0	.0	.0	---	---	---
23	---	---	---	2.5	.5	1.5	.0	.0	.0	---	---	---
24	---	---	---	1.0	.5	.5	.0	.0	.0	---	---	---
25	---	---	---	.5	.5	.5	.0	.0	.0	---	---	---
26	---	---	---	.5	.5	.5	.0	.0	.0	---	---	---
27	---	---	---	.5	.5	.5	.0	.0	.0	---	---	---
28	---	---	---	.5	.5	.5	.0	.0	.0	---	---	---
29	---	---	---	.5	.5	.5	.0	.0	.0	---	---	---
30	---	---	---	1.5	.0	.5	.0	.0	.0	---	---	---
31	---	---	---	---	---	---	.0	.0	.0	---	---	---
MONTH	---	---	---	---	---	---	.0	.0	.0	---	---	---

SPOKANE RIVER BASIN

259

12433561 BLUE CREEK NEAR MOUTH, NEAR WELLPINIT, WA--Continued

WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
FEBRUARY			MARCH			APRIL			MAY			
1	---	---	---	.0	.0	.0	5.5	4.0	5.0	9.5	6.5	8.5
2	---	---	---	.0	.0	.0	5.5	4.0	5.0	11.5	6.5	9.0
3	---	---	---	.5	.0	.5	6.0	5.0	5.5	8.5	7.0	7.5
4	.5	.0	.0	.5	.0	.5	6.0	4.5	5.5	12.0	7.5	9.5
5	.0	.0	.0	.5	.0	.5	6.5	4.0	5.0	12.5	8.5	10.5
6	.5	.0	.5	.5	.0	.5	6.0	4.0	5.0	11.0	9.0	10.0
7	.5	.0	.0	.5	.0	.5	7.0	5.5	6.0	9.5	6.5	8.5
8	.5	.0	.0	1.0	.0	.5	6.5	5.5	6.0	12.5	6.5	9.5
9	1.0	.0	.5	2.0	.5	1.0	7.0	5.5	6.0	12.0	7.0	9.5
10	1.0	.0	.5	2.5	.0	1.0	6.5	5.0	6.0	15.0	8.0	11.5
11	1.0	.0	.5	2.5	.0	1.0	6.5	5.5	6.0	16.0	9.5	12.5
12	1.5	.5	1.0	2.5	.0	1.5	7.0	5.0	6.0	16.5	10.5	13.5
13	1.5	1.0	1.0	3.0	.5	1.5	7.0	5.0	6.0	16.0	11.0	13.5
14	2.0	.0	1.0	2.5	2.0	2.0	8.0	6.0	7.0	16.5	11.5	13.5
15	.0	.0	.0	4.0	2.0	2.5	7.5	5.0	6.5	15.5	10.0	13.0
16	.5	.0	.0	3.0	1.0	2.0	8.0	5.0	6.5	16.0	11.0	13.5
17	.5	.0	.5	3.5	2.5	3.0	8.5	7.0	7.5	16.0	10.5	13.5
18	.5	.0	.5	4.5	2.5	3.0	9.5	7.5	8.5	16.5	10.5	13.5
19	.0	.0	.0	4.5	2.0	3.0	9.0	6.5	8.0	15.5	11.5	13.5
20	.0	.0	.0	4.0	2.5	3.0	8.5	6.0	7.5	15.5	12.5	13.5
21	.0	.0	.0	5.0	2.5	3.5	10.0	7.5	8.5	14.0	11.0	12.5
22	.5	.0	.5	4.0	2.5	3.0	9.0	7.5	8.5	13.5	10.0	11.5
23	.5	.0	.5	3.5	2.5	3.0	8.5	6.5	8.0	14.5	10.0	12.0
24	.0	.0	.0	4.0	2.5	3.5	9.0	7.5	8.5	16.0	9.5	12.5
25	.5	.0	.5	5.0	3.0	4.0	9.0	8.0	8.5	15.5	9.5	12.5
26	.0	.0	.0	5.0	3.0	3.5	9.5	7.5	8.5	16.0	12.0	13.5
27	.0	.0	.0	5.0	3.0	4.0	8.5	7.0	8.0	16.5	11.0	13.5
28	.0	.0	.0	5.0	2.5	3.5	8.5	6.5	7.5	14.5	11.5	13.0
29	---	---	---	5.0	2.5	4.0	---	---	---	16.5	11.5	13.5
30	---	---	---	5.0	3.0	4.0	---	---	---	13.5	10.5	12.0
31	---	---	---	6.0	3.5	5.0	---	---	---	13.5	11.5	12.5
MONTH	---	---	---	6.0	.0	2.2	---	---	---	16.5	6.5	11.8

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
JUNE			JULY			AUGUST			SEPTEMBER			
1	15.0	11.5	13.0	16.0	10.5	13.0	18.0	11.5	14.5	15.5	10.5	12.5
2	14.5	11.5	12.5	15.5	12.0	13.5	19.5	12.5	15.5	16.0	11.0	13.0
3	16.0	11.5	13.0	16.5	11.0	13.0	19.5	12.5	15.5	16.5	11.0	13.5
4	14.5	11.0	12.5	17.0	11.5	13.5	19.5	13.0	16.0	16.5	11.5	13.5
5	16.0	11.5	13.5	17.0	12.0	14.5	19.5	13.5	16.0	16.5	12.0	14.0
6	15.5	11.0	13.0	17.0	12.0	14.0	19.5	13.5	16.0	16.0	11.5	13.5
7	15.0	12.5	13.5	17.5	11.5	14.0	19.0	13.0	15.5	15.5	11.0	13.0
8	16.0	11.0	13.0	17.5	12.0	14.5	18.5	12.5	15.0	16.0	11.0	13.5
9	13.5	11.0	12.0	18.0	13.0	14.5	18.5	12.0	15.0	16.5	11.0	13.5
10	15.0	9.0	12.0	17.5	12.5	14.5	18.0	12.5	15.0	16.0	11.0	13.5
11	13.0	9.0	11.0	17.0	12.5	14.0	19.0	13.0	15.0	13.5	11.5	12.5
12	14.0	9.0	11.5	15.5	11.5	13.0	18.5	11.5	14.5	13.5	9.5	11.5
13	16.5	9.5	12.5	16.0	11.0	13.5	18.5	11.5	14.5	13.0	9.0	11.0
14	15.5	11.5	13.5	17.0	11.5	13.5	17.5	12.0	14.5	12.0	9.0	10.5
15	16.5	11.5	13.5	15.5	11.5	13.0	16.5	14.0	15.0	12.5	10.0	11.0
16	17.0	11.5	14.0	16.0	12.0	13.5	15.0	13.5	14.0	12.5	8.5	10.0
17	18.5	12.0	15.0	14.0	12.5	13.0	16.5	14.0	15.0	12.0	8.0	10.0
18	19.5	12.5	15.5	16.0	12.0	14.0	18.0	13.0	15.0	11.5	7.5	9.5
19	19.5	12.5	15.5	14.5	11.5	13.0	18.5	13.5	15.5	11.5	8.5	10.0
20	19.5	11.5	15.0	15.0	13.0	13.5	18.5	14.0	16.0	9.5	7.5	8.5
21	16.5	12.5	15.0	15.5	12.5	13.5	17.0	15.0	15.5	11.5	7.5	9.0
22	13.5	10.5	12.0	14.0	12.0	13.0	17.5	13.0	15.0	11.0	6.0	8.5
23	13.5	9.0	11.0	16.5	12.5	14.0	18.0	13.5	15.0	11.0	6.0	8.5
24	17.0	9.0	12.5	16.5	13.0	14.0	14.5	10.5	12.5	11.0	6.5	8.5
25	18.0	10.5	14.0	15.0	13.0	14.0	14.5	9.5	12.0	10.5	6.5	8.5
26	19.5	11.5	15.0	18.0	13.0	15.0	15.0	9.5	12.0	10.5	6.5	8.0
27	15.5	12.0	14.0	18.5	13.0	15.5	14.5	10.5	12.5	10.5	6.5	8.5
28	14.0	10.0	12.0	19.5	13.0	15.5	14.0	10.5	12.0	11.5	7.5	9.0
29	16.5	9.5	12.5	17.0	13.5	15.0	15.0	10.0	12.0	12.0	8.0	10.0
30	17.0	10.0	13.0	17.0	11.5	14.0	15.0	10.0	12.0	12.5	9.5	10.5
31	---	---	---	17.5	11.0	13.5	13.5	10.0	12.0	---	---	---
MONTH	19.5	9.0	13.2	19.5	10.5	13.9	19.5	9.5	14.4	16.5	6.0	10.9

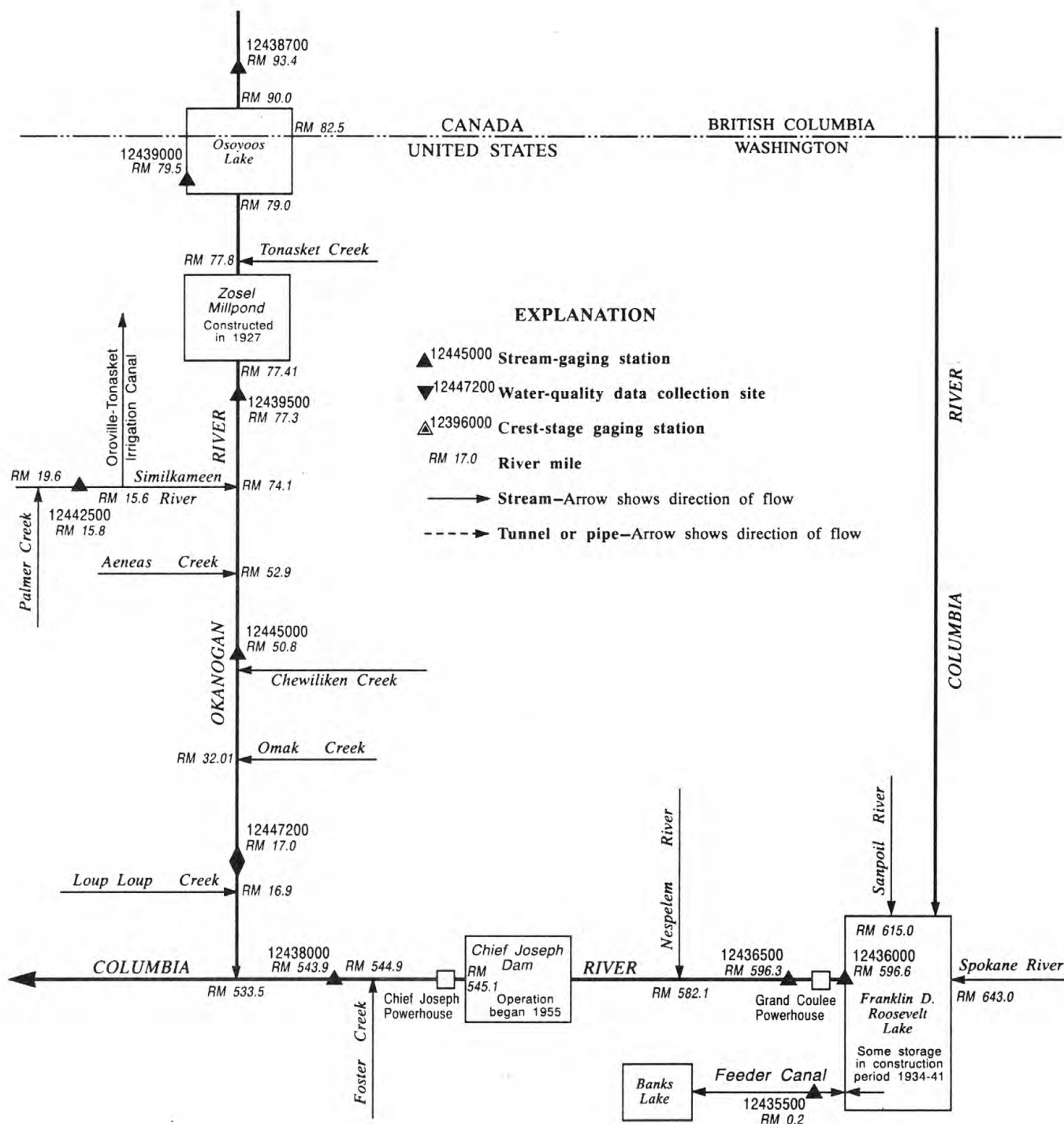


Figure 20. Gaging stations in Columbia River Basin from Franklin D. Roosevelt Feeder Canal to Columbia River at Bridgeport, and in Okanogan River Basin.

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.

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 (station 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 relations between pump operation and head.

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 17,000 ft³/s July 26, 27, 1986; minimum daily, -4,410 ft³/s Sept. 27, 1985, reverse flow from Banks Lake.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1580	.00	.00	.00	.00	.00	106	13600	5430	2710	10300	4690
2	2170	.00	.00	.00	.00	.00	305	13500	3210	5060	7460	3650
3	7080	.00	.00	.00	.00	.00	3340	9150	3220	12100	6850	3900
4	7100	.00	.00	.00	.00	.00	3220	5870	3540	11600	6720	6670
5	2970	.00	.00	.00	.00	.00	838	5510	6720	12100	7120	6960
6	1710	.00	.00	.00	.00	.00	.00	5970	6740	7710	7450	6970
7	1740	.00	.00	.00	.00	.00	.00	6610	4840	6530	10900	4350
8	1740	.00	.00	.00	.00	.00	.00	8010	4840	6530	10600	3480
9	2410	.00	.00	.00	.00	.00	385	4940	4840	7420	7820	2850
10	8850	.00	.00	.00	.00	.00	6560	4930	4840	10300	6830	1590
11	8780	.00	.00	.00	.00	.00	6700	4920	6300	10300	6840	1600
12	8770	.00	.00	.00	.00	.00	2820	4920	10500	7660	6090	1610
13	4680	.00	.00	95	.00	.00	1620	4930	10300	6980	6340	.00
14	6290	.00	.00	.00	.00	.00	1540	5300	7610	5940	10600	.00
15	8760	.00	.00	.00	.00	.00	1530	10300	6730	3840	10500	.00
16	7060	.00	.00	.00	.00	.00	3100	10300	6740	3920	6750	.00
17	1300	.00	.00	.00	.00	.00	6860	8150	6740	8800	5220	.00
18	.00	.00	.00	.00	.00	.00	6890	8440	7430	8820	5220	.00
19	.00	.00	.00	.00	.00	.00	3920	8430	12300	5960	4650	1610
20	.00	.00	.00	.00	.00	.00	3350	8430	12300	5020	4050	2550
21	.00	.00	.00	.00	.00	.00	3250	8880	8030	3780	8720	3530
22	.00	.00	.00	.00	.00	.00	2250	12200	6610	1790	8740	3530
23	.00	.00	.00	.00	.00	.00	1570	12000	6600	2380	6140	4710
24	.00	.00	.00	.00	.00	.00	1570	7100	6600	8820	5260	5500
25	.00	.00	.00	.00	.00	.00	1580	6550	7260	8830	5260	10500
26	.00	.00	.00	.00	.00	.00	1590	5370	12300	5960	5260	10500
27	.00	.00	.00	.00	.00	.00	5170	4800	12300	5210	5520	7650
28	.00	.00	.00	.00	.00	.00	7960	5220	8010	4810	8750	6690
29	.00	.00	.00	.00	---	.00	9290	8570	6580	3380	8760	6700
30	.00	.00	.00	.00	---	128	12500	8580	5210	4280	6140	6660
31	.00	---	.00	.00	---	.00	---	8590	---	10000	5260	---
TOTAL	82990.00	0.00	0.00	95.00	0.00	128.00	99814.00	240070	214670	208540	222120	118450.00
MEAN	2677	.0000	.0000	3.06	.0000	4.13	3327	7774	7156	6727	7165	3948
MAX	8850	.00	.00	95	.00	128	12500	13600	12300	12100	10900	10500
MIN	.00	.00	.00	.00	.00	.00	.00	4800	3210	1790	4050	.00
AC-FT	164600	.00	.00	188	.00	254	198000	476200	425800	413600	440600	234900
CAL YR 1992	TOTAL 1375737.00			MEAN 3759			MAX 13500	MIN .00	AC-FT 2729000			
WTR YR 1993	TOTAL 1186877.00			MEAN 3252			MAX 13600	MIN .00	AC-FT 2354000			

COLUMBIA RIVER MAIN STEM

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 above sea level (levels by Bureau of Reclamation). Prior to Apr. 24, 1942, nonrecording gage at site 2,000 ft upstream at same datum.

REMARKS.--Reservoir is formed by concrete dam; construction of dam began in 1934; completed in 1941; storage began early in construction period. Capacity, 5,022,000 acre-ft between elevations 1,208 ft, proposed lower limit of operation, and 1,288 ft, top of gates. Capacity increased to 5,185,000 acre-ft by use of 2 ft flashboards installed after high-water period each year beginning August 1961. Storage below 1,208 ft, 4,209,000 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 (station 12435500) and for irrigation of about 600,000 acres in the United States plus an additional 66,500 acres in Canada.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents recorded, 9,586,000 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, 9,355,000 acre-ft July 21, elevation, 1,289.52 ft; minimum contents, 6,758,000 acre-ft Mar. 5, elevation, 1,253.96 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	4,301,000	1,270.0	7,864,000
1,230.0	5,309,000	1,291.0	9,477,000
1,250.0	6,502,000		

ELEVATION (FEET NGVD), WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY OBSERVATION AT 24:00 VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1279.46	1286.10	1281.79	1272.80	1267.40	1255.38	1260.12	1283.23	1287.49	1284.54	1285.83	1285.79
2	1279.19	1285.55	1280.64	1272.17	1267.12	1254.88	1260.60	1283.57	1287.48	1283.89	1285.45	1285.54
3	1279.75	1285.37	1279.37	1271.60	1266.52	1254.81	1261.57	1283.06	1287.43	1283.24	1284.75	1285.18
4	1280.59	1285.32	1277.98	1270.40	1266.51	1254.59	1262.94	1283.30	1287.29	1283.86	1284.07	1285.17
5	1280.61	1285.49	1276.42	1269.26	1266.70	1254.42	1263.93	1283.46	1287.56	1283.64	1283.38	1285.43
6	1280.98	1285.57	1275.34	1268.28	1267.48	1254.69	1264.30	1283.42	1288.23	1283.28	1285.19	1285.72
7	1281.62	1286.07	1273.99	1267.54	1267.64	1255.03	1265.09	1283.65	1288.42	1283.76	1283.92	1285.02
8	1282.08	1286.42	1273.09	1267.68	1267.38	1255.07	1265.72	1283.81	1288.55	1283.94	1284.96	1284.45
9	1282.54	1285.78	1272.51	1267.90	1267.22	1254.86	1266.10	1283.58	1288.04	1284.00	1285.00	1284.06
10	1282.93	1285.09	1271.65	1267.78	1267.15	1254.91	1267.08	1283.11	1287.26	1284.78	1285.17	1284.13
11	1283.76	1284.48	1271.42	1267.21	1266.80	1255.05	1268.15	1282.76	1286.40	1285.13	1285.25	1284.86
12	1283.66	1284.28	1271.61	1266.46	1266.75	1255.12	1268.98	1282.73	1286.80	1286.03	1285.01	1286.04
13	1284.09	1284.07	1271.80	1265.67	1266.85	1255.42	1269.49	1283.55	1287.44	1286.84	1284.24	1286.11
14	1284.05	1284.40	1271.32	1265.54	1266.75	1255.89	1270.28	1285.29	1287.69	1287.06	1284.11	1285.94
15	1283.65	1284.92	1270.60	1265.50	1265.73	1255.44	1271.20	1285.39	1287.93	1287.21	1284.17	1285.93
16	1283.64	1284.41	1269.56	1265.76	1264.05	1255.08	1271.97	1285.78	1288.09	1287.28	1283.94	1286.07
17	1284.46	1284.49	1268.25	1266.10	1262.71	1255.17	1272.99	1285.80	1288.15	1288.19	1284.16	1285.76
18	1285.55	1284.44	1267.51	1265.64	1261.77	1255.51	1273.97	1285.69	1287.89	1288.58	1284.45	1286.35
19	1286.35	1283.72	1267.78	1265.48	1261.25	1255.94	1274.52	1285.50	1288.06	1289.15	1284.56	1286.80
20	1286.55	1283.34	1268.47	1266.00	1260.83	1256.20	1275.29	1285.72	1288.50	1289.28	1284.96	1286.00
21	1286.49	1283.04	1268.96	1265.94	1260.63	1256.45	1275.98	1285.90	1288.11	1289.34	1285.76	1285.42
22	1286.64	1283.20	1269.79	1265.69	1259.80	1255.83	1276.40	1285.78	1287.83	1289.31	1286.46	1285.20
23	1286.43	1282.76	1270.87	1265.49	1258.69	1255.54	1277.12	1285.81	1287.38	1288.77	1286.20	1284.61
24	1286.74	1282.11	1272.54	1266.07	1258.01	1255.50	1278.66	1285.56	1287.30	1288.73	1286.02	1284.22
25	1287.20	1282.20	1273.71	1266.61	1256.97	1255.73	1280.44	1285.10	1287.45	1288.87	1285.93	1284.30
26	1287.18	1283.19	1274.70	1267.02	1256.10	1256.51	1281.20	1285.18	1287.22	1288.60	1285.86	1284.80
27	1286.69	1283.61	1275.17	1267.16	1256.26	1257.68	1281.92	1285.50	1287.50	1288.04	1285.98	1284.28
28	1286.24	1283.75	1274.75	1267.42	1256.48	1258.97	1281.89	1286.11	1286.91	1286.94	1286.70	1283.93
29	1285.88	1283.39	1274.08	1267.34	---	1258.93	1282.00	1286.15	1286.46	1286.32	1287.14	1283.39
30	1285.72	1282.81	1273.42	1267.74	---	1259.05	1282.90	1286.78	1285.53	1285.78	1286.49	1282.86
31	1285.95	---	1272.71	1268.06	---	1259.51	---	1287.09	---	1285.54	1286.23	---
MAX	1287.20	1286.42	1281.79	1272.80	1267.64	1259.51	1282.90	1287.09	1288.55	1289.34	1287.14	1286.80
MIN	1279.19	1282.11	1267.51	1265.48	1256.10	1254.42	1260.12	1282.73	1285.53	1283.24	1283.19	1282.86
(†)	9067000	8820000	8061000	7725000	6925000	7129000	8827000	9158000	9033000	9089000	8823000	8823000
(‡)	+516000	-247000	-759000	-336000	-800000	+204000	+1698000	+331000	-125000	+1000	+55000	-266000

CAL YR 1992 MAX 1289.60 MIN 1262.57 AC-FT† -909000
WTR YR 1993 MAX 1289.34 MIN 1254.42 AC-FT† +272000

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

COLUMBIA RIVER MAIN STEM

263

12436500 COLUMBIA RIVER AT GRAND COULEE DAM, WA

LOCATION.--Lat 47°57'56", long 118°58'54", in SW 1/4 SE 1/4 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.--Daily discharge determined from flow through turbines plus spillway flow when present. 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 850 ft downstream at present datum. Jan. 1, 1936, to June 11, 1955, water-stage recorder at present site and datum. June 12, 1955, to July 18, 1988, water-stage recorder at present site and datum with auxiliary water-stage recorder 5.3 mi downstream at datum 1.42 ft lower.

REMARKS.--Flow is regulated by nine major reservoirs and numerous smaller reservoirs and powerplants. Feeder Canal diversion (station 12435500) for Columbia Basin project is used to irrigate approximately 600,000 acres in the United States. An additional 66,500 acres in Canada are irrigated by other diversions.

COOPERATION.--Discharge records provided by U.S. Bureau of Reclamation at Grand Coulee Dam through the Corps of Engineers, North Pacific Division, Reservoir Control Center. The U.S. Geological Survey made 5 discharge measurements at this site during the year.

AVERAGE DISCHARGE.--80 years, 108,700 ft³/s, 78,750,000 acre-ft/yr, unadjusted.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 637,800 ft³/s June 12, 1948, elevation, 987.90 ft; minimum discharge, 14,900 ft³/s Dec. 17, 1956, elevation, 934.37 ft; minimum daily discharge, 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, 163,000 ft³/s May 22; minimum daily discharge, 23,000 ft³/s Apr. 4.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	72300	56100	128000	96000	95100	97000	48100	65000	116000	128000	57700	78800
2	80300	86500	116000	116000	85500	74600	49500	57400	136000	117000	82400	74400
3	56100	79500	129000	113000	95700	63900	32300	103000	133000	113000	91600	81000
4	51600	77300	128000	139000	76400	67000	23000	75600	126000	72500	89200	51600
5	82900	73800	125000	140000	71400	54900	41300	88700	105000	113000	91000	43900
6	71300	69000	120000	148000	55300	44200	56000	90000	80900	112000	78500	49500
7	60400	50200	129000	153000	63300	38300	41600	94800	101000	94800	44100	91300
8	64700	47800	117000	126000	83500	57500	59600	90600	98100	102000	37700	88900
9	67800	87600	116000	113000	70800	62400	56700	111000	116000	108000	79700	84200
10	61400	99000	115000	123000	71600	54900	39800	115000	126000	80900	74900	67800
11	44600	93200	104000	134000	83300	51800	32000	122000	121000	97100	73600	44000
12	79700	75500	89200	135000	70100	53300	53900	124000	67500	94200	92100	32200
13	66800	77100	94600	126000	56200	42600	59800	99500	59100	96200	101000	71700
14	80800	58400	115000	104000	69000	36600	47700	79700	75600	108000	68500	74600
15	87700	61400	121000	96000	97700	67100	47700	130000	74500	109000	64100	73900
16	77600	87300	138000	86700	120000	69400	47300	123000	83700	114000	77700	65400
17	44500	74500	131000	78700	112000	51400	37600	141000	80600	87600	64800	82500
18	39400	79100	126000	106000	116000	43200	34700	151000	85100	103000	68100	38400
19	63400	97200	107000	98600	108000	45200	51700	152000	68100	92700	73800	45600
20	69800	97900	95500	63100	84400	38400	49300	144000	59500	96600	64100	94900
21	66000	99800	110000	94600	76800	37400	47000	147000	94100	97300	38700	74400
22	66300	83200	103000	87900	100000	67500	56000	163000	91600	94600	44800	66400
23	68500	117000	92800	95200	110000	59200	54500	151000	104000	100000	80500	78700
24	49700	120000	58200	63400	95300	61000	27900	158000	90600	75200	83800	77500
25	43600	106000	67800	68200	105000	49900	26900	161000	80100	64800	78000	46600
26	69500	59300	69200	72600	106000	40300	62000	145000	87700	89100	79700	37400
27	79100	73000	85800	77700	66600	29500	66600	131000	71800	94200	78300	84000
28	79900	75300	112000	75000	60400	25300	80000	115000	102000	106000	41400	75400
29	76200	92400	119000	73100	---	70100	78100	135000	110000	93900	41700	80700
30	62700	102000	123000	58100	---	68100	44300	111000	126000	92600	91300	79100
31	57100	---	121000	57100	---	49400	---	114000	---	67200	73900	---
TOTAL	2041700	2456400	3406100	3118000	2405400	1671400	1452900	3688300	2870600	3014500	2206700	2034800
MEAN	65860	81880	109900	100600	85910	53920	48430	119000	95690	97240	71180	67830
MAX	87700	120000	138000	153000	120000	97000	80000	163000	136000	128000	101000	94900
MIN	39400	47800	58200	57100	55300	25300	23000	57400	59100	64800	37700	32200
AC-FT	4050000	4872000	6756000	6185000	4771000	3315000	2882000	7316000	5694000	5979000	4377000	4036000
CAL YR 1992	TOTAL	33198700	MEAN	90710	MAX	180000	MIN	29000	AC-FT	65850000		
WTR YR 1993	TOTAL	30366800	MEAN	83200	MAX	163000	MIN	23000	AC-FT	60230000		

COLUMBIA RIVER MAIN STEM

12438000 COLUMBIA RIVER AT BRIDGEPORT, WA

LOCATION.--Lat 48°00'24", long 119°39'51", in SW 1/4 SW 1/4 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.--Daily discharge determined from flow through turbines plus spillway flow when present. Datum of gage is sea level (levels by Corps of Engineers). Apr. 4, 1952, to Aug. 4, 1988, water-stage recorder; May 26, 1967, to Aug. 4, 1988, auxiliary water-stage recorder 4,800 ft upstream from base gage at same datum.

REMARKS.--Flow regulated by nine major reservoirs and numerous smaller reservoirs and powerplants. Feeder Canal diversion (station 12435500) for Columbia Basin project is used to irrigate approximately 600,000 acres in the United States. An additional 66,500 acres in Canada are irrigated by other diversions.

COOPERATION.--Discharge records provided by Corps of Engineers at Chief Joseph Dam through the Corps of Engineers, North Pacific Division, Reservoir Control Center.

AVERAGE DISCHARGE.--41 years, 110,000 ft³/s, 79,700,000 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, 4,220 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, 166,000 ft³/s May 22; minimum daily, 27,600 ft³/s Apr. 4.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	73900	51500	130000	96300	96900	99800	51100	71100	118000	130000	60100	74700
2	83300	84800	120000	118000	90500	79400	50800	56300	144000	118000	83100	81400
3	57900	77500	132000	115000	97600	65800	31600	102000	133000	118000	94900	79300
4	49000	77800	132000	142000	82300	68100	27600	77200	130000	73100	89000	52900
5	81800	72600	129000	148000	70700	56800	50000	89200	107000	113000	93100	44500
6	67700	68600	121000	153000	55600	48200	52600	91600	81200	117000	82300	50900
7	62600	48900	134000	161000	65000	39000	47000	102000	107000	97000	44600	93000
8	63800	46600	122000	134000	85300	59100	59200	88800	96500	108000	38300	93100
9	63200	88600	119000	113000	72800	64200	58800	104000	119000	107000	83100	86100
10	57000	98200	117000	125000	72900	56900	39700	130000	129000	85800	76600	67700
11	43600	96700	105000	138000	85500	51700	32400	121000	123000	98100	74400	43800
12	77300	77500	88700	137000	71700	55400	56000	131000	70400	99500	94000	35900
13	67000	75600	93200	130000	56900	42000	56000	98400	55700	94200	103000	72500
14	76600	55300	117000	106000	70400	43900	47000	85300	78300	110000	70100	76400
15	89800	56100	122000	95900	98700	64800	49700	130000	76900	112000	66000	75100
16	75100	91100	140000	86400	127000	69700	50500	142000	83900	116000	80900	67100
17	42600	72400	133000	78200	119000	52700	39600	156000	83100	91000	66000	85600
18	37600	80700	130000	107000	120000	44900	36500	156000	90600	101000	71100	39500
19	63300	96200	108000	98800	111000	46100	53800	156000	69700	97500	76800	44600
20	67600	97900	94800	63700	86200	37700	49600	150000	63100	97500	62900	95700
21	70500	101000	111000	95300	77700	38100	53800	150000	93500	98100	40500	76700
22	64000	82900	104000	89600	103000	69900	58900	166000	94000	102000	47400	77500
23	66000	120000	92400	96000	112000	60400	54900	156000	104000	98600	79900	79300
24	50300	123000	54300	66300	105000	61800	31000	161000	93500	76200	85600	77100
25	42100	108000	65500	64900	109000	50200	30100	165000	84400	65900	80100	47700
26	73200	59800	67500	71400	111000	44900	61400	152000	86700	90700	85100	39300
27	77600	71400	88100	78100	67700	29500	65700	132000	76700	94700	77200	81400
28	81100	73500	114000	76400	61000	31800	75100	115000	102000	106000	45800	78200
29	76200	91500	120000	74800	---	68100	78200	131000	112000	96100	41600	81200
30	60500	103000	125000	60000	---	67700	42600	114000	130000	95000	88500	82700

OKANAGAN RIVER BASIN

265

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 U.S. Geological Survey. March 1944 to December 1948 and April 1952 to current year in reports of Water Survey of Canada.

GAGE.--Water-stage recorder.

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

COOPERATION.--Discharge records furnished by Water Resources Branch of Canada. This station is maintained by Canada under agreement with the United States subsequent to Feb. 14, 1965.

AVERAGE DISCHARGE.--43 years (water years 1945-47, 1953-56, 1958-93), 623 ft³/s, 451,400 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 3,740 ft³/s June 11, 1990, gage height, 7.52 ft; minimum, 55.9 ft³/s Jan. 30, 1963, gage height, 0.63 ft.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge 2,740 ft³/s July 21; minimum daily discharge, 110 ft³/s Mar. 29.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	342	348	183	e181	241	172	172	385	604	675	2260	2160
2	348	348	181	e181	234	173	175	378	611	692	2210	2150
3	377	329	178	182	203	172	179	378	646	713	2180	2130
4	417	210	178	178	184	170	183	487	657	703	2150	2050
5	395	198	176	157	183	171	183	1000	622	685	2130	2030
6	370	178	178	151	182	171	190	1470	579	780	2120	2020
7	369	176	179	164	181	170	190	1640	569	1070	2110	2000
8	377	176	180	176	179	170	206	1550	600	1120	2110	1900
9	374	173	178	172	178	171	236	1500	572	1120	2130	1590
10	375	173	177	167	178	171	236	1540	583	1130	2120	1370
11	376	173	178	177	176	170	232	1720	738	1260	2050	1140
12	383	173	177	171	177	169	225	1820	1160	1410	1980	1090
13	380	172	177	172	177	167	221	1850	1210	1470	1960	1010
14	383	193	178	175	173	168	222	1990	1310	1600	1970	540
15	389	191	178	178	170	168	226	2000	1670	1640	2040	420
16	389	198	179	180	168	167	238	1900	1710	1760	2110	371
17	385	203	178	179	168	168	246	1830	1510	1790	2120	364
18	383	200	150	180	169	168	255	1810	1160	1830	2110	357
19	392	207	178	180	171	168	255	1800	1090	1910	2080	367
20	366	204	184	182	174	169	254	1780	1060	2150	2060	396
21	352	204	182	187	173	168	264	1720	999	2740	2040	399
22	349	204	180	215	171	168	267	1700	1030	2400	2030	396
23	347	199	180	245	172	170	260	1630	971	2260	2020	385
24	346	202	182	245	174	168	272	1560	929	2140	2010	378
25	346	203	181	248	173	162	296	1450	844	2140	2020	381
26	348	199	180	243	171	140	320	1200	826	2090	2040	374
27	348	184	182	245	171	138	353	879	840	2120	2120	367
28	349	184	169	246	170	111	352	614	826	2090	2130	367
29	349	184	e184	247	---	110	348	572	812	2140	2140	385
30	348	184	e182	246	---	147	367	572	745	2160	2140	381
31	347	---	e181	240	---	154	---	565	---	2270	2160	---
TOTAL	11399	6170	5528	6090	5041	5029	7423	41290	27483	50058	64850	29268
MEAN	368	206	178	196	180	162	247	1332	916	1615	2092	976
MAX	417	348	184	248	241	173	367	2000	1710	2740	2260	2160
MIN	342	172	150	151	168	110	172	378	569	675	1960	357
AC-FT	22610	12240	10960	12080	10000	9980	14720	81900	54510	99290	128600	58050

CAL YR 1992 TOTAL 100993 MEAN 276 MAX 797 MIN 150 AC-FT 200300
WTR YR 1993 TOTAL 259629 MEAN 711 MAX 2740 MIN 110 AC-FT 515000

e Estimated

LOCATION.--Lat 48°57'24", long 119°26'18", in NW 1/4 NE 1/4 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 sea level. 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 upstream from station in Canada. Elevation may occasionally be affected by dam at Zosel's mill in Oroville and by backwater from the Similkameen River during extreme high water. Diversion of water from the Similkameen River to Osoyoos Lake occurs in summer months during drought conditions. U.S. Geological Survey satellite telemeter at station.

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 downstream from 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, 912.50 ft July 22, 23; minimum, 910.90 ft Jan. 19, Mar. 30.

ELEVATION (FEET NGVD), WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	911.44	911.24	911.09	910.93	911.22	910.99	910.98	912.19	912.16	912.19	912.05	911.77
2	911.40	911.25	911.09	910.93	911.24	910.98	911.02	912.20	912.28	912.20	912.05	911.77
3	911.36	911.25	911.05	910.93	911.25	910.98	911.07	912.22	912.39	912.21	912.02	911.76
4	911.34	911.28	911.03	910.94	911.26	910.97	911.14	912.24	912.38	912.24	912.00	911.73
5	911.32	911.27	911.02	910.93	911.26	910.98	911.18	912.28	912.30	912.23	911.97	911.72
6	911.28	911.26	911.02	910.93	911.25	910.97	911.22	912.30	912.23	912.20	911.95	911.74
7	911.24	911.26	911.02	910.93	911.25	910.97	911.26	912.27	912.22	912.21	911.93	911.76
8	911.21	911.25	911.01	910.93	911.25	910.97	911.32	912.24	912.17	912.25	911.89	911.78
9	911.20	911.23	911.02	910.94	911.24	910.97	911.39	912.17	912.13	912.28	911.88	911.77
10	911.19	911.20	911.03	910.94	911.24	910.97	911.45	912.16	912.21	912.26	911.87	911.74
11	911.21	911.19	911.04	910.94	911.23	910.96	911.51	912.23	912.28	912.28	911.84	911.75
12	911.22	911.18	911.03	910.93	911.22	910.96	911.56	912.32	912.34	912.32	911.80	911.76
13	911.23	911.16	911.02	910.93	911.20	910.96	911.61	912.28	912.31	912.33	911.82	911.76
14	911.22	911.15	911.02	910.93	911.19	910.96	911.65	912.17	912.27	912.32	911.84	911.74
15	911.21	911.14	911.02	910.93	911.17	910.96	911.70	912.19	912.29	912.27	911.91	911.73
16	911.21	911.16	911.01	910.93	911.15	910.96	911.77	912.20	912.31	912.20	911.94	911.70
17	911.22	911.17	911.03	910.93	911.14	910.95	911.83	912.14	912.31	912.17	911.95	911.66
18	911.22	911.18	911.02	910.93	911.12	910.95	911.94	912.04	912.25	912.15	912.01	911.63
19	911.24	911.20	910.98	910.92	911.11	910.95	912.00	911.95	912.19	912.14	912.22	911.61
20	911.25	911.22	910.98	910.95	911.10	910.95	912.04	911.99	912.16	912.21	912.21	911.63
21	911.27	911.22	910.98	910.97	911.10	910.95	912.10	912.07	912.23	912.40	912.10	911.61
22	911.26	911.27	910.98	910.97	911.08	910.95	912.15	912.11	912.33	912.49	912.00	911.61
23	911.25	911.25	910.98	910.98	911.06	910.97	912.18	912.10	912.37	912.48	911.92	911.60
24	911.25	911.24	910.99	911.01	911.05	910.97	912.21	912.07	912.34	912.41	911.83	911.59
25	911.26	911.21	910.98	911.03	911.04	910.97	912.26	912.09	912.26	912.33	911.79	911.59
26	911.25	911.18	910.98	911.05	911.03	910.97	912.31	912.10	912.18	912.24	911.77	911.58
27	911.24	911.16	910.98	911.09	911.01	910.96	912.32	912.26	912.17	912.17	911.80	911.57
28	911.23	911.15	910.99	911.13	911.00	910.94	912.23	912.24	912.16	912.12	911.82	911.56
29	911.23	911.11	910.97	911.15	---	910.92	912.18	912.20	912.16	912.07	911.82	911.55
30	911.24	911.09	910.95	911.17	---	910.92	912.20	912.16	912.18	912.04	911.82	911.55
31	911.24	---	910.94	911.20	---	910.95	---	912.12	---	912.03	911.78	---
MEAN	911.26	911.20	911.01	910.98	911.16	910.96	911.73	912.17	912.25	912.24	911.92	911.68
MAX	911.44	911.28	911.09	911.20	911.26	910.99	912.32	912.32	912.39	912.49	912.22	911.78
MIN	911.19	911.09	910.94	910.92	911.00	910.92	910.98	911.95	912.13	912.03	911.77	911.55
CAL YR 1992	MEAN 911.25		MAX 912.96		MIN 909.40							
WTR YR 1993	MEAN 911.55		MAX 912.49		MIN 910.92							

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

LOCATION.--Lat 48°55'51", long 119°25'09", in SE 1/4 SW 1/4 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 sea level. 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, both at same datum. Auxiliary water-stage recorder 0.5 mi downstream used during high-water periods; May 15, 1946 to Apr. 9, 1948, nonrecording gage at same site, both at datum 900.00 ft above sea level. 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 except for estimated daily discharges and backwater periods, May 12-31, June 1-5, which are fair. Diversions made to irrigate approximately 44,000 acres in Canada and minor diversions in the United States upstream from 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 dam at Oroville, 500 ft upstream from gage. Water temperature April 1986 to September 1987. U.S. Geological Survey satellite telemeter at station.

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

AVERAGE DISCHARGE.--51 years, 667 ft³/s, 483,200 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 3,730 ft³/s June 14, 1972; maximum elevation, 916.89 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 elevation, 903.98 ft Mar. 1, 1948, at datum then in use.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 2,610 ft³/s May 13, elevation 910.42 ft, result of regulation at Zosel dam; maximum elevation, 911.54 ft May 15; minimum discharge, 82 ft³/s Sept. 2, elevation 905.50 ft, result of regulation at Zosel dam.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	424	380	234	e210	215	220	98	391	322	514	2050	1980
2	419	380	236	e210	215	210	98	391	217	544	2050	1900
3	419	304	234	210	215	210	98	391	451	566	2020	1970
4	417	232	226	210	215	210	98	416	830	615	2000	1940
5	414	271	210	210	215	210	98	846	875	615	1990	1830
6	413	258	210	210	215	210	100	1540	691	610	1970	1750
7	405	239	211	210	215	210	100	1740	529	762	1970	1760
8	380	239	210	210	228	202	101	1730	522	880	1930	1720
9	369	243	210	210	244	194	103	1680	360	960	1930	1610
10	369	244	210	210	244	195	103	1490	294	1040	1930	1340
11	369	244	210	210	244	195	103	1460	484	1090	1900	1070
12	370	244	210	210	244	195	103	1580	815	1230	1790	948
13	373	244	210	210	244	195	100	2040	1430	1400	1740	899
14	371	241	210	210	244	195	100	1950	1290	1600	1770	675
15	365	239	210	210	243	196	100	1810	1460	1680	1830	451
16	358	239	210	210	239	195	103	1880	1540	1700	1940	449
17	361	232	211	210	239	195	103	1930	1560	1740	2010	411
18	365	222	215	210	239	195	105	1960	1290	1710	1450	386
19	369	219	215	210	239	195	122	1650	1150	1700	1510	386
20	369	219	215	210	239	195	159	1390	875	1730	2200	386
21	375	219	215	210	239	195	161	1390	743	2060	2140	386
22	382	222	215	210	239	193	163	1500	762	2330	2080	386
23	380	220	215	210	238	193	188	1620	898	2320	2040	386
24	382	258	215	210	234	195	205	1460	1070	2270	1970	364
25	381	278	210	213	234	195	205	1380	1110	2230	1870	353
26	380	269	210	210	234	192	271	726	950	2160	1800	353
27	380	269	210	211	234	191	554	590	767	2100	1820	368
28	380	269	e200	215	234	191	656	681	666	2080	1860	372
29	380	269	e200	215	---	159	458	664	592	2050	1910	329
30	380	249	e200	215	---	122	391	660	529	2060	1990	332
31	380	---	e200	215	---	94	---	609	---	2050	1990	---
TOTAL	11879	7655	6597	6534	6521	5942	5347	39545	25072	46396	59450	27490
MEAN	383	255	213	211	233	192	178	1276	836	1497	1918	916
MAX	424	380	236	215	244	220	656	2040	1560	2330	2200	1980
MIN	358	219	200	210	215	94	98	391	217	514	1450	329
AC-FT	23560	15180	13090	12960	12930	11790	10610	78440	49730	92030	117900	54530

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1943 - 1993, BY WATER YEAR (WY)

	MEAN	520	490	473	465	557	617	696	1084	1116	791	641	549
MAX	1430	1551	1404	1190	1185	1918	2475	2870	3107	2439	1918	1482	1482
(WY)	1949	1949	1949	1949	1983	1983	1983	1983	1990	1990	1993	1993	1948
MIN	179	148	149	162	140	74.1	115	180	111	126	150	81.7	81.7
(WY)	1989	1971	1971	1968	1971	1977	1968	1992	1992	1947	1963	1944	1944

SUMMARY STATISTICS	FOR 1992 CALENDAR YEAR	FOR 1993 WATER YEAR	WATER YEARS 1943 - 1993
ANNUAL TOTAL	91204	248428	
ANNUAL MEAN	249	681	667
HIGHEST ANNUAL MEAN			1432
LOWEST ANNUAL MEAN			213
HIGHEST DAILY MEAN	711	2330	3680
LOWEST DAILY MEAN	83	94	-2270
ANNUAL SEVEN-DAY MINIMUM	84	98	-1080
ANNUAL RUNOFF (AC-FT)	180900	492800	483200
10 PERCENT EXCEEDS	380	1930	1420
50 PERCENT EXCEEDS	244	358	504
90 PERCENT EXCEEDS	91	195	199

e Estimated

OKANOGAN RIVER BASIN

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

LOCATION.--Lat 48°59'05", long 119°37'02", in NW 1/4 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.

REVISED RECORDS.--WSP 1183: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 1,137.70 ft above sea level. Prior to Sept. 11, 1928, staff gages at sites 7 mi downstream (below Oroville-Tonasket Irrigation District canal) at various datums.

REMARKS.--Records good except for estimated daily discharges, which are fair. Flow at high stages regulated by natural diversion into and release from Palmer Lake of about 6,000 acre-feet. Several small diversions upstream from 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. Water temperature April 1986 to September 1987.

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

AVERAGE DISCHARGE.--82 years (water years 1912-93), 2,286 ft³/s, 1,656,000 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; minimum gage height, 1.55 ft Jan. 31, 1988, result of freezeup.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 14,700 ft³/s May 15 gage height, 10.97 ft; minimum daily discharge, 190 ft³/s Dec. 30, result of freezeup; minimum recorded instantaneous discharge, 159 ft³/s Feb. 24, but may have been less during periods of ice effect.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	411	469	e440	e250	e540	e290	613	2050	6150	1900	3770	1260
2	384	471	e420	e300	516	e310	616	2290	6930	1810	3460	1180
3	363	480	e360	e350	482	349	634	2490	6650	1820	3200	1120
4	346	484	e315	e370	464	360	656	2420	6470	1780	2970	1070
5	332	480	e290	e370	449	369	669	2480	6060	1670	2830	1020
6	327	487	e270	e250	435	379	669	2920	5440	1600	2710	978
7	320	501	e300	e250	436	408	659	3770	4960	1530	2530	939
8	322	519	e350	e300	436	462	667	3710	4820	1520	2350	904
9	322	681	e350	e370	439	522	714	3360	4440	1470	2200	867
10	328	681	e350	e370	435	535	799	3250	4170	1410	2060	837
11	323	600	e350	e370	441	517	865	4450	4280	1620	1960	804
12	317	562	e350	e370	442	490	879	7880	4140	1760	1890	780
13	320	578	e350	e370	434	476	885	11100	4140	2210	1780	792
14	321	556	e320	e380	418	476	877	13200	3850	2280	1690	809
15	395	559	e310	e450	376	481	859	14000	3800	2340	1700	795
16	409	585	e310	e430	e260	482	869	14000	4060	2360	2190	823
17	393	600	e310	e410	e210	467	945	13600	3860	2380	2450	823
18	388	614	e310	e430	e210	449	1010	12900	3570	2440	2210	777
19	385	641	e300	e430	e240	444	1120	12800	3340	2560	2040	754
20	426	627	e325	e430	e280	444	1170	13200	3110	2730	1920	771
21	548	606	e330	e450	e260	442	1220	13200	2920	4430	1820	787
22	597	575	e330	e470	e240	440	1310	11100	2830	4860	1820	803
23	630	558	e320	e350	e250	468	1440	9470	2690	4550	1690	825
24	617	501	e310	e420	e260	569	1520	8320	2570	4390	1660	815
25	590	394	e320	e480	e220	737	1560	7710	2450	4200	1640	791
26	557	328	e320	e540	e230	745	1720	7420	2280	4050	1580	759
27	534	343	e250	e540	e245	714	1820	7260	2280	3730	1500	735
28	510	458	e220	e540	e265	684	1780	6870	2330	3450	1410	713
29	495	524	e200	e540	---	654	1780	6720	2150	4200	1380	690
30	492	499	e190	e540	---	636	1850	6630	2020	4790	1410	666
31	478	---	e220	e540	---	625	---	5810	---	4180	1340	---
TOTAL	13180	15961	9690	12660	9915	15424	32175	236380	118760	86020	65160	25687
MEAN	425	532	313	408	354	498	1072	7625	3959	2775	2102	856
MAX	630	681	440	540	540	745	1850	14000	6930	4860	3770	1260
MIN	317	328	190	250	210	290	613	2050	2020	1410	1340	666
AC-FT	26140	31660	19220	25110	19670	30590	63820	468900	235600	170600	129200	50950

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1929 - 1993, BY WATER YEAR (WY)

	701	914	780	641	669	726	1998	7915	8823	3024	946	615
MEAN	701	914	780	641	669	726	1998	7915	8823	3024	946	615
MAX	2265	4531	2185	2067	2235	2206	13510	15360	24910	8495	2625	1614
(WY)	1960	1991	1981	1981	1935	1934	1934	1972	1972	1948	1948	1954
MIN	239	254	231	215	217	341	427	2788	2508	665	295	219
(WY)	1988	1988	1988	1930	1929	1988	1929	1984	1992	1940	1940	1940

SUMMARY STATISTICS	FOR 1992 CALENDAR YEAR	FOR 1993 WATER YEAR	WATER YEARS 1929 - 1993
ANNUAL TOTAL	524899	641012	
ANNUAL MEAN	1434	1756	2316
HIGHEST ANNUAL MEAN			4831
LOWEST ANNUAL MEAN			1152
HIGHEST DAILY MEAN	8360	May 8	14000
LOWEST DAILY MEAN	190	Dec 30	190
ANNUAL SEVEN-DAY MINIMUM	246	Dec 25	233
ANNUAL RUNOFF (AC-FT)	1041000	1271000	1678000
10 PERCENT EXCEEDS	3640	4230	6800
50 PERCENT EXCEEDS	688	667	793
90 PERCENT EXCEEDS	341	319	372

e Estimated

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.

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 above sea level.

REMARKS.--Records excellent except for estimated daily discharges, which are fair. Diversions upstream from station for irrigation of about 10,700 acres in the United States and 55,000 acres in Canada. Flow affected by regulation of Okanagan and Skaha Lakes and by natural storage in other lakes. U.S. Geological Survey satellite telemeter at station. Water temperature April 1986 to September 1987.

AVERAGE DISCHARGE.--64 years, 2,926 ft³/s, 2,120,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 44,700 ft³/s June 2, 1972, gage height, 22.54 ft; minimum discharge recorded, 126 ft³/s Sept. 5, 1931, gage height, 3.43 ft.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 15,600 ft³/s May 16, gage height, 13.58 ft (from outside highwater mark); minimum daily discharge, 390 ft³/s Dec. 30.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	885	934	807	e430	e730	e520	834	2380	6030	2620	5850	3380
2	846	926	781	e500	e700	e540	822	2590	6760	2510	5530	3270
3	816	920	e720	e560	e680	e580	839	2800	6820	2480	5250	3210
4	787	822	e640	e580	e660	e580	870	2900	6990	2550	5000	3170
5	768	806	e540	e580	e660	e590	876	2950	6910	2490	4820	3060
6	759	825	e480	e460	e650	e610	883	3820	6300	2370	4710	2860
7	753	817	e510	e460	e670	e660	887	4910	5550	2320	4580	2810
8	743	813	e560	e510	e680	730	889	5480	5270	2420	4370	2790
9	738	837	e580	e580	e680	766	898	5160	5060	2530	4200	2640
10	764	984	e580	e580	e680	810	932	4830	4520	2490	4040	2510
11	768	980	e570	e580	e680	816	1020	4800	4630	2630	3940	2140
12	764	902	e560	e580	e680	799	1080	7170	4800	2900	3840	1870
13	754	871	e560	e580	e680	771	1080	10600	5310	3310	3630	1810
14	750	881	e540	e580	e660	766	1080	e14000	5150	3800	3560	1760
15	752	861	e530	e660	e620	773	1070	e14900	5040	3920	3560	1460
16	813	879	e520	e640	e500	759	1050	e15100	5300	4070	3820	1360
17	826	906	e520	e620	e450	758	1080	e15000	5400	4090	4410	1380
18	811	898	e530	e640	e450	756	1170	e14900	5000	4130	4270	1300
19	808	923	e520	e640	e490	747	1220	e14500	4580	4220	3520	1230
20	801	935	e540	e640	e520	750	1370	e14000	4190	4350	3900	1240
21	857	928	e550	e660	e500	748	1430	e14000	3820	5080	4110	1250
22	979	910	e550	e680	e490	756	1500	e12500	3710	6960	4030	1270
23	1040	855	e540	e570	e500	766	1600	e10500	3680	6760	3900	1280
24	1070	835	e530	e640	e500	795	1760	e9600	3700	6570	3770	1290
25	1060	822	e530	e690	e470	898	1840	9030	3690	6350	3670	1260
26	1030	729	e530	e750	e480	1040	1920	8380	3460	6200	3520	1230
27	1010	686	e500	e750	e490	1040	2190	7490	3180	5870	3430	1200
28	979	688	e430	e750	e510	1020	2570	7450	3130	5560	3410	1200
29	968	790	e410	e750	---	990	2440	7090	2980	5450	3370	1130
30	964	851	e390	e750	---	921	2290	7160	2750	6630	3450	1080
31	947	---	e420	e750	---	863	---	6550	---	6270	3490	---
TOTAL	26610	25814	16968	19140	16460	23918	39490	262540	143710	129900	126950	57440
MEAN	858	860	547	617	588	772	1316	8469	4790	4190	4095	1915
MAX	1070	984	807	750	730	1040	2570	15100	6990	6960	5850	3380
MIN	738	686	390	430	450	520	822	2380	2750	2320	3370	1080
AC-FT	52780	51200	33660	37960	32650	47440	78330	520700	285000	257700	251800	113900

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1929 - 1993, BY WATER YEAR (WY)

MEAN	1215	1447	1311	1153	1263	1373	2620	8492	9767	3699	1451	1075
MAX	2849	4618	3105	2564	2964	3131	13220	16190	27720	10210	4995	3039
(WY)	1960	1991	1960	1981	1991	1991	1934	1972	1972	1972	1993	1948
MIN	403	413	399	360	532	525	770	3790	2650	605	231	231
(WY)	1932	1930	1930	1930	1937	1931	1931	1941	1992	1940	1931	1940

SUMMARY STATISTICS	FOR 1992 CALENDAR YEAR	FOR 1993 WATER YEAR	WATER YEARS 1929 - 1993
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ANNUAL TOTAL	626728		888940				
ANNUAL MEAN	1712		2435			2926	
HIGHEST ANNUAL MEAN						6019	1972
LOWEST ANNUAL MEAN						1142	1931
HIGHEST DAILY MEAN	8180	May 8	15100	May 16	44200		Jun 2 1972
LOWEST DAILY MEAN	390	Dec 30	390	Dec 30	132		Sep 5 1931
ANNUAL SEVEN-DAY MINIMUM	459	Dec 25	440	Dec 27	146		Aug 31 1931
ANNUAL RUNOFF (AC-FT)	1243000		1763000		2120000		
30 PERCENT EXCEEDS	369		550		750		
50 PERCENT EXCEEDS	1050		984		1440		
90 PERCENT EXCEEDS	557		540		640		

e Estimated

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 SW 1/4 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 above sea level. April 1958 to November 1965, water-stage recorder at site 3.9 mi downstream at sea level.

REMARKS.--Water-discharge records excellent except for estimated daily discharges, which are fair. Diversions upstream from 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. U.S. Geological Survey satellite telemeter at station.

AVERAGE DISCHARGE.--35 years (water years 1959-93), 3,043 ft³/s, 2,205,000 acre-ft/yr, includes records for "near Malott" site located 3.9 miles downstream, water years 1959-65.

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, 15,700 ft³/s May 16, gage height, 11.95 ft; minimum daily discharge, 440 ft³/s Dec. 31.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	931	1000	899	e470	e850	e570	904	2270	6460	2610	6240	3370
2	896	991	880	e490	e820	e590	889	2420	6660	2500	5860	3260
3	870	975	835	e540	e800	e610	885	2620	7200	2450	5530	3120
4	841	971	797	e620	e760	e640	918	2850	7240	2470	5250	3130
5	812	869	663	e660	e760	e660	946	2860	7360	2500	5010	3050
6	795	863	e580	e670	e760	e670	937	3290	6890	2370	4850	2890
7	784	880	e530	e540	e760	e700	937	4450	6130	2270	4710	2750
8	784	880	e570	e530	e740	e730	938	5440	5520	2280	4510	2720
9	774	886	e600	e600	e760	e770	960	5420	5370	2360	4300	2640
10	770	905	e630	e670	e780	830	977	5070	4870	2400	4140	2500
11	786	1030	e630	e670	e780	835	1010	4760	4610	2450	3980	2270
12	802	1020	e630	e670	e780	837	1080	5990	4870	2710	3870	1990
13	803	951	e630	e670	e780	823	1120	9490	5150	2990	3690	1820
14	792	927	e630	e670	e780	802	1120	12700	5520	3530	3540	1780
15	792	927	e600	e670	e760	802	1120	14600	5210	3860	3530	1700
16	800	922	e580	e740	e700	803	1100	15500	5320	4040	3610	1440
17	857	940	e580	e740	e560	784	1100	15600	5590	4090	4140	1400
18	871	946	e580	e720	e520	793	1170	15300	5410	4160	4500	1390
19	863	965	e580	e740	e520	793	1250	14700	4830	4200	3750	1320
20	863	976	e580	e740	e550	787	1280	14300	4460	4330	3610	1270
21	863	993	e590	e740	e600	783	1410	14400	4030	4620	4150	1270
22	912	998	e610	e740	e580	782	1460	14200	3800	6620	4060	1270
23	1020	958	e610	e780	e570	829	1540	12600	3720	7200	3980	1280
24	1060	909	e590	e670	e580	863	1650	11000	3690	6950	3790	1290
25	1080	893	e580	e730	e580	864	1800	9700	3680	6780	3670	1300
26	1080	872	e590	e790	e540	966	1870	9050	3570	6560	3550	1280
27	1060	794	e590	e860	e550	1060	1990	8050	3280	6280	3420	1250
28	1040	758	e570	e860	e560	1060	2300	7850	3080	5900	3360	1230
29	1020	757	e490	e860	---	1040	2470	7550	3020	5640	3330	1210
30	1020	860	e460	e860	---	1020	2330	7450	2810	6360	3310	1140
31	1010	---	e440	e860	---	954	---	7220	---	6790	3410	---
TOTAL	27651	27616	19124	21570	19080	25050	39461	268700	149350	130270	128650	58330
MEAN	892	921	617	696	681	808	1315	8668	4978	4202	4150	1944
MAX	1080	1030	899	860	850	1060	2470	15600	7360	7200	6240	3370
MIN	770	757	440	470	520	570	885	2270	2810	2270	3310	1140
AC-FT	54850	54780	37930	42780	37850	49690	78270	533000	296200	258400	255200	115700

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1966 - 1993, BY WATER YEAR (WY)

	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993
MEAN	1139	1422	1229	1187	1367	1652	2560	8370	10260	4124	1672	1146																
MAX	1714	4747	2544	2970	2979	3946	5751	16420	29290	10990	4150	2321																
(WY)	1983	1991	1981	1984	1991	1983	1983	1972	1972	1972	1993	1982																
MIN	605	574	565	540	618	601	975	4319	2625	938	434	372																
(WY)	1988	1988	1971	1988	1988	1988	1970	1977	1992	1977	1977	1988																

SUMMARY STATISTICS

FOR 1992 CALENDAR YEAR

FOR 1993 WATER YEAR

WATER YEARS 1966 - 1993

	1992	1993	1966-1993
ANNUAL TOTAL	633943	914852	
ANNUAL MEAN	1732	2506	3050
HIGHEST ANNUAL MEAN			6312
LOWEST ANNUAL MEAN			1565
HIGHEST DAILY MEAN	8340	15600	45300
LOWEST DAILY MEAN	440	440	288
ANNUAL SEVEN-DAY MINIMUM	483	494	296
ANNUAL RUNOFF (AC-FT)	1257000	1815000	2210000
10 PERCENT EXCEEDS	3730	5940	7690
50 PERCENT EXCEEDS	1110	1020	1450
90 PERCENT EXCEEDS	610	600	680

e Estimated

OKANOGAN RIVER BASIN

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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 RECORDS

DATE	TIME	DIS-CHARGE, INST. (CUBIC FEET PER SECOND)	SPE-CIFIC CON-DUCT-ANCE (US/CM)	PH (STAND-ARD UNITS)	TEMPER-ATURE WATER (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)
OCT 13...	1445	801	321	8.4	12.0	1.0	10.8	102	K15	K10
FEB 08...	1130	740	293	8.2	0.0	1.4	13.6	96	K1	K15
JUN 07...	1250	6080	126	8.0	17.5	1.0	9.1	99	100	100
AUG 09...	1315	4300	201	8.2	22.5	0.6	8.1	97	28	43
DATE	HARD-NESS (MG/L AS CaCO3)	HARD-NESS, NONCAR-BONATE (MG/L AS CaCO3)	CALCIUM, DIS-SOLVED (MG/L AS Ca)	MAGNE-SIUM, DIS-SOLVED (MG/L AS Mg)	SODIUM, DIS-SOLVED (MG/L AS Na)	SODIUM PERCENT	SODIUM AD-SORP-TION RATIO	POTAS-SIUM, DIS-SOLVED (MG/L AS K)	ALKA-LINITY, DIS IT, FIELD (MG/L AS CaCO3)	BICAR-BONATE, DIS IT, FIELD (MG/L AS HCO3)
OCT 13...	140	21	38	11	11	14	0.4	2.2	119	142
FEB 08...	130	12	35	9.2	9.2	14	0.4	1.9	113	138
JUN 07...	54	3	16	3.3	3.7	13	0.2	0.9	51	62
AUG 09...	87	9	25	6.0	6.7	14	0.3	1.6	80	96
DATE	CAR-BONATE, DIS IT, FIELD (MG/L AS CO3)	SULFATE, DIS-SOLVED (MG/L AS SO4)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)	FLUO-RIDE, DIS-SOLVED (MG/L AS F)	SILICA, DIS-SOLVED (MG/L AS SiO2)	SOLIDS, RESIDUE AT 180 DEG. C (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, NITRITE-DIS-SOLVED (MG/L AS N)
OCT 13...	2	36	3.2	0.2	8.4	177	182	0.24	383	<0.01
FEB 08...	0	33	3.1	0.1	8.5	163	169	0.22	489	0.01
JUN 07...	0	9.9	1.3	<0.1	8.8	75	75	0.10	1230	<0.01
AUG 09...	0	18	1.9	0.1	9.7	127	116	0.17	1470	<0.01
DATE	NITRO-GEN, NO2+NO3, DIS-SOLVED (MG/L AS N)	NITRO-GEN, AM-MONIA, 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)	BARIUM, DIS-SOLVED (UG/L AS BA)	COBALT, DIS-SOLVED (UG/L AS CO)	IRON, DIS-SOLVED (UG/L AS FE)
OCT 13...	<0.05	0.06	0.2	0.04	0.03	<0.01	<10	38	<3	7
FEB 08...	0.15	0.02	<0.2	0.02	0.02	<0.01	20	33	<3	8
JUN 07...	<0.05	0.02	<0.2	0.08	<0.01	<0.01	20	19	<3	37
AUG 09...	<0.05	0.02	<0.2	<0.01	<0.01	0.01	10	25	<3	9
DATE	LITHIUM, DIS-SOLVED (UG/L AS LI)	MANGA-NESE, DIS-SOLVED (UG/L AS MN)	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)	SEDI-MENT, SUS-PENDED (MG/L)	SEDI-MENT, DIS-CHARGE, SUS-PENDED (T/DAY)
OCT 13...	<4	11	<10	1	<1	<1	340	<6	11	24
FEB 08...	<4	10	<10	<1	<1	<1	290	<6	2	4.0
JUN 07...	<4	4	<10	<1	<1	<1	120	<6	54	886
AUG 09...	<4	2	<10	<1	<1	<1	190	<6	19	221

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

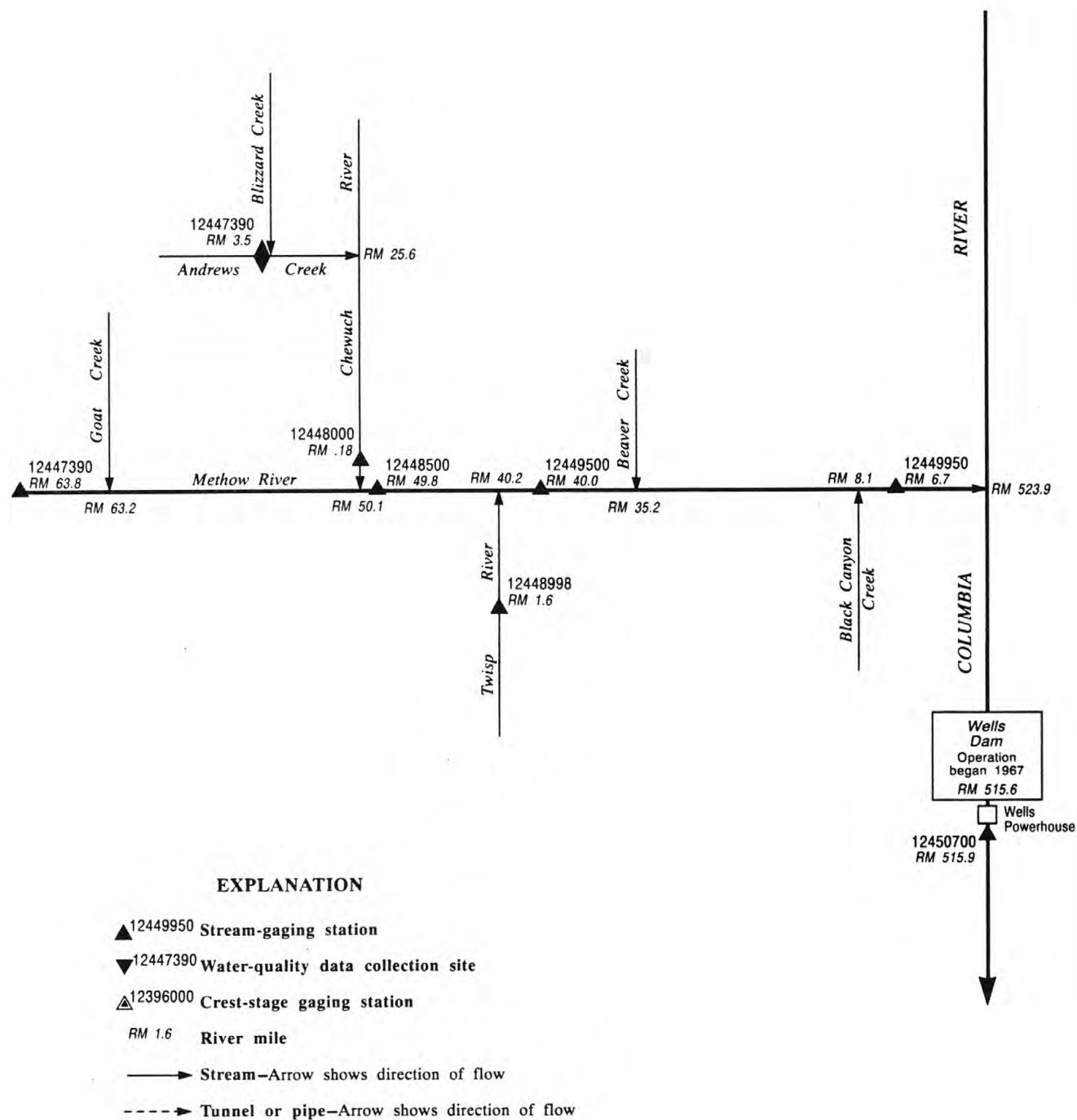


Figure 21. Gaging stations in Methow River Basin.

METHOW RIVER BASIN

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12447383 METHOW RIVER ABOVE GOAT CREEK NEAR MAZAMA, WA

LOCATION.--Lat 48°34'32", long 120°23'05", in NE 1/4 SE 1/4 sec.31, T.36 N., R.20 E., Okanogan County, Hydrologic Unit 17020008, on left bank, 0.6 mi upstream from Goat Creek, and 1.5 mi southeast of Mazama, and at mile 63.8.

DRAINAGE AREA.--373 mi².

PERIOD OF RECORD.--April 1991 to current year.

GAGE.--Water-stage recorder and crest-stage gage. Elevation of gage is 2,040 f, above sea level, from topographic map. Crest-stage gage since September 1992.

REMARKS.--Records fair. No known regulation. Several diversions for irrigation upstream from station. U.S. Geological Survey satellite telemeter at station.

AVERAGE DISCHARGE.--2 years (water years 1992-93), 358 ft³/s, 13.02 in/yr, 259,400 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 6,280 ft³/s May 15, 1993, gage height, 19.46 ft, from crest-stage gage; maximum gage height, 19.6 ft May 21, 1991, from outside high-water mark; minimum discharge, no flow for all or part of many days during the 1992 and 1993 water years.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 6,280 ft³/s May 15, gage height, 19.46 ft, from crest-stage gage; minimum discharge, no flow for all or part of many days October to April.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.2	.00	.00	.00	.00	.00	.00	e170	e2190	e240	487	84
2	1.6	.00	.00	.00	.00	.00	.00	e210	e1950	e260	440	79
3	3.2	.00	.00	.00	.00	.00	.00	e240	e1790	e270	393	77
4	3.4	.00	.00	.00	.00	.00	.00	e280	e1690	e260	365	69
5	2.9	.00	.00	.00	.00	.00	.00	e320	e1600	e230	347	65
6	2.1	.00	.00	.00	.00	.00	.00	e370	e1550	e220	318	59
7	2.3	.00	.00	.00	.00	.00	.00	e420	e1450	e210	290	52
8	1.4	.00	.00	.00	.00	.00	.00	e390	e1300	e210	268	49
9	.00	.00	.00	.00	.00	.00	.00	e380	e1200	e200	243	45
10	.00	.00	.00	.00	.00	.00	.00	e370	e1180	e190	224	40
11	.00	.00	.00	.00	.00	.00	.00	e700	e1150	e190	207	38
12	.00	.00	.00	.00	.00	.00	.00	e1200	e1140	e220	197	36
13	.00	.00	.00	.00	.00	.00	.00	e2000	e1040	e240	180	32
14	.00	.00	.00	.00	.00	.00	.00	e3500	e1040	e230	170	33
15	.00	.00	.00	.00	.00	.00	.00	e5400	e1080	e216	194	37
16	.00	.00	.00	.00	.00	.00	.00	e4500	e1080	e205	188	32
17	.00	.00	.00	.00	.00	.00	.00	e4300	e1000	e207	174	29
18	.00	.00	.00	.00	.00	.00	.00	e4100	e900	e249	177	27
19	.00	.00	.00	.00	.00	.00	.00	e4500	e820	e257	168	23
20	.00	.00	.00	.00	.00	.00	.00	e4900	e720	e399	160	20
21	.00	.00	.00	.00	.00	.00	.00	e4500	e660	e648	153	18
22	.00	.00	.00	.00	.00	.00	.00	e2620	e680	e692	143	16
23	.00	.00	.00	.00	.00	.00	.00	e2150	e600	e656	148	15
24	.00	.00	.00	.00	.00	.00	e18	e1930	e540	e574	136	14
25	.00	.00	.00	.00	.00	.00	e57	e1960	e450	e511	126	12
26	.00	.00	.00	.00	.00	.00	e77	e1950	e400	e475	118	11
27	.00	.00	.00	.00	.00	.00	e90	e2230	e450	e430	108	9.9
28	.00	.00	.00	.00	.00	.00	e103	e2150	e400	e435	104	8.6
29	.00	.00	.00	.00	.00	.00	e123	e1960	e360	e679	105	7.9
30	.00	.00	.00	.00	.00	.00	e145	e1660	e290	e642	98	6.4
31	.00	.00	.00	.00	.00	.00	.00	e1590	.00	e551	92	.00
TOTAL	19.10	0.00	0.00	0.00	0.00	0.00	613.00	62950	30700	10996	6521	1044.8
MEAN	.62	.000	.000	.000	.000	.000	20.4	2031	1023	355	210	34.8
MAX	3.4	.00	.00	.00	.00	.00	145	5400	2190	692	487	84
MIN	.00	.00	.00	.00	.00	.00	.00	170	290	190	92	6.4
AC-FT	38	.00	.00	.00	.00	.00	1220	124900	60890	21810	12930	2070
CFSM	.00	.00	.00	.00	.00	.00	.05	5.44	2.74	.95	.56	.09
IN.	.00	.00	.00	.00	.00	.00	.06	6.28	3.06	1.10	.65	.10

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1991 - 1993, BY WATER YEAR (WY)

	5.60	5.82	1.27	.000	.93	203	422	2080	1716	912	239	41.2
MEAN	5.60	5.82	1.27	.000	.93	203	422	2080	1716	912	239	41.2
MAX	10.6	11.6	2.54	.000	1.83	405	823	2430	2876	1945	391	73.8
(WY)	1992	1992	1992	1992	1992	1992	1992	1991	1991	1991	1991	1991
MIN	.62	.000	.000	.000	.000	.000	20.4	1780	1023	355	118	14.9
(WY)	1993	1993	1993	1992	1993	1993	1993	1992	1993	1993	1992	1992

SUMMARY STATISTICS

FOR 1992 CALENDAR YEAR

FOR 1993 WATER YEAR

WATER YEARS 1991 - 1993

ANNUAL TOTAL	147691.30	112843.90	357
ANNUAL MEAN	404	309	406
HIGHEST ANNUAL MEAN			309
LOWEST ANNUAL MEAN			309
HIGHEST DAILY MEAN	3650	5400	5460
LOWEST DAILY MEAN	.00	.00	.00
ANNUAL SEVEN-DAY MINIMUM	.00	.00	.00
ANNUAL RUNOFF (AC-FT)	292900	223800	258900
ANNUAL RUNOFF (CFSM)	1.08	.83	.96
ANNUAL RUNOFF (INCHES)	14.73	11.25	13.02
10 PERCENT EXCEEDS	1290	1020	1870
50 PERCENT EXCEEDS	30	.00	76
90 PERCENT EXCEEDS	.00	.00	.00

e Estimated

METHOW RIVER BASIN

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

LOCATION.--Lat 48°49'23", long 120°08'41", in NE 1/4 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 and crest-stage gage. Elevation of gage is 4,300 ft above sea level, from topographic map.

REMARKS.--Water-discharge records fair except for estimated daily discharges, which are poor. No regulation or diversion.

AVERAGE DISCHARGE.--25 years, 30.4 ft³/s, 18.68 in/yr, 22,020 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 discharge, 1.2 ft³/s Nov. 4, Dec. 30, 1968, Nov. 20, 1970, Apr. 7, 1975.

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

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
May 19	2000	*334	2.78	No other peak greater than base discharge.			
May 19	--	(a)	*3.04				

Minimum daily discharge, 2.5 ft³/s Mar. 30, Apr. 2, 3.

(a) From crest-stage gage.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	4.3	4.9	3.6	3.6	3.5	3.4	2.6	6.3	162	24	43	15
2	4.2	4.6	3.6	3.6	3.5	3.4	2.5	6.5	131	28	39	14
3	4.1	4.1	3.6	3.6	3.5	3.3	2.5	6.6	116	26	36	14
4	4.1	4.5	3.6	3.6	3.5	3.3	2.7	7.4	106	24	39	13
5	4.1	4.3	3.6	3.6	3.5	3.3	2.8	11	97	22	42	13
6	4.1	4.2	3.5	3.6	3.5	3.3	2.7	19	89	21	37	12
7	4.1	4.4	3.5	3.6	3.5	3.2	2.7	22	86	20	32	12
8	4.1	4.5	3.5	3.6	3.4	3.2	2.7	17	77	20	30	11
9	4.1	3.9	3.5	3.6	3.4	3.1	2.7	16	77	19	28	11
10	4.0	3.9	3.5	3.6	3.3	e3.0	2.7	26	73	18	26	11
11	4.0	4.5	3.5	3.6	3.3	e2.9	2.7	64	67	22	25	10
12	4.0	4.2	3.5	3.6	3.3	e2.8	2.7	135	62	33	24	11
13	4.2	4.0	3.5	3.6	3.3	e2.7	2.7	222	56	35	23	10
14	4.1	4.6	3.5	3.7	3.3	e2.7	2.7	276	58	33	23	11
15	3.8	4.3	3.5	3.6	3.3	e2.8	2.7	288	64	33	32	11
16	3.9	4.3	3.5	3.6	3.3	e2.7	2.7	275	60	38	28	10
17	3.9	4.2	3.5	3.6	3.3	e2.7	2.8	257	53	34	28	10
18	4.1	4.1	3.5	3.6	3.3	e2.6	3.0	262	49	34	31	9.6
19	4.6	4.1	3.5	3.6	3.3	e2.7	3.0	284	45	39	26	10
20	5.5	3.8	3.5	3.6	3.3	e2.8	3.1	311	42	56	24	11
21	5.3	3.5	3.5	3.6	3.3	e2.9	3.3	238	40	62	23	10
22	5.3	4.1	3.5	3.6	3.3	e3.0	3.8	180	38	59	21	10
23	4.9	3.9	3.6	3.6	3.3	3.2	3.7	158	35	54	24	10
24	4.7	3.7	3.5	3.6	3.3	3.1	3.9	153	34	47	21	9.7
25	4.5	3.7	3.5	3.6	3.4	e3.0	4.8	160	32	54	20	9.3
26	4.3	3.7	3.5	3.6	3.4	e2.9	5.1	167	30	45	19	8.9
27	3.9	3.7	3.5	3.6	3.4	e2.8	4.6	155	32	40	18	8.7
28	4.0	3.7	3.5	3.6	3.4	e2.8	4.5	146	28	39	17	8.4
29	4.3	3.7	3.5	3.5	---	e2.7	5.0	144	27	82	18	8.2
30	4.3	3.6	3.5	3.5	---	e2.5	5.8	122	26	57	17	7.9
31	4.5	---	3.5	3.5	---	2.6	---	133	---	48	16	---
TOTAL	133.3	122.7	109.1	111.4	94.4	91.4	99.2	4267.8	1892	1166	830	320.7
MEAN	4.30	4.09	3.52	3.59	3.37	2.95	3.31	138	63.1	37.6	26.8	10.7
MAX	5.5	4.9	3.6	3.7	3.5	3.4	5.8	311	162	82	43	15
MIN	3.8	3.5	3.5	3.5	3.3	2.5	2.5	6.3	26	18	16	7.9
AC-FT	264	243	216	221	187	181	197	8470	3750	2310	1650	636
CFSM	.19	.19	.16	.16	.15	.13	.15	6.23	2.85	1.70	1.21	.48
IN.	.22	.21	.18	.19	.16	.15	.17	7.18	3.18	1.96	1.40	.54

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1968 - 1993, BY WATER YEAR (WY)

	6.66	6.06	4.63	3.94	3.49	3.71	13.8	107	149	43.3	13.7	8.79
MEAN	6.66	6.06	4.63	3.94	3.49	3.71	13.8	107	149	43.3	13.7	8.79
MAX	19.1	19.9	12.4	10.3	6.53	6.85	39.4	170	419	111	34.7	40.8
(WY)	1979	1982	1982	1984	1982	1992	1980	1971	1974	1972	1976	1978
MIN	2.58	2.72	2.17	1.69	2.01	2.07	2.95	36.3	52.3	13.7	5.36	3.28
(WY)	1971	1971	1971	1971	1988	1973	1975	1984	1977	1977	1973	1970

SUMMARY STATISTICS

FOR 1992 CALENDAR YEAR

FOR 1993 WATER YEAR

WATER YEARS 1968 - 1993

ANNUAL TOTAL	8077.8	9238.0	30.4
ANNUAL MEAN	22.1	25.3	59.1
HIGHEST ANNUAL MEAN			12.9
LOWEST ANNUAL MEAN			874
HIGHEST DAILY MEAN	208	May 7	Jun 16
LOWEST DAILY MEAN	2.9	Feb 8	Dec 30
ANNUAL SEVEN-DAY MINIMUM	2.9	Feb 8	Apr 4
ANNUAL RUNOFF (AC-FT)	16020	18320	22040
ANNUAL RUNOFF (CFSM)	1.00	1.15	1.38
ANNUAL RUNOFF (INCHES)	13.60	15.55	18.71
10 PERCENT EXCEEDS	73	61	94
50 PERCENT EXCEEDS	5.4	4.2	6.4
90 PERCENT EXCEEDS	3.1	3.0	2.9

e Estimated

METHOW RIVER BASIN

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12447390 ANDREWS CREEK NEAR MAZAMA, WA--Continued

WATER-QUALITY RECORDS

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

WATER-QUALITY RECORDS

DATE	TIME	DIS-CHARGE, INST. (CUBIC FEET PER SECOND)	SPE-CIFIC CON-DUCT-ANCE (US/CM)	PH (STAND-ARD UNITS)	TEMPER-ATURE WATER (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, NONCARB (MG/L AS CaCO3)	
OCT 14...	1145	3.8	62	7.8	2.5	0.5	11.1	95	K1	K1	26	0	
FEB 09...	1200	3.4	71	7.7	1.0	0.6	11.9	99	K1	K1	28	0	
JUN 08...	1015	78	27	7.4	4.5	4.0	11.5	105	<1	<1	12	0	
AUG 10...	1120	24	40	7.6	8.5	0.2	10.1	101	K2	11	16	0	
DATE		CALCIUM, DIS-SOLVED (MG/L AS Ca)	MAGNE-SIUM, DIS-SOLVED (MG/L AS Mg)	SODIUM, DIS-SOLVED (MG/L AS Na)	SODIUM AD-SORP-TION PERCENT RATIO	POTAS-SIUM, DIS-SOLVED (MG/L AS K)	ALKA-LINITY, DIS IT, FIELD (MG/L AS CaCO3)	BICAR-BONATE, DIS IT, FIELD (MG/L AS HCO3)	CAR-BONATE, DIS IT, FIELD (MG/L AS CO3)	SULFATE, DIS-SOLVED (MG/L AS SO4)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)	FLUO-RIDE, DIS-SOLVED (MG/L AS F)	
OCT 14...	8.3	1.2	2.9	19	0.2	0.6	32	39	0	1.0	0.4	<0.1	
FEB 09...	8.9	1.3	3.0	19	0.2	0.6	31	38	0	1.2	0.4	<0.1	
JUN 08...	3.8	0.57	1.5	21	0.2	0.3	14	17	0	0.7	0.2	<0.1	
AUG 10...	5.2	0.80	1.8	19	0.2	0.4	20	24	0	0.8	0.2	<0.1	
DATE		SILICA, DIS-SOLVED (MG/L AS SiO2)	SOLIDS, RESIDUE AT 180 DEG. C (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, NITRITE, DIS-SOLVED (MG/L AS N)	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 (MG/L AS P)	PHOS-PHORUS, ORTHO, DIS-SOLVED (MG/L AS P)	
OCT 14...	9.9	41	44	0.06	0.42	<0.01	<0.05	0.02	<0.2	0.01	0.02	<0.01	
FEB 09...	11	36	46	0.05	0.33	0.04	0.15	0.08	<0.2	<0.01	<0.01	<0.01	
JUN 08...	8.2	18	24	0.02	3.79	<0.01	<0.05	0.03	<0.2	<0.01	0.02	<0.01	
AUG 10...	9.2	22	30	0.03	1.43	<0.01	<0.05	0.03	<0.2	0.01	<0.01	<0.01	
DATE		ALUM-INUM, DIS-SOLVED (UG/L AS AL)	BARIUM, DIS-SOLVED (UG/L AS BA)	COBALT, DIS-SOLVED (UG/L AS CO)	IRON, DIS-SOLVED (UG/L AS FE)	LITHIUM, DIS-SOLVED (UG/L AS LI)	MANGA-NESE, DIS-SOLVED (UG/L AS MN)	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)
OCT 14...	<10	27	<3	7	<4	<1	<10	<1	<1	<1	<1	88	<6
FEB 09...	<10	27	<3	3	<4	<1	<10	<1	<1	<1	<1	100	<6
JUN 08...	20	12	<3	13	<4	<1	<10	<1	<1	<1	<1	41	<6
AUG 10...	20	16	<3	5	<4	<1	<10	<1	<1	<1	<1	56	<6
DATE		GROSS APPHA, DIS-SOLVED (PCI/LS AS TH-230)	GROSS ALPHA, SUSP. TOTAL (PCI/L AS TH-230)	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)	SEDI-MENT, SUS-PENDED (MG/L)	SEDI-MENT, DIS-CHARGE, SUS-PENDED (T/DAY)
OCT 14...	--	--	--	--	--	--	--	--	--	--	--	1	0.01
FEB 09...	<0.6	<0.6	0.6	<0.6	0.9	<0.6	0.8	<0.6	0.09	0.34	1	0.01	
JUN 08...	<0.6	<0.6	0.6	<0.6	0.8	<0.6	0.8	<0.6	0.04	0.26	1	0.21	
AUG 10...	--	--	--	--	--	--	--	--	--	--	--	1	0.06

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

METHOW RIVER BASIN

12448000 CHEWUCH RIVER AT WINTHROP, WA

LOCATION.--Lat 48°28'38", long 120°11'07", SW 1/4 NW 1/4 sec.2, T.34 N., R.21 E., Okanogan County, Hydrologic Unit 17020008, on right bank, 80 ft downstream from State Road 20 bridge crossing, at northwest end of Winthrop, WA, and at mile 0.18.

DRAINAGE AREA.--525 mi².

PERIOD OF RECORD.--1912 to 1913, seasonal records only. October 1991 to current year. Prior to October 1991 published as "Chewack Creek at Winthrop, WA".

GAGE.--Water-stage recorder. Datum of gage is 1,736.26 ft above sea level (Okanogan County Public Works Bench Mark). Prior to November 1991, nonrecording gage 10 ft upstream from bridge, and at datum 8.74 ft higher.

REMARKS.--Records good except for estimated daily discharges, which are fair. No known regulation. Several diversions for irrigation upstream from station. U.S. Geological Survey satellite telemeter at station.

AVERAGE DISCHARGE.--2 years (water years 1992-93), 249 ft³/s, 180,400 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 2,990 ft³/s May 15, 1993, gage height, 6.75 ft; maximum gage height, 7.16 ft May 15, 1993, from crest-stage gage; minimum daily discharge, 32 ft³/s Jan. 6, 1993.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 2,990 ft³/s May 15, gage height, 6.75 ft; maximum gage height, 7.16 ft, from crest-stage gage; minimum daily discharge, 32 ft³/s Jan. 6.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	53	83	e48	e42	51	e50	55	97	1460	300	564	193
2	70	88	e45	e40	50	47	57	106	1280	305	527	181
3	68	83	e42	e38	48	47	60	109	1120	321	489	171
4	67	87	e41	e37	47	46	63	103	1050	313	458	164
5	67	85	e38	e36	48	45	59	110	972	284	471	158
6	66	84	e42	e32	48	44	57	171	838	267	441	147
7	66	84	e45	e33	48	44	56	263	789	270	397	138
8	67	83	e46	e36	49	45	60	252	722	258	366	130
9	67	81	e47	e37	49	45	67	229	695	239	340	123
10	67	73	e47	e37	50	44	65	258	721	245	317	119
11	66	75	e48	e37	50	43	79	458	696	247	302	115
12	66	78	e47	e36	49	43	80	965	689	344	287	113
13	64	78	e46	e37	49	42	74	1800	621	394	270	110
14	65	78	e45	e37	47	44	72	2410	584	363	291	112
15	66	78	e43	e38	e40	45	71	2700	655	390	320	148
16	67	80	e43	e37	e38	44	72	2660	655	418	455	139
17	72	82	e42	e37	e54	45	76	2550	590	431	385	125
18	73	80	e41	e36	e62	45	82	2440	541	482	444	116
19	76	82	e41	e36	e60	46	82	2520	506	485	381	114
20	82	81	e42	e36	e58	47	82	2790	477	634	334	123
21	84	85	e46	e37	54	49	84	2450	469	1030	324	131
22	84	80	e46	e38	50	52	88	1920	495	822	302	128
23	83	68	e45	e37	47	55	93	1640	449	745	296	124
24	81	e54	e44	e40	e47	61	95	1470	419	660	285	119
25	78	e47	e45	e45	e44	57	101	1400	390	683	264	114
26	76	e50	e47	e50	e45	56	114	1360	363	647	262	109
27	76	e53	e45	e55	e46	55	108	1370	382	572	247	105
28	75	e54	e43	e53	e48	55	105	1250	354	536	232	101
29	81	e54	e43	e52	---	54	107	1200	328	807	227	97
30	82	e50	e42	53	---	54	100	1080	316	748	221	94
31	82	---	e41	52	---	54	---	1040	---	623	205	---
TOTAL	2237	2218	1366	1247	1376	1503	2364	39171	19626	14863	10704	3861
MEAN	72.2	73.9	44.1	40.2	49.1	48.5	78.8	1264	654	479	345	129
MAX	84	88	48	55	62	61	114	2790	1460	1030	564	193
MIN	53	47	38	32	38	42	55	97	316	239	205	94
AC-FT	4440	4400	2710	2470	2730	2980	4690	77700	38930	29480	21230	7660

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1992 - 1993, BY WATER YEAR (WY)

	1992	1993	1992	1993	1992	1993	1992	1993	1992	1993	1992	1993
MEAN	69.1	76.3	54.6	50.4	58.9	101	199	1049	559	431	239	86.9
MAX	72.2	78.6	65.1	60.5	68.2	153	320	1264	654	479	345	129
(WY)	1993	1992	1992	1992	1992	1992	1992	1993	1993	1993	1993	1993
MIN	66.0	73.9	44.1	40.2	49.1	48.5	78.8	835	464	383	132	45.1
(WY)	1992	1993	1993	1993	1993	1993	1993	1992	1992	1992	1992	1992

SUMMARY STATISTICS FOR 1992 CALENDAR YEAR FOR 1993 WATER YEAR WATER YEARS 1992 - 1993

ANNUAL TOTAL	81129	100536										
ANNUAL MEAN	222	275										
HIGHEST ANNUAL MEAN												1993
LOWEST ANNUAL MEAN												1992
HIGHEST DAILY MEAN	1580	May 7	2790	May 20								1993
LOWEST DAILY MEAN	36	Sep 23	32	Jan 6								1993
ANNUAL SEVEN-DAY MINIMUM	37	Sep 22	35	Jan 4								1993
ANNUAL RUNOFF (AC-FT)	160900		199400									
10 PERCENT EXCEEDS	618		691									
50 PERCENT EXCEEDS	84		82									
90 PERCENT EXCEEDS	45		42									

e Estimated

METHOW RIVER BASIN

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12448500 METHOW RIVER AT WINTHROP, WA

LOCATION.--Lat 48°28'25", long 120°10'34", in NE 1/4 SW 1/4 sec.2, T.34 N., R.21 E., Okanogan County, Hydrologic Unit 17020008, on left bank at Winthrop, 0.3 mi downstream from Chewuch River, and at mile 49.8.

DRAINAGE AREA.--1,007 mi².

PERIOD OF RECORD.--January to October 1912, August 1971 to June 1972 (destroyed by flood of May 31, 1972), November 1989 to current year. Published as "near Winthrop" January to October 1912.

GAGE.--Water-stage recorder. Elevation of gage is 1,718.09 ft above sea level. January to August 1912, nonrecording gage at site 0.6 mi downstream at different datum. August 1971 to June 1972, water-stage recorder at same site at different datum.

REMARKS.--Records good except for estimated daily discharges, which are fair. No known regulation. Diversions for irrigation of about 1,170 acres upstream from station. U.S. Geological Survey satellite telemeter at station.

AVERAGE DISCHARGE.--3 years (water years 1991-93), 1,053 ft³/s, 762,900 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 24,400 ft³/s May 31, 1972, gage height, 20.90 ft, from outside high-water mark; minimum discharge observed, 144 ft³/s Feb. 29, Mar. 1, 1912.

EXTREMES FOR CURRENT PERIOD.--Maximum discharge, 9,730 ft³/s May 15, gage height, 16.38 ft; maximum gage height, 16.68 ft May 15, from crest-stage gage; minimum daily discharge, 165 ft³/s Feb. 16.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	206	237	203	e200	186	175	200	530	4230	870	1290	451
2	225	246	209	e195	185	171	202	623	3850	861	1210	431
3	222	237	190	e190	185	177	205	672	3430	858	1130	414
4	218	243	e180	e185	182	173	210	670	3330	828	1060	399
5	214	240	e175	e185	182	171	207	760	3160	780	1070	387
6	209	238	e185	e180	183	170	203	1050	2890	744	1040	370
7	212	237	198	e180	181	171	198	1340	2750	745	966	349
8	216	234	208	e190	178	173	200	1270	2460	710	903	334
9	214	232	211	e195	179	176	207	1180	2270	681	849	322
10	212	223	212	e200	178	177	205	1310	2230	678	801	306
11	211	222	213	e208	183	174	229	2490	2060	667	760	301
12	209	227	211	203	188	173	229	4900	1950	763	721	297
13	209	225	208	207	188	173	221	7620	1790	813	687	292
14	208	222	210	207	185	174	217	8960	1700	803	688	292
15	210	220	200	207	175	176	214	9020	1810	822	737	339
16	215	221	201	207	165	176	214	8400	1800	833	881	332
17	218	225	210	196	e174	179	217	7690	1720	850	788	311
18	217	224	e205	197	174	178	225	7150	1660	937	838	298
19	221	229	e195	199	185	183	224	7550	1600	955	774	294
20	227	231	203	206	187	185	225	8160	1490	1200	709	292
21	227	235	e205	207	183	187	224	6930	1410	1870	683	300
22	228	231	205	205	179	194	229	5170	1380	1710	649	296
23	228	215	204	193	178	200	234	4190	1270	1640	641	293
24	228	196	204	200	168	212	237	3710	1170	1480	622	286
25	224	197	200	200	168	205	246	3690	1090	1460	584	282
26	221	195	204	198	172	202	283	3810	1050	1380	572	274
27	218	210	195	199	180	201	347	3960	1130	1270	545	269
28	219	219	198	200	175	201	396	3940	1060	1210	522	263
29	231	217	201	195	---	199	440	3700	981	1630	512	256
30	239	219	205	191	---	197	477	3290	922	1610	500	249
31	238	---	e200	188	---	195	---	3090	---	1410	470	---
TOTAL	6794	6747	6248	6113	5026	5698	7365	126825	59643	33068	24202	9579
MEAN	219	225	202	197	179	184	245	4091	1988	1067	781	319
MAX	239	246	213	208	188	212	477	9020	4230	1870	1290	451
MIN	206	195	175	180	165	170	198	530	922	667	470	249
AC-FT	13480	13380	12390	12130	9970	11300	14610	251600	118300	65590	48000	19000

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1912 - 1993, BY WATER YEAR (WY)

	MEAN	261	426	307	241	240	463	1234	4192	4425	1477	577	292
MAX	304	915	506	330	374	878	1858	7042	10110	2944	781	364	
(WY)	1972	1991	1991	1991	1991	1992	1990	1972	1972	1991	1993	1912	
MIN	219	225	202	197	173	177	245	2358	1988	941	390	204	
(WY)	1993	1993	1993	1993	1912	1912	1993	1990	1993	1912	1992	1992	

SUMMARY STATISTICS FOR 1992 CALENDAR YEAR FOR 1993 WATER YEAR WATER YEARS 1912 - 1993

ANNUAL TOTAL	316376	297308											
ANNUAL MEAN	864	815											
HIGHEST ANNUAL MEAN										1052			
LOWEST ANNUAL MEAN										1474			1991
HIGHEST DAILY MEAN	6140	May 7	9020	May 15	21400	Jun 9	1972						
LOWEST DAILY MEAN	175	Dec 5	165	Feb 16	144	Feb 29	1912						
ANNUAL SEVEN-DAY MINIMUM	190	Sep 23	172	Mar 2	149	Feb 25	1912						
ANNUAL RUNOFF (AC-FT)	627500		589700										
10 PERCENT EXCEEDS	2280		1790							3330			
50 PERCENT EXCEEDS	277		228							356			
90 PERCENT EXCEEDS	203		181							205			

e Estimated

METHOW RIVER BASIN

12448998 TWISP RIVER NEAR TWISP, WA

LOCATION.--Lat 48°22'12", long 120°08'51", in SE 1/4 SE 1/4 sec.12, T.33 N., R.21 E., Okanogan County, Hydrologic Unit 17020008, on left bank, 20 ft downstream from county road bridge, 0.8 mi west of the Twisp city limits, and at mile 1.6.

DRAINAGE AREA.--245 mi².

PERIOD OF RECORD.--May 1975 to September 1979, October 1989 to current year.

GAGE.--Water-stage recorder and crest-stage gage. Elevation of gage is 1,640 ft, from topographic map, May 1975 to September 1979, water-stage recorder at same site. Crest-stage gage since September 1992.

REMARKS.--Records good except those below 150 ft³/s and estimated daily discharges, which are fair. No known regulation. Several diversions upstream from station for irrigation. U.S. Geological Survey satellite telemeter at station.

AVERAGE DISCHARGE.--8 years (water years 1976-79, 1990-93), 239 ft³/s, 173,200 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 3,440 ft³/s May 19, 1991, gage height, 11.77 ft; minimum discharge, 15 ft³/s Oct. 2-4, 1989, gage height, 6.71 ft.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of May 29, 1948 had a discharge of 9,440 ft³/s, by slope-area measurement made about 1,000 ft upstream from mouth.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 2,270 ft³/s May 14, gage height, 10.87 ft; maximum gage height, 11.10 ft, from crest-stage gage; minimum daily discharge, 20 ft³/s Oct. 5-9.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	23	46	47	e39	34	e37	58	143	1020	182	154	53
2	22	51	43	e38	34	e37	60	157	1030	182	149	47
3	21	53	e39	e37	34	e36	60	151	978	175	139	42
4	21	51	e37	e34	33	36	62	143	883	163	132	39
5	20	49	e35	e30	e30	36	62	150	816	158	130	38
6	20	48	e42	e25	e31	36	62	211	776	153	129	38
7	20	49	e45	e25	33	36	62	263	743	161	120	37
8	20	49	e48	e26	34	36	68	248	652	150	120	37
9	20	49	e51	e27	34	36	75	232	610	142	120	36
10	30	46	e51	e28	34	36	75	264	581	137	117	34
11	41	45	e51	e29	35	36	78	535	501	134	99	34
12	41	46	e51	e30	34	38	79	1110	443	138	90	34
13	41	46	e50	e30	34	38	79	1780	395	136	89	34
14	41	46	e50	e30	34	38	79	1960	390	138	88	34
15	41	46	e50	e31	36	39	79	1810	439	146	93	37
16	41	46	e48	e31	e34	40	81	1720	442	137	101	37
17	41	46	e46	e31	e34	40	84	1580	421	137	98	36
18	41	46	e44	e32	e38	41	88	1540	416	141	89	35
19	41	46	e43	e31	e38	43	92	1680	404	141	84	34
20	41	46	e45	e32	e38	43	94	1800	361	172	81	34
21	42	48	e46	e32	e37	44	96	1440	328	291	81	33
22	43	47	e46	e32	e37	47	106	1250	302	249	72	34
23	43	46	e47	e31	e36	50	111	921	271	239	72	32
24	43	e42	e48	e32	e36	55	114	843	243	219	72	32
25	43	e38	e49	e34	e36	55	122	907	222	201	70	32
26	43	e40	e48	e34	e36	54	129	927	220	194	68	31
27	42	e43	e47	e34	e36	54	130	969	239	180	64	31
28	42	45	e46	e34	e36	54	130	976	226	174	60	31
29	45	44	e42	e34	---	54	130	904	204	199	58	29
30	46	44	e41	34	---	55	133	808	187	185	56	29
31	46	---	e39	34	---	57	---	803	---	167	55	---
TOTAL	1105	1387	1415	981	976	1337	2678	28225	14743	5321	2950	1064
MEAN	35.6	46.2	45.6	31.6	34.9	43.1	89.3	910	491	172	95.2	35.5
MAX	46	53	51	39	38	57	133	1960	1030	291	154	53
MIN	20	38	35	25	30	36	58	143	187	134	55	29
AC-FT	2190	2750	2810	1950	1940	2650	5310	55980	29240	10550	5850	2110

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1976 - 1993, BY WATER YEAR (WY)

	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993
MEAN	61.8	112	105	70.3	68.3	107	282	742	376	109	53.2							
MAX	111	350	281	152	135	174	528	1171	1370	859	302	110						
(WY)	1979	1991	1976	1976	1976	1992	1990	1991	1978	1991	1976	1978						
MIN	34.2	44.8	45.6	31.6	34.9	39.6	89.3	201	282	56.9	23.7	24.0						
(WY)	1990	1978	1993	1993	1993	1977	1993	1977	1977	1977	1977	1992						

SUMMARY STATISTICS

FOR 1993 WATER YEAR

WATER YEARS 1976 - 1993

ANNUAL TOTAL	62182																	
ANNUAL MEAN	170																	
HIGHEST ANNUAL MEAN										239								
LOWEST ANNUAL MEAN										413								
HIGHEST DAILY MEAN										82.9								
LOWEST DAILY MEAN	1960									3200								
ANNUAL SEVEN-DAY MINIMUM	20									16								
ANNUAL RUNOFF (AC-FT)	20									17								
10 PERCENT EXCEEDS	123300									173500								
50 PERCENT EXCEEDS	418									709								
90 PERCENT EXCEEDS	48									92								
	32									34								

e Estimated

METHOW RIVER BASIN

279

12449500 METHOW RIVER AT TWISP, WA

LOCATION.--Lat 48°21'55", long 120°06'54", in NE 1/4 NW 1/4 sec.17, T.33 N., R.22 E., Okanogan County, Hydrologic Unit 17020008, on left bank, 0.25 mi downstream from Twisp River, 0.3 mi east of center of Twisp, and at mile 40.

DRAINAGE AREA.--1,301 mi².

PERIOD OF RECORD.--June 1919 to September 1962. Monthly discharge only for some periods, published in WSP 1316. Miscellaneous measurements in 1967, 1970, 1976, 1978-90. For 1976, 1978-80 published as "at site 2.7 mi downstream", in error. April 1991 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 1,580 ft above sea level, from topographic map. Prior to Oct. 3, 1919, several staff gages in the immediate vicinity at different datum. Oct. 3, 1919 to September 30, 1929, and Oct. 31 to Nov. 6, 1933, chain gage on road bridge 40 ft upstream at same datum as staff gages. Nov. 7 to Dec. 18, 1933, staff gage at present site at different datum.

REMARKS.--Records good except for estimated daily discharges, which are fair. No known regulation. Numerous diversions for irrigation upstream from station.

AVERAGE DISCHARGE.--45 years (water years 1919-62, 1992-93), 1,312 ft³/s, 950,500 acre-ft/yr. Includes discharge for water years 1930-34, which were estimated for WSP 1316.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 40,800 ft³/s May 29, 1948, gage height, 12.94 ft, in gage well, from rating curve extended above 18,000 ft³/s on basis of slope-area measurement of peak flow; minimum observed, 134 ft³/s Sept. 4, 5, 1926, Sept. 9, 10, 1929, but may have been less during period of ice effect Jan. 6 to Mar. 4, 1937.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 11,000 ft³/s May 15, gage height, 5.70 ft; minimum daily discharge, 180 ft³/s Jan. 7, 8, result of freezeup.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	213	302	252	e210	e220	211	268	656	5070	973	1360	461
2	230	318	252	e200	e220	206	271	744	4850	978	1270	443
3	233	304	221	e200	e220	212	279	783	4390	977	1180	418
4	232	307	227	e200	e220	209	282	770	4180	934	1110	399
5	224	301	250	e195	e220	205	277	845	4000	876	1120	386
6	222	293	250	e185	e220	205	277	1130	3690	833	1080	372
7	227	296	244	e180	e220	209	271	1510	3460	848	1000	359
8	227	296	249	e180	e220	211	291	1460	3130	798	931	349
9	229	290	249	e185	e220	215	301	1350	2880	748	875	332
10	257	279	255	e190	e220	215	303	1470	2860	752	823	322
11	285	278	253	e190	e220	214	327	2650	2600	736	779	313
12	284	277	247	e190	e220	213	323	5590	2430	814	736	313
13	278	277	246	e190	221	214	317	8580	2210	860	693	310
14	279	273	245	e190	220	214	314	10200	2110	862	686	314
15	284	271	237	e190	211	220	311	10200	2270	882	733	350
16	284	273	253	e190	190	221	312	9580	2260	878	883	354
17	290	276	251	e190	e185	225	322	8840	2150	900	817	338
18	289	271	243	e190	e185	226	329	8270	2070	986	836	326
19	290	281	239	e190	e195	233	331	8730	1990	1010	784	317
20	296	276	255	e190	e205	236	334	9370	1840	1210	716	323
21	295	287	266	e195	217	244	337	8080	1720	2090	701	331
22	291	276	255	e200	212	254	353	6190	1660	1910	663	324
23	290	264	246	e200	211	263	363	5000	1520	1820	652	317
24	290	234	241	e200	194	281	369	4470	1380	1630	641	311
25	284	228	233	e200	e185	273	390	4430	1270	1600	603	309
26	283	235	237	e200	e185	268	424	4580	1210	1530	581	302
27	278	257	225	e210	e200	267	469	4770	1280	1380	554	297
28	283	266	e220	e220	210	264	509	4740	1220	1300	528	291
29	303	267	e220	e220	---	264	546	4450	1120	1690	515	288
30	306	268	e220	e220	---	264	590	4000	1040	1730	504	284
31	303	---	e210	e220	---	264	---	3840	---	1500	481	---
TOTAL	8359	8321	7491	6110	5866	7220	10390	147278	73860	36035	24835	10153
MEAN	270	277	242	197	209	233	346	4751	2462	1162	801	338
MAX	306	318	266	220	221	281	590	10200	5070	2090	1360	461
MIN	213	228	210	180	185	205	268	656	1040	736	481	284
AC-FT	16580	16500	14860	12120	11640	14320	20610	292100	146500	71480	49260	20140

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1919 - 1993, BY WATER YEAR (WY)

	427	466	397	313	318	420	1538	4944	4835	1694	486	309
MEAN	427	466	397	313	318	420	1538	4944	4835	1694	486	309
MAX	1383	1183	923	578	958	1773	7692	9515	11030	4392	1205	727
(WY)	1960	1934	1960	1935	1935	1934	1934	1957	1950	1954	1954	1959
MIN	189	234	222	178	183	204	180	1546	846	289	162	148
(WY)	1937	1940	1926	1937	1929	1936	1929	1920	1926	1926	1926	1929

SUMMARY STATISTICS

FOR 1992 CALENDAR YEAR

FOR 1993 WATER YEAR

WATER YEARS 1919 - 1993

ANNUAL TOTAL	373870	345918	
ANNUAL MEAN	1022	948	1334
HIGHEST ANNUAL MEAN			2231
LOWEST ANNUAL MEAN			467
HIGHEST DAILY MEAN	6890	May 7	32500
LOWEST DAILY MEAN	207	Sep 22	134
ANNUAL SEVEN-DAY MINIMUM	211	Sep 20	141
ANNUAL RUNOFF (AC-FT)	741600	686100	966800
10 PERCENT EXCEEDS	2740	2170	4060
50 PERCENT EXCEEDS	334	296	426
90 PERCENT EXCEEDS	233	206	224

e Estimated

METHOW RIVER BASIN

12449950 METHOW RIVER NEAR PATEROS, WA

LOCATION.--Lat 48°04'39", long 119°59'02", in SE 1/4 SW 1/4 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 except for estimated daily discharges, which are fair. Diversions for irrigation of about 11,000 acres upstream from station (1959 Bureau of Reclamation land classification). U.S. Geological Survey satellite telemeter at station. Water temperature October 1968 to October 1970.

AVERAGE DISCHARGE.--34 years, 1,531 ft³/s, 1,109,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 28,800 ft³/s May 31, 1972, gage height, 12.25 ft; minimum daily discharge, 150 ft³/s Jan. 8-10, 1974, result of freezeup.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum discharge since 1894, 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 15	0915	*11,400	*7.83	No other peak greater than base discharge.			
Minimum daily discharge, 215 ft ³ /s Jan. 7.							

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	296	357	315	e270	315	270	303	599	5070	1090	1550	560
2	296	360	313	e280	309	269	304	664	5020	1100	1440	538
3	303	363	308	e275	305	266	305	745	4730	1110	1350	516
4	308	363	304	e270	300	263	305	798	4370	1060	1270	493
5	311	359	e288	e260	295	263	307	811	4190	996	1230	482
6	311	356	e310	e245	291	263	307	969	3860	945	1230	470
7	311	353	e329	e215	288	263	309	1440	3620	955	1150	456
8	311	351	e340	e230	285	263	311	1530	3320	925	1070	443
9	315	350	e330	e250	285	263	313	1420	3020	868	1010	429
10	315	346	e338	e250	285	261	324	1420	2980	858	950	415
11	326	341	e335	e240	285	259	332	2160	2750	853	901	405
12	339	338	e320	e240	285	259	349	4720	2600	894	861	402
13	343	338	e310	e237	284	256	355	7940	2380	972	816	402
14	341	334	e305	e239	281	256	356	10200	2220	1000	785	403
15	338	334	e300	e245	281	256	357	10600	2340	1020	808	438
16	338	333	e305	e239	276	258	355	9780	2360	1040	934	457
17	340	330	e308	e236	257	259	355	9030	2260	1080	954	447
18	343	330	e310	e235	249	261	358	8330	2170	1110	905	434
19	343	331	e290	e235	259	261	364	8570	2090	1160	915	422
20	344	334	e280	e237	271	265	367	9390	1960	1250	836	423
21	348	340	e292	e240	277	269	371	8480	1840	2030	806	430
22	351	351	e295	e250	276	275	373	6470	1780	2070	784	433
23	351	347	e302	e240	274	283	382	5370	1660	2020	752	431
24	347	337	e311	e250	272	293	394	4770	1520	1850	749	425
25	346	325	e300	e280	267	304	406	4630	1400	1760	720	423
26	343	316	e295	e320	257	305	423	4700	1320	1750	690	413
27	342	315	e290	e340	257	303	445	4880	1350	1590	661	404
28	338	315	e290	e335	265	303	480	4860	1340	1480	633	397
29	343	315	e288	e330	---	303	524	4700	1240	1620	615	391
30	357	315	e282	e320	---	303	561	4300	1160	1950	602	384
31	359	---	e275	e317	---	303	---	3940	---	1700	581	---
TOTAL	10297	10177	9458	8150	7831	8478	10995	148216	77920	40106	28558	13166
MEAN	332	339	305	263	280	273	366	4781	2597	1294	921	439
MAX	359	363	340	340	315	305	561	10600	5070	2070	1550	560
MIN	296	315	275	215	249	256	303	599	1160	853	581	384
AC-FT	20420	20190	18760	16170	15530	16820	21810	294000	154600	79550	56640	26110

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1959 - 1993, BY WATER YEAR (WY)

	MEAN	488	528	471	431	424	602	1491	4844	5936	2121	701	456
MAX	1458	1327	1280	938	803	1407	2744	9768	13150	4800	1860	1196	
(WY)	1960	1991	1976	1981	1968	1968	1983	1972	1972	1972	1976	1978	
MIN	294	294	297	263	272	237	366	1415	1757	471	284	255	
(WY)	1988	1988	1988	1993	1988	1977	1993	1977	1977	1977	1977	1987	

SUMMARY STATISTICS

FOR 1992 CALENDAR YEAR

FOR 1993 WATER YEAR

WATER YEARS 1959 - 1993

ANNUAL TOTAL	393178	373352	1531
ANNUAL MEAN	1074	1023	2963
HIGHEST ANNUAL MEAN			565
LOWEST ANNUAL MEAN			1972
HIGHEST DAILY MEAN	6770	May 8	27200
LOWEST DAILY MEAN	275	Dec 31	150
ANNUAL SEVEN-DAY MINIMUM	289	Dec 25	154
ANNUAL RUNOFF (AC-FT)	779900	740500	1109000
10 PERCENT EXCEEDS	2770	2240	4320
50 PERCENT EXCEEDS	388	351	555
90 PERCENT EXCEEDS	305	263	310

e Estimated

LOCATION.--Lat 47°56'48", long 119°51'56", in SW 1/4 SE 1/4 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.

PERIOD OF RECORD.--October 1967 to current year. October 1953 to September 1967 (monthly discharge only) in the files of the U.S. Geological Survey.

REMARKS.--Flow regulated by nine major reservoirs and numerous smaller reservoirs and powerplants. Feeder Canal diversion (station 12435500) for Columbia Basin project is used to irrigate approximately 600,000 acres in the United States. An additional 66,500 acres in Canada are irrigated by other diversions.

AVERAGE DISCHARGE.--40 years, 115,200 ft³/s, 83,460,000 acre-ft/yr, unadjusted.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 184,000 ft³/s May 24; minimum daily, 30,500 ft³/s Mar. 27.

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	73900	52200	123000	94900	97000	101000	50800	57700	133000	133000	67300	79300
2	82600	84500	120000	116000	91100	79600	51100	59200	153000	125000	90500	84000
3	59100	78800	128000	114000	102000	68600	33700	104000	149000	122000	101000	81900
4	47800	77700	130000	137000	82000	67300	30700	82500	144000	78500	94600	54700
5	82100	70300	126000	143000	68700	55900	48800	91400	122000	116000	101000	46100
6	67500	69500	117000	149000	56600	49900	52300	93800	92800	123000	88700	54500
7	67400	48800	130000	153000	65600	40200	47100	109000	121000	99900	53000	94600
8	57500	46700	119000	130000	84500	60400	62900	93900	104000	116000	39900	96100
9	62900	87900	115000	111000	74000	65900	60100	110000	126000	107000	89600	68800
10	56700	98500	116000	122000	74800	57600	40200	138000	137000	89800	81500	70700
11	43700	96400	104000	134000	86500	52900	34500	129000	130000	102000	79800	45000
12	76200	77300	88800	132000	73400	56300	57200	138000	76500	106000	95300	37600
13	66700	75600	91800	126000	57900	42600	62300	117000	62200	98800	107000	73000
14	75800	55100	116000	108000	71200	46900	47100	109000	87800	115000	73300	74400
15	88400	55900	123000	94300	97400	63500	50400	151000	83600	116000	69900	75900
16	74000	91000	137000	84400	124000	70000	51600	177000	89400	121000	86300	67900
17	42600	73500	126000	79700	118000	53800	40500	182000	93400	97600	70500	84800
18	39500	80400	129000	103000	118000	45200	32800	180000	96900	107000	75800	41600
19	63800	95400	106000	99400	112000	48700	58300	181000	76700	103000	80200	45400
20	66800	97000	93000	65600	86900	39500	47600	173000	67600	103000	63800	92800
21	71100	101000	109000	92400	78600	38100	54600	180000	96700	105000	46200	81600
22	63900	82900	104000	89200	103000	70100	66500	181000	100000	113000	52700	80500
23	66400	117000	92200	95300	112000	60000	57000	183000	110000	107000	81600	79600
24	49400	121000	57800	69700	105000	62900	33100	184000	100000	84400	89000	78400
25	42700	107000	60900	62900	110000	51200	41300	173000	92900	74600	82900	49200
26	71900	58900	66400	72200	111000	44900	55600	168000	90100	97200	89900	38300
27	76300	73500	87600	78500	68500	30500	66800	148000	83400	103000	83200	82600
28	81300	71700	113000	77000	62500	34300	75900	129000	105000	115000	50600	79500
29	77000	91000	118000	74900	---	68800	84900	144000	116000	105000	45400	83800
30	60700	102000	123000	59800	---	66800	62300	128000	135000	104000	89	

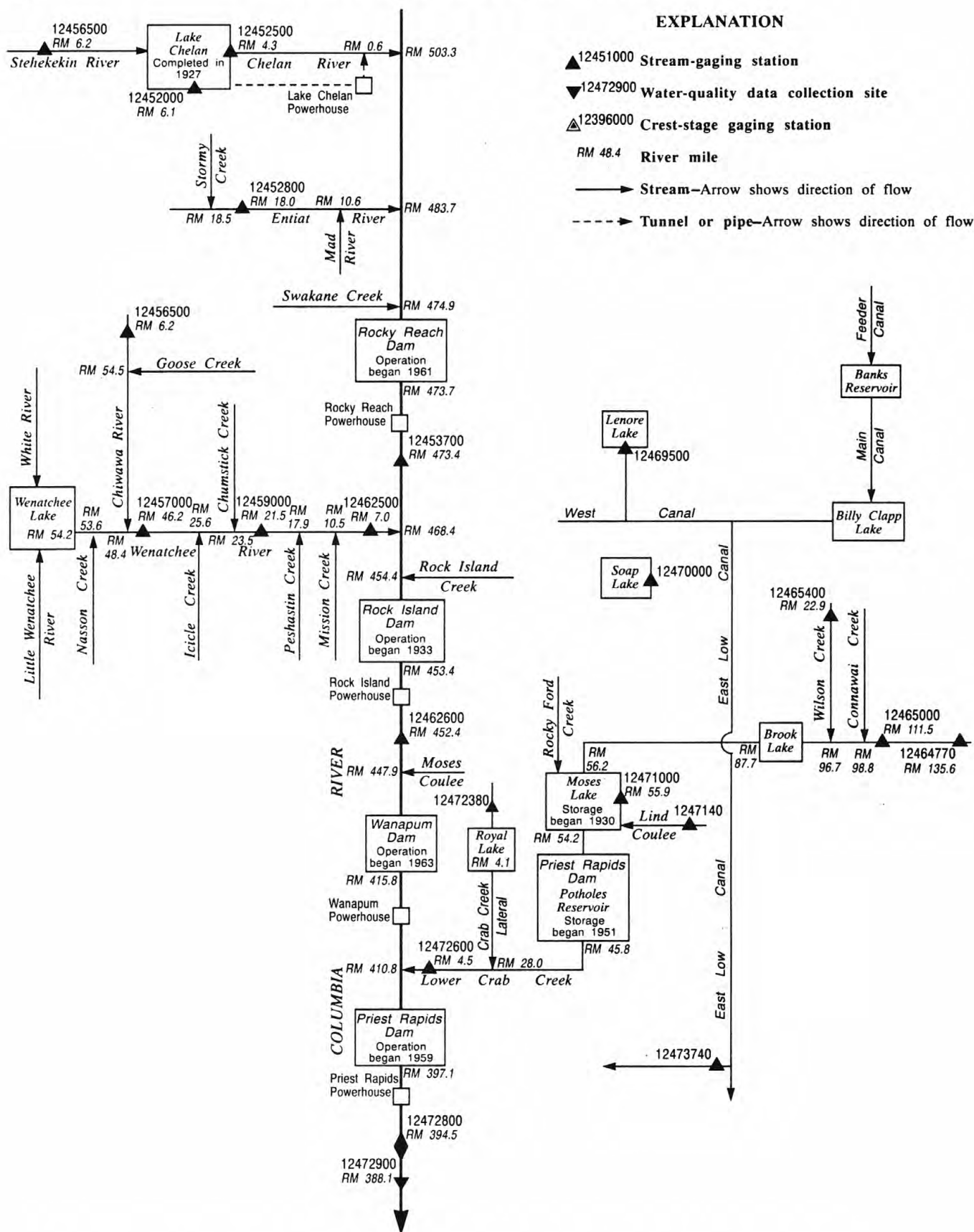


Figure 22. Gaging stations in Columbia River Basin from Chelan River to Priest Rapids gage.

LOCATION.--Lat 48°19'47", long 120°41'26", in NE 1/4 SE 1/4 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.

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

GAGE.--Water-stage recorder. Datum of gage is 1,098.5 ft above sea level. 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.

AVERAGE DISCHARGE.--72 years (water years 1911-14, 1926-93), 1,405 ft³/s, 59.44 in/yr, 1,018,000 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 discharge, 56 ft³/s Jan. 12, 1930.

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
May 13	2245	*11,700	*26.13	May 20	0015	8,530	24.65

Minimum discharge, 181 ft³/s Jan. 7, 20, 21.

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	569	448	315	207	277	203	532	1680	4340	1430	1050	528
2	582	440	313	212	273	202	554	1990	3950	1420	1100	588
3	612	391	268	204	266	202	594	1920	3550	1370	1180	652
4	505	402	264	203	259	204	630	1790	3350	1420	1190	646
5	415	380	279	197	256	203	633	1960	3300	1420	1180	706
6	372	369	271	191	250	226	639	2550	3460	1360	1190	712
7	343	601	274	183	247	223	635	2540	3580	1360	1120	721
8	331	569	275	193	244	228	739	2230	3000	1350	1060	698
9	328	489	270	199	244	239	823	2020	3010	1420	982	708
10	327	429	275	197	242	245	829	2620	3060	1410	893	713
11	332	433	269	189	241	255	822	4830	2640	1390	838	649
12	350	401	254	190	241	262	818	8060	2380	1250	835	590
13	510	383	243	191	241	266	809	9900	2210	1210	826	453
14	356	384	251	191	241	277	794	9330	2380	1240	839	433
15	327	385	244	194	237	309	812	7810	2730	1180	856	503
16	324	399	237	191	214	295	832	6950	2680	1140	821	399
17	320	393	236	189	210	301	865	6220	2760	1150	862	369
18	328	386	218	190	218	298	929	6350	2830	1250	898	351
19	586	394	216	191	237	295	946	7360	2780	1230	898	328
20	746	373	218	190	240	305	964	7630	2510	1790	958	311
21	836	383	238	191	229	317	1010	5780	2360	1730	958	290
22	733	376	237	196	223	362	1130	4420	2110	1490	851	281
23	714	344	251	191	219	572	1200	3850	1840	1360	1130	283
24	686	331	260	191	212	535	1280	3760	1660	1240	900	283
25	597	326	247	287	207	509	1380	4020	1700	1180	711	283
26	501	324	243	387	207	505	1390	4290	1890	1190	612	283
27	447	322	239	344	211	506	1350	4650	2060	1240	573	286
28	415	320	239	319	206	507	1330	4760	1740	1360	535	323
29	406	320	230	300	---	513	1340	4540	1560	1450	516	353
30	390	317	222	292	---	514	1500	3810	1470	1260	516	376
31	380	---	215	285	---	509	---	3870	---	1070	523	---
TOTAL	14668	11812	7811	6875	6592	10387	28109	143490	78890	41360	27381	14099
MEAN	473	394	252	222	235	335	937	4629	2630	1334	883	470
MAX	836	601	315	387	277	572	1500	9900	4340	1790	1190	721
MIN	320	317	215	183	206	202	532	1680	1470	1070	516	281
AC-FT	29090	23430	15490	13640	13080	20600	55750	284600	156500	82040	54310	27970
CFSM	1.47											

MEAN	611	669	529	406	394	518	1427	3538	4155	2601	1253	699
MAX	1869	3192	1896	1577	1209	1546	4644	5810	7738	5479	2716	1399
(WY)	1960	1991	1976	1984	1971	1934	1934	1958	1950	1950	1974	1959
MIN	230	147	125	86.0	115	194	549	1475	1680	1157	681	409
(WY)	1988	1930	1930	1930	1937	1937	1955	1977	1915	1977	1944	1942

ANNUAL TOTAL	441278		391474						
ANNUAL MEAN	1206		1073			1400			
HIGHEST ANNUAL MEAN						2008			1950
LOWEST ANNUAL MEAN						871			1977
HIGHEST DAILY MEAN	5980	May 7	9900	May 13	16400		May 28	1948	
LOWEST DAILY MEAN	215	Jan 8	183	Jan 7	58		Jan 12	1930	
ANNUAL SEVEN-DAY MINIMUM	229	Dec 16	191	Jan 11	67		Jan 9	1930	
ANNUAL RUNOFF (AC-FT)	875300		776500		1014000				
ANNUAL RUNOFF (CFSM)	3.76		3.34		4.36				
ANNUAL RUNOFF (INCHES)	51.14		45.37		59.27				
10 PERCENT EXCEEDS	2960		2660		3610				
50 PERCENT EXCEEDS	752		509		740				
90 PERCENT EXCEEDS	255		215		244				

CHELAN RIVER BASIN

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.

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 above 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 above 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 estimate. Chemical analyses June 1971 to August 1972.

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 elevation 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 contents, 676,400 acre-ft June 15, elevation, 1,099.97 ft; minimum contents, 127,500 acre-ft Mar. 19, 20, elevation, 1,083.03.

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 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1098.59	1095.67	1092.75	1089.61	1086.41	1084.12	1083.53	1085.74	1098.34	1099.68	1099.65	1099.31
2	1098.51	1095.60	1092.63	1089.48	1086.34	1084.06	1083.59	1085.86	1098.63	1099.67	1099.65	1099.30
3	1098.48	1095.48	1092.52	1089.37	1086.25	1083.98	1083.64	1085.99	1098.85	1099.66	1099.65	1099.30
4	1098.36	1095.38	1092.40	1089.28	1086.16	1083.88	1083.70	1086.14	1099.04	1099.64	1099.67	1099.33
5	1098.21	1095.29	1092.27	1089.17	1086.06	1083.81	1083.76	1086.28	1099.21	1099.62	1099.68	1099.35
6	1098.11	1095.19	1092.15	1089.06	1085.96	1083.74	1083.81	1086.42	1099.38	1099.58	1099.70	1099.38
7	1098.00	1095.13	1092.06	1088.95	1085.90	1083.68	1083.86	1086.60	1099.60	1099.53	1099.71	1099.39
8	1097.90	1095.06	1091.96	1088.84	1085.88	1083.65	1083.92	1086.79	1099.67	1099.50	1099.70	1099.36
9	1097.79	1094.95	1091.87	1088.73	1085.82	1083.60	1083.99	1086.96	1099.71	1099.51	1099.71	1099.33
10	1097.66	1094.83	1091.80	1088.62	1085.75	1083.54	1084.06	1087.13	1099.79	1099.50	1099.71	1099.31
11	1097.55	1094.73	1091.71	1088.50	1085.67	1083.47	1084.12	1087.34	1099.84	1099.51	1099.67	1099.33
12	1097.47	1094.65	1091.61	1088.38	1085.58	1083.40	1084.19	1087.78	1099.87	1099.51	1099.64	1099.28
13	1097.35	1094.56	1091.50	1088.26	1085.48	1083.33	1084.25	1088.50	1099.86	1099.52	1099.64	1099.22
14	1097.26	1094.46	1091.40	1088.15	1085.38	1083.27	1084.31	1089.60	1099.89	1099.53	1099.63	1099.19
15	1097.13	1094.36	1091.29	1088.04	1085.32	1083.27	1084.37	1090.59	1099.93	1099.51	1099.62	1099.16
16	1097.01	1094.26	1091.18	1087.93	1085.24	1083.22	1084.44	1091.25	1099.84	1099.49	1099.61	1099.10
17	1096.91	1094.16	1091.10	1087.82	1085.13	1083.15	1084.51	1091.84	1099.84	1099.51	1099.59	1099.05
18	1096.81	1094.06	1090.98	1087.71	1085.03	1083.10	1084.60	1092.39	1099.87	1099.51	1099.57	1099.03
19	1096.71	1093.98	1090.87	1087.61	1084.93	1083.05	1084.69	1093.00	1099.90	1099.52	1099.55	1099.04
20	1096.64	1093.88	1090.78	1087.54	1084.84	1083.03	1084.74	1093.71	1099.85	1099.57	1099.56	1098.98
21	1096.57	1093.80	1090.68	1087.49	1084.75	1083.06	1084.82	1094.29	1099.82	1099.61	1099.58	1098.91
22	1096.50	1093.72	1090.60	1087.38	1084.72	1083.08	1084.89	1094.75	1099.79	1099.65	1099.54	1098.86
23	1096.42	1093.62	1090.50	1087.26	1084.66	1083.14	1084.97	1095.10	1099.76	1099.69	1099.52	1098.83
24	1096.35	1093.50	1090.41	1087.13	1084.56	1083.19	1085.06	1095.42	1099.73	1099.70	1099.53	1098.79
25	1096.26	1093.38	1090.29	1086.99	1084.45	1083.23	1085.17	1095.76	1099.70	1099.69	1099.48	1098.76
26	1096.16	1093.27	1090.17	1086.89	1084.33	1083.27	1085.29	1096.09	1099.71	1099.70	1099.42	1098.74
27	1096.07	1093.17	1090.07	1086.80	1084.22	1083.32	1085.46	1096.45	1099.76	1099.69	1099.40	1098.71
28	1095.98	1093.06	1089.98	1086.70	1084.14	1083.37	1085.44	1096.81	1099.79	1099.71	1099.37	1098.67
29	1095.89	1092.94	1089.89	1086.60	---	1083.40	1085.54	1097.19	1099.75	1099.71	1099.37	1098.62
30	1095.82	1092.87	1089.79	1086.49	---	1083.44	1085.64	1097.56	1099.72	1099.69	1099.37	1098.56
31	1095.72	---	1089.71	1086.42	---	1083.48	---	1097.92	---	1099.67	1099.34	---
MEAN	1097.10	1094.30	1091.19	1087.97	1085.32	1083.43	1084.48	1091.20	1099.67	1099.60	1099.57	1099.07
MAX	1098.59	1095.67	1092.75	1089.61	1086.41	1084.12	1085.64	1097.92	1099.93	1099.71	1099.71	1099.39
MIN	1095.72	1092.87	1089.71	1086.42	1084.14	1083.03	1083.53	1085.74	1098.34	1099.49	1099.34	1098.56
†	537200	445000	340200	235600	162400	142400	212300	616100	667500	666500	654600	628600
‡	-95100	-92200	-104800	-104600	-73200	-20000	+69900	+403800	+51400	-1000	-11900	-26000

CAL YR 1992 MEAN 1092.64 MAX 1099.58 MIN 1083.83 AC-FT† +13900
WTR YR 1993 MEAN 1092.78 MAX 1099.93 MIN 1083.03 AC-FT† -3700

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

‡ Change in contents, in acre-feet.

CHELAN RIVER BASIN

285

12452500 CHELAN RIVER AT CHELAN, WA

LOCATION.--Lat 47°50'05", long 120°00'43", in SE 1/4 NE 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 (station 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 upstream from 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 with an annual depletion of about 11,000 acre-ft, 1946 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 when periods of spill occur.

AVERAGE DISCHARGE.--89 years (water years 1905-93), 2,036 ft³/s, 29.92 in/yr, 1,475,000 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, 4,710 ft³/s June 16; minimum daily discharge, 14 ft³/s May 20-25.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1710	2210	2210	2210	1710	1610	104	109	1320	2220	1510	420
2	2210	2210	2210	2110	2110	2010	104	109	1420	2220	1210	820
3	2110	2210	1910	2210	2110	2110	105	109	2220	2220	1210	520
4	2110	2210	2210	2210	2110	1910	105	109	2220	2220	1120	120
5	2210	2210	2210	2110	2210	1610	105	110	2220	2220	1220	120
6	2210	2210	2210	2210	1410	1610	105	110	2220	2220	1220	120
7	2210	2210	2210	2210	506	306	105	110	2220	2120	1120	1320
8	2210	2210	2210	2210	1710	1610	105	110	2820	1720	1220	1020
9	2210	2210	2210	2210	2110	1610	105	110	3290	1620	1220	1220
10	2210	2210	2210	2210	1910	1610	105	110	3220	1520	1220	1120
11	2210	2210	2210	2210	2010	1610	105	110	3140	1320	1220	1320
12	2210	1910	2210	2110	2210	1510	105	118	3140	1620	1220	118
13	2210	2210	2210	2110	2210	1610	105	117	2800	1620	1120	1220
14	2210	2210	2210	2110	806	106	105	117	2630	1620	1020	1120
15	2210	2210	2210	2210	1710	1410	105	117	4090	1620	1220	1110
16	2210	2210	2210	2210	2110	1510	106	117	4710	1320	1320	1110
17	2210	2210	2110	2210	2210	1410	106	117	3200	1220	1220	1310
18	2210	2210	2110	2110	1810	1510	106	117	3310	1420	1220	111
19	2210	2210	2110	2110	2210	506	106	114	3790	1420	1320	1010
20	2210	2210	2110	2110	2210	106	106	14	4390	1520	1220	1210
21	2210	2210	2110	2110	706	106	108	14	3400	1420	1120	911
22	2210	2210	2110	2210	1410	105	108	14	3490	1420	1320	911
23	2210	2210	2110	2210	2210	105	108	14	2600	1420	1320	711
24	2210	2210	2210	2210	2210	104	108	14	2220	1420	1220	711
25	2210	2210	2210	2210	2210	104	109	14	2020	1320	1220	611
26	2210	2210	2210	2210	2210	104	109	420	1920	1520	1320	611
27	1910	2210	2210	2210	2010	104	109	620	2120	1720	1120	911
28	2110	2210	2210	2210	105	104	108	620	2220	1710	116	1110
29	2210	2210	2210	2210	---	104	108	220	2220	2010	116	1310
30	2210	2210	2210	2210	---	104	108	120	2220	1610	1020	1210
31	2210	---	2210	106	---	104	---	120	---	1710	1220	---
TOTAL	67410	66000	67510	65506	50463	28432	3186	4344	82800	52480	35482	25446
MEAN	2175	2200	2178	2113	1802	917	106	140	2760	1693	1145	848
MAX	2210	2210	2210	2210	2210	2110	109	620	4710	2220	1510	1320
MIN	1710	1910	1910	106	105	104	104	14	1320	1220	116	111
AC-FT	133700	130900	133900	129900	100100	56390	6320	8620	164200	104100	70380	50470
MEAN†	628	651	473	411	484	592	1281	6706	3624	1676	951	411
CFSM†	0.68	0.70	0.51	0.45	0.52	0.64	1.39	7.26	3.92	1.81	1.03	0.45
IN.†	0.78	0.79	0.59	0.51	0.55	0.74	1.55	8.37	4.37	2.09	1.19	0.50
AC-FT†	38600	38700	29100	25300	26900	36390	76220	412400	215600	103100	58480	24470

CAL YR 1992 TOTAL 618014.6 MEAN 1689 MAX 2220 MIN 1.6 AC-FT 1226000 MEAN† 1709 CFSM† 1.85 IN.† 25.16 AC-FT† 1240000
WTR YR 1993 TOTAL 549059 MEAN 1504 MAX 4710 MIN 14 AC-FT 1089000 MEAN† 1498 CFSM† 1.62 IN.† 22.02 AC-FT† 1085000

† Adjusted for change in contents in Lake Chelan.

ENTIAT RIVER BASIN

12452800 ENTIAT RIVER NEAR ARDENVOIR, WA

LOCATION.--Lat 47°49'07", long 120°25'19", in NE 1/4 NE 1/4 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 1,560.97 ft above sea level.

REMARKS.--Records good except for estimated daily discharges, which are fair. No regulation or diversion upstream from station. Water temperature July 1968 to September 1970.

AVERAGE DISCHARGE.--36 years, 370 ft³/s, 24.75 in/yr, 268,100 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 6,430 ft³/s June 10, 1972, gage height, 8.98 ft; minimum daily discharge, 25 ft³/s Dec. 17, 1964.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 1,750 ft³/s and maximum (*):

Date	Time	Discharge (ft /s)	Gage height (ft)	Date	Time	Discharge (ft /s)	Gage height (ft)
May 14	0300	*2,210	5.58	May 20	0100	2,050	5.40
May 14	0300	(a)	*5.82				

Minimum daily discharge, 27 ft³/s Feb. 16.
(a) From outside high-water mark.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	66	76	61	e40	62	e44	87	183	1300	276	166	81
2	66	76	58	e38	60	51	91	198	1180	270	162	80
3	67	70	36	e37	58	51	91	201	1060	262	160	80
4	67	71	e28	e36	57	52	95	199	971	258	159	79
5	65	70	e28	e35	55	52	92	228	921	248	157	79
6	64	66	e40	e37	57	55	92	312	902	240	152	79
7	63	83	62	e35	57	55	90	372	863	231	147	78
8	62	90	65	e34	56	56	97	346	798	222	140	77
9	60	74	63	e38	57	55	104	331	773	218	135	76
10	59	62	62	e40	58	55	102	375	761	217	131	75
11	59	70	61	e45	58	55	101	623	680	210	128	74
12	60	70	61	e47	57	55	99	1190	608	200	124	74
13	60	67	59	e50	57	56	99	1790	553	210	120	72
14	61	67	60	e54	57	58	98	2070	551	220	118	69
15	59	66	59	56	51	67	100	1930	594	214	118	73
16	58	66	54	54	e27	64	102	1850	573	191	121	72
17	59	67	e54	54	e28	62	106	1740	566	209	120	68
18	60	66	e45	54	e35	63	110	1750	578	209	114	65
19	67	68	e40	53	57	65	110	1920	582	196	111	63
20	83	65	52	53	62	68	112	1980	533	224	110	62
21	77	64	57	54	61	70	115	1740	498	241	113	63
22	73	63	63	54	55	76	127	1380	456	218	109	61
23	70	58	61	49	55	108	130	1160	405	209	122	60
24	69	e35	60	55	45	106	134	1050	363	199	125	58
25	68	e30	55	65	e40	92	144	1040	341	206	107	57
26	66	41	55	94	e38	88	156	1050	343	196	99	56
27	64	62	55	89	e37	87	151	1110	375	187	94	55
28	64	73	53	75	e40	86	154	1160	336	184	90	55
29	70	74	51	69	---	86	155	1210	308	212	88	55
30	71	68	47	65	---	85	170	1090	289	192	85	54
31	70	---	42	63	---	83	---	1080	---	172	83	---
TOTAL	2027	1978	1647	1622	1437	2105	3414	32658	19061	6741	3808	2050
MEAN	65.4	65.9	53.1	52.3	51.3	67.9	114	1053	635	217	123	68.3
MAX	83	90	65	94	62	108	170	2070	1300	276	166	81
MIN	58	30	28	34	27	44	87	183	289	172	83	54
AC-FT	4020	3920	3270	3220	2850	4180	6770	64780	37810	13370	7550	4070
CFSM	.32	.32	.26	.26	.25	.33	.56	5.19	3.13	1.07	.61	.34
IN.	.37	.36	.30	.30	.26	.39	.63	5.98	3.49	1.24	.70	.34

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1957 - 1993, BY WATER YEAR (WY)

MEAN	98.5	119	122	106	111	145	312	1051	1426	611	213	113
MAX	292	463	506	308	244	437	627	1862	2793	1479	514	210
(WY)	1960	1991	1976	1981	1968	1972	1990	1958	1974	1979	1976	1978
MIN	51.9	51.2	53.1	47.7	51.3	67.9	93.2	380	522	179	116	68.3
(WY)	1988	1988	1993	1988	1993	1993	1967	1977	1977	1977	1987	1993

SUMMARY STATISTICS	FOR 1992 CALENDAR YEAR	FOR 1993 WATER YEAR	WATER YEARS 1957 - 1993
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ANNUAL TOTAL	98049			78548					
ANNUAL MEAN	268			215				370	
HIGHEST ANNUAL MEAN								621	1972
LOWEST ANNUAL MEAN								175	1977
HIGHEST DAILY MEAN	1890	May	7	2070	May	14	5100	Jun	16 1974
LOWEST DAILY MEAN	28	Dec	4	27	Feb	16	25	Dec	17 1964
ANNUAL SEVEN-DAY MINIMUM	45	Dec	1	36	Jan	2	36	Jan	4 1974
ANNUAL RUNOFF (AC-FT)	194500			155800			267800		
ANNUAL RUNOFF (CFSM)	1.32			1.06			1.82		
ANNUAL RUNOFF (INCHES)	17.97			14.39			24.74		
10 PERCENT EXCEEDS	744			575			1070		
50 PERCENT EXCEEDS	109			74			142		
90 PERCENT EXCEEDS	60			51			67		

e Estimated

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LOCATION.--Lat 47°31'28", long 120°18'04", in SW 1/4 NW 1/4 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.

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

GAGE.--Daily discharge determined from flow through turbines plus spillway flow when present. Datum of gage is sea level. Oct. 1, 1960, to July 22, 1988, water-stage recorder with auxiliary water-stage recorder 1.9 mi downstream from base gage at same datum.

REMARKS.--Flow regulated by nine major reservoirs and numerous smaller reservoirs and powerplants. Feeder Canal diversion (station 12435500) for Columbia Basin project is used to irrigate approximately 600,000 acres in the United States. An additional 66,500 acres in Canada are irrigated by other diversions.

COOPERATION.--Discharge records provided by Public Utility District No. 1 of Chelan County at Rocky Reach Dam through the Corps of Engineers, North Pacific Division, Reservoir Control Center. The U.S. Geological Survey made 6 discharge measurements at this site during the year.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, about 535,000 ft³/s June 10, 1961, elevation, about 635.50 ft; minimum daily discharge, 25,100 ft³/s Nov. 11, 1973.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	75300	54200	126000	98800	98500	103000	50900	55100	135000	133000	68400	807000
2	87200	89000	126000	121000	94900	82700	53600	57400	157000	130000	91600	861000
3	60800	82900	133000	120000	109000	74400	36200	107000	152000	122000	103000	839000
4	50400	80700	137000	143000	85700	70700	32800	83400	147000	82700	95600	551000
5	87500	74500	132000	150000	70900	54900	46200	90000	126000	115000	102000	456000
6	70300	73300	122000	160000	59000	51900	52800	93200	95200	127000	91000	560000
7	72000	51400	139000	165000	66900	41400	50500	109000	123000	103000	55600	964000
8	60300	49400	127000	138000	87100	61100	61400	94900	110000	116000	41400	992000
9	66300	90500	121000	118000	77800	68700	59400	109000	130000	109000	92300	908000
10	61500	105000	122000	128000	76000	60000	40700	140000	141000	92100	82600	732000
11	44500	99100	108000	143000	88300	55400	35800	130000	137000	103000	82200	470000
12	80700	81600	92600	140000	78200	59400	56500	138000	82900	109000	92100	375000
13	71700	79700	96700	135000	60300	44600	62200	119000	66400	99800	109000	776000
14	79600	58700	121000	114000	72100	48500	48200	111000	94600	114000	75400	780000
15	91800	58400	128000	99200	98300	64300	49400	142000	87800	118000	73000	790000
16	78500	94100	145000	86800	130000	72200	51600	176000	95200	123000	89600	708000
17	44000	76800	132000	84200	123000	54800	40300	182000	102000	101000	73000	863000
18	43400	85000	134000	107000	120000	45800	34400	178000	98200	108000	76100	436000
19	66200	96600	112000	105000	116000	51300	56600	182000	81900	108000	83000	468000
20	69600	104000	97600	69800	90200	41200	47600	175000	72400	105000	65100	952000
21	74700	105000	114000	94500	79600	38500	53100	184000	100000	105000	47300	854000
22	68000	86900	109000	94200	105000	73000	67600	175000	104000	117000	54400	832000
23	70000	122000	97600	97000	116000	60300	57700	183000	112000	109000	83500	837000
24	52400	125000	61900	74900	109000	64000	36500	180000	104000	86600	91600	792000
25	47600	115000	62900	64000	113000	53400	41200	177000	97000	76700	85200	497000
26	77100	62600	68900	75500	114000	44600	51900	172000	89700	98100	92300	379000
27	77100	79300	91400	82100	71500	32900	67900	149000	87000	104000	83900	858000
28	86500	74100	118000	81400	64400	34400	76000	134000	105000	117000	52400	821000
29	81200	96000	123000	78100	---	70200	85200	141000	116000	107000	45600	873000
30	63700	107000	130000	62700	---	67900	64700	133000	136000	107000	88100	856000
31	57600	---	128000	61400	---	53400	---	130000	---	78300	88900	---
TOTAL	2117500	2557800	3556600	3291600	2574700	1798900	1568900	4230000	3285300	3324300	2455200	2188700
MEAN	68310	85260	114700	106200	91950	58030	52300	136500	109500	107200	79200	72960
MAX	91800	125000	145000	165000	130000	103000	85200	184000	157000	133000	109000	99200
MIN	43400	49400	61900	61400	59000	32900	32800	55100	66400	76700	41400	37500
AC-FT	4200000	5073000	7055000	6529000	5107000	3568000	3112000	8390000	6516000	6594000	4870000	4341000
CAL YR 1992	TOTAL 35563100		MEAN 97170		MAX 182000		MIN 36600		AC-FT 70540000			
WTR YR 1993	TOTAL 32949500		MEAN 90270		MAX 184000		MIN 32800		AC-FT 65360000			

12456500 CHIWAHA RIVER NEAR PLAIN, WA

LOCATION.--Lat 47°50'15", long 120°39'40", in SE 1/4 sec.13, T.27 N., R.17 E., Chelan County, Hydrologic Unit 17020011, on right bank 3/4 mi upstream from Goose Creek, 5.3 mi north of Plain, 6.2 mi upstream from mouth, 11 mi northeast of Chiwaukum, and at mile 6.2.

DRAINAGE AREA.--170 mi².

PERIOD OF RECORD.--May 1911 to October 1914 (published as Chiewa Creek near Leavenworth), August 1936 to November 1949, August 1954 to September 1957, May 1991 to current year.

REVISED RECORDS.--WSP 1316: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 2,100 ft above sea level (from river-profile map). May 29, 1911 to Oct. 31, 1914, staff gage at site 3 miles downstream at different datum.

REMARKS.--Records good except for estimated daily discharges, which are fair. No regulation or diversion upstream from station.

AVERAGE DISCHARGE.--21 years (water years 1912-14, 1937-49, 1955-57, 1992-93), 489 ft³/s, 39.06 in/yr, 354,300 acre-ft/yr.
Includes discharges for 1912 and 1913, which were estimated for WSP 1316.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 5,880 ft³/s May 29, 1948, gage height, 9.17 ft; minimum daily discharge, 45 ft³/s Feb. 25, Mar. 2-5, 1993.

EXTREMES OUTSIDE PERIOD OF RECORD.--Peak Nov. 25, 1990 was 6,810 ft³/s, gage height, 9.26 ft, from rating curve extended beyond highest measurement of 5,570 ft³/s.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 3,130 ft³/s May 14, gage height, 7.27 ft; minimum daily discharge, 45 ft³/s Feb. 25, Mar. 2-5.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	111	136	97	e80	e130	e46	169	556	1660	399	215	101
2	107	139	96	e74	e125	e45	181	578	1510	400	209	100
3	104	125	e86	e64	e120	e45	195	572	1360	378	208	100
4	103	125	e78	e60	e110	e45	218	551	1300	400	206	99
5	98	124	e70	e56	e106	e45	213	588	1270	398	197	98
6	95	115	e76	e60	e104	e46	210	770	1280	386	193	98
7	92	181	e80	e62	e100	e48	208	838	1310	366	191	96
8	89	189	e82	e64	e96	e49	231	751	1130	359	176	96
9	86	153	e84	e72	e94	e50	273	685	1090	363	169	95
10	84	132	e86	e74	e92	e50	276	743	1140	350	159	94
11	83	130	e88	e70	e91	e50	271	1140	964	334	151	93
12	82	128	e86	e70	95	e50	274	1940	835	305	146	94
13	85	122	e84	e70	92	e50	271	2580	748	299	143	92
14	87	118	e86	e70	92	e50	267	2880	756	306	141	90
15	80	115	e90	e68	90	e52	284	2620	846	286	138	95
16	80	115	e88	e68	e80	e54	295	2490	839	275	139	93
17	84	116	e86	e66	e50	e54	308	2320	887	318	135	89
18	84	114	e84	e66	e52	54	321	2310	900	308	133	87
19	102	120	e78	e66	e56	56	323	2530	896	284	129	86
20	143	120	e80	e68	e58	65	327	2670	795	317	127	86
21	140	121	e86	e70	e60	75	338	2330	729	341	129	86
22	131	112	e90	e70	e56	92	375	1840	651	299	124	85
23	130	108	e94	e68	e50	199	389	1580	566	284	152	83
24	122	e106	e98	e72	e47	219	413	1450	500	267	163	82
25	117	e104	e96	e110	e45	193	442	1480	480	257	134	81
26	111	e102	e94	e170	e46	182	470	1480	522	250	121	80
27	105	e100	e96	e210	e47	178	457	1590	564	253	115	80
28	103	101	e92	e190	e47	175	452	1690	488	251	111	81
29	106	96	e90	e170	---	176	456	1670	437	284	108	81
30	110	102	e86	e160	---	174	515	1500	411	250	105	80
31	114	---	e82	e150	---	166	---	1440	---	222	103	---
TOTAL	3168	3669	2689	2788	2231	2833	9422	48162	26864	9789	4670	2701
MEAN	102	122	86.7	89.9	79.7	91.4	314	1554	895	316	151	90.0
MAX	143	189	98	210	130	219	515	2880	1660	400	215	101
MIN	80	96	70	56	45	45	169	551	411	222	103	80
AC-FT	6280	7280	5330	5530	4430	5620	18690	95530	53280	19420	9260	5360
CFSM	.60	.72	.51	.53	.47	.54	1.85	9.14	5.27	1.86	.89	.53
IN.	.69	.80	.59	.61	.49	.62	2.06	10.54	5.88	2.14	1.02	.55

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1911 - 1993, BY WATER YEAR (WY)

MEAN	172	203	171	139	116	171	577	1562	1527	772	261	164
MAX	347	571	328	263	204	488	1266	2683	2679	1473	516	359
(WY)	1956	1956	1957	1945	1942	1992	1914	1956	1948	1991	1991	1954
MIN	63.5	77.8	86.7	78.4	68.6	91.4	214	826	659	256	106	80.5
(WY)	1943	1937	1993	1937	1943	1993	1937	1944	1941	1941	1941	1942

SUMMARY STATISTICS

FOR 1992 CALENDAR YEAR

FOR 1993 WATER YEAR

WATER YEARS 1911 - 1993

ANNUAL TOTAL	150114		118986				
ANNUAL MEAN	410		326		476		
HIGHEST ANNUAL MEAN					783		1956
LOWEST ANNUAL MEAN					264		1944
HIGHEST DAILY MEAN	2370	May 7	2880	May 14	5580	May 29	1948
LOWEST DAILY MEAN	70	Dec 5	45	Feb 25	45	Feb 25	1993
ANNUAL SEVEN-DAY MINIMUM	79	Dec 3	46	Feb 28	46	Feb 28	1993
ANNUAL RUNOFF (AC-FT)	297800		236000		344800		
ANNUAL RUNOFF (CFSM)	2.41		1.92		2.80		
ANNUAL RUNOFF (INCHES)	32.85		26.04		38.04		
10 PERCENT EXCEEDS	1100		842		1350		
50 PERCENT EXCEEDS	181		121		196		
90 PERCENT EXCEEDS	90		64		90		

e Estimated

WENATCHEE RIVER BASIN

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12457000 WENATCHEE RIVER AT PLAIN, WA

LOCATION.--Lat 47°45'47", long 120°39'54", in NE 1/4 SW 1/4 sec.12, T.26 N., R.17 E., Chelan County, Hydrologic Unit 17020011, on left bank 300 ft downstream from county road bridge at Plain, 0.3 mi downstream from Beaver Creek, 2.2 mi downstream from Chiwawa River, 11.3 mi north of Leavenworth, and at mile 46.2.

DRAINAGE AREA.--591 mi².

PERIOD OF RECORD.--August 1904 to November 1910 estimates of monthly mean discharges are published in Washington State Water-Supply Bulletin No. 5, December 1910 to September 1950 (monthly discharges only for some periods, published in WSP 1316), October 1950 to September 1979, October 1989 to current year. Published as "near Leavenworth" 1911-31.

REVISED RECORDS.--WSP 482: 1911-14. WSP 1316: 1914(M), 1916(M), 1919(M), 1921-23(M), 1927(M).

GAGE.--Water-stage recorder. Elevation of gage is 1,805 ft, from river-profile map. Prior to Jan. 8, 1932, nonrecording gages at site 0.2 mi downstream at different datum.

REMARKS.--Records good except for estimated daily discharges, which are fair. Wenatchee Park Land and Irrigation Company diverts water from the Chiwawa River, upstream from the station for irrigation of 1,400 acres near Plain. Natural regulation by Wenatchee Lake 8.0 mi upstream.

AVERAGE DISCHARGE.--73 years (water years 1911-79, 1990-93), 2,244 ft³/s, 51.56 in/yr, 1,626,000 acre-ft/yr. Includes mean discharges for water years 1930 and 1931, which were estimated for WSP 1316.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 33,200 ft³/s Nov. 25, 1990, gage height, 14.39 ft; minimum discharge, 168 ft³/s Nov. 30, 1952, gage height, 1.31 ft.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 12,100 ft³/s May 14, gage height, 8.89 ft; minimum discharge, 258 ft³/s Sept. 26-28, gage height, 1.41 ft.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	506	545	588	455	1010	471	1380	3120	5990	1690	944	434
2	492	603	562	408	928	471	1400	3340	5570	1650	910	430
3	475	583	496	e350	871	475	1450	3370	5120	1590	895	434
4	456	582	423	e340	824	483	1550	3200	4780	1590	899	443
5	424	589	394	e320	792	518	1550	3080	4700	1590	886	440
6	402	566	414	e340	761	608	1530	3560	4720	1540	868	443
7	381	811	447	e310	733	642	1510	3930	4740	1470	849	444
8	366	1150	462	e360	713	652	1560	3690	4330	1440	812	446
9	347	1050	467	433	701	674	1800	3400	3980	1470	756	438
10	325	928	476	422	689	692	1890	3450	4410	1420	711	434
11	319	863	494	396	672	699	1890	4860	3980	1380	662	436
12	322	841	487	388	657	699	1860	7720	3530	1280	640	409
13	334	800	474	380	645	699	1820	10700	3160	1210	633	386
14	354	773	485	379	633	715	1760	11900	3050	1210	609	366
15	332	749	536	385	613	925	1780	11000	3320	1140	591	365
16	324	727	497	377	562	964	1810	10000	3360	1100	590	364
17	331	728	500	369	508	932	1840	9190	3450	1160	577	343
18	334	735	479	363	518	934	1920	8930	3500	1190	577	333
19	374	757	436	362	540	926	1950	9510	3520	1160	578	321
20	538	754	442	369	559	938	1950	10200	3280	1220	584	309
21	604	769	481	393	559	952	1980	9380	3030	1370	604	293
22	648	766	513	383	550	1010	2090	7910	2740	1290	578	288
23	650	725	546	373	533	1570	2160	6660	2480	1250	620	281
24	638	655	562	394	501	1890	2250	5880	2230	1170	733	274
25	605	609	543	562	474	1800	2410	5840	2060	1110	662	268
26	574	589	538	1250	460	1700	2570	5790	2120	1070	599	260
27	529	600	539	1540	480	1620	2590	6000	2250	1060	553	261
28	502	594	530	1520	474	1540	2540	6430	2130	1050	510	268
29	496	579	513	1380	---	1500	2510	6630	1940	1110	477	276
30	489	601	498	1230	---	1450	2910	6030	1790	1090	458	280
31	490	---	461	1100	---	1390	---	5500	---	1010	444	---
TOTAL	13961	21621	15283	17631	17960	30539	58210	200200	105260	40080	20809	10767
MEAN	450	721	493	569	641	985	1940	6458	3509	1293	671	359
MAX	650	1150	588	1540	1010	1890	2910	11900	5990	1690	944	446
MIN	319	545	394	310	460	471	1380	3080	1790	1010	444	260
AC-FT	27690	42890	30310	34970	35620	60570	115500	397100	208800	79500	41270	21360
CFSM	.76	1.22	.83	.96	1.09	1.67	3.28	10.9	5.94	2.19	1.14	.61
IN.	.88	1.36	.96	1.11	1.13	1.92	3.66	12.60	6.63	2.52	1.31	.68

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1911 - 1993, BY WATER YEAR (WY)

	MEAN	898	1354	1357	1089	1059	1185	2630	5797	6424	3458	1213	690
MAX	2722	6702	4395	3938	3010	3719	8162	9771	11750	7540	3154	1573	
(WY)	1960	1991	1976	1918	1924	1934	1934	1956	1974	1954	1974	1959	
MIN	251	236	296	335	306	487	913	2613	1861	886	456	312	
(WY)	1943	1937	1953	1929	1929	1917	1917	1915	1915	1941	1941	1942	

SUMMARY STATISTICS

FOR 1992 CALENDAR YEAR

FOR 1993 WATER YEAR

WATER YEARS 1911 - 1993

ANNUAL TOTAL	595132	552321		
ANNUAL MEAN	1626	1513		
HIGHEST ANNUAL MEAN			2267	
LOWEST ANNUAL MEAN			3344	1934
HIGHEST DAILY MEAN	8210	May 7	1266	1944
LOWEST DAILY MEAN	295	Sep 20	29900	Nov 25 1990
ANNUAL SEVEN-DAY MINIMUM	326	Sep 15	186	Nov 30 1952
ANNUAL RUNOFF (AC-FT)	1180000		205	Nov 26 1952
ANNUAL RUNOFF (CFSM)	2.75		1643000	
ANNUAL RUNOFF (INCHES)	37.46		3.84	
10 PERCENT EXCEEDS	3710		52.13	
50 PERCENT EXCEEDS	932		5850	
90 PERCENT EXCEEDS	396		1190	
			490	

e Estimated

WENATCHEE RIVER BASIN

12459000 WENATCHEE RIVER AT PESHASTIN, WA

LOCATION.--Lat 47°35'00", long 120°36'46", in SE 1/4 SW 1/4 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 sea level. Prior to Mar. 24, 1932, nonrecording gage at site 1.2 mi downstream at different datum.

REMARKS.--Records excellent except for estimated daily discharges, which are good. Numerous diversions 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. U.S. Geological Survey satellite telemeter at station.

AVERAGE DISCHARGE.--65 years (water years 1929-93), 3,059 ft³/s, 2,216,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 40,000 ft³/s Nov. 25, 1990, gage height, 17.58 ft, from rating curve extended above 26,700 ft³/s on basis of slope-area measurement of peak flow; minimum discharge, 183 ft³/s Oct. 14, 1939; minimum gage height, 1.24 ft Nov. 1, 1952; minimum daily discharge, 250 ft³/s Oct. 30, 1987.

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)
May 13	2400	*16,700	*10.68	No other peak greater than base discharge.			
Minimum discharge, 353 ft ³ /s Sept. 26, gage height, 1.50 ft.							

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	757	704	790	e600	1300	674	1850	4160	8630	2130	1160	542
2	683	806	756	e520	1210	665	1900	4470	7970	2070	1110	529
3	658	794	671	e460	1140	661	1940	4550	7350	2010	1080	525
4	632	775	596	e440	1080	670	2070	4310	6850	1980	1070	529
5	604	791	e530	e420	1040	695	2070	4140	6870	1960	1050	536
6	569	770	e560	e430	1010	812	2040	4860	6860	1900	1020	532
7	543	960	e640	e400	979	861	2000	5460	6810	1820	999	537
8	518	1600	e660	e480	947	876	2050	5050	6230	1760	957	538
9	502	1430	671	e580	933	904	2340	4640	5650	1770	892	539
10	482	1240	687	e560	919	922	2480	4680	6150	1740	840	527
11	466	1170	684	e540	900	931	2450	6910	5590	1680	795	525
12	461	1130	679	e540	885	936	2400	11500	4940	1580	757	518
13	468	1080	659	e530	866	939	2350	15400	4400	1500	736	504
14	492	1050	659	e530	853	948	2270	16200	4180	1520	721	479
15	480	1020	724	e540	833	1140	2260	15000	4590	1430	700	477
16	465	991	698	e520	749	1280	2300	13800	4620	1370	693	485
17	471	981	698	e520	698	1230	2330	12700	4690	1410	688	466
18	474	986	669	e520	704	1220	2460	12600	4770	1470	673	448
19	502	1010	620	e500	746	1230	2510	13300	4780	1410	671	438
20	647	1010	643	e520	774	1240	2500	14100	4440	1470	684	425
21	743	1030	682	e520	782	1260	2530	12900	4090	1650	723	411
22	800	1030	699	e540	757	1320	2660	10900	3680	1590	719	401
23	817	977	726	e520	738	1970	2780	9300	3330	1520	712	392
24	802	858	748	e520	696	2490	2870	8310	2960	1440	860	386
25	768	809	729	e580	679	2370	3070	8260	2690	1360	870	381
26	733	799	711	e1200	664	2240	3320	8190	2710	1310	771	365
27	690	813	717	e2000	687	2130	3360	8410	2900	1280	702	418
28	656	816	715	e1910	692	2050	3280	8790	2760	1260	655	419
29	662	789	692	1740	---	1990	3220	9070	2480	1320	620	422
30	655	791	e660	1580	---	1930	3820	8260	2260	1330	588	388
31	647	---	e620	1420	---	1860	---	7870	---	1250	566	---
TOTAL	18847	29010	20993	22680	24261	40444	75480	278090	146230	49290	25082	14082
MEAN	608	967	677	732	866	1305	2516	8971	4874	1590	809	469
MAX	817	1600	790	2000	1300	2490	3820	16200	8630	2130	1160	542
MIN	461	704	530	400	664	661	1850	4140	2260	1250	566	365
AC-FT	37380	57540	41640	44990	48120	80220	149700	551600	290000	97770	49750	27930

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1929 - 1993, BY WATER YEAR (WY)

MEAN	1118	1833	1823	1500	1539	1796	3696	7929	8751	4439	1478	829
MAX	3654	8800	6202	3760	3944	5607	11250	13800	16180	10350	4003	1997
(WY)	1960	1991	1976	1968	1951	1972	1934	1956	1974	1954	1954	1959
MIN	331	329	421	421	476	806	1475	3506	3191	1164	572	426
(WY)	1988	1930	1953	1930	1937	1929	1929	1977	1941	1941	1931	1942

SUMMARY STATISTICS	FOR 1992 CALENDAR YEAR	FOR 1993 WATER YEAR	WATER YEARS 1929 - 1993
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ANNUAL TOTAL	833196		744489			
ANNUAL MEAN	2276		2040		3077	
HIGHEST ANNUAL MEAN					4830	1972
LOWEST ANNUAL MEAN					1725	1941
HIGHEST DAILY MEAN	11400	May 7	16200	May 14	36900	Nov 25 1990
LOWEST DAILY MEAN	439	Sep 20	365	Sep 26	250	Oct 30 1987
ANNUAL SEVEN-DAY MINIMUM	469	Sep 16	393	Sep 21	255	Oct 26 1987
ANNUAL RUNOFF (AC-FT)	1653000		1477000		2229000	
10 PERCENT EXCEEDS	5260		4810		7910	
50 PERCENT EXCEEDS	1190		931		1630	
90 PERCENT EXCEEDS	538		512		614	

e Estimated

WENATCHEE RIVER BASIN

291

12462500 WENATCHEE RIVER AT MONITOR, WA

LOCATION.--Lat 47°29'58", long 120°25'24", in NE 1/4 SW 1/4 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 good except for estimated daily discharges, which are fair. No regulation. Diversions for irrigation of about 25,000 acres upstream from station. Chelan County Public Utility District No. 1 gage-height telemeter at station. U.S. Geological Survey satellite telemeter at station.

AVERAGE DISCHARGE.--31 years, 3,231 ft³/s, 2,341,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 45,900 ft³/s Nov. 25, 1990, gage height, 29.80 ft; maximum gage height, 30.00 ft, from mean of outside high-water marks surveyed for slope area computation of Nov. 25, 1990 flood; minimum discharge, 307 ft³/s Sept. 26, 27, 1993, gage height, 16.64 ft.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 18,700 ft³/s May 14, gage height, 24.49 ft; minimum discharge, 307 ft³/s Sept. 26, 27, gage height, 16.64 ft.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	726	725	854	648	1430	736	2020	4280	9180	2090	1080	452
2	640	852	818	581	1330	725	2110	4590	8450	2030	1020	429
3	608	849	738	e500	1260	728	2160	4740	7780	1980	966	428
4	583	823	625	e490	1200	741	2300	4470	7200	1930	945	432
5	556	834	572	e470	1150	755	2310	4280	7270	1920	933	440
6	523	825	615	e490	1130	868	2260	4980	7270	1850	905	437
7	503	929	699	e460	1090	959	2220	5740	7160	1770	880	445
8	485	1630	721	e540	1060	992	2250	5290	6550	1700	846	448
9	467	1520	723	e640	1050	1010	2540	4790	5860	1700	786	451
10	447	1330	747	e620	1040	1040	2710	4730	6350	1680	733	444
11	429	1240	739	e600	1020	1060	2690	7150	5850	1610	683	441
12	422	1200	734	e590	1000	1060	2620	12500	5150	1530	639	451
13	422	1150	710	e580	988	1060	2560	16900	4560	1450	613	442
14	440	1110	698	e590	973	1060	2480	18000	4270	1470	602	419
15	443	1080	761	e596	953	1200	2460	16600	4650	1400	585	411
16	470	1050	761	e590	856	1440	2490	15200	4690	1330	577	423
17	508	1030	739	e580	746	1380	2550	14000	4730	1370	573	427
18	515	1040	726	e580	745	1350	2700	13700	4800	1440	558	417
19	528	1060	651	e560	853	1370	2720	14600	4810	1380	551	403
20	634	1070	673	e580	875	1360	2660	15300	4470	1420	559	393
21	772	1090	719	e600	887	1390	2680	14000	4100	1600	603	386
22	823	1090	761	e580	847	1460	2810	11800	3690	1570	623	373
23	854	1050	785	e560	829	2030	2930	9930	3330	1490	609	366
24	845	934	799	633	772	2710	3010	8750	2970	1420	717	361
25	811	858	787	700	737	2600	3190	8680	2680	1350	799	351
26	773	855	763	1440	704	2440	3460	8580	2640	1280	701	338
27	732	866	767	2210	730	2320	3490	8800	2820	1220	621	331
28	693	873	776	2100	749	2230	3410	9190	2730	1180	571	347
29	696	851	747	1880	---	2170	3320	9540	2450	1240	533	356
30	695	838	721	1710	---	2110	3850	8690	2230	1270	505	337
31	679	---	672	1550	---	2040	---	8230	---	1190	480	---
TOTAL	18722	30652	22601	25248	27004	44394	80960	298030	150690	47860	21796	12179
MEAN	604	1022	729	814	964	1432	2699	9614	5023	1544	703	406
MAX	854	1630	854	2210	1430	2710	3850	18000	9180	2090	1080	452
MIN	422	725	572	460	704	725	2020	4280	2230	1180	480	331
AC-FT	37140	60800	44830	50080	53560	88060	160600	591100	298900	94930	43230	24160

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1963 - 1993, BY WATER YEAR (WY)

	1963	1968	2036	1791	1930	2321	3802	7923	9096	4488	1518	835
MEAN	2301	9636	6983	4309	4232	6853	7260	12970	17020	9880	3971	1628
MAX (WY)	1968	1991	1976	1984	1991	1972	1990	1972	1974	1974	1974	1978
MIN (WY)	346	426	656	527	715	1066	1678	3565	4195	1135	605	406
(WY)	1988	1988	1988	1988	1985	1985	1967	1977	1992	1977	1987	1993

SUMMARY STATISTICS FOR 1992 CALENDAR YEAR FOR 1993 WATER YEAR WATER YEARS 1963 - 1993

ANNUAL TOTAL	852829	780136	
ANNUAL MEAN	2330	2137	
HIGHEST ANNUAL MEAN			3231
LOWEST ANNUAL MEAN			5261
HIGHEST DAILY MEAN	12400	18000	43300
LOWEST DAILY MEAN	405	331	311
ANNUAL SEVEN-DAY MINIMUM	416	346	316
ANNUAL RUNOFF (AC-FT)	1692000	1547000	2341000
10 PERCENT EXCEEDS	5370	4880	8040
50 PERCENT EXCEEDS	1140	988	1810
90 PERCENT EXCEEDS	500	457	678

e Estimated

COLUMBIA RIVER MAIN STEM

12462600 COLUMBIA RIVER BELOW ROCK ISLAND DAM, WA

LOCATION.--Lat 47°19'57", long 120°04'48", in NE 1/4 NW 1/4 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.--Daily discharge determined from flow through turbines plus spillway flow when present. Datum of gage is sea level. Prior to Jan. 1, 1916, nonrecording gage 1.2 mi upstream from highway bridge at Wenatchee, at mile 466.3, at datum 583 ft above sea level. Jan. 1 to Dec. 31, 1916, nonrecording gage on pier of highway bridge at Wenatchee, at mile 465.1, at datum 579.30 ft above sea level. 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 above sea level (river-profile survey). June 1, 1961, to July 22, 1988, water-stage recorder at present site and datum; May 21, 1963, to July 22, 1988, auxiliary water-stage recorder 2.0 mi downstream at same datum.

REMARKS.--Flow regulated by nine major reservoirs and numerous smaller reservoirs and powerplants. Feeder Canal diversion (station 12435500) for Columbia Basin project is used to irrigate approximately 600,000 acres in the United States. An additional 66,500 acres in Canada are irrigated by other diversions.

COOPERATION.--Discharge records provided by Public Utility District No. 1 of Chelan County at Rock Island Dam through the Corps of Engineers, North Pacific Division, Reservoir Control Center. The U.S. Geological Survey made 6 discharge measurements at this site during the year.

AVERAGE DISCHARGE.--66 years (water years 1914-16, 1931-93), 119,200 ft³/s, 86,360,000 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 discharge, 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, 194,000 ft³/s May 21; minimum daily, 34,200 ft³/s Mar. 27.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	73800	53600	120000	97600	97600	102000	52400	56500	141000	134000	67100	78600
2	85800	86000	123000	117000	95200	82100	54600	59400	160000	130000	89100	84900
3	60000	80800	129000	117000	107000	74000	37000	111000	157000	124000	99500	81800
4	49600	79200	133000	138000	87500	70600	34600	85400	153000	83400	95700	54900
5	85800	73600	130000	145000	69700	55000	48400	93000	132000	112000	101000	44400
6	69200	71300	120000	155000	58400	52400	54000	95200	108000	129000	90300	53500
7	70300	50500	138000	161000	66600	41600	52000	111000	133000	103000	54500	93800
8	58300	49400	125000	135000	88400	61400	62600	97500	115000	116000	40900	96200
9	64600	89400	119000	115000	77300	68100	62000	110000	132000	108000	89600	90300
10	60400	103000	120600	126000	75400	60400	42900	141000	146000	92800	82400	72300
11	43700	97800	106000	140000	88100	55700	38000	133000	142000	102000	79800	49000
12	78800	80100	91200	139000	77900	59300	58300	147000	87400	108000	90000	35400
13	70000	79300	96800	133000	60000	44300	64400	135000	74900	99500	104000	74600
14	77500	59000	118000	114000	71600	49400	50100	124000	97100	115000	75300	77000
15	89800	58600	126000	97300	96500	64200	51600	147000	90200	118000	71600	76300
16	76300	92900	145000	86300	130000	71200	53700	191000	97500	113000	89200	68500
17	43500	76000	130000	83100	124000	54500	42300	189000	104000	100000	72500	83700
18	41800	83000	133000	106000	119000	45900	37000	189000	100000	103000	73600	43700
19	64400	93000	113000	101000	117000	54800	59200	193000	84800	109000	82600	44800
20	67000	101000	96100	69700	90600	40900	49700	186000	75100	104000	64500	92400
21	73200	103000	111000	93200	80000	39400	54600	194000	102000	103000	46100	82000
22	65200	86900	108000	93800	104000	72000	68100	184000	106000	117000	53600	82800
23	67700	119000	96600	95700	118000	62000	59600	189000	112000	109000	81400	81900
24	50800	123000	61700	75300	108000	65400	38300	187000	103000	85700	89900	77100
25	46000	113000	62900	63700	113000	54800	42800	185000	95100	76100	86000	48800
26	74200	61500	68600	75700	113000	45900	53800	178000	90900	97500	90600	36500
27	74500	77900	90100	83000	72600	34200	69800	158000	86900	103000	81600	83900
28	83700	72000	116000	82800	63900	35400	78600	137000	105000	112000	51600	80100
29	79300	94100	120000	78400	---	71500	85400	143000	117000	107000	44400	85500
30	61600	103000	128000	63000	---	69400	66800	141000	134000	108000	85200	83800
31	56400	---	125000	62400	---	53700	---	135000	---	78900	88200	---
TOTAL	2063200	2510900	3500600	3243000	2570300	1811500	1622600	4425000	3381900	3300900	2411800	2138000
MEAN	66550	83700	112900	104600	91800	58440	54090	142700	112700	106500	77800	71270
MAX	89800	123000	145000	161000	130000	102000	85400	194000	160000	134000	104000	96200
MIN	41800	49400	61700	62400	58400	34200	34600	56500	74900	76100	40900	35000
AC-FT	4092000	4980000	6943000	6432000	5098000	3593000	3218000	8777000	6708000	6547000	4784000	4241000
CAL YR 1992	TOTAL 35891300		MEAN 98060		MAX 182000		MIN 36900		AC-FT 711900000			
WTR YR 1993	TOTAL 32979700		MEAN 90360		MAX 194000		MIN 34200		AC-FT 65420000			

12464770 CRAB CREEK AT MARCELLUS ROAD, NEAR RITZVILLE, WA

LOCATION.--Lat 47°18'10", long 118°22'05", in NW 1/4 NE 1/4 sec.23, T.21 N., R.35 E., Lincoln County, Hydrologic Unit 17020013, on left bank, 100 ft downstream from Marcellus Road bridge crossing, 13 mi north of Ritzville.

DRAINAGE AREA.--384 mi².

PERIOD OF RECORD.--April 14 to September 30, 1993.

GAGE.--Water-stage recorder. Elevation of gage is 1,660 ft, from topographic map.

REMARKS.--Records good except for estimated daily discharges, which are poor. Several diversions for irrigation upstream from station. No regulation.

EXTREMES FOR PERIOD APRIL 14 TO SEPTEMBER 30.--Maximum discharge, 130 ft³/s July 25, gage height, 2.06 ft; minimum daily discharge, 11 ft³/s many days in September.

DISCHARGE, CUBIC FEET PER SECOND, APRIL TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	APR	MAY	JUN	JUL	AUG	SEP
1	---	72	34	16	20	e12
2	---	70	33	23	19	e12
3	---	71	32	17	18	e12
4	---	82	32	17	17	e12
5	---	87	32	16	17	e12
6	---	84	30	16	16	e12
7	---	80	29	16	16	e12
8	---	78	28	15	15	e12
9	---	74	27	15	15	e12
10	---	72	27	15	14	e12
11	---	68	26	15	14	e12
12	---	65	25	15	14	e11
13	---	62	25	15	14	e11
14	e80	60	23	15	14	e11
15	78	59	22	16	14	e11
16	77	57	21	27	14	e11
17	76	55	20	27	e13	e11
18	77	53	19	24	e13	e11
19	77	51	18	27	e13	e11
20	76	49	17	25	e13	e11
21	74	47	16	25	e13	e11
22	73	45	16	25	e13	e11
23	72	44	16	30	e13	e11
24	72	42	16	31	e13	e11
25	72	41	16	39	e13	e11
26	72	39	16	44	e13	e11
27	71	38	16	39	e12	e11
28	70	36	16	29	e12	e11
29	71	36	16	25	e12	e11
30	73	35	16	22	e12	e11
31	---	34	---	21	e12	---
TOTAL	---	1786	680	702	441	341
MEAN	---	57.6	22.7	22.6	14.2	11.4
MAX	---	87	34	44	20	12
MIN	---	34	16	15	12	11
AC-FT	---	3540	1350	1390	875	676
CFSM	---	.15	.06	.06	.04	.03
IN.	---	.17	.07	.07	.04	.03

e Estimated

CRAB CREEK BASIN

12465000 CRAB CREEK AT IRBY, WA

LOCATION.--Lat 47°21'38", long 118°50'56", in NW 1/4 NW 1/4 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 111.5.

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 sea level.

REMARKS.--Records good except those below 0.40 ft³/s, and estimated daily discharges, which are poor. Pumpage from ground-water wells for irrigation has been on the increase upstream from station since 1964. Some diversions for irrigation upstream from station. No regulation.

AVERAGE DISCHARGE.--51 years, 64.6 ft³/s, 46,800 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, 1980, 1989, 1991.

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)
Mar. 10	0130	365	3.54	Mar. 16	0300	*440	*3.74
Minimum discharge, 0.07 ft ³ /s Oct. 4.							

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.10	.50	e.35	e.23	e.39	e.26	94	72	16	15	7.9	7.8
2	.10	.48	e.33	e.21	e.36	e.29	88	71	15	15	8.1	7.9
3	.10	.47	e.30	e.20	e.35	e.34	86	72	15	14	7.9	7.9
4	.09	.59	e.25	e.18	e.36	e.40	83	73	16	14	7.9	7.9
5	.14	.76	e.24	e.16	e.37	.46	82	73	16	13	7.7	7.9
6	.23	.76	e.25	e.13	e.39	15	79	73	15	12	7.7	6.7
7	.31	.76	e.26	e.11	e.42	78	78	73	16	13	7.2	5.0
8	.31	.76	e.28	e.12	e.45	192	78	74	16	12	7.2	5.1
9	.32	.76	e.29	e.12	.50	195	76	73	17	12	7.3	5.0
10	.45	.76	e.29	e.11	.65	245	77	73	17	12	7.3	5.0
11	.46	.65	e.29	e.11	2.1	206	77	71	17	12	7.2	4.9
12	.46	.67	e.29	e.12	3.7	161	76	68	18	12	7.1	5.1
13	.37	.57	e.28	e.14	2.0	120	75	65	18	12	7.3	4.6
14	.26	.55	e.27	e.14	1.4	138	75	61	17	12	7.3	4.9
15	.24	.52	e.26	e.14	.68	180	75	56	18	11	7.5	5.0
16	.30	.50	e.25	e.15	e.40	240	74	54	18	11	7.7	4.5
17	.39	.50	e.24	e.17	e.30	162	74	48	18	11	8.1	4.5
18	.39	.50	e.23	e.20	e.29	130	80	43	17	11	7.8	4.5
19	.47	.50	e.23	e.23	e.33	152	78	31	17	11	7.2	4.5
20	.49	.50	e.24	e.26	e.35	127	78	29	17	11	6.8	5.1
21	.42	.71	e.25	e.32	e.33	126	76	27	17	10	7.4	5.4
22	.36	1.1	e.26	e.32	e.30	132	75	24	17	10	7.3	5.2
23	.43	.69	e.27	e.29	e.27	133	74	22	16	10	7.1	5.0
24	.37	.49	e.27	e.30	e.24	145	73	21	16	10	6.9	5.0
25	.25	.46	e.28	e.34	e.21	160	73	20	15	10	7.1	5.0
26	.28	.43	e.28	e.40	e.20	151	72	18	15	9.8	7.2	5.0
27	.30	e.40	e.28	e.70	e.24	137	70	18	15	9.5	7.2	5.0
28	.42	e.38	e.28	e.60	e.25	124	70	17	15	9.6	7.3	4.6
29	.46	e.37	e.27	e.54	---	112	72	16	15	9.2	7.9	4.6
30	.48	e.36	e.25	e.48	---	104	76	16	15	8.4	7.8	4.6
31	.62	---	e.24	e.43	---	97	---	17	---	8.2	7.6	---
TOTAL	10.37	17.45	8.35	7.95	17.83	3763.75	2314	1469	490	350.7	231.0	163.2
MEAN	.33	.58	.27	.26	.64	121	77.1	47.4	16.3	11.3	7.45	5.44
MAX	.62	1.1	.35	.70	3.7	245	94	74	18	15	8.1	7.9
MIN	.09	.36	.23	.11	.20	.26	70	16	15	8.2	6.8	4.5
AC-FT	21	35	17	16	35	7470	4590	2910	972	696	458	325

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1942 - 1993, BY WATER YEAR (WY)

MEAN	7.61	7.56	16.5	103	223	201	100	47.2	36.2	20.7	13.2	9.13
MAX	34.7	28.9	295	1163	744	1141	441	169	451	109	61.2	41.9
(WY)	1949	1949	1956	1956	1949	1956	1969	1975	1948	1948	1948	1948
MIN	.33	.58	.27	.26	.63	4.26	8.61	5.46	3.06	1.49	.54	.26
(WY)	1993	1993	1993	1993	1992	1992	1992	1990	1992	1990	1992	1992

SUMMARY STATISTICS	FOR 1992 CALENDAR YEAR	FOR 1993 WATER YEAR	WATER YEARS 1942 - 1993
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ANNUAL TOTAL	853.69		8843.60						
ANNUAL MEAN	2.33		24.2			64.6			
HIGHEST ANNUAL MEAN						299			1956
LOWEST ANNUAL MEAN						2.73			1992
HIGHEST DAILY MEAN	10	Apr 13	245	Mar 10	7470			Feb 27	1957
LOWEST DAILY MEAN	.06	Sep 6	.09	Oct 4	.00			Jan 3	1969
ANNUAL SEVEN-DAY MINIMUM	.13	Sep 29	.12	Jan 6	.00			Jan 15	1969
ANNUAL RUNOFF (AC-FT)	1690		17540		46770				
10 PERCENT EXCEEDS	7.6		77		136				
50 PERCENT EXCEEDS	.76		6.9		17				
90 PERCENT EXCEEDS	.24		.25		2.7				

e Estimated

CRAB CREEK BASIN

295

12465400 WILSON CREEK BELOW CORBETT DRAW, NEAR ALMIRA, WA

LOCATION.--Lat 47°39'47", long 118°55'46", in SW 1/4 NW 1/4 sec.16, T.25 N., R.31 E., Lincoln County, Hydrologic Unit 17020013, on left bank, 65 ft downstream from Corbett Draw, 3.5 mi south of Almira, and at mile 22.9.

DRAINAGE AREA.--327 mi².

PERIOD OF RECORD.--March 1969 to June 1971, 1972 to 1979 (annual peaks only), April 1991 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 1,670 ft, from topographic map.

REMARKS.--Records poor. Small diversions above staion for irrigation. No regulation. Suspended sediment data are available from the district office.

AVERAGE DISCHARGE.--3 years (water years 1970, 1992-93), 12.0 ft³/s, 8,690 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 3,220 ft³/s Jan. 16, 1973, gage height, 7.68 ft; minimum, 0.08 ft³/s May 30, June 16, 17, 19, 1992.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 742 ft³/s July 15, gage height, 5.95 ft; minimum daily discharge, 0.15 ft³/s Dec 27, Jan. 2.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	e.32	e.43	e.32	e.16	e.60	e.26	e1.6	10	3.9	9.3	9.6	1.0
2	e.33	e.44	e.32	e.15	.65	e.27	1.9	11	3.2	13	8.0	.78
3	e.38	e.46	e.31	e.20	.65	e.27	2.8	14	3.1	15	9.1	.63
4	e.60	e.50	e.31	e.20	.59	e.27	4.5	14	2.9	17	9.5	.65
5	e.45	e.44	e.30	e.18	.55	e.28	5.2	12	2.2	17	8.9	.72
6	e.38	e.48	e.31	e.17	.55	e.28	6.3	13	1.5	19	8.6	.68
7	e.37	e.56	e.32	e.20	.58	e.30	7.0	15	1.6	21	7.9	.63
8	e.36	e.50	e.34	e.22	.63	e.33	7.6	14	1.7	20	6.9	.59
9	e.34	e.42	e.36	e.24	.67	.35	7.7	14	1.8	22	6.5	.61
10	e.33	e.40	e.37	e.20	.69	.39	9.6	15	1.9	15	6.3	.57
11	e.33	e.40	e.35	e.23	.75	.43	10	15	1.2	195	5.7	.64
12	e.33	e.40	e.36	e.26	.76	.42	7.9	14	1.2	202	5.3	.75
13	e.33	e.40	e.39	e.29	.84	.50	7.9	13	1.0	37	4.9	.57
14	e.32	e.41	e.45	e.32	.78	1.3	7.5	12	.98	12	4.0	.60
15	e.32	e.42	e.50	e.36	.67	12	7.0	8.8	1.1	262	3.9	.68
16	e.32	e.43	e.48	e.33	e.50	1.2	7.3	8.1	1.3	158	5.6	.62
17	e.32	e.45	e.35	e.31	e.43	.45	7.3	8.1	1.5	178	5.1	.59
18	e.32	e.46	e.31	e.33	e.38	e25	6.8	8.8	1.2	158	3.7	.56
19	e.33	e.48	e.30	e.35	e.36	e9.0	6.6	8.6	1.4	57	2.8	.58
20	e.36	e.54	e.31	e.42	e.37	5.4	7.5	8.2	2.0	52	1.8	.66
21	e.37	e.50	e.33	e.39	e.35	e2.0	7.3	7.6	4.4	122	1.6	.76
22	e.35	e.47	e.35	e.35	e.33	e1.8	7.7	8.3	5.2	56	.96	.68
23	e.35	e.45	.40	e.35	e.32	196	9.1	6.4	5.5	99	.68	.63
24	e.35	e.42	.33	e.40	e.31	e40	8.6	4.8	5.3	61	.75	.54
25	e.35	e.40	.26	e.45	e.29	e12	9.0	3.2	5.5	40	.81	.54
26	e.35	e.39	.20	e.50	e.26	e3.0	9.3	2.4	6.5	37	.82	.60
27	e.36	e.36	.15	e.52	e.25	e1.0	9.3	1.9	7.5	26	.86	.60
28	e.37	e.35	e.20	e.56	e.26	e1.1	10	1.1	9.2	21	.84	.61
29	e.39	e.34	e.20	e.57	---	---	11	.94	10	17	.78	.61
30	e.43	e.33	e.20	e.58	---	e1.3	11	.91	8.6	15	.87	.59
31	e.44	---	e.18	e.59	---	e1.5	---	2.5	---	12	1.0	---
TOTAL	11.25	13.03	9.86	10.38	14.37	319.60	222.3	276.65	104.38	1985.3	134.07	19.27
MEAN	.36	.43	.32	.33	.51	10.3	7.41	8.92	3.48	64.0	4.32	.64
MAX	.60	.56	.50	.59	.84	196	11	15	10	262	9.6	1.0
MIN	.32	.33	.15	.15	.25	.26	1.6	.91	.98	9.3	.68	.54
AC-FT	22	26	20	21	29	634	441	549	207	3940	266	38

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1969 - 1993, BY WATER YEAR (WY)

	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993
MEAN	1.11	1.91	2.56	14.1	46.5	84.9	33.2	11.0	4.74	15.0	2.30	.88													
MAX	2.04	3.62	4.75	39.9	157	254	82.9	24.7	8.98	64.0	4.32	1.82													
(WY)	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	
MIN	.36	.43	.32	.33	.51	.62	.71	.24	.30	.99	.34	.30													
(WY)	1993	1993	1993	1993	1993	1992	1992	1992	1992	1992	1992	1992													

SUMMARY STATISTICS

FOR 1992 CALENDAR YEAR

FOR 1993 WATER YEAR

WATER YEARS 1969 - 1993

	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993
ANNUAL TOTAL	186.98						3120.46																		
ANNUAL MEAN	.51						8.55																		
HIGHEST ANNUAL MEAN																									
LOWEST ANNUAL MEAN																									
HIGHEST DAILY MEAN																									
LOWEST DAILY MEAN																									
ANNUAL SEVEN-DAY MINIMUM																									
ANNUAL RUNOFF (AC-FT)	371						6190																		
10 PERCENT EXCEEDS	.78						14																		
50 PERCENT EXCEEDS	.38						.68																		
90 PERCENT EXCEEDS	.22						.31																		

e Estimated

CRAB CREEK BASIN

12467000 CRAB CREEK NEAR MOSES LAKE, WA

LOCATION.--Lat 47°11'22", long 119°15'53", in NW 1/4 NE 1/4 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 above U.S. Bureau of Reclamation datum. Prior to July 14, 1956, at site 300 ft upstream at same datum.

REMARKS.--Records good except for estimated daily discharges, which are fair. Numerous small diversions for irrigation and domestic use upstream from 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, 60 ft³/s Sept. 20, gage height, 2.82 ft; maximum gage height, 3.39 ft Dec. 29, backwater from ice; minimum daily discharge, 8.0 ft³/s Jan. 2, 3.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	51	35	22	e11	16	e9.2	11	13	25	39	33	49
2	49	34	22	e8.0	16	e9.6	12	14	23	38	33	47
3	50	31	20	e8.0	15	10	12	14	25	38	32	48
4	50	34	19	e8.5	14	11	12	15	23	38	33	49
5	50	32	19	e9.0	15	12	11	14	23	38	33	47
6	49	31	18	e10	15	13	10	13	25	38	32	45
7	47	32	19	e11	16	16	10	12	24	40	32	45
8	48	31	19	e12	16	19	11	13	23	38	35	52
9	47	29	19	e13	17	19	11	13	25	37	36	50
10	48	27	21	e14	18	17	11	13	27	38	38	51
11	47	32	21	e14	17	15	10	13	26	36	38	51
12	46	30	20	e14	17	13	10	13	26	37	39	49
13	48	27	19	e14	15	13	9.7	16	26	38	41	49
14	50	27	19	e14	14	14	9.7	18	24	40	42	49
15	53	26	19	14	e13	14	9.6	18	24	40	42	50
16	51	26	18	14	e12	13	9.5	17	24	40	43	49
17	50	25	18	14	e10	13	10	16	25	41	46	50
18	51	25	19	14	e9.0	13	11	16	26	40	46	50
19	51	27	17	14	e10	12	9.8	19	24	39	46	50
20	51	26	17	15	e10	13	9.1	20	24	41	46	54
21	51	31	17	15	e10	13	8.9	19	29	41	46	56
22	45	35	17	15	e10	14	8.7	18	32	40	48	54
23	40	26	17	15	e9.4	18	8.7	17	30	41	47	51
24	37	24	17	13	e9.0	14	9.9	19	e29	40	46	49
25	36	23	16	14	e8.8	12	11	18	e30	50	47	51
26	37	22	16	19	e8.6	11	9.3	18	32	47	47	49
27	35	22	e15	19	e8.8	11	9.9	18	34	44	47	48
28	36	23	e14	19	e9.0	11	10	20	34	42	48	48
29	38	23	e13	18	---	10	12	22	35	40	49	49
30	40	23	e12	17	---	10	13	22	36	37	50	48
31	38	---	e12	17	---	9.7	---	23	---	34	51	---
TOTAL	1420	839	551	426.5	358.6	402.5	310.8	514	813	1230	1292	1487
MEAN	45.8	28.0	17.8	13.8	12.8	13.0	10.4	16.6	27.1	39.7	41.7	49.6
MAX	53	35	22	19	18	19	13	23	36	50	51	56
MIN	35	22	12	8.0	8.6	9.2	8.7	12	23	34	32	45
AC-FT	2820	1660	1090	846	711	798	616	1020	1610	2440	2560	2950

CAL YR 1992 TOTAL 11818.8 MEAN 32.3 MAX 65 MIN 8.5 AC-FT 23440
WTR YR 1993 TOTAL 9644.4 MEAN 26.4 MAX 56 MIN 8.0 AC-FT 19130

e Estimated

LOCATION.--Lat 47°30'52", long 119°30'06", in SE 1/4 SW 1/4 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.

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, 1,079.10 ft May 20; minimum, 1,075.92 ft Oct. 14.

ELEVATION (FEET USBR), WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1076.08	1076.14	1076.33	1076.76	1077.36	1077.94	1078.51	1078.93	1078.62	1078.46	1077.53	1076.51
2	1076.08	1076.15	1076.29	1076.77	1077.38	1077.96	1078.53	1078.94	1078.58	1078.44	1077.51	1076.49
3	1076.08	1076.15	1076.33	1076.78	1077.40	1077.98	1078.55	1078.95	1078.55	1078.44	1077.52	1076.47
4	1076.07	1076.16	1076.34	1076.80	1077.42	1078.01	1078.57	1078.96	1078.53	1078.43	1077.51	1076.46
5	1076.06	1076.17	1076.34	1076.82	1077.44	1078.02	1078.58	1078.98	1078.54	1078.42	1077.50	1076.45
6	1076.04	1076.17	1076.35	1076.83	1077.46	1078.04	1078.59	1078.99	1078.55	1078.39	1077.51	1076.46
7	1076.05	1076.18	1076.36	1076.84	1077.48	1078.06	1078.61	1078.99	1078.54	1078.36	1077.48	1076.46
8	1076.05	1076.19	1076.38	1076.87	1077.50	1078.09	1078.63	1078.99	1078.54	1078.32	1077.48	1076.46
9	1076.04	1076.18	1076.39	1076.89	1077.53	1078.11	1078.65	1079.00	1078.54	1078.28	1077.47	1076.46
10	1076.03	1076.19	1076.43	1076.91	1077.55	1078.13	1078.66	1079.01	1078.55	1078.25	1077.43	1076.46
11	1076.04	1076.19	1076.45	1076.93	1077.57	1078.14	1078.69	1079.02	1078.56	1078.19	1077.34	1076.42
12	1076.05	1076.20	1076.45	1076.94	1077.59	1078.15	1078.71	1079.02	1078.57	1078.16	1077.31	1076.39
13	1076.01	1076.21	1076.45	1076.96	1077.61	1078.17	1078.72	1079.04	1078.56	1078.12	1077.27	1076.39
14	1076.01	1076.21	1076.46	1076.98	1077.63	1078.19	1078.74	1079.05	1078.56	1078.09	1077.22	1076.38
15	1076.00	1076.22	1076.47	1077.00	1077.65	1078.21	1078.75	1079.06	1078.57	1078.06	1077.18	1076.38
16	1076.01	1076.23	1076.47	1077.02	1077.67	1078.22	1078.76	1079.07	1078.56	1078.04	1077.14	1076.37
17	1076.01	1076.24	1076.50	1077.03	1077.68	1078.24	1078.78	1079.07	1078.57	1078.01	1077.12	1076.37
18	1076.02	1076.25	1076.51	1077.05	1077.70	1078.26	1078.79	1079.07	1078.58	1077.97	1077.09	1076.37
19	1076.02	1076.26	1076.51	1077.07	1077.73	1078.28	1078.80	1079.08	1078.57	1077.93	1077.05	1076.37
20	1076.03	1076.26	1076.54	1077.12	1077.76	1078.31	1078.80	1079.05	1078.56	1077.90	1077.01	1076.36
21	1076.04	1076.29	1076.54	1077.14	1077.79	1078.32	1078.82	1079.00	1078.57	1077.86	1076.99	1076.35
22	1076.05	1076.29	1076.55	1077.16	1077.81	1078.34	1078.83	1078.95	1078.56	1077.82	1076.96	1076.35
23	1076.05	1076.28	1076.56	1077.17	1077.83	1078.37	1078.84	1078.89	1078.52	1077.78	1076.91	1076.35
24	1076.06	1076.30	1076.57	1077.20	1077.85	1078.38	1078.86	1078.85	1078.51	1077.73	1076.85	1076.35
25	1076.05	1076.31	1076.58	1077.22	1077.86	1078.40	1078.87	1078.82	1078.51	1077.69	1076.79	1076.34
26	1076.06	1076.31	1076.60	1077.24	1077.88	1078.41	1078.89	1078.79	1078.51	1077.66	1076.76	1

12470000 SOAP LAKE NEAR SOAP LAKE, WA

LOCATION.--Lat 47°24'11", long 119°29'11", in NW 1/4 SW 1/4 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, 1,074.20 ft May 6; minimum, 1,072.41 ft Oct. 15-19.

ELEVATION (FEET USBR), WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1072.51	1072.56	1072.81	1073.15	1073.48	1073.74	1074.02	1074.16	1074.05	1073.76	1073.67	1073.35
2	1072.51	1072.57	1072.80	1073.15	1073.49	1073.76	1074.03	1074.17	1074.05	1073.75	1073.66	1073.35
3	1072.51	1072.57	1072.80	1073.16	1073.50	1073.77	1074.04	1074.17	1074.04	1073.73	1073.66	1073.35
4	1072.49	1072.59	1072.80	1073.17	1073.51	1073.78	1074.05	1074.18	1074.05	1073.73	1073.65	1073.34
5	1072.49	1072.60	1072.80	1073.19	1073.52	1073.79	1074.06	1074.18	1074.04	1073.71	1073.64	1073.34
6	1072.48	1072.60	1072.81	1073.19	1073.53	1073.80	1074.06	1074.18	1074.05	1073.69	1073.64	1073.34
7	1072.47	1072.62	1072.82	1073.20	1073.54	1073.81	1074.07	1074.17	1074.01	1073.69	1073.62	1073.33
8	1072.47	1072.62	1072.84	1073.22	1073.55	1073.82	1074.09	1074.16	1073.97	1073.69	1073.61	1073.33
9	1072.45	1072.62	1072.85	1073.23	1073.56	1073.82	1074.11	1074.17	1073.97	1073.69	1073.60	1073.33
10	1072.45	1072.63	1072.88	1073.24	1073.57	1073.83	1074.12	1074.15	1073.97	1073.69	1073.58	1073.33
11	1072.45	1072.64	1072.90	1073.25	1073.58	1073.84	1074.12	1074.16	1073.97	1073.69	1073.56	1073.30
12	1072.46	1072.65	1072.91	1073.26	1073.59	1073.84	1074.13	1074.17	1073.97	1073.68	1073.54	1073.26
13	1072.45	1072.65	1072.91	1073.27	1073.60	1073.85	1074.13	1074.17	1073.96	1073.67	1073.53	1073.24
14	1072.43	1072.66	1072.92	1073.28	1073.61	1073.85	1074.13	1074.15	1073.96	1073.67	1073.52	1073.24
15	1072.42	1072.67	1072.92	1073.29	1073.61	1073.86	1074.13	1074.16	1073.96	1073.68	1073.51	1073.23
16	1072.42	1072.68	1072.93	1073.30	1073.61	1073.87	1074.14	1074.16	1073.94	1073.68	1073.51	1073.22
17	1072.42	1072.69	1072.95	1073.30	1073.62	1073.88	1074.15	1074.14	1073.94	1073.69	1073.52	1073.21
18	1072.42	1072.69	1072.96	1073.31	1073.62	1073.89	1074.17	1074.15	1073.95	1073.69	1073.52	1073.20
19	1072.42	1072.72	1072.96	1073.32	1073.64	1073.89	1074.15	1074.14	1073.93	1073.69	1073.52	1073.20
20	1072.43	1072.72	1072.98	1073.36	1073.67	1073.91	1074.15	1074.13	1073.92	1073.69	1073.51	1073.18
21	1072.44	1072.75	1072.99	1073.37	1073.68	1073.92	1074.15	1074.11	1073.94	1073.68	1073.50	1073.18
22	1072.45	1072.78	1072.99	1073.38	1073.69	1073.94	1074.15	1074.09	1073.91	1073.68	1073.49	1073.18
23	1072.46	1072.78	1073.00	1073.39	1073.70	1073.96	1074.15	1074.08	1073.89	1073.68	1073.47	1073.18
24	1072.47	1072.77	1073.01	1073.40	1073.71	1073.96	1074.16	1074.07	1073.85	1073.66	1073.45	1073.17
25	1072.47	1072.77	1073.02	1073.41	1073.71	1073.97	1074.17	1074.06	1073.84	1073.67	1073.42	1073.17
26	1072.48	1072.77	1073.03	1073.43	1073.72	1073.98	1074.16	1074.06	1073.85	1073.69	1073.41	1

LOCATION.--Lat 47°06'11", long 119°19'02", in SW 1/4 SW 1/4 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.

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.

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.

EXTREMES FOR PERIOD OF RECORD.--Maximum elevation, 1,048.29 ft Mar. 10, 1950; minimum observed, 1,038.17 ft Aug. 27, 1910.

ELEVATION (FEET USBR), WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1046.71	1046.69	1043.81	1043.70	1043.62	1043.61	1044.60	1046.78	1046.73	1046.77	1046.76	1046.61
2	1046.69	1046.66	1043.79	1043.70	1043.61	1043.63	1044.60	1046.83	1046.68	1046.79	1046.76	1046.62
3	1046.69	1046.49	1043.77	1043.69	1043.61	1043.64	1044.61	1046.85	1046.62	1046.79	1046.74	1046.63
4	1046.68	1046.17	1043.77	1043.69	1043.60	1043.66	1044.62	1046.88	1046.63	1046.80	1046.74	1046.64
5	1046.68	1045.86	1043.77	1043.68	1043.59	1043.66	1044.61	1046.90	1046.67	1046.81	1046.73	1046.66
6	1046.67	1045.58	1043.77	1043.67	1043.59	1043.69	1044.68	1046.87	1046.72	1046.81	1046.73	1046.67
7	1046.66	1045.33	1043.78	1043.67	1043.59	1043.80	1044.74	1046.78	1046.72	1046.80	1046.72	1046.66
8	1046.66	1045.11	1043.79	1043.67	1043.59	1043.91	1044.77	1046.75	1046.69	1046.79	1046.72	1046.67
9	1046.64	1044.92	1043.78	1043.67	1043.59	1044.01	1044.79	1046.77	1046.68	1046.78	1046.71	1046.67
10	1046.64	1044.73	1043.81	1043.66	1043.59	1044.11	1044.83	1046.72	1046.68	1046.77	1046.71	1046.68
11	1046.64	1044.60	1043.81	1043.66	1043.62	1044.18	1044.89	1046.71	1046.68	1046.79	1046.72	1046.68
12	1046.64	1044.46	1043.79	1043.65	1043.62	1044.22	1044.96	1046.70	1046.64	1046.79	1046.72	1046.67
13	1046.64	1044.33	1043.77	1043.64	1043.61	1044.25	1045.02	1046.65	1046.65	1046.80	1046.72	1046.67
14	1046.64	1044.22	1043.76	1043.63	1043.61	1044.29	1045.08	1046.63	1046.67	1046.80	1046.73	1046.68
15	1046.62	1044.11	1043.75	1043.63	1043.60	1044.33	1045.21	1046.66	1046.68	1046.80	1046.74	1046.69
16	1046.62	1044.02	1043.73	1043.62	1043.58	1044.36	1045.36	1046.70	1046.69	1046.80	1046.73	1046.70
17	1046.62	1043.92	1043.74	1043.62	1043.57	1044.40	1045.50	1046.73	1046.70	1046.79	1046.73	1046.70
18	1046.62	1043.84	1043.73	1043.61	1043.56	1044.43	1045.69	1046.78	1046.72	1046.80	1046.73	1046.71
19	1046.62	1043.78	1043.71	1043.61	1043.59	1044.46	1045.94	1046.76	1046.76	1046.79	1046.76	1046.71
20	1046.62	1043.74	1043.72	1043.62	1043.61	1044.49	1046.16	1046.70	1046.78	1046.78	1046.78	1046.73
21	1046.65	1043.83	1043.71	1043.62	1043.61	1044.51	1046.31	1046.65	1046.83	1046.77	1046.78	1046.74
22	1046.67	1043.93	1043.70	1043.62	1043.60	1044.54	1046.44	1046.60	1046.84	1046.77	1046.76	1046.75
23	1046.68	1043.98	1043.69	1043.61	1043.60	1044.57	1046.44	1046.65	1046.84	1046.77	1046.75	1046.76
24	1046.68	1044.01	1043.69	1043.61	1043.59	1044.58	1046.58	1046.69	1046.82	1046.76	1046.71	1046.77
25	1046.69	1043.97	1043.68	1043.60	1043.59	1044.59	1046.64	1046.70	1046.82	1046.78	1046.67	1046.78
26	1046.70	1043.93	1043.68	1043.64	1043.59	1044.59	1046.65	1046.70	1046.81	1046.79	1046.64	1

CRAB CREEK BASIN

12471400 LIND COULEE WASTEWAY AT STATE ROUTE 17, NEAR WARDEN, WA

LOCATION.--Lat 47°20'00", long 119°08'57", in NW 1/4 SW 1/4 sec.35, T.18 N., R.29 E., Grant County, Hydrologic Unit 17020015, on left bank, 0.6 mi downstream from state route 17 road crossing, and 5 mi northwest of Warden.

DRAINAGE AREA.--Indeterminate.

PERIOD OF RECORD.--April to September 1993.

GAGE.--Water-stage recorder. Elevation of gage is 1,060 ft, from topographic map.

REMARKS.--No estimated daily discharges, Records good. Most flow is return and waste from water imported for irrigation from the Columbia River at Grand Coulee Dam. The water is distributed through a complex network of canals and reservoirs.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum discharge, 2,580 ft³/s Jan. 27, 1993, gage height, 7.13 ft, gage height record provided by U.S. Bureau of Reclamation.

EXTREMES FOR PERIOD APRIL TO SEPTEMBER 1993.--Maximum discharge, 699 ft³/s May 4, gage height, 4.12 ft; minimum, 203 ft³/s Sept. 30.

DISCHARGE, CUBIC FEET PER SECOND, APRIL TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	APR	MAY	JUN	JUL	AUG	SEP
1	----	484	352	295	259	243
2	----	484	359	302	259	239
3	----	635	380	314	256	240
4	----	681	419	410	258	239
5	----	570	491	432	264	242
6	----	445	497	370	267	237
7	----	399	523	343	274	232
8	----	367	461	302	291	227
9	----	320	360	293	315	228
10	----	355	389	426	324	236
11	----	326	376	430	291	231
12	----	405	378	427	265	218
13	----	393	324	416	268	219
14	----	542	325	420	272	219
15	----	540	368	428	310	235
16	----	434	343	394	339	235
17	345	369	322	358	324	226
18	336	334	271	347	338	222
19	461	315	231	284	382	224
20	394	312	227	282	284	226
21	383	305	285	285	264	225
22	386	318	306	284	401	219
23	434	339	326	306	388	214
24	455	308	352	300	293	208
25	450	297	297	310	265	210
26	441	312	294	354	262	210
27	467	300	301	306	256	211
28	528	273	283	266	255	211
29	556	278	287	258	251	207
30	513	327	302	263	248	205
31	----	339	---	265	245	---
TOTAL	----	12106	10429	10470	8968	6738
MEAN	----	391	348	338	289	225
MAX	----	681	523	432	401	243
MIN	----	273	227	258	245	205
AC-FT	----	24010	20690	20770	17790	13360

CRAB CREEK BASIN

301

12472380 CRAB CREEK LATERAL ABOVE ROYAL LAKE, NEAR OTHELLO, WA

LOCATION.--Lat 46°52'37", long 119°20'51", in SE 1/4 NE 1/4 sec.18, T.16 N., R.28 E., Adams County, Hydrologic Unit 17020015, on right bank, 100 ft upstream from drop structure to Royal Lake, and 8 mi northwest of Othello.

DRAINAGE AREA.--Indeterminate.

PERIOD OF RECORD.--April to September 1993.

GAGE.--Water-stage recorder. Elevation of gage is 900 ft above sea level, from topographic map.

REMARKS.--Records good except those for May 12, 13, which are poor. Most flow is return and waste from water imported for irrigation from the Columbia River at Grand Coulee Dam. The water is distributed through a complex network of canals and reservoirs.

EXTREMES FOR PERIOD APRIL TO SEPTEMBER 1993.--Maximum discharge, 132 ft³/s Apr. 19, gage height, 2.39 ft; minimum daily discharge, 18 ft³/s May 12, 13.

DISCHARGE, CUBIC FEET PER SECOND, APRIL TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	APR	MAY	JUN	JUL	AUG	SEP
1	---	42	73	48	71	89
2	---	39	69	66	66	79
3	---	39	68	74	60	81
4	---	44	65	73	55	77
5	---	48	60	71	62	79
6	---	55	49	65	71	72
7	---	71	47	64	79	64
8	---	63	46	56	78	64
9	---	69	38	58	81	52
10	---	62	41	51	69	58
11	---	44	47	50	70	58
12	---	e18	56	62	57	57
13	---	e18	42	64	57	58
14	---	42	39	62	78	60
15	---	48	43	60	88	70
16	---	50	55	64	88	62
17	73	53	57	82	91	57
18	78	44	51	50	83	58
19	80	49	44	66	68	60
20	64	53	50	80	74	62
21	61	54	58	109	71	65
22	65	59	37	91	74	68
23	65	57	38	84	72	63
24	73	50	47	67	71	59
25	75	54	54	71	65	68
26	74	58	59	78	68	65
27	67	47	61	70	69	66
28	71	45	69	65	80	60
29	73	60	52	74	85	63
30	62	59	40	76	85	70
31	---	69	---	76	88	---
TOTAL	---	1563	1555	2127	2274	1964
MEAN	---	50.4	51.8	68.6	73.4	65.5
MAX	---	71	73	109	91	89
MIN	---	18	37	48	55	52
AC-FT	---	3100	3080	4220	4510	3900

e Estimated

CRAB CREEK BASIN

12472600 CRAB CREEK NEAR BEVERLY, WA

LOCATION.--Lat 46°49'48", long 119°49'48", in NW 1/4 SW 1/4 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 except for estimated daily discharges, which are poor. Many diversions upstream from 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. Chemical analyses water years 1959-72, 1975-80. Daily water temperatures August 1959 to September 1962, July 1968 to August 1970.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 936 ft³/s Mar. 3, 1980, gage height, 6.46 ft; minimum discharge, 10 ft³/s Jan. 10, 1963, result of freezeup.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 380 ft³/s Sept. 28, gage height, 4.07 ft; minimum recorded discharge, 129 ft³/s Jan. 1, but could have been lower during period of ice effect Jan. 1, 2.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	308	309	215	e150	249	186	159	269	270	275	e210	330
2	293	301	212	e140	246	190	153	251	286	266	e210	335
3	300	287	203	e150	241	193	156	239	295	271	e210	337
4	308	280	191	e160	235	199	165	241	293	e280	e210	339
5	311	282	179	e170	232	200	169	245	293	e290	e210	336
6	315	276	180	e170	233	209	182	240	298	e280	e210	336
7	316	268	184	e170	230	224	200	237	295	e270	e220	333
8	313	268	188	e160	228	242	222	233	302	e260	e220	324
9	313	262	200	e150	229	238	241	234	294	e250	e230	324
10	314	253	208	e140	229	226	253	233	282	e240	e230	327
11	313	249	226	e140	226	212	261	236	259	e260	e230	311
12	310	249	221	e140	226	203	264	223	260	e275	e230	311
13	308	244	215	e150	223	199	262	223	274	e280	e235	306
14	307	238	211	e150	220	198	264	165	279	e285	e240	310
15	305	239	211	e160	214	193	263	172	266	e290	e245	322
16	305	240	210	e160	198	194	261	184	255	e280	e250	333
17	313	232	213	e160	191	200	259	180	255	e275	e265	340
18	321	226	217	e160	203	196	258	185	259	e260	e270	343
19	329	225	205	e160	204	189	270	185	262	e240	e265	342
20	335	228	212	e170	214	187	269	206	239	e230	e260	341
21	339	230	217	179	213	189	263	221	225	e230	e270	344
22	339	257	217	200	209	202	255	235	255	e230	e295	350
23	340	253	245	253	206	219	254	248	278	e230	e280	354
24	339	234	262	224	205	218	257	253	265	e240	e290	360
25	338	224	260	217	198	207	264	258	266	e245	e300	363
26	342	216	243	254	194	197	277	259	269	e250	e310	369
27	344	215	234	292	188	181	280	258	272	e245	e320	376
28	346	221	230	286	188	175	275	251	277	e230	321	380
29	337	220	227	273	---	156	272	246	282	e220	322	375
30	326	216	222	261	---	148	274	249	286	e210	328	369
31	314	---	202	254	---	157	---	256	---	e210	332	---
TOTAL	9941	7442	6660	5803	6072	6127	7202	7068	8191	7897	8018	10220
MEAN	321	248	215	187	217	198	240	228	273	255	259	341
MAX	346	309	262	292	249	242	280	269	302	290	332	380
MIN	293	215	179	140	188	148	153	165	225	210	210	306
AC-FT	19720	14760	13210	11510	12040	12150	14290	14020	16250	15660	15900	20270

CAL YR 1992 TOTAL 85986 MEAN 235 MAX 347 MIN 153 AC-FT 170600
WTR YR 1993 TOTAL 90641 MEAN 248 MAX 380 MIN 140 AC-FT 179800

e Estimated

COLUMBIA RIVER MAIN STEM

303

12472800 COLUMBIA RIVER BELOW PRIEST RAPIDS DAM, WA

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

DRAINAGE AREA.--96,000 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 sea level. Prior to Oct. 1, 1930, nonrecording gages at site 3.4 mi downstream at datum 388.7 ft above sea level. Oct. 1, 1930, to July 27, 1959, water-stage recorder at site 46.5 mi upstream at datum 499.3 ft above sea level (river-profile survey).

REMARKS.--No estimated daily discharges. Water-discharge records excellent. Diversions for irrigation of about 600,000 acres upstream from station. Flow regulated by 10 major reservoirs and numerous smaller reservoirs and powerplants. U.S. Geological Survey satellite telemeter at station.

AVERAGE DISCHARGE.--76 years, 118,900 ft³/s, 86,143,000 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 discharge, 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, 261,000 ft³/s May 16, elevation, 415.13 ft; minimum discharge, 35,300 ft³/s Oct. 25, elevation, 396.21 ft; minimum daily discharge, 41,000 ft³/s Sept 12.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	81000	54300	93400	112000	94800	95000	55800	61000	141000	150000	75900	93300
2	84800	73500	119000	118000	94600	84800	56900	57500	157000	139000	90500	85600
3	64600	87100	121000	120000	102000	70600	55900	73100	166000	112000	97800	76000
4	49800	81500	131000	130000	96600	68300	56200	82900	157000	87000	109000	56800
5	83400	77400	139000	150000	76600	61900	55700	83600	143000	105000	84300	45200
6	75300	79400	126000	161000	66200	56900	55800	105000	119000	142000	102000	55500
7	78300	70300	134000	169000	67700	56800	56300	105000	123000	108000	72100	93000
8	66400	58100	142000	153000	84200	57100	55400	121000	134000	118000	44600	104000
9	77200	74100	122000	132000	78800	56200	53500	95600	133000	106000	66000	97500
10	79700	85300	125000	144000	78500	61200	54100	139000	122000	97100	106000	83000
11	59100	85000	127000	119000	88200	61100	53800	135000	137000	103000	79500	57200
12	78100	89400	96000	136000	84400	57300	53800	149000	123000	113000	81800	41000
13	84900	84800	96300	144000	66200	56400	53300	137000	85200	103000	104000	68700
14	85300	86800	116000	137000	67700	57600	54200	139000	91200	110000	80600	73900
15	71100	84900	127000	109000	93500	59100	53200	140000	70500	121000	72800	80600
16	74900	70800	139000	88000	129000	66400	53600	199000	91900	118000	93800	79700
17	70300	88600	134000	86000	129000	59000	54500	189000	103000	109000	84200	79000
18	53200	84200	138000	108000	118000	56500	55400	200000	100000	102000	73500	48000
19	58400	80400	133000	109000	124000	56600	55500	195000	94300	124000	82500	49000
20	68300	81100	107000	78600	94800	58300	55700	194000	79500	97200	71200	78600
21	75000	104000	101000	88000	82200	56900	55500	201000	101000	111000	51300	95700
22	78100	99000	110000	99100	101000	56000	55800	190000	108000	115000	57300	91000
23	69300	132000	98600	98000	114000	57100	55300	197000	111000	116000	78900	87000
24	54500	108000	67200	74600	114000	56700	55500	193000	113000	88900	88900	83000
25	56100	117000	62200	67500	109000	61900	55300	188000	93300	78200	88300	55600
26	71900	90100	69500	69200	121000	56600	55300	184000	94800	99700	94200	45800
27	75300	85400	89600	89100	92300	56400	55300	164000	88800	99800	89000	73200
28	70700	92800	122000	86100	70800	56400	55300	142000	106000	116000	60000	87900
29	88300	101000	126000	77500	---	57900	68600	145000	113000	118000	50900	84900
30	82600	105000	131000	67300	---	62100	127000	147000	133000	107000	77000	88800
31	60300	---	129000	68800	---	57000	---	141000	---	86000	89000	---
TOTAL	2226200	2611300	3571800	3388800	2639100	1892100	1737500	4492700	3432500	3399900	2496900	2238500
MEAN	71810	87040	115200	109300	94250	61040	57920	144900	114400	109700	80550	74620
MAX	88300	132000	142000	169000	129000	95000	127000	201000	166000	150000	109000	104000
MIN	49800	54300	62200	67300	66200	56000	53200	57500	70500	78200	44600	41000
AC-FT	4416000	5180000	7085000	6722000	5235000	3753000	3446000	8911000	6808000	6744000	4953000	4440000

CAL YR 1992 TOTAL 37133800 MEAN 101500 MAX 187000 MIN 42100 AC-FT 73650000
WTR YR 1993 TOTAL 34127300 MEAN 93500 MAX 201000 MIN 41000 AC-FT 67690000

COLUMBIA RIVER MAIN STEM

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

WATER-QUALITY RECORDS

PERIOD OF DAILY RECORD.--

WATER TEMPERATURE: March 1980 to April 1993 (discontinued). Temperature records for site "at Vernita Bridge, near Priest Rapids Dam" (station 12472900) for period July 1974 to September 1980 are equivalent.

INSTRUMENTATION.--Temperature recorder since December 1979.

EXTREMES FOR PERIOD OF DAILY RECORD.--

WATER TEMPERATURE: Maximum, 21.5°C Aug. 4, 1985, Aug. 7, 1989; minimum, 0.5°C several days in February and March, 1993.

EXTREMES FOR CURRENT PERIOD.--

WATER TEMPERATURE:

October 1992 to April 1993: Maximum, 18.0°C Oct. 1, 2; minimum, 0.5°C several days in February and March.

WATER TEMPERATURE, DEGREES CELSIUS, OCTOBER 1992 TO APRIL 1993

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
OCTOBER			NOVEMBER			DECEMBER			JANUARY			
1	18.0	17.0	17.5	14.0	13.5	13.5	9.0	8.5	9.0	3.5	3.5	3.5
2	18.0	17.5	17.5	13.5	13.0	13.5	9.0	8.5	8.5	3.5	3.0	3.0
3	17.5	16.5	17.0	13.5	12.5	13.0	8.5	8.5	8.5	3.0	2.5	3.0
4	17.5	16.0	16.5	13.5	13.0	13.0	8.5	8.0	8.5	2.5	2.5	2.5
5	17.0	16.0	16.5	13.0	13.0	13.0	8.0	8.0	8.0	2.5	2.5	2.5
6	17.0	16.0	16.5	13.0	13.0	13.0	8.0	8.0	8.0	2.5	2.0	2.0
7	17.0	16.0	16.5	13.5	12.5	13.0	8.0	8.0	8.0	2.0	2.0	2.0
8	17.0	16.0	16.5	13.0	12.5	12.5	8.0	7.5	8.0	2.0	2.0	2.0
9	16.5	15.5	16.0	12.5	12.0	12.0	8.0	7.5	8.0	2.0	2.0	2.0
10	16.5	15.5	16.0	12.0	11.5	12.0	7.5	7.5	7.5	2.0	1.5	2.0
11	17.0	15.5	16.0	12.0	11.5	12.0	7.5	7.5	7.5	2.5	1.5	2.0
12	16.5	16.0	16.5	12.0	11.5	12.0	7.5	7.5	7.5	1.5	1.5	1.5
13	16.5	16.0	16.5	12.0	12.0	12.0	7.5	7.5	7.5	1.5	1.5	1.5
14	16.0	15.0	15.5	12.0	12.0	12.0	7.5	7.5	7.5	1.5	1.5	1.5
15	16.0	15.0	15.5	12.0	11.5	12.0	7.5	7.0	7.0	2.5	1.5	1.5
16	15.5	15.0	15.5	12.0	11.5	12.0	7.0	6.5	7.0	2.0	1.5	1.5
17	15.5	15.0	15.0	12.0	11.5	12.0	7.0	6.5	7.0	2.0	1.5	1.5
18	15.5	15.0	15.0	12.0	11.5	12.0	7.0	6.5	6.5	1.5	1.5	1.5
19	16.0	15.0	15.5	12.0	11.0	11.5	6.5	6.0	6.5	2.0	1.5	1.5
20	15.5	15.0	15.0	11.5	11.0	11.5	6.5	6.0	6.0	2.0	1.5	2.0
21	15.5	15.0	15.0	11.0	11.0	11.0	6.5	6.0	6.0	2.0	2.0	2.0
22	15.5	14.5	15.0	11.5	10.5	11.0	6.0	6.0	6.0	2.0	2.0	2.0
23	15.5	14.5	15.0	11.0	10.5	11.0	6.0	5.5	6.0	2.0	1.5	2.0
24	15.5	14.5	15.0	11.0	10.5	10.5	6.0	5.5	6.0	2.0	1.5	2.0
25	15.5	14.5	15.0	10.5	10.0	10.5	5.5	5.5	5.5	2.5	1.5	2.0
26	15.0	14.5	14.5	10.0	9.5	10.0	5.5	5.0	5.5	2.0	2.0	2.0
27	15.0	14.0	14.5	9.5	9.5	9.5	5.0	5.0	5.0	2.0	2.0	2.0
28	14.5	14.0	14.0	9.5	9.0	9.5	5.0	4.5	4.5	2.0	2.0	2.0
29	14.0	13.5	14.0	9.5	9.0	9.5	4.5	4.0	4.5	2.0	2.0	2.0
30	14.0	13.5	14.0	9.5	9.0	9.0	4.5	4.0	4.0	2.0	2.0	2.0
31	14.0	13.5	13.5	---	---	---	4.0	3.5	4.0	2.0	2.0	2.0
MONTH	18.0	13.5	15.5	14.0	9.0	11.6	9.0	3.5	6.7	3.5	1.5	2.0
DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
FEBRUARY			MARCH			APRIL			MAY			
1	2.0	2.0	2.0	1.0	.5	.5	6.0	5.0	5.5	---	---	---
2	2.0	2.0	2.0	1.0	.5	.5	6.0	5.0	5.5	---	---	---
3	2.0	2.0	2.0	1.5	.5	1.0	6.0	5.5	5.5	---	---	---
4	2.0	1.5	2.0	1.5	.5	1.0	7.0	5.5	6.0	---	---	---
5	2.0	2.0	2.0	2.0	1.0	1.5	7.0	5.5	6.0	---	---	---
6	2.5	2.0	2.5	2.0	1.5	1.5	6.5	5.5	5.5	---	---	---
7	2.5	2.0	2.5	2.0	1.5	1.5	---	---	---	---	---	---
8	2.5	2.0	2.5	2.5	1.5	2.0	---	---	---	---	---	---
9	2.5	2.0	2.5	3.0	2.0	2.0	---	---	---	---	---	---
10	2.5	2.0	2.5	3.0	2.0	2.0	---	---	---	---	---	---
11	2.5	2.0	2.5	3.0	2.0	2.5	---	---	---	---	---	---
12	2.5	2.0	2.5	3.0	2.0	2.5	---	---	---	---	---	---
13	2.5	2.0	2.5	3.0	2.5	2.5	---	---	---	---	---	---
14	2.5	2.0	2.5	3.0	2.5	2.5	---	---	---	---	---	---
15	2.0	2.0	2.0	4.0	2.5	3.0	---	---	---	---	---	---
16	2.0	1.5	1.5	3.5	2.5	3.0	---	---	---	---	---	---
17	1.5	1.0	1.5	3.5	3.0	3.0	---	---	---	---	---	---
18	1.5	1.0	1.0	4.5	3.0	3.5	---	---	---	---	---	---
19	1.0	1.0	1.0	4.5	3.0	3.5	---	---	---	---	---	---
20	1.5	1.0	1.0	4.5	3.5	4.0	---	---	---	---	---	---
21	1.5	1.0	1.0	5.0	4.0	4.5	---	---	---	---	---	---
22	1.5	1.0	1.0	4.5	4.0	4.5	---	---	---	---	---	---
23	1.0	.5	1.0	5.0	4.0	4.5	---	---	---	---	---	---
24	1.0	.5	1.0	5.0	4.0	4.5	---	---	---	---	---	---
25	1.0	1.0	1.0	5.5	4.0	4.5	---	---	---	---	---	---
26	1.0	.5	1.0	5.5	4.0	4.5	---	---	---	---	---	---
27	1.5	.5	1.0	5.5	4.5	5.0	---	---	---	---	---	---
28	1.5	1.0	1.0	6.0	4.5	5.0	---	---	---	---	---	---
29	---	---	---	6.0	4.5	5.0	---	---	---	---	---	---
30	---	---	---	5.5	5.0	5.0	---	---	---	---	---	---
31	---	---	---	6.0	5.0	5.5	---	---	---	---	---	---
MONTH	2.5	.5	1.7	6.0	.5	3.1	---	---	---	---	---	---

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 NW 1/4 SE 1/4 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." Discharge determined by routing flows from the gaging station below Priest Rapids Dam (station 12472800) 6.4 miles upstream.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DATE	TIME	DIS-CHARGE, INST (CUBIC FEET PER SECOND)	SPE-CIFIC CON-DUCT-ANCE (US/CM)	PH (STAND-ARD UNITS)	TEMPER-ATURE WATER (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 17...	1150	48600	140	8.0	12.0	1.1	10.4	98	K2	27	59
MAR 22...	1310	55600	156	8.6	4.0	0.9	14.6	114	K3	K4	70
MAY 04...	1140	98600	158	8.5	8.5	1.1	13.1	114	24	K14	74
JUN 29...	1230	124000	123	8.4	16.0	0.4	10.6	109	K1	K2	59
SEP 08...	1225	110000	137	8.5	19.5	0.6	9.6	105	<1	K94	66

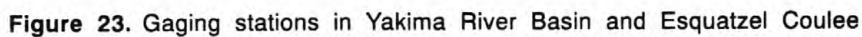
DATE	HARD-NESS, NONCAR-BONATE, (MG/L AS CaCO3)	CALCIUM, DIS-SOLVED (MG/L AS Ca)	MAGNE-SIUM, DIS-SOLVED (MG/L AS Mg)	SODIUM, DIS-SOLVED (MG/L AS Na)	SODIUM PERCENT	SODIUM AD-SORP-TION RATIO	POTAS-SIUM, DIS-SOLVED (MG/L AS K)	ALKA-LINITY, DIS IT, FIELD (MG/L AS CaCO3)	BICAR-BONATE, DIS IT, FIELD (MG/L AS HCO3)	CAR-BONATE, DIS IT, FIELD (MG/L AS CO3)
NOV 17...	2	17	4.1	2.2	7	0.1	0.7	57	70	0
MAR 22...	4	20	4.9	2.5	7	0.1	0.8	66	81	0
MAY 04...	7	21	5.2	2.6	7	0.1	0.8	67	82	0
JUN 29...	8	17	3.9	2.5	8	0.1	0.8	51	60	1
SEP 08...	10	19	4.4	2.5	8	0.1	0.9	56	68	0

DATE	SULFATE, DIS-SOLVED (MG/L AS SO4)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)	FLUO-RIDE, DIS-SOLVED (MG/L AS F)	SILICA, DIS-SOLVED (MG/L AS SiO2)	SOLIDS, RESIDUE AT 180, DEG. C DIS-SOLVED (MG/L)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L)	SOLIDS, DIS-SOLVED (TONS PER AC-FT)	SOLIDS, DIS-SOLVED (TONS PER DAY)	NITRO-GEN, NITRITE, DIS-SOLVED (MG/L AS N)	NITRO-GEN, NO2+NO3, DIS-SOLVED (MG/L AS N)
NOV 17...	8.9	0.9	0.1	4.2	83	73	0.11	10900	0.01	0.13
MAR 22...	11	0.9	<0.1	4.0	91	84	0.12	13700	<0.01	0.07
MAY 04...	12	1.2	0.1	4.5	83	88	0.11	22100	<0.01	0.10
JUN 29...	7.8	0.9	<0.1	6.3	68	70	0.09	22800	<0.01	<0.05
SEP 08...	8.9	4.3	0.1	5.3	77	79	0.10	22900	<0.01	<0.05

DATE	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)	BARIUM, DIS-SOLVED (UG/L AS BA)	COBALT, DIS-SOLVED (UG/L AS CO)	IRON, DIS-SOLVED (UG/L AS FE)	LITHIUM, DIS-SOLVED (UG/L AS LI)
NOV 17...	0.02	<0.2	<0.01	0.01	0.02	<10	26	<3	<3	<4
MAR 22...	<0.01	<0.2	0.01	<0.01	0.01	<10	29	<3	<3	<4
MAY 04...	<0.01	<0.2	<0.01	<0.01	<0.01	<10	27	<3	5	<4
JUN 29...	<0.01	<0.2	<0.01	<0.01	<0.01	<10	26	<3	9	<4
SEP 08...	0.03	<0.2	0.02	<0.01	0.02	<10	30	<3	<3	<4

DATE	MANGA-NESE, DIS-SOLVED (UG/L AS MN)	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)	CARBON, ORGANIC, DIS-SOLVED (MG/L AS C)	SEDI-MENT, SUS-PENDED (MG/L)	SEDI-MENT, DIS-CHARGE, SUS-PENDED (T/DAY)
NOV 17...	<1	<10	<1	<1	<1	95	<6	1.3	1	131
MAR 22...	<1	<10	<1	<1	<1	110	<6	1.1	2	300
MAY 04...	<1	<10	<1	<1	<1	110	<6	1.4	3	799
JUN 29...	2	<10	<1	<1	<1	84	<6	2.4	3	1000
SEP 08...	<1	<10	<1	<1	<1	100	<6	2.4	3	891

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



EAGLE LAKES BASIN

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12473508 PE 16.4 WASTEWAY NEAR MOUTH, NEAR HANFORD, WA

LOCATION.--Lat 46°30'22", long 119°15'22", in SW 1/4 SW 1/4 sec.24, T.12 N., R.28 E., Franklin County, Hydrologic Unit 17020016, on right bank 0.5 mi downstream from county road crossing, 5 mi southeast of Hanford townsite, and 1,000 ft upstream from mouth.

DRAINAGE AREA.--Indeterminate.

PERIOD OF RECORD.--February 1986 to April 1987, published in Open-File Report 89-38, April to September 1993.

GAGE.--Water-stage recorder. Elevation of gage is 380 ft above sea level, from topographic map.

REMARKS.--No estimated daily discharges, Records good. Most flow is return and waste from water imported for irrigation from the Columbia River at Grand Coulee Dam. The water is distributed through a complex network of canals and reservoirs.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 358 ft³/s July 21, 1993, gage height, 9.83 ft; minimum discharge, 27 ft³/s Mar. 21, 1987.

EXTREMES FOR PERIOD APRIL TO SEPTEMBER 1993.--Maximum discharge, 358 ft³/s July 21, gage height, 9.83 ft; minimum discharge, 106 ft³/s May 26, 27.

DISCHARGE, CUBIC FEET PER SECOND, APRIL TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	APR	MAY	JUN	JUL	AUG	SEP
1	---	147	193	267	282	248
2	---	176	210	256	294	252
3	---	185	217	254	279	260
4	---	202	215	269	257	262
5	---	204	226	282	274	260
6	---	188	194	271	251	252
7	---	157	213	259	258	245
8	---	158	211	249	275	249
9	156	179	201	248	283	251
10	154	176	194	255	263	267
11	152	161	224	267	267	286
12	161	168	246	264	246	288
13	159	168	247	257	245	298
14	190	178	220	280	268	279
15	188	124	213	283	288	286
16	199	116	200	305	300	293
17	173	155	215	321	311	269
18	144	167	224	312	318	261
19	177	163	216	325	288	260
20	185	165	221	331	266	251
21	177	152	227	343	285	246
22	180	164	223	315	276	260
23	182	177	251	292	264	243
24	181	171	269	308	264	250
25	174	129	259	327	288	267
26	179	119	253	324	283	235
27	168	123	247	298	276	221
28	163	148	245	308	263	229
29	160	140	251	298	290	258
30	121	180	274	308	287	254
31	---	182	---	273	272	---
TOTAL	---	5022	6799	8949	8561	7780
MEAN	---	162	227	289	276	259
MAX	---	204	274	343	318	298
MIN	---	116	193	248	245	221
AC-FT	---	9960	13490	17750	16980	15430

COLUMBIA RIVER MAIN STEM

12473520 COLUMBIA RIVER AT RICHLAND, WA

LOCATION.--Lat 46°18'46", long 119°15'28", in NW 1/4 NW 1/4 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 March 1993 (discontinued). 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.--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 TEMPERATURE: Maximum, 22.0°C July 21, Aug. 4, 5, 1985; minimum, 0.0°C Feb. 3, 6-9, 1989.

EXTREMES FOR CURRENT PERIOD.--

WATER TEMPERATURE:

Oct. 1, 1992 to March 2, 1993: Maximum, 18.0°C Oct. 1-3; minimum, 0.5°C Mar. 2.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM)	PH (STANDARD UNITS)	TEMPERATURE WATER (DEG C)	TURBIDITY (NTU)	OXYGEN, DIS-SOLVED (MG/L)	OXYGEN, DIS-SOLVED SATURATION (PER-CENT)	COLIFORM, FECA, 0.7 UM-MF (COLS./100 ML)	STREPTOCOCCI, FECA, KF AGAR (COLS. PER 100 ML)	HARDNESS (MG/L AS CaCO3)	HARDNESS, NONCARBONATE (MG/L AS CaCO3)
NOV 18...	1100	140	8.1	12.0	0.9	10.3	96	K5	59	62	2
MAR 23...	1100	158	8.6	5.0	0.7	13.8	110	61	K4	73	25
MAY 06...	1130	159	8.4	9.5	1.4	12.6	112	K5	K10	74	8
JUN 30...	1115	125	8.3	16.0	0.4	10.1	103	K6	K9	55	4

DATE	CALCIUM, DIS-SOLVED (MG/L AS Ca)	MAGNESIUM, DIS-SOLVED (MG/L AS Mg)	ALKALINITY, DIS-IT, FIELD (MG/L AS CaCO3)	BICARBONATE, DIS-IT, FIELD (MG/L AS HCO3)	CARBONATE, DIS-IT, FIELD (MG/L AS CO3)	SULFATE, DIS-SOLVED (MG/L AS SO4)	CHLORIDE, DIS-SOLVED (MG/L AS CL)	FLUORIDE, DIS-SOLVED (MG/L AS F)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L)	NITROGEN, NITRITE, DIS-SOLVED (MG/L AS N)
NOV 18...	18	4.2	61	74	0	9.6	1.1	0.1	74	<0.01
MAR 23...	21	5.1	69 *	--	--	11	0.9	<0.1	102	<0.01
MAY 06...	21	5.3	66	81	0	12	1.2	0.1	86	<0.01
JUN 30...	16	3.7	52	63	0	8.0	0.9	<0.1	69	<0.01

DATE	NITROGEN, NO2+NO3 DIS-SOLVED (MG/L AS N)	NITROGEN, AMMONIA DIS-SOLVED (MG/L AS N)	NITROGEN, AMMONIA + ORGANIC TOTAL (MG/L AS N)	PHOSPHORUS, TOTAL (MG/L AS P)	PHOSPHORUS, ORTHO, DIS-SOLVED (MG/L AS P)	CHROMIUM, DIS-SOLVED (UG/L AS CR)	IRON, DIS-SOLVED (UG/L AS FE)	CARBON, ORGANIC DIS-SOLVED (MG/L AS C)	SEDIMENT, SUSPENDED (MG/L)
NOV 18...	0.12	0.01	0.7	0.06	0.01	2	<3	1.2	2
MAR 23...	0.09	0.01	<0.2	<0.01	<0.01	<1	<3	1.2	4
MAY 06...	0.10	0.01	<0.2	<0.01	<0.01	<1	3	1.6	6
JUN 30...	<0.05	<0.01	<0.2	<0.01	<0.01	1	8	2.5	4

* - Laboratory value.

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

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WATER TEMPERATURE, DEGREES CELSIUS, OCTOBER 1992 TO MARCH 1993

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	OCTOBER			NOVEMBER			DECEMBER			JANUARY		
1	18.0	17.5	18.0	13.5	13.5	13.5	9.0	8.5	9.0	4.0	3.5	4.0
2	18.0	17.5	18.0	13.5	13.5	13.5	8.5	8.5	8.5	3.5	3.0	3.5
3	18.0	17.0	17.5	13.5	13.0	13.0	8.5	8.0	8.5	3.0	2.5	3.0
4	17.0	17.0	17.0	13.0	13.0	13.0	8.5	8.0	8.0	3.0	2.5	3.0
5	17.0	16.0	16.5	13.0	12.5	13.0	8.0	8.0	8.0	2.5	2.5	2.5
6	16.5	16.0	16.5	13.0	12.5	13.0	8.0	7.5	8.0	2.5	2.0	2.0
7	16.5	16.0	16.0	13.0	13.0	13.0	8.0	7.5	8.0	2.0	2.0	2.0
8	16.5	16.0	16.0	13.0	12.5	12.5	8.0	7.5	8.0	2.0	2.0	2.0
9	16.5	16.0	16.0	12.5	12.0	12.0	8.0	7.5	7.5	2.0	1.5	2.0
10	16.5	16.0	16.0	12.0	11.5	11.5	8.0	7.5	8.0	2.0	1.5	1.5
11	16.5	16.0	16.5	11.5	11.5	11.5	7.5	7.5	7.5	1.5	1.5	1.5
12	16.5	16.0	16.5	12.0	11.5	12.0	7.5	7.5	7.5	1.5	1.0	1.5
13	16.5	16.0	16.5	12.0	12.0	12.0	7.5	7.0	7.5	1.5	1.0	1.5
14	16.0	15.5	16.0	12.0	12.0	12.0	7.5	7.5	7.5	1.5	1.5	1.5
15	15.5	15.0	15.0	12.0	12.0	12.0	7.5	7.0	7.5	2.0	1.5	1.5
16	15.0	14.5	15.0	12.0	12.0	12.0	7.0	7.0	7.0	2.0	1.5	2.0
17	15.0	14.5	14.5	12.0	11.5	12.0	7.0	6.5	7.0	2.0	1.5	2.0
18	15.0	14.5	15.0	12.0	11.5	12.0	7.0	6.5	6.5	2.0	1.5	2.0
19	15.5	14.5	15.0	11.5	11.5	11.5	6.5	6.0	6.5	1.5	1.5	1.5
20	15.5	15.0	15.5	11.5	11.0	11.0	6.5	6.0	6.0	2.5	1.5	2.0
21	15.5	15.0	15.0	11.0	11.0	11.0	6.5	6.0	6.0	2.5	2.0	2.5
22	15.5	15.0	15.0	11.0	10.5	11.0	6.5	6.0	6.0	2.5	2.0	2.5
23	15.5	15.0	15.0	11.0	10.5	10.5	6.5	6.0	6.0	2.0	2.0	2.0
24	15.0	15.0	15.0	10.5	10.0	10.5	6.0	6.0	6.0	2.0	2.0	2.0
25	15.0	15.0	15.0	10.0	10.0	10.0	6.0	5.5	6.0	3.0	2.0	2.5
26	15.0	14.5	15.0	10.0	9.5	10.0	5.5	5.5	5.5	3.0	2.5	2.5
27	14.5	14.0	14.5	9.5	9.5	9.5	5.5	5.0	5.0	2.5	2.5	2.5
28	14.5	14.0	14.0	9.5	9.5	9.5	5.0	5.0	5.0	3.0	2.5	2.5
29	14.0	13.5	14.0	9.5	9.0	9.5	5.0	4.5	4.5	2.5	2.5	2.5
30	14.0	14.0	14.0	9.5	9.0	9.0	4.5	4.0	4.5	2.5	2.5	2.5
31	14.0	13.5	13.5	---	---	---	4.5	3.5	4.0	2.5	2.5	2.5
MONTH	18.0	13.5	15.6	13.5	9.0	11.5	9.0	3.5	6.8	4.0	1.0	2.2

[illegible]

SCOOTENAY RESERVOIR BASIN

12473740 EL 68-D WASTEWAY NEAR OTHELLO, WA

LOCATION.--Lat 46°43'47", long 119°02'56", in NE 1/4 SE 1/4 sec.4, T.14 N., R.30 E., Franklin County, Hydrologic Unit 17020016, at State Highway 17, 200 ft upstream from entrance to the Potholes Canal, 1.3 mi upstream from entrance to Scootenay Reservoir, and 9.2 mi southeast of Othello.

DRAINAGE AREA.--121 mi².

PERIOD OF RECORD.--March 1978 to October 1979, April to September 1993.

GAGE.--Dual water-stage recorder. Elevation of gage is 935 ft, from topographic map.

REMARKS.--Records good except for estimated daily discharges, which are fair. Flow from irrigation waste and ground-water returns. Discharge controlled to some extent by upstream catchment basins. Flow used for downstream irrigation. Water quality data, including daily records for water temperature, suspended sediment, total nitrogen, total nitrate-plus nitrite, total ortho-phosphorus and total phosphorus for the period March 1978 through October 1979, in separate data report, "Quality of Irrigation Water Data from Selected Sites in Southeastern Washington".

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 343 ft³/s Feb. 10, 1979, July 3, 1993; maximum gage height, 6.62 ft Feb. 10, 1979; minimum daily discharge, 16 ft³/s Jan. 6, 7, Feb. 2, 1979.

EXTREMES FOR PERIOD APRIL TO SEPTEMBER 1993.--Maximum discharge, 343 ft³/s July 3, gage height, 5.49 ft; minimum discharge, 29 ft³/s Apr. 12, 13.

DISCHARGE, CUBIC FEET PER SECOND, APRIL TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	APR	MAY	JUN	JUL	AUG	SEP
1	---	118	237	258	253	220
2	---	125	226	267	254	221
3	---	134	230	309	252	218
4	---	147	245	277	254	217
5	---	140	247	262	258	216
6	---	128	234	252	258	217
7	---	123	234	243	258	210
8	34	130	232	235	263	214
9	32	139	236	243	265	211
10	32	142	229	261	264	207
11	31	144	232	260	264	203
12	30	136	253	264	263	201
13	31	145	249	263	263	202
14	40	163	243	260	270	202
15	46	163	243	263	272	200
16	e60	167	238	266	273	187
17	e65	176	240	271	270	189
18	e70	178	249	260	249	195
19	e80	188	254	258	236	198
20	e90	198	250	254	236	202
21	e95	206	274	244	246	192
22	e100	206	259	243	248	184
23	e100	202	271	256	238	179
24	e100	200	261	257	230	179
25	e110	195	250	259	233	185
26	e110	208	256	254	224	185
27	e120	216	260	250	227	188
28	e120	224	262	251	228	183
29	120	237	252	251	224	182
30	115	225	258	258	221	177
31	---	233	---	258	215	---
TOTAL	---	5336	7404	8007	7709	5964
MEAN	---	172	247	258	249	199
MAX	---	237	274	309	273	221
MIN	---	118	226	235	215	177
AC-FT	---	10580	14690	15880	15290	11830

e Estimated

LOCATION.--Lat 46°51'46", long 120°28'44", in SW 1/4 NW 1/4 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.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 3,720 ft³/s July 14, gage height, 32.58 ft; minimum daily discharge, 280 ft³/s Jan. 7.

e Estimated

YAKIMA RIVER BASIN

12488500 AMERICAN RIVER NEAR NILE, WA

LOCATION.--Lat 46°58'40", long 121°10'03", in SE 1/4 NW 1/4 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 above 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 for estimated daily discharges, which are fair. No regulation or diversion. U.S. Geological Survey satellite telemeter at station.

AVERAGE DISCHARGE.--56 years (water years, 1910-11, 1940-93), 235 ft³/s, 40.45 in/yr, 170,300 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 4,230 ft³/s Dec. 26, 1980, gage height, 77.99 ft; minimum discharge, 20 ft³/s Nov. 22, 1940, Jan. 7, 1993, but may have been lower during period of ice effect that day.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 1,360 ft³/s May 13, gage height, 75.08 ft; minimum daily discharge, 20 ft³/s Jan. 7, but may have been lower during period of ice effect that day.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	40	52	45	e29	63	e33	170	291	604	194	80	41
2	38	59	44	e26	60	36	177	314	538	187	77	40
3	36	57	e44	e31	57	36	183	322	471	174	74	42
4	35	55	e38	e33	55	38	191	317	431	174	72	43
5	34	55	e38	e34	53	45	186	314	449	163	69	42
6	34	51	e34	e26	52	49	179	378	449	152	68	41
7	33	62	e36	e20	51	55	175	403	430	149	65	41
8	33	82	e41	e30	51	62	185	371	396	131	63	40
9	32	72	39	e32	50	66	227	351	408	120	60	39
10	32	63	42	e24	49	68	226	357	460	121	59	39
11	31	60	38	e33	48	68	212	551	404	108	58	37
12	31	60	40	e11	47	68	201	979	356	117	58	36
13	31	61	40	e40	46	67	193	1360	343	118	57	35
14	31	62	40	e39	45	67	187	1250	346	119	55	35
15	31	60	41	e38	45	82	183	1080	373	113	55	37
16	31	58	39	e37	e39	94	183	958	352	111	54	38
17	31	56	39	34	e41	90	184	911	362	121	52	36
18	31	55	39	34	e39	88	191	952	343	117	53	37
19	32	55	40	33	e39	88	190	983	343	109	52	37
20	35	53	40	32	e38	91	188	1000	321	113	49	35
21	36	53	39	30	e40	92	191	900	286	113	49	36
22	36	51	39	32	e37	112	203	859	259	111	48	36
23	36	54	40	31	e40	333	204	726	236	108	48	36
24	36	47	40	32	e40	351	212	655	215	103	47	35
25	36	50	39	34	e32	272	229	666	205	98	47	33
26	36	46	39	43	e29	238	262	659	231	95	47	33
27	35	48	37	67	e34	215	259	660	239	90	47	33
28	34	47	38	97	e36	199	253	630	222	84	45	32
29	34	46	38	88	---	187	250	670	209	87	44	32
30	36	45	e31	76	---	177	274	598	206	89	43	32
31	39	---	e35	70	---	168	---	622	---	88	41	---
TOTAL	1056	1675	1212	1246	1256	3635	6148	21087	10487	3777	1736	1109
MEAN	34.1	55.8	39.1	40.2	44.9	117	205	680	350	122	56.0	37.0
MAX	40	82	45	97	63	351	274	1360	604	194	80	43
MIN	31	45	31	20	29	33	170	291	205	84	41	32
AC-FT	2090	3320	2400	2470	2490	7210	12190	41830	20800	7490	3440	2200
CFSM	.43	.71	.50	.51	.57	1.49	2.60	8.62	4.43	1.54	.71	.47
IN.	.50	.79	.57	.59	.59	1.71	2.90	9.94	4.94	1.78	.82	.55

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1909 - 1993, BY WATER YEAR (WY)

MEAN	70.9	131	167	133	144	153	292	629	639	288	94.2	61.4
MAX	248	433	532	464	418	501	595	1172	1312	781	327	267
(WY)	1948	1911	1976	1974	1991	1972	1943	1956	1974	1913	1913	1913
MIN	28.4	32.2	33.2	31.2	37.7	46.6	103	203	189	67.8	41.1	34.5
(WY)	1988	1988	1953	1979	1985	1977	1955	1973	1992	1977	1941	1987

SUMMARY STATISTICS	FOR 1992 CALENDAR YEAR	FOR 1993 WATER YEAR	WATER YEARS 1909 - 1993
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ANNUAL TOTAL	55878		54424						
ANNUAL MEAN	153		149					231	
HIGHEST ANNUAL MEAN								379	1974
LOWEST ANNUAL MEAN								94.2	1977
HIGHEST DAILY MEAN	843	May 6	1360	May 13	3070				Dec 26 1980
LOWEST DAILY MEAN	31	Sep 19	20	Jan 7	20				Jan 7 1993
ANNUAL SEVEN-DAY MINIMUM	31	Oct 11	28	Jan 1	26				Nov 26 1952
ANNUAL RUNOFF (AC-FT)	110800		107900		167700				
ANNUAL RUNOFF (CFSM)	1.94		1.89		2.93				
ANNUAL RUNOFF (INCHES)	26.35		25.66		39.86				
10 PERCENT EXCEEDS	358		366		592				
50 PERCENT EXCEEDS	68		55		120				
90 PERCENT EXCEEDS	34		33		47				

e Estimated

YAKIMA RIVER BASIN

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12500450 YAKIMA RIVER ABOVE AHTANUM CREEK, AT UNION GAP, WA
(National stream quality accounting network)

LOCATION.--Lat 46°32'04", long 120°27'58", in NW 1/4 NE 1/4 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 sea level; gage readings have been reduced to elevations above sea level. Prior to Apr. 4, 1967, at site 1,200 ft downstream at same datum.

REMARKS.--Water-discharge records good except those below 1,000 ft³/s and estimated daily discharges, which are poor. 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 discharge, 300 ft³/s Jan. 1, 1979.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 8,170 ft³/s May 13, elevation, 942.47 ft; minimum discharge, 821 ft³/s Dec. 5.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2580	881	995	1030	1240	1080	2760	2830	3750	2970	3020	3020
2	2730	922	1010	1010	1240	1080	3230	3050	3550	3110	3060	3030
3	2270	959	955	e980	1240	1090	3630	3030	3390	3090	2890	3040
4	2030	967	852	e1000	1250	1080	4170	2950	3180	3130	2960	3060
5	1890	997	842	e1000	1250	1080	4130	2670	3730	3110	3180	3070
6	1690	989	904	e920	1250	1160	3900	2650	3850	3010	3170	3130
7	1490	968	952	e900	1260	1340	3480	3110	3390	3090	3120	3080
8	1280	1030	943	e930	1250	1580	3060	3020	3210	3090	3140	3030
9	1170	1140	905	e960	1260	1950	3300	2650	3330	3020	3160	2990
10	1120	1120	971	e1000	1300	2180	3650	2450	3470	3010	3140	3240
11	1100	1100	948	e1000	1300	2120	3560	2920	3370	3150	3110	3010
12	1040	1110	941	e980	1370	2040	3230	4670	3270	3170	3320	2900
13	1010	1140	924	e1000	1420	1930	2940	7430	3250	3180	3190	2800
14	983	1130	924	e1000	1440	1870	2670	7650	3320	3390	3200	2700
15	1030	1070	936	e1000	1420	1980	2510	6570	3300	3330	3320	2800
16	1050	1070	990	1010	1290	2660	2500	5860	3270	3240	3310	2780
17	960	1060	1000	1020	1290	2700	2580	5340	3060	3370	3270	2850
18	906	1040	1010	1020	1270	2550	2820	5150	3030	3390	3150	2850
19	899	1050	938	995	1270	2570	2850	5070	3050	3320	3100	2840
20	882	1060	962	1010	1310	2570	2680	5070	3140	3280	3170	2880
21	883	1110	980	1060	1280	2690	2530	4690	3150	3240	3350	2760
22	871	1130	1020	1070	1220	2800	2410	4220	3240	3060	3310	2640
23	861	1120	1030	1020	1130	3550	2500	3740	3370	3070	3250	2560
24	868	1090	1100	1030	1040	4760	2560	3500	3340	3020	3150	2370
25	878	993	1140	1050	1070	4500	2650	3260	3040	3190	3080	2600
26	869	982	1110	1140	1060	4090	2850	3140	3010	3350	3040	2450
27	867	1010	1110	1210	1060	3860	2710	3340	3150	3100	3080	2350
28	860	1000	1120	1230	1070	3610	2510	3620	3200	3020	3070	2220
29	879	992	1100	1230	---	3370	2260	3600	3140	3220	3110	2180
30	898	979	1080	1230	---	3090	2360	3290	3080	3240	3070	2170
31	881	---	1040	1240	---	2710	---	3300	---	3180	3070	---
TOTAL	37725	31209	30732	32275	34850	75640	88990	123840	98630	98140	97560	83400
MEAN	1217	1040	991	1041	1245	2440	2966	3995	3288	3166	3147	2780
MAX	2730	1140	1140	1240	1440	4760	4170	7650	3850	3390	3350	3240
MIN	860	881	842	900	1040	1080	2260	2450	3010	2970	2890	2170
AC-FT	74830	61900	60960	64020	69120	150000	176500	245600	195600	194700	193500	165400

CAL YR 1992 TOTAL 918616 MEAN 2510 MAX 5200 MIN 842 AC-FT 1822000
WTR YR 1993 TOTAL 832991 MEAN 2282 MAX 7650 MIN 842 AC-FT 1652000

e Estimated

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 September 1993 (discontinued).

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 1992 TO SEPTEMBER 1993

DATE	TIME	DIS-CHARGE, INST. (CUBIC FEET PER SECOND)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH (STAND- ARD UNITS)	TEMPER- ATURE WATER (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)
DEC 01...	1145	993	180	8.0	3.0	1.7	14.0	107	67	61
MAR 29...	1300	3360	130	8.3	9.0	4.9	11.9	106	20	K16
JUN 08...	1220	3260	112	8.2	14.0	4.8	10.6	106	K55	200
JUL 27...	1315	3100	109	8.3	19.0	1.4	10.4	117	30	440
SEP 15...	1215	2820	110	8.0	14.0	4.6	10.2	102	87	260

DATE	HARD- NESS (MG/L AS CACO3)	HARD NESS, NONCAR- BONATE (MG/L AS CACO3)	CALCIUM, DIS- SOLVED (MG/L AS CA)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG)	SODIUM, DIS- SOLVED (MG/L AS NA)	SODIUM PERCENT	SODIUM AD- SORP- TION RATIO	POTAS- SIUM, DIS- SOLVED (MG/L AS K)	ALKA- LINITY, DIS IT, FIELD (MG/L AS CACO3)	BICAR- BONATE, DIS IT, FIELD (MG/L AS HCO3)
DEC 01...	68	0	17	6.3	11	25	0.6	1.5	78	95
MAR 29...	48	0	12	4.4	6.8	23	0.4	1.3	54	66
JUN 08...	44	0	11	3.9	5.5	21	0.4	1.2	47	57
JUL 27...	43	0	10	4.4	4.9	19	0.3	1.0	47	57
SEP 15...	41	0	11	3.4	5.5	22	0.4	1.4	44	54

DATE	CAR- BONATE, DIS IT, FIELD (MG/L AS CO3)	SULFATE, DIS- SOLVED (MG/L AS SO4)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	FLUO- RIDE, DIS- SOLVED (MG/L AS F)	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, NITRITE DIS- SOLVED (MG/L AS N)
DEC 01...	0	6.0	5.6	0.1	19	118	116	0.16	316	0.04
MAR 29...	0	5.2	2.7	0.1	17	89	86	0.12	807	0.02
JUN 08...	0	4.2	2.3	0.1	17	71	75	0.10	625	<0.01
JUL 27...	0	3.5	2.0	<0.1	13	69	68	0.09	578	<0.01
SEP 15...	0	5.4	2.3	0.1	19	77	76	0.10	586	<0.01

DATE	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)	BARIIUM, DIS- SOLVED (UG/L AS BA)	COBALT, DIS- SOLVED (UG/L AS CO)	IRON, DIS- SOLVED (UG/L AS FE)
DEC 01...	0.45	0.13	0.3	0.12	0.09	0.08	10	10	<3	21
MAR 29...	0.75	0.05	0.5	0.11	0.04	0.06	50	8	<3	39
JUN 08...	0.27	0.04	0.3	0.07	0.05	0.04	10	8	<3	33
JUL 27...	0.25	0.04	0.2	0.06	0.02	0.02	30	8	<3	22
SEP 15...	0.23	0.03	<0.2	0.05	0.04	0.04	--	--	--	--

DATE	LITHIUM, DIS- SOLVED (UG/L AS LI)	MANGA- NESE, DIS- SOLVED (UG/L AS MN)	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)	SEDI- MENT, SUS- PENDED (MG/L)	SEDI- MENT, DIS- CHARGE, SUS- PENDED (T/DAY)
DEC 01...	<4	14	<10	<1	<1	<1	75	<6	4	11
MAR 29...	<4	9	<10	<1	<1	<1	59	<6	18	163
JUN 08...	<4	10	<10	1	<1	<1	52	<6	25	220
JUL 27...	<4	6	10	<1	<1	<1	50	<6	20	167
SEP 15...	--	--	--	--	--	--	--	--	14	107

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

YAKIMA RIVER BASIN

315

12502500 AHTANUM CREEK AT UNION GAP, WA

LOCATION.--Lat 46°32'08", long 120°28'20", in SE 1/4 SW 1/4 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.--No estimated daily discharges. 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. Chemical data (irrigation seasons only) for 1975-76 water years. Water temperature records March to December 1981.

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, 243 ft³/s May 14, gage height, 5.12 ft; minimum discharge, 3.5 ft³/s Aug. 30, 31.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	14	15	9.7	9.6	15	21	129	107	113	10	10	5.8
2	17	16	9.9	9.6	15	21	146	116	101	10	11	6.6
3	21	16	9.9	8.7	16	23	153	118	92	8.1	11	6.5
4	23	17	9.4	8.7	15	24	135	123	84	7.5	8.7	6.9
5	14	16	9.3	8.8	16	25	139	117	110	6.5	8.2	7.7
6	7.9	16	9.3	8.6	16	29	130	121	156	6.4	8.4	9.8
7	6.7	16	9.7	8.5	17	34	123	126	147	7.0	13	14
8	9.0	16	9.3	8.2	18	42	122	118	123	9.6	14	11
9	21	17	9.3	8.2	18	55	134	106	114	11	10	9.6
10	17	17	10	8.2	17	75	140	96	111	13	12	12
11	15	17	9.5	8.2	18	84	130	101	99	15	14	14
12	9.1	18	9.3	8.4	21	92	124	135	92	16	10	16
13	7.3	17	9.0	8.8	21	87	120	190	84	13	8.9	11
14	12	17	8.6	9.1	22	93	113	224	76	14	11	11
15	17	17	8.6	8.2	22	104	108	207	67	14	12	12
16	8.6	17	8.9	8.2	20	119	110	195	55	13	9.9	13
17	8.3	17	9.1	8.9	16	106	116	181	47	11	9.5	13
18	8.0	16	8.9	9.4	17	110	122	170	40	11	6.8	13
19	8.6	17	9.8	9.7	21	121	115	176	34	11	4.3	17
20	10	17	9.9	11	23	126	111	174	26	13	5.1	15
21	11	21	9.4	11	22	142	110	168	21	12	8.6	13
22	11	21	10	11	21	140	111	151	21	10	8.4	18
23	11	16	9.7	11	21	167	114	134	19	7.1	8.9	16
24	11	9.5	9.3	11	22	200	114	112	15	8.6	11	15
25	10	9.4	9.3	11	21	166	111	103	11	12	7.4	14
26	9.9	9.3	9.4	11	20	148	111	98	13	14	7.3	13
27	10	9.6	9.6	15	20	141	104	92	13	10	8.3	13
28	11	9.3	9.7	16	21	135	100	89	16	6.7	7.3	13
29	13	9.4	9.5	15	---	134	93	96	14	11	7.5	12
30	13	9.5	9.4	14	---	131	97	89	9.9	12	5.1	13
31	14	---	9.5	15	---	125	---	94	---	10	4.5	---
TOTAL	379.4	456.0	292.2	318.0	532	3020	3585	4127	1923.9	333.5	282.1	364.9
MEAN	12.2	15.2	9.43	10.3	19.0	97.4	119	133	64.1	10.8	9.10	12.2
MAX	23	21	10	16	23	200	153	224	156	16	14	18
MIN	6.7	9.3	8.6	8.2	15	21	93	89	9.9	6.4	4.3	5.8
AC-FT	753	904	580	631	1060	5990	7110	8190	3820	661	560	724

CAL YR 1992 TOTAL 9881.9 MEAN 27.0 MAX 102 MIN 6.0 AC-FT 19600
WTR YR 1993 TOTAL 15614.0 MEAN 42.8 MAX 224 MIN 4.3 AC-FT 30970

YAKIMA RIVER BASIN

12508990 YAKIMA RIVER AT MABTON, WA

LOCATION.--Lat 46°13'53", long 119°59'54", in SW 1/4 SW 1/4 sec.30, T.9 N., R.23 E., Yakima County, Hydrologic Unit 17030003, on right bank at 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.--No estimated daily discharges. Records good. Flow affected by storage in five reservoirs, by diversions upstream from station for irrigation upstream and downstream from station of about 424,000 acres, and by return flow. Water temperatures March 1981 to February 1982.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 37,200 ft³/s Jan. 17, 1974, gage height, 25.30 ft present datum; minimum daily discharge, 320 ft³/s Mar. 25, 1977.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 5,980 ft³/s Mar. 24, gage height, 13.61 ft; minimum discharge, 1,120 ft³/s Aug. 5.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1630	1470	1570	1530	2380	1570	3830	1830	1640	1370	1530	1390
2	1660	1450	1610	1470	2260	1570	3950	2210	1980	1300	1420	1350
3	2200	1480	1600	1390	2190	1600	4290	2330	1850	1370	1350	1340
4	2140	1550	1530	1310	2110	1600	4740	2210	1690	1410	1220	1330
5	1990	1550	1430	1360	2060	1600	4980	2080	1600	1440	1160	1340
6	2010	1580	1400	1370	2020	2400	4760	1760	2300	1430	1300	1380
7	2140	1550	1480	1270	1990	2400	4590	1710	2190	1310	1290	1430
8	2020	1540	1520	1190	1960	2520	4170	2020	1840	1330	1260	1470
9	1920	1610	1510	1250	1960	2750	3960	1930	1660	1330	1260	1470
10	1840	1710	1520	1310	1980	2990	4340	1670	1700	1270	1230	1440
11	1800	1690	1540	1360	2010	3040	4480	1400	1770	1220	1220	2010
12	1770	1690	1490	1370	2070	2920	4350	1700	1700	1350	1210	2210
13	1740	1720	1470	1320	2110	2820	4000	3460	1620	1400	1330	1920
14	1700	1730	1450	1360	2120	2720	3720	5440	1610	1460	1250	1770
15	1700	1700	1460	1380	2110	2920	3340	5460	1590	1590	1280	1680
16	1780	1650	1470	1370	2040	3490	3160	4700	1530	1540	1380	1650
17	1780	1650	1540	1370	1870	3630	3120	4160	1480	1550	1390	1590
18	1670	1650	1530	1370	1920	3600	3160	3710	1310	1740	1330	1640
19	1600	1620	1510	1390	1870	3670	3270	3520	1240	1780	1250	1670
20	1580	1640	1430	1370	1920	3630	3100	3350	1220	1800	1270	1680
21	1570	1700	1460	1390	1910	3730	2910	3300	1310	1740	1400	1820
22	1530	1750	1480	1440	1850	3770	2670	2900	1300	1670	1510	1730
23	1490	1740	1530	1470	1780	4380	2490	2500	1410	1500	1470	1660
24	1480	1730	1580	1420	1680	5660	2520	2070	1560	1450	1450	1580
25	1470	1690	1650	1570	1590	5880	2540	1800	1560	1410	1400	1500
26	1460	1590	1660	2750	1600	5410	2610	1550	1360	1610	1340	1620
27	1440	1580	1630	2670	1570	5060	2650	1390	1260	1760	1330	1560
28	1440	1600	1630	2920	1570	4590	2350	1560	1390	1530	1370	1550
29	1460	1590	1630	2920	---	4210	2150	1730	1460	1430	1400	1520
30	1480	1570	1610	2720	---	3910	1850	1700	1430	1530	1440	1500
31	1500	---	1560	2510	---	3880	---	1520	---	1560	1430	---
TOTAL	52990	48770	47480	50890	54500	103920	104050	78670	47560	46180	41470	47800
MEAN	1709	1626	1532	1642	1946	3352	3468	2538	1585	1490	1338	1593
MAX	2200	1750	1660	2920	2380	5880	4980	5460	2300	1800	1530	2210
MIN	1440	1450	1400	1190	1570	1570	1850	1390	1220	1220	1160	1330
AC-FT	105100	96740	94180	100900	108100	206100	206400	156000	94340	91600	82260	94810

CAL YR 1992 TOTAL 740750 MEAN 2024 MAX 5660 MIN 897 AC-FT 1469000
WTR YR 1993 TOTAL 724280 MEAN 1984 MAX 5880 MIN 1160 AC-FT 1437000

YAKIMA RIVER BASIN

317

12510500 YAKIMA RIVER AT KIONA, WA
(National stream quality accounting network)

LOCATION.--Lat 46°15'13", long 119°28'37", in SE 1/4 NE 1/4 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 sea level. 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 good except for estimated daily discharges, which are fair. 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 diverts about 96,000 acre-ft per 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 discharge, 105 ft³/s Sept. 11, 1906.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 6,550 ft³/s Mar. 25, gage height, 7.10 ft; minimum discharge, 747 ft³/s Aug. 5, 6.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1530	1640	1690	1740	2840	1700	4040	1890	1610	1040	1190	1380
2	1450	1600	1710	1700	2700	1710	4100	2180	2030	985	1140	1350
3	1740	1600	1720	1600	2580	1720	4440	2530	2100	967	1060	1310
4	2220	1680	1670	1500	2480	1750	4850	2490	1870	1010	933	1300
5	1960	1700	1550	e1400	2390	1740	5270	2330	1670	1040	820	1300
6	1890	1720	1480	e1450	2330	2250	5100	2080	2050	1050	834	1330
7	1950	1750	1550	e1350	2270	2760	4930	1780	2550	1010	980	1370
8	2000	1700	1630	e1250	2240	2840	4590	2010	2100	909	954	1410
9	1820	1720	1650	e1300	2210	3040	4230	2160	1740	927	954	1430
10	1720	1860	1650	e1400	2210	3380	4540	1900	1720	901	972	1410
11	1640	1880	1670	e1500	2230	3530	4890	1540	1780	859	989	1540
12	1620	1860	1630	e1500	2270	3440	4800	1400	1780	844	987	2260
13	1570	1870	1600	e1400	2350	3310	4460	2760	1630	924	1040	2000
14	1510	1910	1580	e1450	2350	3180	4140	5350	1580	1010	1140	1790
15	1610	1880	1570	e1500	2350	3170	3800	5970	1590	1100	1110	1630
16	1870	1810	1580	e1500	2320	3810	3500	5210	1480	1170	1210	1590
17	1900	1760	1660	e1500	2220	4170	3420	4570	1430	1150	1330	1580
18	1840	1810	1660	e1500	2010	4120	3440	4050	1270	1240	1300	1590
19	1730	1830	1660	e1500	2230	4150	3530	3780	1120	1390	1230	1630
20	1700	1790	1620	e1500	2140	4170	3370	3610	1040	1410	1160	1660
21	1710	1830	1580	e1500	2160	4170	3260	3610	1050	1390	1340	1730
22	1670	1910	1610	e1550	2110	4220	3010	3310	1140	1330	1490	1800
23	1640	1930	1660	e1600	2030	4550	2740	2890	1130	1250	1570	1670
24	1620	1890	1710	e1550	1950	5880	2700	2460	1210	1120	1510	1590
25	1610	1860	1780	e1600	1780	6470	2720	2110	1320	1100	1470	1470
26	1600	1760	1870	2940	1730	6010	2790	1780	1200	1140	1370	1480
27	1590	1710	1840	3140	1730	5520	2860	1510	1030	1380	1290	1550
28	1600	1710	1850	3500	1700	5110	2670	1480	1000	1380	1340	1490
29	1610	1720	1840	3540	---	4610	2440	1760	1090	1090	1410	1470
30	1630	1710	1820	3320	---	4180	2160	1830	1100	969	1460	1460
31	1650	---	1790	3050	---	4190	---	1710	---	1160	1450	---
TOTAL	53200	53400	51880	56830	61910	114850	112790	84040	45410	34245	37033	46570
MEAN	1716	1780	1674	1833	2211	3705	3760	2711	1514	1105	1195	1552
MAX	2220	1930	1870	3540	2840	6470	5270	5970	2550	1410	1570	2260
MIN	1450	1600	1480	1250	1700	1700	2160	1400	1000	844	820	1300
AC-FT	105500	105900	102900	112700	122800	227800	223700	166700	90070	67920	73450	92370

CAL YR 1992 TOTAL 746953 MEAN 2041 MAX 5980 MIN 818 AC-FT 1482000
WTR YR 1993 TOTAL 752158 MEAN 2061 MAX 6470 MIN 820 AC-FT 1492000

e Estimated

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 TEMPERATURE: December 1952 to September 1980, March 1981 to February 1982.
 SUSPENDED SEDIMENT: June 1977 to October 1980.

12510500

- YAKIMA RIVER AT KIONA, WASH.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DATE	TIME	DIS-CHARGE, INST. (CUBIC FEET PER SECOND)	SPE-CIFIC CON-DUCT-ANCE (US/CM)	PH (STAND-ARD UNITS)	TEMPER-ATURE WATER (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, DIS IT, (COLS. PER 100 ML)
DEC 02...	1115	1690	297	8.4	4.5	1.7	13.9	109	K17	60
MAR 30...	1100	4120	188	8.1	10.0	20	10.6	95	24	20
JUN 09...	1140	1710	228	8.3	18.0	8.7	9.3	100	52	K2700
JUL 28...	1155	1370	301	8.4	23.0	3.5	8.8	105	K58	1500
SEP 16...	1235	1580	266	8.3	16.5	4.6	10.2	106	K30	160
DATE	HARD-NESS (MG/L AS CaCO3)	HARD-NESS, NONCAR-BONATE (MG/L AS CaCO3)	CALCIUM, DIS-SOLVED (MG/L AS Ca)	MAGNE-SIUM, DIS-SOLVED (MG/L AS Mg)	SODIUM, DIS-SOLVED (MG/L AS Na)	SODIUM PERCENT	SODIUM AD-SORP-TION RATIO	POTAS-SIUM, DIS-SOLVED (MG/L AS K)	ALKA-LINITY, DIS IT, FIELD (MG/L AS CaCO3)	BICAR-BONATE, DIS IT, FIELD (MG/L AS HCO3)
DEC 02...	110	0	29	10	18	25	0.7	2.9	135	157
MAR 30...	66	0	16	6.4	10	24	0.5	2.1	77	94
JUN 09...	87	0	22	7.8	11	21	0.5	2.5	92	112
JUL 28...	110	0	29	10	16	23	0.7	3.0	119	140
SEP 16...	99	0	25	8.8	14	23	0.6	3.0	108	132
DATE	CAR-BONATE, DIS IT, FIELD (MG/L AS CO3)	SULFATE, DIS-SOLVED (MG/L AS SO4)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)	FLUO-RIDE, DIS-SOLVED (MG/L AS F)	SILICA, DIS-SOLVED (MG/L AS SiO2)	SOLIDS, RESIDUE AT 180 DEG. C (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, NITRITE DIS-SOLVED (MG/L AS N)
DEC 02...	4	16	7.2	0.2	25	169	197	0.23	771	0.03
MAR 30...	0	8.9	4.0	0.2	22	130	118	0.18	1450	0.01
JUN 09...	0	12	4.8	0.2	21	140	141	0.19	646	0.02
JUL 28...	2	16	6.3	0.2	21	188	179	0.26	695	0.03
SEP 16...	0	15	5.5	0.2	25	167	167	0.23	712	0.02
DATE	NITRO-GEN, NO2+NO3, DIS-SOLVED (MG/L AS N)	NITRO-GEN, AM-MONIA, 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)	BARIUM, DIS-SOLVED (UG/L AS BA)	COBALT, DIS-SOLVED (UG/L AS CO)	IRON, DIS-SOLVED (UG/L AS FE)
DEC 02...	1.5	0.03	<0.2	0.09	0.09	0.07	20	19	<3	12
MAR 30...	0.34	0.03	0.2	0.02	0.02	0.03	40	13	<3	45
JUN 09...	1.0	0.03	0.2	0.80	0.07	0.06	<10	19	<3	23
JUL 28...	1.4	0.03	0.4	0.11	0.06	0.05	10	26	<3	10
SEP 16...	1.3	0.04	0.3	0.13	0.08	0.09	--	--	--	--
DATE	LITHIUM, DIS-SOLVED (UG/L AS LI)	MANGA-NESE, DIS-SOLVED (UG/L AS MN)	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)	SEDI-MENT, SUS-PENDED (MG/L)	SEDI-MENT, DIS-CHARGE, SUS-PENDED (T/DAY)
DEC 02...	<4	19	<10	<1	<1	<1	130	7	5	23
MAR 30...	<4	8	<10	<1	<1	<1	80	<6	82	912
JUN 09...	<4	4	<10	1	<1	<1	100	8	23	106
JUL 28...	4	4	<10	<1	<1	<1	140	8	35	129
SEP 16...	--	--	--	--	--	--	--	--	20	85

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

YAKIMA RIVER BASIN

319

12510618 COLD CREEK AT YAKIMA/BENTON COUNTY LINE, NEAR PRIEST RAPIDS DAM, WA

LOCATION.--Lat 46°35'10", long 119°52'27", in SE 1/4 NE 1/4 sec.25, T.13 N., R.23 E., Yakima County, Hydrologic Unit 17030003, on left bank, 50 ft upstream from boundary between Yakima and Benton Counties, and 4.5 mi south of Priest Rapids Dam.

DRAINAGE AREA.--Not determined.

PERIOD OF RECORD.--April 1990 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 1,410 ft above sea level, from topographic map.

REMARKS.--Records fair. No regulation or diversion upstream from station. U.S. Geological Survey satellite telemeter and recording meteorological instruments at station.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 14 ft³/s Mar. 23, 1993, gage height, 3.14 ft; no flow most days each year.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 14 ft³/s Mar. 23, gage height, 3.14 ft; no flow many days during year.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.00	.00	.00	.00	.00	.56	.37	.19	.15	.00	.00
2	.00	.00	.00	.00	.00	.00	.50	.39	.22	.15	.00	.00
3	.00	.00	.00	.00	.00	.00	.61	.41	.24	.14	.00	.00
4	.00	.00	.00	.00	.00	.00	.56	.44	.26	.13	.00	.00
5	.00	.00	.00	.00	.00	.13	.50	.41	.28	.11	.00	.00
6	.00	.00	.00	.00	.00	e.02	.53	.38	.28	.10	.00	.00
7	.00	.00	.00	.00	.00	.00	.49	.38	.29	.09	.00	.00
8	.00	.00	.00	.00	.00	.00	.52	.39	.29	.08	.00	.00
9	.00	.00	.00	.00	.00	.00	.57	.39	.30	.08	.00	.00
10	.00	.00	.00	.00	.00	.00	.50	.36	.30	.04	.00	.00
11	.00	.00	.00	.00	.00	.00	.49	.35	.30	.04	.00	.00
12	.00	.00	.00	.00	.00	.00	.48	.33	.29	.03	.00	.00
13	.00	.00	.00	.00	.00	.00	.47	.31	.28	.03	.00	.00
14	.00	.00	.00	.00	.00	.00	.47	.31	.28	.02	.00	.00
15	.00	.00	.00	.00	.00	.14	.44	.30	.27	.01	.00	.00
16	.00	.00	.00	.00	.00	.62	.42	.29	.27	.04	.00	.00
17	.00	.00	.00	.00	.00	.05	.42	.28	.25	.12	.00	.00
18	.00	.00	.00	.00	.00	.00	.43	.28	.24	.08	.00	.00
19	.00	.00	.00	.00	.00	.38	.41	.28	.22	.08	.00	.00
20	.00	.00	.00	.00	.00	.54	.41	.27	.22	.05	.00	.00
21	.00	.00	.00	.00	.00	.67	.40	.27	.27	.03	.00	.00
22	.00	.00	.00	.00	.00	.92	.39	.26	.23	.01	.00	.00
23	.00	.00	.00	.00	.00	9.1	.41	.27	.21	.00	.00	.00
24	.00	.00	.00	.00	.00	2.4	.39	.25	.19	.00	.00	.00
25	.00	.00	.00	.00	.00	1.0	.37	.22	.17	.00	.00	.00
26	.00	.00	.00	.00	.00	.81	.39	.19	.16	.00	.00	.00
27	.00	.00	.00	.00	.00	.60	.39	.17	.16	.00	.00	.00
28	.00	.00	.00	.00	.00	.53	.39	.17	.16	.00	.00	.00
29	.00	.00	.00	.00	---	.50	.39	.15	.16	.00	.00	.00
30	.00	.00	.00	.00	---	.49	.38	.14	.16	.00	.00	.00
31	.00	---	.00	.00	---	.46	---	.20	---	.00	.00	---
TOTAL	0.00	0.00	0.00	0.00	0.00	19.36	13.68	9.21	7.14	1.61	0.00	0.00
MEAN	.0000	.0000	.0000	.0000	.0000	.62	.46	.30	.24	.052	.0000	.0000
MAX	.00	.00	.00	.00	.00	9.1	.61	.44	.30	.15	.00	.00
MIN	.00	.00	.00	.00	.00	.00	.37	.14	.16	.00	.00	.00
AC-FT	.00	.00	.00	.00	.00	.38	.27	.18	.14	3.2	.00	.00

CAL YR 1992 TOTAL 0.13 MEAN .000 MAX .13 MIN .00 AC-FT .3
WTR YR 1993 TOTAL 51.00 MEAN .14 MAX 9.1 MIN .00 AC-FT 101

e Estimated

YAKIMA RIVER BASIN

12510625 COLD CREEK AT HIGHWAY 24, NEAR PRIEST RAPIDS DAM, WA

LOCATION.--Lat 46°34'14", long 119°47'17", in SW 1/4 NW 1/4 sec.35, T.13 N., R.24 E., Benton County, Hydrologic Unit 17030003, Hanford Nuclear Reservation, on left bank, 500 ft upstream from culvert on State Route 24, and 8.0 mi southeast of Priest Rapids Dam.

DRAINAGE AREA.--39.4 mi².

PERIOD OF RECORD.--April 1990 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 945 ft above sea level, from topographic map.

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

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 170 ft³/s June 29, 1991, gage height, 4.23 ft; no flow most days.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 5.3 ft³/s Feb. 20, gage height, 2.79 ft; no flow most days.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY 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	.12	.00	.00	.00	.00	.00	.00
4	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
5	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
6	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
7	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
8	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
9	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
10	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
11	.00	.00	.00	.00	.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	.00	.00	.00	.00	.00	.00	.00	.00
14	.00	.00	.00	.00	.00	.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	e.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	e.00	.00	.00	.00	.00	.00	.00	.00
20	.00	.00	e.00	.00	.28	.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	.00	.00	.33	.00	.00	.00	.00	.00	.00
24	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
25	.00	.00	.00	e.00	.00	.00	.00	.00	.00	.00	.00	.00
26	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
27	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
28	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
29	.00	.00	.00	.00	---	.00	.00	.00	.00	.00	.00	.00
30	.00	.00	.00	.00	---	.00	.00	.00	.00	.00	.00	.00
31	.00	---	e.00	.00	---	.00	---	.00	---	.00	.00	---
TOTAL	0.00	0.00	0.00	0.00	0.28	0.45	0.00	0.00	0.00	0.00	0.00	0.00
MEAN	.000	.000	.000	.000	.010	.015	.000	.000	.000	.000	.000	.000
MAX	.00	.00	.00	.00	.28	.33	.00	.00	.00	.00	.00	.00
MIN	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
AC-FT	.00	.00	.00	.00	.6	.9	.00	.00	.00	.00	.00	.00

CAL YR 1992 TOTAL 0.02 MEAN .000 MAX .01 MIN .00 AC-FT .04
WTR YR 1993 TOTAL 0.73 MEAN .002 MAX .33 MIN .00 AC-FT 1.4

e Estimated

YAKIMA RIVER BASIN

321

12510650 DRY CREEK AT HIGHWAY 241, NEAR PRIEST RAPIDS DAM, WA

LOCATION.--Lat 46°31'29", long 119°52'24", in NE 1/4 SE 1/4 sec.13, T.12 N., R.23 E., Yakima County, Hydrologic Unit 17030003, on left bank, just upstream from left culvert on State Route 241 road crossing, and 8.5 mi south of Priest Rapids Dam.

DRAINAGE AREA.--57.9 mi².

PERIOD OF RECORD.--April 1990 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 1,130 ft above sea level, from topographic map.

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

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of Jan. 16, 1971, reached a discharge of 2,280 ft³/s, by slope-area computation 0.7 mi upstream from station.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, unknown, but less than 100 ft³/s June 20, 1991, gage height, 2.27 ft; no flow part or all of each day during period.

EXTREMES FOR CURRENT YEAR.--No flow all year.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY 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	.00	.00	.00	.00	.00	.00	.00	.00	.00
5	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
6	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
7	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
8	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
9	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
10	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
11	.00	.00	.00	.00	.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	.00	.00	.00	.00	.00	.00	.00	.00
14	.00	.00	.00	.00	.00	.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	.00	.00	.00	.00	.00	.00	.00	.00	.00
24	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
25	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
26	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
27	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
28	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
29	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
30	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
31	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
TOTAL	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MEAN	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
MAX	.00	.00	.00	.00	.00	.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	.00	.00	.00	.00	.00	.00	.00	.00	.00
CAL YR 1992	TOTAL 0.00	MEAN .000	MAX .00	MIN .00	AC-FT .00							
WTR YR 1993	TOTAL 0.00	MEAN .000	MAX .00	MIN .00	AC-FT .00							

YAKIMA RIVER BASIN

12510655 DRY CREEK NEAR RATTLESNAKE SPRING, NEAR PRIEST RAPIDS DAM, WA

LOCATION.--Lat 46°30'28", long 119°41'53", in SW 1/4 SW 1/4 sec.21, T.12 N., R.25 E., Benton County, Hydrologic Unit 17030003, Hanford Nuclear Reservation, on left bank, 30 ft upstream from road crossing, 0.4 mi downstream from Rattlesnake Spring, and 14 mi southeast of Priest Rapids Dam.

DRAINAGE AREA.--Not determined.

PERIOD OF RECORD.--April 1990 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 680 ft above sea level, from topographic map.

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

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 74 ft³/s Jan. 12, 1991, gage height, 2.78 ft; minimum discharge, 0.14 ft³/s several days in June, July, August, 1990, Sept. 21, 1991.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 0.83 ft³/s July 13, gage height, 1.22 ft; minimum discharge, 0.25 ft³/s several days in January and July.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	e.38	.37	.43	.36	.37	.38	.49	.49	.37	.38	.37	.46
2	e.38	.37	.42	.34	.37	.38	.49	.49	.36	.37	.37	.49
3	e.38	.38	.37	.34	.37	.42	.43	.49	.36	.37	.38	.49
4	e.38	.43	.37	.34	.37	.43	.43	.49	.36	.38	.38	.49
5	e.38	.43	.37	.34	.37	.44	.43	.49	.35	.39	.39	.50
6	e.38	.43	.37	.34	.37	.43	.43	.50	.33	.40	.40	.53
7	.37	.38	.39	.32	.37	.45	.43	.49	.31	.39	.40	.55
8	.37	.37	.39	.34	.37	.43	.43	.49	.34	.34	.41	.56
9	.37	.37	.39	.34	.37	.43	.43	.49	.35	.30	.41	.57
10	.37	.37	.43	.33	.37	.43	.43	.49	.34	.30	.41	.55
11	.41	.37	.41	.33	.37	.43	.43	.49	.36	.27	.40	.55
12	.42	.37	.41	.34	.37	.43	.43	.49	.31	.30	.41	.55
13	.43	.37	.42	.27	.37	.43	.43	.49	.31	.39	.41	.54
14	.43	.37	.43	.29	.37	.43	.43	.49	.31	.37	.43	.55
15	.43	.37	.43	.28	.36	.43	.43	.49	.31	.37	.42	.55
16	.43	.37	.43	.29	.37	.43	.43	.49	.34	.36	e.43	.55
17	.43	.37	.42	.29	.37	.43	.43	.49	.34	.40	e.43	.56
18	.43	.37	.40	.29	.38	.43	.43	.49	.35	.34	.43	.57
19	.43	.37	.37	.30	.43	.45	.43	.47	.34	.32	.43	.62
20	.42	.37	.38	.33	.42	.48	.43	.47	.29	.33	.44	.61
21	.43	.42	.42	.31	.40	.48	.48	.48	.31	.37	.43	.62
22	.42	.40	.44	.33	.41	.48	.49	.42	.31	.37	.40	.62
23	.43	.38	.40	.31	.43	.49	.49	.39	.31	.37	.36	.62
24	.41	.40	.37	.31	.43	.49	.49	.36	.35	.37	.37	.63
25	.31	.42	.37	.40	e.43	.49	.49	.37	.37	.38	.37	.63
26	.34	.42	.36	.37	e.39	.49	.49	.37	.37	.40	.41	.65
27	.36	.43	.37	.37	.37	.49	.49	.36	.42	.40	.43	.65
28	.37	.43	.37	.37	e.37	.49	.49	.37	.42	.41	.43	.68
29	.37	.43	.37	.36	---	.49	.49	.36	.37	.39	.43	.66
30	.37	.43	.37	.37	---	.49	.49	.35	.38	.42	.43	.67
31	.37	---	.37	.37	---	.49	---	.37	---	.43	.44	---
TOTAL	12.20	11.76	12.24	10.27	10.74	13.96	13.61	13.97	10.34	11.38	12.65	17.27
MEAN	.39	.39	.39	.33	.38	.45	.45	.45	.34	.37	.41	.58
MAX	.43	.43	.44	.40	.43	.49	.49	.50	.42	.43	.44	.68
MIN	.31	.37	.36	.27	.36	.38	.43	.35	.29	.27	.36	.46
AC-FT	24	23	24	20	21	28	27	28	21	23	25	34

CAL YR 1992 TOTAL 153.44 MEAN .42 MAX .52 MIN .29 AC-FT 304
WTR YR 1993 TOTAL 150.39 MEAN .41 MAX .68 MIN .27 AC-FT 298

e Estimated

ESQUATZEL COULEE BASIN

323

12512550 PROVIDENCE COULEE NEAR CUNNINGHAM, WA

LOCATION.--Lat 46°48'11", long 118°48'55", in SE 1/4 NE 1/4 sec.8, T.15 N., R.32 E., Adams County, Hydrologic Unit 17020016, on right bank, 0.8 mi upstream from State Highway 26, 0.9 mi downstream from Cunningham Coulee, 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. Prior to Oct. 1, 1985, at datum 10.00 ft lower.

REMARKS.--No estimated daily discharges. Records fair. No known diversions. Undetermined amount of ground-water withdrawal for irrigation upstream from gage. U.S. Geological Survey satellite telemeter at station.

AVERAGE DISCHARGE.--8 years (water years 1978-85), 0.89 ft³/s, 645 acre-ft/yr. Average discharge is not computed after the 1985 water year because of ground-water withdrawals and return flows from irrigation occurring during the summer months upstream from the gage.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 711 ft³/s Feb. 9, 1979, gage height, 5.40 ft; no flow most days each year.

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, 163 ft³/s Mar. 9, gage height, 12.50 ft; maximum gage height, 12.84 ft Jan. 26 (backwater from ice); no flow most days.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.00	.00	.00	.01	.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	.00	.01	.00	.00	.00	.00	.00	.00	.00
5	.00	.00	.00	.00	2.5	.00	.00	.00	.00	.00	.00	.00
6	.00	.00	.00	.00	4.4	.00	.00	.00	.00	.00	.00	.00
7	.00	.00	.00	.00	9.3	.97	.00	.00	.00	.00	.00	.00
8	.00	.00	.00	.00	17	49	.00	.00	.00	.00	.00	.00
9	.00	.00	.00	.00	11	38	.00	.00	.00	.00	.00	.00
10	.00	.00	.00	.00	.13	3.3	.00	.00	.00	.00	.00	.00
11	.00	.00	.00	.00	.00	.37	.00	.00	.00	.00	.00	.00
12	.00	.00	.00	.00	.00	.01	.00	.00	.00	.00	.00	.00
13	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
14	.00	.00	.00	.00	.00	.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	.00	.00	.00	.00	.00	.00	.00	.00	.00
24	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
25	.00	.00	.00	24	.00	.00	.00	.00	.00	.00	.00	.00
26	.00	.00	.00	82	.00	.00	.00	.00	.00	.00	.00	.00
27	.00	.00	.00	40	.00	.00	.00	.00	.00	.00	.00	.00
28	.00	.00	.00	5.9	.00	.00	.00	.00	.00	.00	.00	.00
29	.00	.00	.00	1.9	---	.00	.00	.00	.00	.00	.00	.00
30	.00	.00	.00	1.6	---	.00	.00	.00	.00	.00	.00	.00
31	.00	---	.00	2.3	---	.00	---	.00	---	.00	.00	---
TOTAL	0.00	0.00	0.00	157.70	44.35	91.65	0.00	0.00	0.00	0.00	0.00	0.00
MEAN	.000	.000	.000	5.09	1.58	2.96	.000	.000	.000	.000	.000	.000
MAX	.00	.00	.00	82	17	49	.00	.00	.00	.00	.00	.00
MIN	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
AC-FT	.00	.00	.00	313	88	182	.00	.00	.00	.00	.00	.00

CAL YR 1992 TOTAL 0.00 MEAN .000 MAX .00 MIN .00 AC-FT .00
WTR YR 1993 TOTAL 293.70 MEAN .80 MAX 82 MIN .00 AC-FT 583

ESQUATZEL COULEE BASIN

12513000 ESQUATZEL COULEE AT CONNELL, WA

LOCATION.--Lat 46°39'49", long 118°51'44", in SW 1/4 SE 1/4 sec.25, T.14 N., R.31 E., Franklin County, Hydrologic Unit 17020016, on right bank, at Clark Street Bridge in Connell, and 7.8 mi downstream from Hatton Coulee.

DRAINAGE AREA.--234 mi², approximately.

PERIOD OF RECORD.--October 1952 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 820 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, July 9, 1967, to Oct. 28, 1981, at site 0.7 mi downstream at different datum, and Oct. 29, 1981, to Sept. 30, 1984 at datum 10 ft lower.

REMARKS.--Records poor. No diversion upstream from station. Most flow for October, and April through September is return and waste from water imported for irrigation, entering about 3 mi upstream on the right bank.

AVERAGE DISCHARGE.--33 years (water years 1953-85), 1.73 ft³/s, 1,253 acre-ft/yr, adjusted for effluent from sewage treatment plant 1959-64. Average discharge is not computed after the 1985 water year because of ground-water withdrawals and return flows from irrigation occurring during the summer months upstream from the gage.

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 at times during most years.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 975 ft³/s Jan. 26, gage height, 17.39 ft; no flow many days Oct. 15 to Apr. 20..

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	14	.00	.00	.00	3.5	.00	.00	12	20	9.7	1.9	4.4
2	.77	.00	.00	.00	.00	.00	.00	16	17	11	2.2	2.5
3	.08	.00	.00	.00	.00	.00	.00	15	7.9	13	4.0	2.9
4	2.9	.00	.00	.00	.00	.00	.00	14	7.0	9.7	4.1	2.8
5	2.3	.00	e.00	.00	.00	.00	.00	12	2.7	11	2.2	2.3
6	5.7	.00	e.00	.00	.00	.00	.00	7.1	7.3	7.1	2.7	.92
7	12	.00	e.00	.00	5.9	38	.00	6.1	4.3	4.6	3.6	2.5
8	8.7	.00	e.00	.00	15	106	.00	3.5	6.0	10	4.9	5.0
9	6.8	.00	e.00	.00	31	82	.00	6.3	4.1	9.0	5.8	5.9
10	4.9	.00	e.00	.00	4.4	30	.00	7.2	6.7	9.5	4.9	2.2
11	4.9	.00	.00	.00	.00	4.2	.00	7.9	5.0	12	6.0	6.1
12	6.4	.00	.00	.00	.00	.00	.00	7.2	15	12	3.2	10
13	14	.00	.00	.00	.00	.00	.00	6.9	7.7	8.1	6.6	8.9
14	14	.00	.00	.00	.00	.00	.00	8.2	8.3	8.8	7.4	13
15	19	.00	.00	.00	.00	.00	.00	11	14	9.8	3.7	11
16	12	.00	.00	.00	e.00	.00	.00	8.2	8.1	9.9	6.4	9.7
17	5.1	.00	.00	.00	e.00	.00	.00	e8.0	9.8	11	14	8.1
18	4.9	.00	.00	.00	e.00	.00	.00	e15	6.0	8.7	12	4.1
19	9.7	.00	.00	.00	e.00	.00	.00	e9.0	7.0	8.7	7.0	2.7
20	7.3	.00	.00	.00	e.00	.00	.00	9.7	3.1	7.1	8.3	5.0
21	6.1	.00	.00	.00	.00	.00	.14	8.7	7.1	7.7	5.7	4.0
22	4.4	.00	.00	.00	.00	.00	1.6	8.7	9.6	10	4.5	7.0
23	.62	.00	.00	.00	.00	.00	3.6	14	11	11	10	1.9
24	.02	.00	.00	.00	.00	.00	e7.0	14	8.3	8.2	6.7	1.5
25	.00	.00	.00	93	.00	.00	5.6	11	8.7	2.7	6.8	.13
26	.00	.00	.00	615	.00	.00	9.3	13	5.0	4.8	5.1	.90
27	.00	.00	.00	173	.00	.00	7.3	12	7.6	6.2	7.7	2.3
28	.00	.00	.00	43	.00	.00	5.6	10	13	5.8	10	1.6
29	.00	.00	.00	21	---	.00	4.3	19	17	4.6	8.6	2.5
30	.00	.00	.00	7.6	---	.00	13	9.0	12	4.7	3.9	5.3
31	.00	---	.00	18	---	.00	---	13	---	4.2	3.3	---
TOTAL	166.59	0.00	0.00	970.60	59.80	260.20	57.44	322.7	266.3	260.6	183.2	137.15
MEAN	5.37	.000	.000	31.3	2.14	8.39	1.91	10.4	8.88	8.41	5.91	4.57
MAX	19	.00	.00	615	31	106	13	19	20	13	14	13
MIN	.00	.00	.00	.00	.00	.00	.00	3.5	2.7	2.7	1.9	.13
AC-FT	330	.00	.00	1930	119	516	114	640	528	517	363	272

CAL YR 1992 TOTAL 1430.97 MEAN 3.91 MAX 21 MIN .00 AC-FT 2840
WTR YR 1993 TOTAL 2684.58 MEAN 7.36 MAX 615 MIN .00 AC-FT 5320

e Estimated

ESQUATZEL COULEE BASIN

325

12513650 ESQUATZEL DIVERSION CHANNEL BELOW HEADWORKS, NEAR PASCO, WA

LOCATION.--Lat 46°21'48", long 119°05'16", in NW 1/4 SW 1/4 sec.8, T.10 N., R.30 E., Franklin County, Hydrologic Unit 17020016, on left bank, 400 ft downstream from diversion dam and headgate, and 7 mi north of Pasco.

DRAINAGE AREA.--Indeterminate.

PERIOD OF RECORD.--April to September 1993.

GAGE.--Water-stage recorder. Elevation of gage is 520 ft above sea level, from topographic map.

REMARKS.--No estimated daily discharges. Records good. Most flow is return and waste from water imported for irrigation from the Columbia River at Grand Coulee Dam. The water is distributed through a complex network of canals and reservoirs.

EXTREMES FOR PERIOD APRIL TO SEPTEMBER 1993.--Maximum discharge, 183 ft³/s July 17, gage height, 3.67 ft; minimum, 49 ft³/s May 25.

DISCHARGE, CUBIC FEET PER SECOND, APRIL TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	APR	MAY	JUN	JUL	AUG	SEP
1	---	121	133	123	151	137
2	---	132	130	138	157	130
3	---	140	124	155	145	129
4	---	145	124	170	127	122
5	---	135	140	170	119	127
6	---	126	161	149	120	143
7	---	124	144	136	125	132
8	---	123	116	118	133	109
9	131	129	112	104	138	107
10	132	114	129	130	115	110
11	130	68	125	150	104	119
12	131	68	154	145	91	138
13	131	86	154	126	106	148
14	117	76	137	131	124	140
15	106	73	137	139	145	151
16	101	102	145	132	150	153
17	107	103	146	155	164	155
18	129	96	137	167	158	142
19	121	82	135	167	144	142
20	108	85	140	155	116	153
21	104	90	145	153	112	159
22	99	101	154	155	128	153
23	97	84	169	152	130	143
24	79	86	165	164	119	139
25	81	52	144	175	114	144
26	97	77	134	169	120	145
27	110	99	141	149	129	139
28	97	115	147	144	138	131
29	116	128	146	137	146	125
30	121	134	130	145	147	119
31	---	138	---	146	139	---
TOTAL	---	3232	4198	4549	4054	4084
MEAN	---	104	140	147	131	136
MAX	---	145	169	175	164	159
MIN	---	52	112	104	91	107
AC-FT	---	6410	8330	9020	8040	8100

COLUMBIA RIVER BASIN

12514095 ZINTEL CANYON WASTEWAY ABOVE VANCOUVER STREET, AT KENNEWICK, WA

LOCATION.--Lat 46°12'05", long 119°08'57", in NW 1/4 SW 1/4 sec.2, T.8 N., R.29 E., Benton County, Hydrologic Unit 17020016, on right bank, 500 ft upstream from culvert under Vancouver Street, in Kennewick.

DRAINAGE AREA.--Not determined.

PERIOD OF RECORD.--April 1992 to September 1993 (discontinued).

GAGE.--Water-stage recorder. Elevation of gage is 450 ft, from topographic map.

REMARKS.--No estimated daily discharges. Records fair. Most flow is return and waste from water imported for irrigation from Yakima River at Prosser. The water is distributed through a complicated network of canals.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 17 ft³/s Aug. 16, 1993, gage height, 5.22 ft, from rating curve extended above 9 ft³/s; minimum discharge, 1.3 ft³/s May 2, 1993.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 17 ft³/s, Aug. 16, gage height, 5.22 ft, from rating curve extended above 9 ft³/s; minimum discharge, 1.3 ft³/s May 2.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	7.3	3.1	2.7	2.5	1.9	1.7	1.7	4.7	7.8	7.2	7.6	9.1
2	7.9	3.1	2.7	2.4	1.9	1.7	1.7	3.5	6.9	8.6	8.4	8.6
3	7.8	3.1	2.7	2.4	1.9	1.7	1.7	5.4	5.9	9.7	8.5	8.3
4	6.7	3.1	2.6	2.4	1.9	1.7	1.6	5.2	6.0	7.1	8.7	8.3
5	6.7	3.0	2.6	2.4	1.9	1.9	1.7	4.7	6.8	5.6	8.9	8.8
6	7.6	3.0	2.6	2.4	1.9	1.8	1.7	4.8	4.8	7.8	9.3	7.6
7	7.7	3.0	2.6	2.4	1.9	1.8	1.7	4.0	5.8	7.5	9.4	8.8
8	7.1	3.0	2.6	2.4	1.9	1.7	1.7	3.6	5.5	6.4	11	9.0
9	6.6	2.9	2.7	2.5	1.9	1.8	3.9	3.7	6.5	6.7	8.7	8.7
10	7.0	2.8	2.8	2.4	1.8	1.7	5.2	4.7	6.7	7.0	8.3	9.8
11	6.8	2.8	2.7	2.4	1.8	1.7	5.4	5.2	7.9	7.8	8.3	11
12	7.1	2.8	2.6	2.4	1.8	1.6	5.5	5.5	5.5	7.6	8.7	10
13	6.3	2.8	2.6	2.4	1.8	1.6	5.9	6.3	5.2	7.5	8.4	11
14	6.7	2.8	2.6	2.3	1.8	1.6	5.3	6.6	5.2	8.2	8.6	11
15	6.6	2.7	2.6	2.2	1.8	1.6	5.7	6.6	7.2	8.5	8.5	9.8
16	3.4	2.7	2.6	2.2	1.8	1.6	4.4	6.3	5.5	8.2	14	8.0
17	3.3	2.7	2.6	2.2	1.8	1.6	5.4	6.5	6.5	8.9	10	7.1
18	3.3	2.7	2.5	2.2	1.9	1.6	5.0	7.0	6.8	7.1	9.3	6.9
19	3.2	2.7	2.5	2.2	1.9	1.6	4.8	5.3	6.3	8.7	9.3	8.1
20	3.2	2.7	2.5	2.3	1.8	1.7	4.1	5.7	6.5	8.1	11	7.9
21	3.3	2.9	2.5	2.2	1.8	1.6	3.8	6.3	8.4	6.7	8.9	8.4
22	3.2	2.7	2.5	2.3	1.8	1.6	6.1	5.2	10	8.2	6.8	9.3
23	3.2	2.7	2.5	2.1	1.8	1.6	6.1	4.9	7.7	7.4	8.4	8.7
24	3.2	2.7	2.5	2.1	1.8	1.6	6.5	4.1	6.1	7.1	8.3	8.0
25	3.1	2.7	2.5	2.2	1.8	1.6	6.0	5.9	7.0	8.1	9.1	9.5
26	3.1	2.7	2.5	2.1	1.8	1.6	5.7	6.0	7.3	6.5	9.5	8.9
27	3.1	2.7	2.5	2.0	1.7	1.6	3.5	6.1	8.9	6.7	8.9	9.3
28	3.2	2.6	2.5	2.0	1.7	1.6	4.4	7.0	9.2	8.2	9.0	9.1
29	3.2	2.6	2.5	2.0	---	1.6	5.0	7.0	8.0	7.5	9.3	9.4
30	3.2	2.6	2.5	1.9	---	1.6	4.7	5.8	6.4	7.0	9.4	8.9
31	3.1	---	2.5	1.9	---	1.7	---	7.0	---	7.2	9.4	---
TOTAL	157.2	84.4	79.9	69.8	51.3	51.4	125.9	170.6	204.3	234.8	281.9	267.3
MEAN	5.07	2.81	2.58	2.25	1.83	1.66	4.20	5.50	6.81	7.57	9.09	8.91
MAX	7.9	3.1	2.8	2.5	1.9	1.9	6.5	7.0	10	9.7	14	11
MIN	3.1	2.6	2.5	1.9	1.7	1.6	1.6	3.5	4.8	5.6	6.8	6.9
AC-FT	312	167	158	138	102	102	250	338	405	466	559	530

WTR YR 1993 TOTAL 1778.8 MEAN 4.87 MAX 14 MIN 1.6 AC-FT 3530

COLUMBIA RIVER MAIN STEM

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12514500 COLUMBIA RIVER ON CLOVER ISLAND, AT KENNEWICK, WA

LOCATION.--Lat 46°13'00", long 119°06'29", in NE 1/4 SW 1/4 sec.31, T.9 N., R.30 E., Benton County, Hydrologic Unit 17020016, on east end of U.S. Coast Guard wharf on south side of Clover Island, at the north city limit of Kennewick, 6.6 mi downstream from mouth of Yakima River, 4.4 mi upstream from mouth of Snake River, and at mile 328.6.

DRAINAGE AREA.--104,000 mi², approximately.

PERIOD OF RECORD.-- November 1987 to current year. Records for October 1963 to September 1966 (discharge) and October 1979 to February 1988 (elevations), published as Columbia River at Pasco (station 12514000) 1.4 mi upstream, are not equivalent for elevations because of fall between sites.

GAGE.--Water-stage recorder. Datum of gage is sea level (Corps of Engineers' bench mark).

REMARKS.--Gage is within the pool formed by McNary Dam.

EXTREMES FOR PERIOD OF RECORD.--Maximum elevation, 341.99 ft June 12, 1990; minimum, 335.73 ft Dec. 31, 1988.

EXTREMES FOR CURRENT YEAR.--Maximum elevation, 341.90 ft May 21; minimum, 336.97 ft Sept. 27.

ELEVATION (FEET NGVD), WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	339.00	339.39	339.03	339.76	338.88	---	338.70	340.24	338.89	337.57	338.56	339.10
2	339.11	339.02	339.07	339.48	339.29	---	338.90	339.77	339.46	338.05	338.33	339.38
3	339.29	339.15	339.37	339.49	339.38	---	339.28	339.55	339.67	338.69	338.02	339.54
4	339.38	339.51	338.76	339.37	339.32	338.75	339.36	338.96	339.58	339.18	337.96	339.11
5	339.18	339.57	339.42	339.67	339.48	338.48	339.60	339.80	339.35	339.05	338.39	338.29
6	339.22	339.50	339.51	339.38	339.16	338.83	340.05	340.24	339.62	339.66	338.09	338.34
7	339.01	339.68	339.30	---	339.02	339.39	339.91	340.05	339.34	339.64	339.37	338.01
8	339.10	339.72	339.28	---	338.82	339.35	339.80	340.06	339.83	339.63	339.49	338.94
9	338.70	339.37	339.58	---	339.20	339.16	339.10	339.86	339.54	339.19	338.13	339.52
10	338.76	338.96	339.56	---	338.92	339.06	339.95	339.65	339.01	339.23	338.30	339.28
11	339.10	339.17	339.57	---	338.96	339.53	339.96	339.36	340.03	339.02	338.81	339.35
12	338.95	339.49	339.72	---	339.04	339.56	339.53	339.37	340.51	339.01	338.08	338.76
13	338.99	339.51	339.57	---	339.03	339.33	339.05	339.45	340.13	339.08	338.37	337.65
14	338.96	339.53	339.57	---	339.14	339.46	338.56	340.12	339.83	338.90	339.64	337.85
15	339.01	339.71	339.60	---	338.99	339.41	338.37	339.77	339.64	339.06	339.54	337.61
16	338.90	339.70	339.52	---	339.24	339.27	338.95	340.12	339.18	339.61	339.56	337.75
17	339.38	339.73	339.09	---	339.58	339.48	338.86	339.54	339.65	340.13	339.82	337.79
18	339.54	339.73	339.44	---	338.97	339.81	339.01	340.29	340.35	339.90	339.47	337.98
19	339.29	339.85	339.70	---	339.16	339.96	339.50	339.91	340.29	340.05	338.71	337.90
20	339.03	340.17	339.85	---	339.16	340.40	339.08	340.34	340.16	339.58	338.54	337.52
21	339.33	339.54	339.78	338.74	339.20	340.43	338.83	340.67	339.73	339.72	338.83	337.69
22	339.41	339.89	339.76	338.93	---	340.50	338.96	340.01	339.74	339.89	338.28	337.82
23	339.42	340.07	339.77	338.77	---	339.59	338.85	339.93	339.65	339.93	338.05	337.77
24	339.37	339.60	339.58	339.23	338.69	338.12	339.21	340.08	340.16	339.67	338.08	338.12
25	339.25	339.21	339.33	339.47	338.92	338.37	339.66	339.52	339.63	339.75	338.59	338.75
26	339.13	339.18	339.50	339.01	---	338.73	339.34	339.41	338.94	339.19	339.16	338.32
27	339.23	339.05	339.46	338.79	---	338.37	339.12	339.59	339.40	339.15	339.02	337.36
28	339.15	339.21	339.42	339.04	---	337.99	339.23	339.40	339.28	339.19	339.16	337.50
29	339.29	339.25	339.53	339.08	---	338.41	338.87	338.67	338.43	339.68	339.07	337.73
30	339.53	339.41	339.65	339.34	---	338.72	339.35	339.36	337.62	339.51	338.46	337.73
31	339.54	---	339.54	339.19	---	339.08	---	338.89	---	338.58	338.87	---
MAX	339.54	340.17	339.85	---	---	---	340.05	340.67	340.51	340.13	339.82	339.54
MIN	338.70	338.96	338.76	---	---	---	338.37	338.67	337.62	337.57	337.96	337.36

CAL YR 1992 MAX 340.49 MIN 337.84

EXPLANATION

▲13494250 Stream-gaging station

▼13334300 Water-quality data collection site

▲12396000 Crest-stage gaging station

RM 18.4 River mile

—→ Stream—Arrow shows direction of flow

- - - - -→ Tunnel or pipe—Arrow shows direction of flow

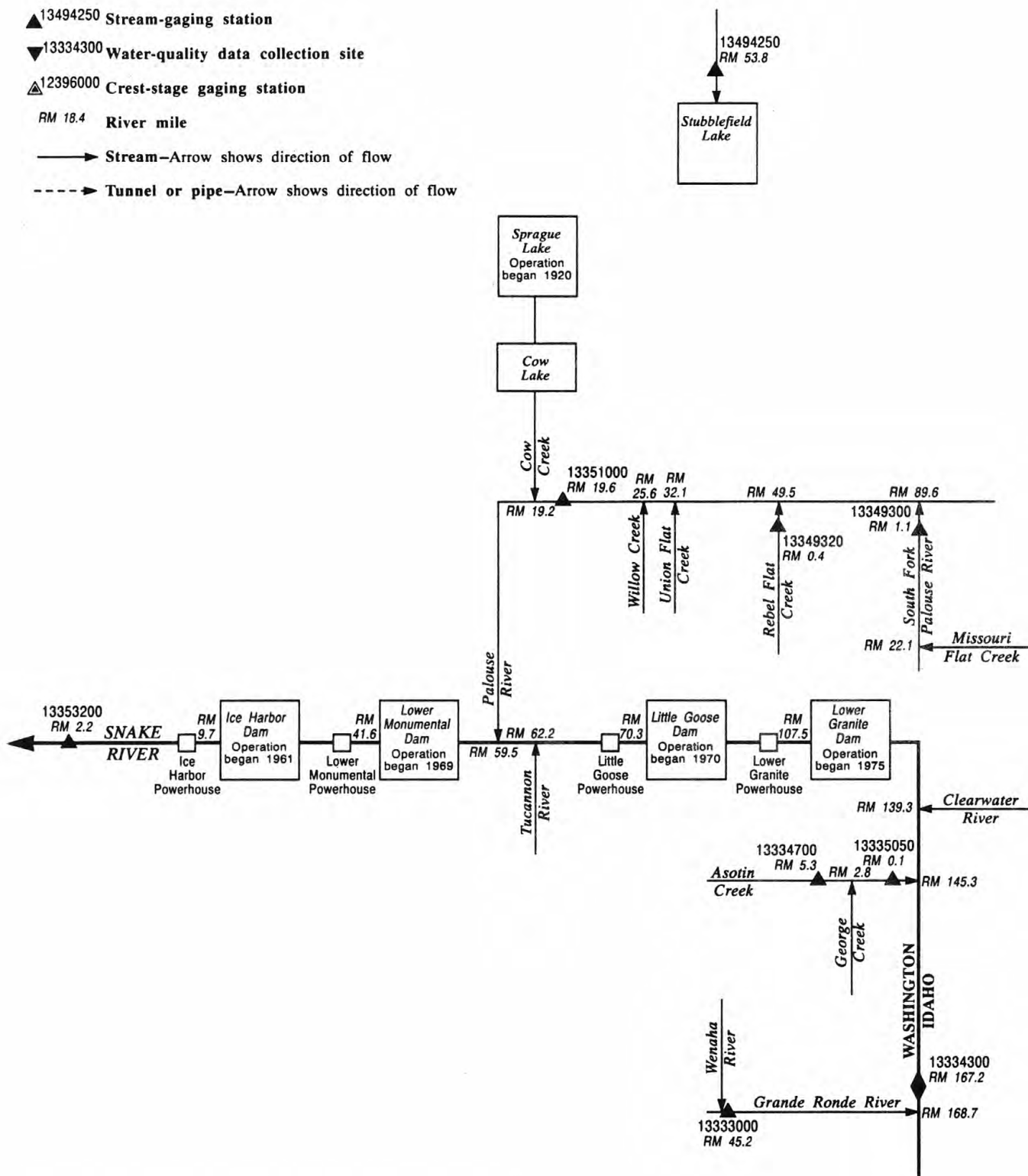


Figure 24. Gaging stations in Snake River Basin.

LOCATION.--Lat 45°56'47", long 117°26'54", in NE 1/4 NW 1/4 sec.4, T.5 N., R.43 E., Wallowa County, Hydrologic Unit 17060106, on left bank 500 ft downstream from bridge at Troy, 600 ft downstream from Wenaha River, and at mile 45.2.

PERIOD OF RECORD.--August 1944 to current year. Monthly discharge only August 1944, published in WSP 1317.

REVISED RECORDS.--WSP 1397: 1946(M), 1948-50.

GAGE.--Water-stage recorder. Datum of gage is 1,585.98 ft above sea level. 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. U.S. Geological Survey satellite telemeter and National Weather Service telemeter at station.

REMARKS.--Records good except for estimated daily discharges, which are poor. Flow slightly regulated by Wallowa Lake (station 13326000) and small reservoirs. Diversions for irrigation upstream from station, chiefly in vicinity of La Grande, Enterprise, and Wallowa; one transbasin diversion from Big Sheep Creek and tributaries in Imnaha River basin for irrigation in Wallowa Valley.

AVERAGE DISCHARGE.--49 years, 3,018 ft³/s, 2,187,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 42,200 ft³/s Dec. 23, 1964, gage height, 11.25 ft; minimum discharge, 335 ft³/s Dec. 6, 1972; result of freezeup, but may have been less during period of ice effect that day.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge 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)
Mar. 20	2330	12,800	7.07	May 4	0900	12,800	7.08
Mar. 24	0730	15,100	7.55	May 14	0600	*16,700	*7.87
Apr. 4	0600	12,900	7.09				

Minimum discharge, 335 ft³/s Dec. 6, result of freezeup, but may have been less during period of ice effect that day.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	577	858	722	918	925	921	6810	9470	6180	2800	1360	811
2	562	966	710	898	890	919	7430	9780	6440	2700	1270	773
3	574	929	679	879	916	927	8870	10400	6650	2840	1200	732
4	642	850	656	867	931	938	12500	12600	6650	2650	1140	693
5	650	884	e470	853	954	969	11100	12400	e6100	2510	1070	682
6	630	857	e460	832	959	1070	9010	12500	e6200	2360	1010	664
7	620	864	e680	800	938	1300	8070	12500	e8000	2240	918	640
8	612	959	e860	e600	950	1740	7780	12100	e7400	2120	887	597
9	604	990	e900	e700	975	2160	8550	11100	e6600	2040	872	576
10	593	925	1010	e800	1030	2430	8480	10200	e5800	2000	838	561
11	593	868	1060	e680	1140	2630	8360	11300	e6200	1890	787	548
12	584	836	e1000	e600	1230	2530	7430	13200	e5800	1810	764	547
13	602	833	e950	e500	1280	2310	6800	14900	e5400	1760	759	543
14	608	818	888	e600	1300	2260	6480	16000	e4700	1760	762	554
15	617	821	888	e800	1320	3350	6180	15700	4650	1660	829	574
16	608	817	833	e860	1240	5350	5950	14600	4690	1630	1110	586
17	603	798	843	e800	1150	4910	6010	13700	4560	1600	1330	612
18	590	804	830	e700	1150	7400	6530	13000	4590	1580	1380	611
19	581	812	822	e600	1140	10800	6330	12900	4630	1530	1240	603
20	573	800	882	987	1150	11600	6010	13100	4910	1570	1160	617
21	575	807	842	1150	1180	11500	5820	12500	5430	1560	1200	623
22	588	833	853	1220	1120	10300	6050	10900	5760	1550	1170	621
23	604	816	888	1080	1070	11700	6330	9030	4800	1820	1110	613
24	589	774	927	1050	1060	14400	6210	7710	4180	2040	1040	611
25	573	693	899	976	974	13100	6270	7110	3720	1860	968	613
26	573	667	907	933	912	11500	7120	7740	3580	1900	967	614
27	574	669	872	930	889	9940	6940	7400	3920	1800	936	610
28	584	e660	878	934	928	9200	6600	7180	3860	1700	885	605
29	605	e670	891	938	---	8390	6760	6700	3420	1650	890	604
30	664	694	870	919	---	7280	9110	6040	3030	1610	878	596
31	745	---	872	942	---	6650	---	5800	---	1510	850	---
TOTAL	18697	24572	25842	26346	29701	180474	221890	339560	157850	60050	31580	18634
MEAN	603	819	834	850	1061	5822	7396	10950	5262	1937	1019	621
MAX	745	990	1060	1220	1320	14400	12500	16000	8000	2840	1380	811
MIN	562	660	460	500	889	919	5820	5800	3030	1510	759	543
AC-FT	37090	48740	51260	52260	58910	358000	440100	673500	313100	119100	62640	36960

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1945 - 1993, BY WATER YEAR (WY)

MEAN	883	1210	1924	2081	2956	4130	6243	7333	5723	2170	852	773
MAX	2559	3023	6295	6280	7386	11520	10780	13820	11610	4951	1385	1291
(WY)	1960	1974	1978	1974	1982	1972	1956	1948	1974	1975	1984	1984
MIN	528	618	685	702	769	888	2257	2368	1501	520	438	465
(WY)	1988	1988	1945	1979	1977	1977	1968	1977	1992	1977	1992	1988

SUMMARY STATISTICS	FOR 1992 CALENDAR YEAR	FOR 1993 WATER YEAR	WATER YEARS 1945 - 1993
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ANNUAL TOTAL	549430			1135196					
ANNUAL MEAN	1501			3110				3019	
HIGHEST ANNUAL MEAN								4912	1974
LOWEST ANNUAL MEAN								1136	1977
HIGHEST DAILY MEAN	6470	Feb 22		16000	May 14		35700	Dec 23	1964
LOWEST DAILY MEAN	368	Aug 16		460	Dec 6		344	Aug 20	1977
ANNUAL SEVEN-DAY MINIMUM	382	Aug 11		558	Sep 9		361	Aug 18	1977
ANNUAL RUNOFF (AC-FT)	1090000			2252000			2187000		
50 PERCENT EXCEEDS	329			920			7360		
90 PERCENT EXCEEDS	928			1010			1610		
90 PERCENT EXCEEDS	449			604			700		

e Estimated

SNAKE RIVER MAIN STEM

13334300 SNAKE RIVER NEAR ANATONE, WA

LOCATION.--Lat 46°05'50", long 116°58'36", in SE 1/4 SE 1/4 NE 1/4 sec.12, T.7 N., R.46 E., Asotin County, Hydrologic Unit 17060103, on left bank 1.2 mi downstream from Grande 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 sea level.

REMARKS.--No estimated daily discharges. Records good. Station equipment includes satellite telemetry. Diversions upstream from station for irrigation of about 4,090,000 acres, of which about 750,000 acres are irrigated by withdrawals from ground water. Flow regulated by many reservoirs upstream from 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. Diurnal fluctuations caused by Hells Canyon powerplant.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	14900	14000	13600	15100	20000	19900	50800	52200	82700	38200	29000	19700
2	15100	14300	13700	13600	22800	19200	50600	49800	82000	37400	25600	21500
3	14700	14400	13600	15600	19900	19600	54900	51800	79900	35400	24100	20800
4	14200	14200	13700	17800	17800	18500	55100	61500	83700	36100	22600	20700
5	14300	14100	12700	15800	17800	15600	67600	66000	80800	34900	21300	20700
6	14500	14000	11900	14900	16500	15400	74700	67400	81700	39600	22000	18700
7	14600	13900	11800	14800	15600	16500	59500	69000	87500	34100	24800	21600
8	14300	13900	12500	14000	15800	17800	52000	70000	98500	32200	24600	21400
9	14100	14100	12900	13200	18200	17500	51500	67800	90800	31100	27700	22500
10	14000	14100	13500	13100	15900	18300	52400	63100	90000	29500	30200	21000
11	14100	13900	13900	16200	14800	18400	54000	64000	95200	27100	29500	21000
12	14200	13700	14300	16000	17700	20300	50800	71100	101000	27800	23000	18100
13	14200	13600	14400	16000	16000	23300	51000	85200	99000	30100	21900	13400
14	14200	13500	14200	17200	15900	22600	48000	99900	94200	29300	21000	11400
15	14300	13700	13900	14400	16100	21800	44100	109000	89600	28400	18100	11300
16	14500	13800	13700	14500	21300	20900	42300	112000	84100	28600	21400	11300
17	14100	13800	13700	14000	24000	21200	43100	112000	86600	29000	27100	11400
18	14200	13700	13600	18600	22600	25900	43400	110000	85200	29400	28800	13100
19	14200	13800	13300	17300	20700	40500	48000	113000	81600	28700	28100	17100
20	14300	13800	13300	15900	15600	53400	42300	114000	76600	34800	31800	16200
21	14400	13600	13400	19700	20100	60200	46600	118000	69900	32800	26300	19100
22	14400	13600	13400	18900	16900	58000	42800	117000	69000	33000	20300	18300
23	14100	13500	13700	20100	20800	59000	42400	107000	68700	33500	21600	22700
24	13400	13500	13800	17700	21700	67400	44000	97200	67200	33200	22200	20700
25	13200	13400	14000	20600	22100	79700	43700	91100	62000	32200	21600	18500
26	13200	12900	13800	17400	21900	78300	47200	87000	56000	34300	21300	21400
27	13200	12500	13700	19200	21200	75200	46500	95900	53600	37800	18700	22700
28	13200	12200	13400	18200	19200	72900	48800	95900	52400	39100	19700	24200
29	13300	12300	13500	19400	---	64400	47800	94500	44400	35400	17400	26900
30	13300	12900	14900	18400	---	57800	50900	92600	38600	28900	16500	26700
31	13700	---	14900	20900	---	56000	---	84400	---	26900	21400	---
TOTAL	436400	408700	420700	519400	528900	1175500	1496800	2689400	2332500	1008800	729600	574100
MEAN	14080	13620	13570	16750	18890	37920	49890	86750	77750	32540	23540	19140
MAX	15100	14400	14900	20900	24000	79700	74700	118000	101000	39600	31800	26900
MIN	13200	12200	11800	13100	14800	15400	42300	49800	38600	26900	16500	11300
AC-FT	865600	810700	834500	1030000	1049000	2332000	2969000	5334000	4627000	2001000	1447000	1139000

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1958 - 1993, BY WATER YEAR (WY)

	MEAN	21720	23390	25730	29060	32710	38570	47810	65480	71410	30190	17760	19370
MAX	31540	36960	41630	48240	72520	90400	88700	118700	134200	63860	26460	27010	
(WY)	1985	1985	1965	1984	1965	1972	1974	1984	1984	1982	1983	1984	
MIN	13760	13620	13570	16750	17090	18680	18880	20610	16850	12830	9765	10180	
(WY)	1989	1993	1993	1993	1977	1977	1977	1977	1992	1977	1992	1992	

SUMMARY STATISTICS

FOR 1992 CALENDAR YEAR

FOR 1993 WATER YEAR

WATER YEARS 1958 - 1993

ANNUAL TOTAL	6426480	12320800	
ANNUAL MEAN	17560	33760	
HIGHEST ANNUAL MEAN			35230
LOWEST ANNUAL MEAN			58220
HIGHEST DAILY MEAN	47000	May 2	118000
LOWEST DAILY MEAN	9220	Sep 4	11300
ANNUAL SEVEN-DAY MINIMUM	9270	Aug 31	12700
INSTANTANEOUS PEAK FLOW			119000
INSTANTANEOUS PEAK STAGE			17.01
INSTANTANEOUS LOW FLOW			a 11200
ANNUAL RUNOFF (AC-FT)	12750000	24440000	b 6010
10 PERCENT EXCEEDS	26800	81100	25530000
50 PERCENT EXCEEDS	15300	21000	73400
90 PERCENT EXCEEDS	9950	13600	25600
			15700

a Also occurred Sep. 18; gage height, 2.91 ft.

b Gage height, 1.29 ft.

SNAKE RIVER MAIN STEM

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13334300 SNAKE RIVER NEAR ANATONE, WA--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1973 to May 1984, October 1985 to current year.

PERIOD OF DAILY RECORD.--

WATER TEMPERATURE: October 1959 to May 1984, April 1986 to current year.

INSTRUMENTATION.--Temperature recorder since October 1959.

REMARKS.--Daily water temperature data for water year 1985 were missing due to equipment malfunction.

EXTREMES FOR PERIOD OF DAILY RECORD.--

WATER TEMPERATURE: Maximum, 25.5°C Aug. 26, 28, 1991; minimum, 0.0°C several days during winter months.

EXTREMES FOR CURRENT PERIOD.--

WATER TEMPERATURE: Maximum, 22.5°C Aug. 3-8; minimum, 1.0°C Feb. 17, 18.

WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

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

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

ASOTIN CREEK BASIN

13334700 ASOTIN CREEK BELOW KEARNEY GULCH, NEAR ASOTIN, WA

LOCATION.--Lat 46°19'35", long 117°09'06", in SW 1/4 SE 1/4 sec.22, T.10 N., R.45 E., Asotin County, Hydrologic Unit 17060103, on left bank 0.3 mi downstream from Kearny Gulch, 2.5 mi upstream from George Creek, 5.0 mi west of Asotin, and at mile 5.3.

DRAINAGE AREA.--170 mi².

PERIOD OF RECORD.--October 1959 to September 1982, October 1989 to current year.

REVISED RECORDS.--WDR WA-80-2: 1979.

GAGE.--Water-stage recorder. Elevation of gage is 1,090 ft from topographic map.

REMARKS.--Records good except for estimated daily discharges, which are poor. Several diversions for irrigation. Prior to Nov. 20, 1959, at a point 3.3 mi upstream, the city of Clarkston diverted about 30 ft³/s for municipal use and irrigation. Natural low flows nearly equivalent to those of former station 3.3 mi upstream. U.S. Geological Survey satellite telemeter at station.

AVERAGE DISCHARGE.--27 years (water years 1960-82, 1990-93), 73.8 ft³/s, 53,470 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, about 3,700 ft³/s Jan. 15, 1974; maximum gage height, 8.07 ft Jan. 14, 1974; minimum discharge, 13 ft³/s Jan. 11, 1963, result of freezeup.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 322 ft³/s May 14, gage height 2.21 ft; minimum discharge, 15 ft³/s Aug. 13, result of regulation from unknown source.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	28	36	34	e30	31	27	77	164	83	40	31	27
2	28	39	35	e26	30	26	83	171	84	47	31	27
3	29	36	33	e30	30	26	94	187	82	48	30	26
4	31	34	e29	e30	30	27	132	210	80	46	29	26
5	31	34	e25	e28	30	35	125	181	78	42	27	26
6	30	34	e30	e26	30	30	108	179	73	40	26	26
7	30	35	e32	e24	30	34	98	175	70	39	26	26
8	29	39	e33	e22	31	43	92	161	66	38	27	26
9	29	38	34	e20	35	48	98	141	63	37	27	26
10	30	36	34	e19	38	48	96	141	61	36	27	26
11	30	34	34	e18	39	46	90	179	61	35	27	26
12	30	34	33	e20	41	43	83	253	60	35	26	29
13	30	35	32	e20	39	41	77	294	58	35	23	30
14	31	35	33	e26	39	40	75	290	55	41	23	30
15	30	35	34	e24	38	46	71	269	58	40	32	30
16	30	35	33	e22	e27	56	68	241	57	42	39	29
17	30	35	33	e25	e30	56	69	203	53	49	37	29
18	30	35	e30	e26	e33	59	79	189	51	43	34	29
19	30	35	e30	e26	e35	72	78	179	49	39	31	29
20	30	35	33	27	35	79	72	171	48	43	30	29
21	31	35	33	32	33	82	72	158	52	39	30	29
22	32	37	32	31	32	80	82	143	52	39	30	30
23	31	36	33	29	30	95	85	127	48	44	28	29
24	31	34	32	29	30	147	86	115	46	40	28	29
25	31	32	32	43	e26	137	89	108	44	39	29	29
26	31	31	32	34	e25	120	116	107	43	37	28	29
27	31	33	33	32	e26	105	116	102	45	36	28	25
28	31	36	33	31	28	96	109	101	44	34	28	22
29	33	35	34	31	---	90	115	95	43	34	29	26
30	34	34	33	31	---	84	155	87	41	35	28	27
31	35	---	33	31	---	76	---	83	---	32	28	---
TOTAL	947	1052	1004	843	901	1994	2790	5204	1748	1224	897	827
MEAN	30.5	35.1	32.4	27.2	32.2	64.3	93.0	168	58.3	39.5	28.9	27.6
MAX	35	39	35	43	41	147	155	294	84	49	39	30
MIN	28	31	25	18	25	26	68	83	41	32	23	22
AC-FT	1880	2090	1990	1670	1790	3960	5530	10320	3470	2430	1780	1640

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1960 - 1993, BY WATER YEAR (WY)

	37.9	44.4	62.7	84.4	80.6	88.3	113	146	107	49.6	37.3	36.4
MEAN	37.9	44.4	62.7	84.4	80.6	88.3	113	146	107	49.6	37.3	36.4
MAX	46.6	86.5	209	487	202	279	189	229	312	85.3	48.1	43.7
(WY)	1973	1974	1965	1974	1982	1972	1969	1976	1974	1974	1976	1980
MIN	30.5	35.1	31.4	27.2	32.2	40.5	49.1	52.5	31.6	29.9	26.2	27.6
(WY)	1993	1993	1991	1993	1993	1977	1977	1977	1992	1992	1992	1993

SUMMARY STATISTICS

FOR 1992 CALENDAR YEAR

FOR 1993 WATER YEAR

WATER YEARS 1960 - 1993

ANNUAL TOTAL	15277	19431	73.8	1974
ANNUAL MEAN	41.7	53.2	152	1977
HIGHEST ANNUAL MEAN			40.9	1974
LOWEST ANNUAL MEAN			3500	1977
HIGHEST DAILY MEAN	104	Feb 22	294	May 13
LOWEST DAILY MEAN	20	Aug 21	18	Jan 11
ANNUAL SEVEN-DAY MINIMUM	23	Aug 15	20	Jan 7
ANNUAL RUNOFF (AC-FT)	30300	38540	53480	Dec 23 1990
10 PERCENT EXCEEDS	73	107	143	Dec 22 1990
50 PERCENT EXCEEDS	34	34	49	
90 PERCENT EXCEEDS	27	26	33	

e Estimated

ASOTIN CREEK BASIN

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13335050 ASOTIN CREEK AT ASOTIN, WA

LOCATION.--Lat 46°20'27", long 117°03'18", in SW 1/4 SW 1/4 sec.16, T.10 N., R.46 E., Asotin County, Hydrologic Unit 17060103, on right bank near mouth, at upstream side of bridge on State Highway 129, at Asotin, and at mile 0.1.

DRAINAGE AREA.--323 mi².

PERIOD OF RECORD.--March 1991 to current year.

GAGE.--Water-stage recorder. Datum of gage is 742.57 ft above sea level.

REMARKS.--Records fair except for estimated daily discharges, which are poor. Several diversions for irrigation. Miscellaneous data from January through September 1989 are available in the Spokane Field Office.

AVERAGE DISCHARGE.--2 years, 62.0 ft³/s, 44,920 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 786 ft³/s May 19, 1991, gage height, 4.99 ft; minimum daily discharge, 19 ft³/s Jan. 11, 12, 1993.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 523 ft³/s May 4, gage height, 4.20 ft; maximum gage height, 4.91 ft Jan. 15, backwater from ice; minimum daily discharge, 19 ft³/s Jan. 11, 12.

REVISIONS:--Revised figures of discharge for the water year 1992 superseding those published in the report for 1992 are given below.

EXTREMES FOR 1992 WATER YEAR.--Maximum discharge, 204 ft³/s Feb. 20, gage height, 3.16 ft, but may have been higher during period of missing record Feb. 21; minimum discharge, 21 ft³/s Aug. 20, 21.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1991 TO SEPTEMBER 1992
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	e31	43	48	48	70	e110	63	e93	e37	38	27	28
2	e31	43	48	48	68	e110	66	e87	e36	40	27	28
3	e32	47	47	48	66	e110	76	e79	e35	43	26	28
4	e33	51	47	48	65	e100	82	e77	e35	38	27	28
5	e33	59	48	49	64	e100	78	e76	34	39	26	28
6	e33	56	52	49	62	e95	71	e76	34	37	25	28
7	e33	43	68	49	61	e90	66	e74	33	37	26	28
8	e33	41	69	49	60	e90	64	e72	33	36	29	29
9	e33	43	64	49	60	e90	68	e70	32	35	27	29
10	e33	43	63	51	59	e85	83	e68	31	35	26	28
11	e32	43	58	49	58	e80	84	e64	33	36	25	28
12	e32	42	57	50	58	e80	81	e62	37	37	25	28
13	e32	45	58	50	60	e85	87	e58	44	34	24	28
14	e33	43	56	50	61	e88	89	e54	44	33	24	29
15	e33	42	53	50	64	e90	86	e52	43	32	24	30
16	e33	41	e52	51	68	e95	89	e50	42	32	23	32
17	e32	43	e56	51	64	94	108	e50	40	31	24	30
18	e32	43	e58	50	63	87	109	e49	38	30	24	29
19	e32	41	e60	50	73	80	98	e50	36	30	24	29
20	e32	e44	55	49	140	81	91	e52	35	31	23	29
21	e32	e47	48	51	e150	79	e94	e50	34	29	23	28
22	e34	e50	48	51	e140	75	e90	e48	33	33	38	28
23	34	e47	48	52	e140	72	e88	e47	32	42	38	28
24	35	e51	48	53	e130	69	e80	e45	32	41	32	30
25	36	e56	48	52	e120	67	e74	e43	32	38	31	32
26	37	e61	48	51	e120	66	e76	e45	32	34	31	31
27	37	e55	48	52	e110	68	e81	e44	32	31	29	30
28	36	48	48	56	e110	67	e82	e44	31	30	28	30
29	35	49	48	61	e110	65	e86	e43	36	29	28	29
30	35	47	48	65	---	63	e94	e41	38	29	28	29
31	39	---	47	68	---	63	---	e39	---	28	28	---
TOTAL	1038	1407	1644	1600	2474	2594	2484	1802	1064	1068	840	869
MEAN	33.5	46.9	53.0	51.6	85.3	83.7	82.8	58.1	35.5	34.5	27.1	29.0
MAX	39	61	69	68	150	110	109	93	44	43	38	32
MIN	31	41	47	48	58	63	63	39	31	28	23	28
AC-FT	2060	2790	3260	3170	4910	5150	4930	3570	2110	2120	1670	1720

WTR YR 1992 TOTAL 18884 MEAN 51.6 MAX 150 MIN 23 AC-FT 37460

e Estimated

ASOTIN CREEK BASIN

13335050 ASOTIN CREEK AT ASOTIN, WA--Continued

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	28	34	34	35	e31	e34	156	324	85	e44	38	31
2	28	35	34	e30	e30	e35	181	322	87	e46	36	30
3	29	38	35	e31	e30	36	213	348	84	e50	36	29
4	30	35	34	e31	e30	37	328	444	83	e50	35	29
5	30	34	e28	e30	e30	45	319	316	83	e45	33	29
6	30	34	e30	e28	e31	43	260	292	77	e42	33	29
7	30	34	e32	e24	e31	49	211	276	74	e40	33	29
8	30	34	e33	e22	e32	59	188	244	70	e39	32	29
9	30	37	e34	e21	37	63	207	202	67	e38	33	29
10	29	36	34	e21	40	65	200	186	65	e37	33	29
11	29	35	34	e19	41	63	180	223	65	e36	33	29
12	29	34	34	e19	43	60	173	281	64	e36	32	30
13	29	34	33	e23	42	56	158	311	60	e37	30	31
14	30	34	33	e26	42	55	154	313	56	e42	26	30
15	30	35	33	e24	41	71	146	297	60	e42	34	30
16	30	35	34	e23	e30	106	142	265	66	e45	39	30
17	30	35	33	e24	e32	89	145	231	59	e50	39	29
18	30	34	33	e26	e34	106	168	208	55	e46	36	29
19	30	34	33	e26	e37	134	169	192	52	e42	34	29
20	30	34	e34	e28	41	146	156	178	51	e45	33	30
21	30	34	33	e31	39	155	149	168	e54	e42	33	30
22	e31	34	33	e31	38	147	162	144	e54	e46	33	30
23	e31	36	34	e30	38	185	172	127	e50	53	32	30
24	e31	35	34	e32	38	398	171	116	e48	49	32	29
25	31	34	34	e42	e36	331	179	108	e46	47	32	29
26	30	33	34	e37	e35	272	263	106	e45	46	32	29
27	31	32	34	e32	e34	229	255	100	e46	44	32	27
28	31	33	34	e32	e34	207	220	98	e45	42	32	25
29	32	35	34	e31	---	188	229	96	e45	41	33	27
30	33	34	35	e31	---	167	346	89	e44	43	32	28
31	33	---	34	e31	---	150	---	85	---	40	31	---
TOTAL	935	1035	1035	871	997	3781	6000	6690	1840	1345	1032	874
MEAN	30.2	34.5	33.4	28.1	35.6	122	200	216	61.3	43.4	33.3	29.1
MAX	33	38	35	42	43	398	346	444	87	53	39	31
MIN	28	32	28	19	30	34	142	85	44	36	26	25
AC-FT	1850	2050	2050	1730	1980	7500	11900	13270	3650	2670	2050	1730

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1991 - 1993, BY WATER YEAR (WY)

	1991	1992	1993	1991	1992	1993	1991	1992	1993	1991	1992	1993
MEAN	31.8	40.7	43.2	39.9	60.9	103	133	167	74.7	54.1	32.5	30.8
MAX	33.5	46.9	53.0	51.6	85.3	122	200	228	127	84.5	37.0	34.4
(WY)	1992	1992	1992	1992	1992	1993	1993	1991	1991	1991	1991	1991
MIN	30.2	34.5	33.4	28.1	35.6	83.7	82.8	58.1	35.5	34.5	27.1	29.0
(WY)	1993	1993	1993	1993	1993	1992	1992	1992	1992	1992	1992	1992

SUMMARY STATISTICS

FOR 1992 CALENDAR YEAR

FOR 1993 WATER YEAR

WATER YEARS 1991 - 1993

ANNUAL TOTAL	17800	26435	62.0
ANNUAL MEAN	48.6	72.4	1993
HIGHEST ANNUAL MEAN			1992
LOWEST ANNUAL MEAN			51.6
HIGHEST DAILY MEAN	150	444	539
LOWEST DAILY MEAN	23	19	19
ANNUAL SEVEN-DAY MINIMUM	24	21	21
ANNUAL RUNOFF (AC-FT)	35310	52430	44910
10 PERCENT EXCEEDS	87	188	154
50 PERCENT EXCEEDS	35	35	43
90 PERCENT EXCEEDS	28	29	29

e Estimated

PALOUSE RIVER BASIN

335

13349200 SOUTH FORK PALOUSE RIVER AT COLFAX, WA

LOCATION.--Lat 46°52'36", long 117°21'45", in SE 1/4 SW 1/4 sec.14, T.16 N., R.43 E., Whitman County, Hydrologic Unit 17060108, on left bank, 400 ft east of U.S. Highway 195 bridge crossing, in Colfax, and at mile 1.33.

DRAINAGE AREA.--277 mi².

PERIOD OF RECORD.--April to September 1993.

GAGE.--Water-stage recorder. Elevation of gage is 1,970 ft, from topographic map.

REMARKS.--Records good except for estimated daily discharges, which are fair. No regulation. Several diversions for irrigation upstream.

EXTREMES FOR PERIOD APRIL TO SEPTEMBER 1993.--Maximum discharge, 1,300 ft³/s May 4, gage height, 8.72 ft; minimum discharge, 3.9 ft³/s Sept. 6-8, 17.

DISCHARGE, CUBIC FEET PER SECOND, APRIL TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	APR	MAY	JUN	JUL	AUG	SEP
1	---	251	32	13	e14	11
2	---	200	33	e13	e13	9.2
3	---	176	45	e14	e12	8.5
4	---	814	37	e15	e11	7.5
5	---	484	32	e16	e10	6.8
6	---	325	27	e14	e10	6.2
7	---	318	24	e15	e9.5	5.9
8	---	224	23	e13	e9.0	7.8
9	---	181	22	e12	e8.0	9.0
10	---	152	21	e11	e7.5	9.0
11	---	128	19	e10	e7.5	8.6
12	---	110	21	e10	e7.0	7.4
13	---	97	20	e15	e8.0	9.1
14	---	88	18	e20	7.6	9.6
15	e110	81	17	e25	7.9	9.2
16	96	75	17	e35	11	8.8
17	89	69	17	e45	11	8.9
18	139	65	16	e38	e13	9.2
19	113	60	16	e29	e13	9.6
20	91	57	14	e30	14	10
21	84	60	15	e32	13	9.9
22	84	55	27	e36	13	11
23	109	48	22	e29	12	11
24	98	45	19	e27	12	11
25	102	42	17	e24	14	11
26	257	54	16	e22	13	11
27	164	50	14	e20	11	12
28	129	39	16	e19	11	13
29	175	43	15	e17	18	11
30	607	33	14	e16	14	11
31	---	29	---	e15	10	---
TOTAL	---	4453	646	650	345.0	283.2
MEAN	---	144	21.5	21.0	11.1	9.44
MAX	---	814	45	45	18	13
MIN	---	29	14	10	7.0	5.9
AC-FT	---	8830	1280	1290	684	562

e Estimated

PALOUSE RIVER BASIN

13349210 PALOUSE RIVER BELOW SOUTH FORK, AT COLFAX, WA

LOCATION.--Lat 46°53'23", long 117°22'09", in NW 1/4 SW 1/4 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 sea level (levels by Corps of Engineers).

REMARKS.--Records good except for estimated daily discharges, which are fair. Small diversions for irrigation upstream from station. Slight regulation by millpond and city of Moscow, Idaho, sewage disposal plant. U.S. Geological Survey satellite telemeter at station.

AVERAGE DISCHARGE.--27 years (water years 1964-72, 1976-93), 356 ft³/s, 257,900 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 16,800 ft³/s Jan. 16, 1974, gage height, 18.73 ft; minimum discharge, 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)
Mar. 16	0100	3,310	9.60	Mar. 24	1900	*3,860	*10.30
Mar. 21	0645	3,450	9.77	May 4	1845	3,700	10.06

Minimum discharge, 13 ft³/s Sept. 18, 30.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	24	43	e64	e80	322	e200	897	1460	129	52	41	34
2	22	48	e60	e64	264	e200	964	1170	127	53	36	32
3	21	84	e62	e65	217	e210	1110	1080	137	61	32	29
4	21	79	e50	e67	224	218	1710	2750	137	68	30	25
5	23	63	e54	e70	232	1120	1830	3050	140	76	28	23
6	21	52	e60	e65	259	1430	1330	2090	119	65	26	21
7	20	61	e66	e70	268	1960	1080	1890	110	67	25	22
8	22	78	e74	e70	343	1960	1020	1440	106	49	25	21
9	23	120	e84	e70	441	1460	1100	1200	109	46	23	23
10	22	154	e82	e70	577	1370	1100	972	98	41	21	23
11	20	118	e86	e70	618	1150	1140	808	89	37	20	21
12	19	92	e66	e65	681	908	956	693	90	34	19	19
13	21	82	e60	e65	658	768	828	603	86	33	20	19
14	21	76	e56	e70	616	954	801	527	95	53	18	20
15	20	79	e66	e80	476	2300	770	460	88	53	19	19
16	20	82	e80	e90	295	2690	693	403	83	116	24	18
17	22	74	e60	e95	e270	1830	629	356	81	146	24	17
18	22	71	e50	e100	e250	2140	836	309	88	124	23	16
19	22	82	e54	e115	e240	2470	982	271	81	94	26	17
20	22	180	e59	e150	e230	2540	809	246	66	96	28	19
21	22	144	e64	e250	e220	3140	688	240	66	99	26	19
22	23	158	97	e200	e210	2110	631	229	81	115	25	19
23	23	179	245	e250	e200	2330	676	203	77	95	21	19
24	22	183	185	e340	e200	3550	623	188	81	92	21	19
25	21	111	169	e500	e200	3030	610	178	73	83	31	18
26	20	87	138	1320	e200	2050	1290	188	63	71	28	18
27	23	91	133	1050	e200	1650	1470	184	56	63	25	17
28	21	82	124	797	e200	1440	1010	170	57	59	26	17
29	24	80	119	597	---	1260	917	159	56	54	30	17
30	29	70	108	490	---	1110	1820	145	52	49	30	16
31	36	---	100	412	---	966	---	134	---	44	29	---
TOTAL	692	2903	2775	7797	9111	50514	30320	23796	2721	2188	800	617
MEAN	22.3	96.8	89.5	252	325	1629	1011	768	90.7	70.6	25.8	20.6
MAX	36	183	245	1320	681	3550	1830	3050	140	146	41	34
MIN	19	43	50	64	200	200	610	134	52	33	18	16
AC-FT	1370	5760	5500	15470	18070	100200	60140	47200	5400	4340	1590	1220

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1964 - 1993, BY WATER YEAR (WY)

	33.2	82.7	241	567	890	1033	766	380	160	40.2	20.1	23.2
MEAN	33.2	82.7	241	567	890	1033	766	380	160	40.2	20.1	23.2
MAX	51.2	211	1377	1636	2925	2959	1877	837	796	77.2	36.5	40.2
(WY)	1983	1984	1965	1965	1982	1972	1969	1967	1990	1981	1976	1984
MIN	12.2	31.4	39.4	28.1	108	134	140	65.9	28.1	8.72	3.50	4.71
(WY)	1967	1970	1966	1979	1977	1977	1992	1992	1992	1977	1966	1967

SUMMARY STATISTICS

FOR 1992 CALENDAR YEAR

FOR 1993 WATER YEAR

WATER YEARS 1964 - 1993

ANNUAL TOTAL	47905.7	134234	
ANNUAL MEAN	131	368	
HIGHEST ANNUAL MEAN			356
LOWEST ANNUAL MEAN			726
HIGHEST DAILY MEAN	2910	3550	12800
LOWEST DAILY MEAN	7.3	16	2.0
ANNUAL SEVEN-DAY MINIMUM	9.3	17	2.6
ANNUAL RUNOFF (AC-FT)	95020	266300	258200
10 PERCENT EXCEEDS	251	1140	939
50 PERCENT EXCEEDS	60	86	90
90 PERCENT EXCEEDS	16	21	17

e Estimated

PALOUSE RIVER BASIN

337

13349320 REBEL FLAT CREEK AT WINONA, WA

LOCATION.--Lat 46°56'37", long 117°47'49", in NW 1/4 NE 1/4 sec.29, T.17 N., R.40 E., Whitman County, Hydrologic Unit 17060108, on right bank, at Winona south road bridge crossing, 0.3 mi southeast of Winona, and at mile 0.4.

DRAINAGE AREA.--73.2 mi².

PERIOD OF RECORD.--October 1992 to September 1993.

GAGE.--Water-stage recorder. Elevation of gage is 1,480 ft above sea level, from topographic map.

REMARKS.--Records fair except for estimated daily discharges, which are poor. Small diversions for irrigation upstream from station. Town of Endicott sewage treatment plant discharges approximately 50,000 gallons of effluent into the creek, 6 mi upstream from gage. Miscellaneous discharge and sediment measurements are available for 1964-65 in U.S. Geological Survey Water Supply Paper 1899-C.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 471 ft³/s Jan. 25, gage height, 7.88 ft; minimum daily discharge, 1.8 ft³/s for many days in August and September.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	e1.9	e3.5	e4.0	e6.0	17	e6.4	12	16	5.4	3.7	2.1	1.9
2	e1.9	e4.5	e3.5	e6.0	e16	e6.8	12	15	5.5	3.8	2.1	1.9
3	e2.0	e6.4	e3.7	e5.5	e15	e7.2	12	17	5.7	3.7	2.1	1.9
4	e2.0	e5.6	e3.0	e5.0	e16	e7.8	13	41	5.7	3.7	2.1	1.9
5	e2.0	e5.0	e3.5	e4.5	e17	85	13	24	6.0	3.6	2.1	1.9
6	e2.0	e4.5	e4.0	e4.0	e18	39	12	19	5.9	3.6	2.1	1.9
7	e2.0	e5.2	e4.5	e3.5	e19	18	12	19	5.7	3.6	2.0	1.9
8	e2.0	e7.8	e5.0	e3.0	e21	16	11	17	5.4	3.6	2.0	1.8
9	e2.1	e10	e4.5	e3.0	e38	15	11	16	5.1	3.4	2.0	1.8
10	e2.0	e12	e5.0	e3.0	e41	14	11	14	5.5	3.2	1.9	1.8
11	e1.9	e10	e4.5	e3.0	e45	13	11	13	5.5	3.2	1.8	1.8
12	e1.9	e8.0	e3.5	e3.5	e48	12	10	12	5.8	3.4	1.8	1.8
13	e2.0	e7.4	e3.0	e3.5	e45	e11	9.7	12	5.7	3.4	1.8	1.8
14	e2.0	e7.0	e2.5	e4.0	e43	e10	9.6	e11	5.5	3.5	1.8	1.8
15	e2.0	e6.6	e2.6	e4.5	e40	e9.0	9.8	e10	5.1	13	2.0	1.8
16	e2.0	e6.4	e2.8	e4.5	e30	e9.5	9.6	e10	4.6	8.2	2.1	1.8
17	e2.0	e6.4	e2.6	e4.5	e20	e10	9.3	e9.0	4.2	4.6	2.1	1.8
18	e2.1	e6.2	e2.5	e4.5	e15	e11	9.9	e9.0	4.3	3.3	1.9	1.8
19	e2.1	e9.0	e3.0	e25	e12	12	11	e8.0	4.4	2.5	1.8	1.8
20	e2.1	e14	e4.0	e150	e10	13	9.8	e8.0	4.2	2.5	1.8	1.8
21	e2.1	e12	e5.6	54	e9.0	15	9.3	7.6	4.3	2.4	1.8	1.8
22	e2.2	e14	e15	18	e7.8	14	9.2	7.2	4.4	2.4	1.9	1.9
23	e2.2	e15	e27	12	e7.0	14	9.2	7.0	4.3	2.4	1.8	1.9
24	e2.2	e16	e33	12	e6.6	15	9.2	6.7	4.0	2.3	1.8	1.9
25	e2.0	e11	16	256	e6.2	15	24	6.4	3.8	2.3	1.9	1.9
26	e2.0	e6.0	12	238	e6.0	14	43	6.4	3.7	2.3	1.9	1.9
27	e2.0	e6.4	e11	62	e6.0	13	19	6.1	3.6	2.3	2.0	1.9
28	e2.0	e5.8	e10	35	e6.2	13	11	6.0	3.6	2.2	2.0	1.8
29	e2.1	e5.2	e9.0	23	---	12	12	5.9	3.7	2.2	2.0	1.8
30	e2.3	e4.5	e8.0	21	---	12	19	5.6	3.8	2.2	2.0	1.8
31	e2.5	---	e7.0	18	---	11	---	5.6	---	2.2	2.0	---
TOTAL	63.6	241.4	225.3	999.5	580.8	473.7	383.6	370.5	144.4	108.7	60.5	55.3
MEAN	2.05	8.05	7.27	32.2	20.7	15.3	12.8	12.0	4.81	3.51	1.95	1.84
MAX	2.5	16	33	256	48	85	43	41	6.0	13	2.1	1.9
MIN	1.9	3.5	2.5	3.0	6.0	6.4	9.2	5.6	3.6	2.2	1.8	1.8
AC-FT	126	479	447	1980	1150	940	761	735	286	216	120	110
CFSM	.03	.11	.10	.44	.28	.21	.17	.16	.07	.05	.03	.03
IN.	.03	.12	.11	.51	.30	.24	.19	.19	.07	.06	.03	.03

WTR YR 1993 TOTAL 3707.3 MEAN 10.2 MAX 256 MIN 1.8 AC-FT 7350 CFSM .14 IN. 1.88

e Estimated

STUBBLEFIELD LAKE BASIN (CLOSED)

13349325 PHILLEO DITCH NEAR CHENEY, WA

LOCATION.--Lat 47°24'07", long 117°29'48", in SE 1/4 NE 1/4 sec.16, T.22 N., R.42 E., Spokane County, Hydrologic Unit 17060109, Turnbull National Wildlife Refuge, on right bank, 0.1 mi northeast of Stubblefield Lake, 8.4 mi south of Cheney, and at mile 0.1.

DRAINAGE AREA.--14.7 mi².

PERIOD OF RECORD.--March to June 1993 (seasonal record).

GAGE.--Water-stage recorder. Elevation of gage is 2,335 ft, from topographic map.

REMARKS.--Records good except for estimated daily discharges, which are fair. No known regulation. Gage is operated during periods when flow is expected. Flow is generally the result of snowmelt.

EXTREMES FOR PERIOD MARCH TO JUNE 1993.--Maximum daily discharge, 50 ft³/s Mar. 15; no flow for many days.

DISCHARGE, CUBIC FEET PER SECOND, MARCH TO JUNE 1993
DAILY MEAN VALUES

DAY	MAR	APR	MAY	JUN
1	e.00	2.2	2.8	.00
2	e.00	2.1	2.9	.00
3	e.00	5.8	3.8	.00
4	e.00	5.9	12.	.00
5	e.00	4.2	6.8	.00
6	e.00	2.8	6.0	.00
7	e.00	2.6	4.9	.00
8	e.00	3.0	4.3	.00
9	e.00	3.4	4.0	.00
10	e.00	4.3	3.6	.00
11	e.00	4.1	2.9	.00
12	e.00	2.9	2.1	.00
13	e10	2.6	1.4	.00
14	e30	6.1	.94	.00
15	e50	4.4	.58	.00
16	e40	3.3	.35	---
17	e30	2.9	.22	---
18	16	5.3	.04	---
19	12	2.8	.00	---
20	20	2.3	.00	---
21	13	1.9	.00	---
22	11	2.2	.00	---
23	27	2.1	.00	---
24	15	3.0	.00	---
25	9.0	2.6	.00	---
26	6.6	5.9	.00	---
27	4.9	3.7	.00	---
28	3.8	2.7	.00	---
29	3.1	3.0	.00	---
30	2.5	3.5	.00	---
31	2.1	---	.00	---
TOTAL	306.00	103.6	59.63	---
MEAN	9.87	3.45	1.92	---
MAX	50	6.1	12	---
MIN	.00	1.9	.00	---
AC-FT	607	205	118	---

e Estimated

13351000 PALOUSE RIVER AT HOOPER, WA

LOCATION.--Lat 46°45'31", long 118°08'52", in NE 1/4 SE 1/4 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 above sea level. 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 except for estimated daily discharges, which are fair. Diversions upstream from station for irrigation and municipal use. U.S. Geological Survey satellite telemeter at station.

AVERAGE DISCHARGE.--55 years (water years 1898-99, 1901-06, 1909-11, 1914-15, 1952-93), 590 ft³/s, 427,500 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. 27	0145	4,220	10.10	Mar. 21	1800	4,130	10.05
Mar. 6	0730	4,100	10.03	Mar. 25	0800	*4,790	*10.44
Mar. 16	1500	4,000	9.97	May 5	0530	4,350	10.18

Minimum discharge, 15 ft³/s Dec. 4, the result of freezeup.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	46	51	106	e120	690	e280	1360	2260	288	116	101	47
2	42	56	97	e100	579	e290	1310	1680	276	111	94	47
3	39	62	96	e88	506	e300	1370	1520	273	118	85	43
4	38	65	72	e96	452	324	1720	2140	277	134	74	46
5	38	82	74	e96	475	837	2290	4160	279	117	72	44
6	37	97	58	e82	498	3070	2020	3020	284	114	69	45
7	36	91	65	e90	531	2960	1620	2570	256	124	64	42
8	36	87	73	e95	588	3200	1440	2210	242	115	61	40
9	36	90	92	e95	746	2570	1400	1840	228	116	57	38
10	36	104	103	e95	884	2300	1480	1580	226	107	53	35
11	35	137	99	e95	997	2050	1490	1350	221	106	52	35
12	37	161	111	e90	1010	1720	1440	1160	214	96	51	38
13	38	137	111	e88	1080	1430	1270	1010	207	92	47	39
14	37	116	110	e90	1010	1300	1160	898	201	94	44	38
15	36	107	97	e95	934	1840	1160	805	193	103	47	38
16	37	101	86	e100	588	3490	1080	722	200	235	56	39
17	39	102	96	e105	535	2800	1000	650	188	208	56	41
18	40	106	88	e110	496	2540	980	587	176	261	56	44
19	39	101	73	e120	e450	3030	1270	537	168	235	53	43
20	41	99	84	e140	e400	2780	1260	487	168	204	47	43
21	45	124	105	e160	e350	3900	1090	455	159	178	46	42
22	44	194	186	e300	e300	3210	971	435	148	178	52	43
23	44	178	314	e200	e280	2560	920	417	145	181	55	44
24	43	190	524	e180	e270	3660	965	389	149	200	50	44
25	43	201	346	e400	e260	4430	943	363	148	178	46	44
26	43	174	243	2640	e260	3130	1060	346	151	167	46	43
27	43	125	243	2490	e260	2480	1980	334	138	156	46	43
28	42	102	232	1450	e270	2140	1560	335	127	141	48	43
29	41	114	261	1090	---	1910	1280	327	122	128	50	40
30	44	109	198	928	---	1700	1740	310	120	118	47	40
31	46	---	e140	817	---	1510	---	295	---	109	46	---
TOTAL	1241	3463	4583	12645	15699	69741	40629	35192	5972	4540	1771	1251
MEAN	40.0	115	148	408	561	2250	1354	1135	199	146	57.1	41.7
MAX	46	201	524	2640	1080	4430	2290	4160	288	261	101	47
MIN	35	51	58	82	260	280	920	295	120	92	44	35
AC-FT	2460	6870	9090	25080	31140	138300	80590	69800	11850	9010	3510	2480

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1898 - 1993, BY WATER YEAR (WY)

	1898	1905	1915	1915	1977	1977	1977	1992	1992	1968	1968	1967
MEAN	65.2	141	426	998	1644	1827	1276	613	251	81.2	32.6	37.0
MAX	151	349	2198	4602	4822	6660	4127	1560	982	291	92.5	90.5
(WY)	1960	1956	1974	1974	1907	1910	1913	1975	1990	1902	1975	1975
MIN	17.7	39.6	36.9	46.6	169	216	203	102	41.6	3.72	.058	3.90
(WY)	1916	1905	1915	1915	1977	1977	1977	1992	1992	1968	1968	1967

SUMMARY STATISTICS

FOR 1992 CALENDAR YEAR

FOR 1993 WATER YEAR

WATER YEARS 1898 - 1993

ANNUAL TOTAL	64021.5	196727	590
ANNUAL MEAN	175	539	1410
HIGHEST ANNUAL MEAN			106
LOWEST ANNUAL MEAN			106
HIGHEST DAILY MEAN	2980	Feb 22	4430
LOWEST DAILY MEAN	5.8	Aug 12	35
ANNUAL SEVEN-DAY MINIMUM	7.4	Aug 12	36
ANNUAL RUNOFF (AC-FT)	127000	390200	427100
10 PERCENT EXCEEDS	365	1710	1620
50 PERCENT EXCEEDS	89	148	173
90 PERCENT EXCEEDS	19	43	29

e Estimated

PALOUSE RIVER BASIN

13351000 PALOUSE RIVER AT HOOPER, WA--Continued

WATER-QUALITY RECORDS

PERIOD OF DAILY RECORD.--

SUSPENDED SEDIMENT DISCHARGE: October 1992 to September 1993.

EXTREMES FOR CURRENT YEAR.--

SEDIMENT CONCENTRATION: Maximum daily mean, 9,100 mg/L Mar. 6; minimum daily mean, 5 mg/L Dec. 5.

SEDIMENT DISCHARGE: Maximum daily, 82,900 tons Mar. 6; minimum daily, 1.0 tons on many days.

SEDIMENT DISCHARGE, SUSPENDED (TONS/DAY), WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DAY	MEAN DISCHARGE (CFS)	MEAN CONCEN- TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN- TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN- TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)
OCTOBER			NOVEMBER			DECEMBER			
1	46	---	1.0	51	---	1.0	106	---	3.0
2	42	---	1.0	56	---	1.0	97	---	3.0
3	39	---	1.0	62	---	1.0	96	---	3.0
4	38	---	1.0	65	---	1.0	72	---	1.0
5	38	---	1.0	82	---	2.0	74	---	1.0
6	37	---	1.0	97	---	3.0	58	---	1.0
7	36	---	1.0	91	---	2.0	65	9	1.6
8	36	---	1.0	87	---	2.0	73	---	1.5
9	36	---	1.0	90	---	2.0	92	---	2.0
10	36	---	1.0	104	---	3.0	103	---	3.0
11	35	---	1.0	137	---	6.0	99	---	3.0
12	37	---	1.0	161	---	9.0	111	---	4.0
13	38	---	1.0	137	---	6.0	111	---	3.0
14	37	---	1.0	116	---	4.0	110	7	2.1
15	36	---	1.0	107	---	4.0	97	---	3.0
16	37	---	1.0	101	---	3.0	86	---	2.0
17	39	---	1.0	102	---	3.0	96	---	3.0
18	40	---	1.0	106	---	3.0	88	---	2.0
19	39	---	1.0	101	---	3.0	73	14	2.8
20	41	---	1.0	99	12	3.2	84	---	2.0
21	45	---	1.0	124	---	5.0	105	12	2.4
22	44	---	1.0	194	---	13	186	---	12
23	44	---	1.0	178	---	11	314	---	38
24	43	---	1.0	190	---	12	524	---	120
25	43	---	1.0	201	---	14	346	---	47
26	43	---	1.0	174	---	10	243	---	21
27	43	---	1.0	125	---	5.0	243	---	21
28	42	---	1.0	102	---	3.0	232	---	20
29	41	---	1.0	114	---	4.0	261	---	26
30	44	---	1.0	109	---	4.0	198	---	14
31	46	---	1.0	---	---	---	e140	---	6.0
TOTAL	1241	---	31.0	3463	---	143.2	4583	---	374.4

DAY	MEAN DISCHARGE (CFS)	MEAN CONCEN- TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN- TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN- TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)
JANUARY			FEBRUARY			MARCH			
1	e120	---	5.0	690	174	327	e280	---	25
2	e100	---	3.0	579	---	180	e290	---	25
3	e88	---	2.0	506	---	130	e300	25	20
4	e96	---	3.0	452	---	99	324	24	21
5	e96	---	3.0	475	---	150	837	---	12000
6	e82	---	2.0	498	---	200	3070	9100	82900
7	e90	---	2.0	531	---	260	2960	4420	35700
8	e95	---	3.0	588	235	376	3200	3280	28300
9	e95	---	3.0	746	300	608	2570	1260	8880
10	e95	---	3.0	884	---	820	2300	657	4080
11	e95	---	3.0	997	---	1200	2050	477	2640
12	e90	---	2.0	1010	---	1200	1720	369	1720
13	e88	---	2.0	1080	---	1200	1430	---	920
14	e90	---	2.0	1010	---	1100	1300	192	678
15	e95	---	3.0	934	---	840	1840	594	3430
16	e100	---	3.0	588	---	300	3490	2560	24800
17	e105	---	3.0	535	---	240	2800	1330	10600
18	e110	---	4.0	496	---	200	2540	580	4010
19	e120	---	5.0	e450	---	150	3030	799	6570
20	e140	---	6.0	e400	---	120	2780	586	4440
21	e160	---	9.0	e350	---	80	3900	---	12000
22	e300	---	35	e300	---	55	3210	709	6380
23	e200	---	14	e280	---	45	2560	313	2170
24	e180	---	13	e270	---	38	3660	822	8430
25	e400	2680	2890	e260	---	37	4430	1120	13600
26	2640	4800	34300	e260	45	32	3130	406	3520
27	2490	3300	25700	e260	---	35	2480	---	1700
28	1450	---	4400	e270	---	30	2140	---	1200
29	1090	543	1640	---	---	---	1910	---	790
30	928	---	700	---	---	---	1700	---	510
31	817	---	520	---	---	---	1510	85	347
TOTAL	12645	---	70283.0	15699	---	10052	69741	---	282406

e Estimated

PALOUSE RIVER BASIN

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13351000 PALOUSE RIVER AT HOOPER, WA--Continued

SEDIMENT DISCHARGE, SUSPENDED (TONS/DAY), WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DAY	MEAN DISCHARGE (CFS)	MEAN CONCEN- TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN- TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN- TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)
APRIL			MAY			JUNE			
1	1360	88	324	2260	---	6200	288	---	9.0
2	1310	---	320	1680	---	1800	276	---	9.0
3	1370	---	360	1520	240	987	273	14	10
4	1720	171	820	2140	---	7400	277	---	10
5	2290	290	1800	4160	2130	24100	279	---	11
6	2020	185	1020	3020	---	12000	284	---	13
7	1620	---	570	2570	---	10000	256	---	15
8	1440	109	426	2210	---	7500	242	---	17
9	1400	---	370	1840	---	5100	228	---	18
10	1480	89	356	1580	---	3500	226	---	20
11	1490	---	380	1350	---	2300	221	---	22
12	1440	90	353	1160	---	1500	214	---	24
13	1270	---	270	1010	---	1100	207	---	26
14	1160	---	210	898	---	710	201	---	29
15	1160	---	190	805	---	430	193	---	31
16	1080	---	140	722	---	240	200	61	33
17	1000	---	150	650	66	117	188	---	29
18	980	---	260	587	---	110	176	---	25
19	1270	---	390	537	---	100	168	---	23
20	1260	86	295	487	---	90	168	---	23
21	1090	---	200	455	---	80	159	---	20
22	971	---	140	435	---	70	148	---	17
23	920	---	130	417	---	60	145	---	16
24	965	---	130	389	---	50	149	---	17
25	943	---	290	363	---	40	148	---	17
26	1060	2040	5910	346	---	30	151	---	18
27	1980	1840	10200	334	---	20	138	---	15
28	1560	---	6100	335	---	20	127	30	10
29	1280	---	3400	327	---	15	122	---	10
30	1740	---	5700	310	---	10	120	---	10
31	---	---	---	295	11	8.8	---	---	---
TOTAL	40629	---	41204	35192	---	85687.8	5972	---	547.0
DAY	MEAN DISCHARGE (CFS)	MEAN CONCEN- TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN- TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN- TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)
JULY			AUGUST			SEPTEMBER			
1	116	---	10	101	---	23	47	---	6.0
2	111	---	9.0	94	85	22	47	---	6.0
3	118	---	10	85	---	19	43	---	6.0
4	134	---	14	74	---	16	46	---	6.0
5	117	---	10	72	---	16	44	---	5.0
6	114	---	10	69	---	15	45	---	5.0
7	124	---	12	64	---	13	42	---	5.0
8	115	---	10	61	---	13	40	48	5.2
9	116	---	10	57	---	11	38	---	5.0
10	107	---	8.0	53	---	10	35	---	5.0
11	106	---	8.0	52	---	10	35	---	5.0
12	96	26	6.7	51	---	9.5	38	---	5.0
13	92	---	6.0	47	---	8.5	39	---	5.0
14	94	---	6.0	44	---	8.0	38	---	5.0
15	103	---	8.0	47	---	8.5	38	---	5.0
16	235	---	47	56	---	9.5	39	---	5.0
17	208	---	40	56	---	9.5	41	---	5.0
18	261	---	50	56	---	9.0	44	---	5.0
19	235	---	48	53	---	8.5	43	---	5.0
20	204	---	40	47	---	7.5	43	---	4.0
21	178	---	36	46	---	7.0	42	---	4.0
22	178	---	36	52	---	7.5	43	---	4.0
23	181	---	36	55	---	8.0	44	---	4.0
24	200	---	40	50	---	7.0	44	---	4.0
25	178	---	36	46	---	6.0	44	---	4.0
26	167	---	34	46	---	6.0	43	---	4.0
27	156	---	32	46	---	6.0	43	---	4.0
28	141	---	30	48	---	6.5	43	---	4.0
29	128	---	26	50	---	6.7	40	---	4.0
30	118	---	25	47	---	6.5	40	---	4.0
31	109	---	24	46	---	6.0	---	---	---
TOTAL	4540	---	717.7	1771	---	319.7	1251	---	143.2
YEAR	196727	---	491909.0						

SNAKE RIVER MAIN STEM

13353200 SNAKE RIVER AT BURBANK, WA
(National stream quality accounting network station)

LOCATION.--Lat 48°12'59", long 119°01'22", in NE 1/4 SW 1/4 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.--

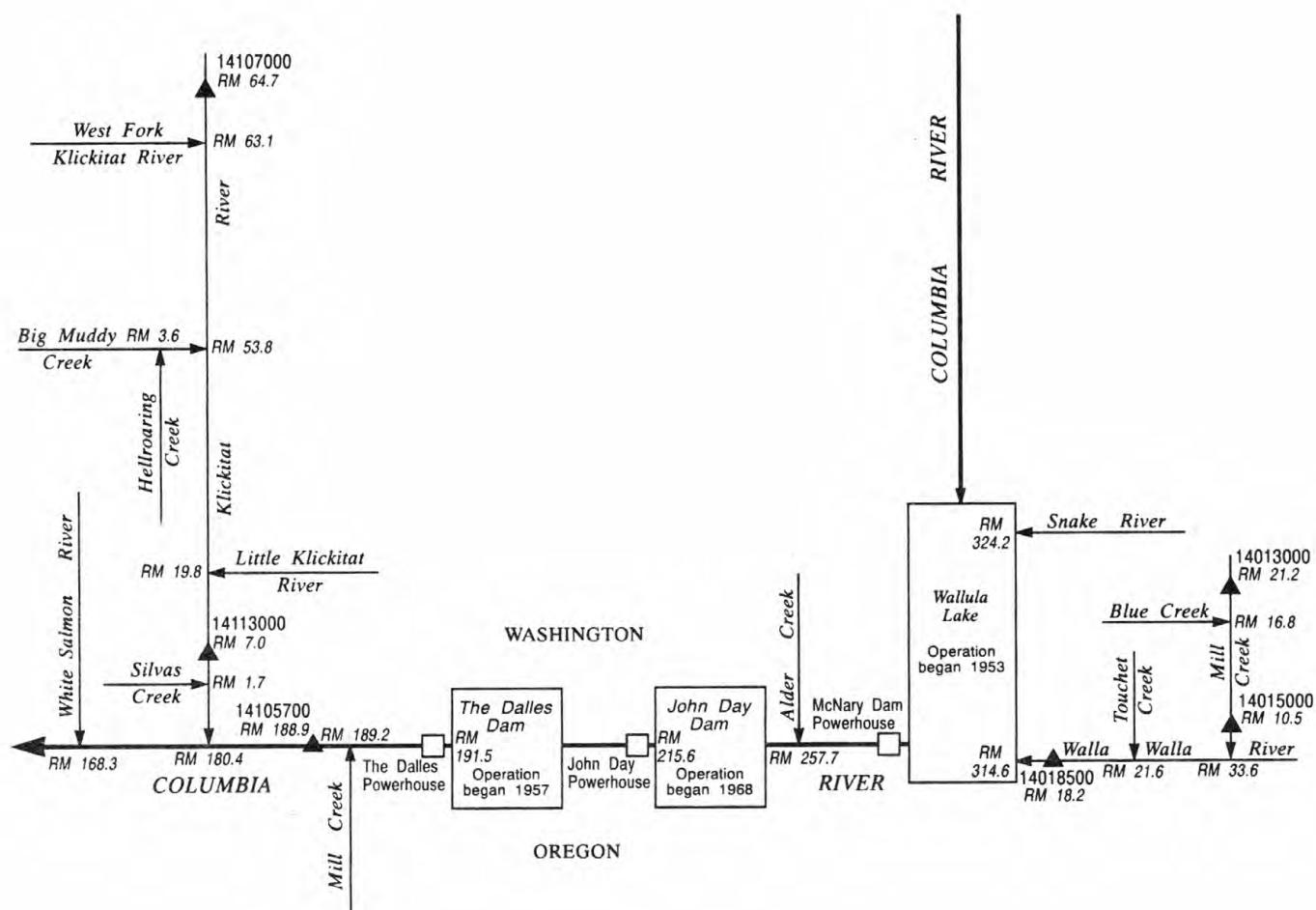
SPECIFIC CONDUCTANCE: March 1973 to September 1979.

WATER TEMPERATURE: April 1973 to September 1981.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1992 TO SEPTMEBER 1993

		DIS-CHARGE, INST. (CUBIC FEET PER SECOND)	SPE-CIFIC CON-DUCT-ANCE (US/CM)	PH (STAND-ARD UNITS)	TEMPER-ATURE WATER (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)	HARD-NESS, NONCAR-BONATE (MG/L AS CACO3)
DEC 03...	1130	31600	354	8.2	9.0	1.5	10.1	86	K3	K18	110	0
APR 20...	1400	60000	178	7.8	10.5	14	10.8	98	<1	<1	59	0
JUL 01...	1125	118000	120	8.1	17.5	1.9	9.4	100	K9	K1	40	0
SEP 07...	1450	29400	178	8.5	21.0	0.5	8.4	95	<1	K18	61	0
DATE	CALCIUM, DIS-SOLVED (MG/L AS CA)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG)	SODIUM, DIS-SOLVED (MG/L AS NA)	SODIUM PERCENT	SODIUM AD-SORP-TION RATIO	POTAS-SIUM, DIS-SOLVED (MG/L AS K)	ALKA-LINITY, DIS-IT, FIELD (MG/L AS CACO3)	BICAR-BONATE, DIS-IT, FIELD (MG/L AS HCO3)	CAR-BONATE, DIS-IT, FIELD (MG/L AS CO3)	SULFATE, DIS-SOLVED (MG/L AS SO4)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)	FLUO-RIDE, DIS-SOLVED (MG/L AS F)
DEC 03...	25	11	29	36	1	3.6	111	135	0	36	17	0.5
APR 20...	15	5.1	11	28	0.6	2.5	61	74	0	14	6.0	0.2
JUL 01...	11	3.1	7.8	29	0.5	1.4	44	54	0	8.8	3.4	0.2
SEP 07...	16	5.1	13	31	0.7	1.5	63	77	0	15	5.7	0.3
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, NITRITE, DIS-SOLVED (MG/L AS N)	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)
DEC 03...	16	209	207	0.28	17800	0.01	0.41	<0.01	<0.2	0.03	0.04	0.03
APR 20...	23	122	117	0.17	19800	0.02	0.81	0.05	0.3	0.14	0.07	0.06
JUL 01...	14	79	77	0.11	25200	<0.01	0.16	0.01	<0.2	0.02	0.01	0.02
SEP 07...	13	99	108	0.13	7860	<0.01	0.06	0.03	0.3	0.04	0.01	0.01
DATE	ALUM-INUM, DIS-SOLVED (UG/L AS AL)	BARIUM, DIS-SOLVED (UG/L AS BA)	COBALT, DIS-SOLVED (UG/L AS CO)	IRON, DIS-SOLVED (UG/L AS FE)	LITHIUM, DIS-SOLVED (UG/L AS LI)	MANGA-NESE, DIS-SOLVED (UG/L AS MN)	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)
DEC 03...	20	28	<3	12	16	2	<10	<1	<1	<1	170	<6
APR 20...	120	45	<3	160	5	6	<10	<1	<1	<1	87	<6
JUL 01...	20	13	<3	27	4	<1	<10	<1	<1	<1	75	<6
SEP 07...	<10	18	<3	6	8	2	<10	<1	<1	<1	100	<6
DATE	GROSS ALPHA, DIS-SOLVED (PCI/L AS TH-230)	GROSS ALPHA, SUSP. TOTAL (PCI/L AS TH-230)	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 YT-90)	GROSS BETA, SUSP. TOTAL (PCI/L AS YT-90)	RADIUM 226, DIS-SOLVED, RADON SOLVED, METHOD (PCI/L AS U)	URANIUM NATURAL DIS-SOLVED (UG/L AS U)	SEDI-MENT, SUS-PENDED (MG/L)	SEDI-MENT, DIS-CHARGE, SUS-PENDED (T/DAY)
DEC 03...	3.4	<0.6	4.4	<0.6	6.3	0.7	4.9	0.7	0.04	2.9	3	256
APR 20...	--	--	--	--	--	--	--	--	--	--	12	1940
JUL 01...	--	--	--	--	--	--	--	--	--	--	6	1910
SEP 07...	--	--	--	--	--	--	--	--	--	--	3	238

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



EXPLANATION

- ▲ 14018500 Stream-gaging station
- ▼ 14142500 Water-quality data collection site
- ▲ 12396000 Crest-stage gaging station
- RM 19.8 River mile
- Stream—Arrow shows direction of flow
- Tunnel or pipe—Arrow shows direction of flow

Figure 25. 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 SW 1/4 SW 1/4 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 sea level (levels by U.S. Corps of Engineers). Prior to Oct. 1, 1938, nonrecording gages at about same site at different datums.

REMARKS.--Records good except for those above 150 ft³/s, which are fair. No regulation. City of Walla Walla diverts about 28 ft³/s 4.0 mi upstream from station for municipal use. Water temperatures March 1962 to July 1965. Sediment records March 1962 to July 1965.

AVERAGE DISCHARGE.--55 years (water years 1914-17, 1940-76, 1980-93), 94.5 ft³/s, 68,470 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 3,240 ft³/s Dec. 23, 1964, gage height, 19.26 ft; minimum daily discharge, 9.5 ft³/s Dec. 9, 10, 1972.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of Mar. 31 or Apr. 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.--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)
May 4	1530	*802	*16.52	No other peak greater than base discharge.			
Minimum discharge, 21 ft ³ /s Oct. 12, 13.							

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	22	47	74	42	65	35	135	364	59	30	26	25
2	22	44	68	39	57	38	145	327	55	30	26	25
3	22	38	57	39	53	40	204	325	75	31	25	24
4	24	36	48	38	50	46	301	667	60	30	25	24
5	23	37	44	36	49	90	264	594	56	30	25	25
6	22	36	41	35	52	177	213	457	53	30	25	24
7	22	43	40	e35	56	252	186	397	52	29	25	24
8	22	62	39	e35	63	280	182	345	48	29	25	24
9	22	81	38	e35	73	234	197	295	46	29	25	24
10	22	65	41	33	80	191	218	264	46	29	24	24
11	22	56	49	33	83	153	246	269	48	28	25	24
12	22	58	50	32	80	126	235	274	53	28	25	25
13	26	70	47	e30	74	110	205	253	47	29	25	24
14	24	67	46	31	69	109	177	223	43	29	25	24
15	23	63	52	30	64	211	157	191	42	29	25	24
16	22	55	53	30	64	290	139	165	41	29	33	24
17	22	49	52	30	50	236	134	146	39	30	29	24
18	22	48	47	29	48	354	172	133	37	29	26	24
19	22	47	43	32	46	411	170	124	36	28	26	24
20	22	46	41	46	51	383	162	117	35	29	25	24
21	22	59	42	56	41	342	150	110	39	27	26	24
22	22	162	41	55	39	296	146	94	40	30	25	24
23	22	115	45	48	38	372	138	83	37	35	25	25
24	22	76	50	47	37	473	139	74	35	29	25	24
25	22	58	50	81	e36	377	161	71	32	28	25	24
26	22	49	52	127	36	286	325	67	32	27	25	24
27	22	47	53	121	e36	227	308	65	33	27	25	24
28	22	56	53	108	35	186	252	63	31	27	26	24
29	23	55	53	94	---	161	300	59	32	27	25	24
30	28	62	49	83	---	139	400	56	30	26	25	25
31	32	---	44	75	---	124	---	57	---	26	25	---
TOTAL	709	1787	1502	1585	1525	6749	6161	6729	1312	894	792	726
MEAN	22.9	59.6	48.5	51.1	54.5	218	205	217	43.7	28.8	25.5	24.2
MAX	32	162	74	127	83	473	400	667	75	35	33	25
MIN	22	36	38	29	35	35	134	56	30	26	24	24
AC-FT	1410	3540	2980	3140	3020	13390	12220	13350	2600	1770	1570	1440

CAL YR 1992 TOTAL 17011 MEAN 46.5 MAX 239 MIN 21 AC-FT 33740
WTR YR 1993 TOTAL 30471 MEAN 83.5 MAX 667 MIN 22 AC-FT 60440

e Estimated

WALLA WALLA RIVER BASIN

345

14015000 MILL CREEK AT WALLA WALLA, WA

LOCATION.--Lat 46°04'35", long 118°16'21", in NE 1/4 NW 1/4 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 sea level (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 between 40 and 70 ft³/s, which are fair, and those below 40 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 Mar. 31 or Apr. 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, 1,050 ft³/s May 4, gage height, 4.05 ft; no flow many days.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.4	22	95	45	98	38	144	359	54	4.2	.00	.00
2	.00	22	89	39	90	42	155	310	46	1.4	.00	1.5
3	.19	11	71	35	82	44	183	311	82	.00	.00	1.7
4	1.9	1.8	56	33	75	54	282	768	67	.00	.00	1.2
5	.82	.00	49	28	74	83	285	792	57	.00	.00	1.8
6	.00	.00	41	e25	80	147	229	561	50	.00	.00	2.3
7	.00	2.3	37	e19	81	215	217	473	45	.00	.00	1.8
8	.00	16	34	16	77	246	190	412	40	.00	.00	1.2
9	.00	58	38	e25	68	221	223	349	35	.00	.00	.92
10	.00	37	35	e21	83	201	234	294	35	.00	.00	1.0
11	.00	26	50	e23	89	174	279	266	26	.00	.00	.72
12	.00	19	53	e15	86	151	270	256	30	.00	.00	3.4
13	.00	22	48	e16	80	137	230	233	41	.00	.00	4.8
14	.00	26	45	e24	77	129	206	202	28	.00	.00	3.3
15	.00	26	56	e23	73	187	174	173	28	.00	.00	4.2
16	.00	21	57	e24	68	303	159	145	27	.00	1.5	2.1
17	.00	15	54	e23	69	259	146	119	22	.00	17	.00
18	.00	13	49	28	68	320	162	106	18	.00	17	.00
19	.00	13	43	31	65	399	168	92	17	.00	4.8	.00
20	.00	16	39	73	64	383	153	93	17	.00	.00	.00
21	.00	21	34	112	63	356	144	99	18	.00	.00	.00
22	.00	159	44	98	53	287	127	89	22	.00	.00	.00
23	.00	152	43	84	50	313	118	77	18	.00	.00	.00
24	.00	93	51	81	48	504	126	57	16	.00	.00	.00
25	.00	68	54	136	40	421	125	51	13	.00	.00	.00
26	.00	55	55	218	38	333	335	51	11	6.7	3.2	.00
27	.00	45	58	197	37	265	329	54	12	9.7	.00	.00
28	.00	55	60	168	37	223	275	51	12	4.4	.00	.00
29	.00	64	62	151	---	188	293	52	12	.00	.19	.00
30	.17	67	57	133	---	157	390	45	10	.00	.00	.00
31	5.5	---	49	119	---	144	---	44	---	.00	.00	---
TOTAL	10.98	1146.10	1606	2063	1913	6924	6351	6984	909	26.40	43.69	31.94
MEAN	.35	38.2	51.8	66.5	68.3	223	212	225	30.3	.85	1.41	1.06
MAX	5.5	159	95	218	98	504	390	792	82	9.7	17	4.8
MIN	.00	.00	34	15	37	38	118	44	10	.00	.00	.00
AC-FT	22	2270	3190	4090	3790	13730	12600	13850	1800	52	87	63

CAL YR 1992 TOTAL 10464.88 MEAN 28.6 MAX 243 MIN .00 AC-FT 20760
WTR YR 1993 TOTAL 28009.11 MEAN 76.7 MAX 792 MIN .00 AC-FT 55560

e Estimated

WALLA WALLA RIVER BASIN

14018500 WALLA WALLA RIVER NEAR TOUCHET, WA

LOCATION.--Lat 46°01'40", long 118°43'43", in NW 1/4 SE 1/4 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 fair except for estimated daily discharges, which are poor. Many diversions upstream from station for irrigation.

AVERAGE DISCHARGE.--42 years, 563 ft³/s, 407,900 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, Oct. 5-7, 1987.

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)
Mar. 24	1930	3,360	9.53	May 5	0500	*7,230	*13.00

Minimum discharge, 5.7 ft³/s Oct. 15.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	58	65	436	457	758	e280	1050	2560	309	67	44	33
2	37	81	495	435	690	e320	1130	2220	323	59	38	32
3	24	104	469	e400	640	e340	1210	2040	445	56	28	29
4	13	101	410	e360	596	435	1880	3890	562	61	24	24
5	11	76	380	e320	565	927	1950	6320	462	57	23	21
6	11	64	362	e300	551	1670	1580	4220	430	60	22	21
7	11	70	360	e280	553	1490	1430	3520	407	78	19	21
8	10	87	370	e260	571	1540	1320	2850	367	63	16	21
9	10	167	406	e240	595	1410	1540	2290	342	56	14	22
10	10	234	378	e230	622	1250	1520	1890	308	49	14	22
11	8.5	180	384	e220	657	1130	1510	1680	267	45	16	19
12	8.0	149	415	e210	664	996	1420	1600	260	45	18	17
13	7.9	139	399	e240	647	894	1260	1500	285	42	17	17
14	6.9	161	383	e280	622	838	1140	1360	262	55	17	20
15	6.5	167	406	e280	602	943	1040	1230	231	74	16	24
16	7.8	163	453	e270	553	1640	963	1070	218	99	41	26
17	17	156	450	e270	479	1560	884	927	204	101	217	24
18	20	148	439	e270	517	1670	964	799	173	107	150	24
19	21	148	419	e300	514	2320	994	713	150	108	105	24
20	16	156	425	464	503	2220	924	630	124	99	73	23
21	14	161	414	817	495	2210	855	678	113	96	57	26
22	14	311	424	872	456	1880	831	623	112	92	53	25
23	18	679	425	727	435	1910	800	547	127	89	52	28
24	16	492	451	657	432	3030	796	470	119	124	45	25
25	21	378	470	932	e380	2920	828	394	104	136	42	24
26	18	315	479	1610	e320	2220	1640	346	86	122	43	22
27	20	301	490	1280	e330	1820	1840	314	73	105	42	23
28	27	314	501	1090	e320	1570	1570	300	71	74	40	23
29	26	372	521	987	---	1400	1460	321	71	51	38	24
30	34	370	513	905	---	1250	2490	288	70	47	39	23
31	48	---	479	830	---	1100	---	262	---	45	37	---
TOTAL	570.6	6309	13406	16793	15067	45183	38819	47852	7075	2362	1400	707
MEAN	18.4	210	432	542	538	1458	1294	1544	236	76.2	45.2	23.6
MAX	58	679	521	1610	758	3030	2490	6320	562	136	217	33
MIN	6.5	64	360	210	320	280	796	262	70	42	14	17
AC-FT	1130	12510	26590	33310	29890	89620	77000	94910	14030	4690	2780	1400

CAL YR 1992 TOTAL 89370.5 MEAN 244 MAX 1390 MIN 2.4 AC-FT 177300
WTR YR 1993 TOTAL 195543.6 MEAN 536 MAX 6320 MIN 6.5 AC-FT 387900

e Estimated

COLUMBIA RIVER MAIN STEM

347

14105700 COLUMBIA RIVER AT THE DALLES, OR

LOCATION.--Lat 45°36'27", long 121°10'20", in SW 1/4 SW 1/4 sec.34, T.2 N., R.13 E., Wasco County, Hydrologic Unit 17070105, Corps of Engineers land, on left bank 0.3 mi downstream from Mill Creek, 2.6 mi downstream from The Dalles Dam, and at mile 188.9.

DRAINAGE AREA.--237,000 mi², approximately.

PERIOD OF RECORD.--October 1857 to September 1877 (annual maximum only, at Lower Cascades Landing, published in WSP 1318), June 1878 to current year. Published as "near The Dalles" 1936-56.

REVISED RECORDS.--WSP 534: 1920(m). WSP 1094: 1894. WSP 1248: 1866, 1888, 1899, 1909. WSP 1518: 1876(M).

GAGE.--Acoustic velocity meter (AVM) with water-stage and velocity-index recorder. Datum of gage is sea level. 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.--Records good. Daily discharge estimates for period Oct. 1 to Feb. 3, June 8-10, Sept. 28-30 determined from records provided by U.S. Army Corps of Engineers. Considerable regulation by many large reservoirs. Diurnal fluctuations caused by powerplant and gates at The Dalles Dam. Many diversions for irrigation upstream from station. Continuous water-quality records for the period October 1957 to February 1985 have been collected at this location.

AVERAGE DISCHARGE.--115 years, 191,400 ft³/s, 138,700,000 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 discharge (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, 401,000 ft³/s May 17; maximum elevation, 82.97 ft May 17; minimum daily discharge, 72,200 ft³/s Sept 19.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	e104000	e79900	e132000	e151000	e129000	131000	142000	222000	260000	198000	114000	124000
2	e91900	e92900	e128000	e138000	e134000	138000	149000	178000	294000	194000	155000	120000
3	e92700	e108000	e147000	e139000	e132000	109000	148000	191000	278000	164000	171000	116000
4	e78200	e107000	e180000	e162000	152000	97600	152000	193000	290000	152000	152000	104000
5	e89600	e107000	e139000	e174000	117000	105000	181000	222000	279000	159000	153000	87900
6	e112000	e104000	e148000	e185000	108000	88200	184000	222000	229000	181000	153000	83800
7	e104000	e99900	e167000	e189000	93700	93800	193000	253000	233000	180000	113000	108000
8	e104000	e88500	e160000	e193000	117000	120000	186000	247000	e281000	180000	112000	124000
9	e99900	e111000	e147000	e181000	113000	119000	186000	272000	e280000	163000	125000	120000
10	e87000	e127000	e166000	e161000	124000	103000	150000	246000	e256000	163000	116000	129000
11	e84300	e101000	e159000	e183000	112000	104000	172000	273000	237000	128000	134000	93100
12	e89800	e117000	e134000	e159000	125000	118000	176000	282000	274000	171000	138000	82800
13	e104000	e104000	e124000	e194000	119000	107000	166000	266000	254000	164000	97600	106000
14	e102000	e115000	e135000	e173000	85800	102000	159000	330000	227000	163000	113000	94800
15	e113000	e103000	e170000	e168000	129000	116000	116000	338000	204000	167000	108000	107000
16	e94600	e98400	e183000	e139000	169000	135000	155000	370000	214000	158000	118000	109000
17	e85700	e118000	e166000	e103000	166000	130000	142000	401000	207000	183000	133000	98400
18	e94600	e123000	e147000	e141000	168000	123000	144000	392000	225000	178000	150000	84900
19	e93300	e105000	e148000	e163000	169000	140000	148000	374000	211000	171000	133000	72200
20	e90200	e114000	e128000	e108000	143000	168000	161000	387000	201000	165000	122000	81600
21	e93400	e127000	e134000	e128000	116000	188000	149000	382000	200000	174000	92200	106000
22	e99100	e116000	e128000	e128000	148000	193000	156000	393000	204000	177000	95000	127000
23	e93100	e145000	e137000	e141000	147000	202000	152000	384000	205000	176000	103000	113000
24	e83600	e173000	e116000	e101000	163000	224000	121000	380000	212000	168000	103000	93800
25	e75300	e149000	e88700	e122000	154000	228000	131000	349000	211000	140000	128000	92800
26	e89100	e133000	e95600	e127000	156000	212000	159000	319000	170000	164000	127000	79500
27	e106000	e98000	e97800	e114000	138000	194000	156000	313000	166000	173000	120000	101000
28	e98300	e100000	e139000	e135000	121000	179000	163000	322000	179000	166000	93300	e118000
29	e102000	e103000	e150000	e115000	---	181000	164000	308000	201000	161000	102000	e120000
30	e115000	e132000	e156000	e117000	---	181000	157000	289000	189000	185000	98200	e123000
31	e92100	---	e165000	e105000	---	169000	---	290000	---	165000	104000	---
TOTAL	2961800	3399600	4415100	4537000	3748500	4498600	4718000	9388000	6871000	5231000	3776300	3120600
MEAN	95540	113300	142400	146400	133900	145100	157300	302800	229000	168700	121800	104000
MAX	115000	173000	183000	194000	169000	228000	193000	401000	294000	198000	171000	129000
MIN	75300	79900	88700	101000	85800	88200	116000	178000	166000	128000	92200	72200
AC-FT	5875000	6743000	8757000	8999000	7435000	8923000	9358000	18620000	13630000	10380000	7490000	6190000
CAL YR 1992	TOTAL 50903100 MEAN 139100 MAX 243000 MIN 75300 AC-FT 101000000											
WTR YR 1993	TOTAL 56665500 MEAN 155200 MAX 401000 MIN 72200 AC-FT 112400000											

e Estimated

LOCATION.--Lat 46°15'54", long 121°14'38", in NW 1/4 SW 1/4 sec.18, T.9 N., R.13 E., Yakima County, Hydrologic Unit 17070106, Yakima Indian reservation, on right bank 0.8 mi upstream from Swamp Creek, 1.9 mi upstream from West Fork, 17.0 mi north of Glenwood, and at mile 64.7.

PERIOD OF RECORD.--October 1944 to September 1977, July to September 1991. Monthly discharge only for some periods, published in WSP 1318.

REMARKS.--Records good except for estimated daily discharges, which are poor. No regulation or diversion upstream from station.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 3,280 ft³/s May 27, 1948, gage height, 4.28 ft; minimum discharge, 4.4 ft³/s Feb. 1, 1957 (result of freezeup, discharge measurement).

EXTREMES FOR CURRENT PERIOD.--Peak discharges greater than base discharge of 900 ft³/s and maximum (*):

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1945 - 1993, BY WATER YEAR (WY)

SUMMARY STATISTICS	FOR 1992 CALENDAR YEAR	FOR 1993 WATER YEAR	WATER YEARS 1945 - 1993
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e Estimated

KLICKITAT RIVER BASIN

349

14113000 KLICKITAT RIVER NEAR PITT, WA

LOCATION.--Lat 45°45'24", long 121°12'32", in SW 1/4 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.

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 sea level (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.--No estimated daily discharges. Records good. Several small diversions upstream from station for irrigation of about 7,500 acres, mostly in vicinity of Glenwood. The largest of these is Hellroaring Irrigation Canal which at times diverts the entire flow of Hellroaring Creek (tributary to Big Muddy Creek). No regulation. Water temperatures October 1950 to September 1970. Chemical analyses October 1950 to September 1970, October 1975 to September 1986.

AVERAGE DISCHARGE.--67 years (water years 1910-11, 1929-93), 1,562 ft³/s, 1,132,000 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 discharge, 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)
Mar. 23	1530	*4,150	*6.93	No other peak greater than base discharge.			
Minimum discharge, 476 ft ³ /s Jan. 16.							

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	555	698	600	625	1090	614	2260	2140	2150	861	662	552
2	557	702	592	592	1030	619	2410	2150	1910	852	672	566
3	554	659	544	594	950	626	2830	2250	1770	853	675	562
4	547	622	498	633	902	630	2950	2260	1660	837	673	564
5	539	641	510	619	880	723	2690	2160	1800	831	683	562
6	532	607	528	594	866	1410	2510	2220	1820	820	697	567
7	523	642	570	545	897	1760	2380	2260	1710	808	675	558
8	511	686	588	564	876	2000	2390	2140	1620	789	645	547
9	509	654	585	604	957	1980	2630	2030	1540	785	618	549
10	506	616	626	595	1010	1730	2620	2020	1600	777	607	548
11	526	598	583	585	1140	1560	2520	2240	1490	759	612	547
12	531	612	588	560	1200	1420	2320	2790	1410	749	607	537
13	533	611	579	565	1140	1360	2210	3400	1340	747	604	526
14	527	605	577	579	1080	1470	2110	3290	1300	785	603	525
15	517	596	623	591	1010	2070	2040	3020	1320	743	600	527
16	517	591	602	501	840	2220	2020	2860	1280	719	601	522
17	522	585	604	547	717	2410	2020	2730	1230	725	602	522
18	523	582	591	561	789	2600	2090	2720	1230	695	591	518
19	527	590	572	564	824	2430	2000	2760	1230	704	595	516
20	540	587	604	587	792	2710	1940	2730	1190	756	614	524
21	578	685	615	702	767	2580	1970	2640	1160	719	613	527
22	554	760	793	752	728	2470	2010	2480	1120	703	592	515
23	545	698	1040	705	717	3660	1980	2290	1080	735	596	515
24	539	612	831	695	699	3590	2020	2120	1030	716	589	512
25	536	568	723	1210	652	3020	2030	2060	999	697	571	513
26	531	555	685	1850	635	2710	2070	2010	967	684	557	513
27	526	608	693	1600	612	2490	1990	1980	986	675	556	513
28	531	606	713	1320	618	2340	1940	1970	950	676	556	519
29	557	583	687	1240	---	2250	1920	1890	913	714	552	516
30	603	587	655	1220	---	2160	2060	1810	887	678	550	521
31	608	---	639	1160	---	2090	---	2020	---	658	550	---
TOTAL	16704	18746	19638	24059	24418	61702	66930	73440	40692	23250	18918	16003
MEAN	539	625	633	776	872	1990	2231	2369	1356	750	610	533
MAX	608	760	1040	1850	1200	3660	2950	3400	2150	861	697	567
MIN	506	555	498	501	612	614	1920	1810	887	658	550	512
AC-FT	33130	37180	38950	47720	48430	122400	132800	145700	80710	46120	37520	31740

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1909 - 1993, BY WATER YEAR (WY)

	MEAN	1909	1910	1911	1912	1913	1914	1915	1916	1917	1918	1919
MEAN	757	969	1459	1789	2111	2232	2327	2474	1943	1150	823	738
MAX	1201	2763	6160	7325	5451	6111	4942	5235	4161	2250	1341	1060
(WY)	1948	1910	1934	1974	1961	1910	1943	1956	1974	1974	1974	1974
MIN	501	521	521	524	723	742	866	900	784	605	545	533
(WY)	1945	1945	1931	1979	1931	1977	1977	1977	1992	1992	1992	1993

SUMMARY STATISTICS	FOR 1992 CALENDAR YEAR	FOR 1993 WATER YEAR	WATER YEARS 1909 - 1993
ANNUAL TOTAL	331777	404500	
ANNUAL MEAN	906	1108	1561
HIGHEST ANNUAL MEAN			2876
LOWEST ANNUAL MEAN			772
HIGHEST DAILY MEAN	3320	3660	39000
LOWEST DAILY MEAN	487	498	430
ANNUAL SEVEN-DAY MINIMUM	500	514	452
ANNUAL RUNOFF (AC-FT)	658100	802300	1131000
10 PERCENT EXCEEDS	1590	2260	2970
50 PERCENT EXCEEDS	686	699	1130
90 PERCENT EXCEEDS	523	531	641

WHITE SALMON RIVER BASIN

14123500 WHITE SALMON RIVER NEAR UNDERWOOD, WA

LOCATION.--Lat 45°45'08", long 121°31'33", in NW 1/4 NW 1/4 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 sea level. 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 good. Diversions for irrigation of about 4,000 acres in Trout Lake area. Low and medium flows regulated by powerplant of Pacific Power & Light Co. Chemical analyses August 1960 to August 1961, water years 1964-1968 (miscellaneous), October 1967 to September 1970 (monthly), November 1975 to June 1980. Water temperatures July 1968 to August 1970.

AVERAGE DISCHARGE.--73 years (water years 1916-30, 1936-93), 1,103 ft³/s, 798,700 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; minimum discharge, practically no flow at times when powerplant is shut down; minimum daily discharge, 158 ft³/s Jan. 17, 1950.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 3,190 ft³/s Apr. 27, gage height, 6.13 ft; minimum discharge, 26 ft³/s Sept. 25.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	392	647	524	498	662	489	1490	1770	1510	836	645	503
2	463	631	448	467	675	509	1580	1700	1370	795	675	511
3	448	599	476	484	575	500	2010	1770	1300	827	584	511
4	426	545	455	462	580	506	2100	1820	1290	847	628	473
5	448	474	459	465	556	575	1880	1750	1290	799	588	514
6	435	439	447	451	520	639	1730	1730	1290	787	596	489
7	409	530	443	437	573	730	1640	1690	1290	788	524	463
8	444	644	489	423	553	665	1690	1660	1260	789	583	494
9	394	498	490	423	551	785	2030	1630	1180	781	564	480
10	443	525	497	423	546	779	2040	1580	1200	737	575	472
11	443	475	473	423	623	766	1950	1740	1140	730	575	472
12	473	484	460	423	662	780	1780	1940	1130	813	556	475
13	403	484	463	423	647	769	1660	2080	1110	687	565	473
14	377	484	449	423	621	826	1570	1980	1080	764	535	473
15	428	462	508	430	620	1440	1520	1840	1060	731	586	484
16	388	442	521	437	582	1600	1500	1740	1080	741	518	474
17	401	459	473	445	493	1430	1500	1690	1060	665	563	426
18	420	469	466	440	558	1520	1540	1680	958	732	523	463
19	407	483	457	415	605	1570	1470	1680	954	774	556	443
20	434	469	476	478	595	1730	1420	1670	954	751	547	479
21	460	563	485	464	546	1650	1540	1690	953	745	529	476
22	410	654	529	526	523	1670	1540	1740	950	752	539	447
23	405	636	665	493	511	2810	1510	1610	978	690	553	463
24	420	594	624	519	523	2920	1630	1480	956	739	553	483
25	429	505	574	604	509	2340	1720	1450	920	697	529	552
26	389	451	538	923	456	1950	1830	1390	905	751	524	432
27	407	476	555	776	442	1720	1870	1380	891	716	523	390
28	423	488	585	781	461	1540	1690	1380	908	565	502	452
29	484	452	534	771	---	1490	1600	1360	882	678	528	456
30	425	528	471	629	---	1400	1750	1330	864	670	528	474
31	565	---	526	652	---	1330	---	1490	---	670	500	---
TOTAL	13293	15590	15560	16008	15768	39438	50780	51440	32713	23047	17294	14197
MEAN	429	520	502	516	563	1272	1693	1659	1090	743	558	473
MAX	565	654	665	923	675	2920	2100	2080	1510	847	675	552
MIN	377	439	443	415	442	489	1420	1330	864	565	500	390
AC-FT	26370	30920	30860	31750	31280	78230	100700	102000	64890	45710	34300	28160

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1916 - 1993, BY WATER YEAR (WY)

	MEAN	625	795	1132	1294	1475	1481	1498	1501	1257	882	692	625
MAX	1003	1607	2984	3362	3156	3417	2518	2565	2506	1911	1225	1003	
(WY)	1951	1956	1918	1974	1961	1972	1943	1956	1956	1916	1916	1916	
MIN	429	396	452	430	508	558	651	659	587	456	432	425	
(WY)	1993	1930	1945	1979	1929	1977	1977	1977	1992	1977	1977	1924	

SUMMARY STATISTICS

FOR 1992 CALENDAR YEAR

FOR 1993 WATER YEAR

WATER YEARS 1916 - 1993

ANNUAL TOTAL	267006	305128	
ANNUAL MEAN	730	836	1103
HIGHEST ANNUAL MEAN			1765
LOWEST ANNUAL MEAN			554
HIGHEST DAILY MEAN	2740	Feb 22	2920
LOWEST DAILY MEAN	374	Aug 31	377
ANNUAL SEVEN-DAY MINIMUM	392	Aug 31	403
ANNUAL RUNOFF (AC-FT)	529600	605200	798700
10 PERCENT EXCEEDS	1230	1680	1870
50 PERCENT EXCEEDS	565	580	920
90 PERCENT EXCEEDS	421	440	524

COLUMBIA RIVER MAIN STEM

351

14128600 COLUMBIA RIVER AT STEVENSON, WA

LOCATION.--Lat 45°41'58", long 121°52'02", in NW 1/4 SE 1/4 sec.36, T.3 N., R.7-1/2 E., Skamania County, Hydrologic Unit 17070105, on right bank 0.9 mi east of Stevenson, and at mile 151.3.

DRAINAGE AREA.--239,800 mi², approximately.

PERIOD OF RECORD.--October 1973 to current year (gage heights only).

GAGE.--Water-stage recorder. Datum of gage is sea level.

REMARKS.--Flow regulated by many reservoirs upstream.

EXTREMES FOR PERIOD OF RECORD.--Maximum gage height, 79.79 ft June 20, 1974; minimum, 70.39 ft Oct. 25, 1981.

EXTREMES FOR CURRENT YEAR.--Maximum gage height, 78.39 ft May 17; minimum, 70.89 ft Nov. 12.

GAGE HEIGHT, FEET, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	OCTOBER			NOVEMBER			DECEMBER			JANUARY		
1	75.76	75.08	75.31	74.62	74.12	74.42	75.56	73.82	74.53	75.45	74.75	75.04
2	75.78	74.80	75.37	74.43	73.73	73.97	74.76	73.50	74.15	75.77	75.01	75.35
3	76.24	74.72	75.60	74.10	73.08	73.70	75.35	73.93	74.59	75.26	74.03	74.56
4	75.93	73.80	74.92	74.09	73.19	73.69	75.75	73.87	74.87	75.14	73.57	74.34
5	73.82	72.77	73.22	74.18	73.22	73.68	75.21	73.71	74.34	76.57	74.27	75.37
6	74.20	72.43	73.32	74.18	73.38	73.68	75.37	73.63	74.21	76.50	75.77	76.14
7	75.05	73.80	74.43	74.12	72.74	73.53	75.06	72.52	73.94	76.45	75.77	76.20
8	75.26	74.35	74.89	74.21	73.87	74.05	75.55	73.05	74.21	76.92	75.66	76.10
9	75.68	74.56	75.09	74.25	73.47	73.93	75.49	73.35	74.37	77.05	76.30	76.58
10	75.75	74.92	75.16	74.09	73.37	73.67	75.50	73.30	74.39	77.10	75.41	76.35
11	75.58	74.76	75.07	73.88	72.45	73.27	75.48	74.30	74.90	75.41	74.01	74.47
12	75.39	74.92	75.12	74.32	70.89	72.42	75.34	74.05	74.76	74.63	72.75	73.70
13	75.27	74.25	74.77	74.41	74.15	74.31	75.15	74.00	74.53	74.65	73.19	73.95
14	75.21	74.55	74.93	74.60	74.28	74.46	75.27	73.48	74.51	74.72	73.80	74.16
15	75.61	74.18	75.00	74.63	74.08	74.38	75.37	74.19	74.88	75.57	73.74	74.37
16	75.14	74.24	74.60	74.28	73.76	74.08	76.75	73.82	75.32	75.76	75.07	75.36
17	74.95	74.52	74.78	74.59	73.78	74.17	76.57	74.32	75.18	75.75	74.68	75.05
18	75.36	74.01	74.70	74.70	73.86	74.32	75.57	73.36	74.69	75.35	74.42	74.84
19	75.10	73.09	73.80	74.60	73.88	74.19	75.54	73.77	74.66	75.42	74.17	74.67
20	73.37	72.57	72.86	75.74	73.54	74.43	75.85	74.46	74.94	75.34	73.23	73.89
21	72.68	71.93	72.38	76.44	75.74	76.09	75.82	73.53	74.63	75.66	73.28	74.34
22	73.87	72.03	72.83	76.12	74.94	75.61	75.38	73.67	74.69	75.66	73.92	74.88
23	74.19	73.31	73.68	75.63	74.30	74.76	75.76	73.74	74.81	75.60	74.65	75.13
24	74.72	73.66	74.01	75.64	74.25	74.86	76.40	74.07	75.20	75.46	74.33	74.98
25	74.85	73.79	74.27	75.57	74.08	74.75	76.56	74.65	75.21	75.70	74.58	75.10
26	74.17	73.56	73.77	75.48	73.91	74.48	75.35	74.30	74.78	75.86	74.67	75.07
27	73.94	73.35	73.68	74.71	73.54	73.83	75.44	74.42	74.84	74.81	72.48	73.27
28	73.89	73.28	73.68	74.28	73.14	73.66	75.84	73.87	74.88	74.56	71.33	72.51
29	73.95	73.43	73.68	74.29	73.05	73.50	75.69	74.21	74.82	76.09	74.05	74.90
30	74.04	73.20	73.74	75.57	73.26	74.06	75.51	74.02	74.72	76.05	75.26	75.57
31	74.51	73.46	74.02	---	---	---	75.50	74.56	74.96	75.83	75.07	75.36
MONTH	76.24	71.93	74.28	76.44	70.89	74.13	76.75	72.52	74.69	77.10	71.33	74.89

14128600 COLUMBIA RIVER AT STEVENSON, WA--Continued

GAGE HEIGHT, FEET, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
FEBRUARY				MARCH			APRIL			MAY		
1	75.62	74.87	75.32	77.03	76.21	76.56	76.21	74.81	75.20	76.11	73.73	74.93
2	75.60	74.25	74.90	77.46	76.22	76.78	76.30	74.35	75.06	76.05	74.69	75.15
3	75.57	74.11	74.90	76.74	74.74	75.26	76.37	74.63	75.64	76.07	73.96	75.17
4	76.00	73.70	74.47	77.43	75.81	76.48	76.28	74.99	75.49	75.89	73.47	74.42
5	76.07	74.61	75.07	76.71	75.47	75.89	76.34	74.91	75.56	75.29	73.50	74.11
6	75.70	74.65	75.10	77.52	76.00	76.72	76.23	73.84	75.03	76.10	74.32	74.96
7	75.89	74.86	75.15	76.10	74.92	75.62	76.35	74.73	75.36	76.37	75.57	76.08
8	75.54	74.39	75.09	75.95	74.70	75.33	76.37	73.89	74.96	76.24	75.61	75.92
9	75.54	74.01	74.86	75.77	74.21	74.69	76.75	73.76	75.15	77.00	75.74	76.36
10	75.85	73.99	74.72	74.21	72.79	73.21	76.86	73.68	75.07	76.49	74.19	75.21
11	75.99	74.52	75.30	73.72	73.22	73.46	76.49	73.21	74.91	76.24	74.19	75.58
12	75.94	74.34	74.93	73.79	72.84	73.24	76.56	73.08	74.76	75.75	74.46	74.87
13	75.72	74.97	75.23	73.59	72.63	73.09	76.44	73.88	75.07	76.63	75.17	75.98
14	75.29	74.07	74.49	73.61	72.62	72.96	76.52	74.41	75.38	77.24	75.03	75.95
15	74.66	73.89	74.31	73.74	72.81	73.45	75.79	73.99	74.46	77.24	76.07	76.56
16	76.44	73.04	74.41	73.71	72.63	73.04	75.52	73.35	74.33	77.59	76.06	76.59
17	76.47	74.48	75.22	74.07	72.41	73.07	75.66	73.86	74.48	78.39	76.05	77.41
18	75.12	73.09	74.12	74.18	73.42	73.75	75.05	73.12	74.07	77.32	75.97	76.39
19	76.15	72.89	74.29	74.44	72.73	73.66	75.17	73.15	74.25	75.97	75.27	75.62
20	76.16	73.89	75.08	75.68	72.27	73.54	75.99	73.01	74.52	76.40	75.64	76.05
21	75.97	74.42	75.06	75.85	73.37	74.40	75.85	73.67	74.55	75.92	75.02	75.65
22	75.42	73.75	74.49	75.55	72.76	73.98	75.98	73.05	74.60	76.68	75.74	76.20
23	75.14	73.10	74.32	75.97	73.08	74.48	76.09	74.19	74.99	77.33	76.68	77.09
24	75.84	73.74	74.86	76.20	75.20	75.74	75.48	73.89	74.58	77.52	76.84	77.19
25	76.13	74.68	75.48	75.57	74.41	74.85	75.74	73.80	74.59	77.22	76.26	76.65
26	75.51	74.62	75.11	75.05	73.55	74.53	76.10	74.22	75.03	76.89	76.05	76.53
27	77.52	75.48	76.86	75.19	73.26	74.21	76.08	75.22	75.66	76.19	75.57	75.86
28	77.44	75.69	76.44	75.24	73.32	73.87	76.37	74.48	75.38	77.20	75.57	76.19
29	---	---	---	74.18	72.81	73.69	76.18	74.43	75.33	76.90	76.21	76.55
30	---	---	---	75.06	73.25	74.10	75.72	73.71	74.60	76.21	75.22	75.68
31	---	---	---	76.16	73.53	74.59	---	---	---	76.93	75.09	76.21
MONTH	77.52	72.89	74.98	77.52	72.27	74.46	76.86	73.01	74.94	78.39	73.47	75.91

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
JUNE				JULY			AUGUST			SEPTEMBER		
1	76.74	75.02	75.96	76.36	74.97	75.54	75.95	74.61	75.04	76.59	74.73	75.46
2	76.51	74.31	75.23	76.80	76.00	76.32	76.70	74.58	75.41	76.74	75.36	75.90
3	76.66	76.00	76.35	76.81	75.55	76.10	76.79	75.01	75.83	76.73	75.50	76.09
4	76.32	75.82	76.06	75.89	74.44	75.22	76.83	74.74	75.63	76.82	75.99	76.33
5	76.76	75.69	76.25	76.67	75.53	75.82	76.73	76.07	76.43	76.95	76.05	76.36
6	77.09	75.69	76.39	76.83	75.21	75.92	76.57	75.35	75.77	76.34	75.74	75.94
7	77.23	76.89	77.07	76.95	75.49	76.00	76.38	74.56	75.46	76.43	75.47	75.86
8	77.31	75.76	76.43	76.25	74.87	75.52	76.53	74.41	75.26	76.77	74.72	75.54
9	77.34	76.11	76.58	75.98	74.95	75.34	76.51	75.51	75.92	76.36	74.87	75.62
10	76.93	76.14	76.51	76.89	75.98	76.47	75.78	74.28	75.00	76.65	74.38	75.41
11	76.78	75.27	76.09	76.53	74.98	75.40	76.19	74.73	75.37	76.37	74.13	74.98
12	77.45	75.27	76.43	75.98	75.23	75.58	76.78	75.81	76.33	75.21	74.54	74.83
13	77.35	76.76	76.99	75.97	74.53	75.05	76.45	74.86	75.32	74.93	74.09	74.65
14	77.02	76.02	76.59	75.81	74.68	75.24	76.16	74.45	75.25	75.24	74.25	74.61
15	76.02	74.92	75.45	75.00	74.23	74.64	76.30	75.48	75.92	75.39	74.65	75.03
16	77.03	75.61	76.06	75.99	74.23	75.15	76.32	74.64	75.39	75.78	74.66	75.14
17	77.23	76.00	76.43	76.60	75.95	76.45	76.69	75.53	76.06	75.89	75.06	75.37
18	76.82	75.34	75.90	77.06	75.98	76.39	76.85	75.03	75.71	75.88	75.16	75.48
19	76.64	75.09	75.78	77.08	75.19	75.61	76.23	74.14	75.22	75.68	74.88	75.20
20	76.18	74.94	75.57	76.13	75.47	75.69	76.14	74.41	75.29	75.42	74.41	74.76
21	76.04	74.79	75.40	75.93	74.04	75.17	75.88	74.42	74.96	75.48	74.43	74.92
22	76.07	74.91	75.36	75.11	72.91	73.72	75.31	74.26	74.81	75.79	74.88	75.34
23	76.51	75.90	76.12	76.30	74.65	75.33	75.26	74.14	74.65	75.77	74.86	75.23
24	76.56	75.99	76.20	76.54	75.88	76.27	75.75	74.70	75.22	75.77	74.81	75.46
25	76.82	74.87	75.89	76.66	75.92	76.31	75.89	74.85	75.25	76.28	74.48	75.22
26	77.16	75.54	75.97	76.44	74.67	75.66	75.94	75.10	75.56	76.35	75.75	76.03
27	76.16	74.51	75.34	76.39	75.10	75.88	75.71	75.03	75.27	76.37	75.89	76.11
28	76.49	74.94	75.74	77.00	74.91	75.95	75.71	74.67	75.09	76.74	75.19	75.71
29	76.56	75.47	76.01	76.73	75.84	76.35	76.10	74.92	75.45	76.85	75.99	76.26
30	76.14	74.72	75.34	76.35	75.33	75.92	75.85	75.03	75.31	76.69	75.78	76.24
31	---	---	---	76.29	74.78	75.50	75.68	74.96	75.21	---	---	---
MONTH	77.45	74.31	76.05	77.08	72.91	75.66	76.85	74.14	75.43	76.95	74.09	75.50

YEAR	78.39	70.89	75.08									
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COLUMBIA RIVER MAIN STEM

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14128870 COLUMBIA RIVER BELOW BONNEVILLE DAM, OR

LOCATION.--Lat 45°38'00", long 121°57'33", in sec.21, T.2 N., R.7 E., Multnomah County, Hydrologic Unit 17080001, on left bank 0.9 mi downstream from Bonneville Dam left bank powerhouse, 50 ft upstream from Tanner Creek, and at mile 144.5.

DRAINAGE AREA.--239,900 mi², approximately.

PERIOD OF RECORD.--May 1981 to current year (gage heights only).

GAGE.--Water-stage recorder. Datum of gage is sea level. Prior to August 15, 1990, at a site 0.5 mi upstream at the same datum.

REMARKS.--Flow regulated by many reservoirs upstream.

EXTREMES FOR PERIOD OF RECORD.--Maximum gage height, 30.40 ft June 11, 1981; minimum, 6.22 ft Sept. 26, 1993.

EXTREMES FOR CURRENT YEAR.--Maximum gage height, 28.50 ft May 18; minimum, 6.22 ft Sept. 26.

GAGE HEIGHT, FEET, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	OCTOBER			NOVEMBER			DECEMBER			JANUARY		
1	11.75	9.08	10.72	10.44	7.84	9.06	15.00	10.09	13.30	14.46	13.08	13.87
2	10.45	8.68	9.59	11.19	8.66	9.92	14.64	9.39	11.87	13.85	12.80	13.27
3	10.30	8.53	9.28	11.36	8.78	10.29	15.18	10.67	13.13	15.10	13.15	13.88
4	11.32	8.42	9.61	12.03	7.85	9.98	15.12	13.40	14.66	15.01	12.98	13.84
5	11.13	8.66	9.36	11.75	8.87	10.21	15.05	11.34	12.73	15.80	12.72	14.30
6	11.09	8.32	9.44	12.35	8.61	10.31	15.30	11.80	13.84	16.11	14.94	15.48
7	10.62	6.95	8.50	11.78	8.84	10.00	15.66	12.41	14.30	16.26	14.92	15.67
8	11.54	7.51	9.48	11.02	7.94	9.64	15.54	12.70	14.24	16.54	15.65	16.16
9	11.24	8.56	9.47	13.42	8.14	11.07	15.14	14.03	14.59	16.24	15.22	15.82
10	10.57	8.31	9.10	13.90	10.28	12.41	15.95	13.44	14.80	16.47	14.07	15.53
11	10.09	7.70	8.53	14.26	8.68	10.97	16.25	14.45	15.40	17.15	15.98	16.52
12	11.16	7.42	9.13	12.51	8.14	10.30	16.17	13.51	14.12	16.19	12.78	14.58
13	11.70	8.34	10.08	11.22	8.46	10.01	15.07	12.15	12.95	16.59	14.00	15.37
14	11.32	8.67	10.09	11.87	9.14	10.62	14.16	11.81	13.27	16.06	13.84	15.13
15	11.58	9.42	10.53	12.07	8.00	10.36	16.00	12.31	15.11	15.14	13.25	13.97
16	10.43	8.13	9.37	12.04	8.51	9.90	16.18	13.83	15.23	13.32	12.06	12.54
17	9.53	7.32	8.73	13.33	8.18	10.88	16.30	15.51	15.98	12.06	9.74	10.44
18	11.50	7.52	8.68	13.07	8.92	11.51	15.95	12.00	14.10	13.72	9.58	11.55
19	11.33	9.10	10.47	12.89	9.21	11.43	14.66	11.69	13.77	15.01	13.02	14.08
20	11.17	8.56	9.63	11.56	8.41	10.01	14.92	12.07	13.22	14.91	11.40	12.79
21	11.28	8.08	9.62	15.47	8.69	12.23	14.11	12.88	13.51	13.80	10.20	11.71
22	10.24	7.92	9.10	14.79	11.97	13.42	14.34	12.86	13.51	14.73	11.67	12.95
23	10.96	7.53	8.99	---	---	---	15.06	12.23	13.75	14.70	13.30	13.84
24	9.85	7.59	8.47	---	---	---	14.77	10.84	12.22	13.40	10.73	11.80
25	10.04	7.53	8.67	---	---	---	12.59	10.46	11.05	14.88	9.58	12.29
26	10.92	7.86	9.47	15.20	11.16	13.02	11.78	9.24	10.74	15.46	10.77	13.67
27	11.80	7.89	10.25	12.56	9.01	10.54	11.49	9.25	10.43	14.74	12.36	13.74
28	11.74	8.22	9.97	11.84	8.97	10.55	14.27	9.47	12.65	13.88	11.67	12.37
29	12.46	7.81	10.17	11.23	8.45	10.13	15.11	13.32	14.39	11.86	9.80	11.03
30	13.31	8.94	11.40	13.02	9.11	11.38	15.05	12.68	14.23	13.27	8.85	11.33
31	12.16	8.07	9.70	---	---	---	15.89	13.61	15.03	11.85	8.72	10.49
MONTH	13.31	6.95	9.54	---	---	---	16.30	9.24	13.62	17.15	8.72	13.55

COLUMBIA RIVER MAIN STEM

14128870 COLUMBIA RIVER BELOW BONNEVILLE DAM, OR--Continued

GAGE HEIGHT, FEET, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
FEBRUARY				MARCH			APRIL			MAY		
1	13.60	9.18	11.96	---	8.98	---	14.97	13.66	14.33	19.13	15.32	17.94
2	13.50	10.46	12.24	14.41	9.54	12.51	15.04	13.31	13.88	18.54	16.44	17.23
3	14.41	10.28	12.75	13.53	8.54	10.50	16.37	13.97	15.03	19.08	16.23	16.91
4	13.53	9.98	12.19	12.37	8.03	9.81	16.72	15.18	15.63	19.17	16.80	17.92
5	13.15	10.34	11.81	11.60	8.40	10.29	18.54	15.05	17.06	20.04	18.51	19.26
6	12.19	9.40	10.83	12.74	8.48	10.01	18.27	16.48	16.98	20.79	18.29	18.72
7	11.47	8.78	10.25	13.70	8.37	10.56	19.63	16.45	17.72	21.64	20.23	20.54
8	12.82	8.45	11.21	14.15	9.20	11.73	18.22	16.80	17.31	21.41	20.33	20.93
9	12.77	9.34	11.52	13.76	10.75	12.79	17.96	17.01	17.44	22.28	21.02	21.45
10	13.39	9.65	11.85	12.78	9.92	11.46	18.04	15.27	16.29	22.45	20.19	21.10
11	12.82	10.87	11.64	11.68	8.31	10.39	17.76	15.89	16.57	23.34	20.97	21.90
12	14.33	9.82	12.36	12.58	8.32	11.14	18.06	16.18	16.93	22.83	20.44	21.83
13	13.75	9.19	11.91	12.47	8.55	10.76	17.14	15.66	16.10	22.37	21.33	21.77
14	12.73	9.08	10.04	13.04	8.99	10.88	16.03	14.23	15.66	23.89	21.26	23.11
15	14.19	9.11	12.16	14.48	8.66	11.83	14.84	12.79	13.59	25.71	23.65	24.35
16	14.27	8.66	12.37	14.92	11.66	13.39	14.65	12.61	13.62	26.78	24.80	25.61
17	15.55	13.94	14.93	13.92	11.77	13.12	14.91	14.29	14.61	28.20	25.63	26.88
18	15.99	14.08	14.72	15.10	10.05	13.52	14.42	13.45	14.15	28.50	27.06	27.79
19	15.09	12.44	13.89	15.99	13.05	14.34	14.83	13.32	14.13	27.20	26.28	26.73
20	14.15	12.74	13.46	16.53	14.57	15.60	15.09	13.54	14.39	27.80	26.40	26.90
21	13.52	11.27	12.04	18.67	15.80	17.56	15.42	14.60	14.89	28.09	27.01	27.46
22	15.25	11.75	13.75	18.88	16.54	17.88	15.79	13.43	14.47	28.01	27.11	27.35
23	14.80	10.86	13.11	20.29	17.90	19.18	16.01	13.93	14.88	27.76	27.04	27.29
24	14.64	13.61	14.13	21.14	20.04	20.61	14.64	12.42	13.64	27.72	26.44	27.12
25	15.51	12.89	14.14	21.40	20.04	20.60	14.59	11.79	13.09	27.24	25.21	26.36
26	14.99	11.49	13.46	20.88	18.71	19.75	15.96	14.25	15.18	26.86	24.54	25.11
27	13.66	8.71	10.81	18.73	17.65	18.03	16.23	14.80	15.59	24.80	24.13	24.40
28	13.99	8.17	11.16	17.90	16.57	17.68	16.00	14.79	15.12	24.55	23.96	24.16
29	---	---	---	17.47	15.01	16.67	16.64	15.29	15.76	---	---	---
30	---	---	---	17.73	15.25	16.01	15.88	15.29	15.51	---	22.86	---
31	---	---	---	16.12	13.72	14.72	---	---	---	24.07	22.07	22.50
MONTH	15.99	8.17	12.38	---	8.03	---	19.63	11.79	15.32	---	---	---
DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
JUNE				JULY			AUGUST			SEPTEMBER		
1	22.50	21.79	22.26	16.05	15.51	15.77	14.53	10.70	12.10	11.94	8.05	10.42
2	22.81	20.57	22.19	16.13	14.84	15.53	12.59	10.25	11.66	11.73	9.56	11.07
3	23.11	21.66	22.24	16.20	14.01	15.05	14.81	12.38	13.85	11.84	9.96	10.89
4	23.18	21.94	22.71	14.36	13.13	13.68	14.81	12.82	14.06	11.81	8.06	9.61
5	23.01	20.17	21.95	13.44	12.95	13.20	14.63	10.87	13.05	11.67	7.85	9.30
6	20.40	18.69	19.50	16.10	12.94	14.49	14.69	12.97	14.14	9.45	7.34	8.34
7	21.41	17.42	19.40	15.79	15.08	15.34	12.97	10.67	11.13	11.26	7.43	9.08
8	22.22	20.94	21.59	16.05	14.83	15.12	11.23	9.05	10.27	11.45	9.11	10.48
9	22.43	21.81	22.09	15.97	13.30	14.20	13.05	10.21	11.48	11.75	9.61	10.95
10	21.92	19.63	20.60	14.64	12.12	13.35	12.28	9.32	10.52	12.23	9.18	10.99
11	---	---	---	14.31	11.53	12.43	12.94	9.32	11.13	12.08	9.05	10.41
12	22.15	---	---	15.40	11.41	13.21	13.14	9.88	11.82	9.61	7.72	8.39
13	21.79	19.28	20.27	15.73	13.43	14.31	12.96	9.37	10.44	10.83	7.16	9.56
14	20.36	18.62	19.10	15.66	13.12	14.32	10.19	9.22	9.64	9.47	7.34	8.53
15	18.72	15.94	17.44	16.07	11.73	14.28	10.63	9.59	10.05	11.17	7.44	9.79
16	17.75	16.48	16.85	15.05	11.53	12.79	12.12	9.50	10.48	11.45	7.93	9.70
17	17.63	16.48	17.24	15.63	12.36	14.41	13.15	9.08	11.60	11.44	8.56	9.67
18	---	---	---	15.25	14.03	14.77	14.70	12.01	13.57	9.85	8.10	8.89
19	---	17.54	---	15.93	13.06	15.11	14.71	11.50	12.45	9.63	7.37	8.31
20	18.09	17.17	17.50	15.41	12.23	14.36	13.28	11.13	11.82	9.21	7.10	8.08
21	17.53	16.24	17.13	16.66	14.00	15.59	11.99	9.34	10.12	10.89	8.26	9.71
22	17.44	16.98	17.18	16.82	12.52	14.99	10.39	9.11	9.63	11.99	8.59	10.38
23	17.77	17.03	17.26	14.89	13.41	14.27	10.37	9.43	9.79	11.67	9.44	10.26
24	18.38	17.64	17.90	15.48	13.52	14.42	10.37	8.59	9.45	10.50	8.23	9.29
25	18.25	17.09	17.28	14.68	12.01	12.91	12.21	8.28	11.10	9.06	6.91	7.63
26	17.49	14.36	16.23	15.28	12.60	13.78	12.89	9.02	11.05	7.69	6.22	6.94
27	16.01	14.15	14.79	14.93	14.48	14.64	12.80	10.38	11.14	10.34	6.46	8.96
28	---	---	---	14.97	13.01	14.00	10.38	8.23	9.11	11.87	8.05	9.87
29	17.37	15.89	16.37	15.83	12.29	14.43	11.30	7.58	8.85	12.16	8.12	10.44
30	17.58	15.75	16.32	15.75	13.62	15.13	11.37	8.04	9.30	13.02	9.11	11.19
31	---	---	---	15.71	14.14	14.78	11.51	7.42	9.35	---	---	---
MONTH	---	---	---	16.82	11.41	14.34	14.81	7.42	11.10	13.02	6.22	9.57

14128910 COLUMBIA RIVER AT WARRENDALE, OR
(National stream quality accounting network station)

LOCATION.--Lat 45°36'45", long 122°01'35", in NE 1/4 SE 1/4 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.

PERIOD OF RECORD.--Water years 1974 to September 1992 (discontinued).

PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: October 1975 to September 1992 (discontinued).

WATER TEMPERATURE: October 1975 to September 1992 (discontinued).

INSTRUMENTATION.--Specific conductance and temperature recorders from October 1975 to September 1992 (discontinued).

EXTREMES FOR PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: Maximum, 244 microsiemens Jan. 7, 1988; minimum, 95 microsiemens June 26, 27, 1982.

WATER TEMPERATURE: Maximum, 22.5°C Aug. 17, 18, 1977, Aug. 11, 1980, July 31, 1992; minimum recorded, 0.0°C many days in January and February, 1979.

WATER-QUALITY DATA

DATE	TIME	DIS-CHARGE, IN CUBIC FEET PER SECOND	SPE-CIFIC CON-DUCT-ANCE (US/CM)	PH WATER WHOLE FIELD (STAND-ARD UNITS)	TEMPER-ATURE WATER (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-TOCOCCHI, KF AGAR (COLS. PER 100 ML)	HARD-NESS, TOTAL (MG/L AS CaCO3)
NOV 1992 18...	1203	E123000	166	8.1	11.5	1.2	10.2	94	K14	K5	66
JAN 1993 26...	1026	E127000	161	8.2	1.5	1.5	13.6	97	K4	<1	70
JUN 25...	0940	211000	112	8.2	17.0	1.7	10.6	111	K5	K2	46
AUG 04...	1029	152000	130	8.1	20.5	1.4	9.5	107	K5	27	57
DATE	CALCIUM, DIS-SOLVED (MG/L AS Ca)	MAGNE-SIUM, DIS-SOLVED (MG/L AS Mg)	SODIUM, DIS-SOLVED (MG/L AS Na)	SODIUM PERCENT	SODIUM AD-SORP-TION RATIO	POTAS-SIUM, DIS-SOLVED (MG/L AS K)	ALKA-LINITY, DIS IT FIELD (MG/L AS CaCO3)	BICAR-BONATE, DIS IT FIELD (MG/L AS HCO3)	CAR-BONATE, DIS IT FIELD (MG/L AS CO3)	SULFATE, DIS-SOLVED (MG/L AS SO4)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)
NOV 1992 18...	18	5.0	6.3	17	0.3	1.1	62	76	0	12	3.0
JAN 1993 26...	19	5.4	5.5	14	0.3	1.1	67	82	0	12	2.8
JUN 25...	13	3.3	5.1	19	0.3	1.1	44	54	0	7.1	2.2
AUG 04...	16	4.1	4.7	15	0.3	1.1	51	62	0	8.6	1.8
DATE	FLUO-RIDE, DIS-SOLVED (MG/L AS F)	SILICA, DIS-SOLVED (MG/L AS SiO2)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L)	SOLIDS, DIS-SOLVED (TONS PER AC-FT)	SOLIDS, DIS-SOLVED (TONS PER DAY)	NITRO-GEN, AMMONIA DIS-SOLVED (MG/L AS N)	NITRO-GEN, AMMONIA TOTAL (MG/L AS N)	NITRO-GEN, NITRITE TOTAL (MG/L AS N)	NITRO-GEN, NITRITE DIS-SOLVED (MG/L AS N)	NITRO-GEN, AM-MONIA + ORGANIC TOTAL (MG/L AS N)
NOV 1992 18...	0.2	7.3	95	91	0.13	--	0.02	0.02	0.01	0.01	<0.2
JAN 1993 26...	0.1	7.9	98	95	0.13	--	<0.01	--	--	0.02	<0.2
JUN 25...	0.2	10	71	69	0.10	40400	0.01	--	--	<0.01	<0.2
AUG 04...	0.1	9.2	78	77	0.11	32000	0.02	--	--	<0.01	<0.2
DATE	NITRO-GEN, NO2+NO3 TOTAL (MG/L AS N)	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N)	PHOS-PHORUS, DIS-SOLVED (MG/L AS P)	PHOS-PHORUS, DIS-SOLVED (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)	BARIUM, DIS-SOLVED (UG/L AS BA)	COBALT, DIS-SOLVED (UG/L AS CO)	IRON, DIS-SOLVED (UG/L AS FE)	LITHIUM, DIS-SOLVED (UG/L AS LI)
NOV 1992 18...	0.19	0.170	0.02	0.02	0.03	0.02	<10	23	<3	4	<4
JAN 1993 26...	--	0.240	0.02	0.01	0.01	--	120	27	<3	6	<4
JUN 25...	--	0.077	0.03	0.02	0.02	--	20	17	<3	20	<4
AUG 04...	--	0.085	0.03	<0.01	<0.01	--	<10	23	<3	9	<4
DATE	MANGA-NESE, DIS-SOLVED (UG/L AS MN)	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)	SEDI-MENT, SUS-PENDED (MG/L)	SEDI-MENT, DIS-CHARGE, SUS-PENDED (T/DAY)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM	
NOV 1992 18...	<1	<10	<1	<1	<1	100	<6	4	--	95	
JAN 1993 26...	<1	<10	<1	<1	<1	93	<6	3	--	85	
JUN 25...	1	<10	<1	<1	<1	69	<6	11	6270	91	
AUG 04...	<1	20	<1	<1	<1	79	<6	9	3690	83	

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

COLUMBIA RIVER MAIN STEM

14129400 COLUMBIA RIVER AT WASHOUGAL, WA

LOCATION.--Lat 45°34'30", long 122°21'10", in SE 1/4 sec.18, T.1 N., R.4 E., Clark County, Hydrologic Unit 17080001, on right bank on rock-fill point at south end of 17th Street, in Washougal, and at river mile 122.9.

DRAINAGE AREA.--240,000 mi², approximately.

PERIOD OF RECORD.--October 1971 to September 1981, February 1990 to September 1993 (discontinued), gage heights only.

GAGE.--Water stage recorder. Datum of gage is sea level.

REMARKS.--Flow regulated by many reservoirs upstream.

EXTREMES FOR PERIOD OF RECORD.--Maximum recorded gage height, 28.87 ft June 19, 1972; minimum, 3.68 ft July 10, 1977.

EXTREMES FOR CURRENT YEAR.--Maximum gage height, 20.52 ft May 18; minimum, 3.74 ft Sept. 26.

GAGE HEIGHT, FEET, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
OCTOBER				NOVEMBER			DECEMBER			JANUARY		
1	8.40	5.97	6.95	7.29	5.24	5.97	8.82	7.51	8.17	9.46	8.40	8.97
2	7.79	5.51	6.17	6.67	5.41	6.03	8.47	6.52	7.60	8.91	8.05	8.36
3	6.91	5.07	5.67	6.42	5.58	6.04	9.10	7.25	8.15	9.07	7.96	8.50
4	6.08	4.62	5.42	6.41	4.77	5.79	9.52	8.77	9.18	9.37	8.25	8.83
5	6.02	4.57	5.34	6.54	5.36	6.06	9.41	7.63	8.38	9.84	8.39	9.17
6	5.79	4.65	5.31	6.86	4.91	6.03	9.49	7.85	8.68	10.76	9.55	10.04
7	5.52	4.24	4.95	7.37	5.42	6.41	9.98	8.46	9.10	10.87	9.76	10.25
8	6.54	4.69	5.58	7.39	5.37	6.25	10.57	8.77	9.46	11.20	10.20	10.65
9	6.38	5.02	5.80	8.11	5.64	6.85	10.43	9.44	9.88	10.91	10.17	10.52
10	6.35	4.85	5.69	8.51	6.46	7.46	11.20	9.42	10.12	10.95	9.77	10.26
11	6.23	4.53	5.44	8.43	5.60	6.83	11.67	10.41	10.93	11.02	10.27	10.77
12	6.80	4.53	5.58	8.05	5.52	6.83	11.62	9.68	10.33	10.96	8.97	9.82
13	7.38	5.18	6.20	7.46	5.50	6.44	10.48	8.55	9.16	10.36	9.09	9.88
14	7.21	5.31	6.18	7.73	5.87	6.73	9.35	7.90	8.78	10.29	9.19	9.87
15	7.10	5.74	6.32	7.72	5.81	6.60	10.11	8.55	9.48	9.73	8.61	9.21
16	6.88	4.93	5.72	7.54	5.59	6.33	10.12	9.09	9.64	8.63	7.57	8.24
17	6.24	4.28	5.30	7.66	5.13	6.36	10.68	9.79	10.19	7.61	6.28	7.14
18	6.81	4.34	5.19	7.66	5.65	6.89	10.32	8.50	9.29	8.22	5.93	7.00
19	6.81	5.64	6.19	8.06	5.99	7.13	9.41	7.89	8.77	9.68	7.88	8.66
20	6.58	5.13	5.98	7.45	5.43	6.47	9.41	8.31	8.93	9.80	8.31	9.06
21	6.77	5.22	6.06	9.83	5.78	7.43	9.52	8.39	8.89	9.41	7.66	8.37
22	6.53	5.02	5.86	10.41	8.96	9.59	9.58	8.46	8.99	9.74	8.48	9.06
23	6.98	4.89	5.88	11.10	9.08	10.02	9.68	8.66	9.18	9.77	9.39	9.57
24	6.97	4.85	5.81	10.92	9.95	10.30	9.63	7.64	8.49	9.51	7.97	8.67
25	6.91	4.88	5.79	10.29	8.78	9.41	8.37	6.99	7.51	9.66	7.27	8.36
26	7.29	4.89	6.02	9.74	8.27	8.83	8.08	6.33	7.17	9.80	8.07	9.20
27	7.82	5.40	6.54	9.00	6.80	7.41	7.95	6.48	7.17	9.80	8.67	9.30
28	7.74	5.55	6.54	8.10	6.37	7.05	9.51	6.38	8.09	9.34	8.12	8.60
29	8.20	5.55	6.69	7.70	5.90	6.61	9.93	8.77	9.52	8.13	6.91	7.54
30	8.54	6.18	7.29	7.57	5.61	6.87	9.91	8.65	9.40	7.94	6.20	7.26
31	8.50	5.84	6.57	---	---	---	10.25	9.31	9.76	7.94	6.10	6.92
MONTH	8.54	4.24	5.94	11.10	4.77	7.10	11.67	6.33	8.98	11.20	5.93	8.97

COLUMBIA RIVER MAIN STEM

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14129400 COLUMBIA RIVER AT WASHOUGAL, WA--Continued

GAGE HEIGHT, FEET, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
FEBRUARY				MARCH			APRIL			MAY		
1	8.09	6.07	7.23	7.72	5.61	6.65	9.52	8.52	9.17	12.34	9.96	11.32
2	8.22	6.99	7.70	7.93	6.25	7.26	9.12	8.52	8.83	12.32	11.09	11.82
3	8.86	6.94	7.88	7.93	5.31	6.96	10.68	8.78	9.78	11.97	10.89	11.27
4	8.46	7.31	7.95	7.35	5.10	6.15	11.26	10.57	10.84	12.52	11.65	12.16
5	8.62	7.27	7.91	7.84	6.19	6.90	12.61	10.92	11.68	13.46	12.52	13.16
6	8.43	6.81	7.54	8.14	5.78	6.93	12.61	11.75	12.15	13.39	12.95	13.13
7	8.21	6.52	7.32	8.49	6.41	7.22	13.08	11.86	12.37	14.58	13.39	14.14
8	8.80	6.14	7.71	8.97	6.69	7.75	13.00	12.08	12.39	15.07	14.58	14.76
9	8.84	6.77	8.00	9.06	7.75	8.57	12.62	12.03	12.30	15.41	14.83	15.12
10	8.57	6.73	7.98	8.87	7.47	8.03	12.40	11.07	11.78	15.46	14.57	15.05
11	8.60	7.24	7.98	7.73	6.10	7.05	12.03	11.39	11.64	15.87	15.06	15.43
12	8.91	6.60	7.94	7.86	5.82	7.13	12.29	11.58	11.92	15.59	14.53	15.27
13	8.03	6.29	7.55	7.69	6.24	7.06	11.75	10.74	11.28	15.11	14.67	14.93
14	7.94	5.67	6.70	7.82	6.02	7.12	10.84	10.35	10.58	16.36	14.96	15.71
15	8.07	5.58	6.90	8.53	5.95	7.35	10.35	8.50	9.37	17.42	16.36	16.86
16	8.24	5.87	7.24	9.05	7.85	8.55	9.09	8.43	8.73	18.34	17.42	18.05
17	9.19	8.00	8.62	9.34	8.38	8.90	9.71	9.04	9.48	19.95	18.03	18.94
18	9.52	8.80	9.14	10.32	8.27	9.36	9.67	9.19	9.46	20.52	19.78	20.22
19	9.19	8.44	8.81	10.69	9.87	10.20	9.54	8.93	9.25	19.78	19.32	19.51
20	8.98	8.14	8.64	11.23	10.20	10.89	9.82	9.19	9.52	19.57	19.37	19.45
21	8.56	7.45	7.99	12.82	11.01	11.91	10.08	9.55	9.84	19.79	19.35	19.56
22	9.34	7.23	8.44	13.22	12.13	12.60	9.98	9.19	9.60	19.43	19.28	19.38
23	9.08	7.82	8.44	14.86	13.13	13.86	10.28	9.42	9.83	19.43	19.29	19.35
24	9.11	8.46	8.80	15.53	14.86	15.18	10.11	9.08	9.49	19.37	18.85	19.21
25	9.18	8.18	8.80	15.58	14.97	15.30	9.51	8.40	8.94	18.96	17.89	18.62
26	9.02	7.84	8.50	15.14	14.04	14.59	10.54	9.45	10.10	17.89	16.99	17.46
27	8.21	6.15	6.83	14.04	12.67	13.17	10.78	10.11	10.51	16.99	16.49	16.74
28	7.63	6.31	6.83	12.67	11.83	12.30	10.47	9.94	10.12	16.55	16.26	16.44
29	---	---	---	12.06	10.68	11.23	10.52	10.03	10.29	16.48	16.17	16.34
30	---	---	---	11.30	10.31	10.55	10.39	9.97	10.25	16.32	15.54	15.91
31	---	---	---	10.32	9.07	9.55	---	---	---	15.82	15.10	15.44
MONTH	9.52	5.58	7.91	15.58	5.10	9.56	13.08	8.40	10.38	20.52	9.96	16.15

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
JUNE				JULY			AUGUST			SEPTEMBER		
1	15.35	15.10	15.24	10.81	10.21	10.47	9.29	7.07	8.15	7.66	5.58	6.70
2	15.67	14.93	15.30	10.52	10.05	10.28	7.83	6.55	7.38	7.71	6.45	7.13
3	15.85	15.45	15.62	10.44	9.59	10.09	9.31	7.51	8.56	7.70	6.38	7.01
4	16.25	15.85	16.11	9.61	8.71	9.17	9.67	8.51	9.14	7.67	5.36	6.28
5	16.19	15.14	15.95	9.11	8.29	8.68	9.36	7.46	8.31	7.25	5.31	6.07
6	15.14	13.48	14.19	10.15	8.27	9.07	9.36	8.62	8.96	6.65	4.73	5.45
7	14.26	12.88	13.46	10.15	9.64	9.88	9.07	6.53	7.39	7.08	4.53	5.46
8	15.33	14.26	14.85	10.10	9.41	9.76	7.47	5.89	6.51	7.21	5.59	6.22
9	15.64	15.33	15.50	10.12	8.61	9.15	7.78	6.28	6.83	7.33	5.95	6.48
10	15.63	14.04	14.83	9.02	7.72	8.27	7.85	5.92	6.45	7.04	6.07	6.51
11	14.05	13.07	13.65	9.00	6.97	7.88	7.44	5.77	6.43	7.43	5.69	6.49
12	14.22	13.07	13.51	8.90	7.18	7.73	7.82	6.23	6.96	6.40	4.55	5.48
13	14.66	13.28	13.98	9.63	8.26	8.89	7.86	5.44	6.55	6.62	4.85	6.05
14	---	---	---	9.14	8.41	8.76	6.74	5.44	6.07	6.40	5.12	5.82
15	---	---	---	9.40	8.21	8.76	7.11	5.55	6.39	7.29	4.91	6.28
16	---	---	---	9.34	7.29	8.25	7.19	5.79	6.60	7.47	5.58	6.59
17	---	---	---	9.51	7.91	8.94	8.24	6.06	7.28	7.41	5.85	6.72
18	---	---	---	9.97	9.13	9.55	9.30	7.48	8.49	7.25	5.29	6.22
19	---	---	---	10.22	9.05	9.74	9.28	7.62	8.28	7.01	4.83	5.88
20	---	---	---	10.05	8.86	9.47	8.50	7.06	7.84	6.87	4.64	5.52
21	---	---	---	10.67	8.96	9.87	8.12	5.85	6.84	6.78	5.41	6.01
22	---	---	---	10.76	9.03	10.11	7.42	5.51	6.37	7.34	5.41	6.13
23	11.30	10.88	11.09	9.92	8.99	9.37	7.42	5.82	6.47	7.36	5.77	6.22
24	11.83	11.18	11.39	10.02	9.04	9.38	7.31	5.46	6.04	6.56	5.06	5.64
25	11.89	10.79	11.19	9.80	7.67	8.45	6.94	6.07	6.55	5.74	4.06	4.89
26	11.16	9.60	10.49	9.13	8.01	8.55	7.05	6.37	6.63	5.27	3.74	4.54
27	9.71	8.84	9.17	9.63	8.91	9.25	7.36	6.10	6.77	6.37	3.86	5.37
28	9.65	8.82	9.21	9.67	8.43	8.92	6.38	5.13	5.77	6.98	5.27	6.04
29	10.73	9.65	10.51	9.69	8.51	9.22	6.26	4.70	5.56	7.39	5.89	6.48
30	11.20	10.32	10.83	9.72	8.55	9.50	6.46	4.90	5.94	7.92	5.94	6.78
31	---	---	---	10.25	9.05	9.58	7.12	5.20	6.07	---	---	---
MONTH	---	---	---	10.81	6.97	9.19	9.67	4.70	7.02	7.92	3.74	6.08

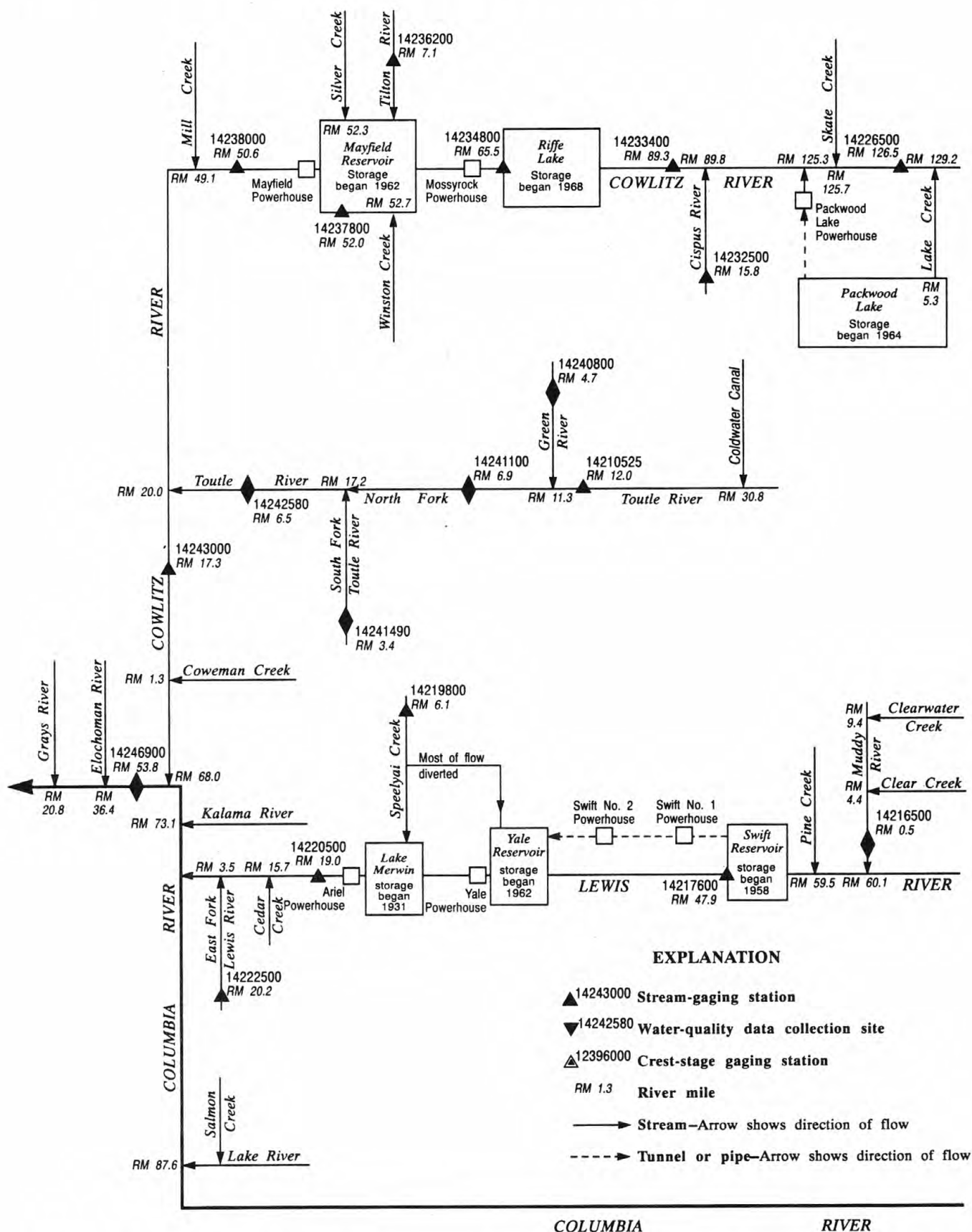


Figure 26. Gaging stations in Lewis and Cowlitz River Basins, and downstream to mouth of Columbia River.

14216500 MUDDY RIVER BELOW CLEAR CREEK, NEAR COUGAR, WA

LOCATION.-- Lat 46°04'33", long 121°59'51", in NE 1/4 SE 1/4 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.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--August 1927 to September 1934, October 1954 to December 1973 (destroyed by flood of January 1974), October 1983 to current year. 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 and crest-stage gage. Datum of gage is 1,032.90 ft above sea level.

AVERAGE DISCHARGE.--36 years (1928-34, 1954-73, 1984-93), 847 ft³/s, 85.20 in/yr, 613,700 acre-ft/yr.

REMARKS.--Records good except for estimated daily discharges, which are fair. No regulation or diversion upstream from station. U.S. Geological Survey telemeter at 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, 64 ft³/s Dec. 29, 1990.

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)
Mar. 23	0745	*7,310	*23.72	No other peak greater than base discharge.			
Minimum daily discharge, 110 ft ³ /s Oct. 15, 16.							

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	129	1060	600	275	e587	370	1260	1910	787	360	235	157
2	129	982	581	241	e535	364	1640	1760	712	351	232	156
3	126	780	512	266	e494	491	2190	1830	671	342	228	154
4	123	776	475	e344	e460	890	2320	1760	637	334	223	152
5	120	644	444	e311	e445	1020	1960	1640	620	327	217	151
6	117	580	431	e287	e433	1150	1720	1620	600	317	215	150
7	116	868	411	e291	e432	1240	1530	1620	584	308	211	148
8	114	768	430	217	e454	1310	1730	1520	556	301	206	147
9	113	716	417	203	e471	1310	2290	1380	630	293	203	146
10	112	636	447	204	e467	1250	2390	1390	599	288	201	144
11	112	652	436	206	e438	1160	2160	1600	600	284	199	142
12	112	640	379	203	e409	1060	1870	1810	569	278	197	142
13	112	602	354	202	e384	995	1650	1840	536	280	195	141
14	111	572	392	200	e357	1250	1460	1650	527	280	193	141
15	110	547	375	196	e334	2030	1480	1460	537	270	190	141
16	110	523	348	191	e295	1990	1390	1360	520	280	190	139
17	112	513	348	187	e272	1980	1570	1330	499	278	189	137
18	122	505	311	183	e277	2120	1590	1340	488	259	185	136
19	159	635	311	191	e272	2000	1500	1360	475	275	182	135
20	e133	538	349	453	e263	2200	1420	1330	457	286	180	135
21	e127	1070	363	412	e251	2060	1500	1300	445	267	179	134
22	e126	1240	395	229	e238	3050	1580	1180	530	301	174	132
23	e124	1030	484	188	e226	6170	1700	1040	501	297	190	131
24	e123	913	422	243	e216	3830	2050	956	442	268	185	129
25	e122	813	390	361	e205	2700	2650	910	421	260	179	129
26	e122	723	391	e1310	e196	2220	3110	850	409	254	173	127
27	e131	838	375	e1070	365	1780	2840	823	402	248	169	125
28	154	735	364	e946	361	1490	2400	787	398	247	167	124
29	e340	618	346	e846	---	1320	2150	749	389	267	165	124
30	e480	657	309	e735	---	1210	1990	746	369	265	162	124
31	957	---	295	e654	---	1130	---	848	---	242	160	---
TOTAL	5198	22174	12485	11845	10137	53140	57090	41699	15910	8907	5974	4173
MEAN	168	739	403	382	362	1714	1903	1345	530	287	193	139
MAX	957	1240	600	1310	587	6170	3110	1910	787	360	235	157
MIN	110	505	295	183	196	364	1260	746	369	242	160	124
AC-FT	10310	43980	24760	23490	20110	105400	113200	82710	31560	17670	11850	8280
CFSM	1.24	5.48	2.98	2.83	2.68	12.7	14.1	9.96	3.93	2.13	1.43	1.03
IN.	1.43	6.11	3.44	3.26	2.79	14.64	15.73	11.49	4.38	2.45	1.65	1.15

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1928 - 1993, BY WATER YEAR (WY)

	MEAN	326	1075	1142	1137	1139	1132	1266	1269	864	379	206	185
MAX	958	2609	2828	2263	2678	2841	1903	2467	2341	1163	438	385	
(WY)	1956	1984	1974	1959	1968	1972	1993	1956	1933	1971	1933	1968	
MIN	107	102	313	365	254	386	620	425	194	143	116	122	
(WY)	1988	1930	1931	1985	1929	1955	1973	1934	1992	1992	1992	1934	

SUMMARY STATISTICS	FOR 1992 CALENDAR YEAR	FOR 1993 WATER YEAR	WATER YEARS 1928 - 1993
ANNUAL TOTAL	209904	248732	
ANNUAL MEAN	574	681	841
HIGHEST ANNUAL MEAN			1297
LOWEST ANNUAL MEAN			566
HIGHEST DAILY MEAN	6070	Jan 28	10200
LOWEST DAILY MEAN	102	Sep 3	94
ANNUAL SEVEN-DAY MINIMUM	105	Aug 28	95
ANNUAL RUNOFF (AC-FT)	416300	493400	609400
ANNUAL RUNOFF (CFSM)	4.25	5.05	6.23
ANNUAL RUNOFF (INCHES)	57.84	68.54	84.66
10 PERCENT EXCEEDS	1160	1670	1800
50 PERCENT EXCEEDS	393	398	609
90 PERCENT EXCEEDS	113	135	156

e Estimated

LEWIS RIVER BASIN

14216500 MUDDY RIVER BELOW CLEAR CREEK, NEAR COUGAR, WA--Continued

WATER-QUALITY RECORDS

PERIOD OF DAILY RECORD.--

SUSPENDED SEDIMENT DISCHARGE: October 1983 to current year. Records prior to October 1985 are published in U.S. Geological Survey Open-File Report 85-632; records for 1984-87 are published in U.S. Geological Survey Open-File Report 91-219.

INSTRUMENTATION.--Water-quality monitor May 1990 to September 1991. Automatic pumping sediment sampler since June 1981.

EXTREMES FOR PERIOD OF DAILY RECORD.--

SEDIMENT CONCENTRATION: Maximum daily, 37,800 mg/L Oct. 26, 1986; minimum, 2 mg/L Apr. 2, 1992.

SEDIMENT DISCHARGE: Maximum daily, 290,000 tons Jan. 9, 1990; minimum, 1.0 tons Sept. 25, 30, 1989.

EXTREMES FOR CURRENT YEAR.--

SEDIMENT CONCENTRATION: Maximum daily, 6,510 mg/L Mar. 23; minimum, 3 mg/L on several days.

SEDIMENT DISCHARGE: Maximum daily, 111,000 tons Mar. 23; minimum, 1.6 tons on several days.

WATER-QUALITY DATA DECEMBER 1987 TO MARCH 1993

DATE	TIME	TEMPER- ATURE WATER (DEG C)	DIS- CHARGE, INST. CUBIC FEET PER SECOND	SEDI- MENT, DIS- CHARGE, SUS- PENDED (MG/L)	SEDI- MENT, DIS- CHARGE, SUS- PENDED (T/DAY)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM	SED. SUSP. SIEVE DIAM. % FINER THAN .125 MM	SED. SUSP. SIEVE DIAM. % FINER THAN .250 MM	SED. SUSP. SIEVE DIAM. % FINER THAN .500 MM	SED. SUSP. SIEVE DIAM. % FINER THAN 1.00 MM	SED. SUSP. SIEVE DIAM. % FINER THAN 2.00 MM	SED. SUSP. FALL DIAM. % FINER THAN .002 MM
DEC 1987												
03...	1355	4.0	2360	3030	19300	--	--	--	--	--	--	--
07...	1337	5.0	3140	2820	23900	--	--	--	--	--	--	--
10...	1012	5.5	6730	6470	118000	--	--	--	--	--	--	6
10...	1013	5.5	6740	6620	120000	--	--	--	--	--	--	--
10...	1235	5.0	6190	5540	92600	--	--	--	--	--	--	--
JAN 1988												
14...	1440	1.0	4070	15800	174000	--	--	--	--	--	--	7
15...	1153	2.0	2070	1770	9890	--	--	--	--	--	--	4
28...	1308	4.0	650	331	581	--	--	--	--	--	--	--
FEB												
11...	1430	7.0	1290	551	1920	--	--	--	--	--	--	--
25...	1240	8.0	770	185	385	26	33	50	82	95	98	--
MAR												
10...	1430	6.0	1250	305	1030	23	31	52	83	94	97	--
22...	1310	5.5	929	307	770	24	33	50	74	86	92	--
APR												
20...	1347	8.5	1230	203	674	--	--	--	--	--	--	--
NOV												
02...	1349	8.5	1230	35500	118000	47	90	100	100	100	--	7
02...	1350	8.5	1230	16700	55500	--	--	--	--	--	--	--
MAR 1989												
14...	1329	4.5	2650	608	4350	--	--	--	--	--	--	--
31...	1312	6.0	1480	134	535	--	--	--	--	--	--	--
APR												
19...	1330	9.0	1930	266	1390	--	--	--	--	--	--	--
DEC												
04...	1502	8.0	8410	7140	162000	--	--	--	--	--	--	5
JAN 1990												
10...	1612	5.0	6780	4380	80200	--	--	--	--	--	--	--
10...	1614	5.0	6770	4220	77100	--	--	--	--	--	--	7
12...	1346	5.0	2840	1320	10100	--	--	--	--	--	--	--
NOV												
26...	1427	6.0	3150	1320	11200	--	--	--	--	--	--	--
MAR 1991												
05...	1605	5.0	2370	670	4290	--	--	--	--	--	--	--
APR												
05...	1608	6.5	7520	3630	73700	--	--	--	--	--	--	8
JAN 1992												
29...	1158	--	5790	4160	65000	18	28	55	85	96	99	--
APR												
20...	1412	10.0	1450	169	662	--	--	--	--	--	--	--
SEP												
24...	1405	12.0	526	3700	5250	--	--	--	--	--	--	29
25...	1322	--	253	1400	956	--	--	--	--	--	--	--
OCT												
30...	1320	7.5	1080	4710	13700	--	--	--	--	--	--	--
MAR 1993												
15...	1241	5.5	2040	743	4090	--	--	--	--	--	--	--
23...	1246	7.5	6280	3370	57100	29	42	65	88	98	100	6

LEWIS RIVER BASIN

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14216500 MUDDY RIVER BELOW CLEAR CREEK, NEAR COUGAR, WA--Continued

WATER-QUALITY DATA DECEMBER 1987 TO MARCH 1993

DATE	SED. SUSP. FALL DIAM. % FINER THAN .004 MM	SED. SUSP. FALL DIAM. % FINER THAN .008 MM	SED. SUSP. FALL DIAM. % FINER THAN .016 MM	SED. SUSP. FALL DIAM. % FINER THAN .031 MM	SED. SUSP. FALL DIAM. % FINER THAN .062 MM	SED. SUSP. FALL DIAM. % FINER THAN .125 MM	SED. SUSP. FALL DIAM. % FINER THAN .250 MM	SED. SUSP. FALL DIAM. % FINER THAN .500 MM	SED. SUSP. FALL DIAM. % FINER THAN 1.00 MM	SED. SUSP. FALL DIAM. % FINER THAN 2.00 MM	BED MAT. SIEVE DIAM. % FINER THAN 4.00 MM
DEC 1987											
03...	--	--	--	--	30	46	72	94	100	--	--
07...	--	--	--	--	27	40	65	85	99	100	--
10...	7	8	16	24	35	52	77	93	99	100	--
10...	--	--	--	--	34	51	76	92	99	100	--
10...	--	--	--	--	33	49	73	89	99	100	--
JAN 1988											
14...	7	11	22	32	44	64	86	97	100	--	--
15...	5	7	13	19	27	40	68	89	99	100	--
28...	--	--	--	--	28	36	58	97	100	--	--
FEB											
11...	--	--	--	--	20	29	62	95	100	--	--
25...	--	--	--	--	--	--	--	--	--	--	100
MAR											
10...	--	--	--	--	--	--	--	--	--	--	100
22...	--	--	--	--	--	--	--	--	--	--	100
APR											
20...	--	--	--	--	28	34	53	92	100	--	--
NOV											
02...	8	9	17	28	--	--	--	--	--	--	--
02...	--	--	--	--	76	91	97	100	100	--	--
MAR 1989											
14...	--	--	--	--	28	41	67	95	100	--	--
31...	--	--	--	--	38	48	71	99	100	--	--
APR											
19...	--	--	--	--	41	52	74	96	100	--	--
DEC											
04...	8	12	21	32	42	65	98	99	100	--	--
JAN 1990											
10...	--	--	--	--	39	56	80	95	100	--	--
10...	8	11	20	29	39	57	80	96	100	--	--
12...	--	--	--	--	32	44	67	92	98	100	--
NOV											
26...	--	--	--	--	22	33	55	85	98	100	--
MAR 1991											
05...	--	--	--	--	26	32	47	86	100	--	--
APR											
05...	8	12	20	28	36	52	78	95	99	100	--
JAN 1992											
29...	--	--	--	--	--	--	--	--	--	--	100
APR											
20...	--	--	--	--	39	55	70	94	100	--	--
SEP											
24...	36	42	48	52	53	87	98	99	100	--	--
25...	--	--	--	--	46	72	91	95	100	--	--
OCT											
30...	--	--	--	--	23	59	91	99	100	--	--
MAR 1993											
15...	--	--	--	--	23	34	52	82	100	--	--
23...	6	8	14	21	--	--	--	--	--	--	100

LEWIS RIVER BASIN

14216500 MUDDY RIVER BELOW CLEAR CREEK, NEAR COUGAR, WA--Continued

SEDIMENT DISCHARGE, SUSPENDED (TONS/DAY), WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DAY	MEAN DISCHARGE (CFS)	MEAN CONCENTRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCENTRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCENTRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)
OCTOBER			NOVEMBER			DECEMBER			
1	129	333	116	1060	2510	7400	600	---	340
2	129	216	76	982	1320	3620	581	---	120
3	126	---	34	780	568	1210	512	---	190
4	123	---	31	776	683	1480	475	---	140
5	120	---	27	644	320	563	444	---	100
6	117	---	27	580	213	335	431	---	94
7	116	---	23	868	2100	5810	411	---	77
8	114	77	24	768	539	1120	430	---	92
9	113	123	38	716	359	700	417	---	82
10	112	---	36	636	314	540	447	---	110
11	112	---	33	652	313	556	436	---	98
12	112	---	33	640	271	470	379	---	55
13	112	---	31	602	266	434	354	---	39
14	111	---	25	572	296	457	392	---	62
15	110	---	22	547	277	410	375	---	52
16	110	---	20	523	201	285	348	---	38
17	112	---	20	513	191	265	348	---	38
18	122	---	36	505	188	258	311	---	23
19	159	---	110	635	657	1190	311	---	23
20	e133	---	110	538	194	285	349	---	39
21	e127	---	170	1070	2710	11700	363	---	45
22	e126	---	120	1240	1820	6220	395	---	68
23	e124	---	83	1030	917	2560	484	---	150
24	e123	---	78	913	---	1600	422	---	84
25	e122	---	75	813	---	1100	390	---	62
26	e122	---	76	723	---	680	391	---	62
27	e131	184	65	838	---	1200	375	---	52
28	154	295	126	735	---	720	364	---	47
29	e340	5300	4860	618	---	380	346	---	37
30	e480	6150	7980	657	---	490	309	---	23
31	957	5590	14400	---	---	---	295	---	19
TOTAL	5198	---	28905	22174	---	54038	12485	---	2461

DAY	MEAN DISCHARGE (CFS)	MEAN CONCENTRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCENTRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCENTRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)
JANUARY			FEBRUARY			MARCH			
1	275	---	14	e587	---	130	370	---	2.4
2	241	---	7.0	e535	---	92	364	---	2.2
3	266	---	11	e494	---	70	491	---	68
4	e344	---	37	e460	---	54	890	---	52
5	e311	---	23	e445	---	47	1020	---	800
6	e287	---	16	e433	---	43	1150	---	1200
7	e291	20	16	e432	---	43	1240	---	1500
8	217	---	4.2	e454	---	52	1310	---	1700
9	203	---	3.1	e471	---	58	1310	156	556
10	204	---	3.2	e467	---	57	1250	116	392
11	206	---	3.3	e438	---	44	1160	91	288
12	203	---	3.1	e409	---	35	1060	63	184
13	202	---	3.0	e384	---	28	995	54	146
14	200	---	2.8	e357	---	20	1250	190	760
15	196	---	2.5	e334	---	16	2030	853	4700
16	191	---	2.2	e295	---	9.6	1990	180	969
17	187	---	1.9	e272	---	6.9	1980	194	1050
18	183	---	1.8	e277	---	7.3	2120	245	1410
19	191	---	2.2	e272	---	6.9	2000	137	746
20	453	---	113	e263	---	6.0	2200	415	2540
21	412	---	79	e251	---	4.8	2060	166	929
22	229	---	5.8	e238	---	3.9	3050	3170	37600
23	188	---	2.0	e226	---	3.1	6170	6510	111000
24	243	---	7.7	e216	---	2.6	3830	2500	26500
25	361	---	45	e205	---	2.0	2700	1010	7540
26	e1310	---	1700	e196	3	1.6	2220	473	2880
27	e1070	---	920	365	---	2.2	1780	222	1070
28	e946	---	620	361	---	2.1	1490	185	747
29	e846	---	450	---	---	---	1320	---	609
30	e735	---	280	---	---	---	1210	---	539
31	e654	---	180	---	---	---	1130	---	435
TOTAL	11845	---	4559.8	10137	---	848.0	53140	---	208914.6

e Estimated

LEWIS RIVER BASIN

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14216500 MUDDY RIVER BELOW CLEAR CREEK, NEAR COUGAR, WA--Continued

SEDIMENT DISCHARGE, SUSPENDED (TONS/DAY), WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DAY	MEAN DISCHARGE (CFS)	MEAN CONCEN- TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN- TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN- TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)
APRIL			MAY			JUNE			
1	1260	---	759	1910	170	881	787	18	39
2	1640	517	2290	1760	150	713	712	6	13
3	2190	626	3760	1830	196	982	671	11	20
4	2320	356	2250	1760	110	529	637	8	14
5	1960	197	1050	1640	91	405	620	5	8.7
6	1720	158	737	1620	89	395	600	6	9.8
7	1530	114	475	1620	84	370	584	6	10
8	1730	355	1740	1520	73	302	556	---	9.6
9	2290	646	4030	1380	52	195	630	---	64
10	2390	473	3050	1390	51	196	599	---	31
11	2160	230	1350	1600	96	424	600	---	29
12	1870	176	895	1810	145	711	569	---	19
13	1650	131	586	1840	142	711	536	---	13
14	1460	---	409	1650	83	373	527	5	7.7
15	1480	---	413	1460	---	257	537	10	15
16	1390	---	349	1360	---	229	520	---	16
17	1570	---	531	1330	---	238	499	---	14
18	1590	---	537	1340	---	238	488	---	13
19	1500	---	447	1360	---	242	475	---	14
20	1420	---	385	1330	---	235	457	---	12
21	1500	---	454	1300	---	215	445	---	11
22	1580	132	565	1180	---	165	530	---	40
23	1700	160	746	1040	---	108	501	13	19
24	2050	435	2420	956	23	60	442	8	10
25	2650	805	6000	910	15	38	421	8	10
26	3110	662	5580	850	13	30	409	8	9.9
27	2840	295	2290	823	14	31	402	12	13
28	2400	195	1270	787	11	24	398	8	8.8
29	2150	153	895	749	10	21	389	5	6.1
30	1990	164	883	746	16	35	369	7	7.8
31	---	---	---	848	17	43	---	---	---
TOTAL	57090	---	47146	41699	---	9396	15910	---	507.4

DAY	MEAN DISCHARGE (CFS)	MEAN CONCEN- TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN- TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN- TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)
JULY			AUGUST			SEPTEMBER			
1	360	7	7.4	235	---	5.7	157	7	3.3
2	351	7	6.7	232	---	5.5	156	11	5.0
3	342	6	6.0	228	---	5.1	154	14	6.1
4	334	7	6.6	223	---	4.4	152	14	5.8
5	327	9	8.7	217	---	4.1	151	8	3.6
6	317	7	6.1	215	---	4.0	150	10	4.1
7	308	6	5.6	211	---	4.2	148	8	3.5
8	301	6	5.5	206	---	3.8	147	8	3.2
9	293	7	6.1	203	---	4.0	146	9	3.8
10	288	7	5.9	201	11	6.0	144	8	3.4
11	284	10	7.8	199	9	5.1	142	5	2.2
12	278	6	4.6	197	11	6.0	142	5	2.0
13	280	8	6.7	195	11	5.9	141	5	2.0
14	280	10	7.8	193	8	4.5	141	5	2.0
15	270	9	6.6	190	6	3.5	141	3	1.5
16	280	9	7.5	190	8	4.2	139	5	1.9
17	278	---	5.2	189	7	4.0	137	5	2.0
18	259	---	4.7	185	9	4.8	136	5	2.1
19	275	---	9.6	182	10	5.0	135	4	1.6
20	286	---	7.9	180	9	4.6	135	3	1.3
21	267	---	7.0	179	9	4.5	134	3	1.2
22	301	---	16	174	9	4.4	132	5	1.9
23	297	---	14	190	13	7.2	131	4	1.6
24	268	---	8.8	185	11	5.6	129	7	2.5
25	260	---	8.9	179	10	5.3	129	---	1.9
26	254	---	6.9	173	6	3.1	127	---	1.9
27	248	---	5.7	169	6	3.2	125	---	1.6
28	247	---	6.7	167	7	3.5	124	---	1.6
29	267	---	11	165	7	3.5	124	---	1.6
30	265	---	10	162	9	4.3	124	---	1.6
31	242	---	5.9	160	9	4.3	---	---	---
TOTAL	8907	---	233.9	5974	---	143.3	4173	---	77.8
YEAR	248732	---	357230.8						

LEWIS RIVER BASIN

14219800 SPEELYAI CREEK NEAR COUGAR, WA

LOCATION.--Lat 46°00'28", long 122°20'46", in NW 1/4 NW 1/4 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). WDR WA-84-1: 1983.

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.--No estimated daily discharges. Records fair. No regulation or diversion upstream from station.

AVERAGE DISCHARGE.--33 years (water years 1960-77, 1979-93), 101 ft³/s, 109.28 in/yr, 73,420 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 discharge, 0.76 ft³/s Aug. 28 to Sept. 4, 1992.

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. 21	1700	821	4.11	Mar. 23	0045	*1,250	*4.80
Mar. 4	1800	727	3.94				

Minimum discharge, 1.6 ft³/s Oct. 15, 16.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3.2	180	113	56	131	26	107	160	40	23	21	5.2
2	3.2	131	98	50	105	27	254	136	40	22	19	5.0
3	3.0	84	81	48	89	60	421	178	38	21	17	4.8
4	2.9	71	69	44	77	403	327	216	36	19	16	4.7
5	2.6	56	61	39	70	562	204	171	34	18	14	4.8
6	2.4	47	53	35	67	353	161	149	32	17	14	4.8
7	2.2	216	48	32	73	246	140	143	33	16	14	4.6
8	2.1	185	62	31	80	194	140	154	31	15	13	4.4
9	2.0	149	72	29	83	161	297	133	43	14	12	4.3
10	2.0	105	143	27	86	135	421	113	51	14	11	4.3
11	1.8	90	148	27	93	110	386	96	59	13	11	4.3
12	1.7	85	108	25	89	92	262	83	58	13	10	4.6
13	1.8	75	85	23	79	80	191	72	52	13	10	4.3
14	1.8	63	94	22	70	147	145	62	47	14	9.5	4.2
15	1.7	53	91	21	63	347	144	55	48	12	9.3	4.3
16	1.7	45	83	20	55	230	137	49	42	15	9.4	4.1
17	2.2	43	79	19	49	230	197	44	38	14	9.0	4.0
18	3.2	43	64	18	45	325	199	40	35	12	8.2	3.9
19	7.9	77	62	25	43	229	170	37	32	12	7.7	4.0
20	9.6	73	95	125	40	203	140	37	29	12	8.4	4.1
21	17	408	183	119	37	163	126	42	28	11	7.6	4.1
22	15	513	198	93	34	452	136	41	45	30	7.4	3.8
23	10	281	191	76	31	819	245	36	50	34	11	3.7
24	7.9	169	160	101	29	360	348	32	43	26	7.9	3.5
25	6.5	115	129	381	27	218	394	30	38	23	8.5	3.5
26	5.5	87	119	378	25	151	428	28	35	21	7.3	3.4
27	5.1	93	109	258	24	117	365	29	32	19	6.8	3.2
28	4.9	90	101	312	23	95	239	26	30	21	6.5	3.2
29	12	77	87	368	---	82	218	24	27	25	6.1	3.1
30	81	116	74	246	---	78	189	27	25	26	5.7	3.1
31	155	---	64	173	---	76	---	38	---	23	5.4	---
TOTAL	378.9	3820	3124	3221	1717	6771	7131	2481	1171	568	323.7	123.3
MEAN	12.2	127	101	104	61.3	218	238	80.0	39.0	18.3	10.4	4.11
MAX	155	513	198	381	131	819	428	216	59	34	21	5.2
MIN	1.7	43	48	18	23	26	107	24	25	11	5.4	3.1
AC-FT	752	7580	6200	6390	3410	13430	14140	4920	2320	1130	642	245
CFSM	.97	10.1	8.00	8.25	4.87	17.3	18.9	6.35	3.10	1.45	.83	.33
IN.	1.12	11.28	9.22	9.51	5.07	19.99	21.05	7.32	3.46	1.68	.96	.36

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1960 - 1993, BY WATER YEAR (WY)

	MEAN	MAX	(WY)	MIN	(WY)
1960	49.8	158	1960	1.34	1960
1961	171	342	1961	19.9	1961
1962	192	393	1962	39.9	1962
1963	195	350	1963	37.1	1963
1964	180	374	1964	57.2	1964
1965	150	357	1965	25.9	1965
1966	129	238	1966	51.5	1966
1967	80.4	151	1967	25.6	1967
1968	40.8	106	1968	6.93	1968
1969	16.2	71.2	1969	3.26	1969
1970	9.82	49.0	1970	1.40	1970
1971	14.8	55.9	1971	2.37	1971
1972			1972		1972
1973			1973		1973
1974			1974		1974
1975			1975		1975
1976			1976		1976
1977			1977		1977
1978			1978		1978
1979			1979		1979
1980			1980		1980
1981			1981		1981
1982			1982		1982
1983			1983		1983
1984			1984		1984
1985			1985		1985
1986			1986		1986
1987			1987		1987
1988			1988		1988
1989			1989		1989
1990			1990		1990
1991			1991		1991
1992			1992		1992
1993			1993		1993

SUMMARY STATISTICS

FOR 1992 CALENDAR YEAR

FOR 1993 WATER YEAR

WATER YEARS 1960 - 1993

ANNUAL TOTAL	20778.97	30829.9	
ANNUAL MEAN	56.8	84.5	
HIGHEST ANNUAL MEAN			101
LOWEST ANNUAL MEAN			155
HIGHEST DAILY MEAN	565	819	54.0
LOWEST DAILY MEAN	.76	1.7	2120
ANNUAL SEVEN-DAY MINIMUM	.78	1.8	.76
ANNUAL RUNOFF (AC-FT)	41220	61150	.78
ANNUAL RUNOFF (CFSM)	4.51	6.70	
ANNUAL RUNOFF (INCHES)	61.35	91.02	8.04
10 PERCENT EXCEEDS	148	217	109.28
50 PERCENT EXCEEDS	20	43	240
90 PERCENT EXCEEDS	1.5	4.3	57
			5.4

LEWIS RIVER BASIN

365

RESERVOIRS IN LEWIS RIVER BASIN, WA

14217600 SWIFT RESERVOIR

LOCATION.--Lat 46°03'38", long 122°11'44", in NE 1/4 SW 1/4 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 sea level (levels by PacifiCorp).

REMARKS.--Hourly elevations for the year were furnished by PacifiCorp. Reservoir is formed by rock and earthfill dam; storage began Sept. 29, 1958; dam completed in December 1958. Usable capacity, 446,600 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 PacifiCorp for power development. Capacity table furnished by PacifiCorp.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 759,100 acre-ft Nov. 15, 1973, elevation, 1,000.77 ft; minimum contents since reservoir was first filled, 325,100 acre-ft May 1, 1967, elevation, 883.60 ft.

EXTREMES FOR CURRENT YEAR.--Maximum contents, 755,500 acre-ft July 6, elevation, 999.99 ft; minimum contents, 465,800 acre-ft Jan. 20, elevation, 927.91 ft.

14218500 YALE RESERVOIR

LOCATION.--Lat 45°57'50", long 122°19'53", in SE 1/4 NE 1/4 sec.32, T.6 N., R.4 E., Clark County, Hydrologic Unit 17080002, at left bank on 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 and long distance indicator in powerhouse. Datum of gage is sea level (levels by PacifiCorp). Prior to Feb. 1, 1954, nonrecording indicator gage at same site and datum.

REMARKS.--Hourly elevations for the year were furnished by PacifiCorp. Reservoir is formed by rock and earthfill dam; storage began July 31, 1952, dam completed in 1952. Usable capacity, 189,500 acre-ft between elevations 430 ft, lower limit for economic operation, and 490 ft, top of spillway gates. Dead storage below elevation 417 ft, 178,000 acre-ft. Figures given herein represent total contents. Water is used by PacifiCorp for power development. Capacity table furnished by PacifiCorp.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 402,500 acre-ft May 13, 1961, elevation, 490.15 ft; minimum contents observed since reservoir was first filled, 227,600 acre-ft Feb. 22, 1957, elevation, 435.65 ft.

EXTREMES FOR CURRENT YEAR.--Maximum contents, 400,100 acre-ft June 1, elevation, 489.56 ft; minimum contents, 273,200 acre-ft Feb. 23, elevation, 451.51 ft.

14220000 LAKE MERWIN

LOCATION.--Lat 45°57'23", long 122°33'13", in SW 1/4 SW 1/4 sec.34, T.6 N., R.2 E., Clark County, Hydrologic Unit 17080002, on left bank on 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 and long distance indicator in powerhouse. Datum of gage is sea level (levels by PacifiCorp).

REMARKS.--Hourly elevations for the year were furnished by PacifiCorp. Reservoir is formed by combination gravity-concrete-arch dam; some storage began March 1931; completed May 13, 1931. Usable capacity, 245,600 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 PacifiCorp for power development. Capacity table furnished by PacifiCorp.

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 contents observed since reservoir was first filled, 164,200 acre-ft Dec. 5, 1936, elevation, 166.7 ft.

EXTREMES FOR CURRENT YEAR.--Maximum contents, 422,400 acre-ft May 29, elevation, 239.50 ft; minimum contents, 381,500 acre-ft Mar. 28, elevation, 229.03 ft.

MONTHEND ELEVATION AND CONTENTS AT 2400, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

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.....	970.14	625,700	-	483.67	378,300	-	236.72	411,400	-
Oct. 31.....	967.04	613,000	-12,700	466.52	319,500	-58,800	236.27	409,600	-1,800
Nov. 30.....	957.51	575,100	-37,900	476.20	351,700	+32,200	233.71	399,600	-10,000
Dec. 31.....	956.33	570,500	-4,600	476.81	353,900	+2,200	234.76	403,700	+4,100
CAL YR 1992	-	-	-55,700	-	-	+19,100	-	-	+1,800
Jan. 31.....	941.52	514,600	-55,900	472.36	338,700	-15,200	233.85	400,100	-3,600
Feb. 28.....	938.93	505,100	-9,500	457.23	290,400	-48,300	235.65	407,200	+7,100
Mar. 31.....	932.18	676,300	+171,200	479.30	362,600	+72,200	230.71	388,000	-19,200
Apr. 30.....	985.50	690,600	+14,300	488.29	395,400	+32,800	234.56	402,900	+14,900
May 31.....	994.45	730,500	+39,900	489.49	399,900	+4,500	237.15	413,100	+10,200
June 30.....	998.25	747,600	+17,100	487.82	393,600	-6,300	235.39	406,100	-7,000
July 31.....	997.80	745,500	-2,100	486.52	388,700	-4,900	235.81	407,800	+1,700
Aug. 31.....	996.62	740,200	-5,300	486.82	389,900	+1,200	235.31	405,800	-2,000
Sept. 30.....	994.58	731,000	-9,200	474.94	347,400	-42,500	238.93	420,100	+14,300
WTR YR 1993	-	-	+105,300	-	-	-30,900	-	-	+8,700

LEWIS RIVER BASIN

14220500 LEWIS RIVER AT ARIEL, WA

LOCATION.--Lat 45°57'07", long 122°33'46", in NW 1/4 NE 1/4 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.

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 sea level (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.--No estimated daily discharges. Records good. No diversion upstream from station. Flow regulated by Swift and Yale Reservoirs, and Lake Merwin (stations 14217600, 14218500, 14220000). Chemical analyses July 1959 to June 1960, April 1979 to September 1986. Additional data from April to August 1980 are published in U.S. Geological Survey Open File Report 81-1007. Water temperatures October 1950 to September 1963.

AVERAGE DISCHARGE.--70 years (water years 1924-93), 4,777 ft³/s, 88.74 in/yr, 3,461,000 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 discharge, 1 ft³/s July 6, 1931.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 12,000 ft³/s Apr. 3, gage height, 7.49 ft; minimum discharge, 784 ft³/s Aug. 19.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2290	4260	6190	1540	5350	2070	2860	11400	3340	2110	1220	1260
2	2540	4280	5780	1540	5270	2050	4480	11000	3350	2030	1210	1260
3	2370	4280	3890	1830	5400	2060	9380	8840	3330	2030	1210	1260
4	1180	4270	5450	5720	5260	2040	9890	8820	3360	2030	1210	1260
5	2360	3150	5450	6110	5250	2630	9470	8760	3340	2040	1210	1250
6	2410	4250	5440	7750	3060	3030	9570	8720	3350	2040	1210	1250
7	2370	4270	5460	7360	3030	3020	8940	8620	3030	2030	1210	1250
8	2270	4260	5820	6660	4330	3030	8310	8400	2720	2030	1210	1250
9	2510	4970	7730	1560	3040	3040	8330	8390	2720	2030	1210	1270
10	1190	5360	2510	1670	4950	3030	8350	7890	2760	2030	1210	2360
11	1190	4240	6990	7490	5250	3030	8830	7510	2760	2030	1210	1250
12	1190	2970	3070	8020	4800	3020	9210	6740	2740	2030	1210	1230
13	1190	4260	3060	8260	3020	3010	9260	6000	2750	2030	1220	1230
14	1200	4230	4060	7620	3040	3010	9250	5970	2740	2020	1220	1220
15	1320	4310	3050	6730	5130	3230	9250	5830	2740	2020	1240	2360
16	2770	5170	3040	4980	6430	5330	9190	4220	2740	1580	1240	2840
17	2680	4950	6200	4810	4970	6810	9200	3000	2740	1520	1250	2470
18	2680	4630	5580	4140	3870	6620	9220	3000	2740	1520	1090	1180
19	2680	3440	2400	3030	3020	5790	8810	2960	2740	1530	1150	1170
20	2680	5000	2410	3870	3020	5360	8420	2950	2740	1520	1260	1160
21	2680	6130	2850	3050	2990	5380	8430	3120	2760	1520	1260	1150
22	2200	6400	3060	2480	4210	5460	8260	3300	2740	1530	1260	1150
23	2680	6100	2400	1550	3000	8700	8050	3300	2710	1520	1250	2130
24	2680	6080	1540	1550	2510	11600	8010	3300	2720	1520	1250	1140
25	2680	4240	1540	5500	1540	9450	8440	3010	2720	1520	1250	1140
26	2680	6070	1550	6070	1690	7600	9500	2710	2730	1530	1250	1130
27	2680	6070	1540	6010	1550	6000	9970	2710	2740	1530	1250	1130
28	2690	6100	1920	6050	1620	5980	9980	2720	2740	1520	1250	1130
29	2220	6120	2980	4910	---	5440	10300	2700	2730	1530	1250	1130
30	2750	6300	1650	3020	---	4690	11100	2720	2730	1530	1250	1140
31	2850	---	1540	3030	---	3910	---	3070	---	1520	1260	---
TOTAL	69860	146160	116150	143910	106600	145420	262260	171680	86050	54970	37980	43150
MEAN	2254	4872	3747	4642	3807	4691	8742	5538	2868	1773	1225	1438
MAX	2850	6400	7730	8260	6430	11600	11100	11400	3360	2110	1260	2840
MIN	1180	2970	1540	1540	1540	2040	2860	2700	2710	1520	1090	1130
AC-FT	138600	289900	230400	285400	211400	288400	520200	340500	170700	109000	75330	85590
MEAN†	1062	4608	3775	3427	2894	8337	9784	6426	2933	1686	1126	810
CFSM†	1.45	6.30	5.16	4.69	3.96	11.41	13.40	8.79	4.01	2.31	1.54	1.11
IN.†	1.68	7.03	5.95	5.41	4.12	13.15	14.94	10.14	4.48	2.66	1.78	1.24
AC-FT†	65300	274200	232100	210700	160700	512600	582200	395100	174500	103700	69230	48190

CAL YR 1992 TOTAL 1110500 MEAN 3034 MAX 11900 MIN 1180 AC-FT 2203000 MEAN† 2986 CFSM† 4.09 IN.† 55.61 AC-FT† 2168000
WTR YR 1993 TOTAL 1384190 MEAN 3792 MAX 11600 MIN 1090 AC-FT 2746000 MEAN† 3908 CFSM† 5.34 IN.† 72.56 AC-FT† 2829000

† Adjusted for change in contents in Lake Merwin, Swift Reservoir, and Yale Reservoir.

LEWIS RIVER BASIN

367

14222500 EAST FORK LEWIS RIVER NEAR HEISSON, WA

LOCATION.--Lat 45°50'13", long 122°27'54", in NE 1/4 NW 1/4 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 356.8 ft above sea level (from river-profile survey). Prior to Oct. 1, 1987, at datum 10.00 ft higher.

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

AVERAGE DISCHARGE.--64 years, 738 ft³/s, 80.16 in/yr, 534,300 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 19,300 ft³/s Dec. 2, 1977, gage height, 12.95 ft, datum then in use; minimum discharge, 29 ft³/s Nov. 3, 1935, Sept. 27, 28, 1967; minimum gage height, 0.04 ft Nov. 3, 1935, datum then in use, 10.04 ft Oct. 11, 12, 1987, present datum.

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)
Mar. 23	0330	*6,240	*17.96	No other peak greater than base discharge.			
Minimum discharge, 45 ft ³ /s Sept. 30, gage height, 10.34 ft.							

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	57	995	1030	653	898	282	812	1660	528	238	187	70
2	62	737	878	584	774	302	1450	1330	473	229	172	69
3	109	500	689	583	685	479	3410	1500	427	220	157	68
4	102	436	581	590	614	951	2590	1480	405	210	145	67
5	78	359	513	518	561	1610	1650	1260	393	199	137	67
6	69	301	463	469	521	1310	1300	1290	367	188	134	67
7	61	694	421	436	506	1070	1160	1250	382	179	133	62
8	58	918	488	418	508	938	1260	1700	377	170	128	61
9	57	908	482	384	505	820	2080	1500	419	161	121	60
10	55	643	1200	360	516	726	2700	1230	442	159	116	59
11	53	518	1080	340	546	622	2660	1050	468	155	113	59
12	51	484	815	321	535	541	1970	897	473	155	112	64
13	59	426	665	310	487	489	1600	797	441	150	114	60
14	56	377	724	301	450	671	1310	695	412	157	112	58
15	51	331	726	289	419	1790	1250	616	475	153	109	59
16	49	295	660	278	381	1340	1150	559	449	188	118	58
17	55	270	689	268	351	1130	1420	515	414	196	118	55
18	55	265	583	257	338	1690	1570	484	381	154	102	55
19	89	476	592	336	336	1350	1400	462	352	156	96	56
20	92	512	1450	1110	326	1230	1180	481	325	181	97	57
21	178	2240	1750	1060	311	1030	1080	520	323	174	96	57
22	134	2960	1860	870	294	1760	1050	485	442	304	90	54
23	103	1770	2160	716	279	5010	1320	421	458	283	103	52
24	89	1130	1640	870	265	2630	1890	381	381	242	106	51
25	80	807	1250	1650	252	1680	2250	363	349	225	96	51
26	74	631	1240	1790	242	1230	2390	346	324	205	88	50
27	69	659	1180	1380	235	991	2240	345	306	189	82	47
28	66	644	1150	1510	231	829	1730	326	289	190	81	48
29	99	558	993	1700	---	727	1820	318	277	241	80	47
30	604	959	839	1330	---	682	1960	329	254	257	75	46
31	742	---	737	1080	---	640	---	447	---	206	71	---
TOTAL	3556	22803	29528	22761	12366	36550	51652	25037	11806	6114	3489	1734
MEAN	115	760	953	734	442	1179	1722	808	394	197	113	57.8
MAX	742	2960	2160	1790	898	5010	3410	1700	528	304	187	70
MIN	49	265	421	257	231	282	812	318	254	150	71	46
AC-FT	7050	45230	58570	45150	24530	72500	102500	49660	23420	12130	6920	3440
CFSM	.92	6.08	7.62	5.87	3.53	9.43	13.8	6.46	3.15	1.58	.90	.46
IN.	1.06	6.79	8.79	6.77	3.68	10.88	15.37	7.45	3.51	1.82	1.04	.52

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1930 - 1993, BY WATER YEAR (WY)

	MEAN	343	1068	1460	1401	1272	1120	930	592	350	147	83.9	115
MAX	1318	2252	3957	3460	2636	2432	1818	1254	914	561	278	555	
(WY)	1952	1943	1934	1953	1961	1932	1937	1933	1933	1983	1968	1941	
MIN	36.7	53.7	288	303	394	352	312	198	88.2	59.4	42.7	42.3	
(WY)	1988	1937	1977	1979	1977	1992	1941	1931	1992	1992	1992	1967	

SUMMARY STATISTICS FOR 1992 CALENDAR YEAR FOR 1993 WATER YEAR WATER YEARS 1930 - 1993

	ANNUAL TOTAL	160114	227396										
ANNUAL MEAN	437		623										
HIGHEST ANNUAL MEAN													
LOWEST ANNUAL MEAN													1974
HIGHEST DAILY MEAN		3590	Feb 20		5010	Mar 23		15600		Jan 20	1972		
LOWEST DAILY MEAN		32	Aug 30		46	Sep 30		30		Sep 27	1967		
ANNUAL SEVEN-DAY MINIMUM		33	Aug 26		49	Sep 24		32		Sep 23	1967		
ANNUAL RUNOFF (AC-FT)		317600			451000								
ANNUAL RUNOFF (CFSM)		3.50			4.98					5.90			
ANNUAL RUNOFF (INCHES)		47.65			67.67					80.16			
10 PERCENT EXCEEDS		1040			1500					1750			
50 PERCENT EXCEEDS		267			421					448			
90 PERCENT EXCEEDS		42			62					64			

COWLITZ RIVER BASIN

14226500 COWLITZ RIVER AT PACKWOOD, WA

LOCATION.--Lat 46°36'47", long 121°40'41", in SE 1/4 SE 1/4 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 sea level (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 for estimated daily discharges, which are fair. Minor regulation by Packwood Lake beginning June 1964. Small diversions for domestic use. Water temperatures November 1970 to April 1971. 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.....	7.59	January.....	21.4	April.....	61.9	July.....	83.4
November.....	42.3	February.....	36.1	May.....	188	August.....	46.1
December.....	30.8	March.....	60.5	June.....	129	September.....	75.6

AVERAGE DISCHARGE.--72 years, (water years 1912-19, 1930-93), 1,590 ft³/s, 1,152,000 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)
May 12	2200	*6,650	*6.47				

Minimum daily discharge, 254 ft³/s Sept. 21, 22.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	438	759	e940	530	1190	407	1270	2390	2920	1000	957	429
2	427	840	e770	509	1080	399	1440	2500	2380	1010	984	464
3	418	674	689	506	1000	420	1850	2310	2080	982	982	480
4	390	763	644	496	923	547	1900	2170	1930	907	944	484
5	369	778	611	466	876	808	1610	2040	2180	882	917	468
6	356	662	593	431	848	1050	1430	2520	2200	882	883	469
7	345	1780	568	427	862	1160	1340	2380	2250	891	801	458
8	332	1630	578	423	884	1290	1510	2090	1980	929	718	444
9	324	1210	573	412	890	1300	2020	1900	2400	929	668	445
10	321	960	562	407	884	1210	1900	2190	2610	862	639	449
11	327	844	560	396	854	1080	1730	3560	2040	844	616	424
12	333	e1310	523	385	810	979	1550	5410	1780	719	614	373
13	345	e1100	496	379	765	899	1410	5420	1640	729	614	345
14	342	e990	680	373	722	1040	1280	4440	1900	768	573	319
15	323	e900	732	370	673	2680	1240	3930	2210	757	533	286
16	312	e780	660	364	594	2230	1210	3590	1960	792	529	288
17	303	e715	647	360	581	1780	1240	3800	1990	863	538	292
18	308	e705	601	356	564	2100	1310	4180	2040	774	564	284
19	508	e840	585	370	556	1900	1250	4370	2060	807	558	272
20	627	e760	629	454	536	1820	1200	4330	1810	991	604	260
21	584	e1070	629	471	511	1650	1300	4150	1610	969	583	254
22	483	e1610	658	444	484	2160	1380	3660	1370	1080	516	254
23	464	e1600	738	426	463	5550	1370	3030	1200	1100	589	262
24	437	e1060	740	470	445	4020	1440	2890	1040	1010	507	273
25	402	e870	708	2610	429	2830	1710	2960	1130	987	420	265
26	378	e790	716	3390	419	2160	1910	2850	1410	937	394	287
27	358	e840	684	2850	412	1780	1840	2970	1520	920	388	314
28	344	e910	652	2220	405	1530	1700	2920	1210	943	391	326
29	338	e840	614	1810	---	1380	1990	2960	1150	1150	393	337
30	351	e1000	582	1530	---	1260	2460	2580	1030	1260	408	332
31	444	---	547	1340	---	1170	---	3170	---	991	436	---
TOTAL	12031	29590	19909	25975	19660	50589	46790	99660	55030	28665	19261	10637
MEAN	388	986	642	838	702	1632	1560	3215	1834	925	621	355
MAX	627	1780	940	3390	1180	5550	2460	5420	2920	1260	984	484
MIN	303	662	496	356	405	399	1200	1900	1030	719	388	254
AC-FT	23860	58690	39490	51520	39000	100300	92810	197700	109200	56860	38200	21100

CAL YR 1992 TOTAL 391176 MEAN 1069 MAX 5700 MIN 292 AC-FT 775900
WTR YR 1993 TOTAL 417797 MEAN 1145 MAX 5550 MIN 254 AC-FT 828700

e Estimated

14232500 CISPUS RIVER NEAR RANDLE, WA

LOCATION.--Lat 46°26'50", long 121°51'46", in NW 1/4 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. WDR WA-86-1: 1985.

GAGE.--Water-stage recorder. Datum of gage is 1,221.60 ft above sea level. 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 fair except for estimated daily discharges, which are poor. No regulation or diversion upstream from station. U.S. Geological Survey satellite telemeter at station. Water temperatures May 1950 to September 1972.

AVERAGE DISCHARGE.--65 years (water years 1911, 1930-93), 1,315 ft³/s, 55.63 in/yr, 952,700 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 discharge, 183 ft³/s Dec. 30, 1936.

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)
Mar. 23	1015	*6,560	*8.72	May 13	0445	4,430	7.88

Minimum discharge, 286 ft³/s several days in October.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	320	767	673	558	894	471	1140	1840	e2190	e942	e745	e379
2	317	883	648	547	851	466	1220	1800	e1840	e883	e745	e384
3	322	759	603	543	813	485	1540	1870	e1670	e835	e730	e393
4	320	709	574	536	774	536	1650	1880	e1620	e843	e695	e384
5	296	654	553	508	751	631	1490	1790	e1670	e843	e681	e379
6	288	596	544	485	736	699	1360	1910	e1630	e843	e668	e379
7	289	688	540	480	739	770	1270	1870	e1630	e812	e596	e375
8	286	804	546	479	756	860	1460	1750	e1570	e745	e589	e370
9	286	782	547	476	759	897	1980	1640	e1510	e695	e596	e370
10	289	688	577	467	759	888	1930	1710	e1660	e681	e565	e370
11	291	661	566	464	743	852	2440	2440	e1580	e702	e548	e370
12	295	668	542	459	715	810	1630	3570	e1550	e695	e536	e356
13	301	684	522	463	695	772	1490	4130	e1460	e695	e530	e352
14	300	672	550	458	674	828	1360	3580	e1430	e752	e518	e348
15	292	664	572	448	647	1480	1310	3230	e1490	e723	e513	e339
16	290	643	549	443	589	1490	1260	2950	e1410	e709	e518	e330
17	298	621	554	443	560	1370	1290	2870	e1320	e745	e518	e335
18	302	617	535	439	574	1480	1340	e3110	e1320	e695	e480	e339
19	322	648	527	440	580	1470	1290	e3230	e1270	e723	e474	e330
20	339	624	566	561	566	1540	1230	e3190	e1220	e820	e496	e330
21	407	799	567	578	553	1460	1330	e3210	e1210	e767	e479	e322
22	373	1120	586	550	537	1670	1400	e2790	e1200	e812	e464	e318
23	360	945	654	510	524	5730	1380	e2480	e1100	e828	e502	e318
24	350	832	650	509	507	3900	1410	e2250	e1030	e851	e490	e310
25	335	758	632	767	490	2520	1610	e2390	e1020	e892	e474	e310
26	331	709	628	1130	478	1890	1850	e1990	e1060	e851	e422	e306
27	322	708	619	1170	473	1610	1790	e1990	e1090	e804	e422	e310
28	326	719	608	1120	471	1400	1640	e2040	e1010	e804	e412	e310
29	352	677	592	1070	---	1270	1600	e1900	e976	e908	e408	e310
30	463	704	576	997	---	1150	1770	e1890	e925	e835	e403	e314
31	553	---	565	943	---	1070	---	e2360	---	e767	e388	---
TOTAL	10215	21803	17965	19041	18208	42465	44820	75650	41661	24500	16605	10340
MEAN	330	727	580	614	650	1370	1494	2440	1389	790	536	345
MAX	553	1120	673	1170	894	5730	1980	4130	2190	942	745	393
MIN	286	596	522	439	471	466	1140	1640	925	681	388	306
AC-FT	20260	43250	35630	37770	36120	84230	88900	150100	82630	48600	32940	20510
CFSM	1.03	2.26	1.81	1.91	2.03	4.27	4.65	7.60	4.33	2.46	1.67	1.07
IN.	1.18	2.53	2.08	2.21	2.11	4.92	5.19	8.77	4.83	2.84	1.92	1.20

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1912 - 1993, BY WATER YEAR (WY)

	MEAN	1201	1615	1427	1416	1288	1735	2453	2075	1022	553	438
MAX	1579	2935	5567	3759	3773	4021	3252	4292	5111	2520	1075	718
(WY)	1948	1933	1934	1934	1982	1972	1943	1949	1974	1974	1974	1972
MIN	266	251	350	396	328	586	794	918	567	419	336	306
(WY)	1936	1953	1953	1937	1937	1977	1975	1992	1992	1992	1992	1934

SUMMARY STATISTICS

FOR 1992 CALENDAR YEAR

FOR 1993 WATER YEAR

WATER YEARS 1912 - 1993

ANNUAL TOTAL	277424	343273	
ANNUAL MEAN	758	940	
HIGHEST ANNUAL MEAN			1314
LOWEST ANNUAL MEAN			2102
HIGHEST DAILY MEAN	6010	Jan 28	5730
LOWEST DAILY MEAN	260	Sep 14	286
ANNUAL SEVEN-DAY MINIMUM	275	Sep 12	289
ANNUAL RUNOFF (AC-FT)	550300	680900	952200
ANNUAL RUNOFF (CFSM)	2.36	2.93	4.09
ANNUAL RUNOFF (INCHES)	32.15	39.78	55.63
10 PERCENT EXCEEDS	1260	1800	2660
50 PERCENT EXCEEDS	631	695	970
90 PERCENT EXCEEDS	302	335	391

e Estimated

COWLITZ RIVER BASIN

14233400 COWLITZ RIVER NEAR RANDLE, WA

LOCATION.--Lat 46°28'13", long 122°05'51", in NE 1/4 sec.6, T.11 N., R.6 E., Lewis County, Hydrologic Unit 17080005, on right bank 0.5 mi downstream from Cispus River, 8.1 mi southwest of Randle, and at mile 89.3.

DRAINAGE AREA.--1,030 mi².

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.

GAGE.--Water-stage recorder. Datum of gage is 799.42 ft above sea level. 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.--Records good. Minor regulation by Packwood Lake (station 14225400) beginning June 1964. Small diversions for domestic use and irrigation upstream from station. U.S. Geological Survey satellite telemeter at station. Water temperatures November 1952 to August 1968, April 1969 to September 1982. Chemical analyses July 1959 to September 1970, December 1973 to September 1985.

AVERAGE DISCHARGE.--46 years, 4,823 ft³/s, 63.59 in/yr, 3,494,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 89,300 ft³/s Dec. 3, 1977, gage height, 26.54 ft; minimum discharge, 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)
Mar. 23	1730	*21,200	*14.93	May 13	0745	16,500	13.64
Minimum discharge, 751 ft ³ /s Oct. 17.							

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEPT
1	1210	2060	2800	1920	3900	1570	4620	8010	7380	2810	2610	1240
2	1180	2690	2590	1840	3700	1560	5000	8080	6210	2780	2550	1230
3	1100	2490	2380	1790	3510	1620	6150	7990	5540	2780	2500	1250
4	1030	2320	2200	1790	3320	1850	6930	7900	5050	2670	2360	1270
5	966	2470	2090	1690	3200	2650	6280	7400	5050	2580	2250	1220
6	921	2190	1990	1640	3060	e3090	5640	7840	5260	2480	2260	1170
7	887	2870	1940	e1580	3070	3410	5260	8110	5190	2430	2190	1160
8	854	3810	1990	e1510	3150	3680	5410	7600	5080	2400	2060	1140
9	830	3470	2090	1440	3190	3820	7340	7110	4700	2400	1940	1180
10	822	2970	2190	1390	3190	3730	7590	6950	5960	2320	1840	1150
11	835	2710	2150	1370	3120	3530	7450	9190	5220	2280	1730	1140
12	837	2890	1990	1420	3000	3310	6860	12900	4950	2200	1680	1060
13	862	2970	1800	1410	2860	3120	6270	15500	4630	2040	1650	1030
14	869	2890	1970	1320	2730	3150	5740	12900	4520	2180	1680	992
15	792	2720	2360	1260	2600	5860	5480	11300	4880	2170	1620	1030
16	764	2540	2180	1230	2380	7030	5320	9980	4740	2160	1600	1050
17	763	2370	2150	1210	2180	5960	5340	9650	4630	2300	1590	1060
18	783	2370	2010	1190	2250	6230	5560	10400	4560	2120	1510	1050
19	855	2490	1920	1200	2240	6320	5430	10900	4600	2060	1490	1040
20	1270	2420	2140	1560	2180	6230	5140	11000	4330	2440	1490	996
21	1330	2860	2340	1840	2100	5940	5310	10400	4010	2570	1590	974
22	1300	4700	2390	1640	2010	6160	5580	9740	3790	2560	1510	e950
23	1110	4240	2620	1510	1930	17900	5570	8290	3730	2820	1530	e960
24	1050	3580	2670	1540	1860	16600	5660	7420	3360	2740	1620	e970
25	999	3140	2500	4000	1750	11700	6380	7410	3210	2640	1450	e940
26	941	2800	2500	8200	1660	8950	7500	6910	3310	2600	1270	e950
27	894	2630	2470	7590	1610	7290	7490	6910	3600	2530	1220	e970
28	865	2880	2360	6220	1580	6200	6930	6700	3380	2470	1190	e980
29	880	2650	2230	5350	---	5510	6750	6780	3130	2760	1170	e990
30	1080	2830	2110	4690	---	4940	7730	6090	2950	3040	1190	e980
31	1380	---	2000	e4240	---	4480	---	6820	---	2790	1210	---
TOTAL	30259	86020	69120	76580	73330	173390	183710	274180	136950	77120	53550	32122
MEAN	976	2867	2230	2470	2619	5593	6124	8845	4565	2488	1727	1071
MAX	1380	4700	2800	8200	3900	17900	7730	15500	7380	3040	2610	1270
MIN	763	2060	1800	1190	1580	1560	4620	6090	2950	2040	1170	940
AC-FT	60020	170600	137100	151900	145500	343900	364400	543800	271600	153000	106200	63710
CFSM	.95	2.78	2.16	2.40	2.54	5.43	5.95	8.59	4.43	2.42	1.68	1.04
IN.	1.09	3.11	2.50	2.77	2.65	6.26	6.63	9.90	4.95	2.79	1.93	1.11

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1948 - 1993, BY WATER YEAR (WY)

MEAN	2128	4889	6185	5689	5633	4632	5778	8082	7472	4005	1965	1507
MAX	6302	11420	16520	13820	11930	14510	9738	13760	16130	8580	3705	2881
(WY)	1960	1991	1978	1974	1982	1972	1990	1949	1974	1974	1974	1959
MIN	675	648	1100	1640	1815	2270	2656	4017	2176	1336	1042	954
(WY)	1988	1953	1953	1979	1977	1955	1975	1992	1992	1992	1992	1987

SUMMARY STATISTICS	FOR 1992 CALENDAR YEAR	FOR 1993 WATER YEAR	WATER YEARS 1948 - 1993
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ANNUAL TOTAL	1087008		1266331				
ANNUAL MEAN	2970		3469			4824	
HIGHEST ANNUAL MEAN						7236	1974
LOWEST ANNUAL MEAN						2580	1977
HIGHEST DAILY MEAN	19700	Jan 29	17900	Mar 23		74100	Dec 3 1977
LOWEST DAILY MEAN	730	Sep 7	763	Oct 17		532	Nov 29 1952
ANNUAL SEVEN-DAY MINIMUM	809	Sep 13	810	Oct 12		549	Nov 27 1952
ANNUAL RUNOFF (AC-FT)	2156000		2512000			3494000	
ANNUAL RUNOFF (CFSM)	2.88		3.37			4.68	
ANNUAL RUNOFF (INCHES)	39.26		45.74			63.63	
10 PERCENT EXCEEDS	5600		7310			9450	
50 PERCENT EXCEEDS	2390		2500			3750	
90 PERCENT EXCEEDS	885		1050			1310	

e Estimated

COWLITZ RIVER BASIN

371

14234800 RIFFE LAKE NEAR MOSSYROCK, WA

LOCATION.--Lat 46°32'07", long 122°25'25", in SE 1/4 SW 1/4 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 sea level (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 taintor 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. Chemical analyses December 1973 to September 1983 (samples were taken near the dam. Midnight readings for Oct. 26 to Nov. 4, 1992 were furnished by Tacoma City Light.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 1,686,300 acre-ft July 31, 1972, elevation, 778.63 ft; minimum contents since normal low operating level was attained, 658,503 acre-ft Mar. 17, 1977, elevation, 666.88 ft.

EXTREMES FOR CURRENT YEAR.--Maximum contents, 1,676,140 acre-ft June 2, elevation, 777.77 ft; minimum contents, 1,004,829 acre-ft Mar. 4, elevation 710.98 ft.

MONTHEND ELEVATION AND CONTENTS AT 2400, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

Date	Elevation (feet)	Contents (acre-feet)	Change in contents (acre-feet)
Sept. 30.....	729.89	1,175,689	--
Oct. 31.....	722.22	1,104,877	-70,812
Nov. 30.....	730.47	1,181,126	+76,249
Dec. 31.....	730.87	1,184,882	+3,756
CAL YR 1992.....	--	--	-23,989
Jan. 31.....	717.36	1,061,073	-123,809
Feb. 28.....	712.39	1,017,133	-43,940
Mar. 31.....	735.24	1,226,305	+209,172
Apr. 30.....	761.73	1,494,910	+268,605
May 31.....	777.29	1,670,491	+175,581
June 30.....	775.25	1,646,621	-23,870
July 31.....	771.96	1,608,618	-38,003
Aug. 31.....	765.60	1,537,158	-71,460
Sept. 30.....	754.57	1,419,009	-118,149
WTR YR 1993.....	--	--	+243,320

COWLITZ RIVER BASIN

14236200 TILTON RIVER ABOVE BEAR CANYON CREEK, NEAR CINEBAR, WA

LOCATION.--Lat 46°35'44", long 122°27'30", in NE 1/4 SW 1/4 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.--Records good. Several small diversions for municipal and domestic use upstream from station. No regulation. U.S. Geological Survey satellite telemeter at station. Water temperatures May 1965 to September 1982.

AVERAGE DISCHARGE.--37 years, 823 ft³/s, 79.26 in/yr, 596,300 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 discharge, 49 ft³/s Oct. 22-26, 28-30, 1987, gage height, 1.93 ft.

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)
Mar. 23	0200	*5,570	*8.31				
Minimum discharge, 83 ft ³ /s Sept. 28-30, gage height, 2.11 ft.							

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	144	847	1360	668	1040	295	741	1180	726	333	345	124
2	139	929	1070	608	933	311	1080	1150	618	321	318	123
3	139	678	873	e570	869	402	1560	1130	555	310	296	119
4	132	608	743	e550	799	1110	1550	1230	515	302	275	116
5	121	528	656	505	803	1890	1180	1100	481	289	256	115
6	114	450	587	476	806	1380	1030	1080	462	275	246	115
7	108	868	538	468	838	1080	1010	1120	453	261	241	112
8	103	1010	586	e420	879	938	1140	1600	429	247	230	108
9	100	868	743	e400	889	821	1950	1440	587	243	220	106
10	97	674	857	381	872	710	1940	1310	790	236	214	104
11	94	622	868	369	783	623	2460	1110	737	225	208	102
12	92	632	712	349	699	553	2090	972	810	226	202	102
13	99	554	621	334	631	506	1690	855	715	219	195	102
14	95	496	1070	325	573	748	1470	763	642	221	193	100
15	92	431	1100	314	527	1780	1430	687	670	217	189	100
16	89	408	905	306	479	1260	1450	621	634	251	186	98
17	98	400	819	295	432	1090	1460	566	562	328	190	96
18	96	530	700	287	415	1500	1560	523	508	283	178	95
19	164	839	655	330	402	1210	1380	489	463	267	169	95
20	198	819	1050	765	388	1190	1170	490	426	387	162	95
21	240	1810	1210	823	371	1060	1080	531	402	474	161	95
22	290	2820	1340	632	352	2120	1070	595	537	503	156	93
23	238	1770	1540	535	335	4700	1240	531	571	592	160	92
24	205	1220	1430	660	319	2620	1460	476	494	542	169	90
25	178	928	1240	3740	304	1690	1850	436	445	486	158	89
26	161	754	1320	3530	292	1280	2000	409	409	427	149	88
27	148	921	1280	2360	284	1040	1830	383	395	381	143	85
28	140	1050	1100	1820	276	879	1490	386	390	354	139	84
29	160	879	954	1660	---	774	1440	457	378	363	138	83
30	265	1420	833	1370	---	706	1320	425	351	468	132	83
31	544	---	734	1180	---	649	---	691	---	380	128	---
TOTAL	4883	26763	29494	27030	16590	36915	44121	24736	16155	10411	6146	3009
MEAN	158	892	951	872	592	1191	1471	798	538	336	198	100
MAX	544	2820	1540	3740	1040	4700	2460	1600	810	592	345	124
MIN	89	400	538	287	276	295	741	383	351	217	128	83
AC-FT	9690	53080	58500	53610	32910	73220	87510	49060	32040	20650	12190	5970
CFSM	1.12	6.33	6.75	6.18	4.20	8.45	10.4	5.66	3.82	2.38	1.41	.71
IN.	1.29	7.06	7.78	7.13	4.38	9.74	11.64	6.53	4.26	2.75	1.62	.79

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1957 - 1993, BY WATER YEAR (WY)

	1957	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	
MEAN	393	1249	1538	1564	1382	1111	1057	708	419	195	121	176																										
MAX	1240	2894	3418	2869	3039	2940	1616	1283	1082	620	294	667																										
(WY)	1960	1991	1976	1971	1982	1972	1991	1974	1981	1983	1968	1959																										
MIN	52.0	276	401	415	377	374	573	304	134	93.4	64.3	60.5																										
(WY)	1988	1980	1977	1977	1977	1992	1973	1980	1992	1970	1970	1967																										

SUMMARY STATISTICS

	FOR 1992 CALENDAR YEAR	FOR 1993 WATER YEAR	WATER YEARS 1957 - 1993
ANNUAL TOTAL	185234	246253	
ANNUAL MEAN	506	675	823
HIGHEST ANNUAL MEAN			1228
LOWEST ANNUAL MEAN			467
HIGHEST DAILY MEAN	4100	4700	17100
LOWEST DAILY MEAN	64	83	49
ANNUAL SEVEN-DAY MINIMUM	65	86	50
ANNUAL RUNOFF (AC-FT)	367400	488400	596400
ANNUAL RUNOFF (CFSM)	3.59	4.78	5.84
ANNUAL RUNOFF (INCHES)	48.87	64.97	79.32
10 PERCENT EXCEEDS	1120	1430	1770
50 PERCENT EXCEEDS	319	523	535
90 PERCENT EXCEEDS	70	113	96

e Estimated

COWLITZ RIVER BASIN

373

14237800 MAYFIELD RESERVOIR NEAR SILVER CREEK, WA

LOCATION.--Lat 46°30'13", long 122°35'11", in SE 1/4 SW 1/4 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 sea level. 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 taintor 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. Chemical analyses December 1973 to September 1983 (samples were taken near the dam).

EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 134,850 acre-ft Dec. 9, 1971, elevation, 425.50 ft; minimum contents since normal operating level was attained, 112,830 acre-ft June 4, 1969, elevation, 415.24 ft.

EXTREMES FOR CURRENT YEAR.--Maximum contents, 132,622 acre-ft May 16, elevation, 424.51 ft; minimum contents, 122,750 acre-ft Nov. 19, elevation, 420.00 ft.

MONTHEND ELEVATION AND CONTENTS AT 2400, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

Date	Elevation (feet)	Contents (acre-feet)	Change in contents (acre-feet)
Sept. 30.....	422.77	128,764	--
Oct. 31.....	422.35	127,840	-924
Nov. 30.....	423.02	129,304	+1,464
Dec. 31.....	422.59	128,359	-945
CAL YR 1992.....	--	--	-2,363
Jan. 31.....	421.67	126,354	-2,005
Feb. 28.....	422.88	129,006	+2,652
Mar. 31.....	421.81	126,662	-2,344
Apr. 30.....	422.10	127,290	+628
May 31.....	423.69	130,788	+3,498
June 30.....	423.61	130,612	-176
July 31.....	423.75	130,925	+313
Aug. 31.....	423.67	130,744	-181
Sept. 30.....	423.24	129,798	-946
WTR YR 1993.....	--	--	+1,034

COWLITZ RIVER BASIN

14238000 COWLITZ RIVER BELOW MAYFIELD DAM, WA

LOCATION.--Lat 46°30'38", long 122°36'54", in SE 1/4 NE 1/4 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 sea level. 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.--No estimated daily discharges. 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. U.S. Geological Survey satellite telemeter at station. Sediment records October 1978 to September 1980. Water temperatures October 1950 to September 1980.

AVERAGE DISCHARGE.--59 years (water years 1935-93), 6,208 ft³/s, 60.22 in/yr, 4,498,000 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 discharge, 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, 10,300 ft³/s May 21, gage height, 13.39 ft; minimum discharge, 2,370 ft³/s July 30.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2520	2550	3940	4020	5080	4010	4090	5050	5910	5020	2480	3210
2	2530	2550	3960	4030	5060	4000	4090	5040	7070	5020	2880	3270
3	2530	2540	3930	4030	5050	4000	4070	5070	7080	5030	2890	3390
4	2540	2520	3940	4300	5050	3990	4070	5160	6660	5030	2890	3390
5	2520	2530	3960	6140	4970	3990	4070	6100	6640	5030	2900	3390
6	2520	2560	3950	6110	4520	3990	4050	6010	6650	5040	2900	3400
7	2510	2590	3950	6280	4480	4000	4060	6000	6630	5030	2890	3390
8	2510	2590	3930	6980	4480	4000	4080	6030	6610	5030	2900	3390
9	2500	2550	3940	6970	4480	4000	4080	5930	6000	5030	2910	3270
10	2510	2500	3950	6980	4550	4000	4060	5020	6060	5040	2900	3140
11	2510	2510	3930	6910	4400	4000	4090	4970	6060	5040	2900	3140
12	2510	2520	3940	6850	4000	4020	4030	5140	6060	5040	2920	3140
13	2510	2520	3950	6860	4010	4030	4080	7470	6080	4940	2990	3140
14	2510	2530	3960	6850	4010	4050	4100	10100	6070	5070	2940	3140
15	2510	2530	3970	6870	4010	4050	4110	10200	6070	5060	2940	3110
16	2520	2540	3950	6900	4000	4040	4070	10100	6080	3410	2940	3120
17	2520	2530	3940	6900	3980	4030	4000	10100	6170	2450	2940	3140
18	2520	2530	3960	6880	4010	4050	4010	10100	6100	2520	2980	3130
19	2520	2550	3970	6860	3990	4060	4000	10100	6090	2510	3030	3140
20	2520	2540	3990	6850	4000	4060	4000	10200	6100	2510	3630	3140
21	2520	2540	4000	6710	4000	4050	4010	10200	6060	2450	3640	3140
22	2500	2880	3990	5430	4010	4060	4490	10200	5830	2400	3640	3140
23	2520	3480	4000	5410	4010	4060	4520	10100	5580	2400	3650	3140
24	2530	3670	3960	5410	4000	4040	4510	8590	5370	2400	3640	3140
25	2520	4080	3970	5460	4010	4060	4510	7370	5020	2400	3620	3140
26	2520	4100	3970	5460	4010	4090	4510	5950	5010	2410	3620	3140
27	2540	3990	3950	5450	4020	4090	4530	5890	5020	2420	3620	3140
28	2530	3920	3940	5450	4010	4090	5040	5860	5020	2420	3620	3140
29	2530	3930	3990	5440	---	4100	5060	5030	5000	2410	3620	3140
30	2540	3950	4020	5450	---	4090	5050	5030	5010	2430	3620	3140
31	2550	---	4010	5350	---	4090	---	5040	---	2430	3620	---
TOTAL	78140	87320	122810	185590	120200	125190	127440	223150	179110	115420	99260	95980
MEAN	2521	2911	3962	5987	4293	4038	4248	7198	5970	3723	3202	3199
MAX	2550	4100	4020	6980	5080	4100	5060	10200	7080	5070	3650	3400
MIN	2500	2500	3930	4020	3980	3990	4000	4970	5000	2400	2480	3110
AC-FT	155000	173200	243600	368100	238400	248300	252800	442600	355300	228900	196900	190400
MEAN†	1354	4218	4006	3940	3550	7400	8775	10109	5569	3109	2037	1199
CFSM†	0.97	3.01	2.86	2.81	2.54	5.29	6.27	7.22	3.98	2.22	1.46	0.86
IN.†	1.12	3.36	3.30	3.25	2.64	6.10	6.99	8.33	4.44	2.56	1.68	0.95
AC-FT†	83260	250900	246400	242300	197100	455100	522000	621700	331300	191200	125300	71300

CAL YR 1992 TOTAL 1443920 MEAN 3945 MAX 12900 MIN 2490 AC-FT 2864000 MEAN† 3911 CFSM† 2.79 IN.† 38.01 AC-FT† 2838000
WTR YR 1993 TOTAL 1559610 MEAN 4273 MAX 10200 MIN 2400 AC-FT 3093000 MEAN† 4608 CFSM† 3.29 IN.† 44.69 AC-FT† 3337000

† Adjusted for change in contents in Riffe Lake and Mayfield Reservoir.

COWLITZ RIVER BASIN

375

14240304 SPIRIT LAKE AT TUNNEL, AT SPIRIT LAKE, WA

LOCATION.--Lat 46°16'35", long 122°09'41", in NE 1/4 NE 1/4 sec.10, T.9 N., R.5 E., Skamania County, Hydrologic Unit 17080005, Mount St. Helens National Volcanic Monument, at entrance of Spirit Lake Outlet Tunnel, 5.6 mi north northeast of the Mount St. Helens volcanic edifice.

DRAINAGE AREA.--18.0 mi², at entrance to Spirit Lake Outlet Tunnel. Prior to the volcanic eruption on May 18, 1980, 14.9 mi².

PERIOD OF RECORD.--October 1987 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 3,470 ft, from topographic map.

REMARKS.--As a result of the May 18, 1980 eruption, a gravitational landslide ensued, transporting an estimated 0.6 mi³ of debris into the upper North Toutle River drainage basin. A massive debris avalanche completely filled the lake, blocking the natural outlet to the North Fork Toutle River with a deposit several hundred feet thick. This filling caused the lake to rise 200 ft to elevation 3,400 ft. Refer to report by Schuster, R. L., ed., 1986, Landslide Dams: Processes, Risk and Mitigation: Geotechnical Special Publication no. 3, American Society of Civil Engineers, 164 p., for history of Spirit Lake as it was impacted by the eruption and actions taken to reduce the resulting flood threat.

EXTREMES FOR PERIOD OF RECORD.--Maximum elevation, 3,443.83 ft May 22, 1993; minimum recorded, 3,437.00 ft Oct. 28, 1987.

EXTREMES FOR CURRENT PERIOD.--Maximum elevation, 3,443.83 ft May 22; minimum recorded, 3,438.06 ft Oct. 10.

ELEVATION (FEET NGVD), WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY OBSERVATION AT 24:00 VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3438.16	3438.75	---	3440.43	---	---	---	3442.68	3443.39	3441.75	3440.32	3439.03
2	3438.16	3438.77	---	3440.38	---	---	---	3442.78	3443.27	3441.66	3440.28	3439.00
3	3438.19	3438.80	---	3440.31	---	---	---	3442.92	3443.19	3441.62	3440.22	3438.97
4	3438.17	3438.89	---	3440.28	---	---	---	3442.94	3443.20	3441.64	3440.18	3438.94
5	3438.16	3438.88	---	3440.21	---	---	---	3442.92	3443.25	3441.50	3440.13	3438.91
6	3438.16	3438.93	---	3440.21	---	---	---	3443.00	3443.15	3441.43	3440.07	3438.87
7	3438.15	3439.15	---	3440.12	---	---	---	3443.05	3443.10	3441.31	3440.02	3438.84
8	3438.11	3439.21	---	3440.07	---	---	---	3443.07	3443.02	3441.29	3439.97	3438.81
9	3438.09	---	---	---	---	---	---	3443.04	3443.04	3441.29	3439.91	3438.78
10	3438.06	---	3440.31	---	---	---	---	3443.05	3442.96	3441.11	3439.86	3438.75
11	3438.07	3439.36	3440.26	---	---	---	---	3443.21	3442.94	3441.09	3439.81	3438.72
12	3438.07	3439.39	3440.21	3439.89	---	---	---	3443.33	3442.90	3440.97	3439.76	3438.68
13	3438.11	3439.39	3440.19	3439.87	---	---	---	3443.50	3442.79	3440.98	3439.72	3438.65
14	---	3439.38	---	3439.84	---	---	---	3443.54	3442.77	3440.93	3439.67	3438.62
15	---	3439.42	---	3439.81	---	---	---	3443.56	3442.66	3440.86	3439.61	3438.59
16	---	3439.43	3440.28	3439.77	---	---	---	3443.52	3442.65	3440.82	3439.59	3438.56
17	3438.11	3439.43	3440.33	3439.85	---	---	---	3443.56	3442.60	3440.79	3439.56	3438.53
18	3438.10	3439.53	---	3439.76	---	---	---	3443.66	3442.46	3440.76	3439.52	3438.50
19	3438.08	---	---	3439.78	---	---	---	3443.68	3442.42	3440.75	3439.49	3438.47
20	3438.18	---	---	---	---	---	3442.19	3443.73	3442.37	3440.74	3439.45	3438.44
21	3438.19	---	---	---	---	---	3442.29	3443.76	3442.26	3440.72	3439.40	3438.41
22	3438.17	---	---	---	---	---	3442.33	3443.83	3442.37	3440.66	3439.38	3438.38
23	3438.20	3439.92	---	---	---	---	3442.37	3443.79	3442.31	3440.60	3439.36	3438.36
24	3438.15	---	3440.36	---	---	---	3442.35	3443.76	3442.18	3440.62	3439.34	3438.33
25	3438.23	---	3440.34	---	---	---	3442.45	3443.72	3442.09	3440.57	3439.31	3438.31
26	3438.14	---	3440.39	---	---	---	3442.52	3443.65	3442.01	3440.46	3439.27	3438.29
27	3438.14	3439.98	3440.48	---	---	---	3442.49	3443.61	3441.96	---	3439.23	3438.27
28	3438.19	3439.96	3440.50	---	---	---	3442.50	3443.57	3442.00	3440.48	3439.19	3438.25
29	3438.32	---	3440.44	---	---	---	3442.56	3443.53	3441.87	3440.45	3439.15	3438.22
30	3438.47	---	3440.44	---	---	---	3442.59	3443.53	3441.85	3440.42	3439.11	3438.20
31	3438.56	---	3440.48	---	---	---	---	3443.51	---	3440.37	3439.07	---
MAX	---	---	---	---	---	---	---	3443.83	3443.39	---	3440.32	3439.03
MIN	---	---	---	---	---	---	---	3442.68	3441.85	---	3439.07	3438.20

COWLITZ RIVER BASIN

14240525 NORTH FORK TOUTLE RIVER BELOW SEDIMENT RETENTION STRUCTURE, NEAR KID VALLEY, WA

LOCATION.--Lat 46°22'19", long 122°34'40", in NE 1/4 NE 1/4 sec.8, T.10 N., R.2 E., Cowlitz County, Hydrologic Unit 17080005, 1.3 mi downstream from Sediment Retention Structure, on left bank, 0.7 mi upstream from the mouth of the Green River, 1.8 mi east of Kid Valley, and at mile 12.0.

DRAINAGE AREA.--175 mi².

PERIOD OF RECORD.--October 1989 to current year.

GAGE.--Water-stage recorder. Datum of gage is 700.00 ft above sea level (levels by U.S. Army Corps of Engineers).

REMARKS.--Records fair. No regulation or diversion upstream from station. U.S. Geological Survey Satellite telemeter at station.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 4,990 ft³/s Jan. 10, 1990, gage height, 58.39 ft; minimum discharge, 147 ft³/s Aug. 15, 1990.

EXTREMES OUTSIDE PERIOD OF RECORD.--An outstanding flood occurred on May 18, 1980, from a mudflow caused by the eruption of Mount St. Helens.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 1,640 ft³/s Mar. 24, gage height, 56.49 ft; minimum discharge, 190 ft³/s Aug. 17.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	248	592	e890	500	868	302	710	1080	847	574	448	250
2	248	646	e850	477	749	353	748	1060	830	561	428	247
3	275	620	e740	470	612	413	854	1060	816	546	401	242
4	282	590	e640	487	504	533	927	1120	783	530	373	242
5	262	561	548	453	480	648	912	1070	753	509	375	244
6	248	491	509	416	465	649	872	1050	772	496	373	245
7	237	540	492	388	464	643	832	1050	813	481	361	247
8	229	615	524	371	474	629	813	1110	858	461	347	241
9	225	647	624	342	479	616	870	1120	880	447	338	242
10	223	632	688	322	492	597	942	1130	918	436	332	240
11	218	591	775	336	471	566	1110	1090	925	427	331	240
12	217	587	747	352	447	533	1270	1040	940	429	328	242
13	222	582	681	362	426	490	1300	1020	928	418	322	228
14	221	540	647	357	400	507	1230	998	901	471	327	226
15	214	497	680	351	381	660	1140	967	894	462	323	226
16	212	464	654	348	353	703	1080	925	887	483	337	227
17	209	441	641	338	315	703	1040	874	851	497	287	231
18	209	436	611	334	303	767	1070	823	802	438	266	229
19	216	577	577	357	281	794	1100	780	731	490	278	222
20	221	639	648	645	281	812	1030	785	674	540	288	221
21	247	708	705	775	281	801	986	804	640	523	287	222
22	244	1070	718	756	269	798	980	841	720	559	284	219
23	233	1200	737	687	256	1410	976	818	820	565	285	221
24	229	1150	740	626	251	1630	994	756	760	557	296	225
25	225	1060	719	717	238	1550	1050	705	673	534	302	217
26	221	947	698	914	218	1420	1150	673	621	495	294	213
27	220	860	686	1010	237	1190	1210	652	614	490	285	208
28	218	e870	661	1040	262	1010	1180	645	649	545	275	204
29	226	e820	631	1050	---	923	1130	678	672	605	272	198
30	348	e880	582	1010	---	838	1120	668	619	528	263	199
31	535	---	531	961	---	743	---	767	---	474	260	---
TOTAL	7582	20853	20574	17552	11257	24231	30626	28159	23591	15571	9966	6858
MEAN	245	695	664	566	402	782	1021	908	786	502	321	229
MAX	535	1200	890	1050	868	1630	1300	1130	940	605	448	250
MIN	209	436	492	322	218	302	710	645	614	418	260	198
AC-FT	15040	41360	40810	34810	22330	48060	60750	55850	46790	30890	19770	13600
CFSM	1.40	3.97	3.79	3.24	2.30	4.47	5.83	5.19	4.49	2.87	1.84	1.31
IN.	1.61	4.43	4.37	3.73	2.39	5.15	6.51	5.99	5.01	3.31	2.12	1.46

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1990 - 1993, BY WATER YEAR (WY)

	1990	1991	1992	1993	1990	1991	1992	1993	1990	1991	1992	1993
MEAN	314	850	942	977	856	1044	783	654	373	236	220	
MAX	491	1240	1165	1508	1181	1461	921	913	502	321	229	
(WY)	1991	1991	1992	1990	1990	1991	1990	1990	1993	1993	1991	
MIN	218	648	664	566	402	539	658	515	278	225	182	173
(WY)	1992	1990	1993	1993	1993	1992	1992	1992	1992	1990	1990	1990

SUMMARY STATISTICS

FOR 1992 CALENDAR YEAR

FOR 1993 WATER YEAR

WATER YEARS 1990 - 1993

ANNUAL TOTAL	187173	216820	692
ANNUAL MEAN	511	594	807
HIGHEST ANNUAL MEAN			1991
LOWEST ANNUAL MEAN			1992
HIGHEST DAILY MEAN	2120	1630	1470
LOWEST DAILY MEAN	165	198	140
ANNUAL SEVEN-DAY MINIMUM	178	209	156
ANNUAL RUNOFF (AC-FT)	371300	430100	501200
ANNUAL RUNOFF (CFSM)	2.92	3.39	3.95
ANNUAL RUNOFF (INCHES)	39.79	46.09	53.71
10 PERCENT EXCEEDS	897	1040	1260
50 PERCENT EXCEEDS	440	561	605
90 PERCENT EXCEEDS	189	229	211

e Estimated

COWLITZ RIVER BASIN

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14240800 GREEN RIVER ABOVE BEAVER CREEK, NEAR KID VALLEY, WA

LOCATION.--Lat 46°22'55", long 122°31'21", in SE 1/4 NW 1/4 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.

DRAINAGE AREA.--129 mi².

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--September 1980 to current year.

GAGE.--Water-stage recorder. Datum of gage is 824.60 ft above sea level.

REMARKS.--Records good except for estimated daily discharges, which are fair. No regulation or diversion upstream from station. Some quality of water data available for this station.

AVERAGE DISCHARGE.--13 years, 488 ft³/s, 51.37 in/yr, 353,600 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 14,500 ft³/s Feb. 23, 1986, gage height, 12.43 ft from floodmark; minimum discharge, 32 ft³/s Oct. 12, 13, 1987.

EXTREMES FOR CURRENT YEAR.--Peak discharge 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)
Mar. 23	0715	*2,390	*7.95				
Minimum daily discharge, 57 ft ³ /s Sept. 30.							

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	100	432	721	321	481	178	490	834	739	364	300	91
2	105	569	618	296	439	178	601	802	602	356	272	89
3	152	486	501	290	405	225	865	833	570	341	251	85
4	126	466	433	282	377	280	838	822	536	327	227	84
5	108	417	386	255	365	361	678	714	509	311	210	84
6	99	359	355	235	355	377	608	835	528	292	200	82
7	92	503	328	239	354	373	560	869	705	270	191	79
8	87	676	363	220	372	373	613	844	749	254	182	76
9	84	648	398	198	386	364	822	784	725	240	170	74
10	81	e525	635	198	383	348	863	817	739	230	162	73
11	78	e550	540	189	359	325	1220	942	805	224	156	73
12	75	e535	424	188	335	303	1110	1000	809	217	150	79
13	85	500	364	192	315	285	965	1010	704	213	149	74
14	81	457	490	183	293	325	870	810	652	237	147	71
15	75	414	495	163	274	612	817	705	726	227	142	72
16	72	375	438	157	242	533	770	609	665	247	158	70
17	71	349	419	153	223	539	810	614	590	302	154	68
18	72	338	371	149	227	878	830	646	541	236	134	67
19	87	430	355	187	223	757	739	671	500	256	126	67
20	86	376	506	442	216	699	661	694	455	335	131	68
21	109	719	542	387	206	607	678	712	433	349	122	68
22	105	1110	555	330	195	743	704	694	596	385	115	66
23	95	856	638	286	185	2150	651	562	593	396	123	64
24	89	646	590	313	177	1550	660	519	495	390	138	63
25	85	514	527	743	168	1130	754	502	451	389	134	63
26	82	434	539	1070	161	873	832	437	428	359	117	61
27	79	506	496	878	157	711	784	432	452	327	109	59
28	79	545	462	776	155	603	697	441	453	322	106	58
29	100	460	417	694	---	536	730	444	436	359	103	58
30	181	828	373	603	---	486	838	458	389	425	97	57
31	288	---	344	536	---	442	---	808	---	337	93	---
TOTAL	3108	16023	14623	11153	8028	18144	23058	21864	17575	9517	4869	2143
MEAN	100	534	472	360	287	585	769	705	586	307	157	71.4
MAX	288	1110	721	1070	481	2150	1220	1010	809	425	300	91
MIN	71	338	328	149	155	178	490	432	389	213	93	57
AC-FT	6160	31780	29000	22120	15920	35990	45740	43370	34860	18880	9660	4250
CFSM	.78	4.14	3.66	2.79	2.22	4.54	5.96	5.47	4.54	2.38	1.22	.55
IN.	.90	4.62	4.22	3.22	2.32	5.23	6.65	6.30	5.07	2.74	1.40	.62

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1980 - 1993, BY WATER YEAR (WY)

	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993
MEAN	185	714	731	734	779	621	702	586	473	190	82.2	89.2		
MAX	394	1185	1258	1224	1514	867	1075	878	824	448	157	169		
(WY)	1986	1991	1981	1984	1982	1987	1991	1984	1981	1983	1993	1983		
MIN	34.2	104	356	360	287	298	426	316	104	72.7	47.2	46.3		
(WY)	1988	1988	1986	1993	1993	1992	1986	1992	1992	1992	1992	1989		

SUMMARY STATISTICS	FOR 1992 CALENDAR YEAR	FOR 1993 WATER YEAR	WATER YEARS 1980 - 1993
ANNUAL TOTAL	119904	150105	
ANNUAL MEAN	328	411	488
HIGHEST ANNUAL MEAN			620
LOWEST ANNUAL MEAN			364
HIGHEST DAILY MEAN	2010	2150	7310
LOWEST DAILY MEAN	37	57	32
ANNUAL SEVEN-DAY MINIMUM	38	60	33
ANNUAL RUNOFF (AC-FT)	237800	297700	353800
ANNUAL RUNOFF (CFSM)	2.54	3.19	3.79
ANNUAL RUNOFF (INCHES)	34.58	43.29	51.43
10 PERCENT EXCEEDS	665	806	954
50 PERCENT EXCEEDS	250	372	398
90 PERCENT EXCEEDS	50	83	66

e Estimated

COWLITZ RIVER BASIN

14240800 GREEN RIVER ABOVE BEAVER CREEK, NEAR KID VALLEY, WA--Continued

WATER-QUALITY RECORDS

PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: May to October 1990, May to September 1991.

WATER TEMPERATURE: May to October 1990, May to September 1991.

SUSPENDED SEDIMENT DISCHARGE: October 1980 to current year. Records prior to October 1985 are published in U.S. Geological Survey Open-File Report 85-632; records for 1984-87 are published in U.S. Geological Survey Open-File Report 91-219.

INSTRUMENTATION.--Water-quality monitor May 1990 to September 1991. Automatic pumping sediment sampler since October 1982.

EXTREMES FOR PERIOD OF DAILY RECORD.--

SEDIMENT CONCENTRATION: Maximum daily, 5,890 mg/L Feb. 23, 1986; minimum, 1 mg/L on many days.

SEDIMENT DISCHARGE: Maximum daily, 167,000 tons Feb. 23, 1986; minimum, 0.10 tons on many days.

EXTREMES FOR CURRENT YEAR.--

SEDIMENT CONCENTRATION: Maximum daily, 371 mg/L Mar. 23; minimum, 1 mg/L on many days.

SEDIMENT DISCHARGE: Maximum daily, 2,200 tons Mar. 23; minimum, 0.15 tons Sept. 30.

WATER-QUALITY DATA JANUARY 1990 TO MARCH 1993

DATE	TIME	TEMPER- ATURE WATER (DEG C)	DIS- CHARGE, INST. CUBIC FEET PER SECOND	SEDIM- ENT, DIS- CHARGE, SUS- PENDED (MG/L)	SEDIM- ENT, DIS- CHARGE, SUS- PENDED (T/DAY)	SED. SUSP. SIEVE % FINER THAN .062 MM	SED. SUSP. SIEVE % FINER THAN .125 MM	SED. SUSP. SIEVE % FINER THAN .250 MM	SED. SUSP. SIEVE % FINER THAN .500 MM	SED. SUSP. SIEVE % FINER THAN 1.00 MM	SED. SUSP. SIEVE % FINER THAN 2.00 MM	SED. SUSP. SIEVE % FINER THAN .002 MM
JAN 1990												
09...	1435	7.5	5900	1450	23100	--	--	--	--	--	--	--
APR 1991												
15...	1250	6.0	5750	3470	53900	--	--	--	--	--	--	9
MAR 1993												
23...	1304	6.5	2280	370	2280	50	61	74	87	95	97	--
23...	1306	6.5	2280	378	2330	47	58	72	86	95	100	--

[illegible]

COWLITZ RIVER BASIN

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14240800 GREEN RIVER ABOVE BEAVER CREEK, NEAR KID VALLEY, WA--Continued

SEDIMENT DISCHARGE, SUSPENDED (TONS/DAY), WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DAY	MEAN DISCHARGE (CFS)	MEAN CONCENTRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCENTRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCENTRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)
OCTOBER			NOVEMBER			DECEMBER			
1	100	2	.54	432	26	31	721	6	14
2	105	1	.28	569	27	42	618	4	6.7
3	152	4	1.6	486	7	10	501	4	5.4
4	126	1	.34	466	8	11	433	3	3.5
5	108	2	.58	417	5	6.3	386	2	2.1
6	99	1	.27	359	4	4.6	355	2	1.9
7	92	1	.25	503	9	13	328	2	1.8
8	87	2	.47	676	17	33	363	6	7.1
9	84	2	.45	648	9	17	398	3	4.0
10	81	2	.44	e525	5	7.1	635	16	32
11	78	2	.42	e550	5	7.4	540	4	6.9
12	75	3	.61	e535	5	7.2	424	2	2.3
13	85	1	.23	500	4	5.4	364	2	2.0
14	81	2	.44	457	4	4.9	490	5	8.1
15	75	1	.20	414	3	3.4	495	4	5.3
16	72	2	.39	375	4	4.0	438	2	2.4
17	71	1	.19	349	2	1.9	419	2	2.3
18	72	1	.19	338	2	1.8	371	4	4.0
19	87	1	.23	430	5	6.6	355	4	3.8
20	86	1	.23	376	3	3.0	506	5	6.8
21	109	1	.29	719	64	193	542	8	12
22	105	1	.28	1110	36	112	555	4	6.0
23	95	1	.26	856	10	25	638	6	10
24	89	2	.48	646	6	10	590	4	6.4
25	85	2	.46	514	5	6.9	527	6	8.5
26	82	1	.22	434	4	4.7	539	4	5.8
27	79	1	.21	506	4	5.5	496	6	8.0
28	79	2	.43	545	5	7.4	462	3	3.7
29	100	2	.54	460	3	3.7	417	2	2.3
30	181	6	3.4	828	33	88	373	2	2.0
31	288	9	7.3	---	---	---	344	2	1.9
TOTAL	3108	---	22.22	16023	---	676.8	14623	---	189.0

DAY	MEAN DISCHARGE (CFS)	MEAN CONCENTRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCENTRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCENTRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)
JANUARY			FEBRUARY			MARCH			
1	321	2	1.7	481	3	3.9	178	2	.96
2	296	2	1.6	439	3	3.6	178	2	.96
3	290	2	1.6	405	8	8.7	225	3	1.8
4	282	2	1.5	377	4	4.1	280	4	3.0
5	255	2	1.4	365	2	2.0	361	6	5.8
6	235	4	2.5	355	1	.96	377	6	6.1
7	239	---	1.3	354	2	1.9	373	4	4.0
8	220	---	1.2	372	3	3.0	373	3	3.0
9	198	---	1.0	386	2	2.1	364	3	2.9
10	198	---	1.0	383	2	2.1	348	2	1.9
11	189	---	.90	359	1	.97	325	2	1.8
12	188	---	.90	335	1	.90	303	3	2.5
13	192	---	.90	315	2	1.7	285	2	1.5
14	183	---	.80	293	1	.79	325	3	3.0
15	163	---	.60	274	1	.74	612	37	64
16	157	---	.60	242	2	1.3	533	11	17
17	153	---	.50	223	4	2.4	539	9	15
18	149	---	.40	227	2	1.2	878	40	97
19	187	---	.90	223	1	.60	757	13	28
20	442	---	6.2	216	1	.58	699	6	11
21	387	---	3.7	206	2	1.1	607	4	6.6
22	330	---	2.0	195	2	1.1	743	24	80
23	286	---	1.5	185	1	.50	2150	371	2200
24	313	---	1.7	177	1	.48	1550	128	551
25	743	---	42	168	1	.45	1130	57	179
26	1070	---	160	161	1	.43	873	25	61
27	878	---	80	157	1	.42	711	14	27
28	776	---	50	155	3	1.3	603	10	16
29	694	---	33	---	---	---	536	6	8.7
30	603	---	20	---	---	---	486	6	7.9
31	536	---	13	---	---	---	442	6	7.2
TOTAL	11153	---	434.40	8028	---	49.32	18144	---	3415.62

e Estimated

COWLITZ RIVER BASIN

14240800 GREEN RIVER ABOVE BEAVER CREEK, NEAR KID VALLEY, WA--Continued

SEDIMENT DISCHARGE, SUSPENDED (TONS/DAY), WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DAY	MEAN DISCHARGE (CFS)	MEAN CONCENTRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCENTRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCENTRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)
APRIL			MAY			JUNE			
1	490	6	7.9	834	12	29	739	14	29
2	601	9	15	802	11	26	602	6	10
3	865	34	91	833	12	28	570	5	7.9
4	838	13	31	822	10	24	536	4	6.6
5	678	6	12	714	8	17	509	3	5.5
6	608	4	7.6	835	11	27	528	5	8.0
7	560	5	7.7	869	11	28	705	12	25
8	613	7	12	844	9	23	749	11	23
9	822	19	44	784	---	17	725	12	24
10	863	18	43	817	---	17	739	9	19
11	1220	45	152	942	---	30	805	---	26
12	1110	24	74	1000	---	32	809	---	24
13	965	15	42	1010	---	38	704	---	17
14	870	12	30	810	---	25	652	---	12
15	817	9	21	705	---	23	726	---	24
16	770	7	16	609	---	18	665	---	15
17	810	7	17	614	---	20	590	---	13
18	830	8	18	646	14	25	541	---	6.0
19	739	6	12	671	22	41	500	---	5.4
20	661	4	7.1	694	20	39	455	---	5.1
21	678	4	7.3	712	17	34	433	4	4.9
22	704	5	9.5	694	16	31	596	11	20
23	651	4	7.0	562	13	20	593	8	14
24	660	4	7.1	519	12	18	495	5	6.7
25	754	8	19	502	9	13	451	5	6.1
26	832	13	30	437	9	11	428	4	4.6
27	784	10	22	432	6	8.1	452	6	7.3
28	697	6	12	441	7	9.0	453	4	4.9
29	730	7	14	444	9	12	436	4	4.7
30	838	14	32	458	8	11	389	4	4.2
31	---	---	---	808	33	79	---	---	---
TOTAL	23058	---	820.2	21864	---	773.1	17575	---	382.9

DAY	MEAN DISCHARGE (CFS)	MEAN CONCENTRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCENTRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCENTRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)
JULY			AUGUST			SEPTEMBER			
1	364	4	3.9	300	3	2.4	91	3	.74
2	356	3	2.9	272	3	2.2	89	2	.48
3	341	3	2.8	251	2	1.4	85	2	.46
4	327	3	2.6	227	2	1.2	84	4	.91
5	311	3	2.5	210	2	1.1	84	4	.91
6	292	3	2.4	200	1	.54	82	2	.44
7	270	3	2.2	191	2	1.0	79	3	.64
8	254	3	2.1	182	2	.98	76	2	.41
9	240	4	2.6	170	5	2.3	74	2	.40
10	230	3	1.9	162	6	2.6	73	4	.79
11	224	3	1.8	156	4	1.9	73	3	.59
12	217	2	1.2	150	8	3.4	79	3	.64
13	213	2	1.2	149	12	5.2	74	2	.40
14	237	6	3.8	147	8	3.4	71	2	.38
15	227	4	2.5	142	8	3.1	72	2	.39
16	247	4	2.8	158	10	4.3	70	2	.38
17	302	10	9.4	154	9	3.7	68	2	.37
18	236	4	2.4	134	4	1.4	67	2	.36
19	256	6	5.5	126	2	.68	67	1	.18
20	335	6	6.3	131	2	.71	68	1	.18
21	349	6	6.6	122	2	.66	68	2	.37
22	385	8	8.3	115	2	.62	66	2	.36
23	396	6	6.4	123	3	1.0	64	1	.17
24	390	6	6.3	138	3	1.1	63	1	.17
25	389	4	4.2	134	2	.72	63	1	.17
26	359	4	3.9	117	6	1.9	61	1	.16
27	327	3	2.6	109	2	.59	59	1	.16
28	322	4	3.5	106	2	.57	58	1	.16
29	359	7	8.0	103	2	.56	58	2	.31
30	425	12	16	97	2	.52	57	1	.15
31	337	4	3.6	93	2	.50	---	---	---
TOTAL	9517	---	132.2	4869	---	52.25	2143	---	12.23
YEAR	150105		6960.24						

14241100 NORTH FORK TOUTLE RIVER AT KID VALLEY, WA

LOCATION.--Lat 46°21'55", long 122°37'40", in NE 1/4 SW 1/4 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.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--June 1980 to current year.

GAGE.--Water-stage recorder. Datum of gage is 575.80 ft above sea level (levels by Corps of Engineers).

REMARKS.--No estimated daily discharges. Records fair. No regulation or diversion upstream from station. Some quality of water data available from Washington office for this station. U.S. Geological Survey satellite telemeter at station.

AVERAGE DISCHARGE.--13 years, 1,242 ft³/s, 59.39 in/yr, 899,800 acre-ft/yr.

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.--Peak discharges greater than base discharge of 5,500 ft³/s and maximum(*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Mar. 23	1030	*4,290	*21.96				
Minimum daily discharge, 258 ft ³ /s Sept. 30.							

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	353	1040	1550	856	1340	502	1270	1990	1600	953	803	344
2	351	1250	1440	805	1200	566	1410	1920	1450	931	746	339
3	436	1200	1270	795	1030	666	1820	1970	1520	909	703	332
4	427	1140	1110	813	909	833	1900	2060	1380	883	651	328
5	379	1060	978	755	867	1030	1680	1850	1290	849	608	327
6	351	930	909	684	841	1050	1550	1950	1310	814	586	325
7	331	1090	862	643	838	1030	1470	2030	1500	774	569	318
8	315	1360	922	611	866	1020	1490	2050	1610	735	547	311
9	308	1420	1070	544	887	1000	1860	2010	1600	703	522	307
10	301	1260	1410	515	897	967	1980	2010	1650	683	502	304
11	292	1200	1390	512	859	917	2630	2080	1750	665	487	301
12	285	1260	1220	529	809	864	2650	2080	1790	666	474	311
13	294	1170	1080	536	761	810	2400	2090	1650	638	471	301
14	294	1080	1140	526	707	847	2180	1840	1550	740	466	298
15	283	991	1210	511	666	1270	2020	1690	1600	722	458	296
16	277	920	1120	503	593	1260	1920	1550	1540	733	483	292
17	272	864	1100	490	526	1270	1970	1490	1430	834	445	288
18	272	845	1020	484	523	1640	2050	1470	1320	711	403	284
19	293	1020	974	525	535	1580	1920	1450	1220	711	401	286
20	300	1010	1190	1110	526	1530	1750	1480	1120	908	412	287
21	345	1360	1290	1210	510	1430	1720	1510	1070	918	411	284
22	345	2160	1300	1130	485	1520	1740	1540	1300	948	401	279
23	323	1960	1370	1010	467	3900	1690	1390	1420	974	408	275
24	310	1660	1330	975	452	3470	1710	1290	1250	974	434	272
25	303	1450	1250	1410	432	2910	1870	1230	1120	968	433	272
26	296	1260	1240	1970	413	2470	2120	1140	1050	918	408	268
27	289	1250	1190	1880	418	2010	2110	1110	1070	852	389	263
28	286	1300	1140	1790	442	1710	1940	1110	1100	837	380	261
29	312	1160	1070	1720	---	1560	1920	1160	1120	917	373	260
30	503	1540	986	1580	---	1420	2010	1150	1020	1040	362	258
31	828	---	912	1470	---	1290	---	1570	---	892	352	---
TOTAL	10554	37210	36043	28892	19799	44342	56750	51260	41400	25800	15088	8871
MEAN	340	1240	1163	932	707	1430	1892	1654	1380	832	487	296
MAX	828	2160	1550	1970	1340	3900	2650	2090	1790	1040	803	344
MIN	272	845	862	484	413	502	1270	1110	1020	638	352	258
AC-FT	20930	73810	71490	57310	39270	87950	112600	101700	82120	51170	29930	17600
CFSM	1.20	4.37	4.09	3.28	2.49	5.04	6.66	5.82	4.86	2.93	1.71	1.04
IN.	1.38	4.87	4.72	3.78	2.59	5.81	7.43	6.71	5.42	3.38	1.98	1.16

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1980 - 1993, BY WATER YEAR (WY)

	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993
MEAN	553	1734	1833	1804	1999	1650	1691	1380	1101	555	321	317		
MAX	1037	3169	3165	2869	3984	2235	2639	2130	1730	1183	516	484		
(WY)	1986	1984	1981	1984	1982	1987	1991	1984	1984	1983	1985	1983		
MIN	174	314	1163	826	707	951	1181	902	401	256	196	184		
(WY)	1981	1988	1993	1981	1993	1992	1986	1992	1992	1980	1980	1989		

SUMMARY STATISTICS	FOR 1992 CALENDAR YEAR	FOR 1993 WATER YEAR	WATER YEARS 1980 - 1993
ANNUAL TOTAL	329546	376009	
ANNUAL MEAN	900	1030	1241
HIGHEST ANNUAL MEAN			1580
LOWEST ANNUAL MEAN			979
HIGHEST DAILY MEAN	4460	3900	15100
LOWEST DAILY MEAN	207	258	114
ANNUAL SEVEN-DAY MINIMUM	209	265	128
ANNUAL RUNOFF (AC-FT)	653700	745800	899400
ANNUAL RUNOFF (CFSM)	3.17	3.63	4.37
ANNUAL RUNOFF (INCHES)	43.17	49.25	59.39
10 PERCENT EXCEEDS	1650	1890	2290
50 PERCENT EXCEEDS	806	974	1030
90 PERCENT EXCEEDS	246	308	262

COWLITZ RIVER BASIN

14241100 NORTH FORK TOUTLE RIVER AT KID VALLEY, WA--Continued

WATER-QUALITY RECORDS

PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: May to September 1990, May to September 1991.

WATER TEMPERATURE: May to September 1990, May to September 1991.

SUSPENDED SEDIMENT DISCHARGE: June 1980 to current year. Records prior to October 1985 are published in U.S. Geological Survey Open-File Report 85-632; records for water years 1984-87 are published in U.S. Geological Survey Open-File Report 91-219.

INSTRUMENTATION.--Water-quality monitor May 1990 to September 1991. Automatic pumping sediment sampler since June 1981.

EXTREMES FOR PERIOD OF DAILY RECORD.--

SEDIMENT CONCENTRATION: Maximum daily, 174,000 mg/L Mar. 20, 1982; minimum, 3 mg/L Sept. 3, 5, 11, 1988.

SEDIMENT DISCHARGE: Maximum daily, 4,130,000 tons Mar. 19, 1982; minimum, 1.7 tons Sept. 11, 1988.

EXTREMES FOR CURRENT YEAR.--

SEDIMENT CONCENTRATION: Maximum daily, 1,410 mg/L Mar. 23; minimum, 8 mg/L Sept. 18.

SEDIMENT DISCHARGE: Maximum daily, 15,200 tons Mar. 23; minimum 6.6 tons Sept. 18.

WATER-QUALITY DATA NOVEMBER 1987 TO MARCH 1993

DATE	TIME	TEMPER- ATURE WATER (DEG C)	DIS- CHARGE, INST. CUBIC FEET PER SECOND	SEDI- MENT, SUS- PENDED (MG/L)	SEDI- MENT, DIS- CHARGE, SUS- PENDED (T/DAY)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM	SED. SUSP. SIEVE DIAM. % FINER THAN .125 MM	SED. SUSP. SIEVE DIAM. % FINER THAN .250 MM	SED. SUSP. SIEVE DIAM. % FINER THAN .500 MM	SED. SUSP. SIEVE DIAM. % FINER THAN 1.00 MM	SED. SUSP. SIEVE DIAM. % FINER THAN 2.00 MM	SED. SUSP. FALL DIAM. % FINER THAN .002 MM
NOV 1987												
13...	1607	9.5	476	5580	7170	--	--	--	--	--	--	--
13...	1702	9.5	545	12800	18800	--	--	--	--	--	--	--
14...	1149	8.0	510	1910	2630	--	--	--	--	--	--	--
DEC												
01...	1228	6.0	761	2670	5490	--	--	--	--	--	--	--
10...	1404	6.5	8150	7480	165000	--	--	--	--	--	--	12
11...	1411	6.0	4210	3440	39100	--	--	--	--	--	--	--
JAN 1988												
15...	1020	4.5	4590	3520	43600	--	--	--	--	--	--	19
DEC 1989												
05...	1030	8.0	4960	2120	28400	--	--	--	--	--	--	15
06...	1640	8.5	3530	1390	13200	--	--	--	--	--	--	--
JAN 1990												
10...	1346	6.0	8640	4810	112000	--	--	--	--	--	--	15
11...	1201	6.5	6380	2460	42400	61	66	78	93	99	100	--
12...	1627	6.0	4760	1410	18100	57	61	73	87	98	100	--
NOV												
26...	1343	6.5	5730	1790	27700	--	--	--	--	--	--	--
FEB 1991												
02...	1415	7.5	1740	3500	16400	--	--	--	--	--	--	--
20...	1638	7.0	5700	1190	18300	--	--	--	--	--	--	--
APR												
05...	0934	7.0	10300	5050	140000	--	--	--	--	--	--	22
05...	1417	7.0	11300	5160	157000	75	76	80	88	95	99	--
08...	1422	6.0	4140	878	9810	72	73	74	77	83	92	--
NOV												
25...	1330	8.0	5000	1030	13900	58	67	78	89	96	98	--
JAN 1992												
28...	1048	7.0	3910	1110	11700	--	--	--	--	--	--	--
SEP												
24...	1348	13.5	627	1160	1960	97	100	--	--	--	--	--
MAR 1993												
23...	1133	8.0	4240	1760	20100	--	--	--	--	--	--	29
23...	1544	8.0	4220	1510	17200	--	--	--	--	--	--	--
24...	1558	--	33	759	6910	--	--	--	--	--	--	--

DATE	SED. SUSP. FALL DIAM. % FINER THAN .004 MM	SED. SUSP. FALL DIAM. % FINER THAN .008 MM	SED. SUSP. FALL DIAM. % FINER THAN .016 MM	SED. SUSP. FALL DIAM. % FINER THAN .031 MM	SED. SUSP. FALL DIAM. % FINER THAN .062 MM	SED. SUSP. FALL DIAM. % FINER THAN .125 MM	SED. SUSP. FALL DIAM. % FINER THAN .250 MM	SED. SUSP. FALL DIAM. % FINER THAN .500 MM	SED. SUSP. FALL DIAM. % FINER THAN 1.00 MM	SED. SUSP. FALL DIAM. % FINER THAN 2.00 MM	BED MAT. SIEVE DIAM. % FINER THAN 4.00 MM
NOV 1987											
13...	--	--	--	--	74	90	98	100	--	--	--
13...	--	--	--	--	86	93	98	100	--	--	--
14...	--	--	--	--	47	70	88	98	100	--	--
DEC											
01...	--	--	--	--	24	33	59	92	100	--	--
10...	20	32	42	49	53	59	78	94	99	100	--
11...	--	--	--	--	51	56	72	90	100	--	--
JAN 1988											
15...	25	42	51	55	58	61	73	91	99	100	--
DEC 1989											
05...	28	38	47	49	55	70	84	98	100	--	--
06...	--	--	--	--	48	57	76	91	100	--	--
JAN 1990											
10...	22	36	42	46	49	56	71	92	99	100	--
11...	--	--	--	--	--	--	--	--	--	--	--
12...	--	--	--	--	--	--	--	--	--	--	--
NOV											
26...	--	--	--	--	60	65	76	89	98	100	--
FEB 1991											
02...	--	--	--	--	99	99	100	--	--	--	--
20...	--	--	--	--	67	70	76	90	98	100	--
APR											
05...	23	28	46	60	69	74	82	92	100	--	--
05...	--	--	--	--	--	--	--	--	--	--	100
08...	--	--	--	--	--	--	--	--	--	--	100
NOV											
25...	--	--	--	--	--	--	--	--	--	--	100
JAN 1992											
28...	--	--	--	--	86	88	92	96	99	100	--
SEP											
24...	--	--	--	--	--	--	--	--	--	--	--
MAR 1993											
23...	52	73	82	89	90	93	95	98	100	100	--
23...	--	--	--	--	96	97	98	99	100	--	--
24...	--	--	--	--	93	95	96	99	100	--	--

COWLITZ RIVER BASIN

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14241100 NORTH FORK TOUTLE RIVER AT KID VALLEY, WA--Continued

SEDIMENT DISCHARGE, SUSPENDED (TONS/DAY), WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DAY	MEAN DISCHARGE (CFS)	MEAN CONCEN- TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN- TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN- TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)
OCTOBER			NOVEMBER			DECEMBER			
1	353	212	203	1040	404	1130	1550	152	641
2	351	228	217	1250	---	---	1500	1440	121
3	436	223	266	1200	---	830	1270	102	354
4	427	221	256	1140	---	590	1110	---	300
5	379	194	199	1060	---	420	978	---	310
6	351	177	168	930	---	320	909	156	385
7	331	174	156	1090	---	650	862	113	265
8	315	205	175	1360	---	890	922	182	457
9	308	172	144	1420	---	690	1070	107	315
10	301	165	135	1260	122	420	1410	157	650
11	292	185	147	1200	103	338	1390	118	452
12	285	149	115	1260	100	341	1220	74	244
13	294	157	125	1170	85	268	1080	59	173
14	294	140	111	1080	73	213	1140	78	246
15	283	155	119	991	62	167	1210	77	253
16	277	---	110	920	57	142	1120	67	205
17	272	185	136	864	54	128	1100	67	200
18	272	218	161	845	70	160	1020	55	153
19	293	---	160	1020	110	305	974	132	350
20	300	---	160	1010	67	185	1190	82	261
21	345	---	230	1360	305	1490	1290	54	190
22	345	---	190	2160	811	4740	1300	44	158
23	323	179	156	1960	377	2020	1370	47	175
24	310	159	134	1660	269	1210	1330	37	136
25	303	158	129	1450	238	932	1250	31	106
26	296	151	121	1260	230	783	1240	33	112
27	289	125	98	1250	195	652	1190	31	102
28	286	123	95	1300	164	579	1140	33	103
29	312	127	108	1160	142	448	1070	33	98
30	503	254	354	1540	198	856	986	34	91
31	828	438	982	---	---	---	912	43	108
TOTAL	10554	---	5860	37210	---	23397	36043	---	8068

DAY	MEAN DISCHARGE (CFS)	MEAN CONCEN- TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN- TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN- TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)
JANUARY			FEBRUARY			MARCH			
1	856	41	96	1340	66	242	502	---	58
2	805	43	95	1200	83	267	566	34	54
3	795	45	99	1030	100	282	666	81	151
4	813	25	57	909	91	223	833	182	417
5	755	22	45	867	59	139	1030	259	722
6	684	---	53	841	58	133	1050	128	363
7	643	---	36	838	55	125	1030	107	300
8	611	---	33	866	63	148	1020	88	245
9	544	---	29	887	43	105	1000	82	223
10	515	---	30	897	42	102	967	80	210
11	512	---	35	859	41	96	917	86	214
12	529	---	53	809	40	89	864	88	206
13	536	---	57	761	35	73	810	72	159
14	526	---	56	707	38	74	847	74	173
15	511	35	49	666	37	68	1270	146	505
16	503	32	44	593	42	68	1260	83	285
17	490	31	42	526	79	114	1270	74	255
18	484	21	28	523	76	108	1640	130	583
19	525	33	52	535	57	83	1580	85	365
20	1110	178	579	526	62	89	1530	75	310
21	1210	212	699	510	56	77	1430	65	254
22	1130	135	413	485	94	124	1520	78	353
23	1010	102	282	467	112	142	3900	1410	15200
24	975	110	293	452	79	97	3470	856	8080
25	1410	185	743	432	90	106	2910	561	4430
26	1970	184	984	413	51	58	2470	408	2730
27	1880	144	733	418	---	45	2010	317	1720
28	1790	126	612	442	---	45	1710	278	1290
29	1720	106	496	---	---	---	1560	297	1250
30	1580	91	393	---	---	---	1420	267	1030
31	1470	83	334	---	---	---	1290	393	1360
TOTAL	28892	---	7550	19799	---	3322	44342	---	43495

COWLITZ RIVER BASIN

14241100 NORTH FORK TOUTLE RIVER AT KID VALLEY, WA--Continued

SEDIMENT DISCHARGE, SUSPENDED (TONS/DAY), WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DAY	MEAN DISCHARGE (CFS)	MEAN CONCEN- TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN- TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN- TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)
APRIL			MAY			JUNE			
1	1270	374	1280	1990	109	587	1600	110	481
2	1410	293	1110	1920	95	494	1450	81	319
3	1820	279	1410	1970	97	519	1520	88	363
4	1900	222	1140	2060	99	552	1380	78	290
5	1680	199	901	1850	86	431	1290	81	286
6	1550	203	852	1950	82	435	1310	94	334
7	1470	211	838	2030	75	416	1500	76	312
8	1490	213	864	2050	80	447	1610	65	286
9	1860	214	1080	2010	77	421	1600	62	269
10	1980	188	1010	2010	72	393	1650	104	465
11	2630	201	1430	2080	69	391	1750	88	418
12	2650	155	1120	2080	72	408	1790	85	412
13	2400	130	843	2090	99	562	1650	62	278
14	2180	111	657	1840	93	464	1550	59	247
15	2020	109	597	1690	89	406	1600	---	290
16	1920	117	612	1550	88	371	1540	---	240
17	1970	130	692	1490	106	430	1430	---	200
18	2050	128	709	1470	124	493	1320	---	170
19	1920	112	581	1450	189	737	1220	---	150
20	1750	108	515	1480	202	809	1120	---	120
21	1720	93	436	1510	156	639	1070	---	110
22	1740	90	423	1540	135	563	1300	---	260
23	1690	95	434	1390	103	391	1420	73	282
24	1710	90	419	1290	173	599	1250	53	182
25	1870	105	540	1230	228	757	1120	113	340
26	2120	168	966	1140	287	883	1050	154	441
27	2110	175	999	1110	285	854	1070	148	428
28	1940	146	769	1110	266	792	1100	---	400
29	1920	123	639	1160	141	448	1120	---	410
30	2010	120	652	1150	150	468	1020	---	330
31	---	---	---	1570	223	942	---	---	---
TOTAL	56750	---	24518	51260	---	17102	41400	---	9113

DAY	MEAN DISCHARGE (CFS)	MEAN CONCEN- TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN- TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN- TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)
JULY			AUGUST			SEPTEMBER			
1	953	---	290	803	27	59	344	21	20
2	931	---	240	746	58	118	339	20	19
3	909	---	230	703	88	167	332	23	21
4	883	---	210	651	98	174	328	21	19
5	849	---	200	608	145	239	327	19	17
6	814	---	180	586	200	317	325	19	17
7	774	---	160	569	278	428	318	20	17
8	735	77	153	547	480	709	311	19	16
9	703	90	172	522	307	434	307	---	13
10	683	95	176	502	490	664	304	12	10
11	665	85	153	487	620	817	301	12	9.8
12	666	60	110	474	475	608	311	11	9.3
13	638	50	87	471	401	510	301	10	8.8
14	740	50	102	466	---	550	298	12	10
15	722	43	84	458	---	560	296	13	11
16	733	43	86	483	---	570	292	12	9.8
17	834	46	106	445	---	460	288	12	9.5
18	711	28	56	403	177	197	284	8	6.6
19	711	---	110	401	---	86	286	12	9.3
20	908	---	250	412	71	79	287	13	10
21	918	---	180	411	45	51	284	14	11
22	948	---	170	401	28	31	279	19	15
23	974	---	140	408	29	32	275	17	13
24	974	---	110	434	31	37	272	15	11
25	968	---	110	433	36	43	272	16	12
26	918	---	110	408	32	36	268	15	11
27	852	---	110	389	23	25	263	16	11
28	837	---	96	380	23	24	261	15	11
29	917	45	113	373	19	20	260	16	11
30	1040	61	179	362	18	18	258	20	14
31	892	25	61	352	20	20	---	---	---
TOTAL	25800	---	4534	15088	---	8083	8871	---	383.1
YEAR	376009		155425.1						

14241490 SOUTH FORK TOUTLE RIVER AT CAMP 12, NEAR TOUTLE, WA

LOCATION.--Lat 46°19'05", long 122°40'01", in NE 1/4 SW 1/4 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.

DRAINAGE AREA.--117 mi².

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--February 1981 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 510 ft from topographic map. Prior to Dec. 22, 1982, gage located 1.6 mi upstream at different datum.

REMARKS.--Records fair. No regulation or diversion upstream from station. Quality of water data on file in Washington office. U.S. Geological Survey satellite telemeter at station.

AVERAGE DISCHARGE.--12 years, 567 ft³/s, 65.81 in/yr, 410,800 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 19,200 ft³/s Jan. 9, 1990, gage height, 18.77 ft, from high-water mark, from rating curve number 14 extended above 10,000 ft³/s on basis of straight line extension; minimum daily discharge, 49 ft³/s Nov. 7, 8, 1987, Aug. 21, 1992.

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.--Peak discharges greater than base discharge of 3,100 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Mar. 23	0230	5,330	*16.77	No other peak greater than base discharge.			
Minimum discharge, 66 ft ³ /s several days in September.							

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	174	948	677	342	618	266	615	920	705	e300	222	108
2	174	1050	659	319	566	249	997	832	538	e290	210	105
3	223	855	521	319	528	387	1370	1090	567	e290	199	98
4	187	720	455	318	495	1070	1250	1150	460	e280	191	96
5	165	594	411	278	492	1300	949	937	430	e260	182	93
6	152	503	385	260	492	860	814	922	492	e240	179	94
7	142	801	356	e256	512	676	737	905	534	e240	176	88
8	134	864	456	255	555	625	956	1110	484	e230	171	89
9	129	826	496	e243	562	585	1390	1010	562	e230	168	81
10	123	653	1040	e233	557	537	1610	936	585	201	165	79
11	118	611	722	e223	525	486	1820	808	648	200	162	75
12	114	559	497	213	480	441	1570	694	660	201	162	77
13	119	517	373	e216	439	406	1290	604	545	198	161	73
14	109	481	409	206	407	474	1050	514	470	220	160	73
15	102	444	409	200	378	741	1060	444	523	212	160	69
16	97	406	375	194	343	623	1000	399	457	226	171	69
17	96	384	379	187	328	699	1390	375	388	236	175	67
18	102	397	321	182	312	958	1370	367	359	211	161	66
19	139	612	337	289	304	721	1100	357	334	214	157	66
20	154	521	586	1390	287	785	926	379	318	238	155	69
21	229	1500	761	881	280	646	930	443	310	239	146	72
22	186	2500	651	626	259	1730	1010	447	470	247	143	71
23	153	1440	663	530	247	3660	1320	377	426	258	161	70
24	135	840	585	562	235	1910	1640	345	e420	257	162	68
25	124	677	518	1200	220	1350	1920	327	e380	260	159	69
26	112	538	501	1560	211	1010	1960	316	e340	247	143	69
27	102	709	468	1170	207	780	1640	308	e340	223	139	67
28	102	745	490	1250	204	640	1240	326	e350	240	133	71
29	191	605	446	1170	---	569	1130	330	e365	287	120	71
30	722	761	392	857	---	543	1040	346	e330	314	118	71
31	1060	---	367	697	---	524	---	770	---	241	112	---
TOTAL	5869	23061	15706	16626	11043	26251	37094	19088	13790	7540	5023	2334
MEAN	189	769	507	536	394	847	1236	616	460	243	162	77.8
MAX	1060	2500	1040	1560	618	3660	1960	1150	705	314	222	108
MIN	96	384	321	182	204	249	615	308	310	198	112	66
AC-FT	11640	45740	31150	32980	21900	52070	73580	37860	27350	14960	9960	4630
CFSM	1.62	6.57	4.33	4.58	3.37	7.24	10.6	5.26	3.93	2.08	1.38	.66
IN.	1.87	7.33	4.99	5.29	3.51	8.35	11.79	6.07	4.38	2.40	1.60	.74

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1981 - 1993, BY WATER YEAR (WY)

	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993
MEAN	252	896	818	975	972	842	816	494	359	179	107	115	
MAX	544	1872	1597	1745	1858	1323	1585	795	600	504	182	226	
(WY)	1983	1984	1983	1990	1982	1987	1991	1984	1990	1983	1983	1983	
MIN	58.5	155	500	374	394	295	448	248	116	83.4	66.9	68.9	
(WY)	1988	1988	1986	1985	1993	1992	1987	1992	1992	1992	1992	1987	

SUMMARY STATISTICS

FOR 1992 CALENDAR YEAR

FOR 1993 WATER YEAR

WATER YEARS 1981 - 1993

ANNUAL TOTAL	147894	183425	567
ANNUAL MEAN	404	503	786
HIGHEST ANNUAL MEAN			408
LOWEST ANNUAL MEAN			11000
HIGHEST DAILY MEAN	4160	3660	Mar 23
LOWEST DAILY MEAN	49	66	Sep 18
ANNUAL SEVEN-DAY MINIMUM	56	68	Sep 15
ANNUAL RUNOFF (AC-FT)	293300	363800	411000
ANNUAL RUNOFF (CFSM)	3.45	4.30	4.85
ANNUAL RUNOFF (INCHES)	47.02	58.32	65.89
10 PERCENT EXCEEDS	804	1060	1180
50 PERCENT EXCEEDS	247	379	394
90 PERCENT EXCEEDS	67	109	88

e Estimated

14241490 SOUTH FORK TOUTLE RIVER AT CAMP 12, NEAR TOUTLE, WA--Continued

WATER-QUALITY RECORDS

PERIOD OF DAILY RECORD.--May 1981 to current year. Records prior to October 1985 are published in U.S. Geological Survey Open-File Report 85-632; records for water years 1984-87 are published in U.S. Geological Survey Open-File Report 91-219.

INSTRUMENTATION.--Automatic pumping sediment sampler since May 1981.

EXTREMES FOR PERIOD OF DAILY RECORD.--

SEDIMENT CONCENTRATION: Maximum daily, 34,100 mg/L Dec. 3, 1982; minimum, 1 mg/L on many days.

SEDIMENT DISCHARGE: Maximum daily, 470,000 tons Dec. 3, 1982; minimum, 0.17 tons Aug. 21-24, Sept. 22, 1986.

EXTREMES FOR CURRENT YEAR.--

SEDIMENT CONCENTRATION: Maximum daily, 28,700 mg/L Oct. 30; minimum, 2 mg/L on many days.

SEDIMENT DISCHARGE.--Maximum daily, 100,000 tons Oct. 31; minimum, 0.36 tons Sept. 18, 19.

WATER-QUALITY DATA

DATE	TIME	TEMPERATURE WATER (DEG C)	DIS- CHARGE, INST. CUBIC FEET PER SECOND	SEDIMENT, SUS- PENDED (MG/L)	SEDIMENT, DIS- CHARGE, SUS- PENDED (T/DAY)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM	SED. SUSP. SIEVE DIAM. % FINER THAN .125 MM	SED. SUSP. SIEVE DIAM. % FINER THAN .250 MM	SED. SUSP. SIEVE DIAM. % FINER THAN .500 MM	SED. SUSP. SIEVE DIAM. % FINER THAN 1.00 MM	SED. SUSP. SIEVE DIAM. % FINER THAN 2.00 MM
NOV 1988											
02...	1510	10.5	585	34100	53900	--	--	--	--	--	--
DEC 1989											
05...	1350	10.5	2800	5410	40900	--	--	--	--	--	--
JAN 1990											
10...	1555	7.0	9520	5270	135000	--	--	--	--	--	--
NOV 26...	1415	--	2300	2360	14700	--	--	--	--	--	--
NOV 1991											
20...	1230	--	2440	3020	19900	--	--	--	--	--	--
25...	1445	--	1890	1540	7860	--	--	--	--	--	--
JAN 1992											
28...	1445	--	3630	2930	28700	--	--	--	--	--	--
SEP 25...	1230	13.5	278	3000	2250	--	--	--	--	--	--
OCT 28...	1230	--	96	1710	443	--	--	--	--	--	--
MAR 1993											
04...	1400	--	1080	323	942	--	--	--	--	--	--
24...	1305	8.0	1910	1080	5570	24	37	66	94	100	100

[illegible]

COWLITZ RIVER BASIN

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14241490 SOUTH FORK TOUTLE RIVER AT CAMP 12, NEAR TOUTLE, WA--Continued

SEDIMENT DISCHARGE, SUSPENDED (TONS/DAY), WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DAY	MEAN DISCHARGE (CFS)	MEAN CONCEN- TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN- TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN- TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)
OCTOBER			NOVEMBER			DECEMBER			
1	174	---	450	948	---	32000	677	49	91
2	174	1380	650	1050	8120	23500	659	---	85
3	223	---	6200	855	9980	23000	521	56	79
4	187	---	2900	720	5540	10800	455	76	93
5	165	---	1800	594	5980	9680	411	78	88
6	152	---	1400	503	2890	3940	385	53	55
7	142	---	1100	801	5670	12600	356	55	54
8	134	---	950	864	---	12000	456	149	203
9	129	---	880	826	---	6100	496	89	122
10	123	---	780	653	---	3700	1040	391	1440
11	118	---	720	611	---	2900	722	64	132
12	114	---	660	559	---	2400	497	32	44
13	119	---	730	517	---	2000	373	17	18
14	109	---	610	481	---	1600	409	45	50
15	102	---	530	444	---	1200	409	19	22
16	97	---	500	406	---	780	375	---	12
17	96	---	480	384	---	500	379	---	11
18	102	---	780	397	---	290	321	---	8.0
19	139	---	2200	612	---	4300	337	---	7.8
20	154	---	2500	521	485	706	586	---	66
21	229	---	7000	1500	3090	19700	761	63	136
22	186	5670	2850	2500	1310	9070	651	17	31
23	153	3460	1430	1440	420	1730	663	22	40
24	135	2940	1080	840	170	393	585	13	21
25	124	2300	770	677	195	358	518	9	14
26	112	2240	677	538	144	211	501	7	9.7
27	102	2390	657	709	328	667	468	8	11
28	102	2010	560	745	195	399	490	10	14
29	191	---	3500	605	135	222	446	6	7.9
30	722	28700	69700	761	---	430	392	5	5.4
31	1060	---	100000	---	---	---	367	3	3.6
TOTAL	5869	---	215044	23061	---	187176	15706	---	2974.4

DAY	MEAN DISCHARGE (CFS)	MEAN CONCEN- TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN- TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN- TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)
JANUARY			FEBRUARY			MARCH			
1	342	5	4.8	618	35	59	266	---	15
2	319	---	5.3	566	30	47	249	---	13
3	319	---	5.4	528	22	32	387	29	32
4	318	---	5.0	495	18	25	1070	305	1260
5	278	---	2.9	492	15	20	1300	272	1020
6	260	---	2.2	492	7	9.5	860	75	180
7	e256	---	1.4	512	16	22	676	51	94
8	255	---	1.9	555	26	39	625	40	68
9	e243	---	1.3	562	12	19	585	36	57
10	e233	---	1.9	557	12	19	537	22	33
11	e223	---	1.8	525	9	14	486	29	39
12	213	---	2.6	480	7	10	441	22	27
13	e216	---	2.9	439	16	19	406	10	12
14	206	5	2.8	407	9	11	474	53	82
15	200	---	3.1	378	5	5.9	741	129	278
16	194	---	2.9	343	7	6.7	623	33	56
17	187	---	2.9	328	---	6.7	699	56	118
18	182	---	3.0	312	---	4.9	958	117	303
19	289	51	67	304	---	4.9	721	43	86
20	1390	863	4150	287	---	5.0	785	126	278
21	881	155	398	280	---	4.8	646	69	121
22	626	65	103	259	---	4.0	1730	3170	30700
23	530	21	31	247	7	5.1	3660	6100	66700
24	562	28	47	235	---	4.5	1910	1410	7610
25	1200	251	977	220	---	4.0	1350	609	2260
26	1560	243	1030	211	---	3.3	1010	---	950
27	1170	119	387	207	---	3.0	780	---	480
28	1250	176	644	204	---	2.9	640	---	270
29	1170	118	384	---	---	---	569	---	160
30	857	63	149	---	---	---	543	---	81
31	697	48	91	---	---	---	524	29	41
TOTAL	16626	---	8512.1	11043	---	411.2	26251	---	113424

e Estimated

COWLITZ RIVER BASIN

14241490 SOUTH FORK TOUTLE RIVER AT CAMP 12, NEAR TOUTLE, WA--Continued

SEDIMENT DISCHARGE, SUSPENDED (TONS/DAY), WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DAY	MEAN DISCHARGE (CFS)	MEAN CONCEN- TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN- TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN- TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)
APRIL			MAY			JUNE			
1	615	78	130	920	36	90	705	32	63
2	997	207	557	832	45	102	538	26	40
3	1370	378	1400	1090	90	289	567	43	71
4	1250	182	630	1150	69	219	460	19	25
5	949	71	187	937	30	76	430	17	21
6	814	33	74	922	34	87	492	23	31
7	737	34	69	905	44	112	534	28	41
8	956	130	346	1110	59	178	484	14	19
9	1390	200	765	1010	37	103	562	35	63
10	1610	213	935	936	37	97	585	23	37
11	1820	218	1070	808	19	43	648	26	48
12	1570	---	770	694	18	34	660	21	39
13	1290	---	470	604	23	39	545	17	25
14	1050	---	280	514	20	28	470	14	19
15	1060	---	300	444	11	13	523	19	28
16	1000	---	270	399	---	11	457	17	22
17	1390	---	680	375	---	11	388	12	13
18	1370	---	640	367	---	11	359	14	14
19	1100	---	420	357	16	16	334	15	14
20	926	---	260	379	13	14	318	17	15
21	930	---	250	443	20	25	310	10	8.6
22	1010	---	280	447	13	17	470	43	55.6
23	1320	---	440	377	6	6.2	426	---	37
24	1640	---	880	345	6	6.4	e420	3	3.4
25	1920	---	1900	327	6	6.0	e380	5	5.1
26	1960	323	1710	316	9	8.4	e340	6	5.5
27	1640	186	842	308	11	9.3	e340	5	4.6
28	1240	87	296	326	15	15	e350	6	5.7
29	1130	53	162	330	13	13	e365	8	7.9
30	1040	40	115	346	18	17	e330	3	2.7
31	---	---	---	770	110	273	---	---	---
TOTAL	37094	---	17128	19088	---	1969.3	13790	---	783.5

e Estimated

DAY	MEAN DISCHARGE (CFS)	MEAN CONCEN- TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN- TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN- TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)
JULY			AUGUST			SEPTEMBER			
1	e300	6	4.9	222	5	3.0	108	4	1.2
2	e290	5	3.9	210	2	1.1	105	6	1.7
3	e290	5	3.9	199	4	2.1	98	6	1.6
4	e280	4	3.0	191	7	3.6	96	4	1.0
5	e260	4	2.8	182	10	4.9	93	3	.75
6	e250	4	2.7	179	8	3.9	94	2	.51
7	e240	11	7.1	176	6	2.9	88	3	.71
8	e230	6	3.7	171	5	2.3	89	4	.96
9	e230	4	2.5	168	5	2.3	81	4	.87
10	201	4	2.2	165	4	1.8	79	4	.85
11	200	5	3.2	162	3	1.3	75	3	.61
12	201	4	2.4	162	4	1.7	77	6	1.2
13	198	9	5.7	161	4	1.7	73	2	.39
14	220	10	6.4	160	4	1.7	73	2	.39
15	212	4	2.4	160	4	1.7	69	2	.37
16	226	6	3.9	171	4	1.8	69	4	.75
17	236	6	4.0	175	2	.94	67	8	1.4
18	211	5	2.8	161	2	.87	66	2	.36
19	214	8	5.1	157	4	1.7	66	2	.36
20	238	9	5.8	155	3	1.3	69	2	.37
21	239	5	3.8	146	4	1.6	72	2	.39
22	247	11	7.9	143	4	1.5	71	4	.77
23	258	8	6.2	161	4	1.7	70	4	.76
24	257	5	4.0	162	4	1.7	68	5	.92
25	260	4	3.2	159	3	1.3	69	4	.75
26	247	6	4.0	143	3	1.2	69	3	.56
27	223	4	2.4	139	6	2.3	67	4	.72
28	240	7	4.5	133	6	2.2	71	2	.38
29	287	5	3.9	120	3	.97	71	4	.77
30	314	8	6.8	118	2	1.64	71	4	.77
31	241	4	2.6	112	4	1.2	---	---	---
TOTAL	7540	---	127.7	5023	---	58.92	2334	---	23.14
YEAR	183425		547632.26						

e Estimated

14242580 TOUTLE RIVER AT TOWER ROAD, NEAR SILVER LAKE, WA

LOCATION.--Lat 46°20'02", long 122°50'20", in NW 1/4 SW 1/4 sec.20, T.10 N., R.1 W., Cowlitz County, Hydrologic Unit 17080005, on right bank 10.7 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.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--March 1981 to current year.

REVISED RECORDS.--WDR WA-86-1: 1982 (M) (P), 1983 (M) (P), 1984 (M) (P), 1985 (M).

GAGE.--Water-stage recorder. Elevation of gage is 160 ft, from topographic map.

REMARKS.--Water-discharge records good. No regulation or diversion upstream from station. Some quality of water data available from Washington Office for this station. U.S. Geological Survey satellite telemeter at station.

AVERAGE DISCHARGE.--12 years, 1,967 ft³/s, 53.85 in/yr, 1,425,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 38,200 ft³/s, Feb. 20, 1982, gage height, 24.25 ft; maximum gage height, 28.03 ft Dec. 3, 1982; minimum daily, 243 ft³/s Oct. 14, 1987.

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.--Peak discharges greater than base discharge of 10,000 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Mar. 23	0530	*9,290	*12.04				
Minimum daily discharge, 354 ft ³ /s Sept. 30.							

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	499	1730	2320	1380	2180	791	2060	3290	2810	1340	1180	522
2	496	1910	2270	1290	1950	913	2470	3160	2440	1300	1100	512
3	609	1740	1960	1290	1750	1080	3370	3390	2800	1270	1040	501
4	619	1580	1710	1360	1580	1690	3490	3670	2400	1220	976	492
5	541	1450	1520	1270	1490	2270	2920	3230	2170	1170	912	492
6	498	1250	1410	1150	1450	2040	2610	3230	2210	1130	878	489
7	468	1480	1320	1100	1430	1870	2460	3320	2390	1080	863	477
8	439	1840	1470	1040	1500	1780	2630	3540	2480	1040	839	461
9	425	1920	1890	968	1530	1710	3530	3380	2450	1010	801	453
10	412	1680	2780	914	1540	1610	3900	3310	2600	985	768	446
11	400	1550	2660	889	1460	1500	4760	3210	2680	948	744	438
12	390	1590	2130	874	1360	1400	4600	3080	2780	953	726	457
13	398	1480	1820	881	1270	1310	3970	3020	2540	900	721	444
14	406	1380	1850	851	1170	1350	3460	2740	2320	1030	714	432
15	385	1250	1940	827	1100	2060	3250	2510	2370	1010	702	435
16	375	1160	1780	809	999	2050	3170	2290	2270	1010	719	425
17	368	1090	1870	792	894	2140	3450	2180	2070	1130	727	417
18	369	1070	1740	777	888	2690	3580	2110	1910	1000	636	409
19	440	1370	1660	824	883	2550	3210	2080	1760	957	619	411
20	451	1380	2190	2140	872	2530	2890	2140	1630	1210	627	415
21	586	2280	2460	2290	855	2320	2840	2240	1530	1230	632	410
22	566	3980	2350	2070	814	2860	2980	2320	1950	1280	612	400
23	512	3120	2350	1830	771	8130	3220	2070	2190	1360	622	392
24	478	2530	2230	1800	739	5920	3610	1880	1870	1370	659	387
25	455	2140	2050	2570	698	4570	4110	1770	1660	1370	663	385
26	437	1840	1990	3480	660	3730	4650	1670	1530	1300	625	379
27	422	1890	1920	3160	659	3060	4330	1600	1510	1210	596	369
28	413	2060	1870	3040	694	2620	3700	1600	1550	1190	577	361
29	477	1830	1770	2980	---	2370	3460	1730	1600	1350	569	359
30	956	2210	1610	2650	---	2180	3450	1720	1440	1560	550	354
31	1600	---	1480	2410	---	1980	---	2630	---	1320	535	---
TOTAL	15890	53780	60370	49716	33186	75074	102130	80110	63910	36233	22932	12924
MEAN	513	1793	1947	1604	1185	2422	3404	2584	2130	1169	740	431
MAX	1600	3980	2780	3480	2180	8130	4760	3670	2810	1560	1180	522
MIN	368	1070	1320	777	659	791	2060	1600	1440	900	535	354
AC-FT	31520	106700	119700	98610	65820	148900	202600	158900	126800	71870	45490	25630
CFSM	1.03	3.61	3.93	3.23	2.39	4.88	6.86	5.21	4.30	2.36	1.49	.87
IN.	1.19	4.03	4.53	3.73	2.49	5.63	7.66	6.01	4.79	2.72	1.72	.97

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1981 - 1993, BY WATER YEAR (WY)

	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993
MEAN	848	2837	2798	3209	3264	2789	2708	1982	1576	803	458	441	
MAX	1551	5111	5197	5085	6602	3813	4697	3014	2643	1653	740	708	
(WY)	1982	1984	1983	1983	1982	1987	1991	1984	1990	1983	1993	1983	
MIN	310	497	1705	1454	1185	1315	1729	1226	539	412	306	277	
(WY)	1988	1988	1986	1985	1993	1992	1986	1992	1992	1992	1992	1989	

SUMMARY STATISTICS

FOR 1992 CALENDAR YEAR

FOR 1993 WATER YEAR

WATER YEARS 1981 - 1993

ANNUAL TOTAL	505637	606255											
ANNUAL MEAN	1382	1661											
HIGHEST ANNUAL MEAN										1967			
LOWEST ANNUAL MEAN										2516			1982
HIGHEST DAILY MEAN										1508			1992
LOWEST DAILY MEAN										24900			Jan 24 1982
ANNUAL SEVEN-DAY MINIMUM										243			Oct 14 1987
ANNUAL RUNOFF (AC-FT)										248			Oct 10 1987
ANNUAL RUNOFF (CFSM)	1003000									1425000			
ANNUAL RUNOFF (INCHES)	2.79	3.35								3.96			
10 PERCENT EXCEEDS	2620	3190								3830			
50 PERCENT EXCEEDS	1040	1490								1560			
90 PERCENT EXCEEDS	313	452								382			

COWLITZ RIVER BASIN

14242580 TOUTLE RIVER AT TOWER ROAD, NEAR SILVER LAKE, WA--Continued

WATER-QUALITY RECORDS

PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: May to October 1990, May to September 1991.

WATER TEMPERATURE: May to October 1990, May to September 1991.

SUSPENDED SEDIMENT DISCHARGE: February 1981 to current year. Records prior to October 1985 are published in U.S. Geological Survey Open-File Report 85-632; records for 1984-87 are published in U.S. Geological Survey Open-File Report 91-219.

INSTRUMENTATION.--Water-quality monitor May 1990 to September 1991. Automatic pumping sediment sampler since February 1981.

EXTREMES FOR PERIOD OF DAILY RECORD.--

SEDIMENT CONCENTRATION: Maximum daily, 232,000 mg/L Mar. 20, 1982; minimum, 1 mg/L Oct. 3, 1989.

SEDIMENT DISCHARGE: Maximum daily, 5,930,000 tons Feb. 20, 1982; minimum, 0.71 tons Oct. 3, 1989.

EXTREMES FOR CURRENT YEAR.--

SEDIMENT CONCENTRATION: Maximum daily, 3,540 mg/L Mar. 23; minimum, 6 mg/l Sept. 14.

SEDIMENT DISCHARGE: Maximum daily, 80,500 tons Mar. 23; minimum, 7.0 tons Sept. 14.

WATER-QUALITY DATA

DATE	TIME	TEMPER- ATURE WATER (DEG C)	DIS- CHARGE, INST. CUBIC FEET PER SECOND	SEDI- MENT, SUS- PENDED (MG/L)	SEDI- MENT, DIS- CHARGE, SUS- PENDED (T/DAY)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM	SED. SUSP. SIEVE DIAM. % FINER THAN .125 MM	SED. SUSP. SIEVE DIAM. % FINER THAN .250 MM	SED. SUSP. SIEVE DIAM. % FINER THAN .500 MM	SED. SUSP. SIEVE DIAM. % FINER THAN 1.00 MM	SED. SUSP. SIEVE DIAM. % FINER THAN 2.00 MM
NOV 1987											
25...	1345	8.0	1190	1740	5590	--	--	--	--	--	--
DEC											
01...	1405	7.5	1850	6380	31900	--	--	--	--	--	--
03...	1435	7.5	6910	9010	168000	--	--	--	--	--	--
04...	1405	9.0	4230	3360	38400	--	--	--	--	--	--
04...	1406	9.0	4230	3600	41100	--	--	--	--	--	--
07...	1405	7.5	6280	3580	60700	--	--	--	--	--	--
09...	1435	9.0	6050	3680	60100	--	--	--	--	--	--
09...	1436	9.0	6100	3960	65200	--	--	--	--	--	--
10...	1310	8.0	13400	8740	316000	--	--	--	--	--	--
10...	1311	8.0	13400	8940	323000	--	--	--	--	--	--
18...	1245	4.5	1550	546	2290	--	--	--	--	--	--
JAN 1988											
14...	1430	7.0	8210	4520	100000	--	--	--	--	--	--
15...	1335	7.0	9450	4900	125000	--	--	--	--	--	--
15...	1336	7.0	9400	5190	132000	--	--	--	--	--	--
26...	1330	5.5	1400	416	1570	--	--	--	--	--	--
29...	1320	7.5	3190	992	8540	--	--	--	--	--	--
FEB											
09...	1225	8.5	2360	767	4890	--	--	--	--	--	--
11...	1305	8.0	3660	1190	11800	--	--	--	--	--	--
25...	1325	9.0	1430	214	826	--	--	--	--	--	--
MAR											
10...	1400	7.5	2900	561	4390	--	--	--	--	--	--
29...	1310	9.0	4560	741	9120	--	--	--	--	--	--
APR											
13...	1315	13.5	3130	382	3230	--	--	--	--	--	--
NOV											
17...	1325	8.5	2780	1160	8710	--	--	--	--	--	--
29...	1345	8.5	3570	690	6650	--	--	--	--	--	--
JAN 1989											
03...	1355	8.5	2700	186	1360	--	--	--	--	--	--
11...	1440	7.0	4040	457	4980	--	--	--	--	--	--
17...	1415	7.0	4920	569	7560	--	--	--	--	--	--
FEB											
17...	1410	7.5	2800	355	2680	--	--	--	--	--	--
MAR											
06...	1310	7.5	3160	355	3030	--	--	--	--	--	--
13...	1400	7.5	6100	1100	18100	--	--	--	--	--	--
30...	1305	7.5	3730	252	2540	--	--	--	--	--	--
APR											
07...	1300	11.0	4050	322	3520	--	--	--	--	--	--
JAN 1990											
10...	1310	7.5	16200	6970	305000	--	--	--	--	--	--
12...	1410	7.5	7170	2810	54400	--	--	--	--	--	--
NOV											
13...	1345	9.0	4500	3030	36800	--	--	--	--	--	--
27...	1300	8.5	7450	1580	31800	--	--	--	--	--	--
JAN 1991											
15...	1400	7.5	8440	2040	46500	--	--	--	--	--	--
FEB											
20...	1410	8.5	12100	2810	91800	--	--	--	--	--	--
APR											
05...	1445	8.5	21000	7330	416000	--	--	--	--	--	--
NOV											
21...	1435	9.5	4210	1060	12000	--	--	--	--	--	--
JAN 1992											
29...	1645	9.5	9160	2210	54700	--	--	--	--	--	--
NOV											
02...	1435	10.0	1960	1420	7510	--	--	--	--	--	--
MAR 1993											
23...	1315	9.5	8940	3170	76500	57	69	83	96	100	100

COWLITZ RIVER BASIN

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14242580 TOUTLE RIVER AT TOWER ROAD, NEAR SILVER LAKE, WA--Continued

WATER-QUALITY DATA

DATE	SED. SUSP. FALL DIAM. % FINER THAN .002 MM	SED. SUSP. FALL DIAM. % FINER THAN .004 MM	SED. SUSP. FALL DIAM. % FINER THAN .008 MM	SED. SUSP. FALL DIAM. % FINER THAN .016 MM	SED. SUSP. FALL DIAM. % FINER THAN .031 MM	SED. SUSP. FALL DIAM. % FINER THAN .062 MM	SED. SUSP. FALL DIAM. % FINER THAN .125 MM	SED. SUSP. FALL DIAM. % FINER THAN .250 MM	SED. SUSP. FALL DIAM. % FINER THAN .500 MM	SED. SUSP. FALL DIAM. % FINER THAN 1.00 MM	SED. SUSP. FALL DIAM. % FINER THAN 2.00 MM
NOV 1987											
25...	--	--	--	--	--	41	63	91	100	100	--
DEC											
01...	--	--	--	--	--	60	83	95	99	100	--
03...	--	--	--	--	--	39	66	91	99	100	--
04...	6	9	11	14	18	27	50	87	99	100	--
04...	--	--	--	--	--	25	48	86	100	100	--
07...	--	--	--	--	--	31	47	80	96	100	--
09...	4	6	9	11	16	23	41	83	97	100	--
09...	--	--	--	--	--	21	40	81	98	100	--
10...	--	--	--	--	--	47	64	87	97	99	100
10...	11	13	19	28	36	45	62	87	98	100	--
18...	--	--	--	--	--	26	34	70	99	100	--
JAN 1988											
14...	--	--	--	--	--	37	58	88	97	99	100
15...	--	--	--	--	--	37	50	78	95	99	100
15...	7	11	18	24	28	34	47	78	96	100	--
26...	--	--	--	--	--	26	31	58	98	100	--
29...	--	--	--	--	--	35	48	80	99	100	--
FEB											
09...	--	--	--	--	--	31	39	69	96	100	--
11...	--	--	--	--	--	33	41	74	99	100	--
25...	--	--	--	--	--	44	48	63	88	100	--
MAR											
10...	--	--	--	--	--	31	37	65	93	100	--
29...	--	--	--	--	--	41	48	71	95	99	100
APR											
13...	--	--	--	--	--	46	52	74	99	100	--
NOV											
17...	--	--	--	--	--	27	48	83	97	100	--
29...	--	--	--	--	--	26	32	54	90	100	--
JAN 1989											
03...	--	--	--	--	--	39	44	64	96	100	--
11...	--	--	--	--	--	29	36	58	96	100	--
17...	--	--	--	--	--	40	55	80	95	100	--
FEB											
17...	--	--	--	--	--	82	87	97	100	100	--
MAR											
06...	--	--	--	--	--	85	88	96	99	100	--
13...	--	--	--	--	--	55	62	78	97	100	--
30...	--	--	--	--	--	75	78	89	99	100	--
APR											
07...	--	--	--	--	--	73	77	86	96	100	--
JAN 1990											
10...	8	11	20	25	31	38	54	82	95	100	--
12...	--	--	--	--	--	38	49	76	97	100	--
NOV											
13...	--	--	--	--	--	51	77	94	100	100	--
27...	--	--	--	--	--	45	56	82	99	100	--
JAN 1991											
15...	--	--	--	--	--	32	39	62	91	100	--
FEB											
20...	--	--	--	--	--	29	39	62	90	100	--
APR											
05...	36	45	49	56	66	52	68	86	96	100	--
NOV											
21...	--	--	--	--	--	44	54	75	94	99	100
JAN 1992											
29...	--	--	--	--	--	34	44	69	90	100	--
NOV											
02...	--	--	--	--	--	50	83	97	99	100	--
MAR 1993											
23...	16	23	29	37	47	--	--	--	--	--	--

COWLITZ RIVER BASIN

14242580 TOUTLE RIVER AT TOWER ROAD, NEAR SILVER LAKE, WA--Continued

SEDIMENT DISCHARGE, SUSPENDED (TONS/DAY), WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DAY	MEAN DISCHARGE (CFS)	MEAN CONCENTRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCENTRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCENTRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)
OCTOBER			NOVEMBER			DECEMBER			
1	499	---	310	1730	1430	6690	2320	---	1200
2	496	166	222	1910	1460	7540	2270	---	820
3	609	294	484	1740	775	3680	1960	120	643
4	619	285	473	1580	594	2530	1710	165	757
5	541	140	204	1450	463	1800	1520	193	789
6	498	108	146	1250	385	1290	1410	148	557
7	468	91	116	1480	776	3260	1320	145	512
8	439	88	106	1840	910	4600	1470	---	830
9	425	89	105	1920	698	3660	1890	---	1400
10	412	74	85	1680	503	2280	2780	532	4640
11	400	67	75	1550	341	1430	2660	271	2040
12	390	---	66	1590	---	1500	2130	167	976
13	398	---	58	1480	---	1400	1820	133	659
14	406	---	63	1380	---	1000	1850	131	668
15	385	---	58	1250	---	790	1940	127	676
16	375	---	52	1160	---	640	1780	---	480
17	368	---	86	1090	---	550	1870	---	540
18	369	---	62	1070	---	480	1740	---	490
19	440	450	550	1370	---	1400	1660	---	410
20	451	642	785	1380	255	948	2190	---	1100
21	586	2460	3870	2280	2570	24500	2460	311	2140
22	566	660	998	3980	1550	17300	2350	---	950
23	512	323	445	3120	710	6210	2350	95	617
24	478	240	311	2530	451	3190	2230	83	513
25	455	197	245	2140	345	2020	2050	72	408
26	437	158	190	1840	275	1380	1990	65	354
27	422	125	146	1890	266	1370	1920	53	281
28	413	105	121	2060	223	1260	1870	59	304
29	477	144	188	1830	182	905	1770	---	230
30	956	2420	6870	2210	---	1700	1610	---	210
31	1600	2840	12100	---	---	---	1480	---	180
TOTAL	15890	---	29590	53780	---	107303	60370	---	26374

DAY	MEAN DISCHARGE (CFS)	MEAN CONCENTRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCENTRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCENTRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)
JANUARY			FEBRUARY			MARCH			
1	1380	---	160	2180	---	310	791	---	81
2	1290	---	150	1950	---	230	913	---	87
3	1290	---	160	1750	---	170	1080	56	173
4	1360	---	180	1580	---	140	1690	330	1790
5	1270	---	140	1490	---	120	2270	317	2010
6	1150	38	118	1450	---	110	2040	132	741
7	1100	---	110	1430	---	110	1870	85	434
8	1040	---	97	1500	---	120	1780	75	363
9	968	---	87	1530	---	130	1710	64	300
10	914	---	82	1540	---	130	1610	60	262
11	889	---	78	1460	---	120	1500	55	222
12	874	---	76	1360	31	114	1400	---	190
13	881	---	78	1270	25	88	1310	---	140
14	851	---	74	1170	25	80	1350	---	110
15	827	---	72	1100	25	76	2060	198	1170
16	809	---	70	999	24	66	2050	108	611
17	792	---	69	894	---	56	2140	85	509
18	777	---	67	888	---	61	2690	210	1590
19	824	---	88	883	31	77	2550	120	863
20	2140	---	3400	872	---	72	2530	85	600
21	2290	349	2240	855	---	57	2320	76	488
22	2070	187	1060	814	---	53	2860	504	6210
23	1830	147	735	771	---	51	8130	3540	80500
24	1800	124	608	739	---	49	5920	1530	25200
25	2570	353	2820	698	---	47	4570	715	9000
26	3480	443	4290	660	---	45	3730	474	4910
27	3160	267	2360	659	---	44	3060	391	3340
28	3040	201	1710	694	---	46	2620	376	2750
29	2990	153	1280	---	---	---	2370	334	2190
30	2650	---	780	---	---	---	2180	299	1790
31	2410	---	440	---	---	---	1980	315	1690
TOTAL	49716	---	23679	33186	---	2772	75074	---	150314

COWLITZ RIVER BASIN

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14242580 TOUTLE RIVER AT TOWER ROAD, NEAR SILVER LAKE, WA--Continued

SEDIMENT DISCHARGE, SUSPENDED (TONS/DAY), WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DAY	MEAN	MEAN	SEDIMENT	MEAN	MEAN	SEDIMENT	MEAN	MEAN	SEDIMENT
	DISCHARGE	CONCENTRATION	DISCHARGE	DISCHARGE	CONCENTRATION	DISCHARGE	DISCHARGE	CONCENTRATION	DISCHARGE
	(CFS)	(MG/L)	(TONS/DAY)	(CFS)	(MG/L)	(TONS/DAY)	(CFS)	(MG/L)	(TONS/DAY)
APRIL			MAY			JUNE			
1	2060	322	1800	3290	97	838	2810	---	870
2	2470	329	2250	3160	91	755	2440	75	473
3	3370	395	3850	3390	123	1130	2800	102	774
4	3490	288	2820	3670	119	1160	2400	61	380
5	2920	197	1610	3230	89	748	2170	68	375
6	2610	189	1380	3230	82	688	2210	74	414
7	2460	170	1170	3320	87	754	2390	64	396
8	2630	---	1200	3540	90	845	2480	66	425
9	3530	236	2330	3380	86	769	2450	58	374
10	3900	242	2600	3310	74	645	2600	87	587
11	4760	539	7000	3210	74	626	2680	80	559
12	4600	374	4700	3080	74	605	2780	84	618
13	3970	270	2910	3020	108	862	2540	60	400
14	3460	223	2070	2740	88	629	2320	51	309
15	3250	---	1600	2510	97	631	2370	54	333
16	3170	---	1400	2290	94	550	2270	50	294
17	3450	---	2000	2180	107	593	2070	---	230
18	3580	---	1800	2110	98	523	1910	---	190
19	3210	---	1200	2080	122	640	1760	---	170
20	2890	---	870	2140	143	775	1630	---	140
21	2840	---	760	2240	132	751	1530	---	130
22	2980	---	680	2320	123	732	1950	---	210
23	3220	85	737	2070	82	430	2190	---	280
24	3610	123	1210	1880	108	507	1870	---	190
25	4110	182	2110	1770	148	651	1660	---	150
26	4650	224	2820	1670	159	657	1530	---	130
27	4330	180	2120	1600	181	713	1510	---	130
28	3700	140	1390	1600	168	661	1550	---	140
29	3460	116	1060	1730	---	710	1600	---	140
30	3450	110	999	1720	---	700	1440	---	120
31	---	---	---	2630	---	1400	---	---	---
TOTAL	102130	---	60446	80110	---	22678	63910	---	9931

DAY	MEAN	MEAN	SEDIMENT	MEAN	MEAN	SEDIMENT	MEAN	MEAN	SEDIMENT
	DISCHARGE	CONCENTRATION	DISCHARGE	DISCHARGE	CONCENTRATION	DISCHARGE	DISCHARGE	CONCENTRATION	DISCHARGE
	(CFS)	(MG/L)	(TONS/DAY)	(CFS)	(MG/L)	(TONS/DAY)	(CFS)	(MG/L)	(TONS/DAY)
JULY			AUGUST			SEPTEMBER			
1	1340	---	100	1180	---	87	522	---	12
2	1300	---	100	1100	---	220	512	---	12
3	1270	---	96	1040	---	340	501	8	11
4	1220	---	92	976	---	470	492	10	13
5	1170	---	88	912	---	620	492	8	11
6	1130	---	82	878	---	730	489	---	10
7	1080	---	78	863	---	870	477	---	10
8	1040	---	75	839	---	950	461	---	9.0
9	1010	---	71	801	---	960	453	---	9.0
10	985	---	68	768	---	1000	446	7	8.4
11	948	---	65	744	485	944	438	7	8.3
12	953	---	66	726	453	861	457	7	8.6
13	900	---	61	721	---	890	444	8	9.6
14	1030	---	75	714	---	830	432	6	7.0
15	1010	---	72	702	---	790	435	7	8.2
16	1010	27	72	719	---	830	425	8	9.2
17	1130	50	149	727	---	760	417	9	10
18	1000	23	62	636	65	112	409	---	10
19	957	21	53	619	27	46	411	---	10
20	1210	53	170	627	22	37	415	---	10
21	1230	41	135	632	18	32	410	---	10
22	1280	37	127	612	20	33	400	---	10
23	1360	43	159	622	15	25	392	---	10
24	1370	33	124	659	19	33	387	---	10
25	1370	25	93	663	19	34	385	---	10
26	1300	19	67	625	21	35	379	---	10
27	1210	20	66	596	15	25	369	---	10
28	1190	---	110	577	12	20	361	---	10
29	1350	---	220	569	11	17	359	---	10
30	1560	---	370	550	9	14	354	11	11
31	1320	---	100	535	9	13	---	---	---
TOTAL	36233	---	3266	22932	---	12628	12924	---	297.3
YEAR	606255		449278.3						

COWLITZ RIVER BASIN

14243000 COWLITZ RIVER AT CASTLE ROCK, WA

LOCATION.--Lat 46°16'28", long 122°54'45", in SW 1/4 SE 1/4 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 September 1985; October 1985 to current year (seasonal records).

REVISED RECORDS.--WSP 1218: Drainage area. WSP 1638: 1947(P), 1951.

GAGE.--Water-stage recorder. Datum of gage is 20.20 ft above sea level. 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 datum. May 23, 1980 water-stage recorder at present site and datum.

REMARKS.--No estimated daily discharges. 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. U.S. Geological Survey satellite telemeter at station.

AVERAGE DISCHARGE.--58 years (water years 1927-85), 9,263 ft³/s, 56.21 in/yr, 6,711,000 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 PERIOD NOVEMBER TO APRIL.--Maximum discharge, 14,700 ft³/s Mar. 23, gage height, 13.19 ft; minimum discharge, 3,750 ft³/s Nov. 17.

DISCHARGE, CUBIC FEET PER SECOND, NOVEMBER 1992 TO APRIL 1993
DAILY MEAN VALUES

DAY	NOV	DEC	JAN	FEB	MAR	APR
1	4110	7670	6780	7990	5410	7100
2	4250	7610	6650	7690	5530	7430
3	4150	7260	6660	7440	5640	8600
4	4030	6890	7100	7230	6190	9020
5	3930	6660	8180	7120	7030	8180
6	3800	6540	8210	6700	6720	7730
7	3940	6440	8010	6570	6520	7550
8	4250	6670	8490	6560	6390	7680
9	4380	7990	8380	6560	6310	9190
10	4160	9450	8280	6580	6180	9760
11	4040	9830	8230	6480	6060	10500
12	4090	8170	8180	6080	5960	10300
13	4040	7440	8180	5930	5870	9380
14	3950	7290	8170	5830	5910	8920
15	3870	7400	8150	5760	6610	8670
16	3810	7150	8150	5660	6710	8710
17	3790	7540	8090	5540	6970	8740
18	3960	7620	8060	5540	7770	9000
19	4430	7370	8170	5510	7510	8680
20	4770	8650	10000	5520	7370	8310
21	5810	9080	10700	5530	7140	8200
22	8270	8620	9200	5500	7350	8690
23	7970	8240	8510	5460	13200	9150
24	7310	7890	8510	5430	11000	9550
25	7170	7580	9410	5380	9140	9940
26	6900	7440	10300	5350	8310	10700
27	6890	7370	9830	5340	7690	10500
28	7210	7410	9500	5350	7280	9960
29	6930	7330	9440	---	7050	9750
30	7300	7130	8940	---	6920	9610
31	---	6940	8550	---	6820	---
TOTAL	153510	236670	263010	171630	220560	269500
MEAN	5117	7635	8484	6130	7115	8983
MAX	8270	9830	10700	7990	13200	10700
MIN	3790	6440	6650	5340	5410	7100
AC-FT	304500	469400	521700	340400	437500	534600

COLUMBIA RIVER MAIN STEM

14246900 COLUMBIA RIVER AT BEAVER ARMY TERMINAL, NEAR QUINCY, OR

LOCATION.--Lat 46°10'55", long 123°10'50", in NE 1/4 sec.16, T.8 N., R.4 W., Columbia County, Hydrologic Unit 17080003, on left bank, 0.7 mi downstream from Crims Island, 3.0 mi northwest of Quincy, and at mile 53.8.

DRAINAGE AREA.--256,900 mi², approximately.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--May 1968 to June 1970, June 1991 to current year.

GAGE.--Acoustic velocity meter with water-stage and velocity index recorder. Datum of gage is 0.52 ft above sea level. May 1968 to June 1970 water-stage recorder with auxillary water-stage recorder 5.6 miles downstream, at datum 10.00 ft lower.

REMARKS.--Records good except for estimated daily discharges, which are fair. Flow regulated by many reservoirs on Columbia River and in tributary basins. Flows are tidal affected and frequently reverse direction during tidal cycles except during periods of high runoff. Mean discharge values are based on a 24 hour day, not a tidal cycle.

AVERAGE DISCHARGE.--3 years (water years 1969, 1992-93), 224,200 ft³/s, 162,500,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 581,000 ft³/s Jan. 28, 1970; minimum daily discharge, 88,400 ft³/s Aug. 31, 1992.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 472,000 ft³/s May 18, 19; maximum elevation, 8.78 ft June 5; minimum daily discharge, 95,700 ft³/s Sept. 19.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	130000	141000	e206000	e263000	e186000	e169000	226000	284000	369000	237000	186000	116000
2	129000	136000	e215000	e241000	e208000	e180000	217000	307000	370000	225000	150000	128000
3	128000	160000	e224000	e223000	e210000	e200000	235000	280000	381000	224000	159000	130000
4	128000	160000	e258000	e221000	e204000	138000	e276000	302000	387000	201000	176000	119000
5	131000	139000	e294000	e251000	e224000	169000	e280000	314000	386000	183000	163000	115000
6	134000	149000	e238000	e268000	e177000	170000	310000	322000	363000	182000	180000	102000
7	115000	140000	e235000	e281000	e169000	167000	309000	324000	339000	207000	160000	107000
8	111000	136000	e254000	e282000	e146000	171000	304000	363000	354000	209000	134000	127000
9	124000	135000	e241000	e280000	151000	e192000	308000	371000	367000	208000	140000	135000
10	114000	150000	e229000	e259000	e153000	e183000	316000	375000	369000	186000	143000	134000
11	104000	169000	e271000	e229000	e169000	e189000	325000	383000	345000	182000	135000	e141000
12	96800	145000	e294000	e253000	e164000	e186000	e339000	381000	330000	168000	152000	123000
13	110000	135000	e271000	e223000	e180000	e196000	327000	370000	339000	198000	153000	121000
14	120000	139000	e240000	e263000	e173000	149000	e307000	375000	322000	195000	128000	113000
15	132000	143000	e234000	e235000	e132000	e175000	274000	401000	303000	197000	131000	107000
16	118000	143000	e265000	e228000	e182000	e181000	249000	425000	275000	192000	132000	112000
17	106000	134000	e275000	e192000	e229000	e227000	250000	441000	269000	189000	133000	102000
18	99100	157000	e254000	e149000	e224000	e257000	259000	472000	268000	203000	151000	96200
19	121000	152000	e239000	e193000	e224000	291000	e249000	472000	275000	202000	152000	95700
20	121000	159000	e239000	e221000	e224000	299000	246000	462000	258000	194000	145000	97500
21	130000	140000	e209000	e170000	e194000	313000	249000	465000	250000	186000	130000	112000
22	141000	235000	e218000	e234000	e164000	323000	242000	464000	245000	202000	111000	125000
23	116000	e193000	e221000	e263000	e206000	e360000	242000	461000	250000	186000	119000	141000
24	117000	e237000	e234000	e284000	e209000	e401000	244000	453000	249000	197000	126000	132000
25	107000	e267000	e208000	e227000	e227000	e415000	233000	449000	248000	185000	139000	120000
26	112000	e229000	e168000	242000	e215000	e415000	261000	420000	235000	181000	150000	109000
27	104000	176000	e170000	e240000	e215000	e383000	288000	399000	207000	196000	155000	104000
28	108000	e181000	e174000	236000	e191000	e363000	281000	389000	207000	198000	130000	125000
29	110000	e158000	e229000	e239000	---	e298000	274000	379000	233000	203000	118000	122000
30	106000	e162000	e250000	e211000	---	276000	280000	379000	245000	210000	119000	134000
31	134000	---	e262000	e209000	---	245000	---	371000	---	214000	104000	---
TOTAL	3656900	4900000	7319000	7310000	5350000	7681000	8200000	12063000	9038000	6140000	4404000	3545400
MEAN	118000	163300	236100	235800	191100	247800	273300	389100	301300	198100	142100	118200
MAX	141000	267000	294000	284000	229000	415000	339000	472000	387000	237000	186000	141000
MIN	96800	134000	168000	149000	132000	138000	217000	280000	207000	168000	104000	95700
AC-FT	7253000	9719000	14520000	14500000	10610000	15240000	16260000	23930000	17930000	12180000	8735000	7032000

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1968 - 1993, BY WATER YEAR (WY)

	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993
MEAN	143500	194500	236200	266500	228600	221400	269400	322100	334500	221600	149600	129800														
MAX	166700	248000	271400	334200	259900	247800	406500	469600	403200	270100	184500	151100														
(WY)	1969	1969	1969	1970	1970	1973	1969	1969	1968	1968	1991	1968														
MIN	118000	163300	216000	199400	191100	196700	196200	210900	203900	139500	122200	112700														
(WY)	1993	1993	1970	1992	1993	1992	1992	1968	1992	1992	1992	1992														

SUMMARY STATISTICS

FOR 1992 CALENDAR YEAR

FOR 1993 WATER YEAR

WATER YEARS 1968 - 1993

ANNUAL TOTAL	65445200	79607300	224200	
ANNUAL MEAN	178800	218100	271800	1969
HIGHEST ANNUAL MEAN			182900	1992
LOWEST ANNUAL MEAN			581000	Jan 28 1970
HIGHEST DAILY MEAN	365000	Feb 22	472000	May 18
LOWEST DAILY MEAN	88400	Aug 31	95700	Sep 19
ANNUAL SEVEN-DAY MINIMUM	95700	Aug 27	103000	Sep 15
ANNUAL RUNOFF (AC-FT)	129800000		157900000	
10 PERCENT EXCEEDS	242000		363000	373000
50 PERCENT EXCEEDS	176000		207000	205000
90 PERCENT EXCEEDS	113000		119000	130000

e Estimated

COLUMBIA RIVER MAIN STEM

14246900 COLUMBIA RIVER AT BEAVER ARMY TERMINAL, NEAR QUINCY, OR--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--August 1967 to September 1970, October 1990 to current year.

PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: October 1992 to September 1993.

WATER TEMPERATURE: August 1967 to September 1970. October 1992 to September 1993.

INSTRUMENTATION.--Temperature recorder August 1967 to September 1970. Temperature and specific conductance recorders from October 1992 to September 1993.

EXTREMES FOR PERIOD OF DAILY RECORD.--

WATER TEMPERATURE: Maximum, 23.5°C Aug. 21, 22, 1967; minimum, 0.0°C Jan. 31, Feb. 1, 1969.

EXTREMES FOR CURRENT YEAR.--

SPECIFIC CONDUCTANCE: Maximum recorded, 208 microsiemens Sept. 4, minimum, 93 microsiemens June 1, 2.

WATER TEMPERATURE: Maximum, 22.5°C Sept. 8-10, 12, minimum, 0.5°C Jan. 16, 18, 19.

WATER-QUALITY DATA

			DIS-CHARGE, INST. CUBIC FEET PER SECOND	SPECIFIC CONDUCTANCE (US/CM)	PH WATER WHOLE FIELD (STANDARD UNITS)	TEMPERATURE WATER (DEG C)	TURBIDITY (NTU)	OXYGEN, DIS-SOLVED (MG/L)	OXYGEN, DIS-SOLVED (PER-CENT SATURATION)	COLIFORM, FECA, 0.7 UM-MF (COLS./100 ML)	STREPTOCOCCI, KF AGAR (COLS. PER 100 ML)	HARDNESS, TOTAL (MG/L AS CaCO3)
NOV 1992												
19...	1235	108000	154	8.0	11.0	1.9	10.5	96		K10	K7	56
JAN 1993												
27...	1143	E240000	126	8.0	3.5	6.7	13.1	99		280	69	54
MAR												
16...	1139	E181000	158	8.3	5.0	5.5	13.1	103		K6	K10	61
APR												
27...	0941	352000	152	8.0	10.5	5.7	11.3	102		K85	28	54
MAY												
03...	0953	346000	144	7.9	11.5	8.2	11.0	--		--	--	54
10...	1036	480000	136	7.9	12.0	7.6	11.4	107		--	--	52
17...	0907	489000	141	7.9	14.0	12	11.0	108		--	--	55
24...	0919	544000	127	8.0	15.0	8.1	11.5	115		--	--	48
JUN												
01...	1032	374000	110	7.9	15.0	6.0	10.8	108		--	--	43
07...	0902	442000	104	7.8	15.0	5.6	10.9	108		--	--	42
24...	0929	342000	108	8.2	17.0	1.8	10.6	107		K19	K3	40
AUG												
06...	1113	339000	132	8.3	21.0	1.6	9.5	108		59	K12	53
DATE		CALCIUM, DIS-SOLVED (MG/L AS Ca)	MAGNESIUM, DIS-SOLVED (MG/L AS Mg)	SODIUM, DIS-SOLVED (MG/L AS Na)	SODIUM PERCENT	SODIUM ADSORPTION RATIO	POTASSIUM, DIS-SOLVED (MG/L AS K)	ALKALINITY, DIS IT FIELD (MG/L AS CaCO3)	BICARBONATE, DIS IT FIELD (MG/L AS HCO3)	CARBONATE, DIS IT FIELD (MG/L AS CO3)	SULFATE, DIS-SOLVED (MG/L AS SO4)	CHLORIDE, DIS-SOLVED (MG/L AS Cl)
NOV 1992												
19...	15	4.4	7.4	22	0.4	1.1	54	66		0	11	5.0
JAN 1993												
27...	15	4.1	5.5	18	0.3	1.0	48	59		0	8.3	4.1
MAR												
16...	16	5.0	8.2	22	0.5	1.3	57	70		0	12	6.1
APR												
27...	14	4.6	9.1	26	0.5	1.5	61	75		0	11	5.9
MAY												
03...	14	4.5	8.3	25	0.5	1.5	51	62		0	10	4.9
10...	14	4.0	7.2	23	0.4	1.4	48	59		0	10	4.1
17...	15	4.2	6.6	20	0.4	1.4	51	63		0	10	3.4
24...	13	3.8	6.4	22	0.4	1.3	48	59		0	9.0	3.1
JUN												
01...	12	3.1	4.7	19	0.3	1.0	40	49		0	7.4	2.6
07...	12	3.0	4.6	19	0.3	1.0	35	43		0	7.1	2.6
24...	11	3.1	5.1	21	0.3	1.0	40	49		0	6.7	3.1
AUG												
06...	15	3.8	5.6	18	0.3	1.0	49	59		0	9.2	3.5
DATE		FLUORIDE, DIS-SOLVED (MG/L AS F)	SILICA, DIS-SOLVED (MG/L AS SiO2)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L)	SOLIDS, SUM OF CONSTITUENTS, DIS-SOLVED (MG/L)	SOLIDS, DIS-SOLVED (TONS PER AC-FT)	SOLIDS, DIS-SOLVED (TONS PER DAY)	NITROGEN, AMMONIA DIS-SOLVED (MG/L AS N)	NITROGEN, AMMONIA TOTAL (MG/L AS N)	NITROGEN, NITRITE TOTAL (MG/L AS N)	NITROGEN, NITRATE DIS-SOLVED (MG/L AS N)	NITROGEN, AMMONIA + ORGANIC TOTAL (MG/L AS N)
NOV 1992												
19...	0.2	8.9	89	89	0.12	25900	<0.01	0.01	0.01	0.01	0.01	<0.2
JAN 1993												
27...	0.1	10	83	80	0.11	E53800	0.03	--	--	--	0.02	<0.2
MAR												
16...	0.1	11	105	96	0.14	E51300	0.02	--	--	--	<0.01	0.2
APR												
27...	0.1	16	103	102	0.14	97900	0.04	--	--	--	<0.01	<0.2
MAY												
03...	<0.1	16	95	92	0.13	88800	0.03	--	--	--	<0.01	0.3
10...	0.2	15	94	87	0.13	122000	0.02	--	--	--	0.01	<0.2
17...	<0.1	15	97	88	0.13	128000	0.03	--	--	--	0.01	<0.2
24...	0.2	14	87	82	0.12	128000	0.02	--	--	--	<0.01	0.2
JUN												
01...	0.1	11	74	67	0.10	74700	0.03	--	--	--	<0.01	<0.2
07...	0.1	11	66	63	0.09	78700	0.02	--	--	--	<0.01	<0.2
24...	0.1	9.7	66	64	0.09	61000	0.01	--	--	--	<0.01	<0.2
AUG												
06...	0.1	9.5	83	77	0.11	76100	0.04	--	--	--	<0.01	<0.2

E - Estimated.

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

COLUMBIA RIVER MAIN STEM

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14246900 COLUMBIA RIVER AT BEAVER ARMY TERMINAL, NEAR QUINCY, OR---Continued

WATER-QUALITY RECORDS

DATE	NITRO- GEN, NO2+NO3 TOTAL (MG/L AS N)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N)	PHOS- PHORUS, TOTAL (MG/L AS P)	PHOS- PHORUS, DIS- SOLVED (MG/L AS P)	PHOS- PHORUS ORTHO, DIS- SOLVED (MG/L AS P)	PHOS- PHORUS, ORTHO TOTAL (MG/L AS P)	ALUM- INUM, DIS- SOLVED (UG/L AS AL)	BARIUM, DIS- SOLVED (UG/L AS BA)	COBALT, DIS- SOLVED (UG/L AS CO)	IRON, DIS- SOLVED (UG/L AS FE)	LITHIUM, DIS- SOLVED (UG/L AS LI)
NOV 1992 19...	0.700	0.700	<0.01	0.01	0.02	0.01	<10	19	<3	22	<4
JAN 1993 27...	--	0.530	0.04	0.02	0.02	--	50	20	<3	45	<4
MAR 16...	--	0.310	0.04	<0.01	<0.01	--	20	21	<3	30	<4
APR 27...	--	0.520	0.04	0.02	0.02	--	90	17	<3	70	<4
MAY 03...	--	0.460	0.06	0.04	0.03	--	100	18	<3	120	<4
10...	--	0.410	0.03	0.02	0.03	--	90	18	<3	84	<4
17...	--	0.310	0.06	0.02	0.02	--	80	18	<3	100	<4
24...	--	0.320	0.06	0.04	0.02	--	60	19	<3	69	<4
JUN 01...	--	0.180	0.02	<0.01	0.01	--	50	15	<3	47	<4
07...	--	0.160	0.02	0.02	0.01	--	50	15	<3	60	<4
24...	--	0.085	0.03	0.02	0.02	--	--	--	--	--	--
AUG 06...	--	0.081	0.04	0.02	0.02	--	--	--	--	--	--

DATE	MANGA- NESE, DIS- SOLVED (UG/L AS MN)	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)	SEDI- MENT, SUS- PENDE (MG/L)	SEDI- MENT, DIS- CHARGE, SUS- PENDE (T/DAY)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM
NOV 1992 19...	2	<10	<1	<1	<1	90	<6	6	1740	96
JAN 1993 27...	4	<10	<1	<1	<1	75	<6	16	E10400	80
MAR 16...	2	<10	2	<1	<1	91	<6	20	E9770	78
APR 27...	4	<10	<1	<1	<1	77	<6	15	14300	88
MAY 03...	3	<10	<1	<1	<1	77	<6	22	20600	76
10...	3	<10	<1	<1	<1	80	<6	28	36300	64
17...	3	<10	<1	<1	<1	79	<6	42	55400	62
24...	2	<10	<1	<1	<1	74	<6	36	52800	63
JUN 01...	2	<10	<1	<1	<1	61	<6	22	22200	78
07...	1	<10	1	<1	<1	61	<6	18	21500	76
24...	--	--	--	--	--	--	--	16	14800	87
AUG 06...	--	--	--	--	--	--	--	16	14700	86

DISCHARGE AT PARTIAL-RECORD STATIONS AND MISCELLANEOUS SITES

As the number of streams on which streamflow information is likely to be desired far exceeds the number of stream-gaging stations feasible to operate at one time, the Geological Survey collects limited streamflow data at sites other than stream-gaging stations. When limited streamflow data are collected on a systematic basis over a period of years for use in hydrologic analyses, the site at which the data are collected is called a partial-record station. Data collected at these partial-record stations are usable in low-flow or floodflow analyses, depending on the type of data collected. In addition, discharge measurements are made at other sites not included in the partial-record program. These measurements are generally made in times of drought or flood to give better areal coverage to these events. Those measurements and others collected for some special reason are called measurements at miscellaneous sites.

Records collected at crest-stage partial-record stations are presented in the following table. Discharge measurements made at low-flow partial-record sites and at miscellaneous sites and for special studies are given in separate tables.

Crest-stage partial-record stations

The following table contains annual maximum discharge for crest-stage stations. A crest-stage gage is a device which will register the peak stage occurring between inspections of the gage. A stage-discharge relation for each gage is developed from discharge measurements made by indirect measurements of peak flow or by current meter. The date of the maximum discharge is not always certain but is usually determined by comparison with nearby continuous-record stations, weather records, or local inquiry. Only the maximum discharge for each water year is given. Information on some lower floods may have been obtained but is not published herein. The years given in the period of record represent water years for which the annual maximum has been determined.

Annual maximum discharge at crest-stage partial-record stations during water year 1993

Station name and number	Location and drainage area	Period of record	Water year 1993 maximum		Period of record maximum			
			Date	Gage height (ft)	Dis- charge (ft ³ /s)	Date	Gage height (ft)	Dis- charge (ft ³ /s)
KENNEDY CREEK BASIN								
Kennedy Creek near Kamilche (12078400)	Lat 47°04'37", long 123°07'33", in SW 1/4 NE 1/4 sec.1, T.18 N., R.4 W., Mason County, on left bank, 100 ft upstream from Kennedy Falls, 2.2 mi upstream from mouth at Oyster Bay, and 3.9 mi south of Kamilche.	1961-71†, 1972-74, 1976-79, 1991-93	1-31-93	3.13	432	12-11-77	4.50	1,380
PEND OREILLE RIVER BASIN								
Calispell Creek near Dalkena, (12396000)	Lat 48°14'40", long 117°20'26", in NE 1/4 SW 1/4 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. Drainage area is 68.3 mi ² .	1950-73†, 1974-93	3-24-93	7.42	478	1-15-74	14.38	3,190

† Operated as a continuous-record gaging station.

DISCHARGE AT PARTIAL-RECORD STATIONS AND MISCELLANEOUS SITES

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Discharge measurements made at miscellaneous sites during water year 1993

Stream	Tributary to	Location	Drainage area (mi ²)	Measured previously (water years)	Measurements Date	Discharge (ft ³ /s)
CHEHALIS RIVER BASIN						
12020565 Chehalis River	Grays Harbor	Lat 46°37'54", long 123°14'51", in NW 1/4 NE 1/4 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.	---	1978-92	10-16-92 2-19-93 4-14-93 8- 2-93 9-27-93	39 273 1,180 111 43
BLACK RIVER BASIN						
12029150 Mill Creek	Black River	Lat 46°53'17", long 123°05'44", in SW 1/4 SW 1/4 sec.5, T.16 N., R.3 W., Thurston County, 125 ft upstream from Mina Creek, and 3.8 mi west of Littlerock.	---	---	11- 4-92 12-14-92 2-19-93 4-12-93 6-10-93 7-30-93 9-27-93	3.7 6.0 4.6 15 5.6 2.3 1.0
HUMPTULIPS RIVER BASIN						
12039000 Humptulips River	Grays Harbor	Lat 47°13'42", long 123°56'23", NE 1/4 NE 1/4 sec.17, T.20 N., R.10 W., Grays Harbor County, on right bank, southeast of Humptulips, 2.3 mi upstream from Stevensmile Creek, 3.3 mi downstream from confluence of East and West Forks, at mile 24.8.	130	1933-35†, 1942, 1942-79†, 1980-82, 1985-92	10-19-92 12-14-92 2- 8-93 4-19-93 7- 6-93 9-28-93	1,040 2,880 944 1,790 305 110
DESCHUTES RIVER BASIN						
12079004 Deschutes River	Budd Inlet	Lat 46°52'37", long 122°43'44", in SE 1/4 NW 1/4 sec.18, T.16 N., R.1 E., Thurston County, at State Highway 507, 2.2 mi southwest of Rainier, and at mile 21.6.	101	1980-91	10- 7-92 12- 2-92 2-12-93 4- 6-93 6- 9-93 8- 5-93	30 175 144 215 138 56
CHAMBERS CREEK BASIN						
12090330 Clover Creek	Chambers Creek	Lat 47°06'17", long 122°22'32", in SW 1/4 NW 1/4 sec.25, T.19 N., R.3 E., Pierce County, 2.7 mi east of Spanaway, at Military Road, at crest-stage gage.	---	1991-92	6-25-93	*3.0
12090335 Clover Creek	do.....	Lat 47°07'07", long 122°22'48", in SE 1/4 NE 1/4 sec.23, T.19 N., R.3 E., at 152nd Street East, near Spanaway.	---	---	6-26-91 4-21-92 6-25-93	a19 a16 *10
12090355 Clover Creek	do.....	Lat 47°07'140", long 122°23'43", in SW 1/4 SW 1/4 sec.14, T.19 N., R.3 E., Pierce County, at 25th Avenue East crossing, 3.2 mi southeast of Parkland.	20.7	1991-92†	6-25-93	*9.6
12090358 Clover Creek	do.....	Lat 47°07'30", long 122°24'44", in NW 1/4 SW 1/4 sec.48, T.19 N., R.3 E., Pierce County, at 12th Avenue East, below Brookdale Golf Course, near Spanaway.	---	---	6-26-91 4-21-92 6-25-93	a11 a13 *6.3
12090360 Clover Creek	do.....	Lat 47°07'56", long 122°25'33", in NW 1/4 SE 1/4 sec.16, T.19 N., R.3 E., Pierce County, 1.9 mi southeast of Parkland, at 138th Street South, at crest-stage gage.	---	1991-92	6-25-93	*1.2
12090362 Clover Creek	do.....	Lat 47°08'01", long 122°25'43", in NW 1/4 SE 1/4 sec.16, T.19 N., R.3 E., Pierce County, 1.7 mi southeast of Parkland, at 136th Street South, at staff gage.	---	1991-92	6-25-93	*0.66
12090430 Clover Creek	do.....	Lat 47°08'35", long 122°27'28", in SW 1/4 SW 1/4 sec.8, T.19 N., R.3 E., Pierce County, 0.8 mi southwest of Parkland, at 17th Avenue South, at crest-stage gage.	---	1991-92	6-25-93	b0.01
12091500 Chambers Creek	Puget Sound	Lat 47°11'55", long 122°31'45", in NE 1/4 NE 1/4 sec.27, T.20 N., R.2 E., Pierce County, 300 ft downstream from Leach Creek, 1.5 mi downstream from outlet of Steilacoom Lake, and 4.0 mi northeast of Steilacoom.	104	1938-40†, 1941, 1943-65†, 1966, 1972,1973 1975,1976, 1984-92	10- 7-92 12-18-92 1-14-93 2-12-93 4-16-93 7-19-93 8-20-93	30 63 60 78 117 58 46

† Operated as a continuous-record gaging station.

* Base flow.

a Not previously published.

b Estimated.

DISCHARGE AT PARTIAL-RECORD STATIONS AND MISCELLANEOUS SITES

Discharge measurements made at miscellaneous sites during water year 1993--Continued

Stream	Tributary to	Location	Drainage area (mi ²)	Measured previously (water years)	Measurements Discharge Date (ft ³ /s)
PUYALLUP RIVER BASIN					
12095690 Carbon River	Puyallup River	Lat 47°07'00", long 122°13'08", in NE 1/4 SW 1/4 sec.19, T.19 N., R.5 E., Pierce County, 1.5 mi northwest of Orting, and at mile 1.1.	230	1988-92	10- 8-92 226 12- 3-92 692 1-25-93 6,890 2-16-93 309 4- 5-93 831 6- 3-93 1,070 8-10-93 459
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, 1982-92	10-28-92 479 12- 7-92 953 2-16-93 673 4- 5-93 1,520 6- 4-93 1,990 8-10-93 1,090
12102075 Clarks Creek	Puyallup River	Lat 47°11'52", long 122°20'10", in NE 1/4 NE 1/4 sec.30, T.20 N., R.4 E., Pierce County, at private bridge at end of Tacoma Road, 1.0 mi northwest of Puyallup, and at mile 1.5.	---	---	6-11-93 41 9-30-93 41
12102100 Clarks Creek	do.....	Lat 47°12'50", long 122°20'25", in NE 1/4 NE 1/4 sec.19, T.20 N., R.4 E., Pierce County, at Clarks Creek- Puyallup River Road bridge, 1.1 mile northwest of Puyallup, and at mile 0.02.	---	1981-84, 1986-87, 1990-92	10-29-92 51 12- 8-92 49 2- 5-93 45 4- 2-93 47
12101110 White River	do.....	Lat 47°12'15", long 122°14'10", in NW 1/4 SW 1/4 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 1977-91	10-15-92 590 2- 5-93 1,700 6-11-93 2,850
LAKE WASHINGTON BASIN					
12126500 Sammamish River	do.....	Lat 47°45'20", long 122°11'35", in NW 1/4 SE 1/4 sec.8, T.26 N., R.5 E., on left bank in Bothell, 0.25 mi downstream from North Creek, and 3.5 mi upstream from mouth.	212	1940-63†, 1964, 1982-92	10-15-92 98 12-11-92 660 1-22-93 379 2-17-93 239 3-17-93 339 4-21-93 535 5-19-93 317 7-21-93 333 8-18-93 145
SNOHOMISH RIVER BASIN					
12141100 Skykomish River	Snohomish River	Lat 47°51'08", long 121°57'29", in NE 1/4 NE 1/4 sec.12, T.27 N., R.6 E., Snohomish County, at State Highway 203 bridge, at south city limits of Monroe.	834	1922 1951, 1955 1959 1967-87 1989 1991	9-30-93 836
12145000 Tokul Creek	Snoqualmie River	Lat 47°33'13", long 121°50'09", in SW 1/4 NW 1/4 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, c1959-61, 1962-92	10- 5-92 32 7-14-93 1,370
12155400 Pilchuck River	Snohomish River	Lat 47°54'47", long 122°04'56", in NW 1/4 SE 1/4 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, 1978-92	10-13-92 76
STILLAGUAMISH RIVER BASIN					
12164510 South Fork Stillaguamish River	Stillaguamish River	Lat 48°12'03", long 122°07'04", in NE 1/4 SE 1/4 sec.2, T.31 N., R.5 E., Snohomish County, at State Highway 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, 1978-92	10-16-92 274 12-23-92 4,590 2-12-93 1,200 4-12-93 1,800 6-28-93 1,400 8-16-93 348
12165500 North Fork Stillaguamish River	do.....	Lat 48°16'48", long 121°42'04", in NW 1/4 NW 1/4 sec.7, T.32 N., R.9 E., Snohomish County, at county highway bridge, 1.0 mi north of Whitehorse, at mile 30.0.	82.2	1950-57†, 1974 1976	10-16-92 48 12-17-92 268 2-12-93 424 4-15-93 438 6-25-93 367 8-30-93 87
12167700 Stillaguamish River	Port Susan	Lat 48°11'48", long 122°12'33", in SW 1/4 SE 1/4 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†, 1976-92	10-16-92 557 12-21-92 4,750 2-11-93 3,340 4-12-93 4,020 6-16-93 3,980 8-16-93 754

† Operated as a continuous-record gaging station.

* Base flow.

b Not previously published.

c 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 1993--Continued

Stream	Tributary to	Location	Drainage area (mi ²)	Measured previously (water years)	Measurements Date	Discharge (ft ³ /s)
SKAGIT RIVER BASIN						
12177900 Ladder Creek	Skagit River	Lat 48°40'12", long 121°14'20", in NE 1/4 SE 1/4 sec.21, T.27 N., R.12 E., Whatcom County, Ross Lake National Recreation Area, at Gorge powerhouse, at east edge of Newhalem, and 250 ft upstream from mouth.	7.95	1934, 1960, 1988-92	10-13-92 12-10-92 4-12-93 6-23-93 8-25-93	19 19 26 48 25
SAMISH RIVER BASIN						
12201100 Friday Creek	Samish River	Lat 48°33'32", long 122°19'38", on section line, SW 1/4 SW 1/4 sec.32, T.36 N., R.4 E., Skagit County, at county bridge, 0.7 mi upstream from mouth, and 5.7 mi north of Burlington.	38.1	1974	10-14-92 12-22-92 2-10-93 4- 5-93 6-21-93 8-11-93	27 278 75 93 28 7.1
12201500 Samish River	Samish Bay	Lat 48°32'44", long 122°20'19", in SE 1/4 SE 1/4 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†, c1972-79, 1972-74, 1976-92	10- 7-92 12-22-92 2-11-93 4- 8-93 6-21-93 8-11-93	49 564 183 283 90 48
PEND OREILLE RIVER BASIN						
12396000 Calispell Creek	Pend Oreille River	Lat 48°14'40", long 117°20'26", in NE 1/4 SW 1/4 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, 1976-83, c1974-92	4-13-93 6-22-93 8-31-93	188 30 4.0
Harvey Creek	Sullivan Lake	Lat 48°46'08", long 117°17'45", in NE, NW sec.30, T.38 N., R.44 E., Pend Oreille County, Hydrologic Unit 17010216, 6.5 mi southeast of Metaline Falls.	---	1967	8-31-93	18
12396900 Sullivan Creek	Pend Oreille River	Lat 48°50'47", long 117°17'09", in SW, SE sec.30, T.39 N., R.44 E., Pend Oreille County, Hydrologic Unit 17010216, Colville National Forest, at road bridge 0.1 mi upstream from Outlet Creek, and at mi 5.	70.2	1912, 1973, 1977	8-31-93	64
12398000 Sullivan Creek	do.....	Lat 48°51'40", long 117°21'50", in SW, SW sec.22, T.39 N., R.43 E., Pend Oreille County, Hydrologic Unit 17010216, at state highway 31, 0.5 mi east of Metaline Falls, and at mile 0.5.	142	1977	5-13-93 6-24-93 8-31-93	1,040 166 87
FRANKLIN D. ROOSEVELT LAKE BASIN						
12399600 Deep Creek	Franklin D. Roosevelt Lake	Lat 48°55'47", long 117°44'59", in SE, NW sec.34, T.40 N., R.40 E., Stevens County, Hydrologic Unit 17020001, 0.5 mi upstream from mouth, 2 mi northeast of Northport.	191	1977	10-15-92 4-15-93 6-23-93	12 134 81
SANPOIL RIVER BASIN						
12433790 Sanpoil River	do.....	Lat 48°39'04", long 118°42'16", in NW, NE sec.5, T.36 N., R.33 E., Ferry County, Hydrologic Unit 17020004, at private road bridge, just upstream from an unnamed tributary, 1.7 mi upstream from Granite Creek, 1.5 mi east of Republic.	90.5	1975-77	10-29-92 3-24-93 5-20-93 6- 7-93	4.9 28 101 33
12434590 Sanpoil River	do.....	Lat 48°05'04", long 118°41'25", in NW 1/4 SW 1/4 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, 1980-92	3-26-93 5-20-93 8-12-93	625 576 171
NESPELEM RIVER BASIN						
12437505 Nespelem River	do.....	Lat 48°09'55", long 118°58'46", on south line of SE 1/4 SE 1/4 sec.24, T.31 N., R.30 E., 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†, c1975-79, 1981-92	3-26-93 5-17-93 8-12-93	44 121 21

† Operated as a continuous-record gaging station.

c Operated as a crest-stage gage.

DISCHARGE AT PARTIAL-RECORD STATIONS AND MISCELLANEOUS SITES

Discharge measurements made at miscellaneous sites during water year 1993--Continued

Stream	Tributary to	Location	Drainage area (mi ²)	Measured previously (water years)	Measurements Date	Discharge (ft ³ /s)
OKANOGAN RIVER BASIN						
12443600 Similkameen River	Okanogan River	Lat 48°56'05", long 119°26'27", in NE 1/4 SW 1/4 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, 1975-92	3-23-93 474 5-20-93 11,900 8-11-93 1,970	
ICICLE CREEK BASIN						
12458000 Icicle Creek	Wenatchee River	Lat 47°32'28", long 120°43'08", in SE 1/4 SE 1/4 sec.28, T.24 N., R.17 E., Chelan County, on right bank 1,000 ft upstream from Icicle Canal diversion dam, 0.4 mi upstream from Snow Creek, 4.8 mi southwest of Leavenworth, and at mile 5.8.	193	1926, 1936-72, 1975-77, 1991-92	9-30-93 71	
12458500 Icicle Creek	do.....	Lat 47°33'49", long 120°40'00", in SW 1/4 NW 1/4 sec.24, T.24 N., R.17 E., Chelan County, downstream side county road bridge, near center of span, 1.8 mi south of Leavenworth, and at mile 2.5.	211	---	10-15-92 93 12- 9-92 144 2-12-93 154 4-16-93 381 5-15-93 3,170 6- 9-93 1,210	
CRAB CREEK BASIN						
12470500 Rocky Ford Creek	Moses Lake	Lat 47°18'46", long 119°26'40", in SW 1/4 SW 1/4 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.	12	1909-11, 1942-92	10- 8-92 57 10- 8-92 55 2- 4-93 37 4- 9-93 30 5-28-93 25 6-24-93 37 7-20-93 35 8-19-93 39	
YAKIMA RIVER BASIN						
Wilson Creek	Yakima River	Lat 46°55'01", long 120°30'25", in NE 1/4 SW 1/4 sec.31, T.17 N., R.19 E., Kittitas County, 200 ft upstream from mouth, 0.7 mi downstream from Cherry Creek, 0.8 mi south of Thrall.	382	1914, 1915, 1971, 1973-75, 1977	12- 8-92 89 2- 9-93 106 4- 7-93 174 8- 3-93 314	
GRANDE RONDE RIVER BASIN						
Grande Ronde River	Snake River	Lat 46°04'13", long 117°00'16", in SW 1/4 NE 1/4 sec.23, T.7 N., R.46 E., Asotin County, Hydrologic Unit 17060106, at county road bridge, 2.8 mi upstream from mouth, 1.5 mi downstream from Joseph Creek, and 8 mi southeast of Anatone.	---	1976-77, 1981	12- 3-92 828 1-27-93 1,090 9-15-93 706	

A series of discharge measurements were made on June 25, 1993 on Clover Creek and its main tributaries to study the gains and losses of water on the main stem of Clover Creek. The creek is 12.5 miles long beginning as a spring at mile 12.1 and ending at Stellacoom Lake. Several channel modification projects sponsored by the Clover Creek Council were conducted in February and March 1992, September 1992 and May 1993 that were intended to reduce seepage losses in the main stem of Clover Creek and maintain streamflows throughout the year in order to enhance the salmon fish habitat. Creek flows were stable during the seepage run with no rain falling during the prior two days before measurements were made. The flow of Clover Creek possibly may be a combination of gains and not a gain or loss. No diversions of flow are known. Indicated gains or losses may be substantially in error as affected by small inaccuracies in the open-channel measurements.

			Meas. disch. (ft ³ /s)	Gain or loss	Water temp. (°C)	Specific conductance (uS/cm)	Chloride (Cl) (mg/L)
Clover Creek mile	Stream	Location	June 25, 1993				
10.4	Clover Creek	Crest-stage gaging station at Military Road, near Spanaway (12090330).....	3.04	--	--	--	--
9.3	do.....	NE1/4SW1/4 sec.23, T.19 N., R.3 E. at 152nd Street (12090335).....	10.2	+7.16	--	--	--
8.2	do.....	Gaging station at 25th Ave. East, near Parkland (12090355).....	9.55	-0.65	--	--	--
7.4	do.....	NW1/4SW1/4 sec.48, T.19 N., R.3 E. at 12th Ave. East, below Brookdale Golf Course, near Spanaway (12090358).....	6.30	-3.25	--	--	--
6.5	do.....	Crest-stage gaging station below 138th St. South, near Parkland (12090360).....	1.20	-5.10	--	--	--
6.3	do.....	Staff gage station at 136th St. South near Parkland (12090362).....	0.66	-0.54	--	--	--
6.2	North Fork Clover Creek	SW1/4SE1/4 sec.41, T.19 N., R.3 E., 0.04 mi upstream from mouth.....	0.0	--	--	--	--
4.6	Clover Creek	Crest-stage gaging station at 17th Ave. South, near Parkland (12090430).....	*0.01	-0.65	--	--	--
* Estimated discharge							

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.--Elevation of land-surface datum is 2,060.4 ft above sea level.

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 1992 TO SEPTEMBER 1993

Date	Water Level	Date	Water Level	Date	Water Level	Date	Water Level
OCT 23	107.94	JAN 22	108.58	APR 22	103.16	JUL 23	104.84
DEC 2	107.30	FEB 22	108.67	MAY 25	100.30	AUG 27	106.72
DEC 21	106.91	MAR 23	107.44	JUN 22	103.79	SEP 24	106.85

STEVENS COUNTY

475529118052201. Local number, 28/37-13K1.

LOCATION.--Lat 47°55'29", long 118°05'23", Hydrologic Unit 17010307, Spokane Indian Reservation.

Owner: USGS No. 33

AQUIFER.--Holocene alluvium; Pre-Cambrian Granite contact.

WELL CHARACTERISTICS.--Drilled observation-test water table well, diameter 4 in, total depth 9 ft, PVC casing.

DATUM.--Elevation of land-surface datum is 2,140 ft.

REMARKS.--Water level measured in casing.

PERIOD OF RECORD.--May 1984 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 0.52 ft below land-surface datum, Mar. 26, 1993; lowest measured, 3.09 ft below land-surface datum, Aug. 23, 1988.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

Date	Water Level	Date	Water Level	Date	Water Level	Date	Water Level
OCT 2	2.40	JAN 29	1.64	MAY 3	1.01	JUL 30	1.08
DEC 1	1.69	MAR 5	1.52	MAY 25	1.15	AUG 30	1.03
DEC 31	1.83	MAR 26	0.52	JUN 28	1.21		

475530118052301. Local number, 28/37-13L1.

LOCATION.--Lat 47°55'30", long 118°05'23", Hydrologic Unit 17010307, Spokane Indian Reservation.

Owner: USGS No. 34

AQUIFER.--Holocene alluvium; Pre-Cambrian Granite contact.

WELL CHARACTERISTICS.--Drilled observation-test water table well, diameter 4 in, total depth 11 ft, PVC casing.

DATUM.--Elevation of land-surface datum is 2,171 ft.

REMARKS.--Water level measured in casing.

PERIOD OF RECORD.--May 1984 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 2.87 ft below land-surface datum, Mar. 26, 1993; lowest measured, 4.15 ft below land-surface datum, Aug. 26, 1986.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

Date	Water Level	Date	Water Level	Date	Water Level	Date	Water Level
OCT 2	3.52	JAN 29	3.31	MAY 3	3.17	JUL 30	3.16
DEC 1	3.34	MAR 5	3.33	MAY 25	3.20	AUG 30	3.13
DEC 31	3.35	MAR 26	2.87	JUN 28	3.26		

475529118052301. Local number, 28/37-13L3.

LOCATION.--Lat 47°55'29", long 118°05'23", Hydrologic Unit 17010307, Spokane Indian Reservation.

Owner: USGS No. 32

AQUIFER.--Holocene alluvium; Pre-Cambrian Granite contact.

WELL CHARACTERISTICS.--Drilled observation-test water table well, diameter 4 in, total depth 18 ft, PVC casing.

DATUM.--Elevation of land-surface datum is 2,142 ft.

REMARKS.--Water level measured in casing, temperature, conductance, and pH measurements made from samples pumped (peristaltic pump) from well.

PERIOD OF RECORD.--May 1984 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 3.40 ft below land-surface datum, Mar. 26, 1993; lowest measured, 5.34 ft below land-surface datum, Aug. 23, 1988.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

Date	Water Level	Date	Water Level	Date	Water Level	Date	Water Level
OCT 2	4.58	JAN 29	3.91	MAY 3	3.66	JUL 30	3.63
DEC 1	3.99	MAR 5	3.88	MAY 25	3.71	AUG 30	3.58
DEC 31	4.06	MAR 26	3.40	JUN 28	3.77		

THURSTON COUNTY

470318122581601. Local number, 18N/02W-07R01.

LOCATION.--Lat 47°03'18", long 122°58'19", Hydrologic Unit 17110019, near Olympia.

Owner: Robert Garrigues

AQUIFER.--Vashon advance outwash of Pleistocene age.

WELL CHARACTERISTICS.--8-inch diameter well drilled to a total depth of 125 ft, cased to 120 ft, and screened from 120 ft to 125 ft.

DATUM.--Elevation of land-surface datum is 170 ft.

REMARKS.--Water level measured by owner since January 1991. Additional record for period April 1980 to September 1990 available in Tacoma district office.

PERIOD OF RECORD.--June 1972 to September 1979; October 1990 to present.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 68.98 ft below land-surface datum, June 1976; lowest water level measured, 87.26 ft below land-surface datum, January 1978.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

Date	Water Level	Date	Water Level	Date	Water Level	Date	Water Level
OCT 31	84.04	JAN 2	85.53	FEB 28	85.85	MAR 28	85.97
NOV 30	84.78						

QUALITY OF GROUND WATER

405

STEVENS COUNTY

LOCATION.--Lat 47°55'29", long 118°05'23", Hydrologic Unit 17010307, Spokane Indian Reservation.

Owner: USGS No. 32

AQUIFER.--Holocene alluvium; Pre-Cambrian Granite contact.

WELL CHARACTERISTICS.--Drilled observation-test water table well, diameter 4 in, total depth 18 ft, PVC casing.

DATUM.--Elevation of land-surface datum is 2,142 ft.

REMARKS.--Water level measured in casing, temperature, conductance, and pH measurements made from samples pumped (peristaltic pump) from well (see Ground-Water Levels section for water levels).

PERIOD OF RECORD.--May 1984 to current year.

WATER-QUALITY DATA, OCTOBER 1992 TO SEPTEMBER 1993

LOCAL IDENT- I- FIER	STATION NUMBER	GEO- LOGIC UNIT	DATE OF SAMPLE	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH (UNITS)	TEMPER- ATURE (DEG C)
28/37-13L3	475529118052301	110ALVM	92-10- 2	1650	6.8	10.5
			92-12- 1	1810	7.2	6.8
			92-12-31	1970	7.1	5.5
			93- 1-29	2060	6.8	4.9
			93- 3- 5	2170	6.7	4.4
			93- 3-26	2110	6.6	4.4
			93- 5- 3	2020	7.0	6.0
			93- 5-25	1970	6.6	7.8
			93- 6-28	1860	6.7	9.8
			93- 7-30	1850	6.6	11.0
			93- 8-30	1880	6.6	12.0

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CONVERSION FACTORS AND VERTICAL DATUM

Multiply	By	To obtain
<i>Length</i>		
inch (in.)	2.54×10^1	millimeter
	2.54×10^{-2}	meter
foot (ft)	3.048×10^{-1}	meter
mile (mi)	1.609×10^0	kilometer
<i>Area</i>		
acre	4.047×10^3	square meter
	4.047×10^{-1}	square hectometer
	4.047×10^{-3}	square kilometer
square mile (mi ²)	2.590×10^0	square kilometer
<i>Volume</i>		
gallon (gal)	3.785×10^0	liter
	3.785×10^0	cubic decimeter
	3.785×10^{-3}	cubic meter
million gallons (Mgal)	3.785×10^3	cubic meter
	3.785×10^{-3}	cubic hectometer
cubic foot (ft ³)	2.832×10^1	cubic decimeter
	2.832×10^{-2}	cubic meter
cubic-foot-per-second day [(ft ³ /s) d]	2.447×10^3	cubic meter
	2.447×10^{-3}	cubic hectometer
acre-foot (acre-ft)	1.233×10^3	cubic meter
	1.233×10^{-3}	cubic hectometer
	1.233×10^{-6}	cubic kilometer
<i>Flow</i>		
cubic foot per second (ft ³ /s)	2.832×10^1	liter per second
	2.832×10^1	cubic decimeter per second
	2.832×10^{-2}	cubic meter per second
gallon per minute (gal/min)	6.309×10^{-2}	liter per second
	6.309×10^{-2}	cubic decimeter per second
	6.309×10^{-5}	cubic meter per second
million gallons per day (Mgal/d)	4.381×10^1	cubic decimeter per second
	4.381×10^{-2}	cubic meter per second
<i>Mass</i>		
ton (short)	9.072×10^{-1}	megagram or metric ton

Sea level: In this report “sea level” refers to the National Geodetic Vertical Datum of 1929 (NGVD of 1929)—a geodetic datum derived from a general adjustment for the first-order level nets of both the United States and Canada, formerly called Sea Level Datum of 1929.



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